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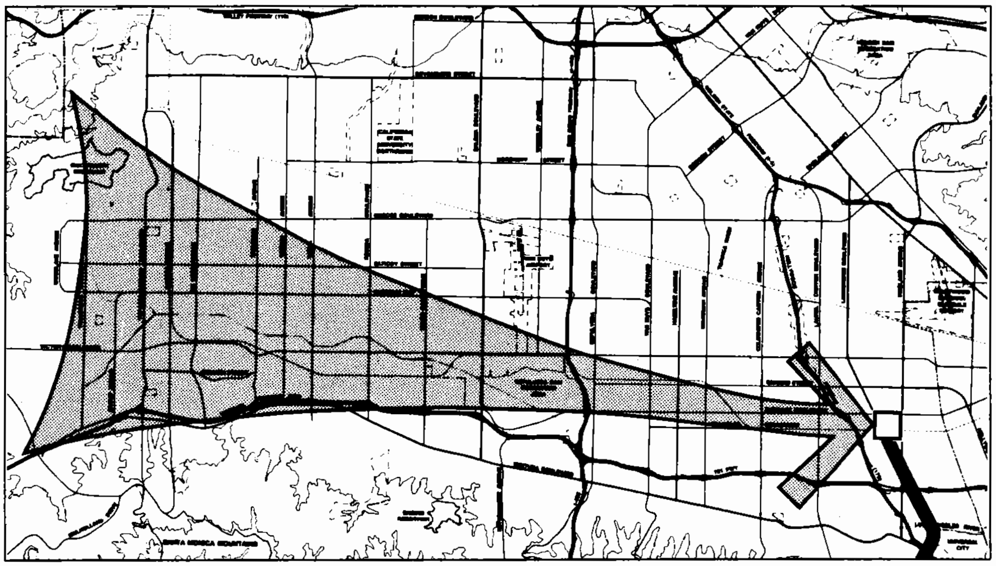
Draft MIS/EIS/SEIR
Major Investment Study
Environmental Impact Statement
Supplemental Environmental Impact Report



SAN FERNANDO VALLEY
EAST-WEST TRANSPORTATION CORRIDOR

March, 1997

U.S. Department of Transportation
Federal Transit Administration (FTA)

Los Angeles County
Metropolitan Transportation Authority (MTA)

FTA REVIEW DRAFT

MAJOR INVESTMENT STUDY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT
(MIS/DEIS/DSEIR)

for the

SAN FERNANDO VALLEY EAST-WEST TRANSPORTATION CORRIDOR

Los Angeles County, California

Prepared in accordance with the National Environmental Policy Act (42 U.S.C. §4332), Federal Transit Laws (49 U.S.C. Chapter 53), 49 U.S.C. §303, 16 U.S.C. 470, 23 CFR Part 771, 23 CFR Part 450, Executive Order 12898, and the California Environmental Quality Act (California Public Resources Code, Article 21000, et. seq.).

by the

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION

and the

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Date	Leslie Rogers Region IX Administrator Federal Transit Administration
Date	Linda Bollinger Acting Chief Executive Officer Los Angeles County

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California State Clearinghouse Number: 95101050

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

PROPOSED ACTION: San Fernando Valley East-West Transportation Corridor; Los Angeles County, California.

ABSTRACT

This report documents the financial, transportation and environmental characteristics and impacts of the No Project, Transportation Systems Management (TSM)/Enhanced Bus, and Los Angeles Metro Rail extension alternatives in the San Fernando Valley East-West Transportation Corridor. The corridor begins at the Metro Rail Red Line North Hollywood station (currently under construction), located in the vicinity of Lankershim Boulevard and Chandler Boulevard in the North Hollywood portion of the City of Los Angeles, and extends westerly to the vicinity of Valley Circle Boulevard, in the Woodland Hills portion of the City of Los Angeles; a distance of approximately 17 miles. The corridor is divided into two segments: the East Valley segment (approximately 6 miles in length) and the West Valley segment (approximately 11 miles in length). In addition the TSM Alternative, which could be implemented throughout the entire corridor, several rail transit alternatives are under consideration for implementation in the East Valley segment. Alternatives being considered in the West Valley segment (referred to as Cross Valley Strategies), are not being considered for implementation at the present time, but are discussed in this document for planning purposes.

Thsi report is a combined Major Investment Study/Draft Environmental Impact Statement/Draft Supplemental Environmental Impact Report, satisfying the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). It focuses on the environmental impacts of the alternatives under consideration in the East Valley.

This MIS/DEIS/DSEIR examines potential areas of impact including transportation (effects on transit, highways, travel corridors, station areas, and parking), land use and development, acquisitions and displacements, demographics and neighborhoods, community facilities and services, fiscal and economic conditions, visual and aesthetic conditions, air quality, energy, noise and vibration, geotechnical considerations, biological resources, water resources, safety and security, cultural resources, Section 4(f) considerations, and construction. Mitigation measures for the impacts are identified.

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

S-1 PURPOSE OF THE MAJOR INVESTMENT STUDY/ENVIRONMENTAL IMPACT STATEMENT/SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT (MIS/EIS/SEIR)

The purpose of the MIS/EIS/SEIR is to select the most appropriate transit option for the San Fernando Valley East-West Transportation Corridor, while ensuring that potentially significant environmental impacts are considered and disclosed to the public. This document is being circulated for public and agency review and comment. In addition to accepting written comments, the Federal Transit Administration (FTA) and the Los Angeles County Metropolitan Transportation Authority (MTA) will conduct public hearings to obtain input from the general public as part of the decision-making process.

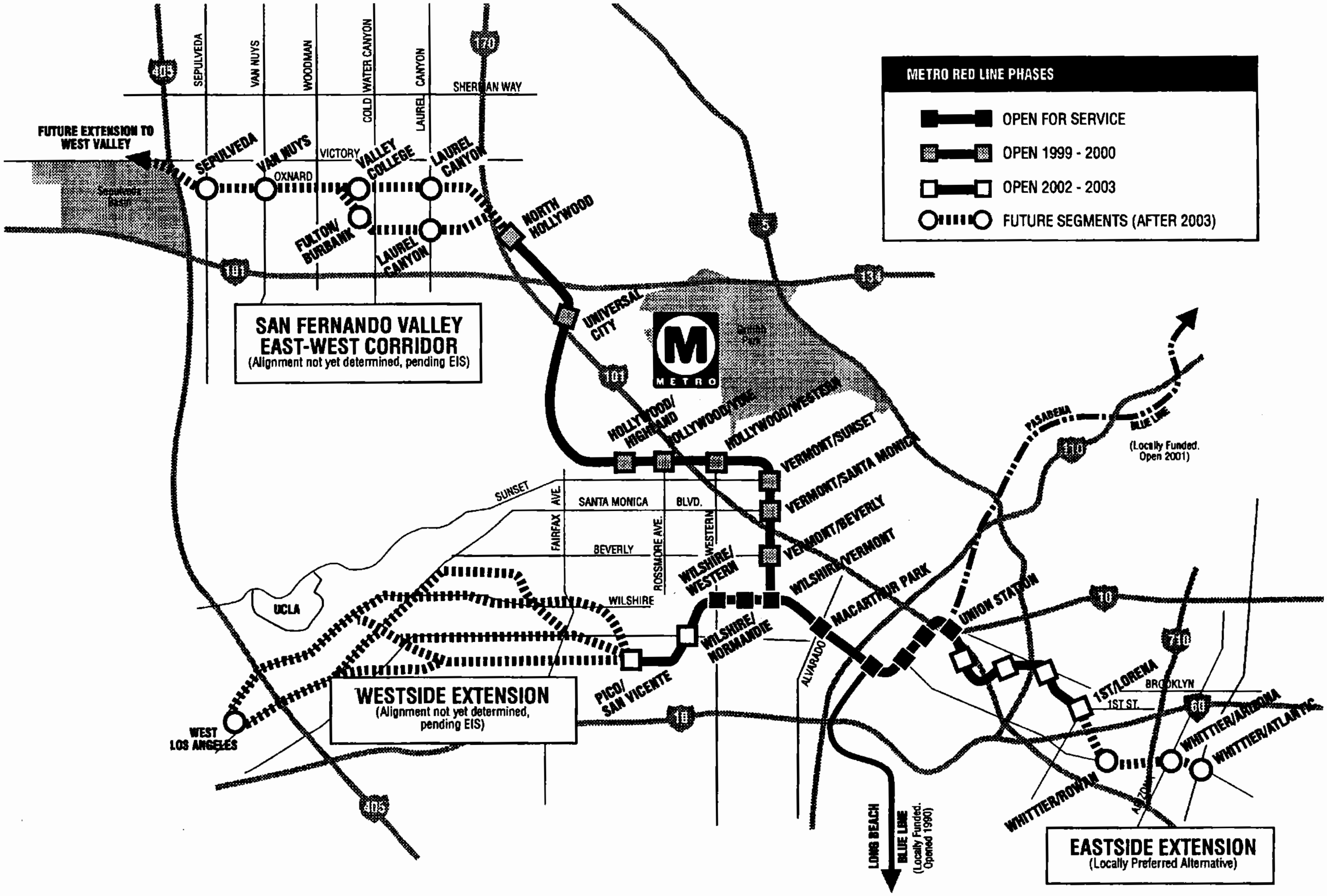
The MIS is required by the U.S. Department of Transportation (USDOT) for all major federally funded transportation projects, and its goal is to facilitate local decision-making by ensuring that a broad range of project alternatives are considered. The MIS/EIS/EIR will culminate in the selection by the MTA Board of a preferred investment strategy for the San Fernando Valley East-West Transportation Corridor. The decision will be documented in a *Preferred Investment Strategy Report*, after which the MTA will be able to initiate preliminary engineering activities and to prepare a Final Environmental Impact Statement and Final Supplemental Environmental Impact Report (FEIS/FSEIR). Once the FEIS/FSEIR is completed, the MTA will be in a position to seek federal financial participation and commit capital funding to the project.

S-2 NEED FOR THE PROPOSED ACTION

S-2.1 Study Corridor

The San Fernando Valley East-West Transportation Corridor study area is located in the central part of Los Angeles County, approximately 20 miles northwest of the Los Angeles Central Business District (see Figure S-1). The corridor connects major activity areas through the heart of the San Fernando Valley, including Warner Center, the Valley Government Center in Van Nuys, and Universal City; Pierce College and Valley College; and the Sepulveda Basin Recreation Area. The San Fernando Valley today is home to over 1.3 million people, and if considered as a separate city, would comprise the sixth largest city in the country.

The San Fernando Valley began its development as a major suburb of Los Angeles in the 1940s. With the gradual development of major employment centers throughout the 1980s, the Valley had generated enough employment to theoretically support its own population, but many residents continued to commute to jobs outside the Valley. Employment growth in the Valley through 2015 is forecast to be substantially less than the county-wide growth, due to losses of many high-paying, skilled jobs in the aerospace and defense industries. Much of the projected 19 percent



SOURCE: ADOPTED FROM MTA LONG RANGE PLAN, MARCH 1995.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE S-1
Potential Future Extensions

increase in the Valley's employment by the year 2015 is expected to be in the service sector and in the entertainment and tourism industries.

The Valley has also begun to experience significant demographic changes in recent years. Between 1980 and 1995, the Valley's population increased by about 25 percent and another 24 percent population increase is projected for 1995 to 2015. Unlike growth in the past that was dominated by in-migration, this growth is in part attributed to the relatively high birth rates among Hispanics (the fastest growing single segment of both the Valley's and county's populations) and migration to the Valley from other parts of the county and the world.

Between 1980 and 1995, the increase in the number of housing units in the Valley outpaced the county. While growth in the Valley's housing market is expected to increase 25 percent by the year 2015, it is expected to just keep pace with the county. The employment growth rate is flattening out in the Valley at the same time.

S-2.2 Travel Patterns and Services

The five-county transportation planning region is divided into areas called Regional Statistical Areas (RSAs), and contains the project area represented by RSA 12 (West Valley) and RSA 13 (East Valley). RSAs 17 (Hollywood, Mid-Wilshire, Beverly Hills), 21 (Downey, Southeast LA), and 23 (Downtown LA) are other subareas in Los Angeles County that would be potential service areas for an east-west Valley transit facility. The Valley can be directly connected to these RSAs through the connection of the East-West Transportation Corridor with the Red Line at North Hollywood and the Red Line extensions to the east and west. Travel statistics indicate that currently 52 percent of all Valley residents in RSAs 12 and 13 work outside of the Valley and over half of these commute to jobs located within RSAs 17, 21, and 23. Overall, nearly 22 percent of all trips and nearly 30 percent of work trips to and from the Valley RSAs originate from or are destined to these three RSAs. This indicates that approximately one-fifth of all trips originating or terminating outside the Valley occur along the corridor defined by the existing Red Line and the proposed east-west transportation corridor.

The San Fernando Valley is served by five major freeways under the jurisdiction of the California Department of Transportation (Caltrans) and the arterial and local street system under the jurisdiction of the city of Los Angeles. During the morning and evening peak periods, many of the freeways and arterials in the Valley are operating at or near capacity in the peak direction of travel. Increasing the capacity on these freeways and roadways is very difficult due to limited rights-of-way and rapidly increasing traffic demand.

The San Fernando Valley has an extensive transit system. Currently there are four major transit operators providing fixed-route bus service in the San Fernando Valley:

- Los Angeles County Metropolitan Transportation Authority (MTA)
- City of Los Angeles Department of Transportation (LADOT Commuter Express/DASH)
- Antelope Valley Transit Authority (AVTA express)
- Santa Clarita Transit

Non-traditional transit service and commuter (Metrolink) and intercity rail (Amtrak) service are also provided.

S-2.3 Transportation Problems

Growth projections indicate that increases of 34 percent in work trips and of 30 percent in total number of trips are expected to be generated in the Valley between 1995 and 2015. Vehicle miles of travel (VMT) are projected to increase by 39 percent between 1995 and 2015. Vehicle hours of travel and vehicle hours of delay (time loss due to delay) will increase by 77 percent and 229 percent, respectively. In 2015, over 26 minutes out of every hour of travel will be spent in delayed conditions, nearly twice the amount (14 minutes) in 1995. It is projected that by 2015 average speeds will decline by 28 percent from 32.9 mph to 23.7 mph.

Despite its recent widening projects, the Ventura Freeway (US 101) is currently operating at capacity in both directions during peak hours. This corridor has been projected to be one of Southern California's most congested corridors in the future, operating at 50 to 60 percent over capacity by the year 2015, suggesting the need for up to eight new lanes in each direction. The MTA Long Range Plan does not propose HOV lanes on US 101 in the next 20 years due to limitations in available room for widening. As a result, increased freeway congestion would result in no travel time advantage to carpools or commuter express buses on freeways.

By the year 2015, the east-west arterials are projected to be the most congested in the Valley. The most severely congested arterial segments would include Victory Boulevard, Vanowen Street, and Sherman Way, from west of Balboa Boulevard to east of Van Nuys Boulevard. Other arterial segments for which severe congestion is projected include Ventura Boulevard through Tarzana and Encino, and Roscoe Boulevard near I-405. In general, miles of severe arterial congestion are projected to increase by over 90 percent in 2015 compared to the late 1980s.

This project looks at a variety of solutions to the transportation deficiencies in the study corridor, within the planning frameworks of the agencies involved. The goals and objectives for the San Fernando Valley East-West Transportation Corridor (see Table S-1) have been developed from the transportation and land use goals and objectives of the participating government agencies and are consistent with the other transit improvements being planned for Los Angeles County.

S-3 SCREENING PROCESS

A series of studies have been conducted over the past 12 years to identify promising transit alternatives and rail technologies for the San Fernando Valley East-West Transportation Corridor. The most significant among them are:

- *Initial Alternatives Evaluation Report*, 1987
- *San Fernando Valley East-West Rail Transit Project Environmental Impact Report (EIR)*, 1990
- *San Fernando Valley East-West Rail Transit Project Subsequent Environmental Impact Report: Ventura Freeway Advanced Aerial Technology Alternative (SEIR)*, 1992

Table S-1: Goals and Objectives of the San Fernando Valley East-West Transportation Corridor

Goal	Objective
1. *Improve east-west mobility in the San Fernando Valley*	• Provide an alternative to the congested Ventura Freeway corridor. • Provide convenient access to the regional transit system. • Minimize total travel times. • Provide enhanced bi-directional transit service. • Provide opportunities to intercept traffic passing through the Valley.
2. *Support land use and development goals*	• Provide high capacity transit linkages between centers (North Hollywood, Van Nuys, Warner Center). • Provide transit supportive land use policy. • Provide General Plan Framework Plan goals for increased transit mode split and concentration of growth in Targeted Growth Areas. • Provide Warner Center Specific Plan transit access enhancements. • Provide joint development opportunities. • Provide accessibility to governmental facilities in the Van Nuys Government Center.
3. *Achieve local consensus, i.e., the project will be identified in a manner that is responsive to community and policy makers.*	• Incorporate the citizen and policy maker input from previous studies in the San Fernando Valley. • Provide opportunities for community input to the MIS/EIS/SEIR process. • Build community and political support through effective communication and integration with local and regional plans.
4. *Provide a transportation project that is compatible with and enhances the physical environment where possible.*	• Identify an alternative that minimizes adverse effects on the environment. • Avoid impacts on park lands. • Minimize noise impacts. • Minimize impacts on cultural resources. • Minimize air pollution.
5. *Provide a transportation project that minimizes impacts on the community.*	• Minimize business and residential dislocations, community disruption, and property damage. • Avoid creating physical barriers, destroying neighborhood cohesiveness or in other ways lessening the quality of the human environment. • Minimize traffic and parking impacts. • Minimize impacts during construction.
6. *Provide a transportation project that is cost effective and within the ability of MTA to fund, including capital and operating costs.*	• Identify cost saving measures through value engineering to reduce project costs. • Maximize the benefits associated with use of right of way already purchased by the MTA. • Ensure fiscal consistency with the MTA Long Range Plan.

Source: Major Investment Study Alternatives Screening Report, May 1996.

- *Ventura Freeway Rail Transit Draft Project Study Report (PSR)*, 1994
- *Southern Pacific (SP) Burbank Branch Pre-Preliminary Engineering Study*, 1994
- *Major Investment Study (MIS) Alternatives Screening Report*, 1996

Alignment alternatives are listed on, and the evaluation and sequential narrowing down of candidate alternatives is summarized in, Figure S-2, and discussed below and in Appendix J.

S-3.1 Preliminary Route Assessment

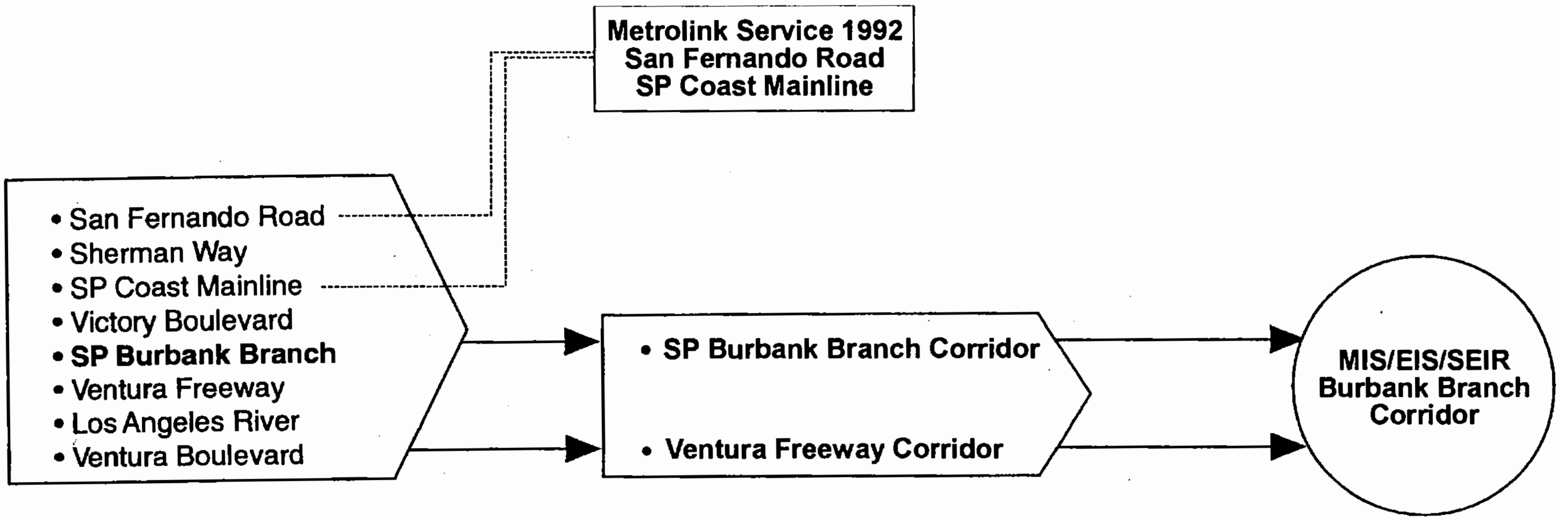
In 1983, the Los Angeles County Transportation Commission (LACTC, now the MTA) initiated preliminary assessment of various above-ground rail transit alternatives for an east-west corridor through the San Fernando Valley. From north to south, the alignments initially considered were:

- SP Coast Mainline
- Sherman Way
- Los Angeles River
- SP Burbank Branch
- Ventura Freeway
- Ventura Boulevard

The results of this initial analysis process led LACTC in 1984 to remove the Sherman Way and Ventura Boulevard alternatives from further consideration and carry the remaining alternatives forward. A Sherman Way alignment would have served the commercial districts of Canoga Park, Reseda, and Van Nuys, and pass through residential areas along the rest of its length. Due to the need to acquire substantial numbers of commercial properties in the Reseda commercial district and the expected difficulties of construction in the Van Nuys airport tunnel, LACTC dropped the Sherman Way alternative from consideration in 1984. In 1995, Sherman Way was revived as a candidate for a proposed subway in the West Valley, but the high costs associated with an entirely subsurface alignment led to its dismissal.

The Ventura Boulevard alternative follows a long, densely developed commercial corridor that traverses the southern edge of the San Fernando Valley extending from the Warner Center area on the western edge of the Valley to Universal City, and would be expected to generate substantial ridership. The principal drawbacks to the Ventura Boulevard alignment would be the required acquisition of many commercial properties and its location at the extreme southern edge of the Valley. These concerns prompted LACTC to drop this alternative from future consideration in 1984. In 1991, Ventura Boulevard was revived as a candidate for a proposed subway through the Valley, but the high costs associated with an entirely subsurface alignment led to its dismissal.

Based on the preliminary assessment of the remaining candidate routes, in October 1983 LACTC selected a light rail line generally following the SP Burbank Branch alignment as a representative route for system planning purposes.



1983/1984	1985/1986	1987-1992	1993/1994	1995-1997
Initial LACTC Evaluation	Route Refinement Study	In-Depth Route Refinement/EIR/SEIR	Ventura Freeway Draft Project Study Report (PSR)	MIS/EIS/SEIR
		1990 Adoption & Certification of SP Burbank Branch EIR (CEQA)	SP Burbank Branch Geotechnical/Engineering Study	
		1992 Draft SEIR proposed to include Ventura Freeway Rail Alternative	October 1994 MTA Board Adoption of SP Burbank Branch Corridor	

SOURCE: GRUEN ASSOCIATES, 1996.

FIGURE S-2
Successive Evaluation and Re-Evaluation of Candidate Alternatives

S-3.2 Route Refinement Study

The preliminary assessment was followed by a route refinement study conducted in 1985-86, focusing on options within the SP Burbank Branch right-of-way (ROW). However, in response to local opposition to the SP Burbank Branch alignment, LACTC broadened the range of alternatives under consideration to include again three other routes: the SP Coast Mainline, the Los Angeles River, and the Ventura Freeway; and to add Victory Boulevard.

In February 1987, LACTC authorized the preparation of an EIR for the proposed rail transit line connecting the West Valley to the Metro Rail station in either North Hollywood or Universal City. The *Initial Alternatives Evaluation Report,* a precursor to the EIR, was issued in September 1987, and detailed conceptual plans were prepared for the five alternatives. Each of these routes was analyzed with respect to engineering issues, environmental impacts, and land uses. For all five alternatives, the rail technology evaluated was light rail, operating along a combination of at-grade and grade-separated alignments. Following completion of the *Initial Alternatives Evaluation Report*, LACTC eliminated the SP Coast Mainline, Victory Boulevard, and Los Angeles River alignments from further consideration.

The SP Coast Mainline alignment would have provided rail transit service between North Hollywood and Chatsworth, with 13 to 14 stations at major north-south arterial streets, including Reseda, Sepulveda, and Van Nuys Boulevards. While the existing ROW was grade-separated at most street crossings, 10 were at-grade and at least 5 were projected to require construction of grade separations to eliminate conflicts between trains and north-south automobile traffic. The need to construct several grade-separated street crossings was perceived as a significant engineering problem, as was the need to build a new bridge structure to carry the rail line over the Hollywood Freeway. Furthermore, the route failed to serve major activity centers, and would have had limited ridership. Finally, the alignment was already in use for freight trains and Amtrak passenger rail, which posed a conflict.

The Victory Boulevard alignment began at Warner Center, and continued east in the SP Burbank Branch ROW to Woodley Avenue. East of Woodley Avenue, the alignment left the SP Burbank Branch ROW and proceeded down Victory Boulevard for a total of 4 miles, to connect the North Hollywood Metro Rail station. A total of 15 stations were proposed, with elevated stations in the center of Victory Boulevard at the intersections with Sepulveda and Van Nuys Boulevards (serving the Van Nuys Governmental Center) and at Woodman and Coldwater Canyon Avenues. To provide room for the support structures of the elevated guideway, at least one lane of the boulevard would be permanently closed to traffic. Aerial crossings of the San Diego and Hollywood Freeways would also have been required. Adverse impacts on adjacent homes were identified as a substantial disadvantage, and in addition, placement of the guideway in the middle of the street meant the removal of a lane of traffic from Victory Boulevard.

The Los Angeles River flows from west to east through the southern half of the San Fernando Valley, except for the portion within the Sepulveda Basin. The river channel and Sepulveda Basin are maintained as flood control facilities by the L.A. County Flood Control District and the U.S. Army Corps of Engineers, respectively. This route would follow the flood control channel for its 15-mile length, extending from near Warner Center to North Hollywood, where the alignment would run parallel to the Hollywood Freeway. Light rail, on a 25-foot or higher aerial guideway parallel to the river channel, and 13 stations were proposed. Operating speeds would have been reduced to as low as 25 miles per hour along the eastern portion of the alignment (compared to an average speed of 55 miles per hour for other alignments), due to tight curves along the river channel. The Los Angeles River alignment would have required substantial cooperation with the flood control agencies to ensure that construction and operation of the rail transit line did not interfere with flood control requirements. The all-aerial guideway would have led to significant impacts (noise, vibration, visual intrusion, and loss of privacy) on the residences that comprised the majority land use along the route.

Of the five alignments documented in the *Initial Alternatives Evaluation Report*, LACTC retained the Ventura Freeway and SP Burbank Branch for future consideration. However, in a series of public meetings opposition was voiced by residents along all five route alternatives. In particular, there was concern that light rail transit in the SP Burbank Branch alignment, as proposed, would disrupt an Orthodox Jewish community located along Chandler Boulevard in the North Hollywood area. In November 1987 LACTC voted to defer environmental impact studies of the project and requested assistance from elected officials serving the San Fernando Valley to decide whether to continue with a rail project in the Valley and, if so, where the project should be located. In August 1988 the panel issued its report, entitled *Transportation Solutions*, which recommended that LACTC pursue further studies of the SP Burbank Branch and the Ventura Freeway alignments. In response, LACTC commissioned an EIR on the SP Burbank Branch and Ventura Freeway alignments for the proposed rail transit project.

S-3.3 Preparation of the 1990 EIR and 1992 SEIR

The remaining candidates, the SP Burbank Branch and the Ventura Freeway, were carried forward for full-scale environmental analysis under the California Environmental Quality Act (CEQA). The *San Fernando Valley East-West Rail Transit Project Final EIR*, certified in 1990, studied a variety of alignments and technologies for these two routes. In addition, a "phased length" option was considered for each alternative, under which the rail line would initially be built only to Sepulveda Boulevard, roughly halfway between Universal City and Warner Center. The Final EIR, completed in 1990, identified "Alternative 3a," the Burbank Metro Rail Red Line Extension with deep-bore subway in residential areas comprising 9 miles of the total 14 miles of the route as the environmentally superior alternative. This determination was based on the following factors:

1) The alternative was in subway through residential areas, thus eliminating adverse noise and visual impacts;
2) The alternative, being located in the existing SP Burbank Branch ROW, required no displacement of existing residences;
3) The alternative had a higher projected ridership than other alternatives, which would translate into reduced traffic congestion and improved air quality due to the reduction in automobile trips.

However, the alternative was among the most costly alignments studied, due to the expense of deep-bore subway construction. On March 28, 1990, LACTC adopted Findings and a Statement of Overriding Considerations and approved a Mitigation Monitoring Program for the Red Line extension, thus completing CEQA environmental clearance for the project. It also requested, however, a study of two additional alternative alignments. The Ventura Boulevard alignment, previously discarded, was revived for study as a candidate for a Metro Rail subway extension. An alignment in the Ventura Freeway median (rather than the edge of freeway) was also considered for the use of advanced aerial technology, including monorail, mag-lev trains, and driverless LRT.

In June 1991 the Governor signed Senate Bill 211, an act of the California Legislature that endorsed an underground configuration for a rail transit project along Chandler Boulevard between the North Hollywood Metro Rail subway station and Hazeltine Avenue, some 3.5 miles to the west. Section 2 of SB211 provided a statutory definition of the San Fernando Valley rail rapid transit route. This definition included the following components: (a) in the area between Hazeltine Avenue and the Hollywood Freeway, the guideway shall not be constructed other than as a subway, (b) in the area below and extending 1 mile east and west of Tujunga Wash, the guideway shall be constructed in subway using deep-bore technology, and (c) in the area of the Tujunga Wash, only a station at Los Angeles Valley College shall be permitted. SB211 also states, however, that it is not intended to mandate the selection of any transit route or the construction of any route configuration or alignment, but rather to define the route and alignment adopted by the LACTC in 1990.

In 1991, a report entitled *Supplemental Evaluation of Ventura Boulevard and Ventura Freeway Alternatives* was released. Based on cost estimates from that study, LACTC deleted the Ventura Boulevard alternative from further consideration due to the expense of constructing an all-subway alignment. The Ventura Freeway median alignment was retained, however, for consideration in a Subsequent EIR to supplement the existing 1990 EIR.

The purpose of the Subsequent EIR, completed in 1992, was to provide LACTC with a basis for determining whether advanced aerial technology located in the Ventura Freeway median would provide a more cost-effective alternative to the already-adopted Metro Rail subway extension along the SP Burbank Branch ROW. In December 1992, LACTC conditionally adopted the Ventura Freeway alignment as the preferred route for the San Fernando East-West Transportation Corridor, pending the completion of engineering studies that would provide greater detail on project costs and feasibility. In January 1993, LACTC ordered that pre-preliminary engineering studies be done for both the Ventura Freeway and SP Burbank Branch alternative alignments.

S-3.4 Pre-Preliminary Engineering and Selection of the SP Burbank Branch Alignment

Following the Northridge earthquake in January 1994, revised construction standards adopted by the MTA meant that wider support columns would be needed, which in turn meant the freeway median might need to be widened beyond its current 6-foot width. Caltrans determined that closure of freeway lanes to facilitate construction of an aerial guideway was not acceptable.

Caltrans assessed construction issues regarding the Ventura Freeway alignment in a *Project Study Report* (PSR) written in 1994. In August of that year, Caltrans rejected a "constrained freeway" alternative that would have narrowed the freeway lanes to accommodate construction and required only 7 feet of road widening in each direction. Citing public safety concerns, and only incremental cost increases above the constrained freeway approach, Caltrans determined that the "full standard" alternative was preferable. Under this design, the Ventura Freeway alignment would require widening the existing freeway median to 28 feet to accommodate the 6-foot wide support columns for the aerial guideway. Overall, the freeway would have to be widened by 34 feet (17 feet on each side) to provide five 12-foot wide traffic lanes in each direction of travel, a design which would meet Federal Highway Administration standards and provide a safer traffic facility. Caltrans estimated the costs of this widening at approximately $240 million.

In a parallel effort, the MTA prepared cost estimates for the SP Burbank Branch alignment in the *Pre-Preliminary Engineering Study*, completed in September 1994, that revealed that the cost savings of an aerial configuration on the Ventura Freeway versus a subway in the SP Burbank Branch ROW were less than expected, due primarily to the construction of the subway with cut-and-cover methods and proposed use of open-air station construction in the SP Burbank Branch.

After examining the results of these studies and hearing testimony from all interested parties, in October 1994 the MTA's Board of Directors reaffirmed LACTC's earlier endorsement of the SP Burbank Corridor over the Ventura Freeway Corridor.

In 1995, the MTA Board of Directors directed the preparation of an MIS for alternative alignments within the SP Burbank Branch Corridor. This MIS contains information on costs, benefits, and transportation impacts of each alternative, and assesses each alternative's cost-effectiveness, efficiency, and mobility improvements. The MIS has been prepared as part of the EIS required by the National Environmental Policy Act (NEPA) and the Supplemental EIR required under CEQA.

S-4 MIS/EIS/SEIR ALTERNATIVES CONSIDERED

The following discussion identifies the alternatives examined in the *MIS Alternatives Screening Report*, May 1996, and those to be carried forward and evaluated in this MIS/EIS/SEIR. As discussed in greater detail in Chapter 2, these have been divided into East Valley projects, which can be cleared environmentally by this document, and Cross Valley strategies, which are discussed on a programmatic level because no funding has been identified for rail improvements in the West Valley in the current MTA 20-Year Plan. In addition, the No Project Alternative is included for comparison to comply with CEQA and NEPA guidelines. Although transportation strategies have been defined for the entire San Fernando Valley, the purpose of this document is to examine in detail the environmental effects in the East Valley. It should be noted that some strategies, in particular the LRT Alternative (6a/6b), if implemented only in the East Valley, may not be cost-effective or operationally feasible, i.e., they would be feasible only on a valley-wide basis.

S-4.1 MIS Alternatives

Table S-1 provides a summary of the alternatives considered in the *MIS Alternatives Screening Report*. Following a review of the cost-effectiveness of the alternatives, on May 22, 1996, the MTA Board of Directors approved the findings of the *MIS Alternatives Screening Report* to carry forward a reduced number of alternatives for environmental review. Based on cost-effectiveness criteria, the following alternatives were carried forward in the MIS process: 1, 2, 6, 9, and 10. Consequently alternatives 3, 4, 5, 7, and 8 were removed from further consideration (See Table S-2).

This action was presented to the MIS Interagency Review Committee chaired by the Southern California Association of Governments on September 26, 1996, which endorsed the previous action by the MTA Board.

Table S-2: San Fernando Valley East-West Transportation Corridor Development of Alternatives for the MIS/EIS/SEIR

Alternative	Deleted from Consideration in MIS Alternatives Screening Report May 22, 1996	Added to Study MIS Alternatives Screening Report May 22, 1996	Included in Draft MIS/EIS/SEIR
1. Red Line Extension to I-405 (SPROW)			X
2. Red Line Extension to I-405 (Oxnard)			X
3. Light Rail Transit to I-405	Deleted 5/22/96		
4. Red Line Extension to Valley Circle (SPROW)	Deleted 5/22/96		
5. Red Line Extension to Valley Circle (Sherman Way)	Deleted 5/22/96		
6. Light Rail Transit to Valley Circle			X
7. Alternative Rail Technology	Deleted 5/22/96		
8. Busway	Deleted 5/22/96		
9. Enhanced Bus			X
10. No Project			X
11. Dual Mode Red Line Extension to I-405		Added 5/22/96	X
12. Dual Mode Red Line Extension to Valley Circle		Added 5/22/96	X

Source: MFA, 1997.

S-4.2 EIS/SEIR Alternatives

The MTA Board also directed that the actions listed below proceed and these have been incorporated into the current alternatives analysis:

- East Valley (east of I-405) - Identify and develop community-sensitive alternative solutions to deep bore subway in the area covered by state-mandated subway legislation. *(This area is approximately 3.5 miles in length and covers the segment of the SP right-of-way between the Hollywood Freeway and Hazeltine Avenue. In 1991, the Governor of California signed SB211, which mandates that any rail transit line constructed in this area be "covered and below ground.")* Also consider cut-and-cover subway, open-air subway, and the addition of a station at Laurel Canyon Boulevard.

- West Valley (west of I-405) - Continue to evaluate the Enhanced Bus and the predominantly at-grade LRT Alternatives. Remove from further consideration the less cost-effective Red Line Extension, Busway, and LRT Alternatives.

- Technology/Construction - Although the Red Line Extension to the West Valley (Alternative 4) was recommended for elimination from further consideration based on its high cost, the *MIS Alternatives Screening Report* recommended that consideration of modifications to the Red Line vehicle design be considered to permit dual mode (third rail + overhead pantograph) electrification. Such a vehicle would allow the Red Line to be extended into the Valley in a predominantly at-grade configuration that would not be possible with a conventional Red Line vehicle. This alternative has therefore been added to the list of alternatives with the following descriptions:

  - <u>Alternative 11: Dual Mode Red Line Extension to I-405</u>
    - 11a) Predominantly at-grade, North Hollywood to I-405
    - 11b) Same as 11a + cut-and-cover subway on Chandler Boulevard

  - <u>Alternative 12: Dual Mode Red Line Extension to Valley Circle</u>
    - 12a) Predominantly at-grade, North Hollywood to Valley Circle
    - 12b) Same as 12a + cut-and-cover subway on Chandler Boulevard

a. East Valley Alternative Projects

East Valley project alternatives all start at the North Hollywood Metro Red Line station and extend west for approximately 6 miles to the I-405 (San Diego Freeway), with the exception of Alternative 6 (LRT), which would need to extend into and across the West Valley to be cost-effective. Only the East Valley portion of the alternative is being examined in detail, however. These alternatives, which are to be examined at the *project* level, are summarized in Table S-3 and their locations are shown in Figure S-3.

The rail alternatives (subway or at-grade) also have a supporting bus component in the West Valley. With the exception of the Light Rail Transit Alternative, all East Valley alternatives under consideration may lead to implementation in the near term. Because the LRT Alternative must be implemented in conjunction with a West Valley extension, a decision to select this alternative implies (a) the need to amend the 20-year plan to include the West Valley and (b) the need to prepare additional environmental documentation before the decision can be effected.

Table S-3: East Valley Project Alternatives

Alternative Number	Alternative Variation	Description
10		No Project
9		Enhanced Bus (TSM)
1		Red Line Extension via SP ROW to I-405
	1a)	Deep Bore Subway, Hollywood Freeway to Hazeltine Avenue
	1b)	Cut & Cover Subway, Hollywood Freeway to Hazeltine Avenue
	1c)	Open-Air Subway, Hollywood Freeway to Hazeltine Avenue
	1d)	Aerial, Hollywood Freeway to I-405
2		Red Line Extension via Oxnard (subway)
6		Light Rail Transit Cross-Valley
	6a)	LRT At-Grade
	6b)	LRT At-Grade, same as 6a + Cut-and-Cover Subway on Chandler Boulevard
11		Red Line Extension via SP ROW to I-405 (Dual Mode)
	11a)	Predominantly At-Grade, North Hollywood to I-405
	11b)	Same as 11a + Cut-and-Cover Subway on Chandler Boulevard

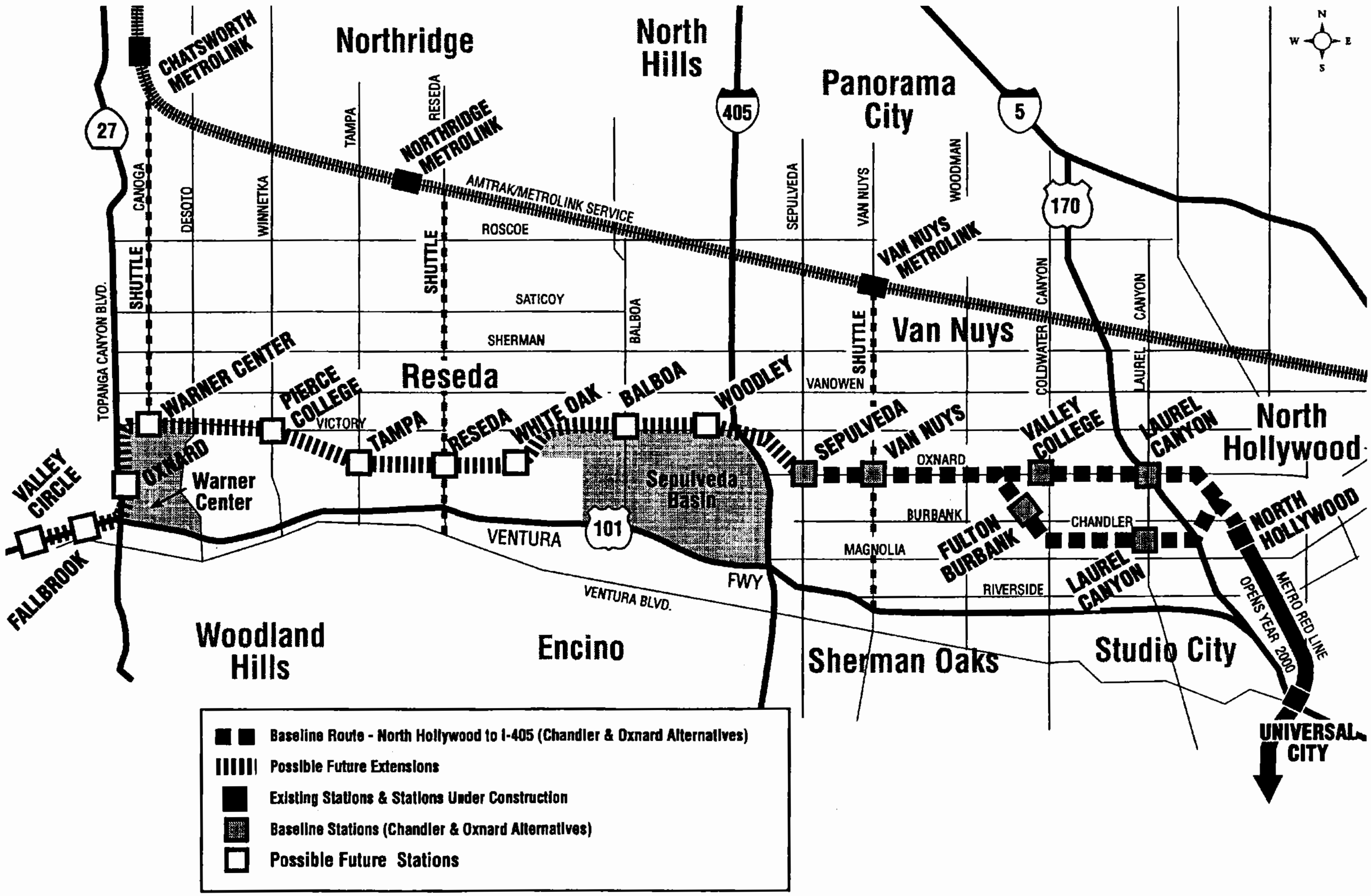
Source: MFA, 1997.

b. Cross Valley Alternative Strategies

Although Cross Valley strategies are not being cleared for implementation at the present time, they are being considered for extension of service into the West Valley in the future, and consequently are to be examined at a *programmatic* level. The Cross Valley strategies are summarized in Table S-4 and shown in Figure S-4.

The Dual Mode or LRT Cross Valley rail alternatives would require amending the MTA's 20-year transit development plan and would necessitate the preparation of additional environmental documents.

Figure S-5 shows the types of transit vehicles under consideration.



SOURCE: MTA, GRUEN ASSOCIATES, 1996.

FIGURE S-3
Location of Study Corridor

Table S-4: Cross Valley Alternative Strategies		
Alternative		**Description**
Number	**Variation**	
10		No Project
9		Enhanced Bus (TSM)
1		Red Line Extension to I-405
	1a)	Deep Bore Subway, Hollywood Freeway to Hazeltine Avenue
	1b)	Cut & Cover Subway, Hollywood Freeway to Hazeltine Avenue
	1c)	Open-Air Subway, Hollywood Freeway to Hazeltine Avenue
	1d)	Aerial, Hollywood Freeway to I-405
2		Red Line Extension to I-405 via Oxnard Street
	Red Line Extension to I-405 via Oxnard Street + West Valley Option	+ Enhanced Bus in West Valley
		+ Dual Mode Red line Extension in West Valley
6		Light Rail Transit to Valley Circle
	6a)	LRT At-Grade
	6b)	LRT At-Grade, same as 6a + Cut-and-Cover Subway on Chandler Boulevard
12		Red Line Extension to Warner Center/Valley Circle with Dual Mode Vehicle
	12a)	Predominantly At-Grade, North Hollywood to Valley Circle
	12b)	Same as 12a + Cut-and-Cover Subway on Chandler Boulevard

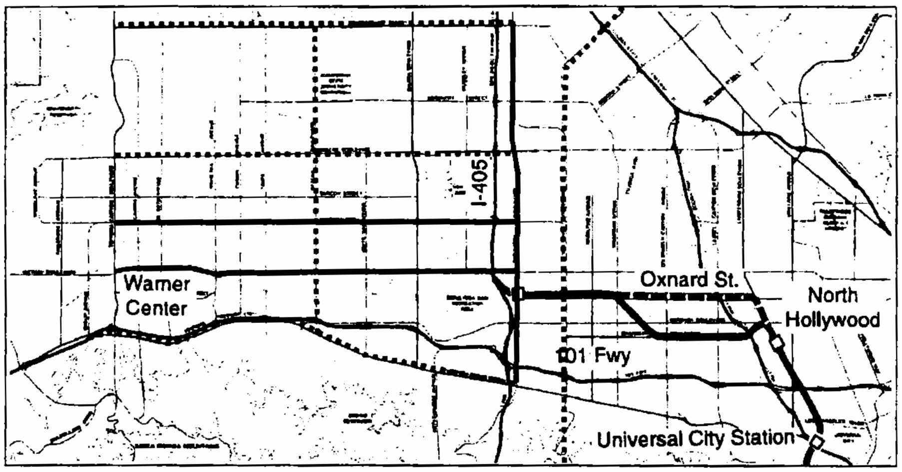
Source: MFA, 1997.

S-5 SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES

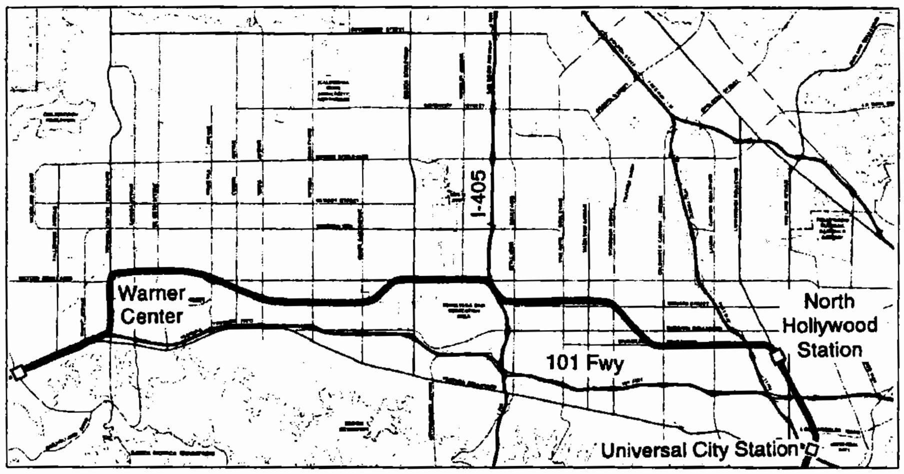
Provided below are summaries of the environmental impacts and mitigation measures for the East Valley Alternative Projects and the Cross Valley Alternative Strategies.

S-5.1 EAST VALLEY ALTERNATIVE PROJECTS

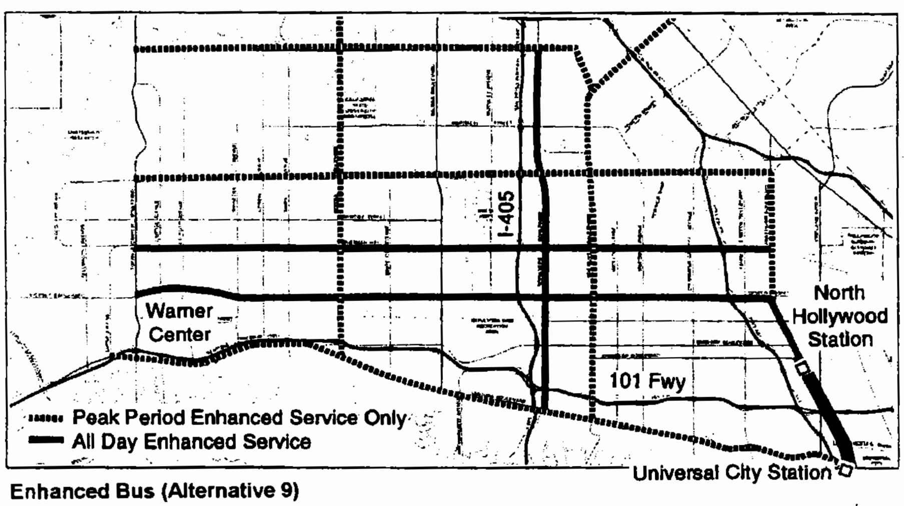
Table S-5 identifies the environmental impacts of the proposed East Valley Alternative Projects (TSM and rail alternatives), the mitigation measures that have been proposed, and the degree of residual impact after application of the indicated mitigation measures. The No Project Alternative is shown only for those categories for which a measurable change from existing conditions would occur for the year 2015.



Red Line Extension from North Hollywood to I-405 (Alternative 1,2) & TSM



Dual Mode Red Line Extension or Light Rail Transit from North Hollywood via SP Right-of-Way to West Valley (Alternative 6,12)



Enhanced Bus (Alternative 9)

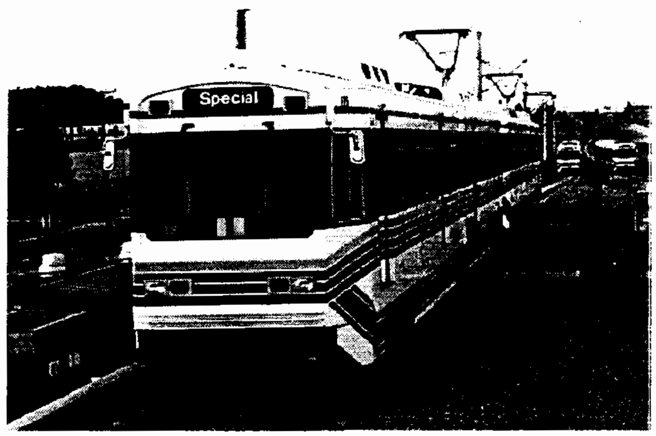
Note: Alternative 10 - No Project would essentially maintain existing levels of transit service in the East - West Corridor.

SOURCE: MIS ALTERNATIVES SCREENING REPORT, MAY 1996.

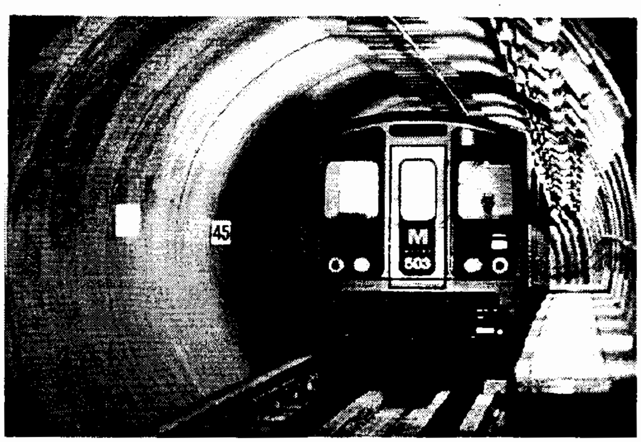
San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE S-4
Cross Valley Strategies

Conventional MTA Bus



Conventional LRT Vehicle
(Metro Blue Line & Metro Green Line)



Conventional Heavy Rail Vehicle
(Metro Red Line)

Note: Dual mode vehicle same as redline vehicle with addition of pantograph. (Overhead electrical power pickup in addition to conventional third rail power pickup)

SOURCE: GRUEN ASSOCIATES, 1997.

**Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts**

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Transportation (Chapter 3)					
Transit Impacts	No Project	There would be 1,028,600 daily transit trips, 1,749,850 daily transit boardings (note: transit boardings account for transfers between transit modes), and 1,207,700 daily bus boardings countywide in year 2015 under the No Project Alternative. Countywide daily transit trips as a share (mode share) of countywide trips by all modes of travel would be 2.69% in year 2015.	No Effect	None required.	No Effect
	TSM	Countywide daily transit trips and transit boardings would increase by 1.3% (13,600 trips) and 1.7% (29,150 boardings) in comparison to No Project levels. Countywide daily transit trips mode share would be 2.73% in year 2015.	Beneficial	None required.	Beneficial
	Rail Alternatives	Countywide daily transit trips under Alternatives 1 and 2 would increase by 1.8% (18,300 trips) and 2.0% (20,850 trips), respectively, in comparison to the No Project level. Countywide daily transit boardings under Alternatives 1 and 2 would increase by 1.7% (30,000 boardings) and 2.2% (38,450 boardings), respectively. TSM-enhanced Alternatives 1 and 2 would increase transit trips by 2.9% (30,200 trips) and 3.2% (32,600 trips), and transit boardings by 3.6% (62,450 boardings) and 4.0% (69,400 boardings), respectively. Countywide daily bus boardings under Alternatives 1 and 2 would increase by 0.6% (6,900 boardings) and 0.9% (10,800 boardings), respectively, in comparison to the No Project level. TSM-enhanced Alternatives 1 and 2 would increase daily bus boardings by 2.9% (34,900 boardings) and 3.2% (38,700 boardings), respectively. Countywide daily transit trips under Alternatives 1 and 2 as a share (mode share) of countywide trips by all modes of travel would be 2.74% in year 2015. TSM-enhanced Alternatives 1 and 2 would result in mode shares of 2.77% and 2.78%, respectively.	Beneficial	None required.	Beneficial

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts: Description	Environmental Impacts: Degree	Mitigation	Residual Impact
Highway Impacts a. Vehicle Trips b. Vehicle Miles of Travel (VMT) c. Vehicle Hours of Travel (VHT) d. Average Vehicle Speeds	No Project	a. Countywide, there would be 27,644,000 daily vehicle trips on the highway system in the year 2015.	No Effect	None required.	No Effect
		b. Countywide, there would be 228,568,000 daily auto VMT on the highway system. Valleywide, there would be 26,592,200 daily auto VMT.	No Effect	None required.	No Effect
		c. Countywide, there would be 9,190,600 daily auto VHT on the highway system. Valleywide, there would be 958,600 daily auto VHT on the highway system.	No Effect	None required.	No Effect
		d. Countywide, the average vehicle speed on the highway system would be 24.9 mph in the year 2015. Valleywide, the average vehicle speed on the highway system would be 27.74 mph.	No Effect	None required.	No Effect
	TSM	a. Countywide, there would be 27,632,400 daily vehicle trips on the highway system in the year 2015, a decrease of 11,500 trips or 0.04% in comparison the to No Project trips.	Beneficial	None required.	No Effect
		b. Countywide, there would be 228,408,100 daily auto VMT on the highway system, a 0.07% decrease from the No Project level. Valleywide, there would be 26,494,000 daily auto VMT, a 0.37% decrease from the No Project VMT.	Beneficial	None required.	No Effect
		c. Countywide, there would be 9,176,400 daily auto VHT on the highway system, a 0.15% decrease from the No Project level. Valleywide, there would be 944,000 daily auto VHT on the highway system, a 1.53% decrease from the No Project VHT.	Beneficial	None required.	No Effect
		d. Countywide, the average vehicle speed on the highway system would be 24.9 mph in the year 2015. Valleywide, the average vehicle speed on the highway system would be 28.07 mph, or 1.18% higher than the No Project speed.	Beneficial	None required.	No Effect

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Highway Impacts a. Vehicle Trips b. Vehicle Miles of Travel (VMT) c. Vehicle Hours of Travel (VHT) d. Average Vehicle Speeds	Rail Alternatives	a. Countywide daily vehicle trips on the highway system would decrease (in comparison to the No Project Alternative) by 15,700 or 0.06% under Alternative 1 and by 18,000 or 0.06% under Alternative 2. TSM-enhanced Alternatives 1 and 2 would result in decreases in daily vehicle trips compared to the No Project levels of 25,800 (0.09%) and 27,800 (0.10%), respectively.	Beneficial	None required.	No Effect
		b. Countywide, Alternatives 1 and 2 would result in daily VMT on the highway system of 228,236,000 and 228,138,200, respectively, or 0.15% and 0.19% fewer miles than the No Project VMT. Valleywide, Alternatives 1 and 2 would result in daily VMT of 26,437,100 and 26,421,400, respectively, which are 0.58% and 0.64% less than No Project VMT. Countywide, TSM-enhanced Alternatives 1 and 2 would result in 227,561,900 and 221,330,000 daily VMT, respectively, or 0.44% and 3.17% less than No Project VMT. Valleywide, TSM-enhanced Alternatives 1 and 2 would result in VMT of 25,523,100 and 25,738,200, respectively, which are 4.02% and 3.21% less than the No Project VMT.	Beneficial	None required.	No Effect
		c. Countywide, Alternatives 1 and 2 would result in daily VHT of 9,134,400 and 9,128,100, respectively, or 0.61% and 0.68% fewer hours of travel than under the No Project Alternative. Valleywide, Alternatives 1 and 2 would result in 934,100 and 931,600 VHT, respectively, which are 2.56% and 2.82% less than No Project VHT. TSM-enhanced Alternatives 1 and 2 would result in 8,431,900 and 8,484,400 daily VHT, countywide, respectively, or 8.26% and 7.68% less than the No Project. Valleywide, TSM-enhanced Alternatives 1 and 2 would result in 857,400 and 861,600 daily VHT, respectively, or 10.56% and 10.12% less than the No Project VHT.	Beneficial	None required.	No Effect

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Highway Impacts a. Vehicle Trips b. Vehicle Miles of Travel (VMT) c. Vehicle Hours of Travel (VHT) d. Average Vehicle Speeds	Rail Alternatives	d. Average vehicle speeds on the countywide highway system would be 25.0 mph for Alternatives 1 and 2, 0.47% higher than the No Project speed. For the Valleywide highway system, Alternatives 1 and 2 would result in average vehicle speeds of 28.30 mph and 28.36 mph, respectively, increases of 2.03% and 2.24% over No Project speeds. TSM-enhanced Alternatives 1 and 2 would result in average vehicle speeds on the countywide system of 27.0 mph and 26.1 mph, respectively, or increases of 8.52% and 4.89% compared to the No Project average vehicle speed. Valleywide, TSM-enhanced Alternatives 1 and 2 would result in average vehicle speeds of 29.77 mph and 29.87 mph, respectively, increases of 7.31% and 7.69% over the No Project speed.	Beneficial	None required.	No Effect
Impacts on Travel Corridors	No Project	The screenline analysis indicates that the No Project Alternative would result in a total volume of traffic of 1,795,900 as measured at the 10 screenline locations.	No Effect	None required.	No Effect
	TSM	The TSM alternative would result in a total screenline volume of 1,657,900 or 138,000 fewer than the No Project volume, a 7.68% decrease.	Beneficial	None required.	No Effect
	Rail Alternatives	Alternatives 1 and 2 would result in screenline volumes of 1,780,600 and 1,776,900, respectively, decreases of 15,300 (0.85%) and 19,000 (1.06%) in comparison to the No Project volume. TSM-enhanced Alternatives 1 and 2 would result in screenline volumes of 1,642,700 and 1,640,100, respectively, decreases or 153,200 (8.53%) and 155,800 (8.68%) from the No Project volume.	Beneficial	None required.	No Effect
Station Area Impacts	No Project	34 of 41 study intersections are projected to operate at level of service (LOS) "E" or worse during the evening peak hour in year 2015.	No Effect	None required.	No Effect

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Station Area Impacts	TSM	Since this alternative does not have transit stations, no intersections would be affected. 29 of 41 intersections would operate at LOS E or worse or 5 fewer than the No Project Alternative. All 41 intersections would improve in operation compared to the No Project conditions.	Beneficial	None required.	No Effect
	Rail Alternatives	Under Alternative 1, 35 of 41 study intersections would operate at LOS E or worse during the evening peak hour in the year 2015. According to LADOT criteria, significant impacts would occur at 9 of the 41 intersections. However, in comparison to the No Project Alternative, Alternative 1 would result in improved operating conditions at 21 of 41 study intersections. Under Alternative 2, 35 of 41 study intersections would operate at LOS E or worse during the evening peak hour in the year 2015. Significant impacts would occur at 11 study intersections. However, operating conditions at 21 of the 41 study intersections would improve compared to No Project conditions. Under TSM-enhanced Alternative 1, 33 of 41 study intersections would operate at LOS E or worse during the evening peak hour. Significant impacts would occur at 5 of the 41 intersections. However, operating conditions would improve at 34 of the 41 intersections compared to No Project conditions. Under TSM-enhanced Alternative 2, 32 of 41 study intersections would operate at LOS E or worse during the evening peak hour. Significant impacts would occur at 7 of the 41 intersections. However, operating conditions would improve at 34 of the 41 intersections compared to No Project conditions.	Significant	Expand parking capacity at alternate stations including Laurel Canyon and Van Nuys stations to reduce demand at Sepulveda station and redistribute station access traffic. Implement physical roadway improvements at affected intersections including addition of turn lanes and through lanes. Improvements may require widening and acquisition of additional right-of-way.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Parking Impacts	Rail Alternatives	All of the stations except the Sepulveda Station would provide parking at a level that is near or exceeds projected demand. The projected parking demand at the Sepulveda Station would exceed the number of spaces provided by 900 spaces.	Significant	Implement a three-phase mitigation program consisting of: 1) monitoring of actual parking demand at each station as system ridership grows; 2) implementation of demand management measures to maximize use of the at-grade parking areas to be provided at the individual stations; and 3) if determined necessary, construction of additional at-grade parking lots in the West Valley.	Not Significant
Land Use and Development (Section 4-1)					
Localized Impacts	TSM	No impacts are anticipated under the TSM alternative.	No Effect	None required	No Effect
	1a, 1b, 1d, 2, 6b, and 11b	Significant local land use impacts are not anticipated under these alternatives.	Not Significant	None required.	Not Significant
	1c	The potential for proximity impacts would result in land use impacts, primarily affecting residential property along the diagonal segment.	Significant	Examine the feasibility of maintaining sufficient space for a bikeway or greenway along the edge of the rail alignment.	Not Significant
	6a, 11a	This alternative could affect 72 residential blocks, 3 schools, three religious institutions, and 2 fires stations.	Significant	Residential, educational, or open space uses within 50 feet of the rail alignment shall be screened with a combination of fences, walls, and landscaping .	Not Significant
	Stations	Sensitive land uses are not located within close proximity to station locations, and therefore significant local impacts are not anticipated.	No Effect	None required.	No Effect
Consistency with Existing Plans and Zoning	TSM	No impacts are anticipated under the TSM alternative.	No Effect	None required	No Effect

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts: Description	Environmental Impacts: Degree	Mitigation	Residual Impact
Consistency with Existing Plans and Zoning	1, 6, 11	Construction along Chandler Boulevard would be consistent with local plans, but could affect the feasibility of the *North Hollywood Community Plan* objective of bicycle and equestrian trails along the SP right-of-way.	Beneficial/ Potentially Significant for trails	Determine feasibility of implementing bicycle and/or equestrian path within right-of-way. An on-street facility may be required east of Whitsett due to a narrower median. The plan should be revised if not feasible.	Potentially Significant for trails
	2	Rail alternative 2 would be consistent within existing plans and zoning.	Beneficial	None required.	Beneficial
	Stations	With the exception of the Valley College - Fulton/Oxnard station, the remaining stations would be consistent with the policies of the applicable *Transportation/Land Use Policy*. The location of the Fulton Oxnard Station would not support the policies of the *Transportation/Land Use Policy*.	Not Significant	None required.	Not Significant
Station Area Development Potential	Stations	Potential new development could significantly alter the current character of the Sepulveda station and potentially result in impacts to residential neighborhoods to the north of Erwin Street. The remaining stations would not result in impacts.	Potentially Significant	A planning study should be conducted for the area within one quarter of a mile of the Sepulveda station.	Not Significant
Acquisitions and Displacements (Section 4-2)					
Residential Acquisitions and Displacements	TSM	The TSM alternative would not result in residential acquisitions.	No Effect	None required.	No Effect
	1, 2, 6, 11	Would require the acquisition of 2 residential parcels.	Significant	The MTA would provide relocation assistance in compliance with the Uniform Act and the 1987 Amendments.	Not Significant
Nonresidential acquisitions and displacements	TSM	The TSM alternative would not result in nonresidential acquisitions.	No Effect	None required.	Not Significant
	1, 2, 6, 11	All of the proposed alternatives would result in the acquisition of 5 store and restaurant parcels, 4 office parcels, 9 warehouse or garage parcels, and 3 parking lot or vacant parcels which would displace 18 businesses and an estimated 149 employees. Alternatives 1, 6, and 11 would also require the acquisition of 2 parking lot parcels.	Significant	The MTA would provide relocation assistance in compliance with the Uniform Act and the 1987 Amendments.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Leases	TSM	The TSM alternative would not require the reacquisition of leased property.	No Effect	None required.	No Effect
	1, 6, 11	Approximately 28 businesses and 16 residences have leased property that would be reacquired. Twenty businesses would be displaced. Residential property leases to be cancelled are generally backyard encroachments into the railroad right-of-way and do not involve relocation or displacement of homes.	Not Significant	None required.	Not Significant
	2	MTA would reacquire property from approximately 22 businesses, 16 of which would be displaced.	Not Significant	None required.	Not Significant
Demographics and Neighborhoods (Section 4-3)					
Neighborhood Impacts	TSM	New buses would not travel through residential neighborhoods; thus, neighborhood character, perceived security, and access would not be adversely affected.	No Effect	None required.	No Effect
	1a, 1b, 1c, 2, 6, 11	These alternatives would not affect neighborhood character, perceived security, or access.	No Effect	None required.	No Effect
	1d	The aerial guideway west of Coldwater Canyon Boulevard would introduce a substantially different scale into the neighborhood and would consequently affect neighborhood character. The height and new views associated with the structure would affect perceived neighborhood security.	Significant	Gaps should be filled in with dense vegetation so that backyards and second stories are shielded from the guideway by trees and shrubs. Trees should be at least 20 feet in height.	Not Significant
	Stations	Adverse impacts on neighborhood character could result from intensification of development around stations in residential areas if future development is incompatible with the character of the surrounding neighborhood.	Potentially Significant	Station area development plans should be developed as necessary for station areas to provide a comprehensive set of policies, programs, and regulations for guiding and ensuring appropriate development.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Environmental Justice	All alternatives	The study area does not contain significant minority or low income populations relative to the county. Because all alternatives of this project increase transit accessibility, the project would benefit the study area's transit dependent population. No disproportionately high and adverse human health or environmental effects on minority or low income populations would occur.	Beneficial	None required.	Beneficial
Community Facilities and Services (Section 4-4)					
Fire and Police Protection	TSM	Fire and police protection services would not be affected by the TSM alternative.	No Effect	None required.	No Effect
	Rail Alternatives	None of the alternatives would significantly affect fire and police services.	Not Significant	None required.	Not Significant
Schools and Libraries	TSM	The TSM Alternative would increase the numbers of buses in service and would improve transit access to schools and libraries.	Beneficial	None required.	Beneficial
	Rail Alternatives	The rail alternatives would improve access to schools located within 1/4 mile of the alignments. Potential safety impacts at schools located within 1/4 mile of at-grade or open-cut segments (Alternatives, 1c, 6a, and 11a).	Beneficial to Not Significant	Standard safety measures such as fencing, crossing protection at grade crossings, and designated crosswalks would be utilized.	Beneficial to Not Significant
Religious Institutions, Health Care Facilities, Parks and Recreational Facilities	TSM	The TSM Alternative would increase the numbers of buses in service and would improve transit access to religious, health care, and recreational facilities.	Beneficial	None required.	Beneficial
	Rail Alternatives	The rail alternatives would benefit access to religious institutions and health care and recreational facilities located within 1/4 mile of the alignments.	Beneficial	None required.	Beneficial
Fiscal and Economic Conditions (Section 4-5)					
Employment and Economic Activity	TSM	The TSM Alternative would generate approximately 260 direct, on-site full-time employment (FTE) jobs, 180 direct, off-site FTE jobs, and 590 indirect FTE jobs for a total of 1,030 FTE jobs. Since no property acquisitions would be required, no jobs would be displaced.	Beneficial	None required.	Beneficial

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Employment and Economic Activity	1, 11	Alternative 1 would generate approximately 1,370 jobs and displace 150 jobs for a net increase of 1,220 jobs.	Beneficial	None required.	Beneficial
	2	Alternative 2 would generate approximately 1,280 jobs and displace 150 jobs for a net increase of 1,130 jobs.	Beneficial	None required.	Beneficial
	6	Alternative 6 would generate approximately 570 jobs and displace 150 jobs for a net increase of 420 jobs.	Beneficial	None required.	Beneficial
Tax Revenues	TSM	Development of the TSM Alternative would not require property acquisitions; thus, this alternative would not result in losses in property tax revenue.	No Effect	None required.	No Effect
	Rail Alternatives	Alternatives 1 and 6 would result in property tax revenue losses of $180,500; $176,400 under Alternative 2; and $178,100 under Alternative 11. The losses would total 0.0003% of the total property tax revenue allocated to any one group of jurisdictions.	Not Significant	None required.	Not Significant
Housing Demand	TSM	The TSM Alternative could create a potential demand for approximately 1,000 new housing units, which is equivalent to 0.5% or less of the housing supply of either the region, county, or city.	Not Significant	None required.	Not Significant
	Rail Alternatives	The potential demand for new housing units would be approximately 1,400 under Alternatives 1 and 11, 1,300 for Alternative 2, and 600 for Alternative 6; 0.5% or less of the housing supply of either the region, county, or city.	Not Significant	None required.	Not Significant
Visual and Aesthetic Conditions (Section 4-6)					
Changes to Existing Visual Environment	TSM	The TSM Alternative would not result in changes to the visual and aesthetic environment.	No Effect	None required.	No Effect
	1a, 1b, 1c, 1d	Potential loss of western portion of the eucalyptus hedgerow in the median of the SP ROW between SR-170 and Laurel Canyon Boulevard.	Significant	A certified botanist shall investigate the feasibility of preserving the trees. If the trees cannot be preserved, they shall be replaced in kind.	Not Significant

**Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts**

Category	Alternative	Environmental Impacts: Description	Environmental Impacts: Degree	Mitigation	Residual Impact
Changes to Existing Visual Environment	1d	Incompatible visual elements (aerial guideway) would be added to the visual environment along the SP ROW from Woodman Avenue to Hazeltine Avenue and from Ethel Street to Woodman Avenue that could be seen by sensitive viewers.	Significant	The guideway shall be screened and softened with landscaping.	Not Significant
	2	This alternative would not result in significant changes to the visual and aesthetic environment.	No Effect	None required.	No Effect
	6a, 6b, 11a, 11b	Incompatible visual elements (catenary wires and poles) would be added to the visual environment along the SP ROW from Woodman Avenue to Hazeltine Avenue that could be seen by sensitive viewers.	Significant	The right-of-way shall be landscaped to screen views.	Not Significant
	6b, 11b	Potential loss of eucalyptus hedgerow in the median of the SP ROW between SR-170 and Laurel Canyon Boulevard	Significant	A certified botanist shall investigate the feasibility of preserving the trees. If the trees cannot be preserved, they shall be replaced in kind.	Not Significant
		Incompatible visual elements (open trench, fencing) would be added to the visual environment along the SP ROW from Woodman Avenue to Hazeltine Avenue that could be seen by sensitive viewers.	Significant	The right-of-way shall be landscaped to screen views.	Not Significant
	Stations	The aerial Valley College - Fulton/Burbank Station would introduce an incompatible visual element that could be seen by sensitive viewers. The remaining stations would not result in significant visual impacts.	Significant	The guideway shall be screened and softened through the use of landscaping.	Not Significant
Air Quality (Section 4-7)					
Subregional Air Quality	No Project	Would produce approximately Year 2015 daily emissions (in tons) as follows; reactive organic gases, 18,700; carbon dioxide, 220,800; nitrogen oxide, 176,300; sulfur oxide, 4,700; particulate matter, 4,100.	Not Significant	None required.	Not Significant
	TSM	Daily emissions in Year 2015 would be slightly reduced compared to the No Project Alternative.	Beneficial	None required.	Beneficial

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Subregional Air Quality	Rail Alternatives	Daily emissions in Year 2015 would be slightly reduced compared to both the No Project and TSM alternatives. Alternative 2 would produce the greatest reductions, followed by Alternatives 1 and 11, and Alternative 6.	Beneficial	None required.	Beneficial
Local Air Quality	No Project	No violations of federal or state CO standards in the Year 2015.	Not Significant	None required.	Not Significant
	TSM	No violations of federal or state CO standards in the Year 2015.	Not Significant	None required.	Not Significant
	Rail Alternatives	No violations of federal or state CO standards in the Year 2015. Concentrations would be almost identical for each alternative.	Not Significant	None required.	Not Significant
Conformity	TSM and Rail Alternatives	All of the alternatives are in conformity with the Federal *Clean Air Act* and *Regional Air Quality Management Plan.*	Beneficial	None required.	Not Significant
Energy (Section 4-9)					
Energy Consumption	TSM	The TSM Alternative would result in a slight decrease in energy consumption when compared to the No Project alternative.	Beneficial	None required.	Beneficial
	Rail Alternatives	Alternatives 1, 2, and 6 would result in a slight increase in energy consumption when compared to the No Project Alternative while Alternative 11 would result in a slight decrease. However, on a per passenger mile base, each of the alternatives would result in an improvement compared to the No Project Alternative.	Beneficial	None required.	Beneficial
Noise and Vibration (Section 4-9)					
Noise Impacts	TSM	No noise impacts are projected for the TSM Alternative.	No Effect	None required.	No Effect
	1a, 1b, 2	No noise impacts are projected.	Not Significant	None required.	Not Significant
	1c	This alternative would result in moderate noise impacts at 3 single-family residences.	Significant	Extend the sides of the trench to 8 feet above grade or apply sound absorption treatment on the sides of the trench.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Noise Impacts	1d	Moderate noise impacts at 111 single-family residences, 65 multi-family residences, 3 schools, and 1 place of worship. Severe noise impacts at 138 single-family residences and 6 multi-family residences.	Significant	21,000 linear feet of 4 foot high barrier and 7,900 feet of 8 foot high barrier.	Not Significant
	6a	Moderate noise impacts at 21 single-family residences, 21 multi-family residences, and 1 place of worship. Severe noise impacts at 3 multi-family residences. Impacts would be more extensive and severe if trains are required to sound horns before grade crossings per existing Public Utilities Commission requirements.	Significant	Quieter bells at grade crossings and either sound walls or berms along the at-grade sections.	Not Significant
	6b	Moderate noise impacts at 8 single-family residences.	Significant	Quieter bells at grade crossings and sound walls.	Not Significant
	11a	Moderate noise impacts at 27 single-family residences, 16 multi-family residences, and 3 places of worship. Severe noise impacts at 1 multi-family residence.	Significant	Quieter bells at grade crossings and either sound walls or berms along the at-grade sections.	Not Significant
	11b	Moderate noise impacts at 14 single-family residences.	Significant	Quieter bells at grade crossings and sound walls.	Not Significant
Ground-borne Vibration and Noise	TSM	The TSM Alternative would not result in ground-borne vibration or noise impacts.	No Effect	None required.	No Effect
	1a	Would result in ground-borne vibration impacts at 33 single-family and 3 multi-family buildings; ground-borne noise impacts at 62 single-family and 14 multi-family buildings.	Significant	Potential measures include ballast mat, resilient ties, and floating slab track beds.	Not Significant
	1b	Would result in ground-borne vibration impacts at 33 single-family and 6 multi-family buildings; ground-borne noise impacts at 77 single-family and 49 multi-family buildings.	Significant	Potential measures include ballast mat, resilient ties, and floating slab track beds.	Not Significant
	1c	Would result in ground-borne vibration impacts at 35 single-family and 6 multi-family buildings; ground-borne noise impacts at 77 single-family and 51 multi-family buildings.	Significant	Potential measures include ballast mat, resilient ties, and floating slab track beds.	Not Significant
	1d	Would result in ground-borne vibration impacts at 15 single-family and 4 multi-family buildings; ground-borne noise impacts at 51 single-family and 32 multi-family buildings.	Significant	Potential measures include ballast mat, resilient ties, and floating slab track beds.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts: Description	Environmental Impacts: Degree	Mitigation	Residual Impact
Ground-borne Vibration and Noise	2	Would result in ground-borne vibration impacts at 63 single-family and 23 multi-family buildings; ground-borne noise impacts at 114 single-family and 24 multi-family buildings.	Significant	Potential measures include ballast mat, resilient ties, and floating slab track beds.	Not Significant
	6	Would result in ground-borne vibration impacts at 23 single-family and 4 multi-family buildings; ground-borne noise impacts at 45 single-family and 50 multi-family buildings.	Significant	Potential measures include ballast mat, resilient ties, and floating slab track beds.	Not Significant
	11	Would result in ground-borne vibration impacts at 38 single-family and 6 multi-family buildings; ground-borne noise impacts at 83 single-family and 57 multi-family buildings.	Significant	Potential measures include ballast mat, resilient ties, and floating slab track beds.	Not Significant
Geotechnical Considerations (Section 4-10)					
Soils	TSM	The TSM Alternative would not be affected by local soil conditions.	No Effect	None required.	No Effect
	Rail Alternatives	There is the potential for settlement of unsuitable foundation soils along portions of each of the alternatives.	Potentially Significant	Proper engineering design in accordance with current building code requirements. Appropriate use of piles and caissons.	Not Significant
		If cut and fill slopes required for the alternatives are not properly designed, there would be a possibility for gross instability.	Potentially Significant	Proper engineering design in accordance with current building code requirements.	Not Significant
Seismicity	TSM	The TSM Alternative is not anticipated to be significantly affected by seismically related impacts.	No Effect	None required.	No Effect
	Rail Alternatives	Potential ground shaking could result in moderate to strong ground accelerations in the vicinity of the proposed alignments.	Significant	Proper engineering design in accordance with current building code requirements. All structural elements will be designed to resist Maximum Design Earthquake.	Not Significant

**Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts**

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Seismicity	Rail Alternatives	Portions of the alignments west of Tujunga Wash could be susceptible to liquefaction, including the Sepulveda and Van Nuys station sites. In addition, there may be localized areas subject to seismic settlement along each of the alignments.	Significant	Proper engineering design in accordance with current building code requirements. Potential measures include: soil compaction, lowering of the groundwater table, and special foundations.	Not Significant
		Seismically induced slope instability could affect open air segments (Alternatives 1c and 11a) and open cut or cut/cover segments (1b and 11b).	Significant	Proper engineering design in accordance with current building code requirements. Potential measures include: retaining walls, tie-back systems, and soil nailing.	Not Significant
Hazardous Materials	TSM	Hazardous materials would not affect operation of the TSM Alternative.	No Effect	None required.	No Effect
	Rail Alternatives	There is a potential for public exposure to contaminated soil and/or groundwater due to operational activities in tunnel and cut/cover segments (affecting portions of all alternatives, except 6a).	Not Significant	Proper engineering design in accordance with current building code requirements. Potential measures include: removal of contaminated material and use of high density polyethylene barrier.	Not Significant
		If unreported wells exist, there would be a remote possibility for the accumulation of flammable of toxic gases in tunnel and cut/cover segments of the proposed alignments.	Not Significant	Measures include: natural ventilation, ventilation fans, collecting and sampling of air samples.	Not Significant
Biological Resources (Section 4-11)					
Biological Resources	TSM	The TSM Alternative would not result in significant impacts to biological resources. Potential minor effects associated with noise, increased lighting, and stormwater runoff in vicinity of Sepulveda Basin.	Not Significant	None required.	Not Significant
	Rail Alternatives	The rail alternatives would not result in significant impacts to biological resources. Potential minor effects associated with noise, increased lighting, and stormwater runoff in vicinity of Sepulveda Basin.	Not Significant	None required.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Water Resources (Section 4-12)					
Surface Waters	TSM	Water quality impacts during operation of the TSM alternative would be minor given the urban nature of the San Fernando Valley.	Not Significant	None required.	Not Significant
	Rail Alternatives	Water quality impacts during operation of a rail alternative would be minor given the urban nature of the San Fernando Valley.	Not Significant	None required. Oil-water separators should be included as necessary at proposed parking lots to further improve water quality.	Not Significant
Groundwater	TSM	Operation of the TSM Alternative would not be affected by groundwater.	No Effect	None required.	No Effect
	Rail Alternatives	Since groundwater depth in the vicinity of the East Valley are greater than 100 feet below ground surface, operation of a rail alternative would not be affected by groundwater.	No Effect	None required.	No Effect
Floodplains	TSM	Operation of the TSM Alternative would not be affected by floodplains.	No Effect	None required.	No Effect
	1a, 1b, 2	These alternatives would not encroach on floodplains.	No Effect	None required.	No Effect
	1c	From approximately Whitsett Avenue to the transition to deep bore tunnel (including the Laurel Canyon station), would be within a 500-year floodplain as identified in *Los Angeles County Drainage Area Review.*	Potentially Significant	Complete coordination with the USACOE and Los Angeles County Department of Public Works to establish flood design parameters. A short barrier (less than 3 feet) could be used at open trench and station sites to prevent floodwaters from entering.	Not Significant
	1d	Although this alignment is predominantly aerial, it would transition into a below-ground segment from Laurel Canyon to the North Hollywood station. The below-ground segment would be located within the 500-year floodplain east of Whitsett Avenue (including the Laurel Canyon station).	Potentially Significant	Complete coordination with the USACOE and Los Angeles County Department of Public Works to establish flood design parameters.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Floodplains	6a	The at-grade section of the alignment in the vicinity of Coldwater Canyon Avenue would be located within the 100-year floodplain. From approximately Whitsett Avenue to the North Hollywood station, the at-grade alignment would be within the 500-year floodplain.	Not Significant	Complete coordination with the USACOE and Los Angeles County Department of Public Works to establish flood design parameters.	Not Significant
	6b	The Laurel Canyon station would be located within the 500-year floodplain.	Potentially Significant	Complete coordination with the USACOE and Los Angeles County Department of Public Works to establish flood design parameters.	Not Significant
	11a	The at-grade section of the alignment in the vicinity Coldwater Canyon Avenue would be located within the 100-year floodplain. From approximately Whitsett Avenue to the transition to deep bore tunnels, the at-grade or open cut alignment would be within the 500-year floodplain.	Potentially Significant	Complete coordination with the USACOE and Los Angeles County Department of Public Works to establish flood design parameters.	Not Significant
	11b	The Laurel Canyon station would be located within the 500-year floodplain.	Potentially Significant	Complete coordination with the USACOE and Los Angeles County Department of Public Works to establish flood design parameters.	Not Significant
Safety and Security (Section 4-13)					
Safety and Security	TSM	The TSM Alternative would not result in safety or security impacts.	No Effect	None required.	No Effect
	Rail Alternatives	There is potential for safety and/or security incidents along alignments and near and within the rail stations.	Not Significant	MTA will implement standard safety procedures similar to those utilized within the existing Red, Blue, and Green Lines.	Not Significant
Cultural Resources (Section 4-14)					
Archaeological Resources	TSM	Operation of the TSM Alternative would not affect archaeological resources.	No Effect	None required.	No Effect
	Rail Alternatives	Operation of a rail alternative would not result in impacts to archaeological resources.	No Effect	None required.	No Effect

Table S-5: San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Historic Resources	TSM	Operation of the TSM Alternative would not affect historic resources.	No Effect	None required.	No Effect
	Rail Alternatives	The operation of the proposed rail alternatives would not affect historic resources. Alternative 6 offers potential for reuse of historic Lankershim Southern Pacific Depot.	No Effect	Under Alternative 6, restoration of the Lankershim Southern Pacific Depot and reinstatement of rail passenger services shall be undertaken in accordance with the procedures stipulated in the 1983 (amended 1994) Memorandum of Agreement (part of the Metro Rail North Hollywood Extension EIS).	No Effect
Section 4(f) (Section 4-15)					
Section 4(f)	TSM	Operation of the TSM Alternative would not result in Section 4(f) (constructive or temporary) use of recreational or cultural resources.	No Effect	None required.	No Effect
	Rail Alternatives	Operation of the rail alternatives would not result in a Section 4(f) (constructive or temporary) use of recreational or cultural resources.	No Effect	None required.	No Effect
Other Impact Considerations (Section 4-16)					
Cumulative Impacts	TSM	The TSM Alternative would not result in significant cumulative effects.	No Effect	None required.	No Effect
	Rail Alternatives	No cumulative impacts were found for the following alternatives: Land Use and Development, Acquisitions and Displacement, Demographics and Neighborhoods, Community Facilities, Fiscal and Economic Conditions, Visual and Aesthetics, Air Quality, Energy, Noise and Vibration, Geotechnical, Biological Resources, Water Resources, Safety and Security, Cultural Resources, or Section 4(f).	No Effect	None required.	No Effect

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts: Description	Environmental Impacts: Degree	Mitigation	Residual Impact
Cumulative Impacts	Rail Alternatives	As a result of increased traffic in the vicinity of stations, between 7 and 11 intersections would experience a decrease in LOS to unacceptable levels. There would also be a potential for cumulative parking impacts at the Sepulveda Station.	Significant	Mitigation measures include: parking supply to be relocated among stations to spread demand; local street improvements at affected intersections; monitor parking demand; and increase supply of parking as needed.	Not Significant
Construction Impacts					
Transportation (Construction)	TSM	The TSM Alternative would not involve fixed facilities, and therefore, would not have adverse transportation impacts.	No Effect	None required.	No Effect
	Rail Alternatives	Construction of a rail alternative would result in temporary lane and night-time street closures. Alternatives 1a and 2 would require the fewest closures. Decking would affect the efficiency of traffic flow.	Significant	The following are example mitigation measures which will be implemented: completion of a Worksite Traffic Control Plan, coordination with the Los Angeles Department of Transportation, use of decking, development of a truck route haul plan, and adoption of a site specific parking plan.	Not Significant
		Trucks removing excavated materials would have the potential to have traffic impacts.	Potentially Significant		Not Significant
		Construction could result in localized parking shortages in the area immediately surrounding a proposed station.	Potentially Significant		Not Significant
Effects on Business (Construction)	TSM	Construction of this alternative is not anticipated to result in adverse impacts on businesses.	No Effect	None required.	No Effect
	Rail Alternatives	Construction could result in isolated adverse impacts to individual businesses.	Significant	Possible mitigation measures include: compensation for loss of parking, community input prior to construction, establishment of site and field offices, information telephone lines, signage, traffic management plans, and appropriate site maintenance.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Neighborhoods, Community Facilities, and Services (Construction)	TSM	Construction of the TSM Alternative is not anticipated to result in adverse impacts to neighborhoods or community facilities.	No Effect	None required.	No Effect
	Rail Alternatives	There is the potential that street or lane closures, construction staging areas, or the use of construction easements could affect neighborhood access.	Potentially Significant	MTA would do the following: review design plans to ensure reduced access in residential neighborhoods is minimized, explore alternatives as necessary; establish information/outreach program; require mitigation measure performance surveys.	Not Significant
		Increased traffic on local streets and possible street and lane closures may adversely affect response times.	Not Significant	Coordination with emergency personnel will be completed prior to construction.	Not Significant
		Safety during construction could be a concern at schools and parks located adjacent to aboveground construction sites.	Not Significant	Construction specifications shall be written to reduce potential construction hazards.	Not Significant
Employment and Housing (Construction)	TSM	Construction of the TSM Alternative would result in approximately 420 to 500 total direct full-time equivalent (FTE) jobs and annual, indirect economic benefits of approximately 6 million dollars. Would not affect housing.	Beneficial	None required.	Beneficial
	Rail Alternatives	Construction of the rail alternatives would result in approximately 10,000 to 25,000 total direct FTE and annual, indirect economic benefits of 100 to 216 million dollars. Because it is a longer (cross-valley) alternative, Alternative 6 would be the most costly to build and would therefore generate the most jobs and economic benefits. The alternatives would not affect housing.	Beneficial	None required.	Beneficial

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Visual and Aesthetic Concerns (Construction)	TSM	Construction of the TSM Alternative would not result in visual and aesthetic impacts.	No Effect	None required.	No Effect
	Rail Alternatives	Construction equipment and staging areas would temporarily introduce visual elements that would be out of character with the surrounding visual environment.	Not Significant	The following measures would be employed: screening of construction sites, implementation of a construction period arts program, and the creation of pedestrian paths, bridges, and other amenities.	Not Significant
Air Quality (Construction)	TSM	Construction of the TSM Alternative would not result in adverse construction related air quality impacts.	No Effect	None required.	No Effect
	Rail Alternatives	Assuming a worst-case daily maximum, construction would result in the following: Alternatives 1 and 2 would result in CO impacts; Alternatives 1, 2, 6a, and 11a would result in ROG impacts; and all alternatives would result in NO_x impacts.	Significant	Adhere to mitigation measures prescribed by the South Coast Air Quality Managment District (SCAQMD).	Potentially Significant (NO_x) (Short term)
		Worst-case daily PM10 concentration for each alternative would range from 89 to 141 pounds per day, below the SCAQMD threshold. However, if 2 or more segments of an alternative were constructed simultaneously, adverse PM10 impacts would result.	Significant	Adhere to mitigation measures prescribed by the SCAQMD, including Rule 403.	Potentially Significant (Short term)
Energy (Construction)	TSM	Construction of the TSM Alternative would not require substantial amounts of energy.	No Effect	None required.	No Effect
	Rail Alternatives	Short-term energy consumption during construction of a rail alternative would range from 490 billion BTU's for Alternative 6a to 1,312 billion BTU's for Alternative 1a.	Not Significant	None required.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Noise and Vibration (Construction)	TSM	Construction of the TSM Alternative would not result in significant noise or vibration impacts..	No Effect	None required.	No Effect
	Rail Alternatives	Construction of a rail alternative could result in daytime impacts within 200 to 400 feet and nighttime impacts 400 to 4,000 feet. Distances vary significantly depending on the type of construction activity. Alternative 2 along Oxnard Boulevard would have the least potential for noise impacts during construction.	Significant	Mitigation measures include requiring specific noise mitigation measures (e.g., sound walls) within construction documents, and establishing residential property line noise limits that the contractor cannot exceed.	Not Significant
		Construction of a rail alternative could result in intermittent, localized impacts along the corridor.	Potentially Significant	Construction vibration will be controlled through: specific vibration limits in contract documents, limiting where and when high vibration activities can occur, and requiring vibration monitoring.	Not Significant
Geotechnical Considerations (Construction)	TSM	The TSM Alternative would not involve substantial construction, and therefore, would not have any geotechnical impacts.	No Effect	None required.	No Effect
	Rail Alternatives	During construction of the deep bore segments (portions of Alternatives 1, 2, and 11), excessive loss of ground could result in surface settlement.	Potentially Significant	Standard construction practices would be utilized, including the following: completion of a geotechnical investigation, a sensitive structure survey, videotaping of sensitive structures, monitoring of ground surface, and additional foundation support or grouting for sensitive structures.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Geotechnical Considerations (Construction)	Rail Alternatives	During construction of the cut/cover and open air segments of all the alternatives, lateral deflection of vertical excavation walls could result in differential settlement of existing structures.	Potentially Significant	Standard construction practices would be utilized, including the following: completion of a geotechnical investigation, use of horizontal monitoring devices, shoring, approval of all slopes by a geotechnical engineer, and additional foundation support or grouting for critical structures.	Not Significant
		Potential hazardous materials impacts include the following: encountering hazardous materials during construction, contamination of soil/groundwater as a result of construction practices, and encountering an abandoned oil or gas well.	Not Significant	Standard construction practices would be utilized. Measures include additional exploration and monitoring, excavation of hazardous materials, proper storage and handling of hazardous materials, and the use of magnetometer to detect abandoned wells.	Not Significant
Biological Resources (Construction)	TSM	Construction of the TSM Alternative would not result in adverse biological impacts.	No Effect	None required.	No Effect
	Rail Alternatives	Impacts associated with construction of the rail alternatives would be limited to landscaping and common urban vegetation; no native plant communities would be affected.	Not Significant	None required.	Not Significant
Water Resources (Construction)	TSM	Since the TSM Alternative would not involve significant amounts of construction activities, adverse impacts to water resources are not anticipated.	No Effect	None required.	Not Significant
	Rail Alternatives	Construction of the rail alternatives could result in erosion and sediment loadings on the storm water and/or surface water systems.	Potentially Significant	Compliance with building code and regulatory requirements, including the requirements of a NPDES General Construction Permit (e.g., use of best management practices).	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Water Resources (Construction)	Rail Alternatives	There is a potential for encountering perched groundwater during construction of a rail alternative.	Potentially Significant	Additional piezometers will be installed during final design. If necessary an appropriate dewatering system will be implemented.	Not Significant
Safety and Security (Construction)	TSM	Since the TSM Alternative would not involve significant amounts of construction activities, adverse safety and security impacts are not anticipated.	No Effect	None required.	Not Significant
	Rail Alternatives	Construction activities, including the use of heavy equipment, would potentially expose the public to safety hazards. In addition, the presence of construction sites in close proximity to residential areas could result in perceived security impacts.	Not Significant	Reasonable and prudent construction management practices will be required to ensure the safety of construction workers and the public.	Not Significant
Utilities (Construction)	TSM	Construction of the TSM Alternative would not result in adverse utility impacts.	No Effect	None required.	No Effect
	Rail Alternatives	Construction of a rail alternative could be affected by the presence of underground or aboveground utilities. The potential for conflicts with utilities would be greatest for the cut/cover and open air segments.	Potentially Significant	Coordination with all utility providers will be completed to determine the need for an alternative design or the need for utility relocation. When disruption of service is necessary, it will be scheduled so that it is local and short term. Prior notification will be given.	Not Significant

Table S-5:
San Fernando Valley East-West Transportation Corridor - Summary of East Valley Project Impacts

Category	Alternative	Environmental Impacts		Mitigation	Residual Impact
		Description	Degree		
Cultural Resources (Construction)	TSM	Construction of the TSM Alternative would not effect cultural resources.	No Effect	None required.	No Effect
	Rail Alternatives	There is a potential, although unlikely, for encountering previously unknown archaeological resources during construction.	Not Significant	MTA's standard construction monitoring plan for archaeological resources will be followed.	Not Significant
		Excessive vibration or unforeseen soil settlement could affect historic architectural resources.	Not Significant	Vibration monitoring equipment will be installed near sensitive historic structures. Grouting will be used, as necessary, to reduce the potential for settlement around historic resources.	Not Significant
		There is a potential for encountering paleontological resources during construction of a rail alternative, particularly along cut/cover and open cut segments.	Not Significant	Mitigation requirements identified in MTA's Standard Contract Specification Section 01170 and other contract documents will be implemented.	Not Significant

S-5.2 CROSS VALLEY ALTERNATIVE STRATEGIES

A programmatic level discussion of the potential environmental effects of the Cross Valley alternatives is presented in Chapter 6 of this document. A summary of that discussion, which is provided below, focusses on those impacts that can reasonably be assumed to be significant, pending the outcome of more detailed analyses.

The Cross Valley strategies would have a beneficial impact on countywide transportation when compared to the No Project Alternative. The number of daily transit trips countywide would increase by approximately 1.3 to 2.2 percent. The impacts of the Cross Valley strategies are more pronounced when considering the travel statistics locally within the Valley. Total vehicle miles travelled valleywide would decrease by 0.4 to 4 percent and vehicle hours of travel would be reduced by between 1.5 and 10.6 percent, depending upon the alternative selected. Generally, the transportation benefits of the Valleywide TSM strategy would be less than those of the rail strategies that couple East Valley Rail with West Valley Enhanced Bus. West Valley rail alignments have been necessarily limited by cost-effectiveness indices to predominantly at-grade alignments with limited use of aerial segments.

Land use impacts could occur due to the proximity of the rail alignments to sensitive uses and the resulting potential for increased noise, shade and shadow, and increased ambient light levels. Additional right-of-way may also have to be acquired along some sections of the alignments. Property acquisition to widen streets to accommodate the rail alignments could reduce setbacks resulting in nonconforming uses and the loss of visual open space and landscaped areas. Proximity impacts (e.g., noise, traffic, light and glare) could also occur at those stations adjacent to sensitive residential areas.

Assuming that the number of acquisitions in the West Valley would be proportionate to the number of acquisitions in the East Valley, then the 11-mile long West Valley rail alignments would displace approximately 30 businesses, 250 employees, and 15 residents. This impact would be considered significant prior to implementation of mitigation, which would consist of relocation assistance in accordance with state and federal regulations.

The greatest potential for significant visual impacts would occur in proximity to the grade-separated aerial flyovers that would be provided at major cross streets. These structures have the potential to block key views of the Santa Monica and Santa Susana Mountains, to cast shadows on adjacent land uses, and to add visual features that are out of scale or incompatible with the existing visual character of adjacent residential and open spaces. The Cross Valley rail alternatives could create visual impacts on the Sepulveda Basin due to the introduction of rail related structures and facilities in an area perceived as an undeveloped open space. The conversion of open space or landscaped areas to station parking lots could have visual impacts if the parking areas are not properly screened from the view of adjacent residential uses. Aerial rail stations could create visual impacts due to increased shade and shadow, loss of privacy to adjacent residential uses, and the addition of visual elements that are out of scale and character with the existing visual environment.

The Cross Valley rail alternatives could result in noise impacts from train horns and warning signals at grade crossings. Mitigation could include reducing the loudness and duration of warning bells and sound insulation for residences. Some noise impacts would also be caused by normal train operations on at-grade and aerial track, although the degree of noise impact would be considerably lower than for the at-grade crossings. Use of berms and sound walls could mitigate potential impacts.

Vibration impacts may occur where there are residences less than 60 feet from at-grade track; 120 feet where there would be special at-grade trackwork for crossovers, pocket tracks, or turnouts. Impacts could be mitigated through relocating special trackwork to at least 200 feet from sensitive receptors and using ballast mats when there are residences less than 60 feet from the tracks.

Construction above and in the immediate vicinity of the Los Angeles River railroad crossing bridge could affect disturbed wetland resources. Although the river is configured as a concrete lined channel in this area, and the disturbed wetland community found in the project area is isolated and does not have a high biological value, it may be considered sensitive by state and federal permitting agencies. Construction within the Los Angeles River would require the appropriate Section 404 permit from the U.S. Army Corps of Engineers and a Streambed Alteration Agreement from the California Department of Fish and Game. Biological resources in the Sepulveda Basin could also be affected by operational noise and lighting effects of rail operations as well as increased surface runoff.

The Cross Valley rail alternatives could require use of Section 4(f) properties (Section 4(f) properties are defined as historic sites and publicly owned parks, recreational areas, wildlife or waterfowl refuges). What is called "temporary use" of 4(f) property in the Sepulveda Basin could result from construction of the two potential stations at Balboa Boulevard and Woodley Avenue. What is called "constructive use" under Section 4(f) could occur if rail service reduces access within the Sepulveda Basin. Traditional use under Section 4(f) would occur if acquisitions in the Sepulveda Basin are required. Section 4-15 explains the types of use under Section 4(f).

Other potential impacts, which are not expected to be significant, include neighborhood, fiscal and economic, air quality, geotechnical, water resources, safety and security, community services and facilities, and cultural resources impacts.

S-6 FINANCIAL ANALYSIS AND COMPARISON OF THE ALTERNATIVES

An evaluation of the alternatives was conducted (see Chapter 7) using a variety of measures to determine the project's effectiveness in complying with a combination of local (see Table S-1) and FTA goals and objectives. The measures that were used to evaluate how well each alternative satisfies the objectives were grouped into categories which are consistent with FTA guidelines and local goals: mobility, land use and development (transit-supportive existing land use policies and future patterns), local consensus, environmental impacts (and benefits), community impacts, cost-effectiveness, and financial feasibility.

The evaluation procedure in Chapter 7 follows what is referred to as the Multiple Measure Method, which is consistent with FTA's current guidelines for evaluating major projects. No attempt was made to provide an overall ranking or single index combining all measures. The community and its decision-makers can apply their own values in weighing the importance of the various measures and selecting a Locally-Preferred Alternative.

S-6.1 Mobility

To assess the effectiveness of the alternatives in improving mobility, measures such as the number of new riders, sample travel time savings, and effects on zero-car households were considered.

New ridership is a good method for evaluating how well the alternatives achieve objectives such as providing an alternative to the Ventura Freeway, and intercepting through traffic. According to the analysis, Alternative 2 would attract 19,000 more new riders than the TSM alternative. Alternatives 1 and 11 would attract slightly fewer riders than Alternative 2, about 16,600 new riders. Alternative 6 does not perform as well with 4,200 new riders. However, it should be observed that many of the new riders for Alternatives 1, 2, and 11, would be attracted by the enhanced bus service in the West Valley, which is not in Alternative 6.

The build alternatives would provide significantly faster travel times than those for the No Project and TSM Alternatives for most trips. For trips from Warner Center, the fastest times would be provided by Alternative 6 (LRT), which would serve the West Valley. Alternatives 1, 2, and 11 would be slower since they require a transfer to the Red Line at Sepulveda. For the trips to and from Van Nuys, the times of all of the build alternatives would be in the same range, with Alternative 6 being a few minutes slower due to the extra transfer required at North Hollywood.

Since the build alternatives offer faster travel times by transit in the corridor, some auto trips would be diverted from highway to transit. This in turn would decrease highway traffic volumes and increase highway speeds, thus reducing travel times for many highway users as well. An analysis of the net effect on travel times of the alternatives shows a net savings of 10 million hours annually for the TSM Alternative, 16 million hours for Alternative 6, 23 million hours for Alternatives 1 and 11, and 29 million hours for Alternative 2. Using the FTA value of time of (LA County average wage rate of $11.70 per hour), the value of the annual net time savings for transit and auto combined is $116 million for the TSM Alternative, $160 million for Alternative 6, $273 million for Alternatives 1 and 11, and $340 million for Alternative 2.

To measure the effect of the different alternatives in addressing the mobility of transit-dependent persons, the number of zero-car households located within approximately 1/2 mile of a new rail station. Compared to the No Project and TSM Alternatives, which only include the North Hollywood Station in the study area, Alternatives 1, 2, and 11 would have four additional stations in the East Valley. Alternatives 1 and 11 would serve approximately 2,700 zero-car households, while Alternative 2 would serve about 2,400. Alternative 6 would also serve the West Valley, with a total of 15 new stations. Therefore it would serve more zero-car households (about 4,800), even though the concentration of such households is lower in the West Valley than the East Valley.

Although the effectiveness of each alternative in improving mobility may vary according to the measure considered, the overall effect on travel and mobility is similar for Alternatives 1, 2, 6, and 11. The TSM Alternative is less effective in improving mobility than the rail alternatives, due to the heavy levels of congestion that are projected for Valley streets and highways that will make it progressively more difficult to move buses through rush hour traffic.

S-6.2 Land Use and Development

An analysis of the alternatives' consistency with local land use plans and zoning and the alternatives' station area development potential (joint development opportunities) was conducted. The purpose of the analysis was to determine to how effectively the alternatives support land use and development goals of the city of Los Angeles, and to evaluate the degree to which local land use policies and the development market foster transit-supportive land use.

All of the alternatives are largely consistent with various local planning documents. The rail alternatives would be more effective than the No Project or TSM Alternatives in reinforcing the General Plan's concept of connecting significant activity centers. The transit station locations are all identified in local community plans, with the exception of Alternative 2's Valley College station at Fulton/Oxnard and Laurel Canyon station at Laurel/Oxnard. Because of their ability to reinforce designated transit locations in community plans, all of the rail alternatives are rated better than the No Project and TSM Alternatives.

Station area development potential is best realized with stations along a fixed rail corridor as would be provided under all of the rail alternatives, unlike the No Project or TSM Alternatives. All of the rail alternatives would provide good station area development potential at the North Hollywood and Van Nuys station locations. In addition, Alternative 2 would provide opportunities at the Laurel/Oxnard station. The Valley College station alternative sites and the Sepulveda station are a concern for all rail alternatives because of potential encroachment of incompatible uses into adjacent residential areas, though significant adverse impacts are not expected. Given that the rail alternatives allow opportunities to guide transit-related development at appropriate locations, the rail alternatives are rated higher than the No Project and TSM Alternatives in supporting land use and development goals.

S-6.3 Local Consensus

The project alternatives were also evaluated to determine their effectiveness in achieving local consensus. A project can be considered responsive to the concerns of the local community and policy makers if it incorporates citizen and policy maker input from previous studies, provides opportunities for continuing community input to the MIS process, and develops community and political support through effective communication and integration with local and regional plans.

The project corridor has been the subject of extensive public review and debate. All previous studies of this corridor have been done in a public format, eliciting considerable input. Based on years of community input from previous studies, the MTA Board has previously identified a subway project, as represented by Alternative 1, as the generally favored option prior to the MIS process. While state legislation SB211 defines a particular subway construction method represented by Alternative 1a, other below-ground profiles as developed for 1b and 1c would be consistent with the intent of SB211 and therefore have similar strong ratings. On the other hand, an at-grade alternative such as Alternative 6a, or an aerial alternative, such as 1d, are known to raise substantial concerns for the communities along the corridor and are therefore rated lower. Two alternatives are also rated lower not because of known community concerns, but because of a lack of community input. Alternative 11a (dual mode Red Line via SP ROW) and Alternative 2 (Oxnard Street alignment) have emerged within the MIS process and therefore limited public comment has been offered to date. The TSM Alternative has some significant support by those who believe that the San Fernando Valley is best served by improved bus service. However, this alternative is considered insufficient by a significant segment of the public.

These ratings are based on the public comment to date. No conclusive ratings can be made because of the ongoing public review process for the MIS. Once this document has been circulated for public review and public comments have been received, the MTA Board will then be apprised of the updated public sentiment for each of the alternatives.

S-6.4 Environmental Impacts

The fourth project goal is to provide a transportation project that is compatible with and enhances the physical environment where possible. To evaluate the project alternatives' effectiveness in meeting this goal, changes in pollutant emissions, changes in energy consumption, noise impacts, and impacts to cultural resources, among other measures, were considered.

As a result of the reduction in vehicle miles travelled (VMT), all of the alternatives would have slightly beneficial effects on corridor emissions of criteria pollutants. The reductions in emissions would be generally proportional to the reductions in VMT with all of the rail alternatives showing a larger improvement than the TSM Alternative.

The reductions in VMT would also lead to decreased energy consumption by automobiles. However, for all of the rail alternatives this decrease would be offset by increased energy consumption for the construction, propulsion, and maintenance of the new transit facilities. The result would be a slight increase in overall energy consumption for the Red Line alternatives, a negligible decrease for LRT, and a slight decrease for the TSM Alternative.

The No Project and TSM Alternatives would have no expected noise impacts. While rail alternatives would have varying degrees of noise impacts, these impacts can be mitigated to acceptable levels.

None of the alternatives would negatively affect cultural resources.

In summary, the TSM would result in the least amount of impact. However, it also has the least ability to reduce emissions since fewer cars would be taken off the road. Levels of impacts among the rail alternatives would tend to be similar since mitigation measures are identified where any significant impacts are expected.

S-6.5 Community Impacts

The fifth project goal is to provide a transportation project that minimizes impacts on the community. To assess the alternatives' effectiveness in complying with this goal, the following impacts were considered: localized station area impacts, acquisitions and displacements, neighborhood impacts, community facilities/services impacts, visual/aesthetic effects, traffic/parking impacts, and construction impacts.

No localized station impacts are anticipated under the TSM Alternative. Impacts for the majority of rail alternatives would not be significant. Significant impacts under Alternatives 1c, 6a, and 11a could be mitigated to acceptable levels under CEQA and NEPA criteria.

The TSM Alternative would require no acquisitions or displacements. All rail alternatives would require acquisition of two residential parcels and displacement of 18 businesses.

The TSM Alternative as well as Alternatives 1a, 1b, 1c, 2, 6, and 11 would not significantly affect neighborhood character. Aerial guideway on Alternative 1d would introduce project elements that may be out of balance with the scale of the neighborhood. All rail alternatives could potentially have impacts at stations and it is recommended that station area development plans be prepared to guide and ensure appropriate development.

The alternatives would improve access to public facilities compared to No Project conditions. Fire and police protection would not be significantly affected by any alternative.

The TSM Alternative, as well as Alternatives 1a, 1b, and 2, would not result in significant changes to the visual and aesthetic environment. Alternative 1c introduces a segment of open trench; 1d involves aerial guideway; and 6a and 11a involve catenary wires and poles. Mitigations have been identified that would reduce impacts to non-significance.

Since the TSM Alternative would not involve transit stations, no intersections would be affected. For the rail alternatives, significant impacts would occur at 5 to 11 intersections; however, conditions would improve for a greater number of intersections over the No Project condition. In addition, roadway improvements have been identified that would reduce impacts to non-significant levels. Parking impacts are expected at the Sepulveda station for all the rail alternatives, and a recommended mitigation program has been identified.

The TSM Alternative would result in no major construction impact, although there may be the need for local street improvements. Rail alternatives would result in impacts that could be mitigated to an insignificant level in the areas of transportation, effects on businesses, neighborhood access, noise and vibration, earth settlement, water resources, and utilities. Rail alternatives would have potentially significant air quality impacts during construction, although such impacts would be limited in duration and confined to areas immediately adjacent to construction sites.

In summary, the TSM would result in the fewest community impacts. Among the rail alternatives, there are few points of distinction since most impacts can be mitigated to acceptable impact levels. Perhaps the greatest distinction among the alternatives occurs in the visual/aesthetic category, where visual conditions vary widely: while Alternatives 1a, 1b, and 2 are underground, Alternative 1c involves an open trench, 1d involves aerial structure, and 6a and 11a involve surface rail with poles and catenary.

S-6.6 Cost Effectiveness

One of the major goals for the corridor is to provide a transportation system that is cost effective and within the ability of MTA to fund, including capital and operating costs.

The FTA guidelines identify several measures to evaluate operating efficiency: passengers per vehicle mile or passenger-miles per vehicle are used to determine how efficiently the transit system transports passengers; operating cost per vehicle mile, per passenger, and per passenger-mile are used to evaluate the cost-efficiency of providing the service and carrying riders.

Each of the Red Line alternatives, including Dual Mode (Metro Red Line vehicle with capability to receive power from overhead catenary as well as a third rail), would attract slightly fewer passengers per vehicle-mile than the TSM or No Project Alternatives. Alternative 6 (LRT) would attract slightly more passengers per vehicle-mile. This reflects the better utilization of vehicle capacity with light rail. As an independent rail line, the light rail trains could be scheduled for maximum utilization at their peak load point, approaching North Hollywood. The Red Line vehicle would be only partially full at that location, since they would continue to receive boarding passengers through the Hollywood/Vermont section of the line. Thus, trains in the Valley would be driven by the need to accommodate peak loading on other parts of the Red Line system.

The Red Line alternatives, including Dual Mode, compare slightly better in terms of passenger-miles of travel, while LRT would be the most efficient. These patterns reflect the longer average trips attracted by the build alternatives, as discussed in the mobility section of Chapter 7.

For the rail system, each of the build alternatives shows an improvement in operating cost per vehicle-mile versus the TSM Alternative. Alternative 6 shows only a slight reduction compared to those for the heavy rail alternatives. This reflects the economies of scale of extending the Red Line versus using a different mode. The comparison is also affected by the larger size of the light rail vehicles. When expressed in system cost per passenger, most of the build alternatives would have about the same cost as the TSM. The system cost per passenger-mile shows a different pattern. The build alternatives would be more efficient than the TSM, with Alternative 6 (LRT) showing the largest cost reduction.

Capital costs are divided into base capital, and systemwide (fleet-related) costs. Base capital costs include construction of line and stations, plus system elements such as traction power and train control, with all appropriate add-ons for design, construction management, and contingency. Right-of-way includes the property that would have to be acquired for the project; this does not include the value of the SP right-of-way already purchased by MTA. Fleet-related costs are based on the number of additional bus and rail vehicles that would be required to operate the system.

The base capital costs for the Red Line extensions to I-405 via the SP would range from $663 million (Alternative 1-D) to $919 million (Alternative 1-A), depending on the vertical profile and type of construction. The Red Line extension to I-405 via Oxnard (Alternative 2) falls in the middle of the range for the SP alternatives at $873 million. The Dual Mode Alternative to I-405 (11-A), would cost slightly less than Alternative 1-D, $634 million. The lower construction cost for Alternative 11-A is more than offset by the additional cost of converting much of the Red Line fleet to Dual Mode operation. The LRT Alternative (6-A), which would extend to Valley Circle, would be the most expensive at $1,133 million, but the cost per mile would be lower than the other build alternatives.

Systemwide costs for the bus and rail system would consist of additional vehicles and improvements to maintenance/storage yards. There is adequate capacity at the two MTA bus divisions in the San Fernando Valley to accommodate the estimated increases in bus fleet size, although with some crowding in some cases.

The TSM alternative would have a bus capital cost of $31 million relative to No Project. Some of the build alternatives would require fewer buses than the No Project Alternative, so they have a cost credit for this item, while others would require slightly more buses.

The incremental capital costs for the build alternatives were calculated relative to the TSM Alternative. The annualized capital cost was calculated with a discount rate of 7%, established by FTA. Each major category of costs is annualized based on the expected life of those items:

Structures (line and stations)	50 years
Rail vehicles	25 years
Buses	12 years

The resulting annualized capital cost for the TSM Alternative (relative to No Project) would be $4 million. The annualized costs for the Red Line extensions to I-405, including Dual Mode, would range from $68 to $87 million. The annualized capital cost for the cross-valley LRT alternative would be $108 million.

Since the early 1980's FTA has used a cost-effectiveness index to evaluate and compare new start transit projects. The cost-effectiveness index is an attempt to calculate the net cost, considering most major quantifiable costs and benefits, of attracting one new rider to transit. The original index is defined as follows:

$$\text{Cost-Effectiveness Index} = \frac{\Delta\text{Capital Cost} + \Delta\text{O\&M Cost} - \Delta\text{Value of Transit Travel Time Savings}}{\Delta\text{Linked Transit Riders}}$$

For the build alternatives, each of the above four components was calculated as the *annualized increment* (Δ) compared to the TSM alternative. The TSM alternative was compared against the No Project condition.

The following observations can be made from the cost-effectiveness analysis:

- The TSM Alternative has by far the lowest cost-effectiveness indices, indicating that it would be the most effective alternative in attracting new trips to transit. (As noted above, the TSM Alternative is compared to the No-Project Alternative, while the build alternatives are compared to the TSM.)

- The indices for the five options for a Red Line extension to I-405 are clustered fairly closely. The most cost-effective ones would be 1d (SP aerial) and 2 (Oxnard). Alternative 1d scores well because it has the lowest capital cost of the six options to I-405. Alternative 2 scores well because it attracts slightly more riders than the alternatives along the SP corridor, even though the capital cost is in the middle of the group.

- Alternative 6 (LRT) has the highest cost per new rider. This index is very sensitive to the number of *new* riders, and LRT is projected to attract the fewest new passengers to transit even though it would extend across the entire valley. As discussed earlier, this in part reflects differences in bus service among the alternatives. The Enhanced Bus service in the West Valley accounts for most of the new riders for the alternatives ending at I-405, and is not included in Alternative 6. The MTA ridership model is very sensitive to waiting times and transferring. Accordingly, LRT is adversely affected by the additional transfer for many passengers at North Hollywood. However, the annualized cost of LRT, which serves the entire Valley, is only slightly higher than the annualized cost of the most expensive Red Line to I-405 option ($112 versus $105 million). The annual operating cost is the lowest of any alternative except No-Project.

- Alternative 11 (Dual Mode) has ridership and cost inputs very similar to Alternative 1d, except for higher vehicle costs. The resulting cost-effectiveness indices are slightly higher (more expensive) than Alternatives 1d and 2.

S-6.7 Financial Feasibility

Financial capability was examined for the San Fernando Valley alternatives under the assumption that the priorities in the MTA's Long Range Transportation Plan (LRTP) are kept. The LRTP is the MTA's long range strategic planning document, adopted in 1995. The LRTP is currently being updated. As part of the update, the MTA Board of Directors has adopted an implementation schedule for rail extensions that were in the adopted LRTP. This schedule is currently being reviewed by FTA and proposes the delay of several projects by between 2 to 6 years. Pending consideration and adoption of a new LRTP, it is fully expected that the San

Fernando Valley East-West Corridor will remain as a funded component. Consistent with previous MTA Board policy, the financial analysis assumes that the San Fernando Valley rail project is implemented before further Red Line extensions to Wilshire & Federal and Whittier & Atlantic.

Numerous assumptions which reflect the best available estimate of future trends in funding and costs over the analysis period are included in the update of the Long Range Transportation Plan. Existing MTA policy, as well as federal and state policies and laws, guided the development of the assumptions. These assumptions address such factors as: inflation (3.28 percent average annual inflation rate applied to projected revenues and operating costs; 2.41 percent average annual inflation rate applied to estimated transit capital cost items), the federal Urbanized Area Formula Program (assumed to be discontinued in FY2003), fare revenues (assumed to increase every two years by the rate of inflation), sales tax funds (local sales tax revenues of $43 billion over the next 20 years), federal new start funds (assumed to provide 50 percent funding for each of the three rail lines planned in the second and third decade of the plan), capital costs, operating and maintenance costs, and debt financing.

It is expected that the priorities in the adopted Plan will remain fundable though construction dates may slip from 2 to 6 years for the East-West corridor project and other rail extensions. The updated plan is expected to be reviewed and adopted by the Board later this year.

MTA has identified five potential revenue sources which may have the potential for addressing annual funding deficits for the San Fernando Valley East-West alternatives. These sources would generate approximately $220 million (FY1997 dollars) annually in Los Angeles County. These sources include:

- ¼-cent countywide general sales tax;
- 6-cent per gallon statewide fuel tax;
- Additional 4 percent statewide sales tax on fuel;
- ⅓-cent per mile vehicle use fee.

Implementation of any of these new funding sources would require legislation at the state and/or local level. Additional funding sources may be available through the use of local funding participation and privatization techniques including but not limited to, design-build or turnkey construction packaging.

S-7 COMMENTS AND COORDINATION

An extensive public and agency outreach effort has been conducted for this study in order to identify and involve various stakeholders in the project. This included meetings with groups and elected officials, station siting workshops, newsletters, and the public scoping process associated with the environmental document. Comments on the Draft MIS/EIS/ SEIR will be responded to in the Final document and considered in the choice of a preferred alternative.

S-8 AREAS OF CONTROVERSY

Over the course of the development of the San Fernando Valley East/West Transportation Corridor, which has occurred over the last 14 years, three main areas of controversy have continued to be discussed, as follows:

- *Valley Component of the MTA System.* Since the passage of Proposition A in 1980, San Fernando Valley residents, who comprise over 40 percent of the city of Los Angeles' population, have paid sales tax dollars with the understanding that those dollars would go to building a countywide rail transit system. In the past year an increasing number of San Fernando Valley organizations and individuals have argued that the Valley taxpayers "are not getting a fair share" of the rail projects. Stakeholders believe that they have little to show for their portion of sales taxes which are supposed to be used for building a rapid transit system in the San Fernando Valley. They feel that while the MTA has been studying concepts for the Valley, other areas of the county have already obtained subway and/or other rapid transit systems, or are closer to getting improved transit.

  This argument of "fair share" is also being used in a larger context by Valley residents. There is an increasing dissatisfaction among community leaders who believe that the San Fernando Valley is not receiving adequate services in the areas of public safety, education, public works, and transportation. The current MIS process and accompanying environmental document explores potential project alternatives that address the public transportation component of this argument.

- *Selection of an Appropriate Corridor.* Since the inception of studies to determine an appropriate location for transit improvements in the Valley, a number of alternative corridors have been suggested and analyzed in varying degrees of detail. The process of corridor selection has witnessed the broadening and narrowing of choices, in response to engineering, financial and environmental considerations, and community opinion. In October 1994, the MTA Board reaffirmed the position that had been stated following the 1990 Final EIR, namely that the SP Burbank Branch should be the designated Red Line extension corridor in the San Fernando Valley. That decision then led to the present Major Investment Study effort, in which the SP Burbank Branch is the foundation. The MIS/DEIS/DSEIR includes one additional route alignment, Alternative 2 along Oxnard Street, in response to engineering considerations related to the WOW curve, offering an option that would avoid the use of the WOW, for purposes of comparison. With the exception of the inclusion of the Oxnard Street alternative, all the alternatives under consideration in this document follow the SP Burbank Branch which has received the endorsement of the MTA Board, thus reaffirming this corridor as the preferred location for the proposed action.

- *Selection of an Appropriate Profile.* Along with the development of the San Fernando Valley East/West Transportation Corridor, much debate has occurred over the profile which a proposed transit line would assume. This debate was focused on an aerial guideway configuration in the median of the Ventura Freeway at one point, but much of the discussion has centered around the profile to be assumed in the SP Burbank Branch. The debate has been intense, and as a result of community opinion, Senate Bill 211 was developed and signed into law in June 1991. SB211 articulates a statutory definition of the corridor adopted by the LACTC in 1990, namely as a below ground subway in the area between Hazeltine Avenue and the Hollywood Freeway (3.5 miles), and further that deep bore tunneling technology be used in the vicinity of the Tujunga Wash. SB211 goes on to state, however, that it is not intended to mandate the selection of any route or the construction of any route configuration or alignment, but rather to define the route and alignment adopted by the LACTC in 1990. Recognizing the past debate that has occurred regarding this issue, Alternatives 1a, 1b, and 1c fulfill the intent of SB211. However, recognizing that SB211 does not preclude the study of other options, additional profile alternatives have been included (Alternatives 1d, 6a, 6b, 11a, and 11b), in the interest of providing a sufficiently broad range of alternatives to satisfy the requirements of the Federal Transit Administration and the MIS process, and to provide a reasonable comparison among profile choices, taking into account engineering, cost, and environmental factors. The debate over the appropriate profile to be implemented in the San Fernando Valley East/West Transportation Corridor will likely persist through the public review of the environmental document and the process leading to selection of a Locally Preferred Alternative (Preferred Investment Strategy).

S-9 ISSUES TO BE RESOLVED

There are several issues which must be resolved before the proposed action can proceed further toward implementation, as follows:

- *Selection by the MTA of the alternative to be implemented.* Following completion of the public comment period, a *Preferred Investment Strategy Report* will be prepared and submitted to the Board, in which the preferred alternative for implementation will be identified. This report may identify an alternative for implementation in the East Valley only, the TSM (Enhanced Bus) solution, or, if the LRT were to be selected, would identify the need to consider further engineering development and environmental documentation of the project in the West Valley. The MTA Board will concur with, or modify, the recommendations presented in the *Preferred Investment Strategy Report*, resulting in a project selection. This selection will also constitute the selection of a Locally Preferred Alternative (LPA), in order to satisfy federal requirements which will permit initiation of preliminary engineering activities. The MTA Board, by selecting an LPA, will also declare its intent to provide the necessary local funds for the selected project.

- *Approval by the FTA of the LPA for purposes of Preliminary Engineering.* The FTA will receive and consider the MTA Board's selected LPA, and would approve that recommendation. This action is a preliminary declaration of the intent by the federal government to fund implementation of the project, pending the outcome of preliminary engineering activities.

- *Preliminary engineering activities.* After the MTA has adopted the Preferred Investment Strategy, preliminary engineering will be undertaken on the selected alternative. The purpose of this activity is to refine the project, further develop required impact mitigation measures, and permit a detailed description of both to be provided in the FEIS/FSEIR.

- *Completion of the FEIS/FSEIR and funding decisions by MTA and FTA.* During the period in which the preliminary engineering is being completed, the DEIS/DSEIR will be converted into an FEIS/FSEIR, which will include a) refinements to the project description resulting from preliminary engineering activities, b) additional specificity regarding mitigation measures, and c) responses to comments received on the DEIS/DSEIR. The FEIS/FSEIR will then be submitted for approval by the MTA Board (thus completing the CEQA process) and the issuance of a Record of Decision by the FTA (thus completing the NEPA process). These actions having been taken, the project can then move forward into final design and subsequent construction. The FTA, by it issuance of a Record of Decision, also would indicate the eligibility of the project to receive federal portions of project funding.

- *Permit processing and agency coordination.* During the preliminary engineering period of project development, coordination will be undertaken with affected federal, state, regional and local agencies (see section S-10 for a listing of them), in order to ensure that all permit and approval conditions can either be met at that time or that sufficient assurance can be obtained that approval would be forthcoming at the end of final design activities. A record of this coordination process, together with the results, would be presented in the FEIS/FSEIR.

S-10 USES OF THE ENVIRONMENTAL DOCUMENT/OTHER FEDERAL ACTIONS REQUIRED

Once an FEIS/FSEIR has been prepared, it will be used by federal, state, regional, and local agencies to make a number of discretionary decisions regarding the project. The FTA and MTA will decide whether to fund the project, and in the process, the MTA will designate one alternative as its Locally Preferred Alternative for implementation in the East Valley. The MTA will also consider the Cross Valley Strategies outlined in the document, and may take actions to modify the Long Range Plan based on those considerations. If local funds other than Proposition A and C are used, agencies such as the State of California Transportation Commission could also use the FEIS/FSEIR as part of the funding approval process.

In addition to these actions, other federal, state, regional, and local agencies may be required to take actions, and would use the environmental document in considering those actions, which would include:

• U.S. Army Corps of Engineers	Approve permits (e.g. Section 404) for water crossings
• U.S. Environmental Protection Agency	Approve permits (e.g. NPDES) during construction
• Caltrans	Approval to cross SR 170 and I-405 freeways; use of park-ride lot for rail station

• Southern California Association of Governments	Approve completion of MIS process
• Regional Water Quality Control Board	Approve permits (e.g. NPDES) during construction
• South Coast Air Quality Management District	Approve permits
• Los Angeles County Flood Control District	Approve water crossings (e.g. Tujunga Wash)

CHAPTER 1

PURPOSE AND NEED

CHAPTER 1: PURPOSE AND NEED

1-1 NEED FOR TRANSPORTATION IMPROVEMENTS

1-1.1 Description of the Study Corridor

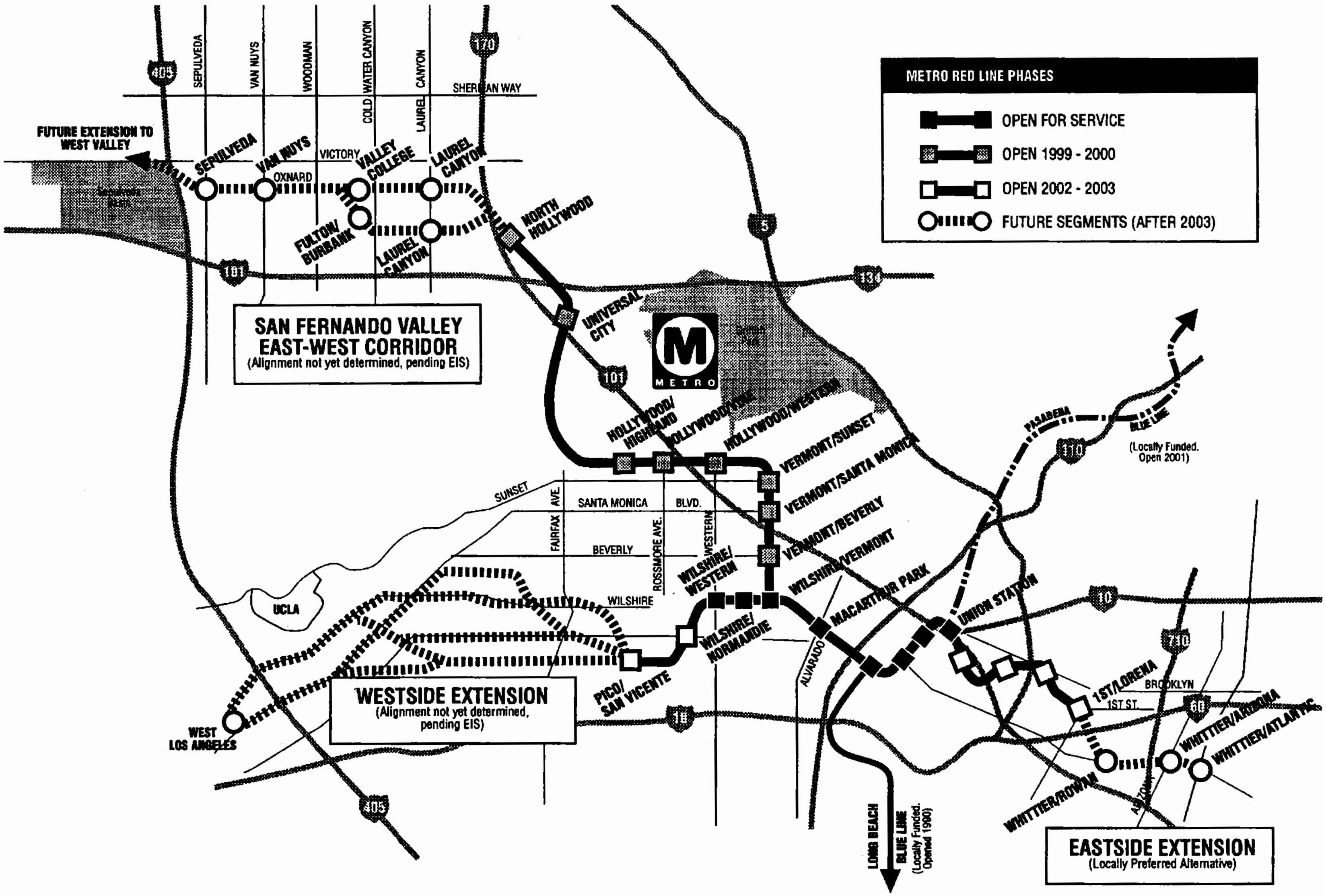
a. *Physical Features and Activities*

The San Fernando Valley East-West Transportation Corridor study area (corridor study area) is located in the central part of Los Angeles County, generally 20 miles northwest of the Los Angeles Central Business District (CBD). Figure 1-1 shows the corridor study area location within the larger region. Figure 1-2 provides a more detailed plan of the study area. The corridor begins on the east at the current Metro Red Line Segment 3 terminal station in North Hollywood and continues west through the valley communities of Van Nuys, Reseda, Canoga Park, and Woodland Hills, terminating near Valley Circle Boulevard and the community of Calabasas. The broadly defined corridor study area is approximately 20 miles long and varies in width from 1 to 2 miles. The corridor connects major activity areas through the heart of the San Fernando Valley, including Warner Center, the Sepulveda Basin Recreation Area, the Valley Government Center in Van Nuys, Pierce College and Valley College, and Universal City. This corridor designation, adopted by the MTA Board in October 1994, was subsequently reviewed and approved by the Southern California Association of Governments (SCAG) Major Investment Studies Peer Review Group in June 1995.

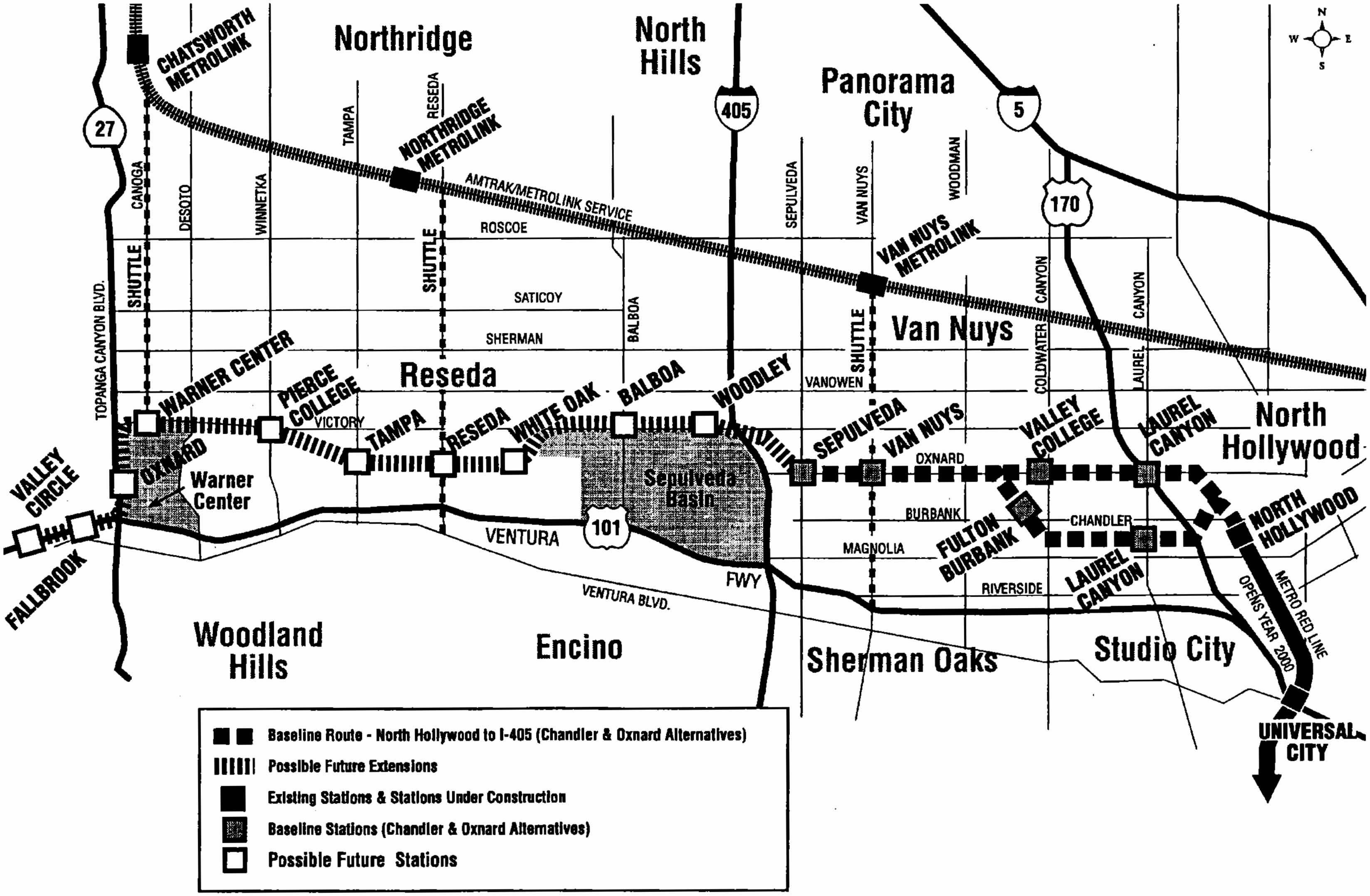
b. *Growth and Development Trends*

Los Angeles County is the most populous county in the state of California, with approximately 9.5 million residents in 1995. Over 60 percent of the population in the SCAG planning region (which is composed of Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial Counties) is contained in Los Angeles County. The county grew from 7.4 million people in 1980 to approximately 9.5 million people in 1995, representing an increase in population of over 25 percent. By the year 2015, Los Angeles County is projected to have a population of approximately 12 million people (representing a 25 percent increase over 1995). (*Year 2015 Population, Housing, and Employment Projections*, SCAG, May 1994.)

The San Fernando Valley began its development as a major suburb of Los Angeles in the 1940s. This large, former agricultural area of over 260 square miles became affordable for workers commuting to downtown Los Angeles, Hollywood, West Los Angeles, and Burbank. With the gradual development of major employment centers throughout the 1980s, the valley had generated enough employment to theoretically support its own population, but many residents continued to commute to jobs outside the valley, resulting in suburban development that has "leap-frogged" to Ventura County, Santa Clarita, and the Antelope Valley. This in turn has resulted in commuters from those areas passing through the San Fernando Valley.



SOURCE: ADOPTED FROM *MTA LONG RANGE PLAN*, MARCH 1995.



SOURCE: MTA, GRUEN ASSOCIATES, 1996.

FIGURE 1-2
Location of Study Corridor

The Valley has also begun to change sharply in demographics in recent years, which is demonstrated graphically on Figure 1-2.

Between 1980 and 1995, the Valley's population increased by about 25 percent, and a similar 24 percent population increase is projected to occur between 1995 and 2015. This growth is in part attributed to the relatively high birth rates among Hispanics (the fastest growing single segment of both the Valley's and county's populations); migration to the Valley from other parts of the county; and immigration to the Valley from other countries (making up 30 percent of the Valley's 1995 population). Between 1980 and 1990, the proportion of whites residing in the San Fernando Valley decreased from 74 to 57 percent; Hispanics increased from 18 to 31 percent; blacks increased from 3 to 4 percent; and Asians increased from 4 to 8 percent.

Employment growth in the Valley is forecast to be substantially less than county-wide growth, due to the loss of many high-paying, skilled jobs in the aerospace and defense industries. Much of the projected 19 percent increase in the Valley's employment by the year 2015 is expected to be in the service sector and in the entertainment and tourism industries, centered around the major valley studios at Warner Brothers, Disney, and Universal.

Between 1980 and 1995, the increase in the number of housing units in the Valley exceeded that of the county. While growth in the Valley's housing market is expected to increase 25 percent by the year 2015, it is expected to just keep pace with the county. The employment growth rate is projected to flatten out in the Valley during that same time.

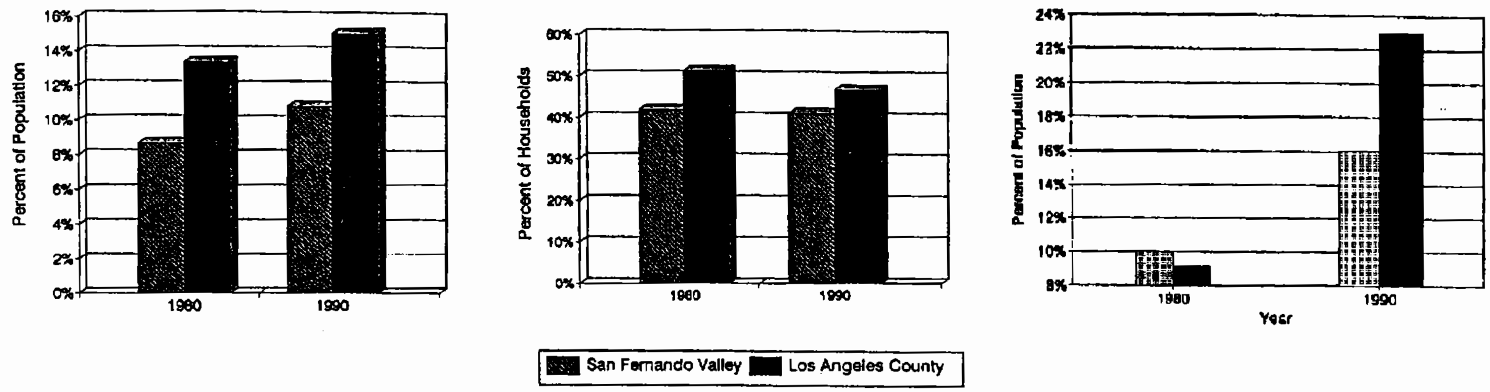
In summary, the Valley will continue in its role as a major suburban area with a growing but not self-sufficient employment base. Valley population will also grow, and will be composed of an increasing population of Hispanic residents.

c. Travel Patterns and Potential Corridor Service Areas

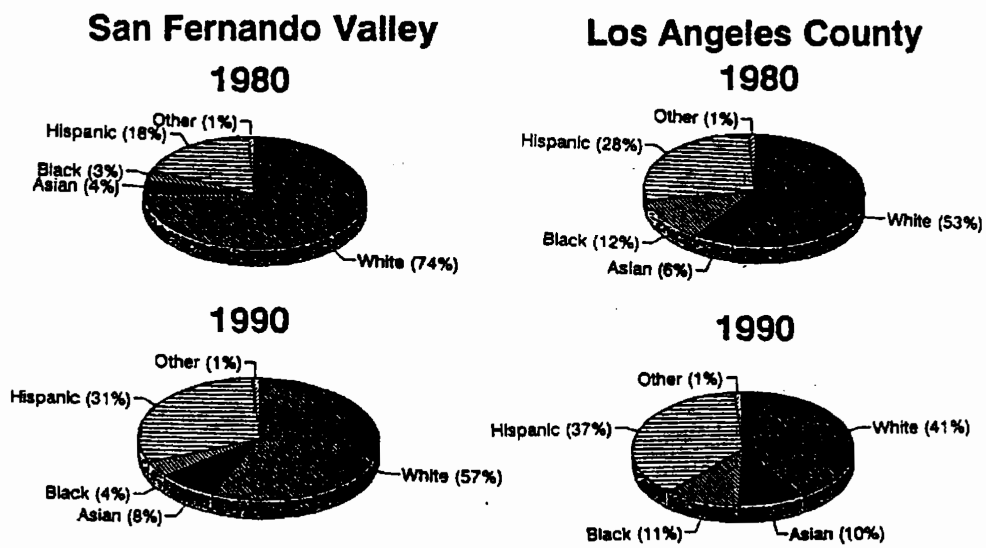
Regional travel projections for Los Angeles County and the study corridor are generated by the Los Angeles County Metropolitan Transportation Authority (MTA) travel simulation model, using socioeconomic data developed by SCAG (*Year 2015 Population, Housing, and Employment Projections*, SCAG, May 1994). This travel forecast model was used for both the projections presented in this document and the adopted MTA Long Range Plan (*A Plan for Los Angeles County Transportation in the 21st Century*, March, 1995, to be updated in 1997).

The modeling area, which encompasses the five-county urbanized southern California region, is divided into planning areas called Regional Statistical Areas (RSAs) and contains the project area represented by RSA 12 (West Valley) and RSA 13 (East Valley) (see Figure 1-3). Also shown on this figure are RSAs 17, 21, and 23, subareas in Los Angeles County that would be potential service areas for an east-west valley transit facility. The Valley can be directly connected to these RSAs through the connection of the East-West Transportation Corridor with the Red Line at North Hollywood. Travel statistics indicate that currently 52 percent of all Valley residents in RSAs 12 and 13 work outside of the Valley and over half of these commute to jobs located within RSAs 17 (Hollywood, Mid-Wilshire, Beverly Hills), 21 (Downey, Southeast Los Angeles),

PERSONS BELOW POVERTY LEVEL INCOME | HOUSEHOLDS WITH ZERO OR ONE VEHICLES | NON-ENGLISH SPEAKING PERSONS

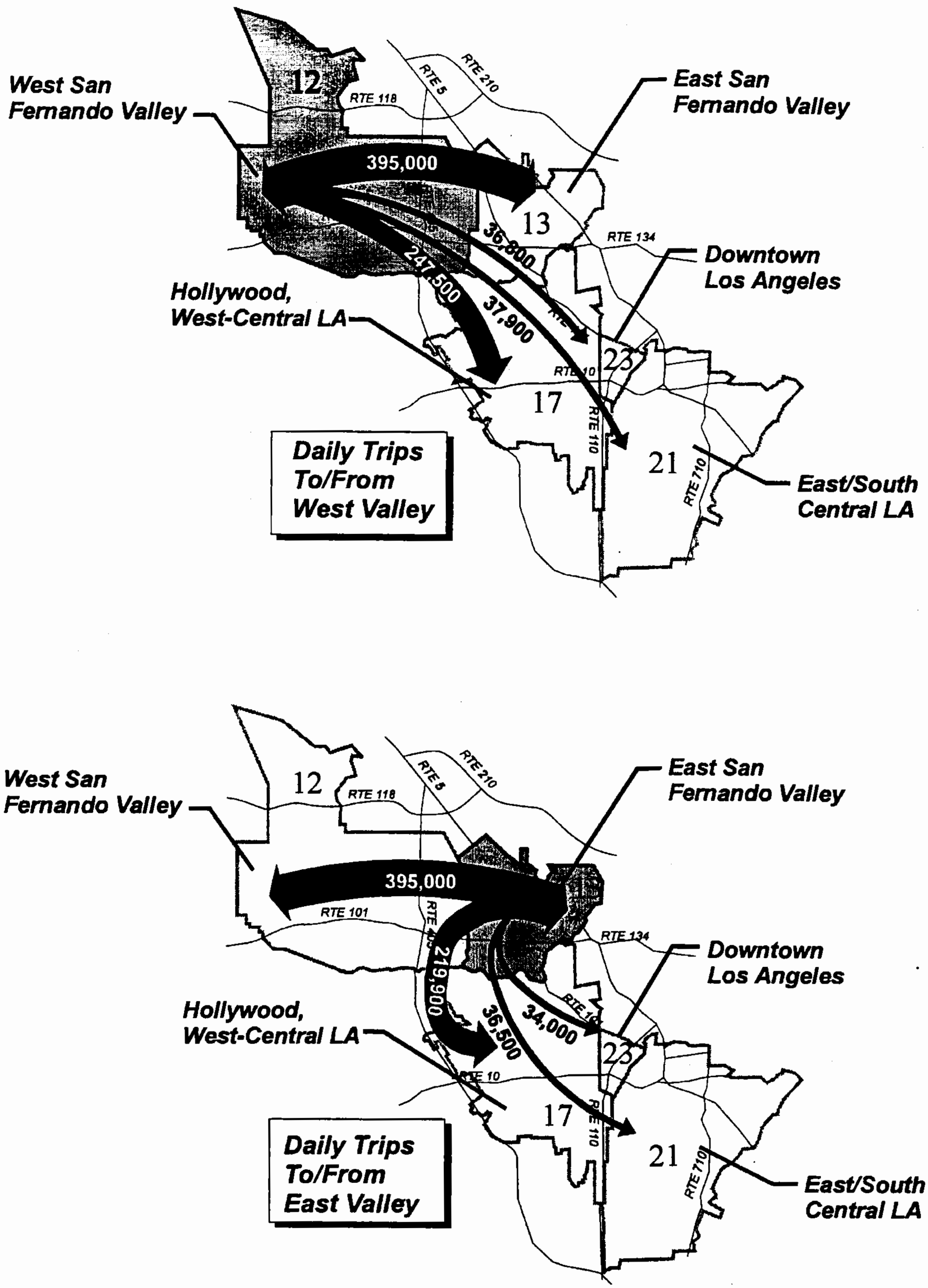


ETHNIC COMPOSITION



SOURCE: 1980 & 1990 CENSUS OF POPULATION AND HOUSING; MYRA L. FRANK & ASSOCIATES, INC., 1996.

FIGURE 1-3
Demographic Changes 1980-90



SOURCE: MEYER, MOHADDES ASSOCIATES, SCAG AND MTA MODELING GROUP, 1996.

FIGURE 1-4
Project Area Regional Statistical Areas and Existing Travel Patterns

and 23 (Downtown Los Angeles). Total daily two-way person trips between RSAs 12 and 13 and between RSAs 12 and 13 and each of the three external RSAs are shown on Figure 1-3.

As seen on Figure 1-3, in 1990 there were a total of 395,000 internal valley trips between the East Valley and West Valley RSAs, which could potentially be served by an east-west corridor. Table 1-1 presents the total daily trips (all trip types and work trips) to and from RSAs 12 and 13, and shows that a large portion of these trips are to and from RSAs 17, 21, and 23, the potential direct service areas for the transit corridor. Overall, nearly 22 percent of all trips and nearly 30 percent of work trips to and from the valley RSAs originate from or are destined to these three RSAs. RSA 17 has the heaviest trip interchange with the Valley; 17 percent of all Valley trips and 23 percent of all work trips originate in or are destined for RSA 17. This indicates that approximately one-fifth of all trips originating or terminating in points outside the Valley occur along the corridor defined by the existing Red Line and the proposed East-West Transportation Corridor.

Table 1-1: Valley-Related Daily Trip Distribution

		All Trip Types		Work Trips	
RSA	Area	To/From RSAs 17, 21, and 23	To/From All Other RSAs	To/From RSAs 17, 21, and 23	To/From All Other RSAs
13	East Valley	290,400	1,310,000	107,900	393,000
12	West Valley	322,200	1,820,000	180,100	713,000
TOTAL		**612,600**	**3,130,000**	**288,000**	**1,106,000**

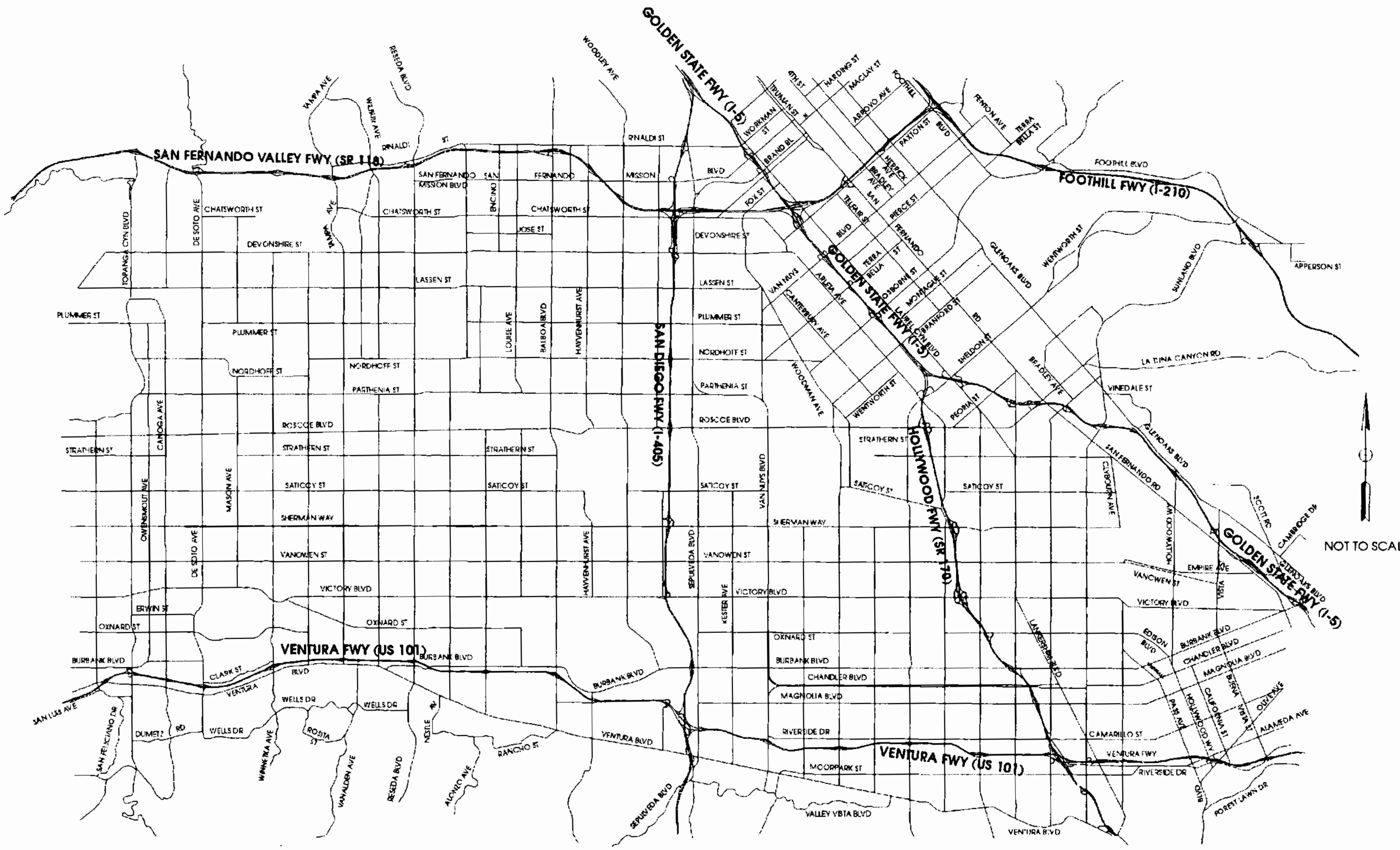
Source: *1995 MTA Travel Model.*

1-1.2 Existing Transportation Facilities and Services in the Corridor

a. *Freeway System*

The San Fernando Valley area is served by five major freeways (see Figure 1-4), some of which serve as major intra-state travel routes and are among the busiest in the nation. Three freeways, I-405 (San Diego Freeway), US 101/SR 134 (Ventura Freeway), and I-5 (Golden State Freeway), connect the Valley directly with the Los Angeles Basin through the Santa Monica Mountains. The Ventura Freeway and SR 118 (Simi Valley Freeway) provide for east-west travel between Los Angeles County and Ventura County and connect the San Fernando Valley with points east through the San Gabriel Valley via I-210 (Foothill Freeway).

The Ventura Freeway, the primary freeway paralleling the East-West Transportation Corridor, is generally a 10-lane freeway. The freeway is congested in both directions for much of the day. Despite its recent widening (by one lane in each direction through most of the Valley), this freeway is still one of the most congested freeways in southern California. The peak-hour congestion patterns persist for 3 to 4 hours in each of the peak periods on a daily basis. In addition, the freeway also experiences congestion patterns during the off-peak periods. The



SOURCE: GRUEN ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 1-5
Highway System
San Fernando Valley

freeway corridor serves a large number of activity centers and provides connections to Hollywood and downtown Los Angeles. The Ventura Freeway is used by local traffic as well as long-distance commuters.

Table 1-2 summarizes the range of daily and peak-hour traffic volumes and number of lanes on the Valley's major freeways.

Table 1-2: Traffic Volumes on Valley Freeways

Freeway	Alignment	Number of Lanes (General Purpose + HOV)	Average Daily Traffic (Number of Vehicles)	Location of Lowest Volume	Location of Highest Volume
I-5	Northwest-southeast	8	147,000-240,000	Sun Valley, Jct. SR 170 (Hollywood Fwy.)	Panorama City, Osborne St. interchange
I-405	North-south	8 + 2*	200,000-272,000	Los Angeles, Roscoe Blvd. interchange	Los Angeles, Jct. US 101 (Ventura Fwy.)
SR 170	North-south	8 + 2	95,000-163,000	Sun Valley, Jct. I-5 (Golden State Fwy.)	North Hollywood, Magnolia Blvd. interchange
US 101	East-west	10	211,000-308,000	Woodland Hills, Topanga Canyon Blvd. interchange	Encino, Balboa Blvd. interchange
SR 118	East-west	8 + 2*	96,000-184,000	Chatsworth, Topanga Canyon Blvd. interchange	Hayvenhurst Ave. interchange

*HOV lanes currently under construction.

Source: *1995 Traffic Volumes on the California State Highway System*, Caltrans, 1995.

b. Arterial Highways

The entire corridor study area is located within the jurisdiction of the city of Los Angeles. The arterial and local street system conforms predominantly to an east-west/north-south grid system.

Table 1-3 summarizes the key east-west arterials within the study area, their functional classifications, and range of typical daily traffic volumes.

Only two major arterials, Sherman Way and Victory Boulevard, and one secondary arterial, Vanowen Street, are continuous throughout the entire length of the study corridor. Other east-west arterials are mostly continuous in the East Valley (east of the I-405) but become discontinuous in the West Valley. This is due to a number of natural and/or constructed barriers, including I-405, Van Nuys Airport, the Sepulveda Basin Recreation Area, and the Ventura Freeway. These obstructions, together with traffic from the freeway system, force east-west travel onto a limited number of congested arterials in the study area.

Table 1-3: Characteristics of Major East-West Valley Arterials				
Arterial	**Classification**	**Average Daily Traffic**	**Location of Lowest Volume**	**Location of Highest Volume**
Saticoy Street	Secondary Highway or Arterial	11,000-27,000	West of Laurel Canyon Boulevard	East of Reseda Boulevard
Sherman Way	Major	42,000-67,000	East of Canoga Avenue	East of Firmament Avenue
Vanowen Street	Secondary	23,000-31,000	West of Laurel Canyon Boulevard	East of Reseda Boulevard
Victory Boulevard	Major	30,000-38,000	East of Topanga Canyon Boulevard	West of Laurel Canyon Boulevard
Oxnard Street	Secondary	13,000-27,000	At Lindley Avenue	West of Laurel Canyon Boulevard
Burbank Boulevard	Secondary	7,000-52,000	East of Shoup Avenue	At Sepulveda Boulevard
Ventura Boulevard	Major	31,000-44,000	East of Topanga Canyon Boulevard	At Woodley Avenue

Source: City of Los Angeles Department of Transportation, Electronic Traffic Count Database (1994–1996).

c. *Existing Levels of Service*

During the a.m. and p.m. peak hours, many of the freeways and arterials in the valley are operating at or near capacity in the peak direction of travel. Most of the freeways are experiencing average operating speeds of under 30 miles per hour in the peak direction of travel (toward the Los Angeles CBD).

d. *Public Transportation*

The San Fernando Valley has an extensive transit system. A number of changes have been implemented since then to improve the cost-effectiveness of the transit system and to meet the mobility challenges for an increasing population. Public transportation in the Valley is provided in three forms:

- Traditional transit service (fixed-route bus service with scheduled stops)
- Non-traditional transit service (special shuttle systems and demand-responsive services)
- Rail service (commuter and intercity rail)

Currently there are four major transit operators providing fixed-route bus service in the San Fernando Valley. These are:

- Los Angeles County Metropolitan Transportation Authority (MTA)
- City of Los Angeles Department of Transportation (LADOT Commuter Express/DASH)
- Antelope Valley Transit Authority (AVTA)
- Santa Clarita Transit

The MTA currently operates 44 fixed bus routes that serve the San Fernando Valley. Eight are local lines that extend to downtown Los Angeles, 15 are local east-west MTA routes in the Valley, and 10 are local north-south routes. There are four all day express routes and seven peak-period express routes.

In the east-west direction, the heaviest bus ridership occurs along Vanowen Street, Victory Boulevard, and Ventura Boulevard. North-south, the heaviest ridership occurs along the southern segment of Topanga Canyon Boulevard and Van Nuys Boulevard. Bus ridership along each of these arterials totals more than 10,000 passengers each day. The east-west corridor has a daily bus ridership in the range of 40,000 to 50,000 passengers. Existing transit routes in the Valley are illustrated on Figure 1-5.

LADOT operates a total of 10 bus lines in the Valley: 1 all-day express route, 7 peak-period express lines, and 2 local DASH routes.

The AVTA operates one peak-period express line, Route 787 from the Antelope Valley to the San Fernando Valley. Santa Clarita Transit operates buses between Santa Clarita Valley, Chatsworth, and Van Nuys.

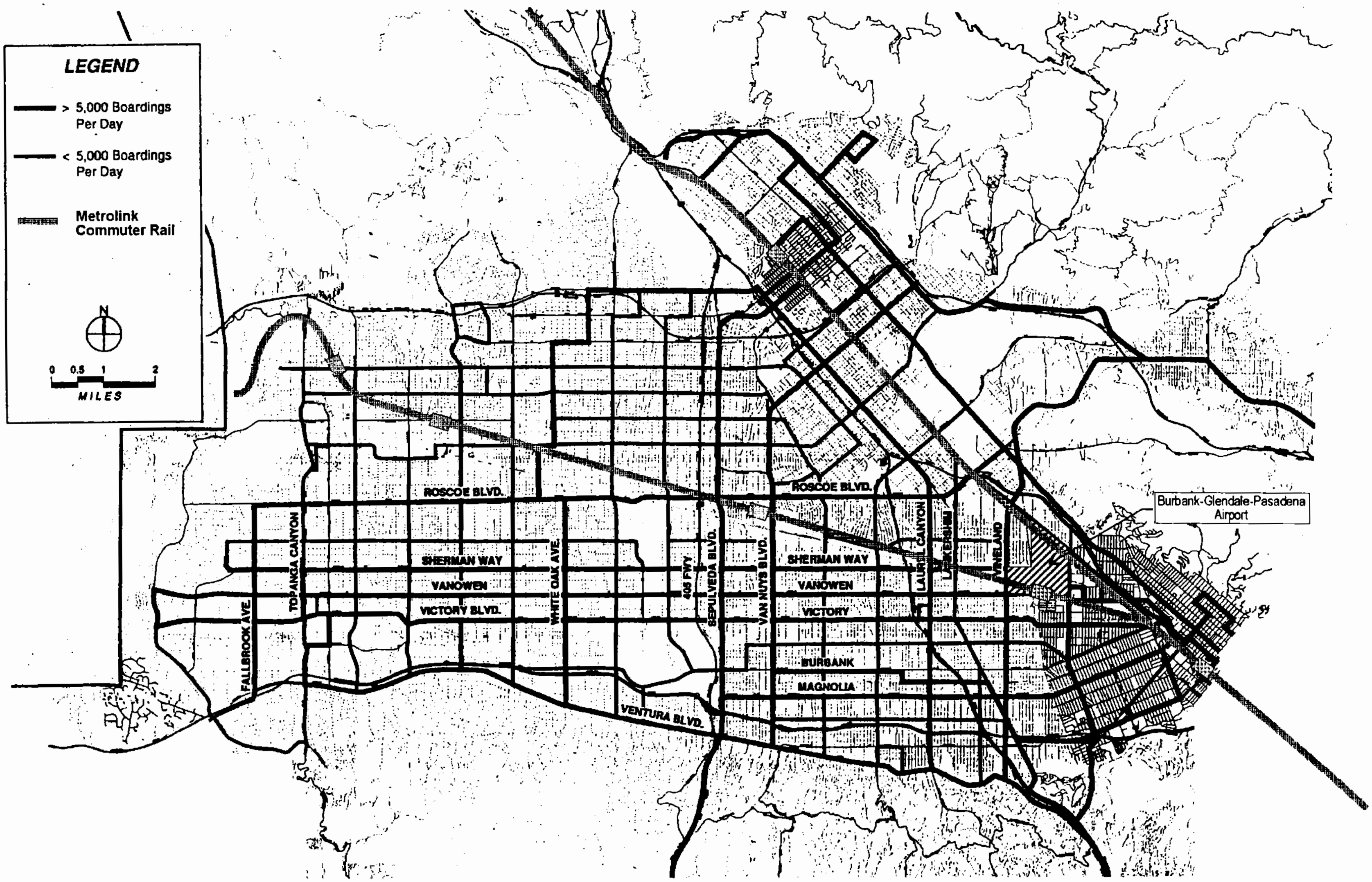
Non-traditional transit service options in the San Fernando Valley are a mixture of Metrolink rail station shuttles and dial-a-ride services. There are two circulator Metrolink shuttles operated by the Burbank-Glendale-Pasadena Airport and the Burbank Media District Transportation Management Organization (TMO). The City of Los Angeles 12th Council District Transportation Management Association (TMA) operates a free taxi service within a 5-mile radius of the Chatsworth Metrolink station. Finally, the cities of Agoura Hills, Glendale, and Los Angeles each operate dial-a-ride services in the San Fernando Valley.

Existing commuter rail service is provided by the Southern California Regional Rail Authority (SCRRA) Metrolink and intercity rail service is provided by Amtrak. Amtrak operates 14 trains per day between San Diego, Santa Barbara, and Seattle. Two Metrolink lines serve the Valley. The Ventura County Line has 16 one-way trips, 6 peak-period round trips, and 2 mid-day round trips. The Santa Clarita Line has 18 one-way trips, 6 peak-period round trips, and 3 off-peak round trips.

1-1.3 Transportation Planning Responsibilities

a. Agencies and Organizations

There are four key agencies involved with transportation planning and implementation in the project area. Each agency is in charge of a particular aspect of the transportation system with regard to the planning, development, and maintenance of the system. The agencies are the California Department of Transportation (Caltrans), SCAG, MTA, and City of Los Angeles Department of Transportation.



SOURCE: LAMTA, GRUEN ASSOCIATES, MYRA L. FRANK & ASSOCIATES, INC., 1996

METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 1-6
Existing Transit Routes in the Study Area

Caltrans is in charge of construction, funding, maintenance, and planning for all state highway projects in California.

SCAG, as the Metropolitan Planning Organization (MPO) for the region, prepares regional policies and handles regional issues that cross city and county boundaries that relate to transportation, air quality, housing, growth, hazardous wastes, and water quality. SCAG prepares the Regional Transportation Plan (RTP), which has a 20-year planning horizon, every 2 years and the Regional Transportation Improvement Plan (RTIP), which lists a 7-year program of projects, every year.

Formed in April 1993, the MTA, as the principal public transportation agency in Los Angeles County, administers transportation services and has primary responsibility for the planning, funding, construction, and operation of ground transportation in Los Angeles County, including: (1) bus and rail transit services, (2) urban rail construction, (3) highway, arterial street, and traffic flow management funding, (4) transit centers and park-and-ride facilities development, (5) alternative types of transportation, (6) research and development of alternative energy sources for vehicles, and (7) air quality, environmental impact, land use, and economic development decisions related to transportation.

The city of Los Angeles designs, develops, and maintains the transportation system in the city. In addition, the city is also in charge of developing its land use and transportation plans.

b. Goals and Objectives

The proposed goals and objectives for the San Fernando Valley East-West Transportation Corridor (see Table 1-4) have been developed from the transportation and land use goals and objectives of the participating government agencies and are consistent with the other transit improvements being planned for Los Angeles County.

c. Planned Transportation Improvements

The MTA Long Range Plan sets forth major policy directions for Los Angeles County. It includes a list of transportation improvements for which there has been a funding commitment. The list of planned transportation improvements (see Appendix I) was compiled from the MTA Long Range Plan (March 1995) and consists of projects that are to be in place by 2015.

1-1.4 Transportation Problems in the Corridor

As shown in Table 1-5, growth projections indicate that increases of 34 percent in the number of work trips and of 30 percent in the total number of trips are expected to be generated in the Valley between 1995 and 2015. Vehicle miles of travel (VMT) are projected to increase by 39 percent between 1995 and 2015. Vehicle hours of travel and vehicle hours of delay (time loss due to delay) will increase by 77 percent and 229 percent, respectively. In 2015, over 26

Table 1-4: Goals and Objectives of the San Fernando Valley East-West Transportation Corridor

Goal	Objective
1. *Improve east-west mobility in the San Fernando Valley.*	• Provide an alternative to the congested Ventura Freeway (US 101/SR 134). • Relieve congestion through the Cahuenga and Sepulveda passes by providing Valley stations that are connected to the Metro Red Line North Hollywood Segment. • Minimize total travel times. • Provide enhanced bi-directional transit service. • Provide opportunities to intercept traffic passing through the valley.
2. *Support land use and development goals*	• Provide high-capacity transit linkages between centers (North Hollywood, Van Nuys, Warner Center). • Provide transit-supportive land uses. • Achieve General Plan Framework Plan goals for increased transit mode split and concentration of growth in Targeted Growth Areas. • Provide Warner Center Specific Plan transit access enhancements. • Provide joint development opportunities. • Provide accessibility to governmental facilities in the Van Nuys Government Center.
3. *Maximize community input, i.e., define the project in a manner that is responsive to community and policy makers.*	• Incorporate the citizen and policy maker input from previous studies in the San Fernando Valley. • Provide opportunities for community input to the MIS/EIS/SEIR process. • Seek ways to incorporate community views into planning.
4. *Provide a transportation project which is compatible with and enhances the physical environment where possible.*	• Identify cost-effective alternatives that minimize adverse effects on the environment. • Avoid impacts on parklands. • Minimize noise impacts. • Minimize impacts on cultural resources. • Minimize air pollution.
5. *Provide a transportation project that minimizes impacts on the community.*	• Minimize business and residential dislocations, community disruption, and property damage. • Avoid creating physical barriers, destroying neighborhood cohesiveness, or in other ways lessening the quality of the human environment. • Minimize traffic and parking impacts. • Minimize impacts during construction.
6. *Provide a transportation project that is cost-effective and within the ability of MTA to fund, including capital and operating costs.*	• Identify cost-saving measures through value engineering to reduce project costs. • Maximize the benefits associated with use of right-of-way already purchased by the MTA. • Ensure fiscal consistency with the MTA Long Range Plan.

Table 1-5: Existing and Projected Travel in the San Fernando Valley			
RSAs 12 and 13	**1995**	**2015**	**% Change**
Population	1,042,000	1,288,000	24%
Employment	636,000	753,000	19%
Total Trips	7,329,000	9,509,000	30%
Work Trips	1,349,000	1,811,000	34%
Vehicle Miles of Travel (Daily)	20,649,000	28,641,000	39%
Vehicle Miles of Travel (a.m. peak hour)	4,145,000	5,284,000	27%
Vehicle Hours of Travel (a.m. peak hour)	126,000	223,000	77%
Vehicle Hours of Delay (a.m. peak hour)	30,000	98,000	229%
Delay per Hour (minutes)	14.2	26.4	86%
Average Speeds (mph)	32.9	23.7	(-28%)
Average Auto Occupancy	1.24	1.23	(-1%)
Transit Mode Split	5.2%	6.5%	25%

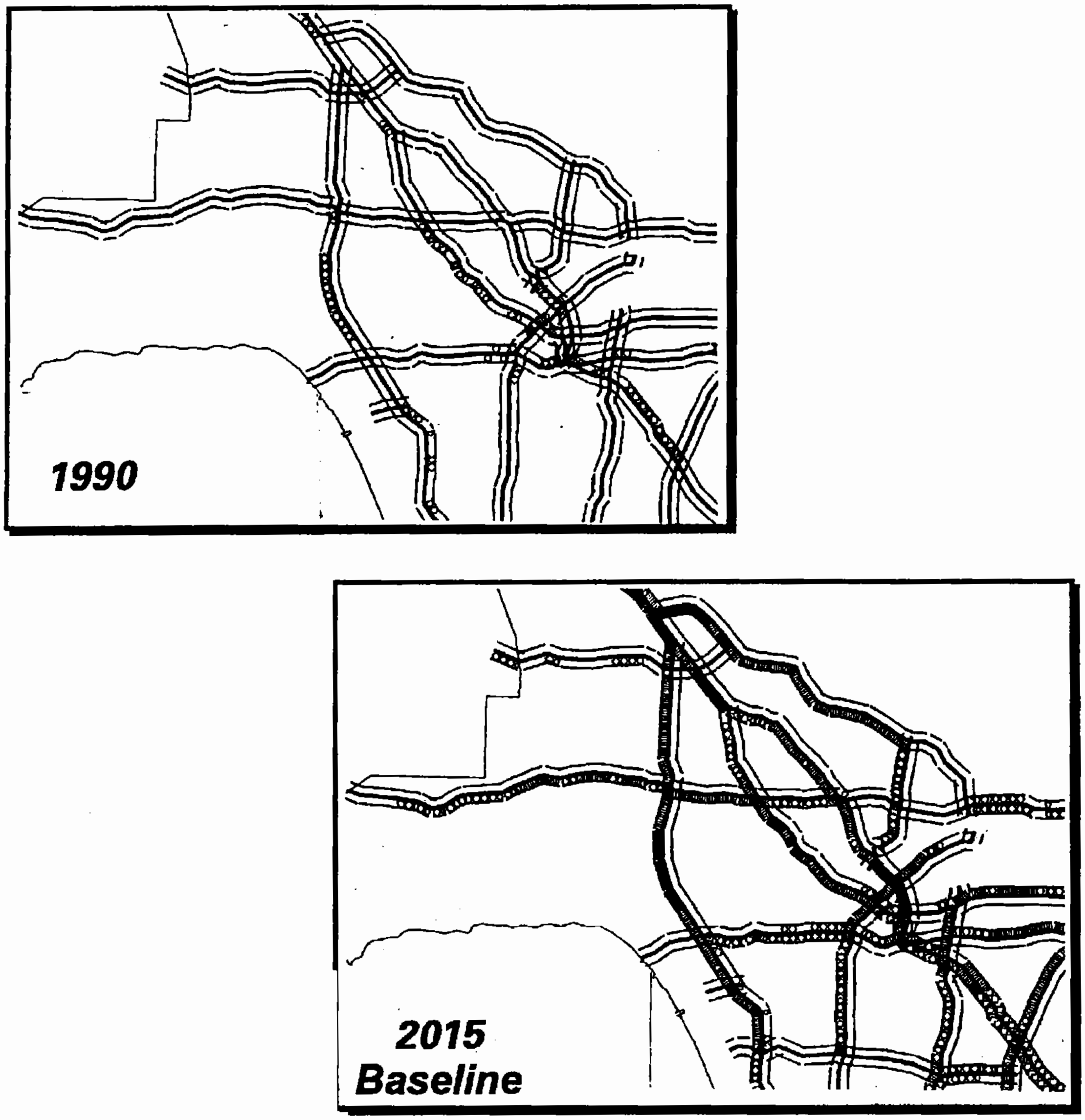
Source: MTA Travel Model for Years 1995 and 2015.

minutes out of every hour of travel will be spent in delayed conditions, nearly twice the amount (14 minutes) as in 1995. It is projected that by 2015 average speeds will decline by 28 percent from 32.9 mph to 23.7 mph. Figure 1-6 schematically represents and compares the locations of freeway congestion in 1995 and 2015.

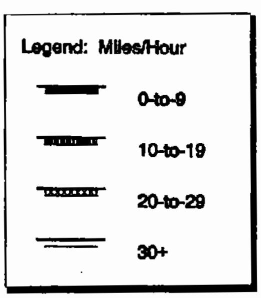
Despite recent widening, US 101 is currently operating at capacity in both directions during peak hours. This freeway is projected to be one of southern California's most congested facilities in the future, operating at 50 to 60 percent over capacity by the year 2015, suggesting the need for up to eight new lanes in each direction.

By the year 2015, the east-west arterials are projected to be the most congested in the Valley. The most severely congested arterial segments would include Victory Boulevard, Vanowen Street, and Sherman Way, from west of Balboa Boulevard to east of Van Nuys Boulevard. Other arterial segments for which severe congestion is projected include Ventura Boulevard through Tarzana and Encino and Roscoe Boulevard near I-405. In general, miles of severe arterial congestion (measured by volumes exceeding capacity) are projected to increase by over 90 percent in 2015 compared to the late 1980s.

The MTA Long Range Plan does not propose high occupancy vehicle (HOV) lanes on US 101 in the next 20 years; it will be one of the few freeways in the county that will not have an HOV facility. As a result, increased freeway congestion would result in no travel time advantage to commuter express buses on freeways. This increase in congestion would enhance the potential for ridership on the transit corridor that parallels this freeway. To the extent that HOV lanes will be implemented in the Valley, they will be oriented more toward north-south trips (e.g., SR 14/I-5/SR 170 to SR 134 connection and SR 118 to I-405 connection) than east-west trips within the Valley.



AM Peak Hour Average Speeds



SOURCE: MEYER, MOHADDES ASSOCIATES, 1996.

FIGURE 1-7
Freeway Congestion Comparison: Speeds in 1995 and 2015

In an effort to quantify existing and projected deficiencies, four screenlines were developed to analyze the traffic demand in the corridor study area. A screenline is an imaginary line drawn across streets and freeways that is used to record traffic volumes at the points where the screenline intersects the facility. Volume-to-capacity (V/C) ratios are used to compare the demand for travel across the screenline against a theoretical capacity of all of the facilities in the corridor. Based on the V/C ratio, the general performance of the corridor can be assessed. Ideally, the V/C ratio should be at or below 1.0, where the demand is equal to or less than the capacity of the corridor. Volume-to-capacity ratios above 1.0 indicate congested conditions and delays. As the V/C ratio increases beyond 1.0, congestion becomes more severe and delays become increasingly more burdensome. Results of the demand/capacity comparison across the screenlines for 1995 and 2015 are shown in Table 1-6 and graphically with bar charts on Figure 1-7.

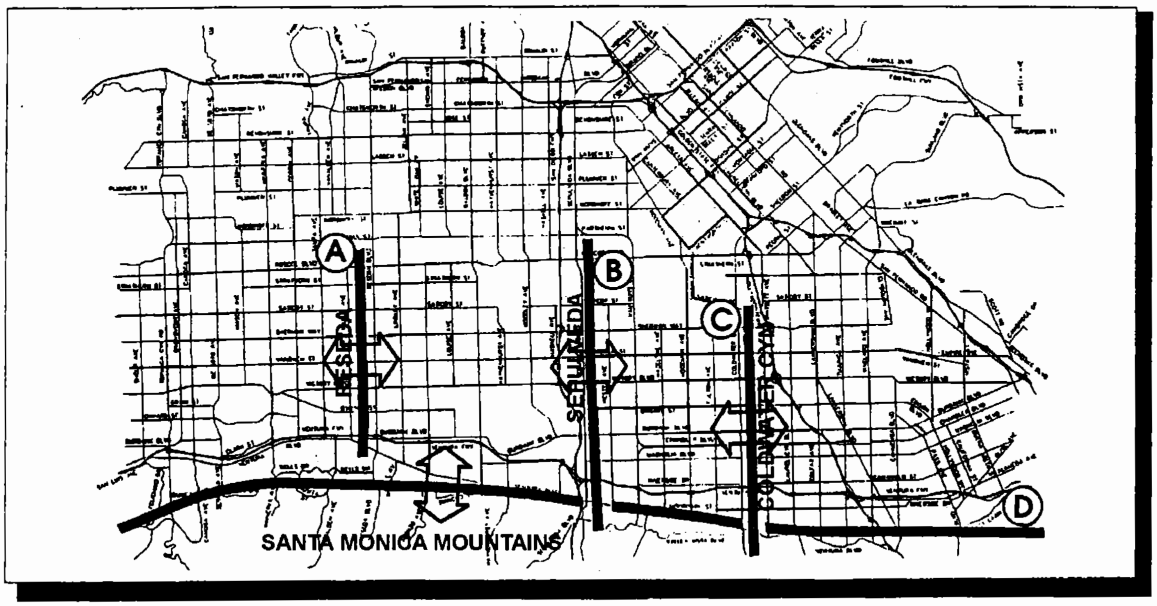
Table 1-6: AM Peak-Hour Demand vs. Capacity, 1995 and 2015

Screenline	Volume/Capacity Ratios[1]		
	1995	2015	Traffic (Travel Demand) Increase
A (Reseda Blvd.)	1.04	1.41	35%
B (Sepulveda Blvd.	1.03	1.49	45%
C (Coldwater Canyon Avenue)	0.91	1.29	43%
D[2] (Santa Monica Mountains)	1.17	1.57	44%

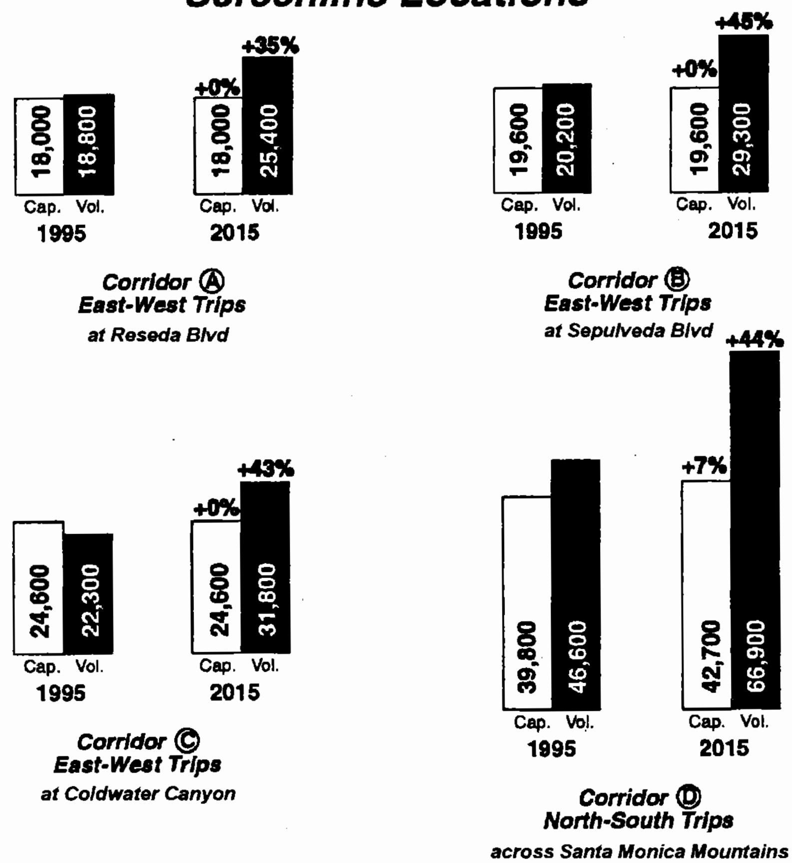
[1]Ratios greater than 1.00 indicate a capacity deficiency; e.g., 1.04 = a capacity deficiency of 4 percent.
[2]Capacity includes future HOV lanes on I-5 in 2015.

Source: 1995 Caltrans and City of Los Angeles DOT traffic volume data; 2015 MTA Travel Model.

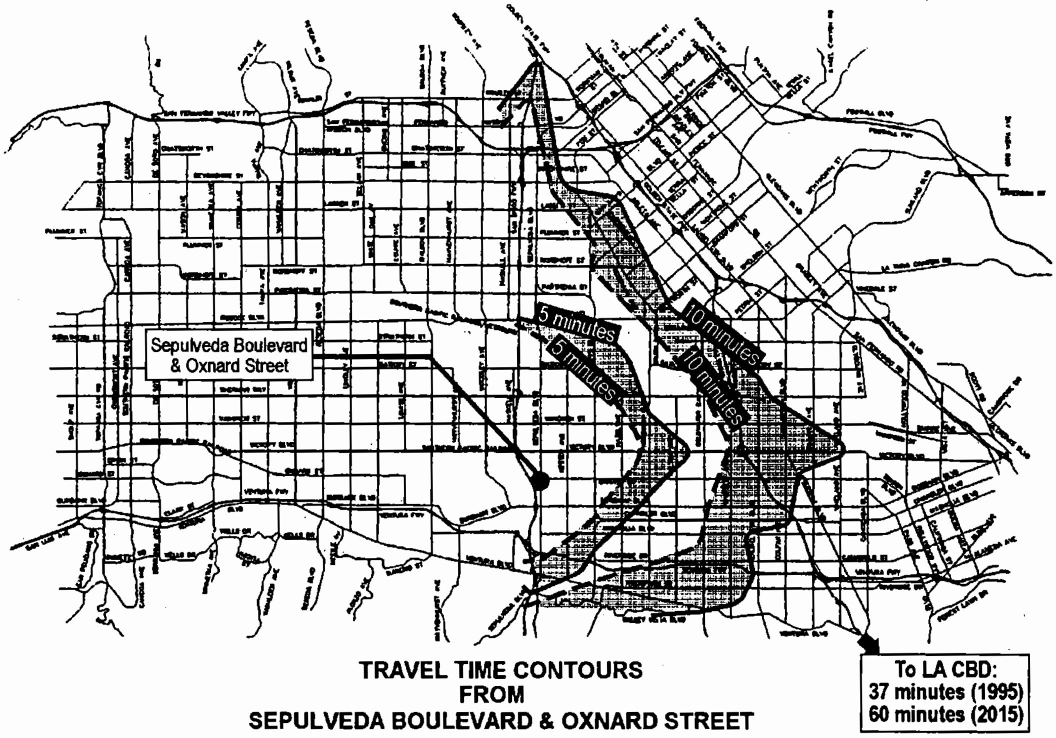
The impact of increased congestion on travel times across the Valley can be illustrated by the use of travel time contour maps, which depict lines representing equal travel times from a common point. Figure 1-8 shows a.m. peak-hour travel time contours for trips originating at the intersection of Oxnard Street and Sepulveda Boulevard near the I-405, and for trips originating at the intersection of Victory Boulevard and Topanga Canyon Boulevard in Warner Center. From Oxnard Street and Sepulveda Boulevard, the average travel time to the Los Angeles CBD during the a.m. peak hour is projected to increase from 37 minutes to 60 minutes by 2015. From Victory Boulevard and Topanga Canyon Boulevard, the travel time to the Los Angeles CBD will increase from 50 minutes to 83 minutes. East-west travel time across the length of the Valley will increase by more than 10 minutes, from 30 minutes to over 40 minutes, by 2015. The average travel time from Topanga Canyon Boulevard and Victory Boulevard to the intersection of Chandler Boulevard and Lankershim Boulevard, which was 26 minutes in 1995, is projected to increase to over 38 minutes by 2015.



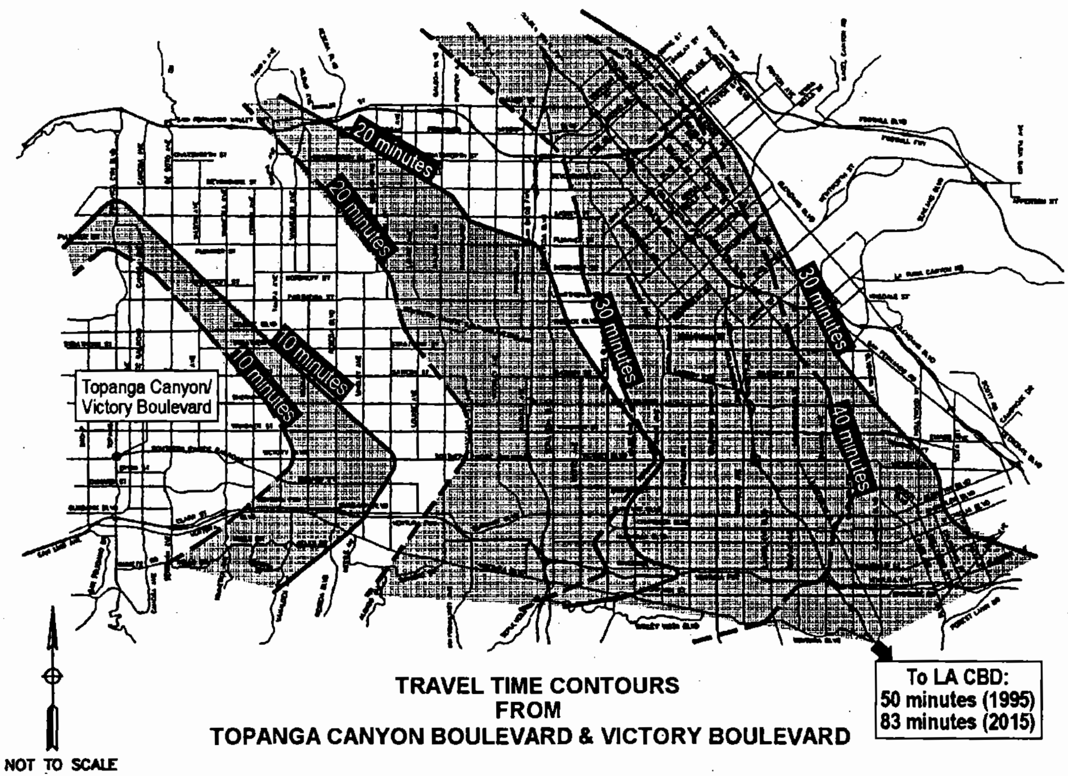
Screenline Locations



SOURCE: MEYER, MOHADDES ASSOCIATES, 1996.



TRAVEL TIME CONTOURS
FROM
SEPULVEDA BOULEVARD & OXNARD STREET



TRAVEL TIME CONTOURS
FROM
TOPANGA CANYON BOULEVARD & VICTORY BOULEVARD

SOURCE: MEYER MOHADDES ASSOCIATES

1-2 PLANNING CONTEXT/PROJECT HISTORY

Rail transit planning for the San Fernando Valley began in earnest in 1980, when Los Angeles County voters approved a one-half cent sales tax increase dedicated to funding a regional rail system. Among the alignments studied over the next several years were Sherman Way, Victory Boulevard, Ventura Boulevard, the Los Angeles River, the Southern Pacific (SP) Coast Mainline, the SP Burbank Branch, and the Ventura Freeway. Technologies under consideration ranged from at-grade and aerial light rail to deep-bore heavy rail (subway). Route refinement and environmental assessment activities continued until 1990, when the Los Angeles County Transportation Commission (LACTC, now MTA) certified the San Fernando East-West Rail Transit Project Final Environmental Impact Report (EIR) and adopted a predominantly deep-bore subway alternative following the SP Burbank Branch right-of-way from North Hollywood to the Warner Center area, a distance of roughly 14 miles (9 miles subway and 5 miles aerial). In 1992, a Supplemental EIR was completed, documenting the costs, expected ridership, and environmental impacts of the previously-adopted SP Burbank Branch subway and a newly-considered Ventura Freeway median aerial alignment. Pre-preliminary engineering studies for both of these alternatives were undertaken and after reviewing revised cost estimates, the Board of Directors of the MTA endorsed the SP Burbank Branch East-West Corridor in October 1994.

Construction of a project in the San Fernando Valley East-West Transportation Corridor will require federal matching funds to supplement local and state funding commitments. Completion of this Major Investment Study/Environmental Impact Statement/Supplemental Environmental Impact Report (MIS/EIS/SEIR) document is necessary to make the project eligible for these matching funds. To secure federal funding, the currently-adopted alternative is being evaluated along with other alignment options in an MIS, as required by the Federal Transit Administration (FTA).

1-3 ROLE OF THIS MIS/EIS/SEIR

The purpose of the MIS/EIS/SEIR is to select the most appropriate public transportation strategy for the San Fernando Valley East-West Transportation Corridor, while ensuring that potentially significant environmental impacts are considered and disclosed to the public. This document will be circulated for review by interested parties, including residents, community groups, business organizations, public agencies, and elected officials. Furthermore, meetings will be held to obtain input from the general public as part of the decision-making process.

The MIS/EIS/SEIR will culminate in the selection of a preferred investment strategy for the San Fernando Valley East-West Transportation Corridor. This selection will be made by the MTA's Board of Directors after reviewing the MIS/EIS/SEIR and public comments obtained during its circulation. An *MIS Alternatives Screening Report*, which outlined the alternatives to be carried forward into the environmental process, was presented to the MTA Board on May 22, 1996. A summary of the alternatives screening process is provided in Appendix J. The Board concurred with the recommendations presented in that report. Upon completing the environmental process, a recommended implementation strategy for the San Fernando Valley will be declared and documented in a *Preferred Investment Strategy Report*.

After completion and adoption of the *Preferred Investment Strategy Report*, the MTA will be able to proceed with preliminary engineering activities and to prepare a Final Environmental Impact Statement and Final Supplemental Environmental Impact Report (FEIS/FSEIR). Once the FEIS/FSEIR is completed, the MTA will be in a position to apply to the FTA to commit capital funding to the project.

CHAPTER 2

ALTERNATIVES CONSIDERED

CHAPTER 2: ALTERNATIVES CONSIDERED

2-1 ALTERNATIVES AND STRATEGIES EVALUATED IN THE ENVIRONMENTAL DOCUMENT

As a part of the Major Investment Study (MIS) analysis, a report entitled the *MIS Alternatives Screening Report* was released in May 1996. The report evaluated the relative cost-effectiveness of a broad range of project alternatives. Alternatives included all of the previously studied rail transit options included in the 1990 EIR and 1994 Geotechnical/Value Engineering studies. Alternative Rail Transit (ART) such as Diesel Multiple Unit vehicles were considered. Also, bus service improvements including dedicated busway enhancements to existing bus service were evaluated. Discussions with the Southern California Association of Governments (SCAG) MIS Peer Review Group (formerly called the Interagency Review Committee) were held in June 1995 and September 1996. Public scoping workshops were held in November 1995 to further expand the list of feasible alternatives for study.

The *MIS Alternatives Screening Report* provided cost estimates and ridership forecasts for 10 corridor transportation alternatives. A cost-effectiveness index was then calculated, which compared the capital and operating costs with the expected benefits in travel time savings and new transit ridership. (A discussion of the screening process and the preliminary alternatives considered can be found in Appendix J.) Alternatives considered in the *MIS Alternatives Screening Report* included the following:

- <u>Alternative 1: Red Line Extension to I-405 Freeway</u> (Southern Pacific right-of-way [SPROW])
  - 1a) Deep Bore Subway, Hollywood Freeway to Hazeltine Avenue
  - 1b) Cut & Cover Subway, Hollywood Freeway to Hazeltine Avenue
  - 1c) Open-Air Subway, Hollywood Freeway to Hazeltine Avenue
  - 1d) Aerial, Hollywood Freeway to I-405

- <u>Alternative 2: Red Line Extension to I-405</u> (Oxnard Street)

- <u>Alternative 3: Light Rail Transit to I-405</u>
  - 3a) At Grade, North Hollywood Freeway to I-405
  - 3b) Cut & Cover Subway, Hollywood Freeway to Fulton/Burbank

- <u>Alternative 4: Red Line Extension to Valley Circle</u> (SP ROW)
  - 4a) Deep Bore Subway, White Oak to De Soto
  - 4b) Cut & Cover Subway, White Oak to De Soto
  - 4c) Open-Air Subway, White Oak to De Soto
  - 4d) Aerial, I-405 to Valley Circle

- Alternative 5: Red Line Extension to Valley Circle (Sherman Way)

- Alternative 6: Light Rail Transit to Valley Circle
  - 6a) At Grade, North Hollywood to Valley Circle
  - 6b) Cut & Cover Subway, Hollywood Freeway to Fulton/Burbank

- Alternative 7: Alternative Rail Technology (North Hollywood to Chatsworth)

- Alternative 8: Busway (North Hollywood to Warner Center)

- Alternative 9: Enhanced Bus

- Alternative 10: No Project

Following a review of the cost-effectiveness of the above alternatives, on May 22, 1996, the Metropolitan Transportation Authority (MTA) Board of Directors adopted the staff recommendations to approve the findings of the *MIS Alternatives Screening Report* (Figure 2-1) and carry forward a reduced number of alternatives for environmental review. Based on cost-effectiveness criteria, the following alternatives were carried forward in the MIS process: 1, 2, 6, 9, and 10. The following alternatives were consequently removed from further consideration: 3, 4, 5, 7, and 8.

The MTA Board also directed that the actions listed below proceed and these have been incorporated into the current alternatives analysis:

- East Valley (east of I-405) - Identify and develop community-sensitive alternative solutions to deep bore subway in the area covered by state-mandated subway legislation. *(This area is approximately 3.5 miles in length and covers the segment of the SP right-of-way between the Hollywood Freeway and Hazeltine Avenue. In 1991, the Governor of California signed SB211, which mandates that any rail transit line constructed in this area be "covered and below ground.")*[1] Also consider cut-and-cover subway, open-air subway, and the addition of a station at Laurel Canyon Boulevard.

- West Valley (west of I-405) - Continue to evaluate the Enhanced Bus and the predominantly At-Grade LRT Alternatives. Remove from further consideration the less cost-effective Red Line Extension, Busway, and ART Alternatives.

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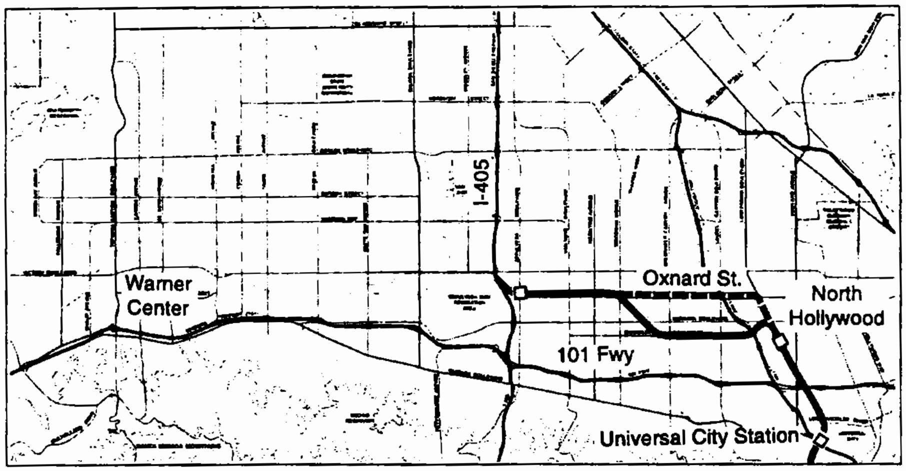
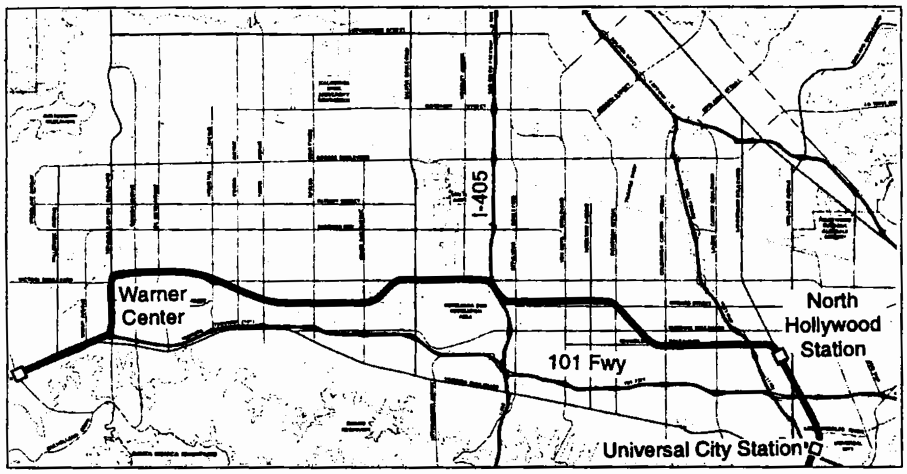
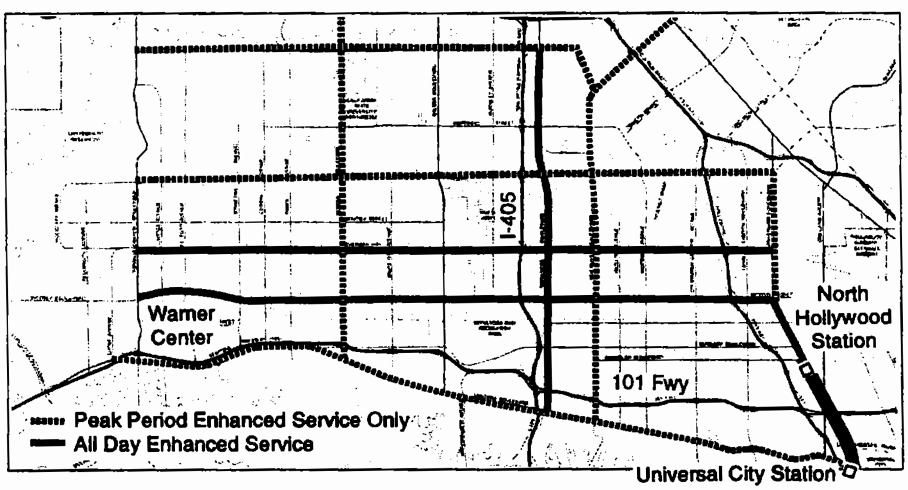
[1]Section 2 of SB211 provided a statutory definition of the San Fernando Valley rail rapid transit route. This definition included the following components: (a) in the area between Hazeltine Avenue and the Hollywood Freeway, the guideway shall not be constructed other than as a subway, (b) in the area below and extending 1 mile east and west of Tujunga Wash, the guideway shall be constructed in subway using deep-bore technology, and (c) in the area of the Tujunga Wash, only a station at Los Angeles Valley College shall be permitted. SB211 also states, however, that it is not intended to mandate the selection of any transit route or the construction of any route configuration or alignment, but rather to define the route and alignment adopted by the LACTC in 1990.



Red Line Extension from North Hollywood to I-405 (Alternatives 1,2)



Light Rail Transit from North Hollywood via SP Right-of-Way to West Valley (Alternative 6)



Enhanced Bus (Alternative 9)

Note: **Alternative 10 - No Project would essentially maintain existing levels of transit service in the East - West Corridor.**

SOURCE: MIS ALTERNATIVES SCREENING REPORT, MAY 1996.

FIGURE 2-1
Recommended Alternatives
MIS Alternatives Screening Report

- Technology/Construction - Although the Red Line Extension to the West Valley (Alternative 4) was recommended for elimination from further consideration based on its high cost, the *MIS Alternatives Screening Report* recommended that consideration of modifications to the Red Line vehicle design be considered to permit dual mode (third rail + overhead pantogtraph) electrification. Such a vehicle would allow the Red Line to be extended into the Valley in a predominantly at-grade configuration that would not be possible with a conventional Red Line vehicle. This alternative has therefore been added to the list of alternatives with the following descriptions:

  - <u>Alternative 11: Dual Mode Red Line Extension to I-405</u>
    - 11a) Predominantly At-Grade, North Hollywood to I-405
    - 11b) Same as 11a + Cut-and-Cover Subway on Chandler Boulevard

  - <u>Alternative 12: Dual Mode Red Line Extension to Valley Circle</u>
    - 12a) Predominantly At-Grade, North Hollywood to Valley Circle
    - 12b) Same as 12a + Cut-and-Cover Subway on Chandler Boulevard

The following sections identify the alternatives to be carried forward. These have been divided into East Valley projects, which can be cleared environmentally by this document, and West Valley strategies, which are discussed on a programmatic level. In addition, the No Project Alternative is included for further study to comply with California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) guidelines. Although transportation strategies, have been defined for the entire San Fernando Valley (Valley), the purpose of this document is to examine in detail the environmental effects in the East Valley. It should be noted that some strategies, for example the LRT Alternative (6a/6b), if implemented only in the East Valley, may not be cost-effective or operationally feasible, i.e., they would be feasible only on a Valley-wide basis.

Development of the Valley-wide Enhanced Bus (TSM) Alternative was accomplished through close coordination with MTA's Area Team, Bus Planning and Operations, and county-wide Modeling staffs. In addition, several recently completed or ongoing relevant bus planning studies were reviewed in detail for reference and input. These studies included:

- *Study of Restructuring Public Transit Services in the San Fernando Valley*, Crain and Associates, September 1994.

- *San Fernando Valley High Occupancy vehicle lane and Transit Priority Treatment Project*, BRW Inc., December 1995.

- *The East-West Valley Rail Line: Would Valley Taxpayers Get Their Money's Worth?*, Ryan Snyder Associates, Inc., March 1995.

Information from these studies was used by the planning team to determine the most suitable arterials for implementation of bus operational improvements and appropriate peak- and off-peak bus frequencies for enhanced service as part of the Enhanced Bus (TSM) Alternative.

2-1.1 East Valley Project Alternatives

East Valley project alternatives all start at the North Hollywood Metro Red Line Station (currently under construction and scheduled to open for service in 2000). All alternatives extend west for approximately 6 miles to the I-405 (San Diego Freeway), with the exception of Alternative 6 (LRT), which would need to extend into and across the West Valley to be cost-effective. Only the East Valley portion of the alternative is being examined in detail, however. These alternatives to be examined the *project* level are shown below in Table 2-1.

The rail alternatives (subway or at-grade) also have a supporting bus component in the West Valley. With the exception of the Light Rail Transit Alternative, all East Valley alternatives under consideration may lead to implementation in the near term. Because the LRT Alternative must be implemented in conjunction with a West Valley extension, a decision to select this alternative implies (a) the need to amend the 20-year plan to include the West Valley and (b) the need to prepare additional environmental documentation before the decision can be effected.

Table 2-1: East Valley Project Alternatives

Alternative		Description
Number	Variation	
10		No Project
9		Enhanced Bus (TSM)
1		Red Line Extension via SP ROW to I-405
	1a)	Deep Bore Subway, Hollywood Freeway to Hazeltine Avenue
	1b)	Cut & Cover Subway, Hollywood Freeway to Hazeltine Avenue
	1c)	Open-Air Subway, Hollywood Freeway to Hazeltine Avenue
	1d)	Aerial, Hollywood Freeway to I-405
2		Red Line Extension via Oxnard (subway)
6		Light Rail Transit Cross-Valley
	6a)	LRT At-Grade
	6b)	LRT At-Grade, same as 6a + Cut-and-Cover Subway on Chandler Boulevard
11		Red Line Extension via SP ROW to I-405 (Dual Mode)
	11a)	Predominantly At-Grade, North Hollywood to I-405
	11b)	Same as 11a + Cut-and-Cover Subway on Chandler Boulevard

Source: MFA, 1997.

2-1.2 Cross Valley Alternative Strategies

Although a number of Cross Valley strategies are not being cleared for implementation at the present time, they are being considered for extension of service into the West Valley in the future, and consequently are to be examined at a *programmatic* level. The Cross Valley alternative strategies are shown in Table 2-2.

Table 2-2: Cross Valley Alternative Strategies

Alternative		Description
Number	Variation	
10		No Project
9		Enhanced Bus (TSM)
1		Red Line Extension to I-405
	1a)	Deep Bore Subway, Hollywood Freeway to Hazeltine Avenue
	1b)	Cut & Cover Subway, Hollywood Freeway to Hazeltine Avenue
	1c)	Open-Air Subway, Hollywood Freeway to Hazeltine Avenue
	1d)	Aerial, Hollywood Freeway to I-405
	Red Line Extension to I-405 + West Valley	+ Enhanced Bus in West Valley
		+ Dual Mode Red line Extension in West Valley
2		Red Line Extension to I-405 via Oxnard Street
	Red Line Extension to I-405 via Oxnard St. + West Valley Option	+ Enhanced Bus in West Valley
		+ Dual Mode Red line Extension in West Valley
6		Light Rail Transit to Valley Circle
	6a)	LRT At-Grade
	6b)	LRT At-Grade, same as 6a + Cut-and-Cover Subway on Chandler Boulevard
12		Red Line Extension to Warner Center/Valley Circle with Dual Mode Vehicle
	12a)	Predominantly At-Grade, North Hollywood to Valley Circle
	12b)	Same as 12a + Cut-and-Cover Subway on Chandler Boulevard

Source: MFA, 1997.

The dual mode or LRT Cross Valley rail alternatives would require amending the MTA's 20-year transit development plan and would necessitate the preparation of additional environmental documents.

An overview of the Major Investment Study/Environmental Impact Statement/Supplemental Environmental Impact Report (MIS/EIS/SEIR) alternatives development process is provided in Table 2-3.

Table 2-3: San Fernando Valley East-West Transportation Corridor Development of Alternatives for the MIS/EIS/SEIR

Alternative	Deleted from Consideration in MIS Alternatives Screening Report May 22, 1996	Added to Study MIS Alternatives Screening Report May 22, 1996	Included in Draft MIS/EIS/SEIR
1. Red Line Extension to I-405 (SPROW)			
2. Red Line Extension to I-405 (Oxnard)			
3. Light Rail Transit to I-405	Deleted 5/22/96		
4. Red Line Extension to Valley Circle (SPROW)	Deleted 5/22/96		
5. Red Line Extension to Valley Circle (Sherman Way)	Deleted 5/22/96		
6. Light Rail Transit to Valley Circle			
7. Alternative Rail Technology	Deleted 5/22/96		
8. Busway	Deleted 5/22/96		
9. Enhanced Bus			
10. No Project			
11. Dual Mode Red Line Extension to I-405		Added 5/22/96	
12. Dual Mode Red Line Extension to Valley Circle		Added 5/22/96	

Source: MFA, 1997.

2-2 DETAILED DESCRIPTION OF EAST VALLEY PROJECT ALTERNATIVES

2-2.1 No Project Alternative (Alternative 10)

The No Project Alternative reflects conditions anticipated in the year 2015 without any major transit improvement investments within the Valley's East-West Transportation Corridor. This would mean that the MTA-owned SP Burbank Branch right-of-way (ROW) would not be used for a transit project. All other funded transportation improvements in the MTA Long Range Plan, and major projects that will be implemented by others, such as the city of Los Angeles, are assumed to be in place. Those improvements are listed in Appendix I. No new roadways and no major widening of any arterial highways in the San Fernando Valley is anticipated under this alternative by 2015. Traffic signal system improvements such as ATSAC will be operational in selected arterial corridors through the Valley. Rail lines would include the Blue Line from Pasadena to Long Beach, the Green Line from Norwalk to El Segundo, Red Line Segments 1 to 3 plus the western and eastern extensions to I-405 and Whittier/Atlantic, respectively, and the current Metrolink system.

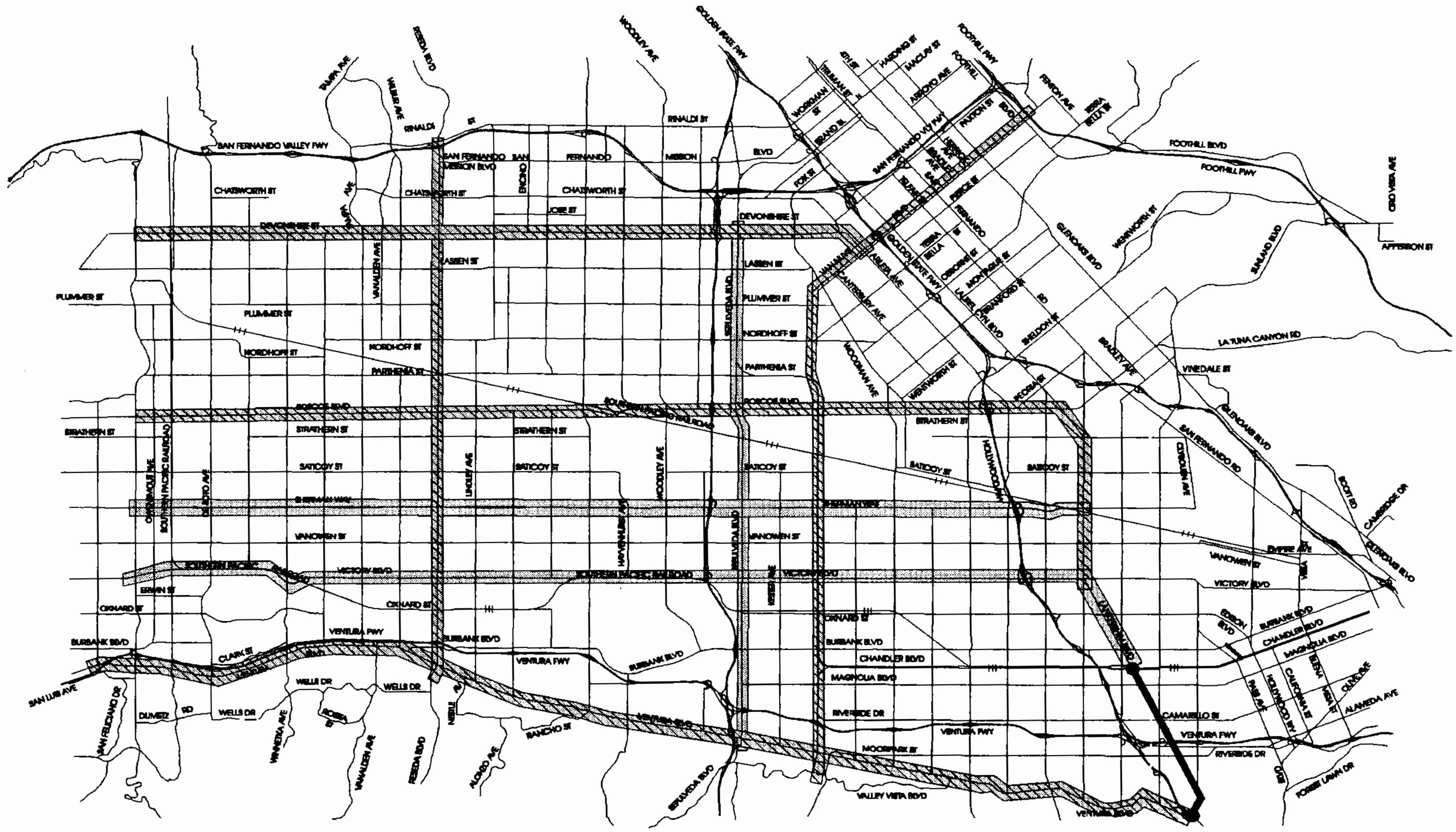
The recommendations of the *San Fernando Valley Transit Restructuring Study* will be fully implemented. These include Transit Centers in Sylmar, Burbank, Chatsworth, Warner Center, and Universal City. MTA bus lines will be restructured to facilitate timed transfers at each of these transit centers. MTA routes will also be revised to implement the Red Line bus-rail interface plans at the Universal City and North Hollywood stations. These changes will include redeployment of some express routes to downtown Los Angeles that would duplicate Red Line service. It is assumed that MTA's Mobility Allowance service will also be implemented in the San Fernando Valley.[2] In addition, the Valley will receive its relative share of additional buses identified in the 1995 MTA Long Range Plan.

2-2.2 Enhanced Bus (TSM) Alternative (Alternative 9)

The goal of the Enhanced Bus Alternative is to significantly improve mobility within the San Fernando Valley in general, and the East-West Transportation Corridor in particular, through enhancement of the existing bus system rather than construction of a rail transit project. This enhanced bus service alternative would be designed to increase and improve bus operations to the point of maximum efficiency, i.e. the point after which bus service will degrade due to congestion and slower speeds. Major capital expenditures for street widenings that would require property displacement, land takings, and relocation of homes and businesses have not been considered. The Enhanced Bus Alternative was therefore defined as the optimal level of bus service that could be provided on the existing highway and roadway network. (See Figure 2-2.)

The Enhanced Bus Alternative assumes the same bus routes and rail network as the No Project alternative. Enhanced Bus improvements would include various projects to enhance the performance of bus transit on major arterials, where bus service frequencies would be increased. These measures include traffic signal progression and adjustments for transit priority; implementation of "queue-jumpers" at intersections to provide automobile queue bypass and signal priority lanes for buses at major intersections; and on-street dedicated bus lanes through some of the more congested arterial segments. It is, however, not expected that these exclusive bus lanes would be implemented through taking of regular traffic lanes or by other measures that would result in capacity reductions to regular vehicular traffic. Specific locations for potential operational improvements would be identified based on the evaluation of impacts of such strategies on the overall system.

[2] Outlying and suburban areas with lower transit demand will be provided with a "mobility allowance" that will take the amount that would normally be budgeted for MTA buses and combine that amount as an incentive for alternative services operated by a combination of municipal operator city and private resources.



Peak Period Only

All Day

SOURCE: MEYER, MOHODDES ASSOCIATES, INC.

METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-2
TSM Alternative

Improvements would be implemented on the following major arterials, with particular focus on operational improvements and corresponding bus service increases, for the time periods indicated in parentheses:

East/West Arterials
- Ventura Boulevard (peak hours)
- Victory Boulevard (all day)
- Sherman Way (all day)
- Roscoe Boulevard (peak hours)
- Devonshire Street (peak hours)

North/South Arterials
- Reseda Boulevard (peak hours)
- Sepulveda Boulevard (all day)
- Van Nuys Boulevard (peak hours)

Buses would operate at least every 10 minutes during peak travel periods on these streets and every 20 minutes at other times. On all other routes, buses would run every 20 minutes during peak periods and every 30 minutes during off-peak hours.

The Enhanced Bus Alternative represents the Transportation Systems Management (TSM) alternative required by federal law, and serves as the baseline for comparing the costs and performance of the various transit alternatives in the MIS to be submitted to the FTA in pursuit of federal funds.

2-2.3 Red Line Extension via SP ROW (Alternative 1)

a. *Route Alignment*

The project would connect to the existing North Hollywood station at Lankershim and Chandler Boulevards and proceed west approximately 6.7 miles to a western station at Sepulveda Boulevard and a western track terminus just east of Woodley Avenue. The initial turn west would occur along an "S" curve that is referred to as the "WOW" curve, which describes a semi-circle that extends northwest from the North Hollywood station, then southwest across the Hollywood Freeway (US 101), and back to Chandler Boulevard and the (former) Southern Pacific right-of-way (SP ROW). The WOW curve passes under a mainly residential area and would be tunneled in all of the variations of this alternative (see Profiles and Construction Methods, below). Two alignment options for the WOW curve are being considered. Both options would begin at the end of a pocket track section that would be completed at the end of the North Hollywood station.

Under one option, the pocket track would be completed along a tangent (straight) section, which would extend for a distance of 400 feet beyond the end of tailtrack located at the station. Then the alignment would begin in tunnel in a curve to the northwest along a radius of slightly over 1,000 feet (estimated to be 1,036 feet), passing beneath an area of commercial buildings and single-family residences at a tunnel depth of approximately 40 feet (measured to the top of the tunnel). At approximately Camelia Avenue, south of Collins Street, the curve would begin a curve to the southwest, and at approximately Lemp Avenue, it would assume a northeast/southwest orientation, continuing beneath Burbank Boulevard, the Hollywood Freeway, and North Hollywood Park. At a point west of Colfax Avenue, the alignment would again change to a curve (along an estimated 1,400-foot radius) to the northwest, finally reaching the SP Burbank Branch ROW, where it would join the remainder of the project alignment.

Under a second option, the pocket track would be completed along a curved section that would extend for a distance of 500 feet beyond the end of tailtrack located at the station. Then the transit line alignment would begin in tunnel in a curve to the northwest along a radius of 1,400 feet, passing beneath the same general area as the first option. At approximately Burbank Boulevard, the second option would assume the same alignment as the first. The WOW section, approximately 5,000 feet, is shown in Figure 2-3.

The alignment would then remain on the SP ROW in the median of Chandler Boulevard and follow the ROW when it turns out of the median west of Coldwater Canyon Avenue and travels north of Chandler Boulevard. The alignment would remain along the SP ROW as it travels northwest from Chandler Boulevard and then turns west parallel to Oxnard Street to Sepulveda Boulevard. The ROW would then continue northwest along the eastern edge of the San Diego Freeway (I-405), cross under the freeway, and continue west along the northern edge of the Sepulveda Basin. This project would end just east of Woodley Avenue. Key cross streets include Laurel Canyon Boulevard, Whitsett Avenue, Coldwater Canyon Avenue, Burbank Boulevard, Woodman Avenue, Hazeltine Avenue, Van Nuys Boulevard, Kester Avenue, and Sepulveda Boulevard. The tracks would cross under the San Diego Freeway (I-405) and continue to just east of Woodley Avenue to provide for train storage ("tail tracks").

b. Station Locations and Conceptual Design

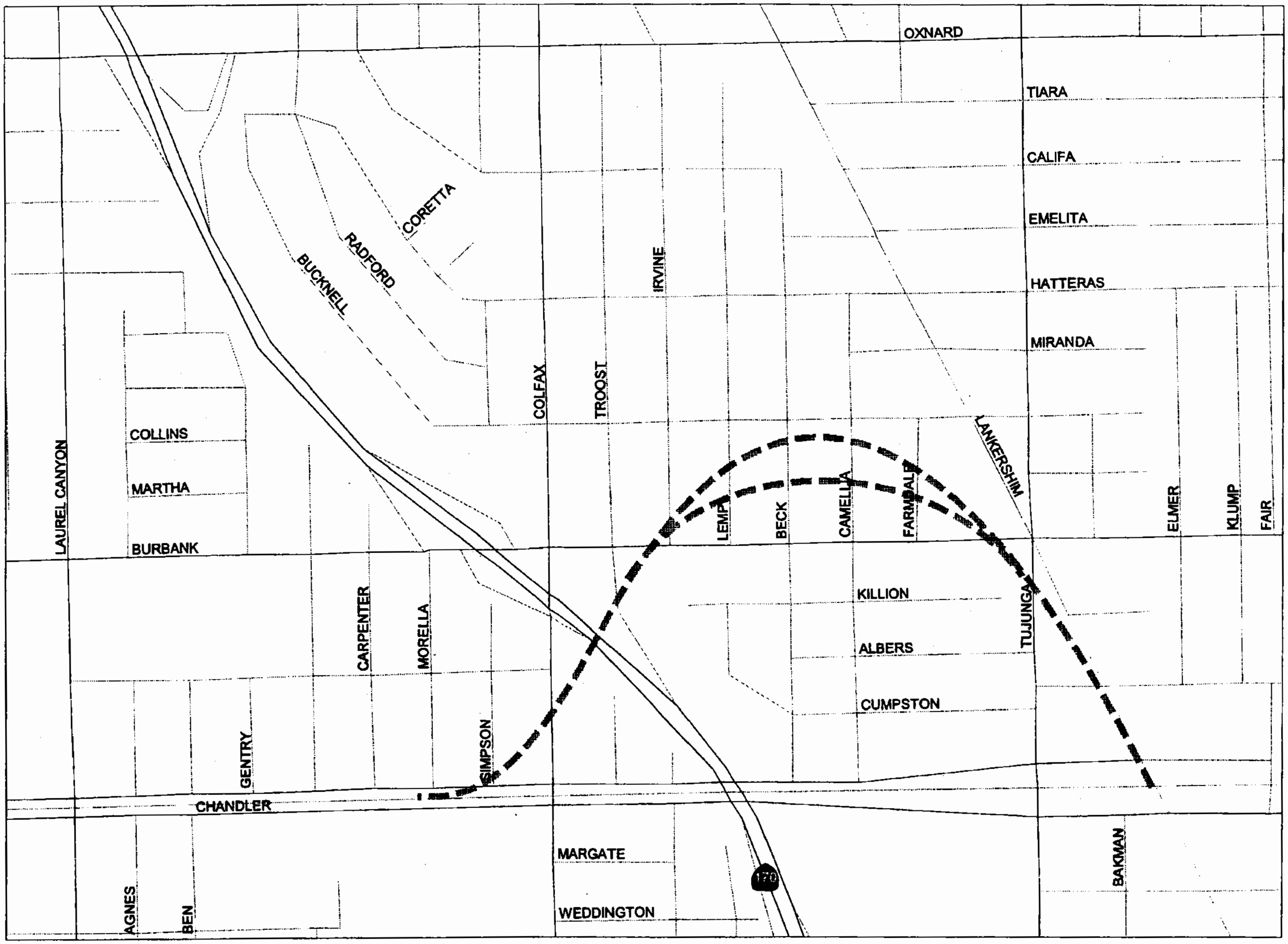
Stations would be located at Laurel Canyon Boulevard (and Chandler Boulevard), at Valley College (at the corner of Fulton Avenue and Burbank Boulevard), at Van Nuys Boulevard, and at Sepulveda Boulevard. Park-and-ride lots would be included in the station designs.

(1) Laurel Canyon Boulevard

The Laurel Canyon Boulevard station would be located approximately 1.25 miles from the North Hollywood station. Located east of Laurel Canyon Boulevard along Chandler Boulevard, the station would be constructed using cut-and-cover construction methods under variation 1a, and open-air construction methods under variations 1b, 1c, and aerial construction methods under variation 1d. Bus drop-off zones would be located on either side of Laurel Canyon Boulevard and 110 parking spaces would be provided at the station utilizing an existing parking lot on the north side of Chandler Boulevard. The station platform would be screened from surrounding land uses by vegetation. Please refer to Figure 2-4, Figure 2-5, and Figure 2-6.

(2) Valley College

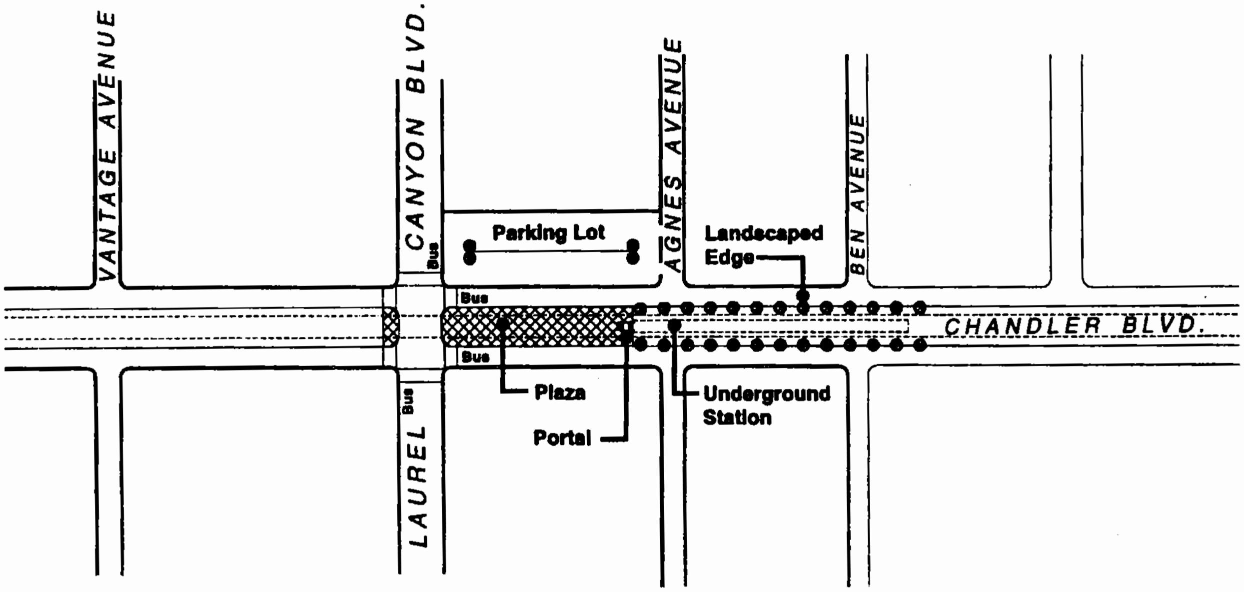
The Valley College station would be approximately 1.6 miles west of the Laurel Canyon station and located in and northwest of the intersection of Fulton Avenue and Burbank Boulevard along the SP ROW. The station would be in subway under variation 1a, open-air under variation 1b

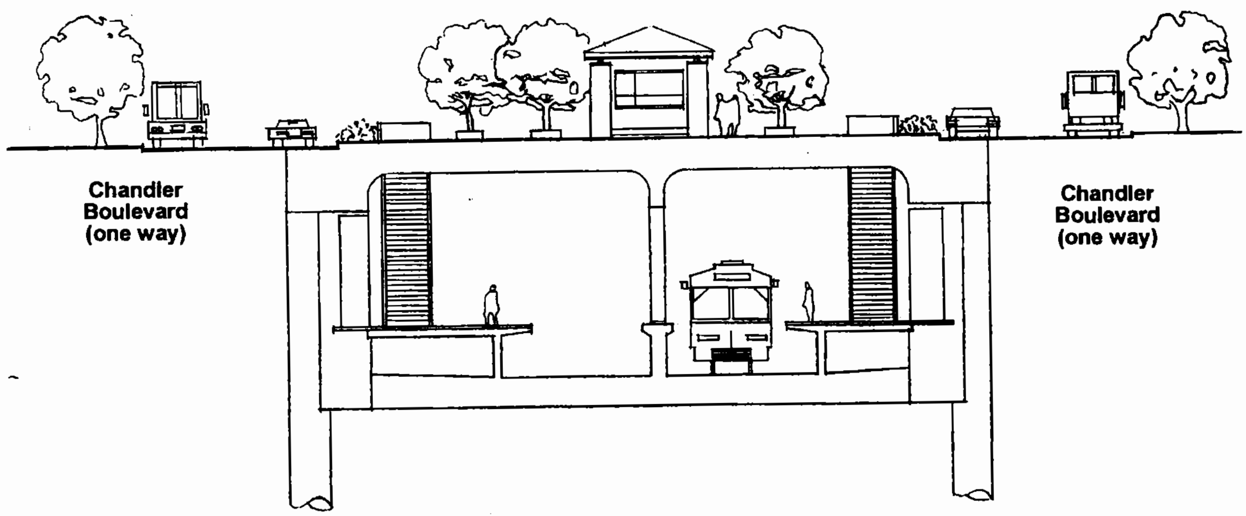


SOURCE: DELEUW, CATHER, & ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-3
"Wow" Section



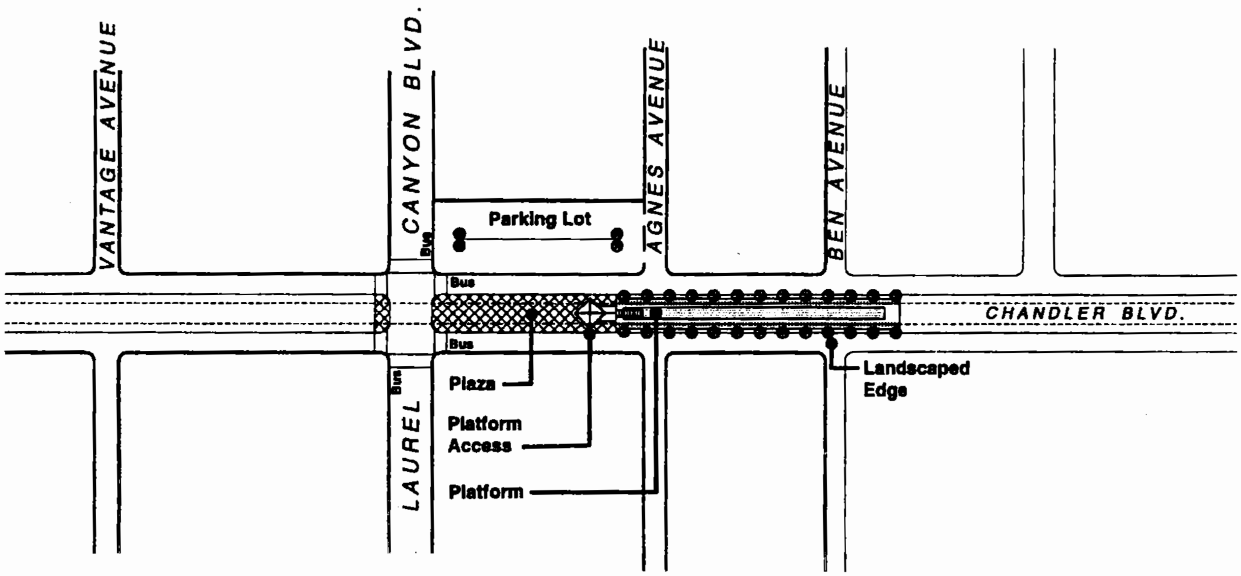


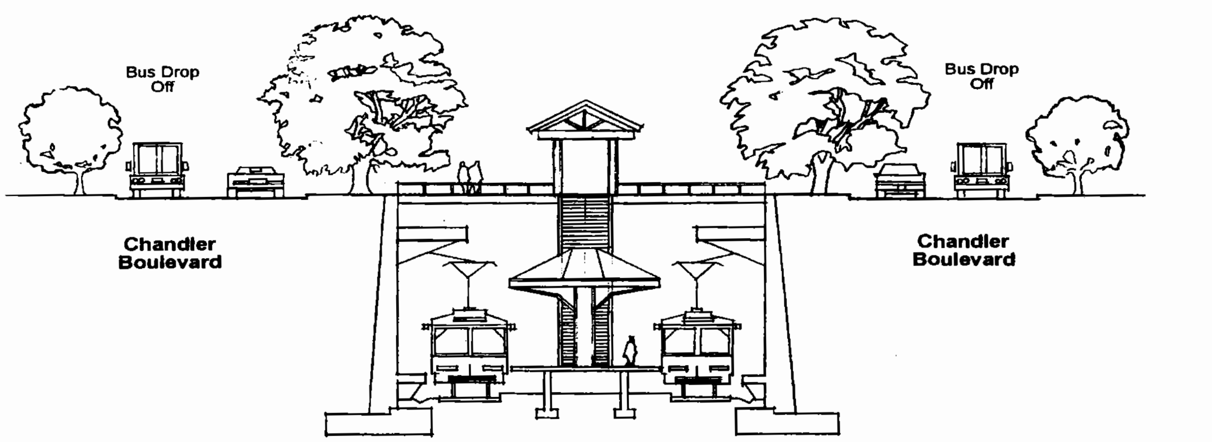
Cut-and-Cover Underground Station (Side or Center Platform)

Note: This Configuration used with Alternatives 1a.

SOURCE: GRUEN ASSOCIATES, 1996.

FIGURE 2-4
Laurel Canyon/Chandler Cut-and Cover Underground Station

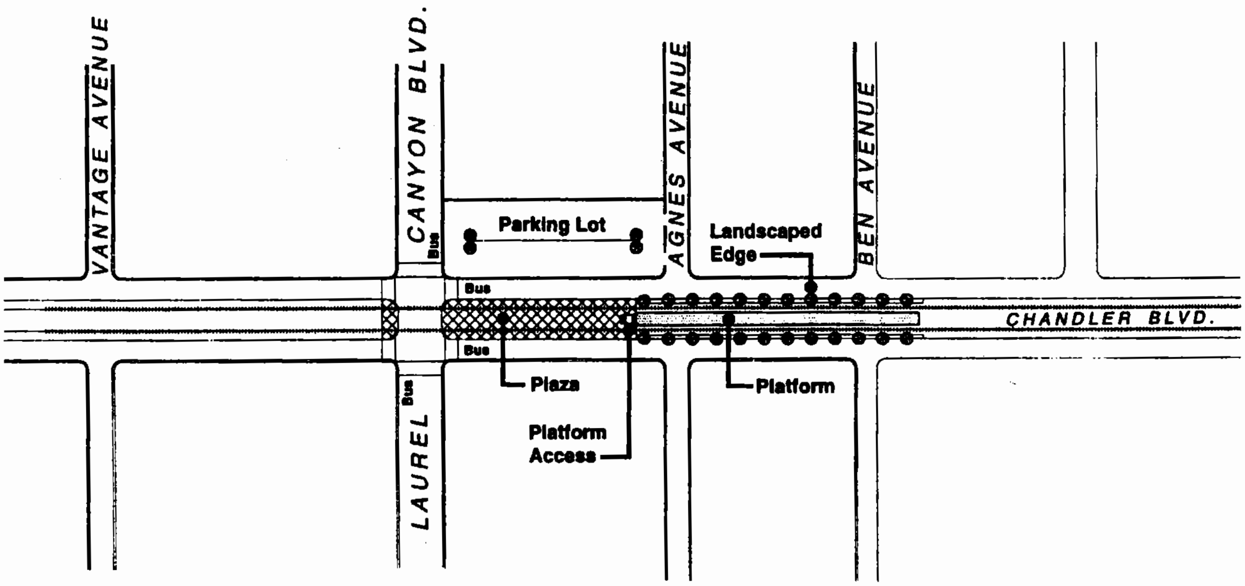


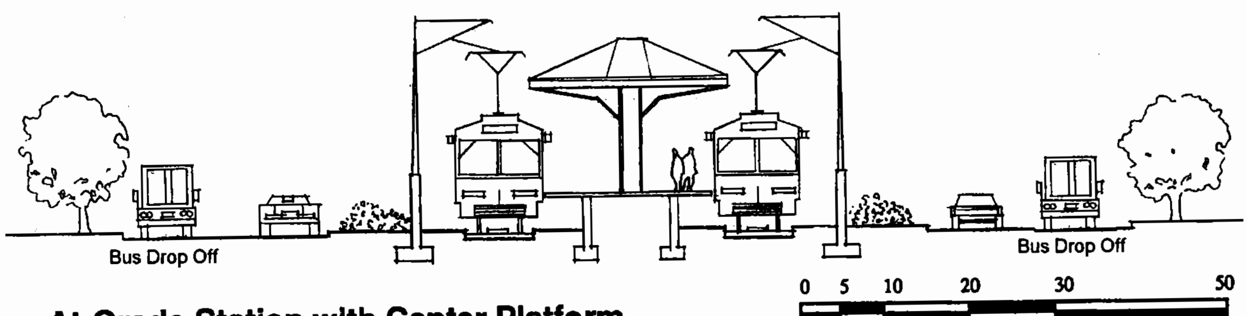


Open Air Underground Station (Center or Side Platform)

Note: This Configuration used with Alternatives 1b, 1c, 6b, 11b, & 12b.

SOURCE: GRUEN ASSOCIATES, 1996.





At-Grade Station with Center Platform

Note: This configuration used with Alternative 6a, 11a, 12a.

SOURCE: GRUEN ASSOCIATES, 1996.

and 1c, and aerial for variation 1d. The station under the street (variation 1a) would by constructed using cut-and-cover construction methods. The station would be screened from surrounding land uses by vegetation and include 83 parking spaces. Please refer to Figure 2-7, Figure 2-8, and Figure 2-9.

(3) Van Nuys Boulevard

The Van Nuys Boulevard station would be located approximately 1.7 miles west of the Valley College station and straddle Van Nuys Boulevard on an aerial structure for all Alternative 1 variations. A bus facility, kiss and ride access, and park and ride with 1,250 parking spaces would be provided. Pedestrian connections to the Government Center would also be improved. Please refer to Figure 2-10.

(4) Sepulveda Boulevard

The Sepulveda Boulevard station would be located approximately 1 mile west of the Van Nuys Boulevard station between Sepulveda Boulevard and I-405 north of the SP ROW. This station would be aerial for all Alternative 1 variations and would straddle Sepulveda Boulevard. Vehicle access to the station would be from Sepulveda or Erwin Street, with a new access road provided along the edge of the San Diego Freeway from Victory Boulevard along the SP ROW. Kiss and ride access and park and ride with 1,800 spaces would be provided. A bus turnaround and transfer facility would also be provided. Please refer to Figure 2-11. In addition, 350 parking spaces would be provided in the MTA right-of-way in the vicinity of the future Woodley Station.

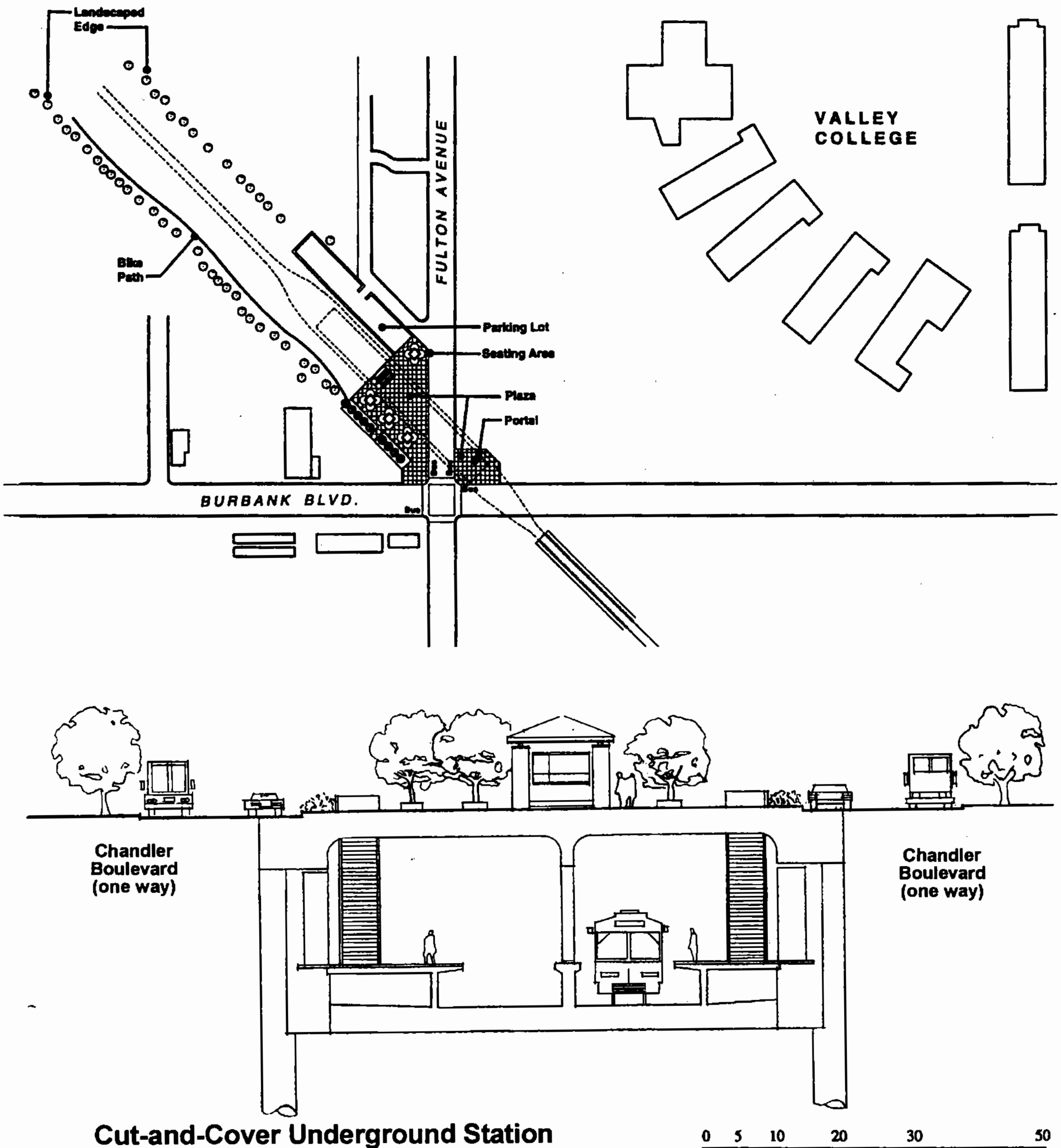
c. *Profile and Construction Methods*

The following sections describe the vertical profiles and construction methods associated with the SP ROW. For a detailed description of the actual construction process for this and all other alternatives, see Section 5-1.

The SP ROW has four variations in its vertical profile that are under consideration. These are discussed in the subsections below. However, there are two portions of this alternative that are common to all four variations: (1) the easternmost portion and (2) the portion of the alignment west of Tyrone Avenue. These are described immediately below.

At the eastern end of the corridor (the WOW curve, as described in Section 2-2.3 a, the alignment would be located in twin deep-bore tunnels, in which the top of rail is approximately 20 feet below the interior tunnel roof (called the "soffit") and the top of the tunnel is typically approximately 40 feet below the ground surface. The tunnel would be bored along one of two optional alignments (see Figure 2-3) from the North Hollywood station to approximately Colfax Avenue, where the transitions to the variations begin as described below for the four variations.

The second portion of the SP ROW that is common to all variations begins at approximately Tyrone Avenue (east of Van Nuys Boulevard), where the profile of the Red Line extension (all variations) becomes aerial, with the top of rail about 25 feet above grade. The structure would



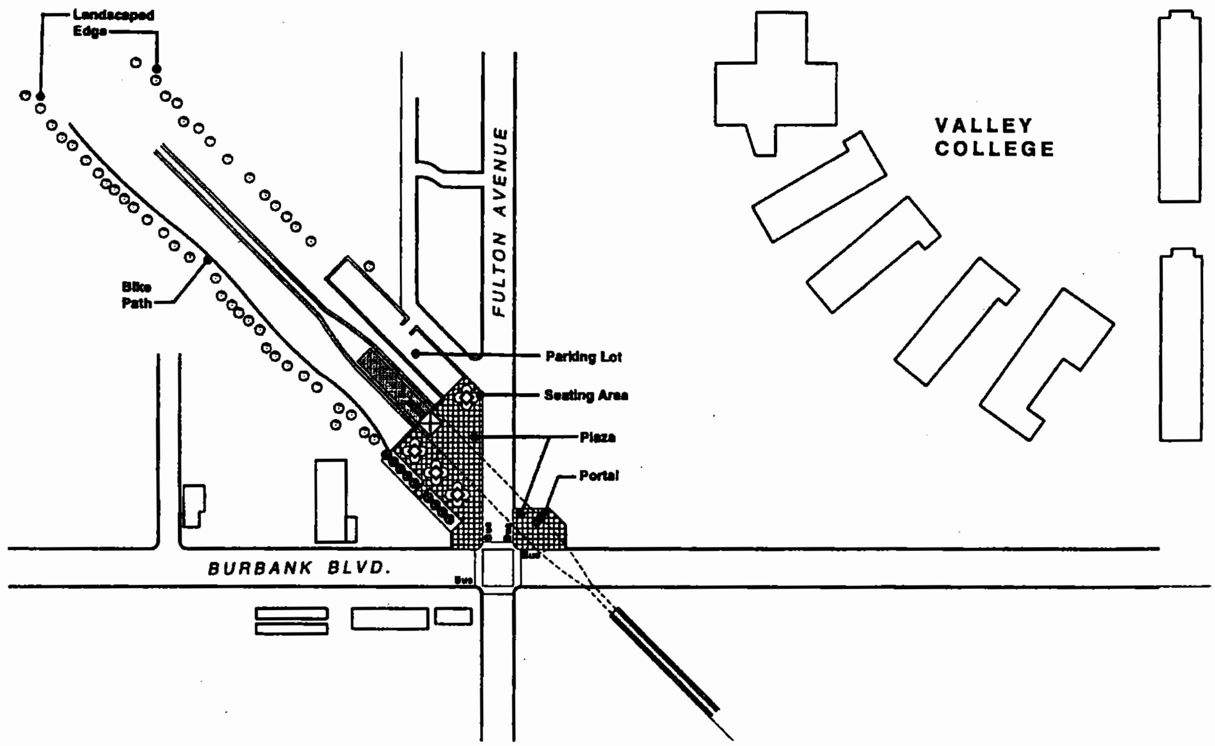
Cut-and-Cover Underground Station
(Side or Center Platform)

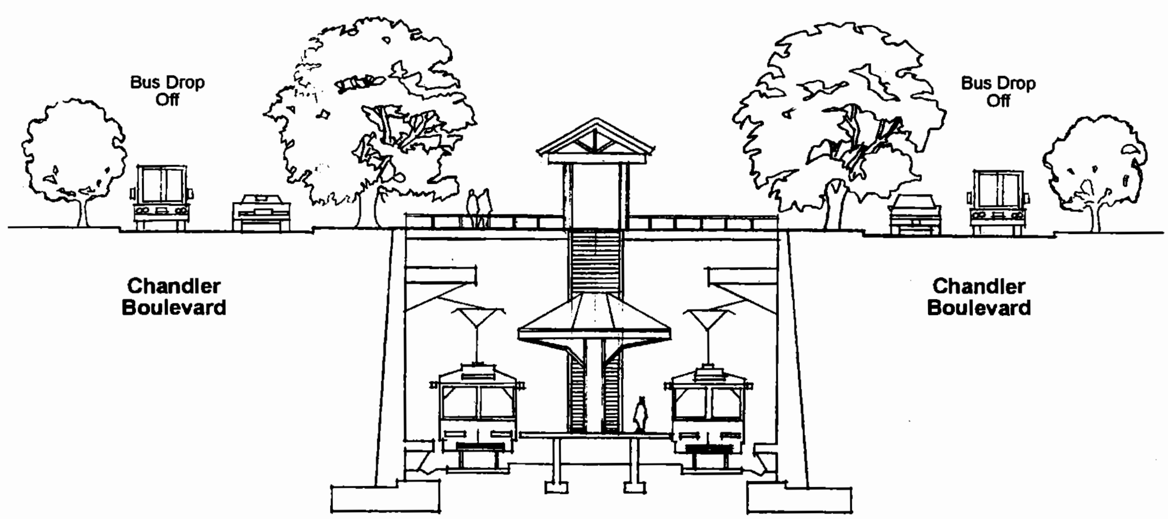
Note: This configuration used with Alternatives 1b, 1c, 6a, 6b, 11a, 11b, 12a, & 12b.

SOURCE: GRUEN ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-7
Fulton/Burbank Underground Station





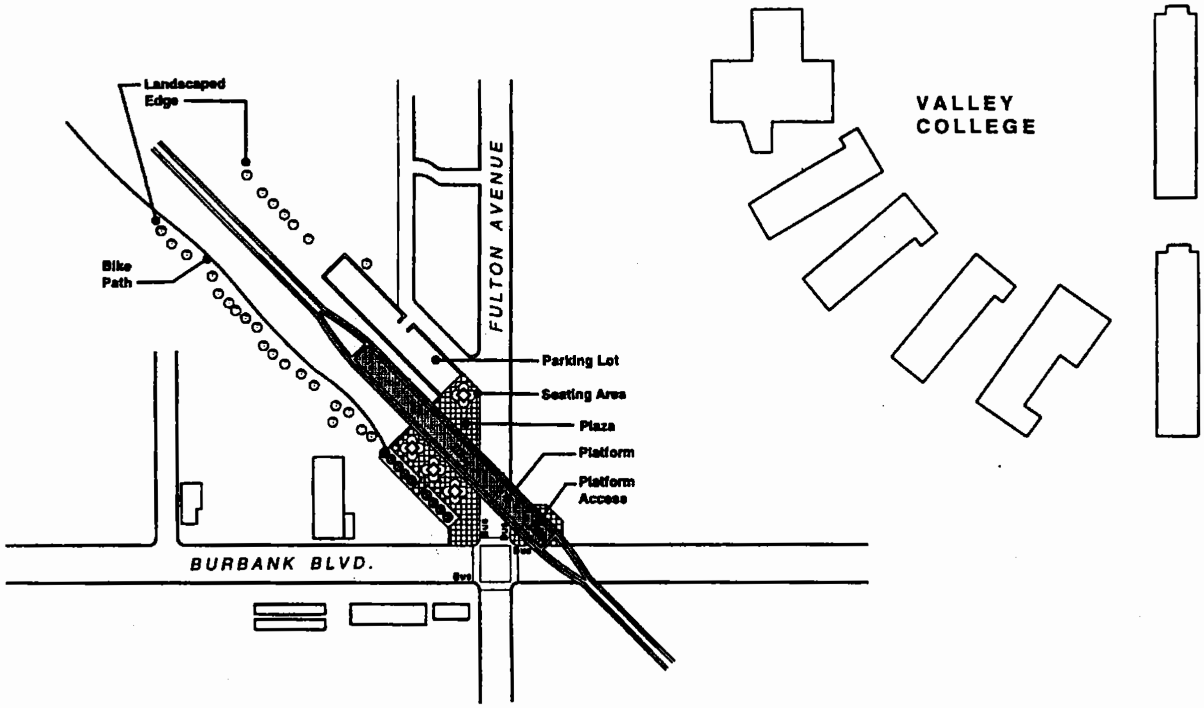
Open Air Underground Station (Center or Side Platform)

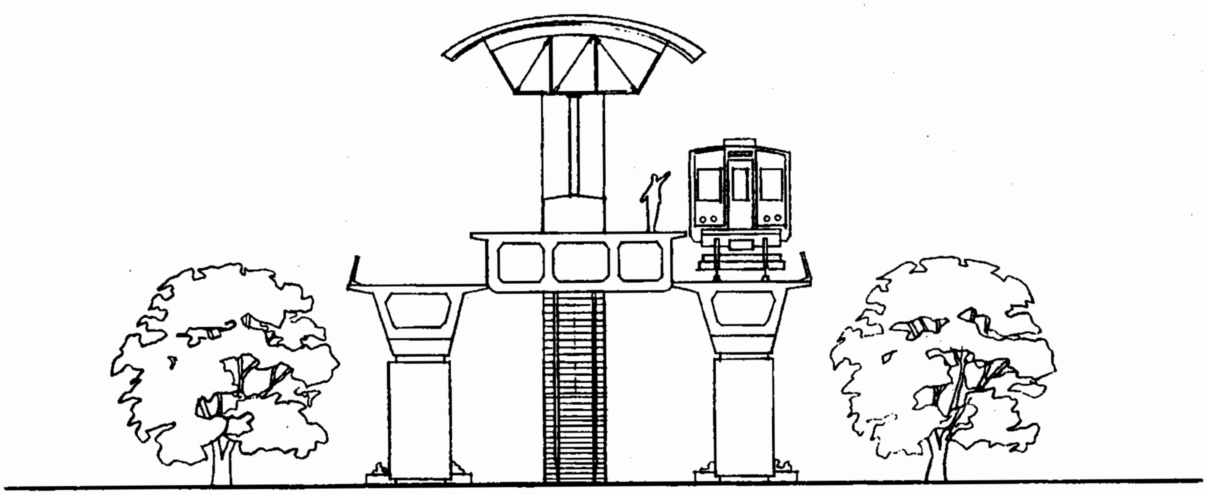
0 5 10 20 30 50

Note: this configuration used with Alternatives 1b, 1c, 6a, 6b, 11a, 11b, 12a, & 12b.

SOURCE: GRUEN ASSOCIATES, 1996.

FIGURE 2-8
Fulton/Burbank Open Air Station



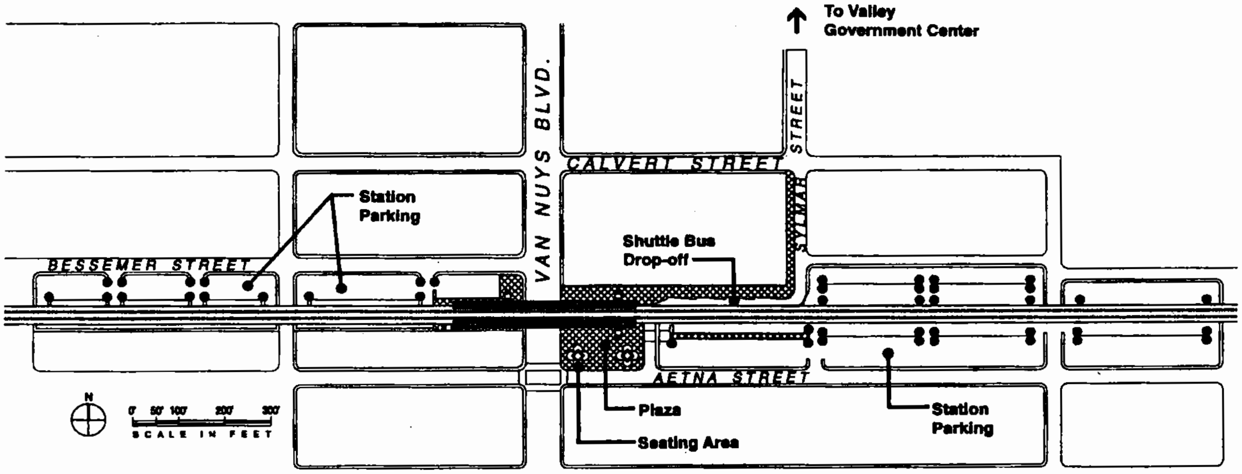


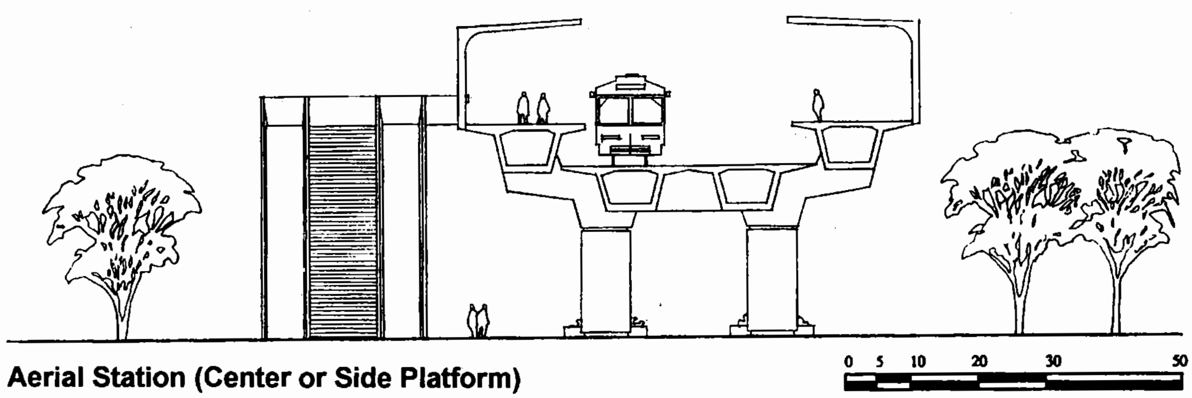
Aerial Station (Center or Side Platform)

0 5 10 20 30 50

Note: This configuration used with Alternative 1d.

SOURCE: GRUEN ASSOCIATES, 1996.

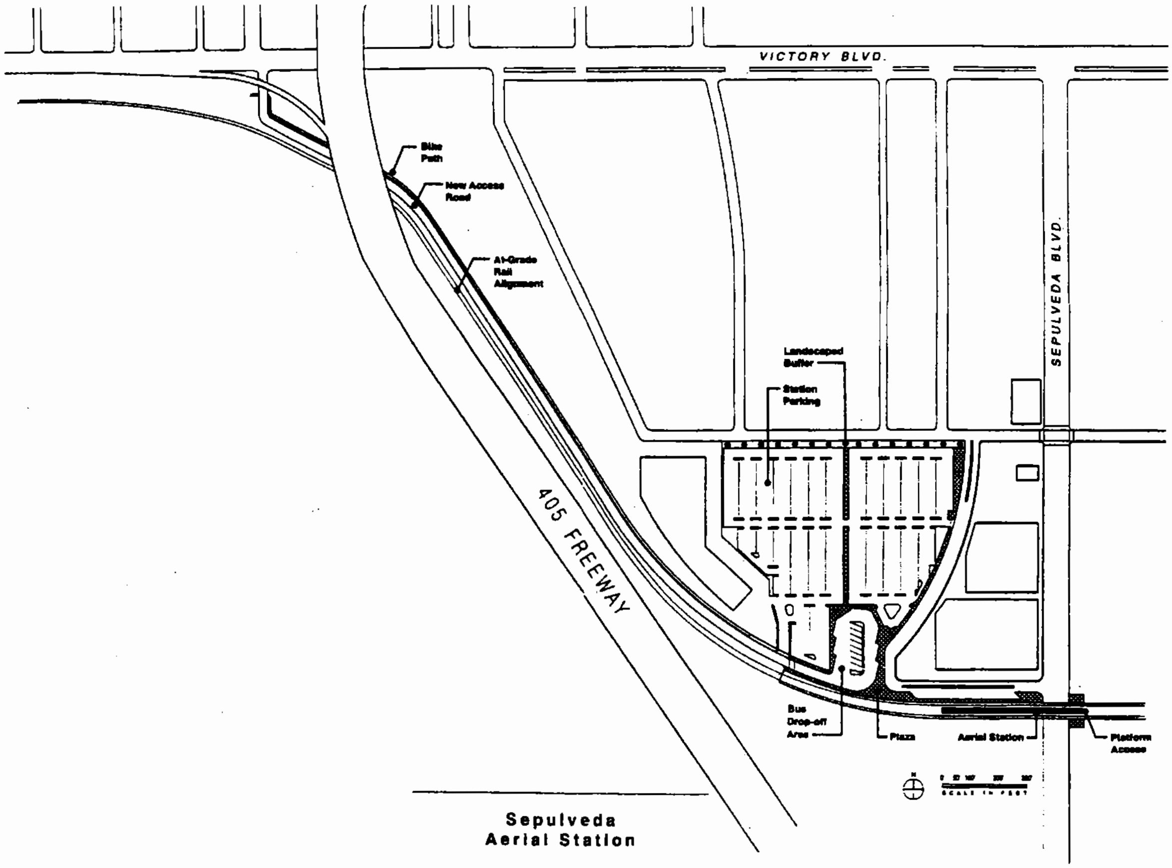




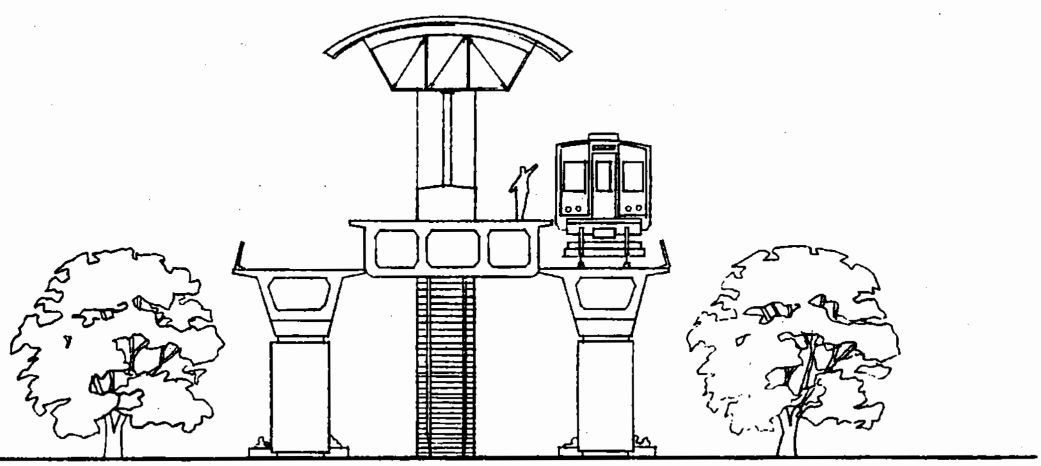
Aerial Station (Center or Side Platform)

Note: This configuration used with all rail alternatives.

SOURCE: GRUEN ASSOCIATES, 1996.



Sepulveda
Aerial Station



Aerial Station with Center Platform

0 5 10 20 30 50

Note: This configuration used with all rail alternatives.

SOURCE: GRUEN ASSOCIATES, 1996.

be supported on columns nominally 100 feet apart (the distance may vary). The project would continue along the SP ROW on structure, including the stations at Van Nuys and Sepulveda Boulevards, crossing over the intersecting stretch of Sylmar Avenue, Van Nuys Boulevard, Vesper Avenue, and Sepulveda Boulevard, to just west of the Sepulveda station where it would transition to grade. The SP ROW crosses beneath the freeway at grade and continues west of I-405, to the end of the project at Woodley Avenue. The length of this second common section would be approximately 12,800 feet, or 2.4 miles. A combination of at-grade and aerial construction methods would be used for this section. (See Chapter 5 for a discussion of these techniques.)

(1) Variation 1a: Deep-Bore Subway

The profile of this variation of Alternative 1 remains in deep-bore tunnel from Colfax Avenue (the western end of the WOW curve) to Tyrone Avenue, with a transition to aerial beginning at Hazeltine Avenue. At its deepest point the top of the tunnel would be approximately 45 feet from existing ground (at the flood control channel at Coldwater Canyon Avenue). At its shallowest point, the tunnel would be 32 feet from grade (east and west of the Valley College station), although the top of the station would be much shallower. As the tunnel reaches grade at Hazeltine Avenue, the transition would be constructed via cut-and-cover methods, then retained cut as the tracks emerge above the surface ("daylight") at Tyrone Avenue. A combination of deep-bore and cut-and-cover construction methods would be used for this section. Figure 2-12 illustrates Alternative 1a, and typical sections are shown on Figure 2-13.

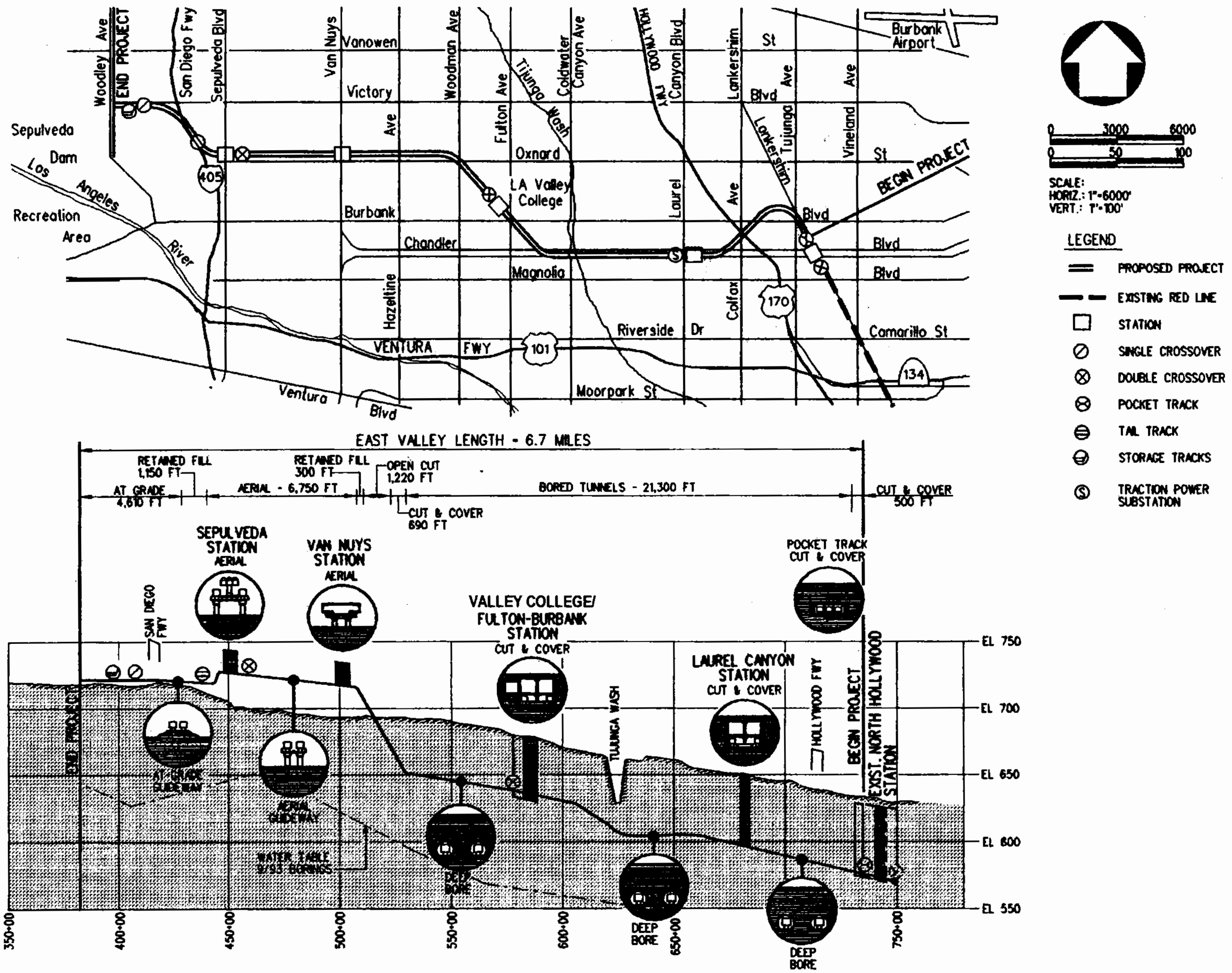
(2) Variation 1b: Cut-and-Cover Subway

From Colfax Avenue to Tyrone Avenue, this variation of Alternative 1 would be constructed with a cut-and-cover technique and the profile would be shallower. The top of the tunnel would be approximately 15 feet from the existing grade, except where a deeper section is required to pass under existing utilities or drains. Cut-and-cover construction methods would be used for this section, coupled with open-air-with-roof stations at Laurel Canyon Boulevard and Valley College (Fulton Avenue/Burbank Boulevard). Figure 2-14 illustrates Alternative 1b, and a typical cut-and-cover section is shown on Figure 2-13.

(3) Variation 1c: Open-Air Guideway

This variation would be even shallower than Variation 1b, with the section between Colfax and Tyrone Avenues in a retained cut trench. In other words, the tracks would be depressed about 25 to 35 feet below grade and they would be open to the sky. There would be cut-and-cover sections to go under the flood control channel, cross streets, and transition to the WOW curve section.

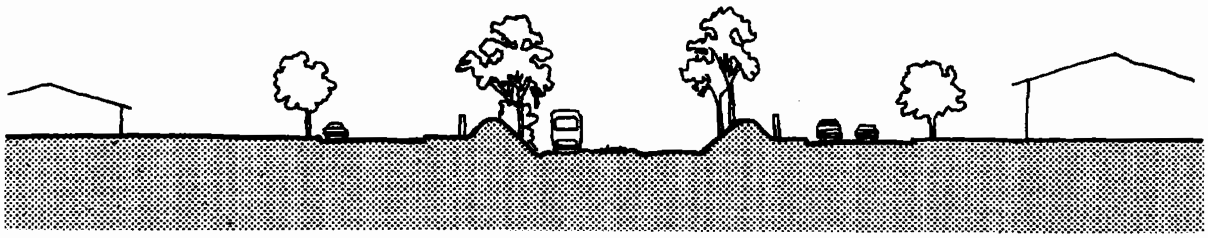
Open-cut construction methods would be used for this section. Figure 2-15 illustrates Alternative 1c, and a typical section is shown on Figure 2-13.



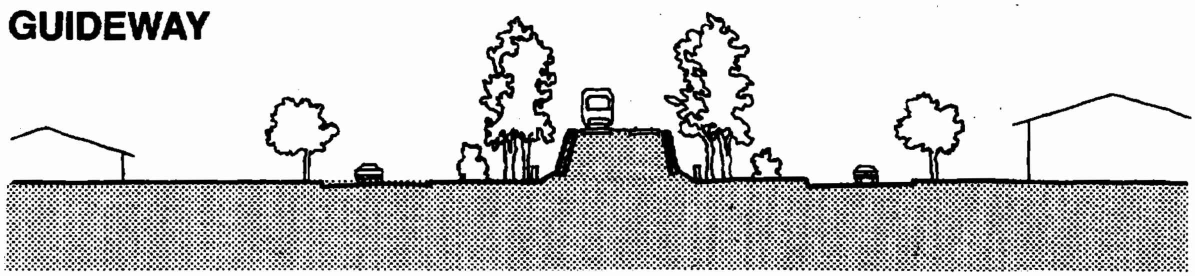
SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

FIGURE 2-12
Alternative 1a

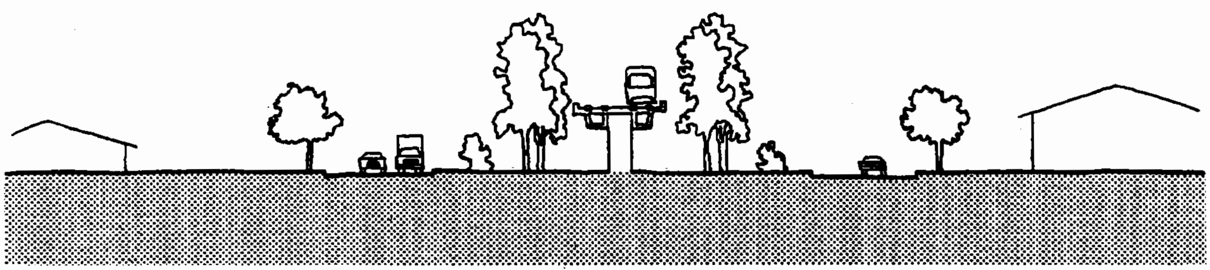
AT-GRADE GUIDEWAY



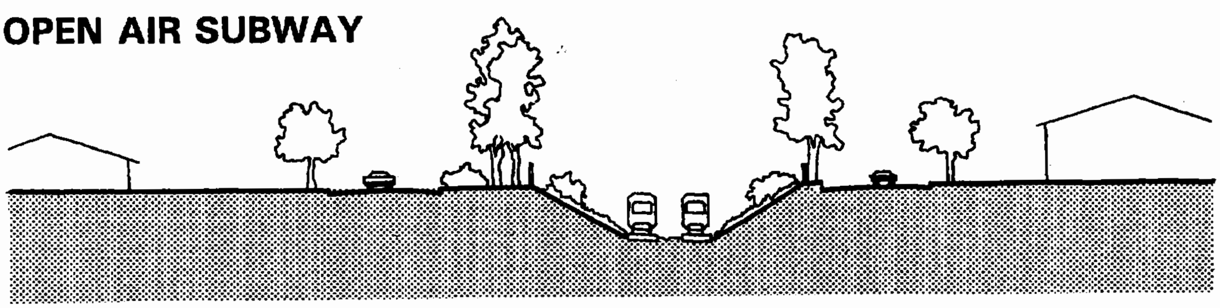
RETAINED FILL AERIAL GUIDEWAY



AERIAL GUIDEWAY



OPEN AIR SUBWAY

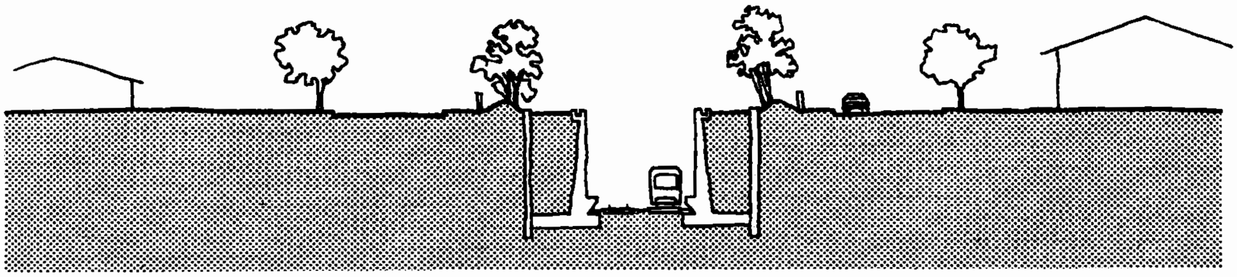


SOURCE: GRUEN ASSOCIATES, 1997.

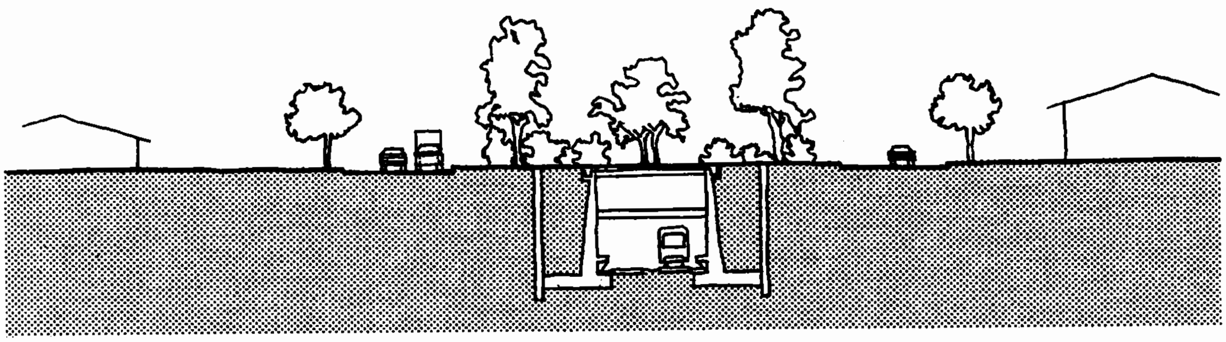
San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-13
Typical Sections
(page 1 of 2)

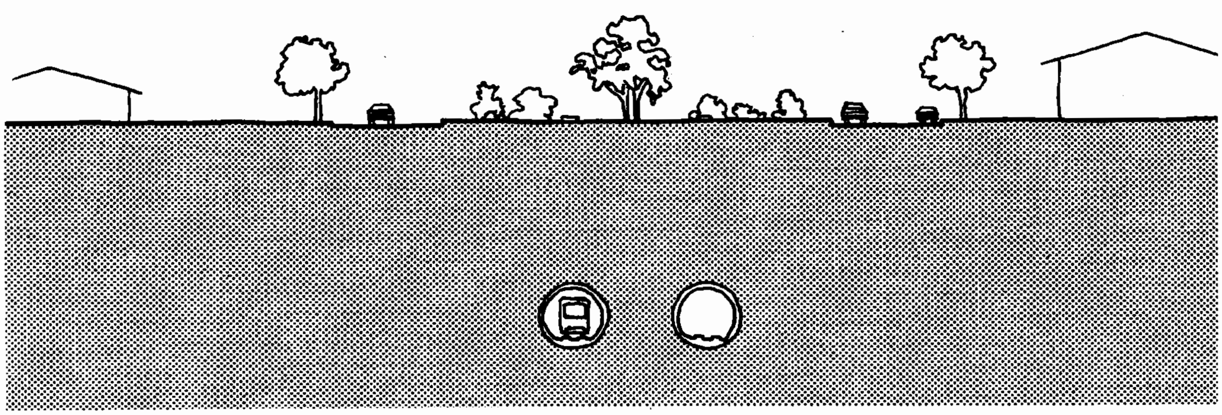
OPEN-AIR SUBWAY



CUT AND COVER SUBWAY

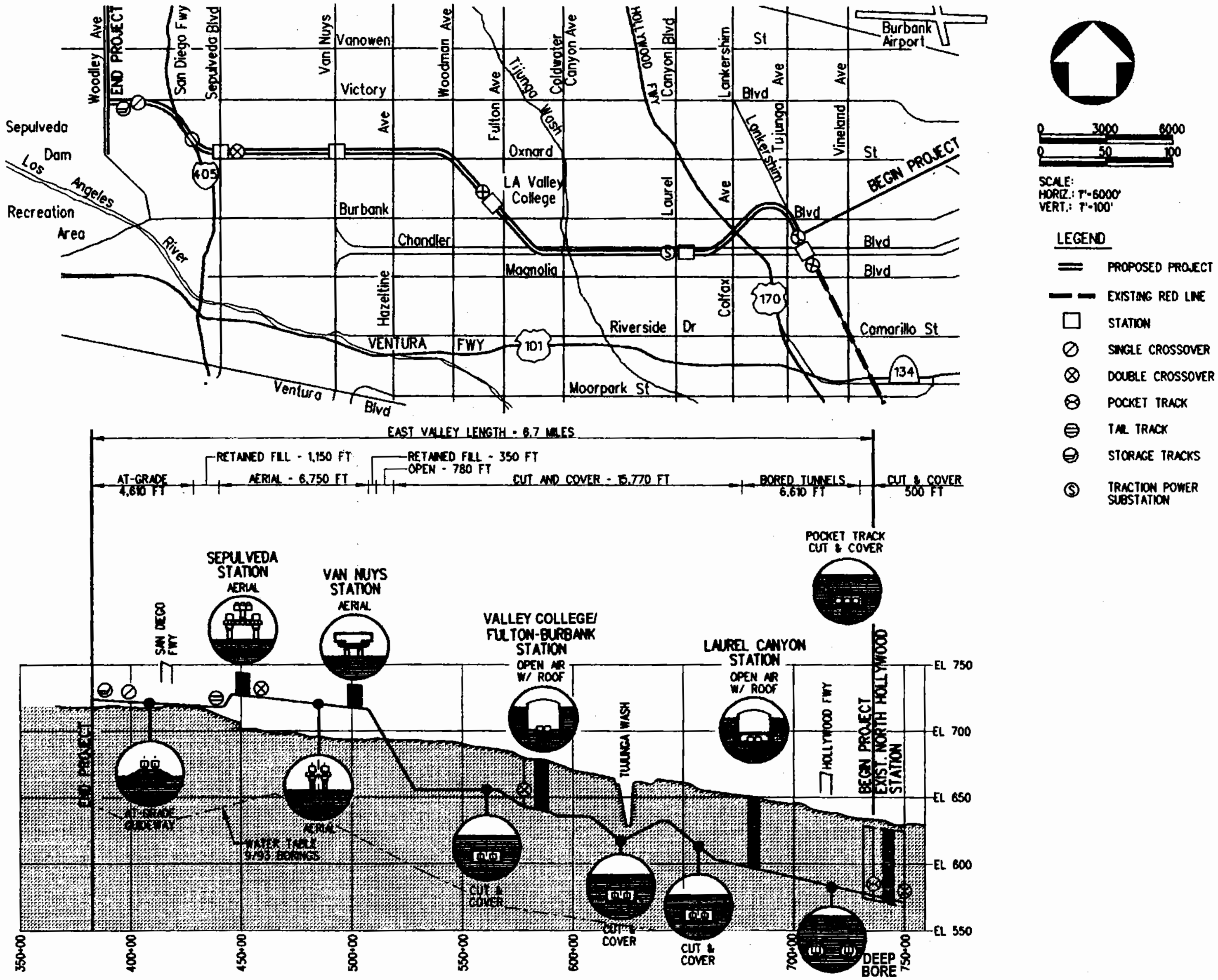


DEEP BORE SUBWAY



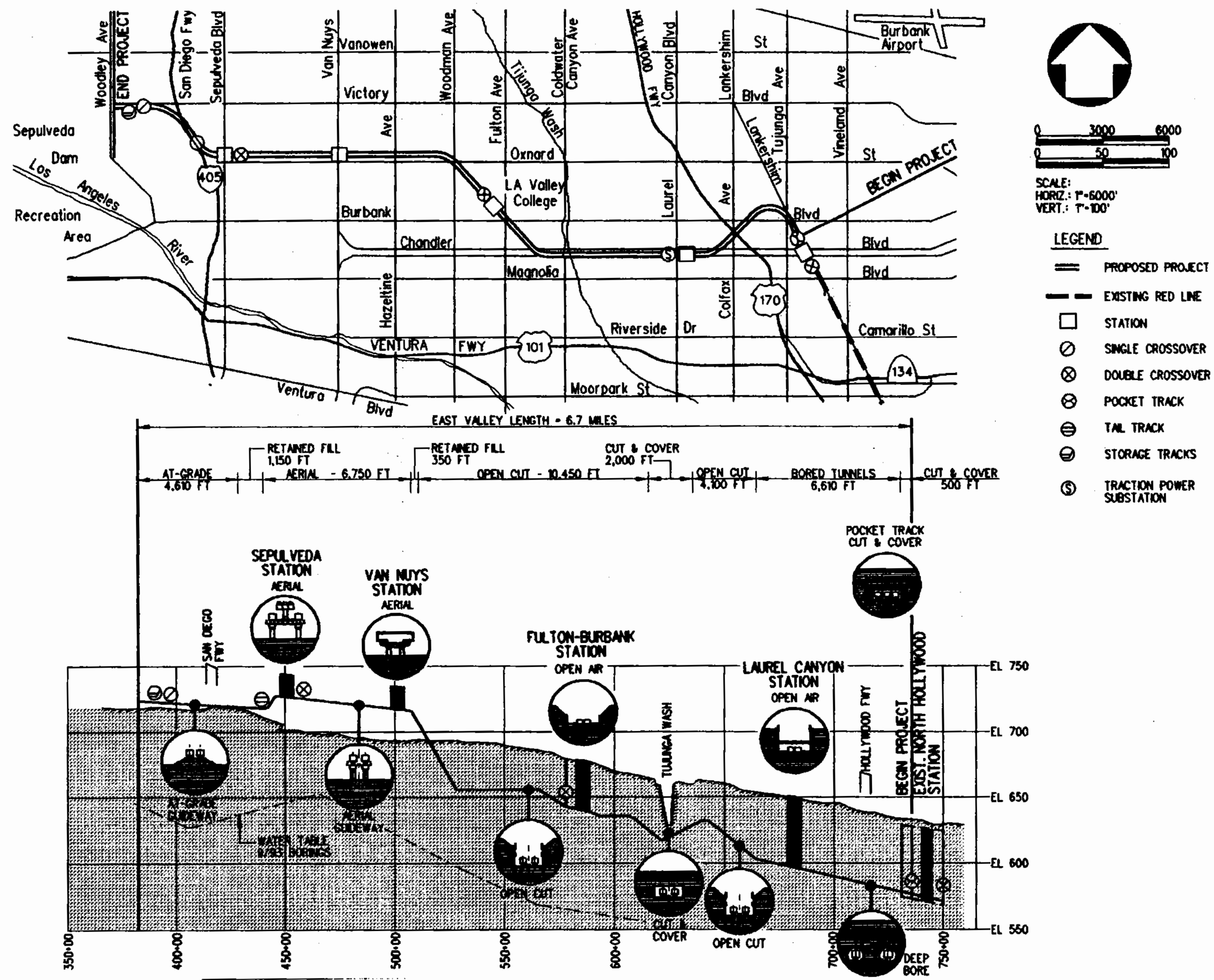
SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 2-12
Typical Sections
(page 2 of 2)



SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

FIGURE 2-14
Alternative 1b



SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-15
Alternative 1c

(4) Variation 1d: Aerial Guideway

This variation would become aerial west of Laurel Canyon Boulevard and remain aerial to the west of the Sepulveda Boulevard station. The structure typically has the top of rail about 25 feet above grade, with a clearance of 16 feet underneath the structure. The structure would be supported on piers nominally 100 feet apart (the distance may vary). Aerial construction methods would be used for this variation. Figure 2-16 illustrates Alternative 1d and a typical section is shown on Figure 2-13.

2-2.4 Red Line Extension via Oxnard Street (Alternative 2)

a. Route Alignment

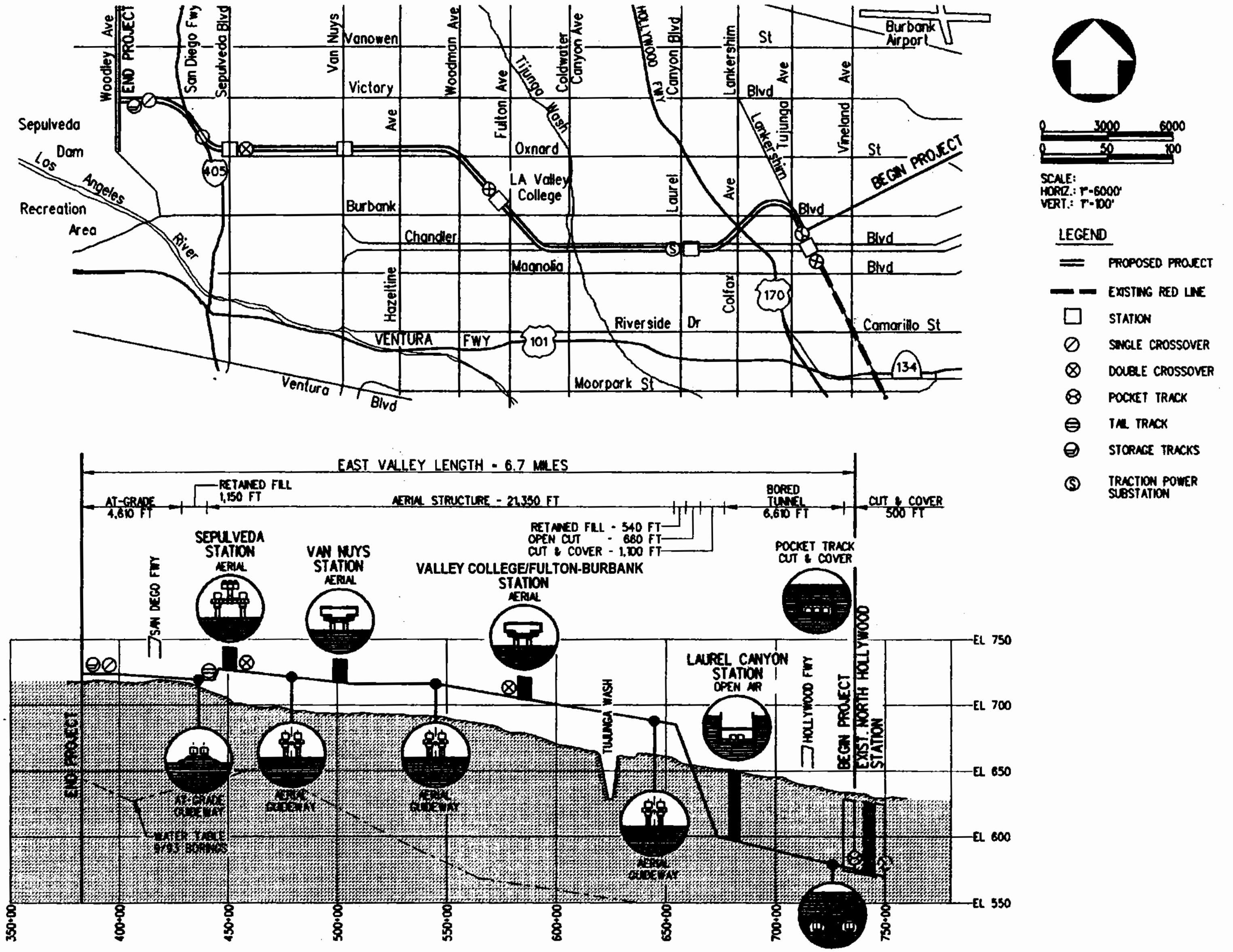
The project would connect to the existing North Hollywood station at Lankershim and Chandler Boulevards and proceed west approximately 6.5 miles to a western station at Sepulveda Boulevard and a western track terminus just east of Woodley Avenue. From the North Hollywood station the alignment would proceed northwest along Lankershim Boulevard to Oxnard Street. There the alignment would turn west and proceed along Oxnard Street to Woodman Avenue, where it would it connect to the SP ROW and continue west in a manner identical to Alternative 1. Alternative 2 is illustrated on Figure 2-17.

Key cross streets include Laurel Canyon Boulevard, Whitsett Avenue, Coldwater Canyon Avenue, Woodman Avenue, Hazeltine Avenue, Van Nuys Boulevard, Kester Avenue, and Sepulveda Boulevard. The tracks would cross under the San Diego Freeway (I-405) and continue to just east of Woodley Avenue where storage and tail track would be provided.

b. Station Locations and Conceptual Design

Stations would be located at Laurel Canyon Boulevard (and Oxnard Street, with 140 parking spaces), at Valley College at the corner of Fulton Avenue and Oxnard Street (no parking), at Van Nuys Boulevard (with 1,250 parking spaces), and at Sepulveda Boulevard (with 1,800 parking spaces). In addition, 350 parking spaces would be provided in the vicinity of the future Woodley Station. The Sepulveda Boulevard and Van Nuys Boulevard stations, 1 mile apart, would be configured as in Alternative 1. The Laurel Canyon Boulevard station would be approximately 1.5 miles east of Valley College and 1.7 miles west of the North Hollywood station and located under Oxnard Street, just to the east of the Hollywood Freeway. It would be built via cut-and-cover construction methods. A pedestrian tunnel would connect the station to uses west of the Hollywood Freeway. A kiss-and-ride lot and bus drop-off facility would utilize the existing Caltrans park-and-ride lot on the south side of Oxnard Street. Please refer to Figure 2-18.

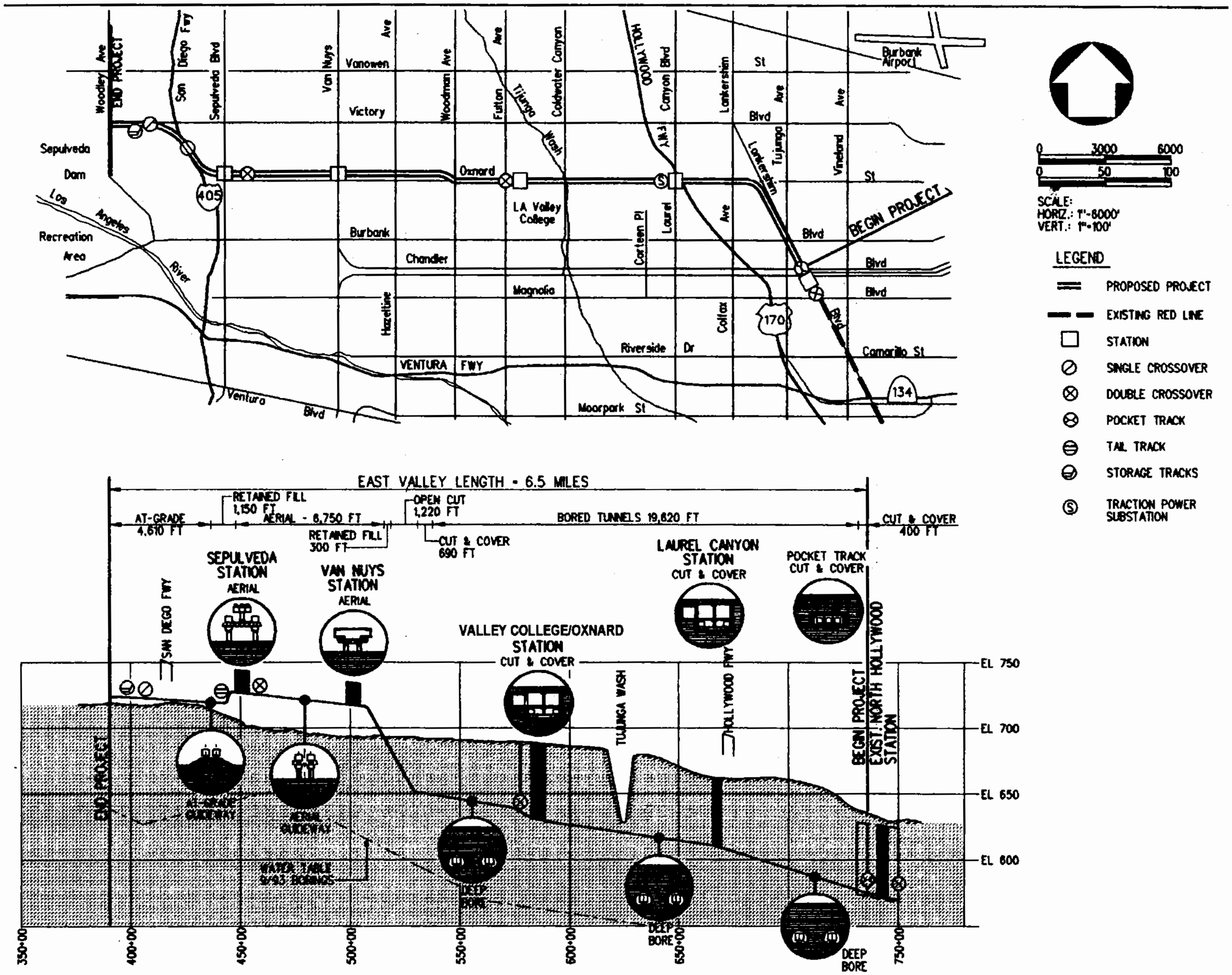
The Valley College station, as shown on Figure 2-19, would also be built using cut-and-cover construction methods. This station would be located east of Fulton Avenue under Oxnard Street, approximately 1.6 miles east of the Van Nuys Station. In this alternative, no parking or kiss and ride access would be provided.



SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

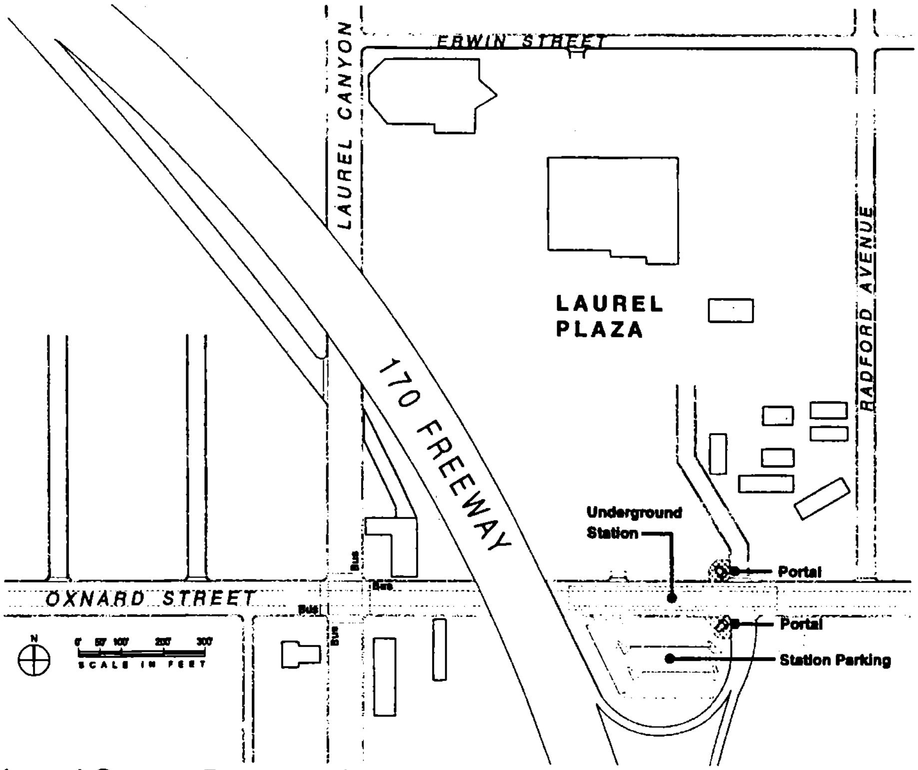
FIGURE 2-16
Alternative 1d



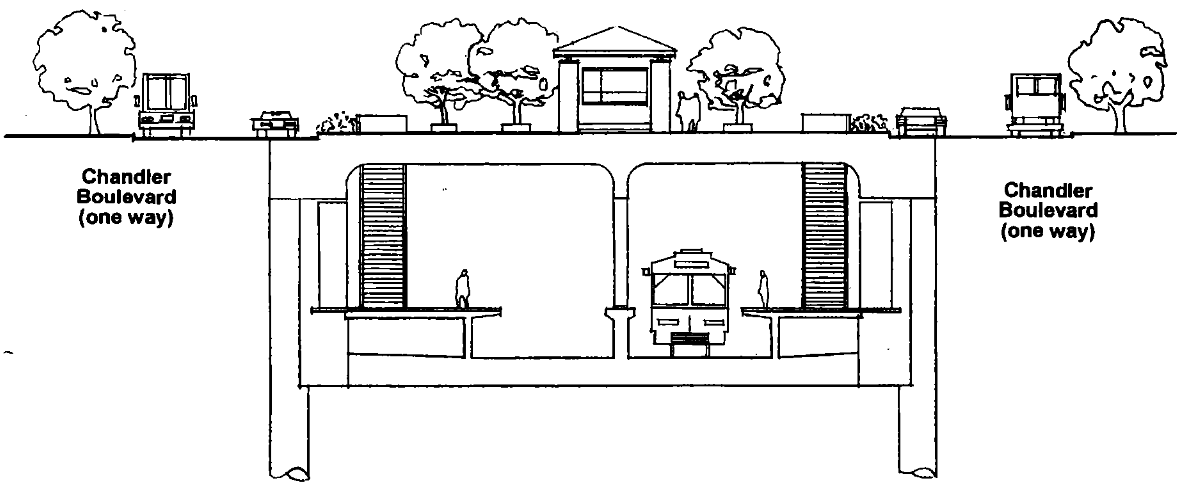
SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-17
Alternative 2



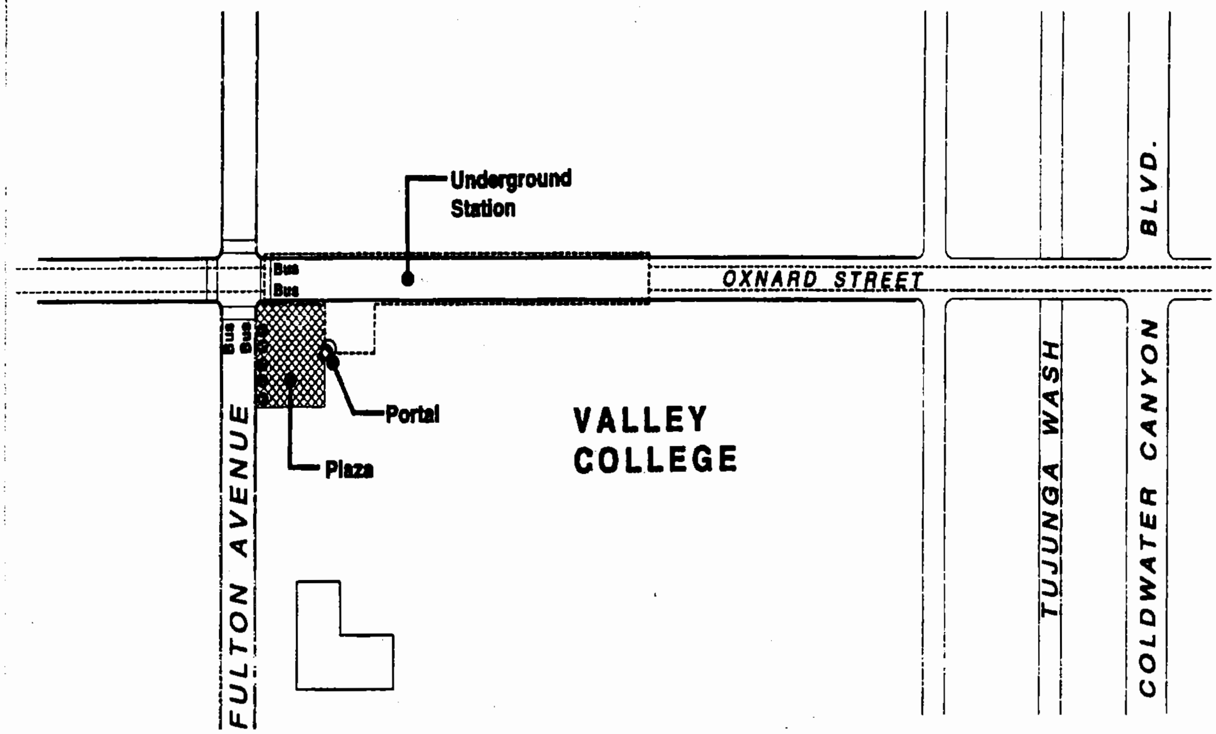
Laurel Canyon Boulevard/Oxnard Street Station

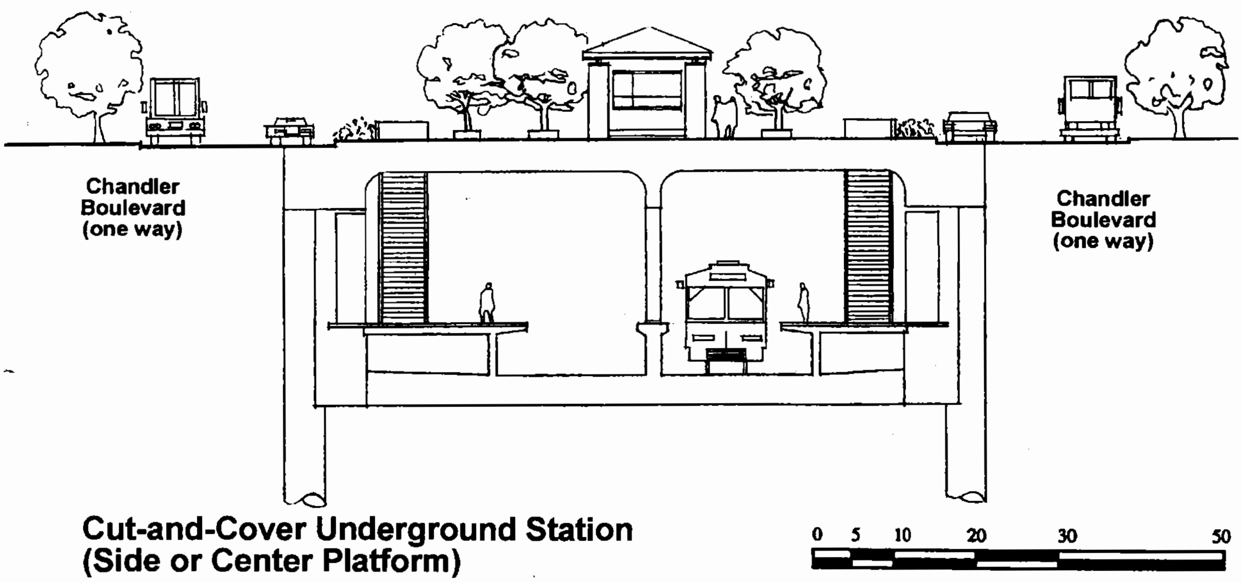


Cut-and-Cover Underground Station (Side or Center Platform)

0 5 10 20 30 50

SOURCE: GRUEN ASSOCIATES, 1996.





Cut-and-Cover Underground Station (Side or Center Platform)

SOURCE: GRUEN ASSOCIATES, 1996.

c. *Profile and Construction Methods*

The Oxnard Street alignment (Alternative 2) would be constructed with a deep-bore tunnel from the North Hollywood Station to approximately Hazeltine Avenue. At its deepest point the top of tunnel would be approximately 50 feet from existing ground (at the turn from Lankershim Boulevard). At its shallowest point, the tunnel would be 30 feet from grade (near Woodman Avenue). As the tunnel reaches grade at Hazeltine Avenue, the transition would be constructed via cut-and-cover, then retained-cut construction methods as the tracks "daylight" at Tyrone Avenue. Deep-bore construction methods would be used for this alternative.

The project west of Tyrone Avenue would have the same aerial profile as Alternative 1.

2-2.5 At-Grade LRT Extension via SP ROW (Alternative 6)

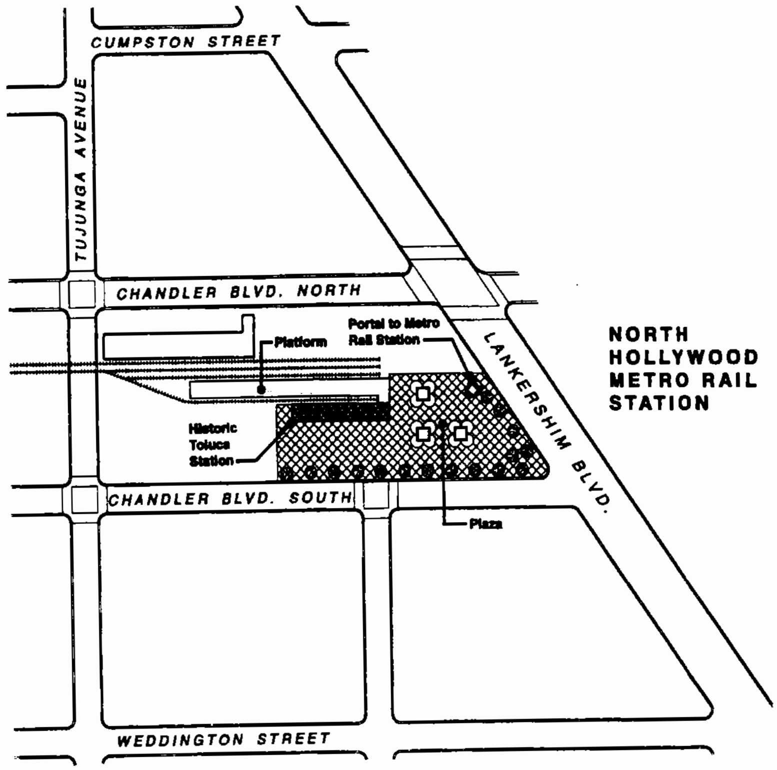
The LRT Alternative is discussed here as an East Valley alternative only. Continuation of the LRT into the West Valley, while appearing in this document only as a Cross Valley strategy, is, nonetheless, considered an essential part of this alternative in terms of cost-effectiveness. It should therefore be noted that a decision to select this alternative implies (a) the need to amend the 20-year plan to include the West Valley and (b) the need to prepare additional environmental documentation for the West Valley segment before the decision can be effected.

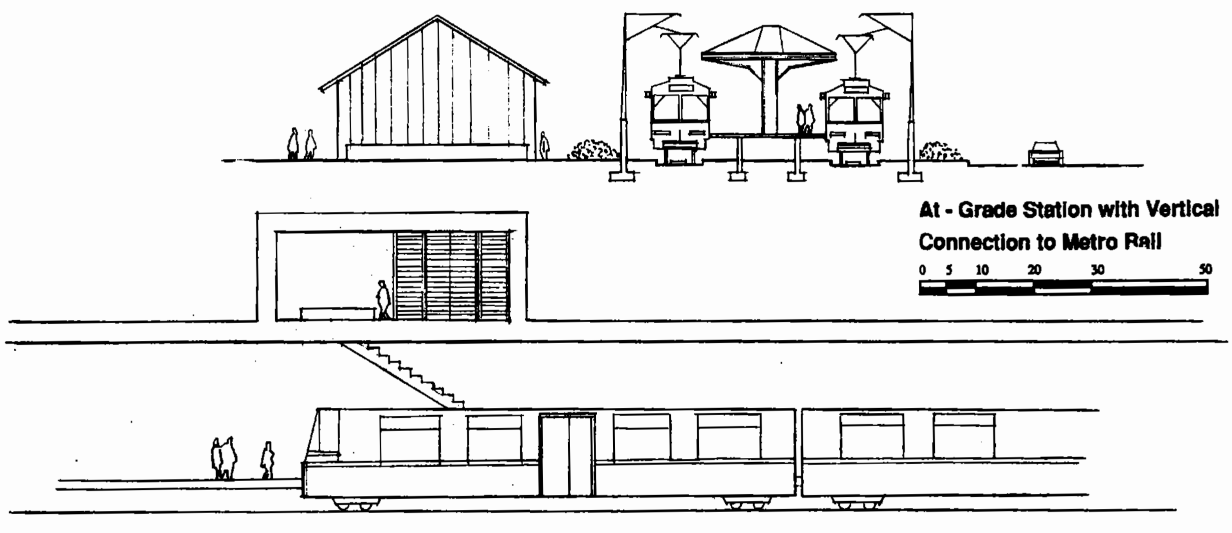
a. *Route Alignment*

The East Valley portion of Rail Alternative 6 would begin at the North Hollywood Red Line station and follow the SP ROW a distance of 6.6 miles to Woodley Avenue. The portion of the alternative extending from the North Hollywood station to east of Colfax Avenue is a portion of the SP ROW that is not used under any of the other alternatives. In this portion, the ROW lies in the median of Chandler Boulevard, and passes under the Hollywood Freeway. The route alignment west of Colfax Avenue is the same as Alternative 1 as described in Section 2-2.3. This alternative has two profile variations, as described in section c below.

b. *Station Locations and Conceptual Design*

This alternative would use the same station locations and layouts as discussed under Alternative 1 for the stations located at Sepulveda Boulevard and Van Nuys Boulevard. These stations, which would have platforms 180 feet in length and be in aerial configuration, are described under Alternative 1. The station located at Valley College would be an open-air station, as described for Alternative 1c. A station at Laurel Canyon Boulevard is described below for each variation. The station located at North Hollywood would be an at-grade station with a vertical connection to the Red Line station below, as shown on Figure 2-20.





SOURCE: GRUEN ASSOCIATES, 1996.

FIGURE 2-20
North Hollywood Station

c. Profiles and Construction Methods

Two variations are under consideration in this alternative.

(1) Variation 6a: At-Grade with Open-Air Segment

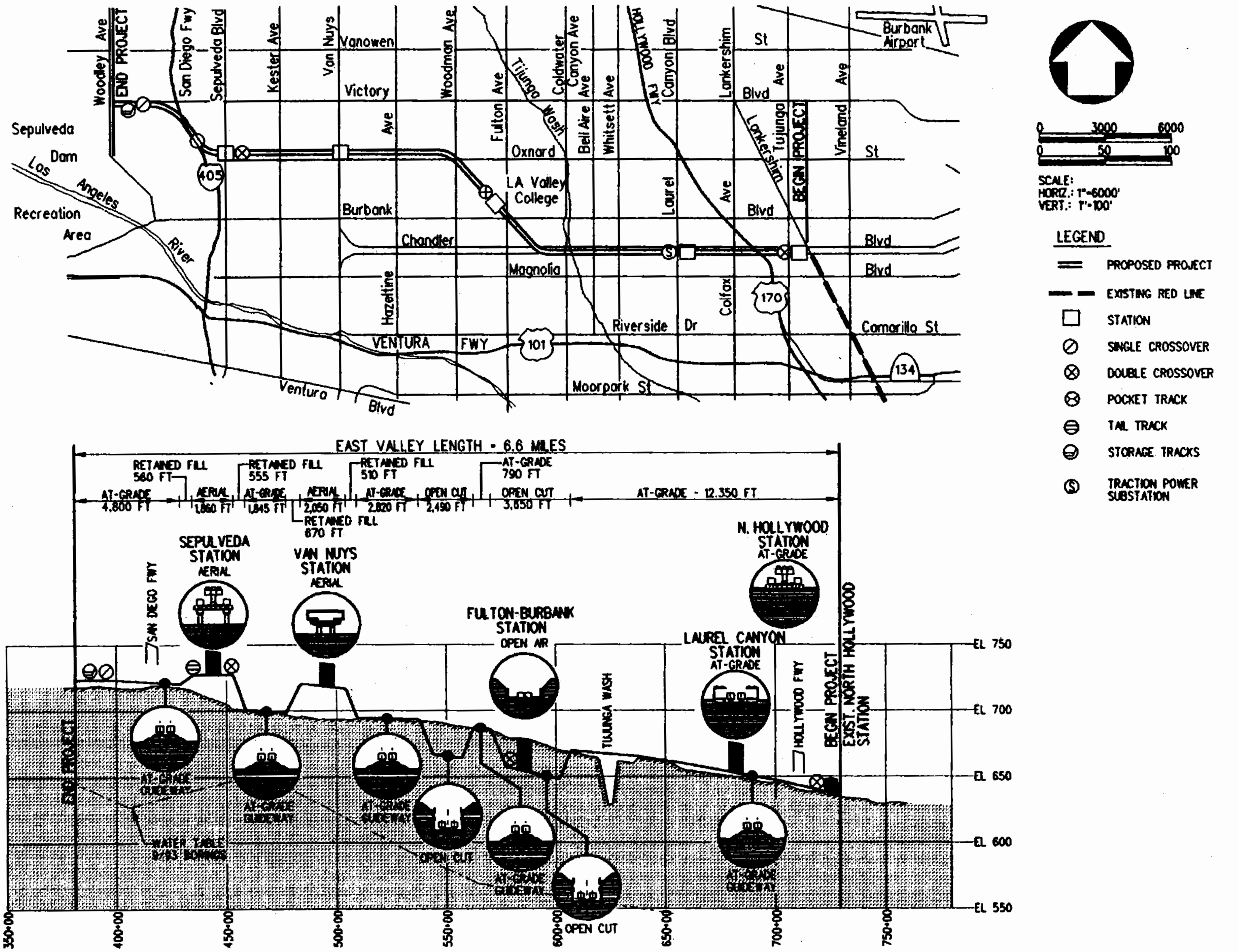
Variation 6a would construct the LRT alternative as generally at-grade, but periodically interrupted by sections in a slightly depressed cut accompanied by berms on either side. From the North Hollywood station westward to Ethel Avenue, the profile would be principally at-grade, except for three short sections, each of which would be slightly depressed (approximately 6 feet below grade) within a bermed section that would function both to separate the LRT visually and act as a sound barrier. Tujunga and Ethel Avenues would be crossed at-grade, and the guideway would also pass beneath the elevated Hollywood Freeway at-grade. In addition, LRT trains would have the ability to preempt traffic signalization at all at-grade crossings. These bermed sections would occur for lengths of approximately 1,600 feet (between Colfax and Gentry Avenues), 1,700 feet (between Vantage and Whitsett Avenues), and 1,800 feet (between Babcock and Goodland Avenues). An at-grade station would be located in this section at Laurel Canyon Boulevard.

At Ethel Avenue, the profile would begin a descent to a retained open-cut profile, depressed below grade approximately 27 feet. Fulton Street and Burbank Boulevard would pass over the open-air guideway on new bridge structures. After passing the Fulton/Burbank intersection and the Valley College station (open-air), the profile would transition to another bermed section (6 feet to top-of-berm) for a length of approximately 800 feet, where it would transition back to the deeper profile, remaining as such until past Woodman Avenue. Oxnard Street and Woodman Avenue would pass over the open-air guideway on new bridge structures. Past Woodman Avenue, the guideway would again transition to another bermed section, which would occur for a length of approximately 1,400 feet, until Hazeltine Avenue.

At Hazeltine Avenue, the guideway would rise for a short distance in order to cross Hazeltine at grade, and then descend again after Hazeltine, finally rising before Tyrone Avenue, to assume an aerial profile at the Van Nuys Station (at a height of approximately 20 feet to the bottom of the support structure). The profile would remain aerial past Vesper Avenue. Both Van Nuys Boulevard and Vesper Avenue would cross beneath the guideway at grade. The alignment would transition again to at grade past Van Nuys, crossing Kester Avenue at grade, and rising to aerial again after Kester Avenue, reaching the Sepulveda Station in aerial profile. Sepulveda Boulevard would cross beneath the guideway. After leaving the Sepulveda Station, the guideway would again transition to grade and remain as such until the end of the line at Woodley Avenue. Figure 2-21 illustrates Alternative 6a.

(2) Variation 6b: At-Grade with Open-Air/Cut-and-Cover Segment

Variation 6b would begin at an at-grade station at North Hollywood and proceed westward a short distance past Tujunga Avenue, where it would begin a descent to a cut-and-cover tunnel section, passing beneath the Hollywood Freeway at a depth of 40 feet below grade. The guideway would continue in cut-and-cover tunnel at a typical depth of 20 feet below grade,



SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

FIGURE 2-21
Alternative 6a

passing beneath Colfax Avenue, which would be rebuilt. Shortly before reaching Laurel Canyon Boulevard, an open-air station would be built, similar to that described under Alternative 1b. Laurel Canyon Boulevard would similarly be rebuilt to pass over the guideway.

The guideway would continue westward in a cut-and-cover tunnel section, passing beneath Corteen and Whitsett Avenues, both of which would pass over the guideway on new bridge structures. At approximately Bellaire Avenue, the guideway would begin a further descent to a depth of 50 feet below grade in order to pass beneath the Tujunga Wash, rising to meet its typical depth again at a point between Leghorne and Ethel Avenues. The guideway would enter the Valley College station (open-air) at Fulton Avenue and Burbank Boulevard and after leaving the station, the guideway would begin a rising transition to a bermed section at approximately Hatteras Street, after which it would assume the profile of Variation 6a for the remainder of its length, terminating at Woodley Avenue. Figure 2-22 illustrates Alternative 6b.

2-2.6 Dual Mode Red Line Extension via SP ROW (Alternative 11)

a. Route Alignment

The project would connect to the existing North Hollywood Red Line Station and proceed westerly along the same alignment as Alternative 1. For profiles and construction methods, see Section c below.

b. Station Locations and Conceptual Design

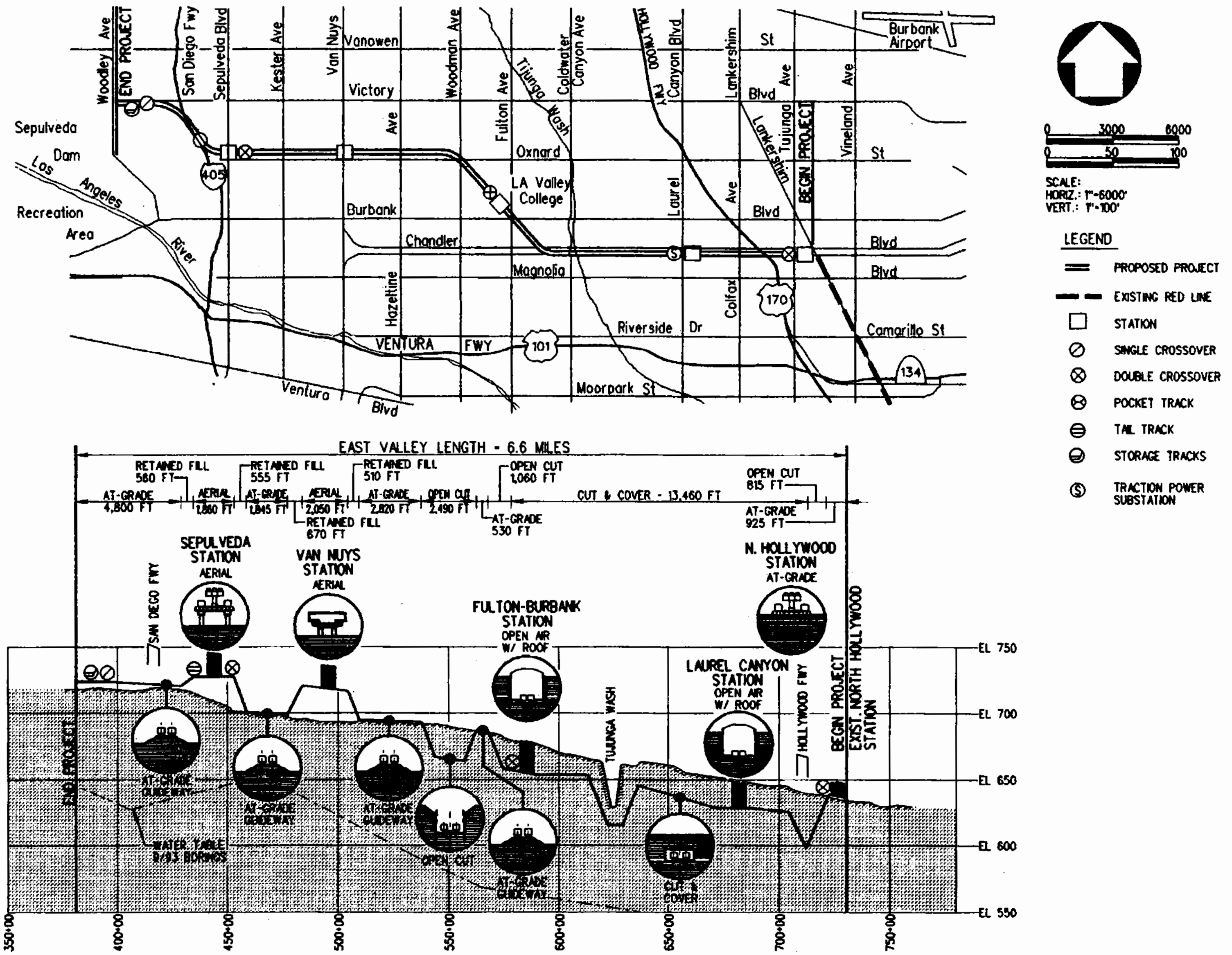
Stations would be located at Laurel Canyon and Chandler Boulevards (open-air station with 110 parking spaces), Valley College (Fulton/Burbank; open-air station with 83 parking spaces), Van Nuys Boulevard (aerial station with 1,250 parking spaces), and Sepulveda Boulevard (aerial station with 1,800 parking spaces). Descriptions and illustrations of these stations are provided in Section 2-2.3 b.

c. Profile and Construction Methods

Two variations have been developed for this alternative, described as follows:

(1) Variation 11a: Deep Bore Subway

This variation would construct a subway tunnel using deep bore technology from the North Hollywood Red Line station westward to the Laurel Canyon station, where the guideway would emerge to an open-air station at that location. From the Laurel Canyon station, the guideway would proceed westerly in an at-grade configuration, crossing over the Tujunga Wash and entering an open-cut configuration that would come to grade shortly after the Valley College station. It would again enter an open-cut configuration until reaching the Van Nuys Boulevard station, which would be aerial. After the Van Nuys station, the guideway would again come down to grade and proceed at-grade until reaching the Sepulveda Boulevard station, which would be aerial. The guideway again would proceed at-grade after the Sepulveda station until reaching the end of the line at Woodley Avenue. Variation 11a is illustrated on Figure 2-23.



SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

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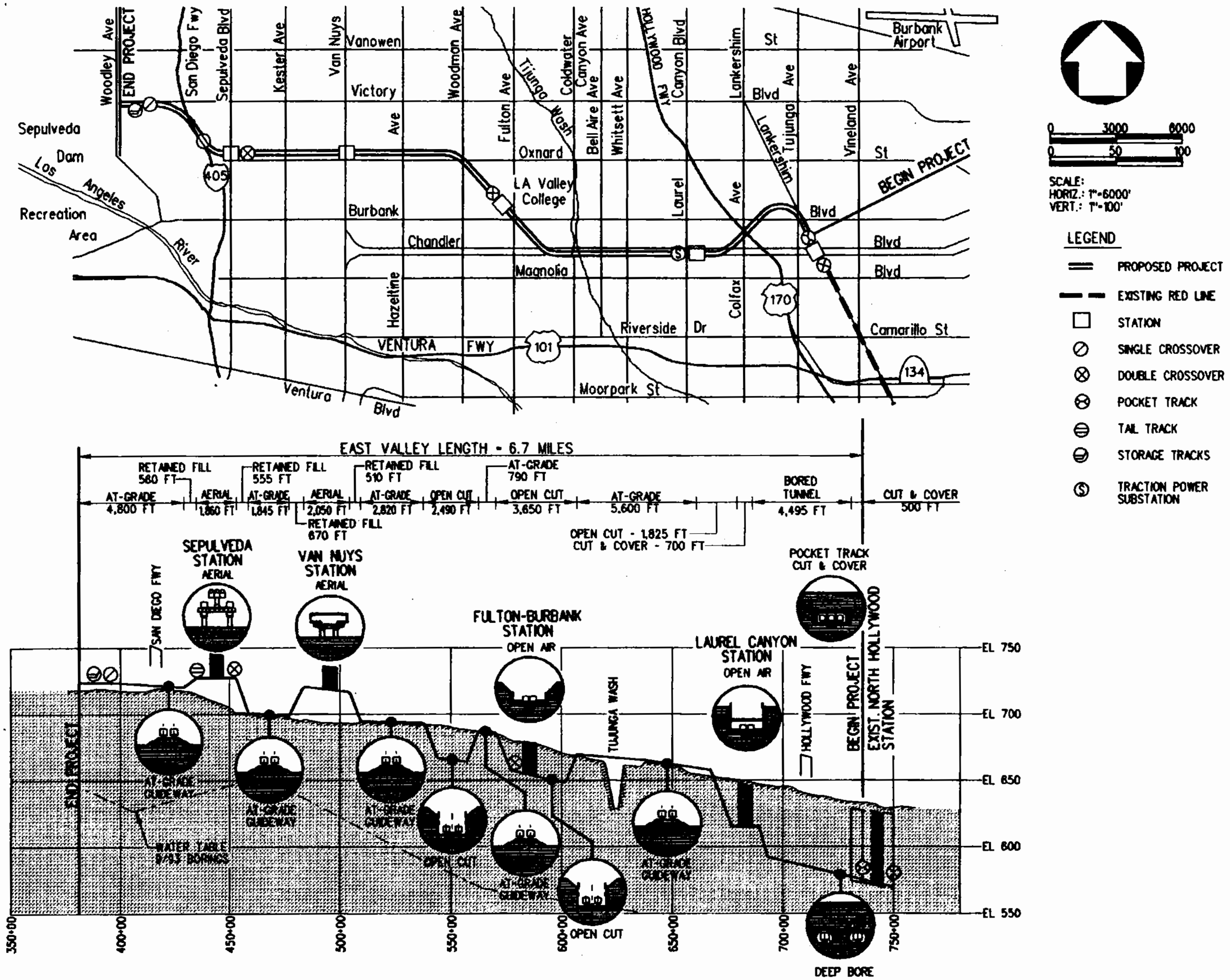
FIGURE 2-22
Alternative 6b



SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-23
Alternative 11a

(2) Variation 11b: Cut-and-Cover Subway

This variation would construct a subway using deep-bore techniques from the North Hollywood Red Line station until the vicinity of the Laurel Canyon station, at which point cut-and-cover construction techniques would be used to construct the project to the Valley College station. From the Valley College station westward, this variation would be the same as Variation 11a. Variation 11b is illustrated on Figure 2-24.

2-2.7 Operating Characteristics of Rail Alternatives

a. *Heavy Rail Red Line Extension*

The current Red Line vehicles are approximately 75 feet long and 10.5 feet wide. They operate in married pairs, with trains from two to six cars long. Electrical power is drawn from a third rail just above ground level, which requires a fully protected right-of-way. Top speed is 70 miles per hour (mph). Average speeds, including station stops, are in the 30 to 35 mph range, depending on station spacing and speed restrictions due to curves. The seating capacity is 59 persons. Total scheduled capacity is defined by MTA as a function of headway; with shorter headways, more standees are allowed, up to 159 persons per car. Thus, a typical 6-car Red Line train has a capacity of 954 transit riders. The current Red Line vehicle is illustrated on Figure 2-25.

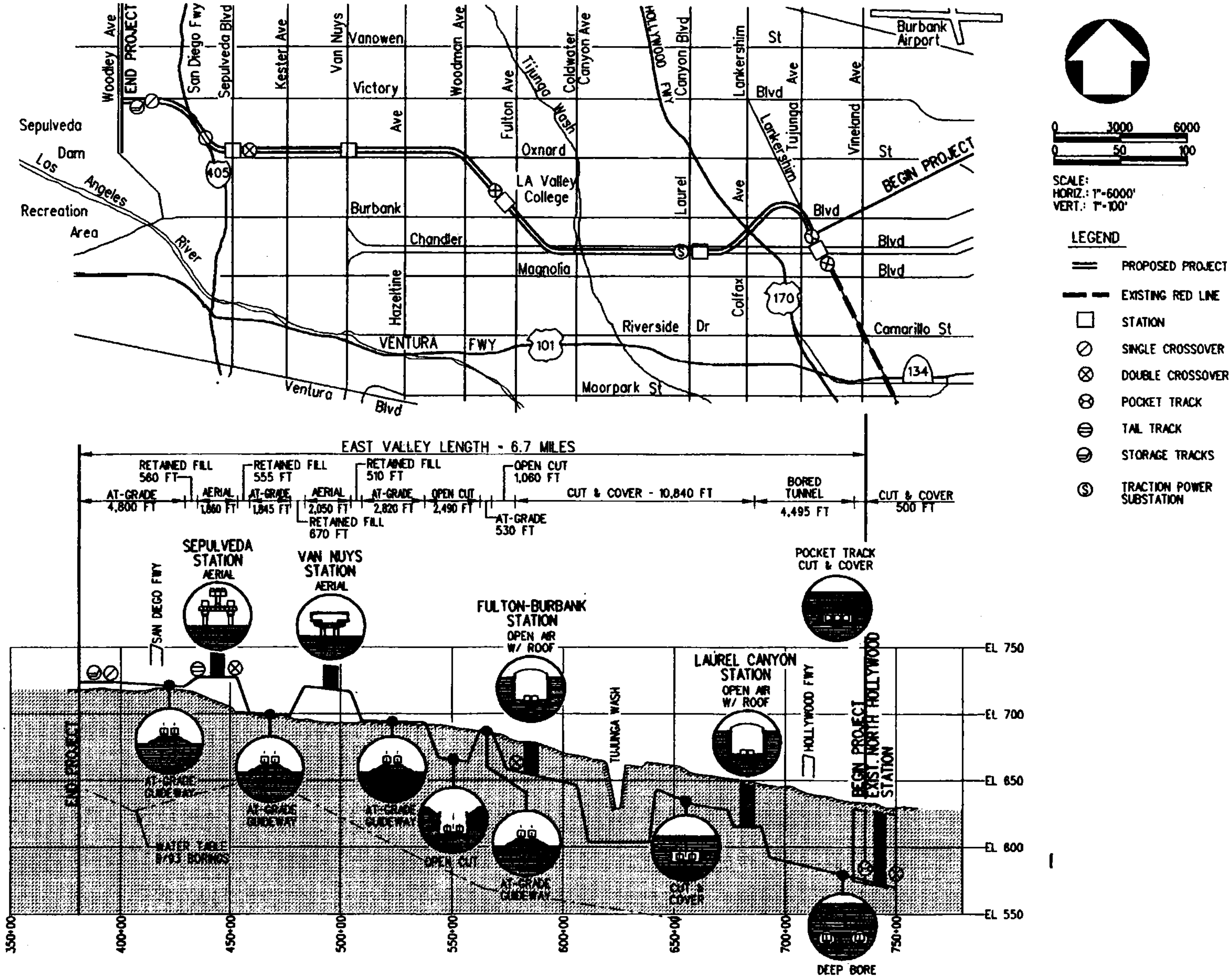
The standard Red Line vehicle would be used for Alternatives 1 and 2.

b. *Dual Mode Vehicles*

Dual mode vehicles could be used to extend service into the West Valley and would use modified Red Line vehicles. The vehicle dimensions and performance characteristics would be the same as for the existing Red Line vehicle. The electrical power system would be modified to allow the use of overhead catenary as well as third rail power, thus allowing at-grade operation in non-exclusive right-of-way. It is assumed that the dual mode vehicles would have priority at all at-grade street crossings. The proposed operating pattern calls for dual mode vehicles to operate across the Valley and then onto the existing Red Line through Hollywood, continuing to Union Station or East Los Angeles. This means that some of the future Red Line vehicles, and possibly some that are currently being procured, would have to include equipment to allow catenary as well as third rail operation. As illustrated on Figure 2-25, the proposed dual-mode vehicle is virtually identical to the Metro Red Line vehicle, with the exception that an overhead catenary would be added to each vehicle. The overhead catenary is shown on the typical LRT vehicle.

c. *Light Rail*

The current Metro Blue Line light rail vehicles are approximately 90 feet long and 8.5 feet wide. They can operate as single cars or in trains up to four cars long, depending on the station platform length that is provided. Electrical power is drawn form an overhead catenary. Top speed of the existing Long Beach/Los Angeles cars is 55 mph. The new "L.A. Car" that is being



SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
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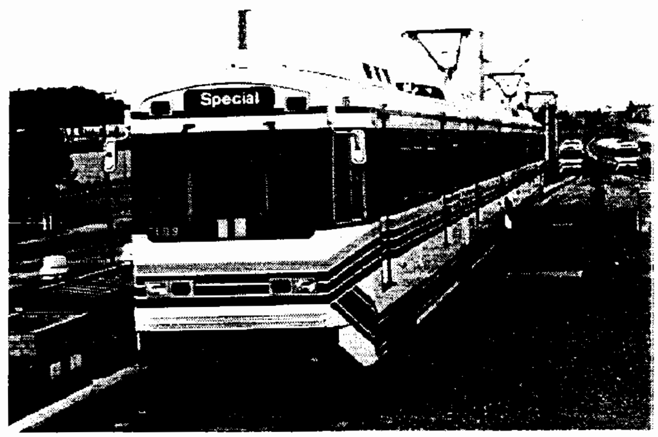
FIGURE 2-24
Alternative 11b

Conventional MTA Bus



Conventional LRT Vehicle
(Metro Blue Line & Metro Green Line)


Conventional Heavy Rail Vehicle
(Metro Red Line)

Note: Dual mode vehicle same as redline vehicle with addition of pantograph. (Overhead electrical power pickup in addition to conventional third rail power pickup)

SOURCE: GRUEN ASSOCIATES, 1997.

procured will have a top speed of 65 mph. Average speeds, including station stops, are in the 25 to 35 mph range, depending on station spacing and speed restrictions due to curves and/or traffic signals. The seating capacity of the L.A. Car is 72 persons. Total scheduled capacity is defined by MTA as a function of headway; with shorter headways, more standees are allowed, up to 144 persons per car. Thus, a typical four-car LRT train has a capacity of 576 transit riders. The current Blue Line light rail vehicle is illustrated on Figure 2-25.

The standard light rail vehicle would be used for Alternative 6.

d. Operating Schedule

For all of the rail alternatives, service is typically provided from approximately 5 a.m. to 1 a.m. on weekdays, with slightly shorter hours on weekends.

Headways for the Red Line and Dual Mode Alternatives in the East Valley would match those proposed for the Hollywood Branch; i.e., all trains through Hollywood would continue to I-405. This would provide a maximum of 4-minute peak headways, and 8- to 10-minute offpeak headways in the East Valley.

The Light Rail Alternative would operate independently of the Red Line. Maximum headways would be 5 minutes during peak periods and 10 minutes offpeak.

e. Feeder Bus Operations

The proposed bus/rail interface for the East-West Transportation Corridor includes the provision of feeder bus access to all rail stations and enhanced bus service in the West Valley, for all East Valley rail alternatives. Feeder bus operations would be concentrated at the Sepulveda Boulevard station at the western end of the project. Express bus service from the West Valley would terminate at the rail station for passenger transfer to rail for the remainder of the trip downtown.

f. Storage and Maintenance Facilities

The estimated fleet size for the Metro Red Line in the year 2015 with terminals at North Hollywood, 1st/Lorena, and Pico San Vicente is approximately 160 vehicles. In that scenario, the SFV extension to I-405 would increase the fleet size to about 212 cars. Since the existing Red Line yard/shop has a maximum capacity of 190 cars, the additional 22 cars could be stored on tail tracks at the three terminal stations. Therefore no new yard/shop would be required to accommodate the extension to I-405. However, additional yard and shop facilities would be required, somewhere on the Red Line system, when the Whittier/Atlantic and Westwood extensions are added.

The LRT Alternative (Alternative 6) would require a fleet of 48 light rail vehicles. A new storage and maintenance facility would be required along the San Fernando Valley line at a location in Canoga Park along Canoga Avenue between Van Owen Boulevard and Sherman Way. This land is presently owned by the MTA. Some major repairs and overhaul functions could be handled at the existing main shop at Del Amo on the Blue Line.

DESCRIPTION OF CROSS VALLEY STRATEGIES
The following strategies would provide service to the entire Valley and are described for evaluation at a programmatic level.

2-2.8 No Project

The No Project Alternative is the same as that described for the East Valley (see Section 2-2.1).

2-2.9 Enhanced Bus

The Enhanced Bus Alternative is the same as that described for the East Valley (see Section 2-2.2).

Red Line Extension with Supporting Bus Network
This alternative is the same as Alternatives 1 or 2 as described for the East Valley (see Sections 2-2.3 and 2-2.4).

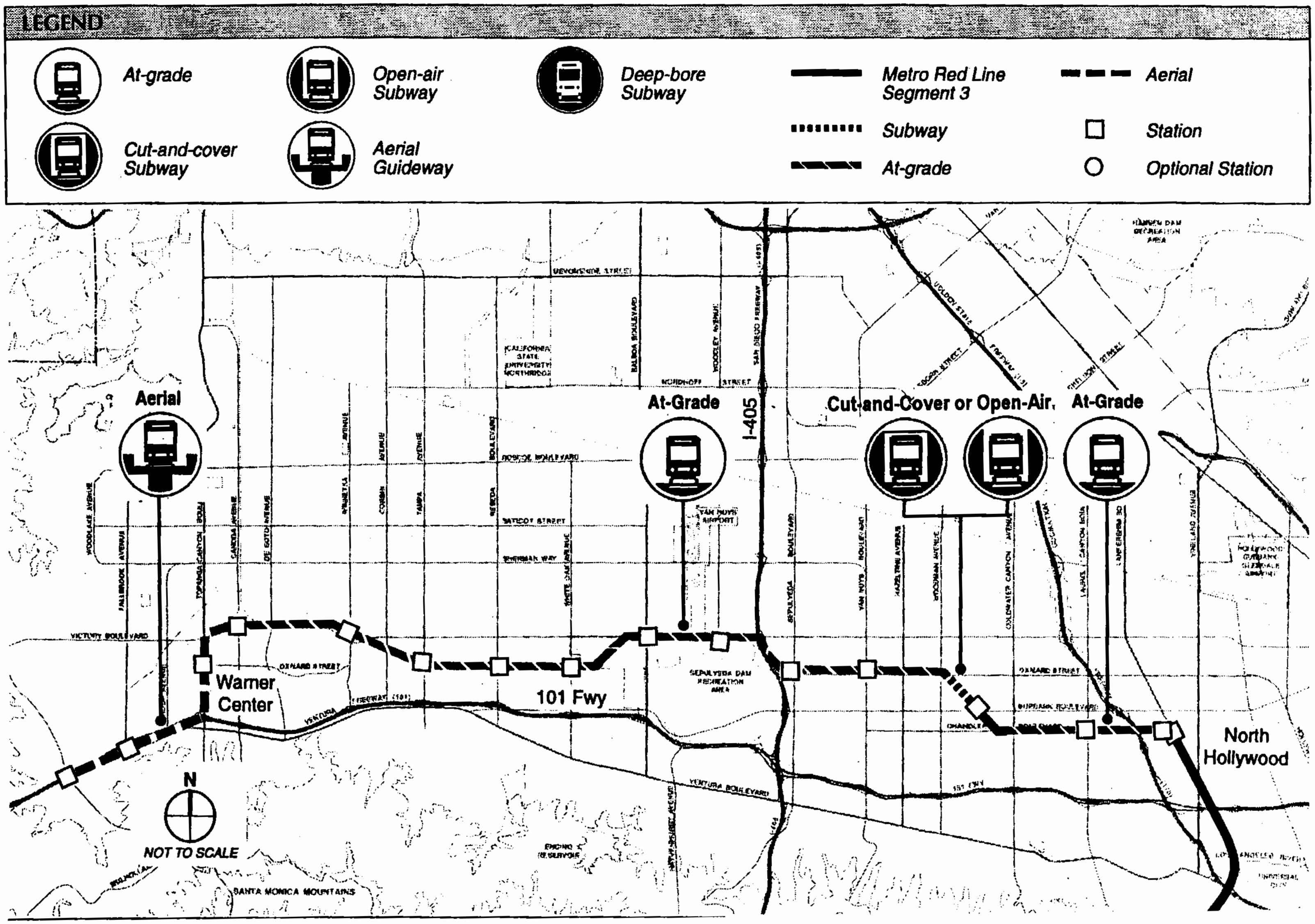
2-2.10 Dual Mode Red Line Operation

If the dual mode vehicle were to be selected for operation in the East Valley, its use could be extended to the West Valley as well. The alignment to be used would be the remainder of the SP Burbank Branch, extending westward from Woodley Avenue to Warner Center and potentially to Valley Circle Boulevard, in an above-ground profile. Grade separations would be constructed at major streets as determined necessary by traffic conditions. Potential station locations (at-grade) would include Woodley Avenue, Balboa Boulevard, White Oak Avenue, Reseda Boulevard, Tampa Avenue, Winnetka Avenue, Victory/Owensmouth, Topanga/Oxnard, Fallbrook at the Ventura Freeway, and at Valley Circle Boulevard and the Ventura Freeway. The portion of the alignment located between Woodley Avenue and De Soto Avenue would be located entirely within the existing SP ROW. Between De Soto Avenue and Valley Circle Boulevard, however, the alignment would be constructed on aerial guideway above public roadways.

2-2.11 Light Rail Alternative

Either Alternative 6a or 6b would be extended from I-405 into the West Valley at grade in the SP ROW, with aerial grade separations at major cross-streets as determined necessary by traffic conditions. Aerial stations would be located at Balboa Boulevard, Reseda Boulevard, Winnetka Avenue, Victory/Owensmouth, Topanga/Oxnard, and Valley Circle Boulevard. An optional aerial station could be built at Fallbrook Avenue. Optional at-grade stations could be sited at Woodley, White Oak, and Tampa Avenues. This Cross Valley Alternative is illustrated on Figure 2-26.

RELATED PROJECTS
A variety of urban development projects currently are being contemplated or implemented within



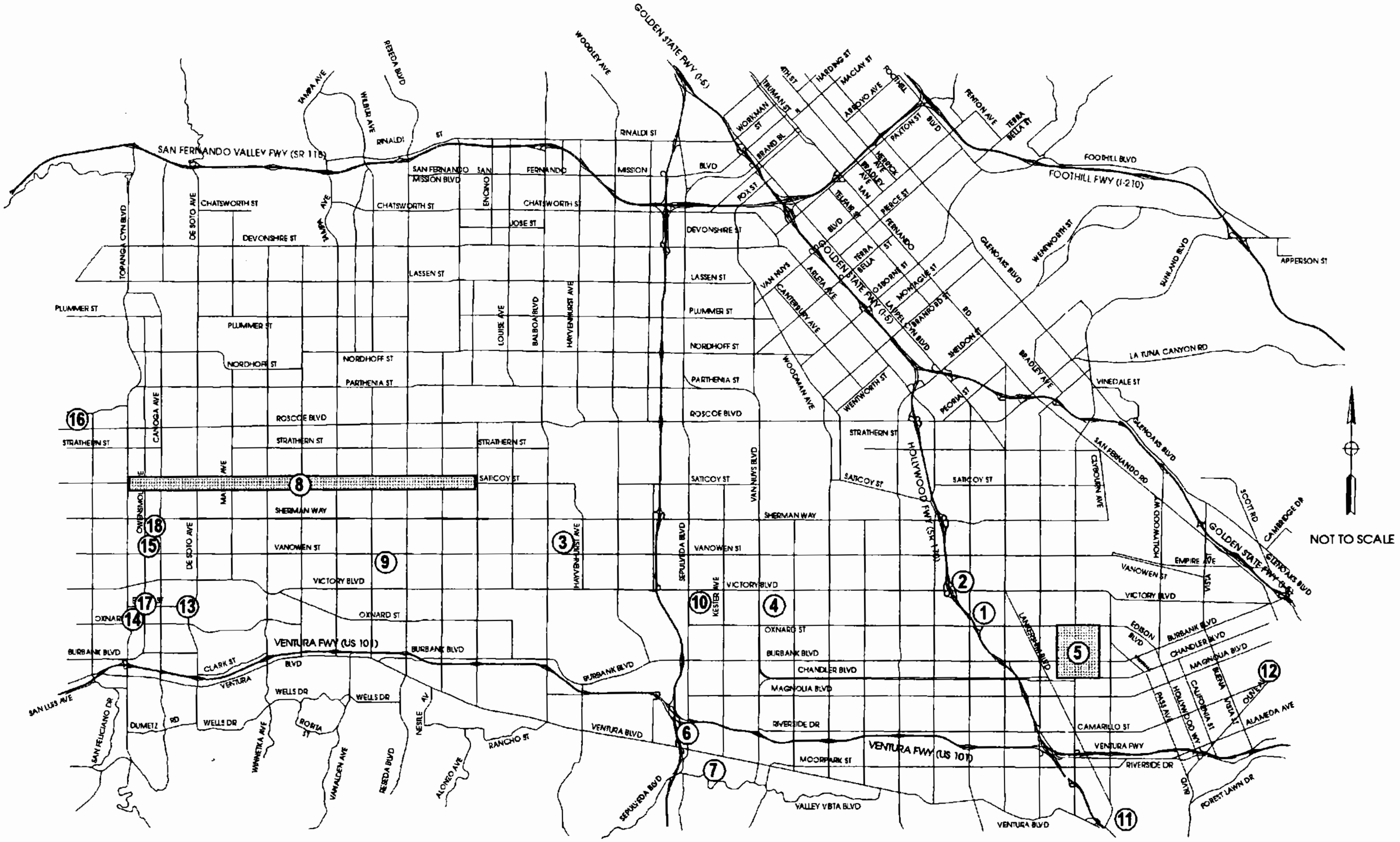
SOURCE: DELEUW, CATHER, AND ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-26
Cross-Valley Rail Alternatives
(Alternatives 6, 12)

the vicinity of the San Fernando Valley East-West Transportation Corridor. Local projects under construction and located near or adjacent to the corridor are listed in Table 2-4. Figure 2-27 shows their locations.

Planned and funded transportation projects, as assumed in the No Project scenario, are listed in Appendix I.



SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1996.

METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 2-27
Local Related Projects

Table 2-4: Local Related Projects

No.	Project	Location	Description/ Remarks
1	Laurel Plaza	NE corner of Laurel Canyon Bl & Oxnard St	Mall expansion; currently on hold.
2	Valley Plaza	NW corner of Laurel Canyon Bl & Victory Bl	Mall expansion; currently on hold.
3	Van Nuys Airport Master Plan	North of Vanowen St near Havenhurst Av	Light industrial,office, and retail uses (16 movie theaters) for former General Motors site; plans not yet concrete; seeking federal $; on hold for 2-3 years.
4	Revitalization of Van Nuys Government Center	Van Nuys Bl south of Victory Bl	Design concepts only developed thus far.
5	North Hollywood Redevelopment Project	Retail/office development centered around Burbank Bl/Magnolia Bl between Cahuenga Av and Tujunga Av; residential scattered through North Hollywood	1.3 million sq ft of office; 200,000 sq ft of retail; 218 hotel rooms; 500 housing units; rehabilitation of 25 commercial buildings and 340 housing units.
6	Sherman Oaks Galleria	Ventura Bl & Sepulveda Bl	Change from office to retail use—45,000 sq ft.
7	Deervale	Deervale Av; south of Ventura Bl between 1-405 and Beverly Glen Bl	Subdivision of 80 acres into 24 estate lots and open space; currently in planning stage.
8	Facade improvement	Sherman Wy between White Oak Av and Topanga Canyon Bl	Cosmetic improvements to decaying commercial buildings.
9	Ralph's Supermarket	Van Owen St east of Reseda Bl	New supermarket.
10	Price Club/Costco	Sepulveda Bl near Oxnard St	Add 20,000 sq ft to existing store; add gas pump; add 24,000 sq ft of freestanding retail.
11	Universal City Project	NE of Lankershim Bl and US-101	New development to the year 2020: 1,169K office; 450K studio; 1,138K entertainment; 358K retail; 2,737K hotel.
12	Media District Specific Plan	City of Burbank	9,767,000 future studio & other development (1,917,000 sq ft is Warner Bros)
13	Warner Ridge	De Soto Av south of Victory Bl	690K sq ft of commercial; 125 housing units. Approved in 1992, but in litigation at present.
14	Retail Complex	Victory Bl & Topanga Canyon Bl	18 movie theaters and retail—project abandoned for now due to another developer building movie theaters nearby; in planning stage.
15	11 story office building	Owensmouth Av in Warner Center	280K sq ft office tower; planning stage completed.
16	Hughes Missile Site Redevelopment	Fallbrook Av & Roscoe Bl	Bank corporate headquarters; computer/business college; office park; 911 dispatch center for SFV; in planning stage.
17	Home Depot	Warner Center-site not decided	100K sq ft store; in planing stage.
18	Madrid Theater	Sherman Wy near Owensmouth Av	500 seat performing arts center. To be completed early 1998

Sources: *North Hollywood Redevelopment Plan Amendment DEIR*, November 1993; *Universal City DEIR*, October 1996; Ileana Liel, Senior Planner, CRA; Leslie Lambert, Planner, CRA; Ron Mabin, Department of City Planning; Tom Henry, Planning Deputy, Councilman Joel Wachs' Office; Simon Pastucha, Planning Deputy, Councilman Mike Feuer's Office; Ken Bernstein, Planning Deputy Councilwoman Laura Chick's Office.

CHAPTER 3

TRANSPORTATION SETTING IMPACTS AND MITIGATION

CHAPTER 3: TRANSPORTATION SETTING, IMPACTS, AND MITIGATION

Existing travel conditions in the corridor area were described in Chapter 1 of this document. Data and discussion were provided on types and patterns of trips, origin/destinations and modes of travel including highways and transit. Expected effects of projected growth in travel demand were also discussed in Section 1-1.4. This Chapter discusses the expected impacts of the east-west corridor project alternatives on the future transportation system and traffic conditions. General as well as local impacts on the transportation system are presented. General impacts include effects of the project on system-wide (County and Valley) transportation performance indicators and on the Valley's predominant travel corridors; whereas, local impacts deal with specific traffic access, circulation, intersection and parking impacts at the proposed stations.

3-1 BENEFICIAL EFFECTS OF THE PROJECT ON THE TRANSPORTATION SYSTEM

The impacts of the east-west corridor project on the overall operating conditions of the transportation system can be measured by comparing several key travel statistics and system operating parameters for each of the alternatives against those of the No Project Alternative. Travel statistics and performance indicators for each alternative can also be compared with other alternatives to identify relative traffic impacts, or effectiveness of each in improving traffic operations. Transportation impacts of each east-west corridor transit alternative will be more pronounced at localized transit station areas in the Valley, but the beneficial effects of the transit alternatives will also improve travel conditions and patterns throughout the County, and even the entire southern California area.

3-1.1 Transit Impacts

Table 3-1.1 summarizes these key statistics and performance indicators on a Countywide basis and for RSA's 12 and 13, which comprise the Valley. The following sections discuss the findings from analyzing some of the most significant statistics.

Segment Boardings
The various corridor Red Line extension alternatives are projected to have daily boardings generally in the range of 52,000 to 59,000. Alternative 2, the Oxnard alignment will generate over 4,400 more (8.6 percent) boardings than Alternative 1, the SP alignment. When each of the two Alternatives 1 and 2 are supplemented by Enhanced Bus or TSM in the West Valley, the segment boardings increase by 2 and 5.4 percent, respectively.

Transit Trips and Transit Boardings
Operation of the east-west rail project results in an increase of total daily Countywide transit trips. The increase in transit trips (compared to the No Project) ranges from a low of 13,600

Table 3-1.1: East Valley Alternatives Comparison of Travel Statistics

	Alternative 10 No Project	Alternative 9 TSM/Enhanced Bus	Alternative 1 Red Line SP to I-405	Alternative 2 Red Line Oxnard to I-405	Alternative 1+TSM Red Line SP to I-405 +TSM W. Valley	Alternative 2+TSM Red Line Oxnard to I-405 +TSM W. Valley
Countywide Statistics						
Daily Person Trips	38,234,000	38,234,000	38,234,000	38,234,000	38,234,000	38,234,000
Daily Segment Boardings East-West Corridor	N. A.	N. A.	51,790	56,230	52,850	59,110
Daily Transit Trips	1,028,630	1,042,210	1,046,920	1,049,480	1,058,820	1,061,190
Change from No Project		13,580	18,290	20,850	30,190	32,560
% Change		1.32%	1.78%	2.03%	2.93%	3.17%
Daily Transit Boardings	1,749,850	1,779,000	1,779,880	1,788,300	1,812,300	1,819,250
Change from No Project		29,150	30,030	38,450	62,450	69,400
% Change		1.67%	1.72%	2.20%	3.57%	3.97%
Daily Bus Boardings	1,207,700	1,231,880	1,214,570	1,218,480	1,242,620	1,246,390
Change from No Project		24,180	6,870	10,780	34,920	38,690
% Change		2.00%	0.57%	0.89%	2.89%	3.20%
Daily Transit Mode Split	2.69%	2.73%	2.74%	2.74%	2.77%	2.78%
Daily Vehicle Trips	27,643,900	27,632,410	27,628,240	27,625,950	27,618,100	27,616,070
Change from No Project		-11,490	-15,660	-17,950	-25,800	-27,830
% Change		-0.04%	-0.06%	-0.06%	-0.09%	-0.10%
Daily Auto VMT	228,567,960	228,408,110	228,235,980	228,138,190	227,561,870	221,330,000
% Change		-0.07%	-0.15%	-0.19%	-0.44%	-3.17%

Table 3-1.1: East Valley Alternatives Comparison of Travel Statistics

	Alternative 10 No Project	Alternative 9 TSM/Enhanced Bus	Alternative 1 Red Line SP to I-405	Alternative 2 Red Line Oxnard to I-405	Alternative 1+TSM Red Line SP to I-405 +TSM W. Valley	Alternative 2+TSM Red Line Oxnard to I-405 +TSM W. Valley
Daily Auto VHT	9,190,630	9,176,420	9,134,370	9,128,090	8,431,910	8,484,440
% Change		-0.15%	-0.61%	-0.68%	-8.26%	-7.68%
Avg. Veh. Speed	24.9	24.9	25.0	25.0	27.0	26.1
% Change		0.08%	0.47%	0.50%	8.52%	4.89%
Valley RSA's 12 and 13						
Daily Auto VMT	26,592,190	26,494,010	26,437,130	26,421,410	25,523,070	25,738,190
% Change		-0.37%	-0.58%	-0.64%	-4.02%	-3.21%
Daily Auto VHT	958,630	943,990	934,060	931,640	857,380	861,580
% Change		-1.53%	-2.56%	-2.82%	-10.56%	-10.12%
Avg. Veh. Speed	27.74	28.07	28.30	28.36	29.77	29.87
% Change		1.18%	2.03%	2.24%	7.31%	7.69%

Source: Meyer, Mohaddess Associates, 1997.

transit trips (1.3 percent increase) for the Valleywide TSM Alternative to a high of 32,600 (3.2 percent increase) for TSM-Enhanced Alternative 2. Alternatives 1 and 2 increase Countywide transit trips by 1.8 to 2 percent. It can be seen; however, that the addition of TSM in the West Valley to Alternatives 1 and 2 will result in an increase of 11,000 to 12,000 transit trips systemwide, or by more than another percent.

Unlike "transit trips," "transit boardings" also account for transfers between transit modes. The projected total Countywide transit boardings follow a similar trend to transit trips and result in a range of 1.7 (Valleywide TSM) to 4.0 (TSM-Enhanced Alternative 2) percent increase in transit boardings over the No Project Alternative.

Bus Boardings

The TSM-Enhanced Alternative 2 is expected to generate the highest number of Countywide bus boardings, with an increase of nearly 39,000 (3.2 percent increase) over the No Project. Whereas Alternatives 1, 2 and TSM all increased *transit* boardings similarly, the Valleywide TSM Alternative, with its substantially improved bus network, results in a much higher increase in *bus* boardings compared to Alternatives 1 and 2. However, when Alternatives 1 and 2 are supplemented by TSM in the west Valley, they result in an increase of bus boardings over the Valleywide TSM Alternative.

Transit Mode Shares

As seen in Table 3-1.1, by 2015, the share of daily transit trips, is expected to be 1.029 million, or 2.69 percent out of a total of 38.2 million daily trips made by all modes of travel. Countywide transit mode shares are expected to increase by 0.04-0.09 points to 2.73-2.78 percent for the various transit alternatives compared to the No Project Alternative. The Valleywide TSM Alternative has the lowest transit mode split (2.73 percent), Alternatives 1 and 2 are very close seconds (2.74 percent). When west Valley TSM is added to Alternatives 1 and 2, the resulting Countywide transit mode splits increase to 2.77 and 2.78 percent, respectively.

3-1.2 Impacts on Highway Travel

a. *Countywide Impacts*

Vehicle Trips

Table 3-1.1 shows the total number of daily vehicle trips on the system for each alternative. The actual number of reduced trips ranges from a low of 11,500 for the TSM Alternative to a high of 28,800 for the Oxnard alignment of the Red Line augmented by TSM in the West Valley. Vehicle trip reduction potential of all rail alternatives are higher than the Valleywide TSM Alternative. The figures show that supplementing the Red Line service with TSM in the West Valley can result in a reduction of an additional 10,000 to 11,000 trips from the system.

Vehicle miles of travel (VMT)

VMT is an indicator of the total magnitude of travel, both in terms of total amount and distance of all trips. A decrease in VMT indicates a decrease in total number and overall length of trips, which translate into lower emissions. All alternatives result in a decrease in VMT compared to the No Project. The decrease ranges from a low of 0.1 percent for TSM to a high of 3.2 percent for TSM-Enhanced Alternative 2.

Vehicle hours of travel (VHT)
VHT is an indicator of the duration of total daily travel and a measure of delay. A decrease in VHT indicates less time spent traveling, more efficient travel, and consequently less delay. Here again, all build alternatives show a decrease in VHT compared to the No Project. This decrease ranges from a low of 0.2 percent for TSM to a high of 8.3 for TSM-Enhanced Alternative 1.

Average Vehicle Speeds
The various transit alternatives result in increases in average travel speed countywide. This is a result of the previously mentioned decreases in vehicle trips and VMT. The TSM Alternative does not result in a significant increase in speeds, but all the rail alternatives increase the average speeds from a low of 0.5 percent (Alternative 1 and 2) to a high of 8.5 percent (TSM-Enhanced Alternative 1).

b. Valleywide Impacts

The above figures were all comparison of Countywide statistics. The bottom four rows in Table 3-1.1 summarize the more localized Valleywide impacts of the transit alternatives. As stated before, impacts of the alternatives are more pronounced in the Valley compared to the County. It can be seen that here also, all build alternatives perform better than the No Project Alternative, both in terms of VMT and VHT. VMT will decrease by 0.4 percent for the Valleywide TSM Alternative, and 0.6 percent for both Alternatives 1 and 2. However, with the addition of TSM in the west Valley VMT is expected to significantly decrease by 3.2 to 4.0 percent.

VHT statistics follow the same trend as VMT, with relatively small decreases (1.5 to 2.8 percent) for the TSM Alternative, and Alternatives 1 and 2, but much higher reductions (in the range of 9 to 10 percent) for other alternatives. Average travel speeds in the Valley are expected to increase as a result of the project alternatives. This increase ranges form a low of 1.2 percent for the TSM Alternative to a high as 7.7 percent for TSM-Enhanced Alternative 2. Again, supplementing Alternatives 1 and 2 with TSM in the West Valley, raises the increase in average travel speeds from the 2 to 2.2 percent range to 7.3 to 7.7 percent. In each case, addition of the west Valley TSM to Alternatives 1 and 2 will increase the average highway travel speeds by 1.5 miles per hour in the Valley.

3-2 BENEFICIAL EFFECTS ON SAN FERNANDO VALLEY TRAVEL CORRIDORS

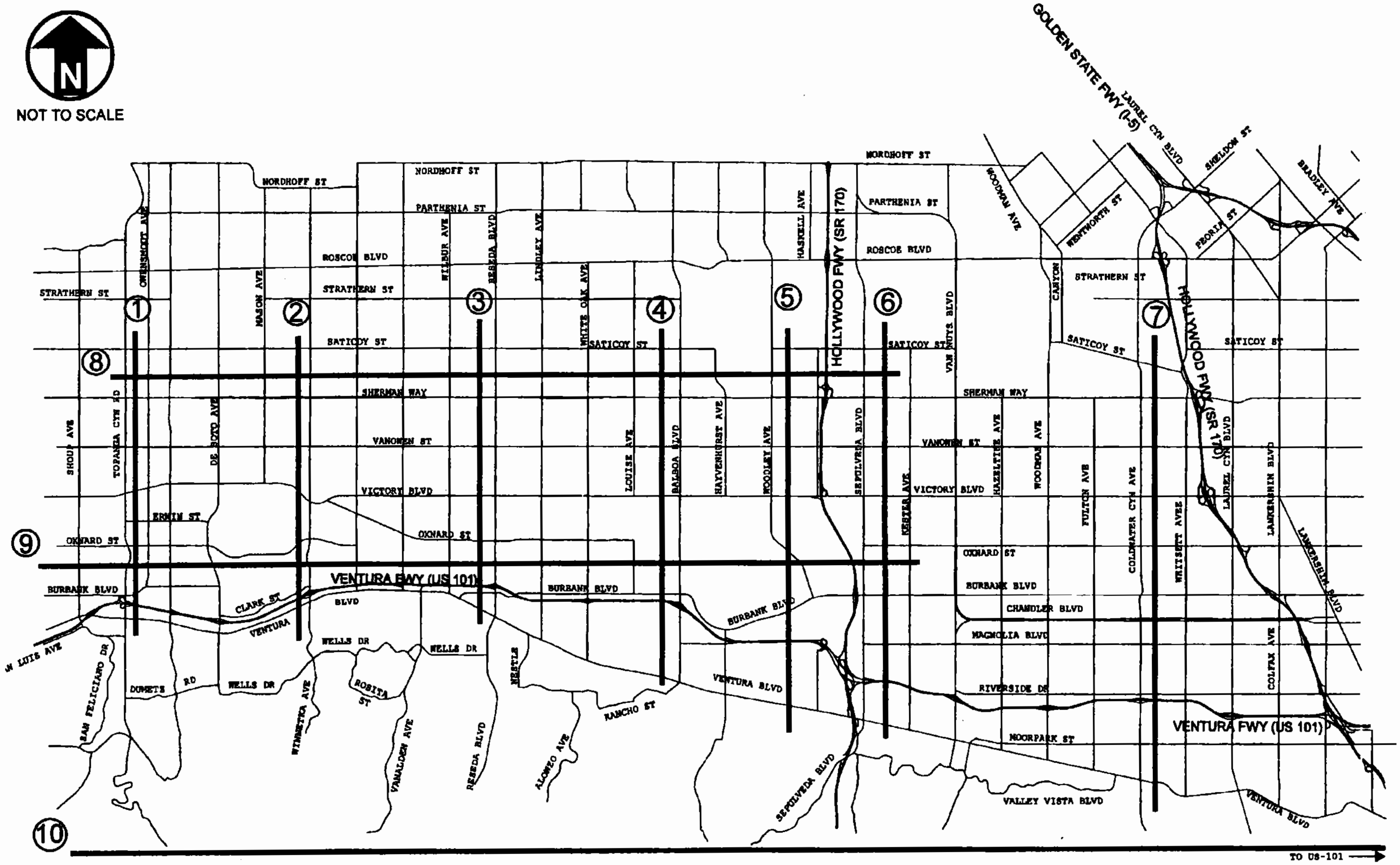
Ultimately, implementation of an east-west transit system through the Valley is expected to result in a reduction of vehicle trips and improvement of traffic operating conditions in various corridors within the Valley. The previous section showed how the transit improvements will affect the overall system performance indicators. In order to more directly quantify the amount and patterns of traffic impacts an extensive screenline analysis was conducted using a system of ten screenlines established across various travel corridors in the Valley. Screenlines are imaginary lines which are drawn across streets and freeways, and are used to track and record traffic volumes at the points where the screenline intersects the facility.

Figure 3-2.1 shows the location of these screenlines. There are seven north-south screenlines, which capture east-west traffic flow, located east of Topanga Canyon, west of Winnetka, west of Reseda, west of Balboa, east of Woodley, east of Sepulveda and east of Coldwater Canyon. In addition, there are three east-west screenlines that measure traffic movement in the north-south direction, including north of Sherman Way, north of Burbank, and south of Mulholland Drive.

The locations of these screenlines were chosen to capture the approximate boundaries of the immediate East-West Corridor. Because of the orientation of the Valley and the need for analyzing the impacts of the east-west project corridor at various locations in the Valley, more north-south screenlines (7) were analyzed than east-west (3).

Table 3-2.1 summarizes the results of the screenline analysis based on the 4-hour PM peak traffic forecasts produced by the MTA travel demand model. This table presents results of the screenline traffic summaries for the No Project, TSM/Enhanced Bus, Alternatives 1, 2, and TSM-Enhanced Alternatives 1 and 2. To assist with the analysis, summary results are also presented for each of the 10 screenlines as well as overall summaries for north-south, east-west screenlines and the grand total for all screenlines.

As can be seen from this table, similar to the results of the systemwide performance indicators presented in the previous section, the screenline analyses also point to the vehicle-trip reducing effects of the project corridor alternatives. The "overall" screenline totals indicate that the heavy rail Alternatives 1 and 2 would result in an approximately one percent overall reduction of trips from the arterial and freeway system, with Alternative 2 having a 0.2 percent higher trip-reduction effect. This is consistent with the higher patronage projected for Alternative 2. This one percent overall reduction is also consistent with the reduction in vehicle miles of travel (0.6) experienced under both alternatives, as discussed in the previous section. As with the systemwide performance indicators, the trip reduction impacts of the East Valley (Red Line to Sepulveda) Alternatives (1 and 2) are noticeably different when augmented with TSM in the West Valley. The West Valley TSM enhancement results in more than an eight-fold reduction in overall trips. Alternatives 1 and 2 with TSM in the West Valley show 8.5 and 8.7 percent reduction in overall trips, respectively, compared to the approximately one percent for Alternatives 1 and 2. The Valleywide TSM Alternative (Alternative 9), with an overall 7.7 percent traffic reduction, has a higher overall trip reduction effect than Alternatives 1 and 2, but not as high as rail plus West Valley TSM.



SOURCE: Meyer, Mohaddes Associates, Inc.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 3-2.1
Screenline Locations

Table 3-2.1: East Valley Alternatives
Projected Traffic Reduction at Screenline Locations (Year 2015)

	Alternative 10 No Project	Alternative 9 TSM/Enhanced Bus	Alternative 1 Red Line SP to I-405	Alternative 2 Red Line Oxnard to I-405	Alternative 1+TSM Red Line SP to I-405 +TSM W. Valley	Alternative 2+TSM Red Line Oxnard to I-405 +TSM W. Valley
(1) e/o Topanga Canyon	135,740	123,080	135,460	135,560	122,230	122,250
Change from No Project		-12,660	-280	-180	-13,510	-13,490
% Change		-9.33%	-0.21%	-0.13%	-9.95%	-9.94%
(2) w/o of Winnetka	130,190	117,970	129,180	129,060	116,890	116,890
Change from No Project		-12220	-1,010	-1,130	-13,300	-13,300
% Change		-9.39%	-0.78%	-0.87%	-10.22%	-10.22%
(3) w/o of Reseda	156,240	143,050	154,860	154,790	141,890	141,800
Change from No Project		-13,190	-1,380	-1,450	-14,350	-14,440
% Change		-8.44%	-0.88%	-0.93%	-9.18%	-9.24%
(4) w/o of Balboa	175,840	161,640	174,140	173,700	160,150	159,900
Change from No Project		-14,200	-1,700	-2,140	-15,690	-15,940
% Change		-8.08%	-0.97%	-1.22%	-8.92%	-9.07%
(5) e/o of Woodley	176,300	162,610	174,560	174,090	161,180	160,650
Change from No Project		-13,690	-1,740	-2,210	-15,120	-15,650
% Change		-7.77%	-0.99%	-1.25%	-8.58%	-8.88%
(6) e/o of Sepulveda	164,630	150,360	162,200	162,450	148,770	148,910
Change from No Project		-14,270	-2,430	-2,180	-15,860	-15,720
% Change		-8.67%	-1.48%	-1.32%	-9.63%	-9.55%
(7) e/o Coldwater Canyon	176,480	160,510	174,050	174,020	158,290	158,470
Change from No Project		-15,970	-2,430	-2,460	-18,190	-18,010
% Change		-9.05%	-1.38%	-1.39%	-10.31%	-10.21%
(8) n/o Sherman Way	194,540	182,700	193,890	193,190	180,900	180,830
Change from No Project		-11,840	-650	-1,350	-13,640	-13,710
% Change		-6.09%	-0.33%	-0.69%	-7.01%	-7.05%

Table 3-2.1: East Valley Alternatives
Projected Traffic Reduction at Screenline Locations (Year 2015)

	Alternative 10 No Project	Alternative 9 TSM/Enhanced Bus	Alternative 1 Red Line SP to I-405	Alternative 2 Red Line Oxnard to I-405	Alternative 1+TSM Red Line SP to I-405 +TSM W. Valley	Alternative 2+TSM Red Line Oxnard to I-405 +TSM W. Valley
(9) n/o Burbank	235,270	219,610	232,840	232,110	216,840	216,990
Change from No Project		-15,660	-2,430	-3,160	-18,430	-18,280
% Change		-6.66%	-1.03%	-1.34%	-7.83%	-7.77%
(10) s/o Mulholland	250,640	236,370	249,380	247,950	235,560	233,380
Change from No Project		-14,270	-1,260	-2,690	-15,080	-17,260
% Change		-5.69%	-0.50%	-1.07%	-6.02%	-6.89%
N/S SL's (E/W Traffic)	1,115,430	1,019,220	1,104,460	1,103,670	1,009,400	1,008,870
Change from No Project		-96,210	-10,970	-11,760	-106,030	-106,560
% Change		-8.63%	-0.98%	-1.05%	-9.51%	-9.55%
E/W SL's (N/S Traffic)	680,450	638,680	676,110	673,250	633,300	631,200
Change from No Project		-41,770	-4,340	-7,200	-47,150	-49,250
% Change		-6.14%	-0.64%	-1.06%	-6.93%	-7.24%
Grand Total	1,795,870	1,657,900	1,780,570	1,776,920	1,642,700	1,640,070
All Screenlines		-137,970	-15,300	-18,950	-153,170	-155,800
		-7.68%	-0.85%	-1.06%	-8.53%	-8.68%

Source: Meyer, Mohaddes Associates, 1997.

The north-south screenlines provide information on the geographic variations of the impacts to the east-west traffic throughout the Valley. For Alternatives 1 and 2 the east-west traffic reduction begins with about 0.1 to 0.2 percent reduction at the west end of the Valley (near Topanga Canyon), increases to about one percent near the center (at Balboa and Woodley), and tops at about 1.5 percent in the East Valley (east of the 405 Freeway). The east-west trip reduction effects of the Red Line plus the TSM alternatives do not have the same progressive pattern through the Valley as Alternatives 1 and 2. The percentages of traffic reduction across screenlines for these alternatives are more consistently in the range of 9 to 10 percent regardless of the location in the West or East Valley. The largest reduction of east-west traffic for all alternatives occurs typically across Screenline #7, east of Coldwater Canyon Avenue, which stretches from Saticoy Street to Ventura Boulevard. Alternatives 1 and 2 reduce peak period traffic volumes across this screenline by about 2,500 vehicles, or over 600 cars per hour. On the other hand, with the West Valley TSM supplementing the Red Line, the peak period trip reduction increases to 18,000 trips, or over 4,500 per peak hour. The Valleywide TSM Alternative produces between 8 to 9 percent reduction of east-west traffic, which is more than Alternatives 1 and 2, but less than Alternatives 1 and 2 with TSM in the west Valley.

The east-west screenlines provide information on the geographic variations of the impacts to the north-south traffic throughout the Valley. The range of traffic effects is fairly narrow among the three screenlines, with the middle screenline (#9) typically showing the highest trip reduction effects. This screenline, which is located north of Burbank Boulevard, is the closest to the east-west corridor study area. Comparing trip reduction effects of alternatives, it can be seen that the effects are very consistent with the impacts on the north-south screenlines. Alternatives 1 and 2 have the lowest effects, in the range of 0.5 to 1.3 percent; Valleywide TSM produces between 5.1 to 6 percent, and finally Alternatives 1 and 2 with TSM have the highest north-south trip reduction potential, in the range of 6 to 8 percent. Alternatives 1 and 2, have a potential of reducing 3,200 peak period, or over 800 peak hour north-south trips, across Burbank Boulevard. Alternatives 1 and 2 with TSM can reduce peak period north-south traffic volumes at this location by as much as 18,300 trips, or over 4,600 vehicles in the peak hour. Screenline #10, located south of Mulholland Drive, emphasizes the potential for reducing north south traffic connecting the Valley and the Los Angeles Basin through the passes and canyons. Alternative 1 has the lowest effect at 0.5 percent, (1,300 peak period trips), Valleywide TSM by 5.7 percent (14,300 peak period trips), and TSM-Enhanced Alternative 2 has the highest effect with 6.9 percent (17,300 peak period trips).

Reviewing the total north-south vs. east-west traffic volumes, it can be seen that generally, the transit corridor has a higher trip reduction percentage effect on east-west traffic (by about 40 to 60 percent) than on north-south traffic. The exception is Alternative 2, which has an almost equal percent effect for trip reduction (1.1 percent for both) on north-south and east-west traffic.

3-3 LOCALIZED STATION AREA TRAFFIC IMPACTS

The implementation of the Metro Rail San Fernando Valley East-West Corridor extension would affect traffic conditions in the San Fernando Valley in two ways. First, it is anticipated that operations of a rail line in coordination with enhanced bus service connecting the San Fernando Valley with Hollywood and LACBD would divert vehicle trips from the roadways to rail. This would result in a reduction in traffic volume along freeways and regional arterials within the corridor. These effects were quantified and discussed in detail in previous sections of this Chapter.

However, localized increases in traffic near station areas, especially those with parking or bus loading/unloading facilities, or those expected to be major points for access by park-and-ride and kiss-and-ride patrons, is anticipated. These increases in traffic volumes could have an effect on traffic flow at critical intersections within the corridor and actions may be needed to mitigate estimated impacts.

3-3.1 Existing Traffic Conditions

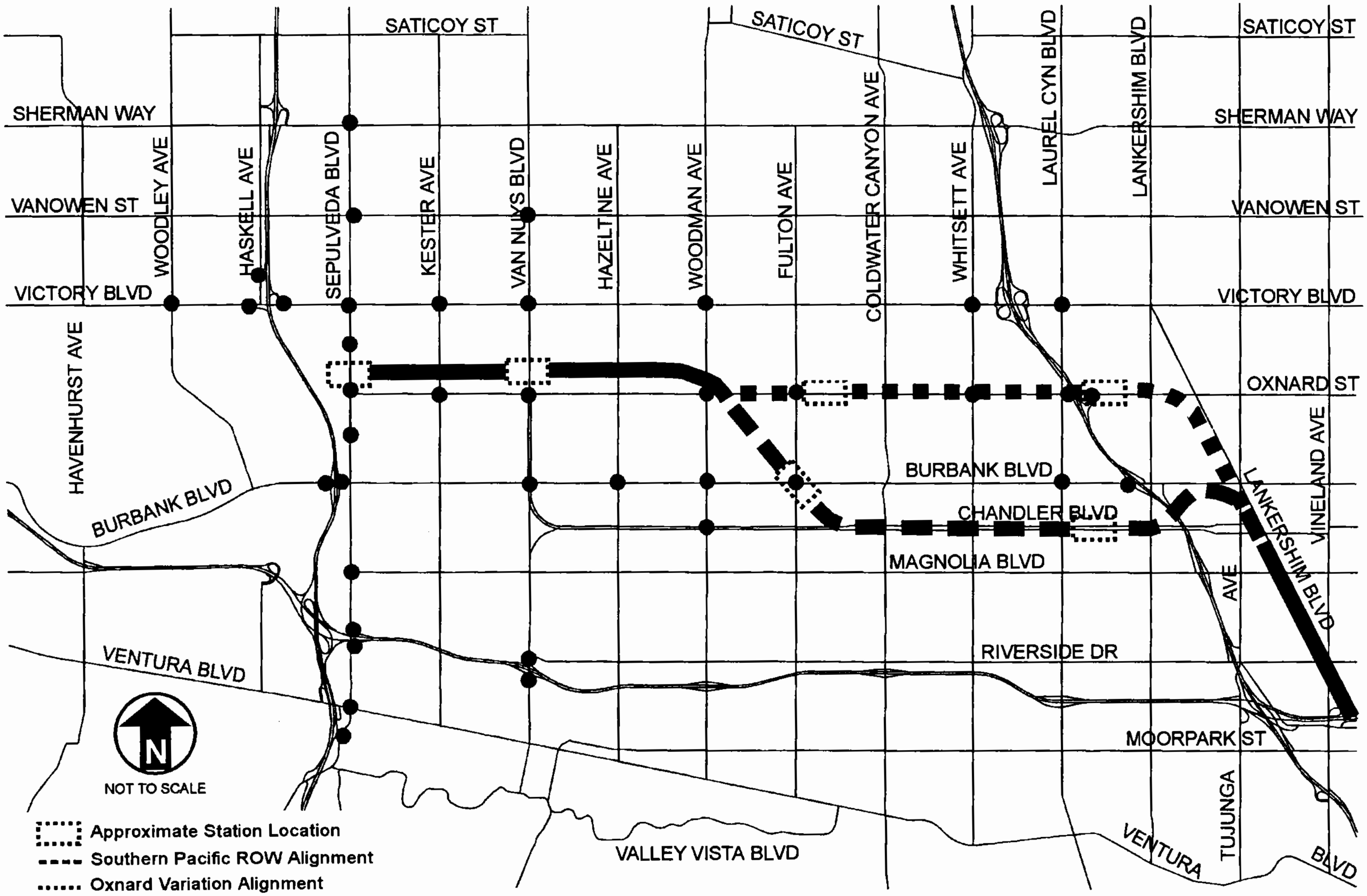
The proposed rail alignment alternatives and associated station locations are indicated on Figure 3-3.1.

Forty-one intersections within the study area are included in the peak hour capacity analysis. These intersections were chosen in consultation with the City of Los Angeles Department of Transportation (LADOT) and represent intersections that would potentially be affected by a nearby Metro Rail station or are on an access route to a station. The selection was made based on potential travel pattern orientation, access routes and expected level of auto access activity at each station. The locations of these intersections are illustrated on Figure 3-3.2.

Peak period turning movement ground counts were compiled for all of the study intersections from a combination of existing recent data available in LADOT computerized data files at two locations, and new data collected in the spring of 1996, for the remaining 39 locations. Current conditions at each intersection were analyzed using Critical Movement Analysis (Interim Materials on Highway Capacity Manual, NCHRP Circular 212) analysis technique, as prescribed by the LADOT. Based on discussions with LADOT staff, intersections were evaluated for worst case (evening peak hour) conditions.

Table 3-3.1 summarizes the existing intersection volume/capacity (V/C) ratios and levels of service (LOS) results for each intersection, organized by the closest rail station area. Among the forty-one intersections analyzed, 27 are presently operating at acceptable levels of service of "D" or better. Fourteen intersections are presently operating at unacceptable levels of service (LOS E or F). The 14 intersections currently operating at LOS E or F are:

- Sepulveda Boulevard/Sherman Way
- Sepulveda Boulevard/Vanowen Street
- Sepulveda Boulevard/Victory Boulevard



SOURCE: Meyer, Mohaddes Associates, Inc.

METRO

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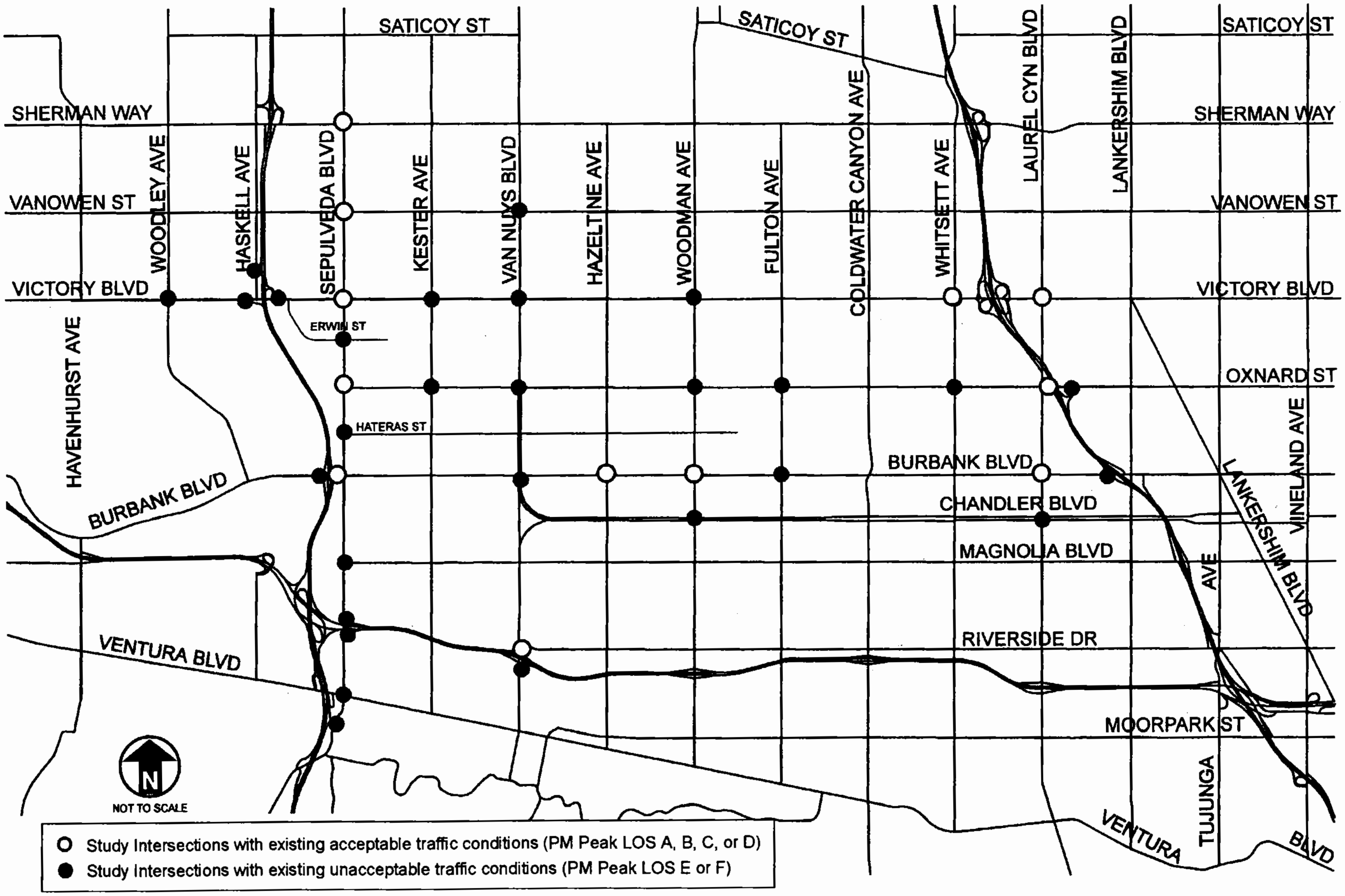
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 3-3.1
Station Locations and Rail Alignment Alternatives



SOURCE: Meyer, Mohaddes Associates, Inc.

FIGURE 3-3.2
Study Intersections

Table 3-3.1: Intersection Levels of Service - PM Peak Hour Existing Conditions

		Existing	
		V/C	LOS
Sepulveda Station			
1	Woodley Ave./Victory Blvd.	0.822	D
2	Haskell Ave./I-405 ramps/Haynes St.	0.503	A
3	Haskell Ave./Victory Blvd.	0.694	B
4	I-405 NB on-off ramps/Victory Blvd.	0.825	D
5	I-405 SB on-off ramps/Burbank Blvd.	0.720	C
6	I-405 NB on-off ramps/Burbank Blvd.	0.819	D
7	Sepulveda Blvd./Sherman Way	1.023	F
8	Sepulveda Blvd./Vanowen St.	0.998	E
9	Sepulveda Blvd./Victory Blvd.	1.055	F
10	Sepulveda Blvd./Erwin St.	0.699	B
11	Sepulveda Blvd./Oxnard St.	0.977	E
12	Sepulveda Blvd./Hatteras St.	0.522	A
13	Sepulveda Blvd./Burbank Blvd.	1.103	F
14	Sepulveda Blvd./Magnolia Blvd.	0.848	D
15	Sepulveda Blvd./101 WB off ramp	0.573	A
16	Sepulveda Blvd./101 EB on ramp	0.634	B
17	Sepulveda Blvd./Ventura Blvd.	0.964	E
18	Sepulveda Blvd./I-405 NB on-off ramp	1.061	F
	Weighted Average	0.873	
Van Nuys Station			
19	Kester Ave./Victory Blvd.	0.820	D
20	Kester Ave./Oxnard St.	0.744	C
21	Van Nuys Blvd./Vanowen St.	0.856	D
22	Van Nuys Blvd./Victory Blvd.	0.877	D
23	Van Nuys Blvd./Oxnard St.	0.702	C
24	Van Nuys Blvd./Burbank Blvd.	0.850	D
25	Van Nuys Blvd./101 WB on-off ramp	0.942	E

Table 3-3.1: Intersection Levels of Service - PM Peak Hour Existing Conditions

		Existing	
		V/C	LOS
26	Van Nuys Blvd./101 EB on-off ramp	0.895	D
27	Hazeltine Ave./Burbank Blvd.	0.906	E
	Weighted Average	0.846	
	Valley College Station		
28	Woodman Ave./Victory Blvd.	0.854	D
29	Woodman Ave./Oxnard St.	0.863	D
30	Woodman Ave./Burbank Blvd.	0.923	E
31	Woodman Ave./Chandler Blvd.	0.619	B
32	Fulton Ave./Oxnard St.	0.652	B
33	Fulton Ave./Burbank Blvd.	0.739	C
	Weighted Average	0.793	
	Laurel Canyon Station		
34	Whitsett Ave./Victory Blvd.	0.917	E
35	Whitsett Ave./Oxnard St.	0.761	C
36	Laurel Canyon Blvd./Victory Blvd.	1.071	F
37	Laurel Canyon Blvd./Oxnard St.	1.003	F
38	Laurel Canyon Blvd./Burbank Blvd.	0.907	E
39	Laurel Canyon Blvd./Chandler Blvd.	0.765	C
40	Route 170 NB on-off ramp/Oxnard St.	0.792	C
41	Route 170 SB off ramp/Burbank Blvd.	0.646	B
	Weighted Average	0.886	

Source: Meyer, Mohaddes Associates, 1997.

- Sepulveda Boulevard/Oxnard Street
- Sepulveda Boulevard/Burbank Boulevard
- Sepulveda Boulevard/Ventura Boulevard
- Sepulveda Boulevard/I-405 NB on-off ramp
- Van Nuys Boulevard/101 WB on-off ramp
- Hazeltine Avenue/Burbank Boulevard
- Woodman Avenue/Burbank Boulevard
- Whitsett Avenue/Victory Boulevard
- Laurel Canyon Boulevard/Victory Boulevard
- Laurel Canyon Boulevard/Oxnard Street
- Laurel Canyon Boulevard/Burbank Boulevard

Table 3-3.1 also presents overall weighted average V/C ratios for intersections calculated by each station area grouping. The weighted average V/C's were calculated by multiplying the V/C ratio for each individual intersection by the total intersection approach volumes. These weighted average V/C numbers do not actually represent any specific real operating condition; however, they do reflect overall and relative levels of congestion and general level of systemwide intersection capacity deficiency/availability within the group representing each of the four station area vicinity. As can be seen by the weighted averages, although some individual intersections operate at near or above capacity conditions, the four station study areas generally operate within 79 to 89 percent of overall capacity. The Laurel Canyon station area has the worst conditions, whereas the Valley College area has the best conditions.

3-3.2 Future Traffic Volume Forecast Methodology

The East-West San Fernando Valley Corridor extension is expected to affect traffic flow in two ways. First, as discussed earlier, the diversion of trips to the transit system would reduce the volume of auto traffic along freeways, arterials and other surface streets through the study area. However, for east-west rail transit alternatives, transit patrons travelling to/from the transit stations by auto would likely contribute to localized increases in auto trips and shifts in travel patterns in the areas immediately surrounding the rail stations. This is particularly true of the intermediate terminal station at Sepulveda Boulevard, which also due to its proximity to the I-405 Freeway, would draw trips from a relatively larger potential service area. These increases in traffic volumes along streets surrounding station areas would affect traffic flow at critical intersections in the vicinity of the rail stations.

Year 2015 traffic conditions were forecast and evaluated for the No Project Alternative and for each of the project alternatives. The No Project Alternative, in effect, represents the projected horizon year traffic volumes in the study area in the absence of the east-west San Fernando Valley Corridor extension project. It would reflect traffic conditions with the Metro Red Line terminating at the North Hollywood Station.

Year 2015 traffic volume forecasts for No Project conditions and each of the project alternatives were developed using the LACMTA travel demand forecast model. The model was updated and refined specifically for use in this study, as described in *SFV E-W Transportation Corridor MIS*

Model Technical Background Report, July 1996. The model was re-calibrated to 1995 conditions and then used to forecast travel characteristics in 2015. The levels of travel demand reflected in the forecasts are based on a set of 2015 sociodemographic projections which have been developed for the region by the Southern California Association of Governments (SCAG). The travel demand projections reflect anticipated patterns of growth and development in population and job opportunities within the region between now and 2015. As such, these forecasts provide the "cumulative" traffic conditions projected for the study area, Los Angeles County and the southern California region.

The highway network assumed for the 2015 No Project forecasts is consistent with the SCAG Regional Mobility Plan 2015 highway network. Within Los Angeles County, the network includes projects identified for construction between 1995 and 2015 from the MTA's Adopted 30-Year Integrated Transportation Plan, and from similar long range plans for the balance of the region. The most significant change to the highway network between 1990 and 2015 in the San Fernando Valley is the addition of high occupancy vehicle (HOV) lanes along most of the freeways within the area, including the SR-134 and I-405 freeways. The 2015 highway network configuration was the same for all project alternatives.

The No Project transit network reflects the transit service levels anticipated by the MTA to exist in 2015, without the east-west Corridor project. The No Project alternative is described in the "Conceptual and Detailed Definition of Alternatives," and is consistent with the MTA Fundable Plan of the 30-Year Integrated Transportation Plan, with the exception of the deletion of the east-west project portion of the Metro Rail Red Line and its related transit interface services.

To estimate the impacts associated with each project alternative, intersection traffic volume projections for each scenario were developed using a two-step process, as follows:

1. Developing future *base* traffic volumes reflecting 1995 to 2015 background traffic growth, and changes due to vehicle trip reduction and other shifts in traffic as a direct result of the east-west Corridor transit service.

2. Determining the additional, *incremental* peak hour auto access trips to stations.

This two-step process was employed because the projected 2015 vehicle trips produced directly by the highway assignment module of the MTA model do not include any transit vehicle or auto portion of transit-access (park-and-ride or kiss-and-ride) trips. Use of this methodology allowed for a "true" impact analysis which reflects both macro-level reductions and/or shifts in background traffic due to the transit service as well as the micro-level additional local impacts created by station-access traffic.

To develop the "base" traffic volumes for the first step, a growth-factoring process was used. Traffic growth factors were calculated for the study area arterials by comparing traffic volume results from the MTA travel model for years 1995 and 2015 for the No Project and for each of the project alternatives. For each scenario, a different growth factor was developed for every arterial that was part of a study intersection. As mentioned before, since traffic volume projections were from the highway component of the MTA model, the growth factors reflected traffic that did not include any transit-related auto trips, and furthermore were "customized" to the unique impacts of each alternative. The growth factors were then applied to the existing year actual traffic *ground counts* to develop future background volumes at each of the study intersections. As expected, the overall average annual traffic growth factors at study intersections varied by alternative as follows:

• No Project	
• Alternative 1	1.0% to 2.4%
• Alternative 2	1.0% to 2.4%
• TSM-Enhanced Alternative 1	0.5% to 1.6%
• TSM-Enhanced Alternative 2	0.6% to 1.6%
• Valleywide TSM Alternative	0.4% to 1.7%

The relatively lower range of growth factors for all "build" alternatives compared to the No Project, is consistent with, and reflects the vehicle-trip reduction characteristics of each of the project alternatives, as discussed in earlier sections of this chapter.

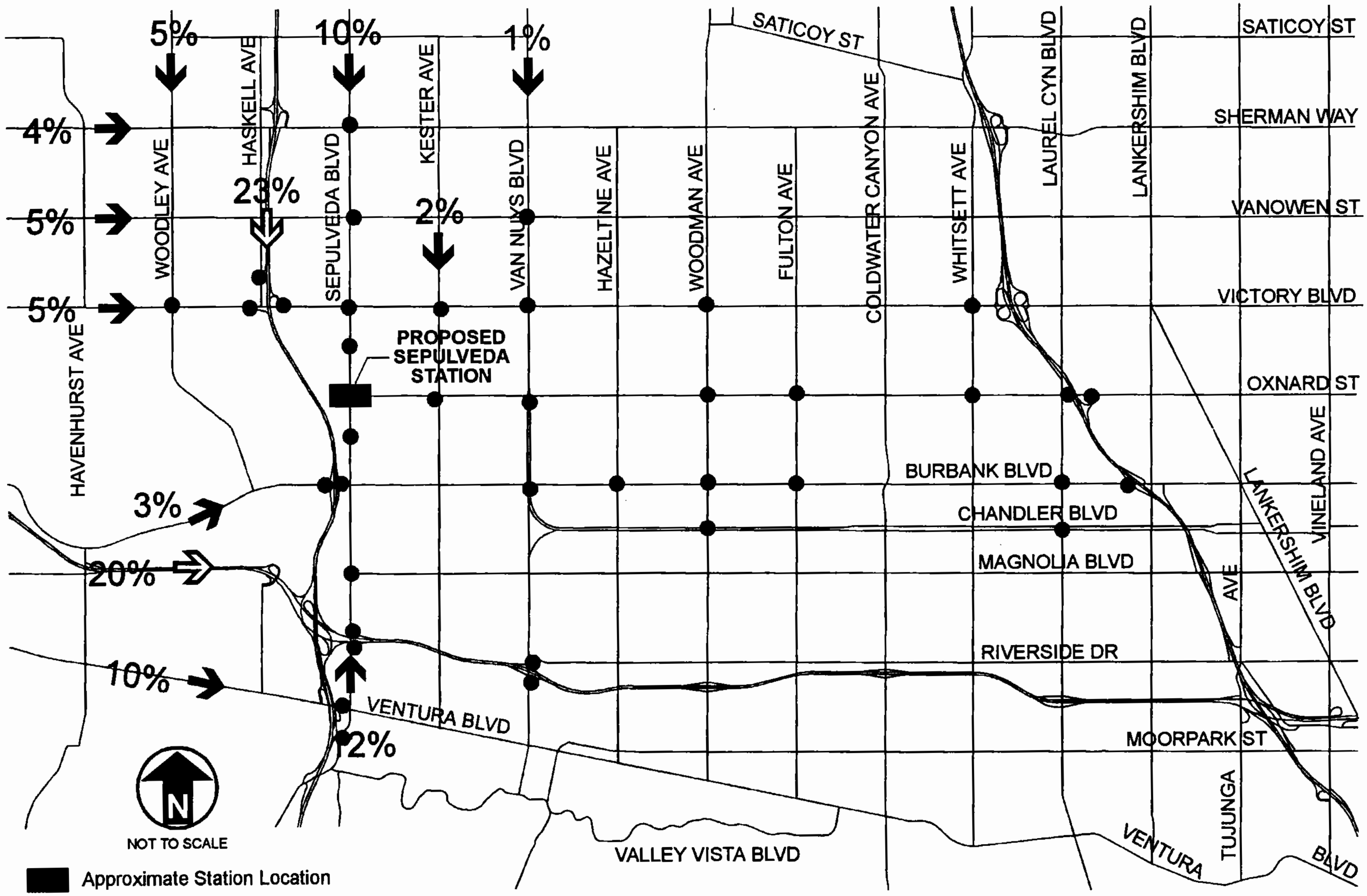
In the second step of the forecasting process, the projected base intersection volumes for each of the scenarios, except for the Valleywide TSM Alternative, were adjusted by adding the rail station vehicle access traffic. For the vehicle-trip distribution and assignment process, magnitude and origin-destinations of vehicular transit access trips were directly derived from the MTA model's transit "mode of access" reports and the transportation analysis zone (TAZ) system. Station access auto traffic, which constitute vehicle trip generation, includes park-and-ride, kiss-and-ride auto traffic, and bus and shuttle traffic consisting of feeder and line haul buses. The estimated vehicle trip generation for each of the rail project alternatives will be described in more detail in the subsequent sections, which discuss the impacts of each alternative. The estimated trip distributions were reviewed, adjusted for local conditions and approved by LADOT. The assumed station access vehicle trip distribution for each of the proposed stations is depicted in Figure 3-3.3, Figure 3-3.4, Figure 3-3.5, Figure 3-3.6, Figure 1-7 and Figure 1-8.

3-3.3 Traffic Impacts of Transit Alternatives

a. Thresholds of Significance

Intersection capacity analyses were performed for the 41 critical intersections within the San Fernando Valley Corridor study area for No Project conditions and for each of the project alternatives. The City of Los Angeles Department of Transportation provides guidelines determining acceptable peak hour operating conditions and significant levels of impact at intersections. Based on the LADOT guidelines, a project impact is significant if the addition of project traffic results in the following increases in the volume-to-capacity ratio at an intersection:

- For V/C ratios of 0.701 to 0.800 - a V/C increase greater than or equal to 0.04.
- For V/C ratios of 0.801 to 0.900 - a V/C increase greater than or equal to 0.02.
- For V/C ratios greater than 0.900- a V/C increase greater than or equal to 0.01.



SOURCE: Meyer, Mohaddes Associates, Inc.

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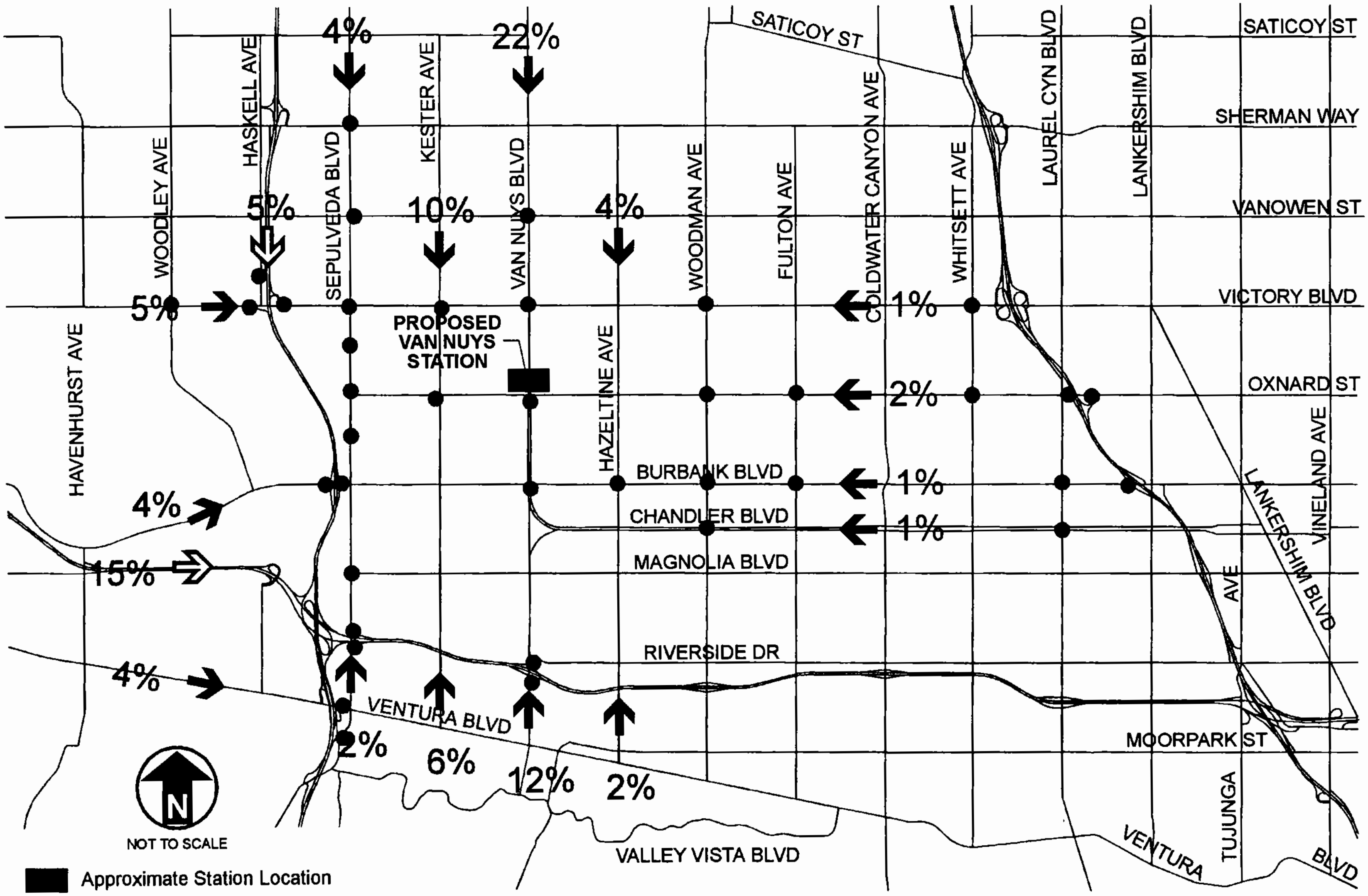
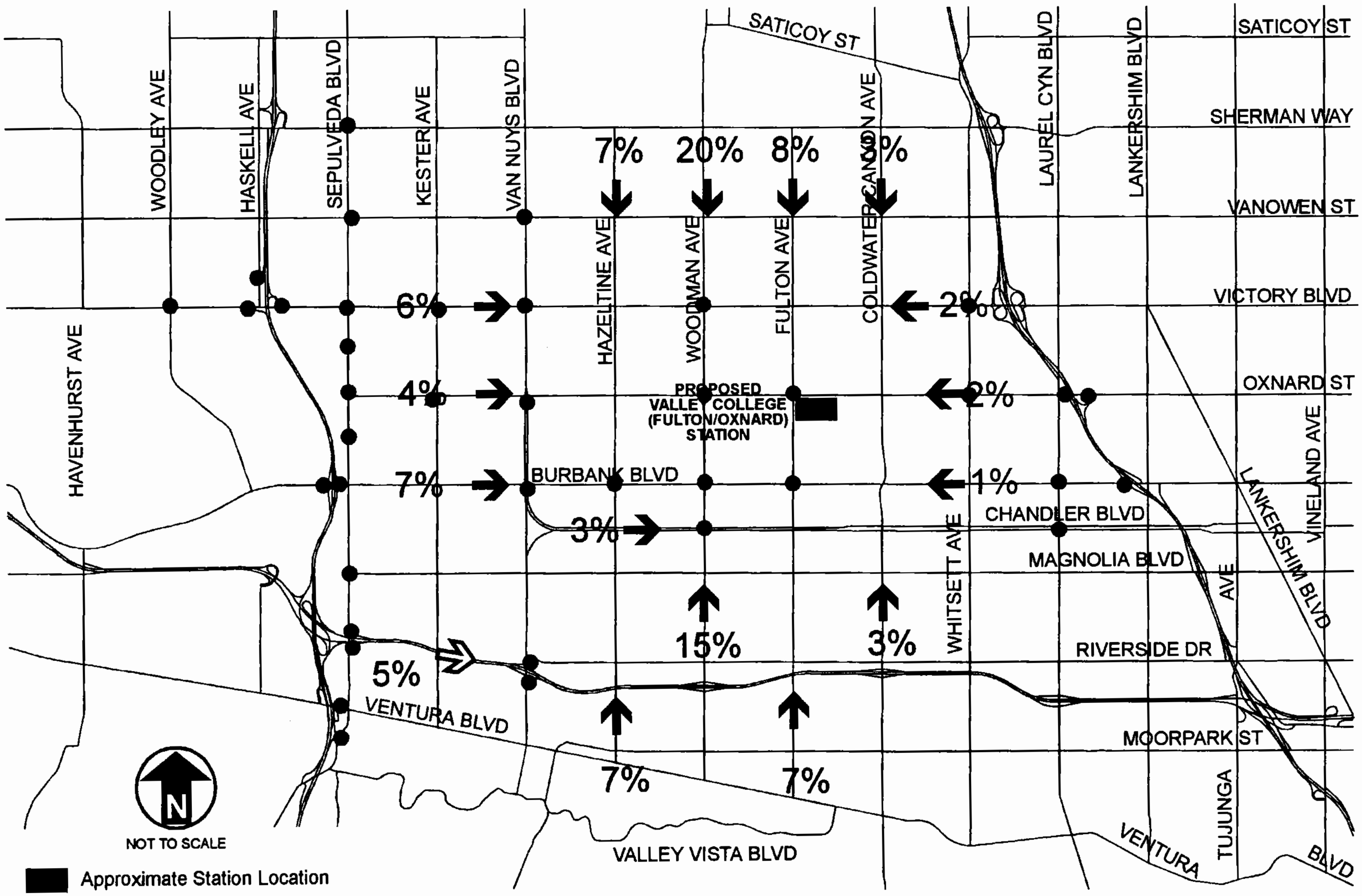
FIGURE 3-3.3
Sepulveda Station Trip Distribution



SOURCE: Meyer, Mohaddes Associates, Inc.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

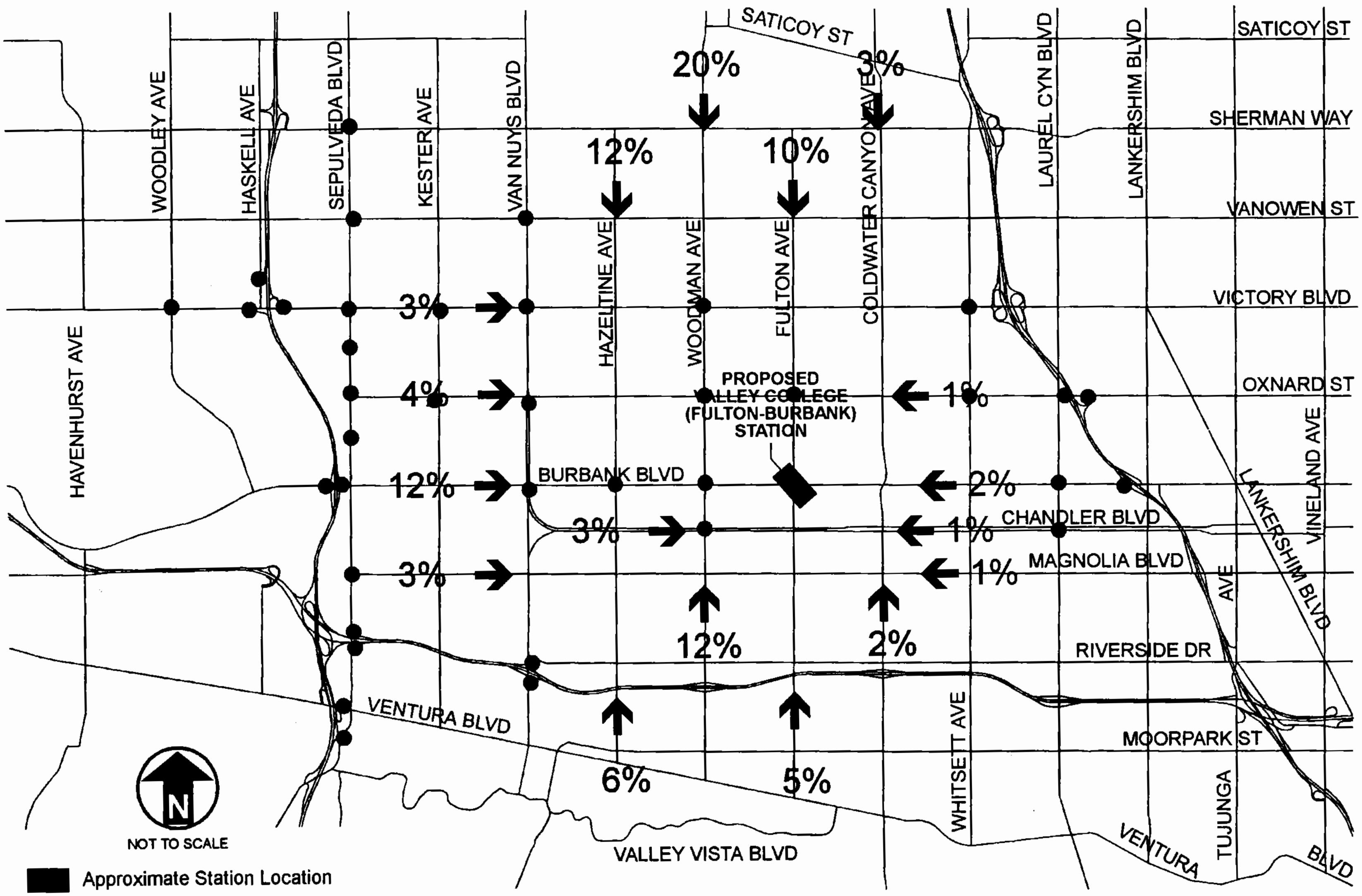
FIGURE 3-3.4
Van Nuys Station Trip Distribution



SOURCE: Meyer, Mohaddes Associates, Inc.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

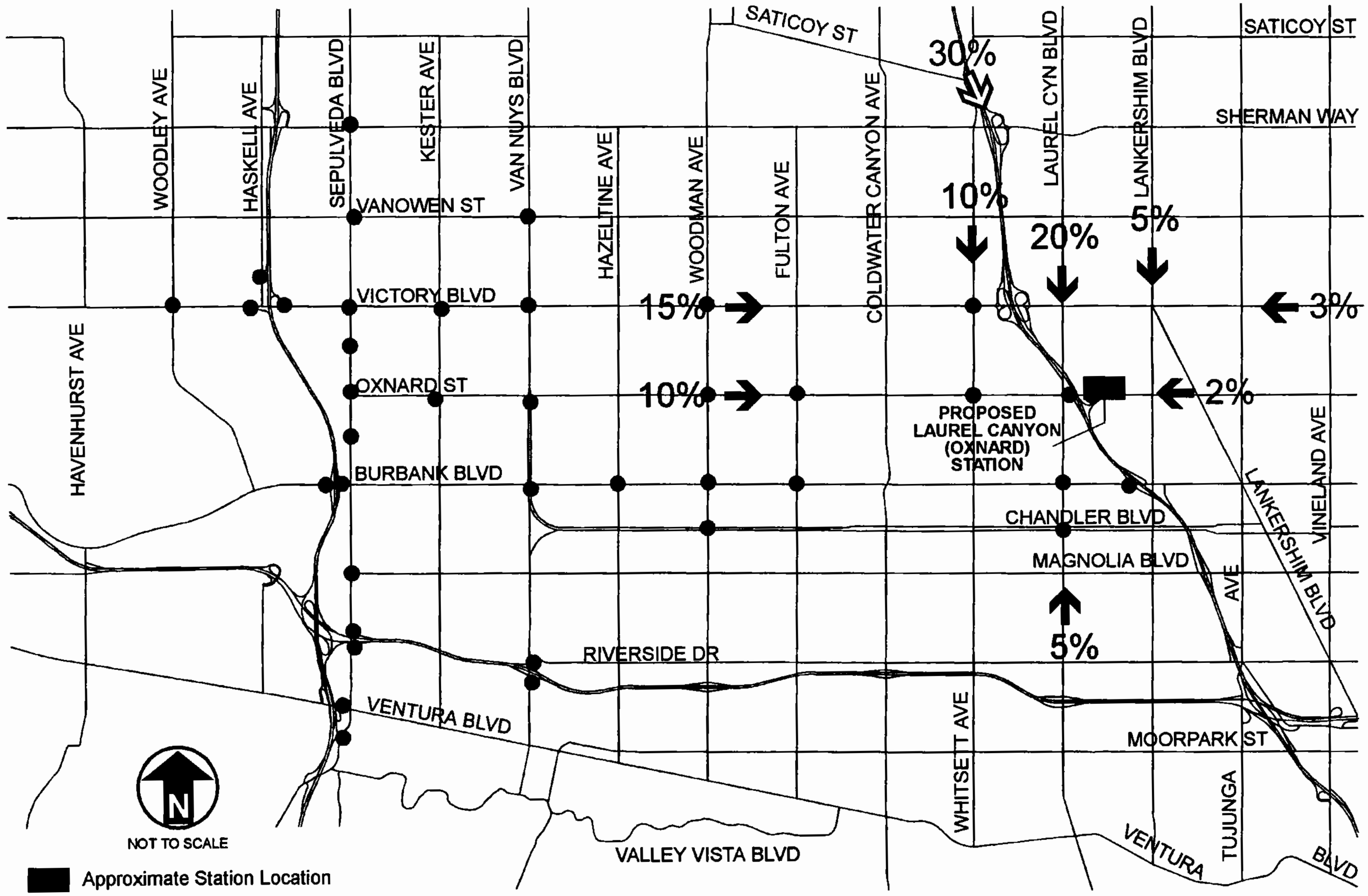
FIGURE 3-3.5
Valley College Station Trip Distribution



SOURCE: Meyer, Mohaddes Associates, Inc.

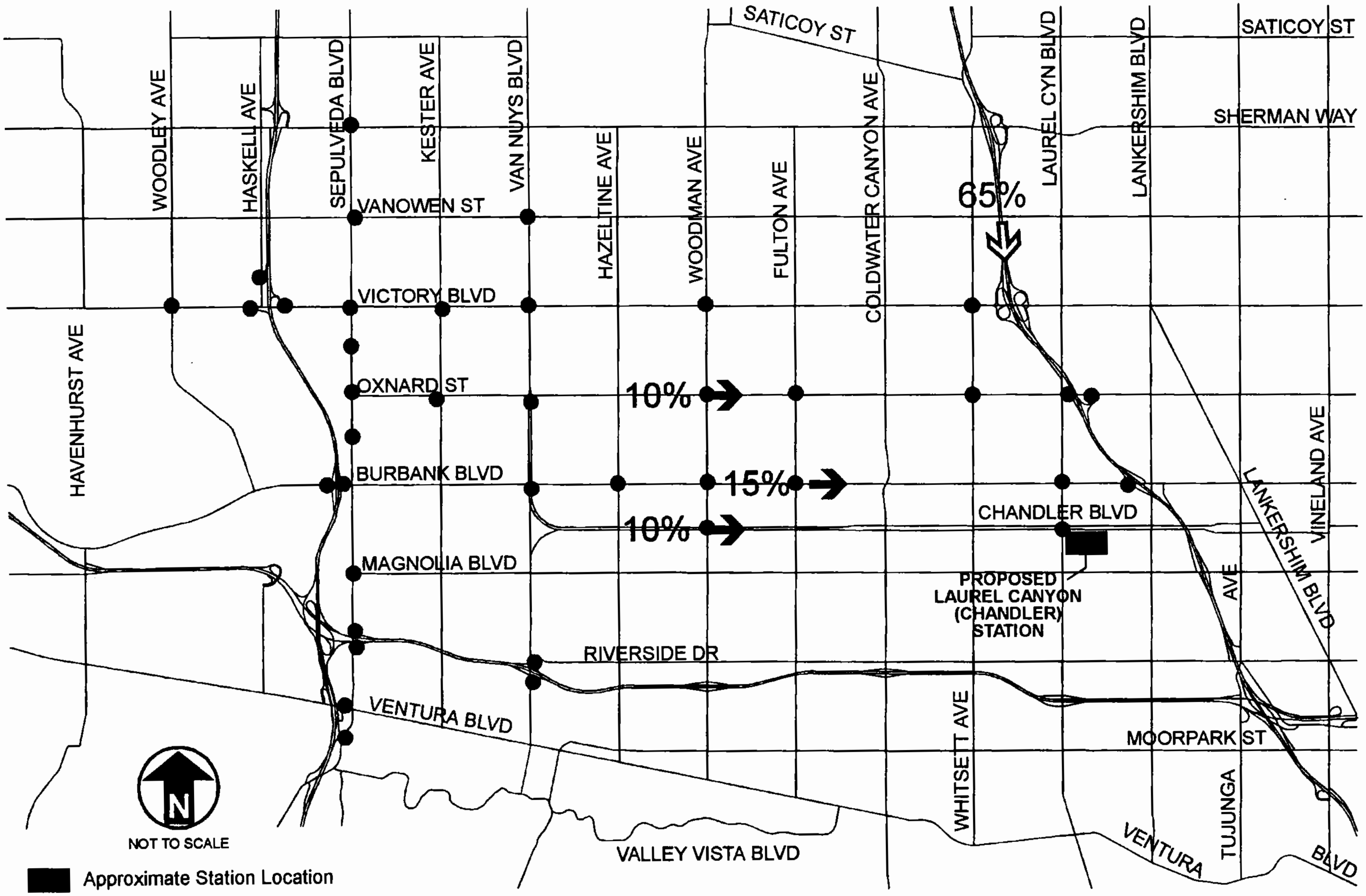
San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 3-3.6
Valley College Station Trip Distribution



SOURCE: Meyer, Mohaddes Associates, Inc.

FIGURE 3-3.7
Laurel Canyon Station Trip Distribution



SOURCE: Meyer, Mohaddes Associates, Inc.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 3-3.8
Laurel Canyon Station Trip Distribution

It is important to note that, under these guidelines, an intersection may be significantly affected by a project yet continue to operate at a level of service significantly better than E and it would still require mitigation. LADOT guidelines specify that the affected intersections must be mitigated to a level of insignificance. Mitigation of impacts to levels of insignificance based on these revised LADOT guidelines would likely require acquisition of additional right-of-way and roadway widenings, which would entail diversion of transit funds from the provision of mass transit service to the accommodation of automobiles.

However, all of the previous MTA Metro Rail System environmental analysis processes have used an earlier version of the LADOT impact analysis guidelines. For consistency purposes, the East-West San Fernando Valley Corridor project also used the earlier LADOT guidelines. For this study, an intersection is considered to be significantly affected if project traffic is projected to cause a deterioration in level of service to E or worse, or results in an increase in the volume-to-capacity ratio of 0.02 or more at an intersection projected to operate at LOS E or worse under No Project conditions.

b. No Project Alternative

Applying the individual arterial growth factors (over 1995 conditions) to peak hour turning movements at the 41 study area intersections identified for analyses, estimated 2015 No Project traffic volumes were developed for the evening peak hour.

Intersection analyses were performed for the 41 intersections. Table 3-3.2 summarizes the results of these analyses and compares them to existing conditions. Review of Table 3-3.2 shows that 34 intersections are projected to operate at level of service (LOS) "E" or worse during the evening peak hour. This compares to 14 intersections currently (1995 conditions) operating at LOS E or worse.

A review of the overall weighted average V/C ratios for 2015 emphasize the magnitude of worsening operating conditions compared to 1995. The weighted average V/C's show a range of between 6 to 24 percent over capacity conditions for the four station areas. These numbers compare with the previously discussed overall average operations between 79 and 89 percent of capacity for 1995. The results indicate that the overall operating conditions for the station area intersections are projected to worsen by approximately 35 to 45 percent between 1995 and 2015.

c. Alternative 1

The amount of vehicular access traffic for each station along the Alternative 1 alignment was estimated based on forecasted rail patronage boardings by mode of arrival and departure from the MTA travel demand forecast model. Station access traffic includes park-and-ride and kiss-and-ride auto traffic, and bus traffic consisting of feeder and line haul buses.

Table 3-3.2: Intersection Levels of Service - PM Peak Hour Alternative 10 - No Project				
	Existing		No Project	
	V/C	LOS	V/C	LOS
Sepulveda Station				
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F
Weighted Average	0.873		1.192	
Van Nuys Station				
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F
20 Kester Ave./Oxnard St.	0.744	C	1.126	F
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F

Table 3-3.2: Intersection Levels of Service - PM Peak Hour
Alternative 10 - No Project

	Existing		No Project	
	V/C	LOS	V/C	LOS
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F
Weighted Average	0.846		1.210	
Valley College Station				
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E
Weighted Average	0.793		1.064	
Laurel Canyon Station				
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D
Weighted Average	0.886		1.242	

Source: Meyer, Mohaddes Associates, 1997.

Passengers using the park-and-ride mode of arrival drive to the station, singly or in carpools, park their vehicles at the station and complete their trips by rail. Upon return to the station by rail, they again use their automobile to return home. This represents one outbound vehicle trip per boarding activity during the evening peak hour. Since the MTA model provides data by *person-trip* for the park-and-ride patrons, some reduction should be assumed for more than one person in some cars to convert the trip generation to *vehicle-trips*. An average auto occupancy factor of 1.20 persons per vehicle was applied to estimated station park-and-ride boardings to determine the number of park-and-ride vehicle trips. This factor was derived from an analysis of several similar transit systems throughout the United States and is also consistent with assumptions developed by SCAG for use in Los Angeles County.

Kiss-and-ride (or drop-off) rail patrons are driven to the station to board the Metro Rail and are picked up again upon return to the station. Based on a review of other transit systems in California and actual data from the operating segments of the Metro Rail system, kiss-and-ride patrons were estimated to be 30 percent of total patronage. In contrast to the park-and-ride mode, kiss-and-ride patrons represent one inbound trip plus one outbound trip during the evening peak hour. Similarly, an auto occupancy factor of 1.20 transit patrons per vehicle was applied to the estimated station kiss-and-ride person trips (boardings) to determine the total number of kiss-and-ride vehicle trips. The total number of (inbound plus outbound) vehicle trip-ends are determined by multiplying this number by two.

In addition, the number of buses traveling to/from the station was estimated, based on the patronage forecast and service level assumptions for each alternative.

Table 3-3.3 summarizes the estimated PM peak period patronage and the resulting estimate of vehicle trips to/from each station for this alternative.

Table 3-3.3: PM Peak Hour Station Access Vehicle Trips Alternative 1 (Year 2015)

Station	Park-and-Ride		Kiss-and-Ride	
	In	Out	In	Out
Sepulveda	NA	1273	545	545
Van Nuys	NA	215	92	92
Valley College	NA	31	13	13
Laurel Canyon	NA	16	7	7
TOTAL	NA	1535	657	657

Source: Meyer, Mohaddes Associates, 1997.

Station access traffic was distributed to the roadway system for each station area based on trip distribution characteristics developed from the MTA travel forecast model based on zonal origin-destination patterns, as described earlier. The resulting station access traffic volume turning movements at study area intersections were added to the 2015 background traffic volumes specifically developed for this alternative using the arterial growth factors discussed in previous sections. Intersection capacity analyses were performed for the resultant total volumes for this alternative. Table 3-3.4 summarizes the results of the intersection capacity analyses of study intersections, using Level of Service E to identify intersections with unacceptable levels of service.

For Alternative 1, a review of Table 3-3.4 shows that 35 intersections are projected to operate at LOS E or worse during the evening peak hour, up from 34 intersections for the No Project Alternative. Based on a comparison to No Project conditions, using the significance criteria, it can be seen that the vehicle trips generated by the Alternative 1 station access traffic is expected to significantly affect nine intersections. These are:

- Woodley Avenue/Victory Boulevard
- Haskell Avenue/Victory Boulevard
- I-405 NB on-off ramps/Victory Boulevard
- I-405 SB on-off ramps/Burbank Boulevard
- I-405 NB on-off ramps/Burbank Boulevard
- Sepulveda Boulevard/Victory Boulevard
- Sepulveda Boulevard/Erwin Street
- Sepulveda Boulevard/Burbank Boulevard
- Van Nuys Boulevard/Oxnard Street

As seen in Table 3-3.4, most of the impacts are concentrated near the Sepulveda station, which attracts the most patronage and accordingly the most vehicle trips. Only one intersection (Van Nuys at Oxnard) is significantly affected near the Van Nuys station.

One notable observation is that many of the intersections actually experience an improvement of future operating conditions compared to the No Project Alternative. It should be reemphasized that, as described earlier due to the integrated forecasting process, the final intersection operating conditions are a combination of the decrease in vehicle trips due to improved transit service plus the added station access vehicle trips. In many cases the vehicle trip reduction characteristics more than compensate for the added station traffic and therefore the final V/C results show an improvement over conditions without the transit service. This is the case for all intersections near the Laurel Canyon and Valley College stations, 5 of 9 intersections near the Van Nuys station, and only 2 intersections near the Sepulveda station. It is evident that in the case of the Sepulveda station, at the focused local level, the large volumes of vehicles generated by the park-and-ride and kiss-and-ride activities, driven by the relatively high number of transit boardings at this station, outweigh the trip reduction benefits caused by the transit system on the local streets.

Table 3-3.4: Intersection Levels of Service - PM Peak Hour
Alternative 1 - Red Line Extension to I-405 via Southern Pacific

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.276	F	0.108
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.750	C	0.035
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	1.105	F	0.183
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	1.354	F	0.298
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	1.029	F	0.145
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	1.105	F	0.089
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.354	F	-0.038
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.436	F	0.012
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.451	F	0.033
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	1.110	F	0.126
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.486	F	0.016
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.784	C	0.030
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.781	F	0.326
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.239	F	-0.004
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.807	D	0.005
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.891	D	0.004
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.303	F	0.014
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.498	F	0.012
Weighted Average	0.873		1.192		1.269		0.077
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	1.098	F	-0.001
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	1.107	F	-0.019
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.242	F	-0.010
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.214	F	0.009

Table 3-3.4: Intersection Levels of Service - PM Peak Hour
Alternative 1 - Red Line Extension to I-405 via Southern Pacific

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	1.123	F	0.028
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.156	F	0.010
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.409	F	0.015
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.313	F	-0.012
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.245	F	-0.005
Weighted Average	0.846		1.210		1.213		0.003
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	1.075	F	-0.009
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.229	F	-0.013
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.144	F	-0.009
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.817	D	-0.006
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	0.997	E	-0.014
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.949	E	-0.009
Weighted Average	0.793		1.064		1.053		-0.010
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.292	F	-0.038
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	1.225	F	-0.038
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.329	F	-0.016
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.413	F	-0.023
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.112	F	-0.009
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	1.025	F	-0.004
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.269	F	-0.030
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.789	C	-0.012
Weighted Average	0.886		1.242		1.219		-0.023

Source: Meyer, Mohaddes Associates, 1997.

Overall weighted average V/C ratios by each station area were also calculated for this scenario, and shown in the table. As can be seen, on the average the V/C's at the Sepulveda and Van Nuys station area intersections are expected to increase by 0.077 and 0.003, respectively. On the other hand, the average V/C's for the Valley College and Laurel Canyon station area intersections will decrease by 0.010 and 0.023, respectively. This and the previous discussion show that the implementation of the east-west corridor transit system will have an overall positive effect on two of the station areas, a slight overall increase on one and adverse impacts near the Sepulveda station.

In summary, compared to the No Project Alternative, with Alternative 1, 21 of the 41 study intersections improve in operating conditions, 11 intersections worsen in operating conditions but are not significantly affected by the project traffic, and 9 intersections are significantly affected.

d. Alternative 2

Table 3.3-5 summarizes the estimated PM peak period patronage and the resulting estimates of park-and-ride and kiss-and-ride vehicle trips to/from each station for this alternative.

Table 3.3-5: PM Peak Hour Station Access Vehicle Trips Alternative 2 (Year 2015)

Station	Park-and-Ride		Kiss-and-Ride	
	In	Out	In	Out
Sepulveda	NA	1325	568	568
Van Nuys	NA	202	86	86
Valley College	NA	0	17	17
Laurel Canyon	NA	17	7	7
TOTAL	NA	1544	678	678

Source: Meyer, Mohaddes Associates, 1997.

For Alternative 2, a review of Table 3.3-6 shows 35 intersections are projected to operate at LOS E or worse during the evening peak hour. Based on a comparison to No Project conditions, using the significant impact criteria, it can be seen that the vehicle trips generated by the Alternative 2 station access traffic are expected to significantly affect 11 intersections. These intersections are as follows:

- Woodley Avenue/Victory Boulevard
- Haskell Avenue/Victory Boulevard
- I-405 NB on-off ramps/Victory Boulevard
- I-405 SB on-off ramps/Burbank Boulevard
- I-405 NB on-off ramps/Burbank Boulevard
- Sepulveda Boulevard/Victory Boulevard
- Sepulveda Boulevard/Erwin Street
- Sepulveda Boulevard/Oxnard Street

- Sepulveda Boulevard/Burbank Boulevard
- Sepulveda Boulevard/I-405 NB on-off ramp
- Van Nuys Boulevard/Oxnard Street

Nine of the 11 significantly affected intersections for Alternative 2 are the same as for Alternative 1, and two additional intersections (Sepulveda at Oxnard and Sepulveda at I-405 ramps) will be significantly affected with Alternative 2. Similar to Alternative 1, most of the significantly affected intersections are concentrated near the Sepulveda Station. Since Alternative 2 generates relatively more transit ridership, its impacts near the Sepulveda station are slightly higher than Alternative 1, as also shown by the higher overall average V/C difference (0.083). On the other hand, the overall vehicle trip reduction effects of Alternative 2 are higher than Alternative 1. Therefore, as evidenced by the average V/C's, the other three station area intersections on the average show higher levels of improvement over the No Project conditions compared to Alternative 1.

In summary, compared to the No Project Alternative, with Alternative 2, 21 of the 41 study intersections improve in operating conditions, 9 intersections worsen in operating conditions but are not significantly affected by the project traffic, and 11 intersections are significantly affected.

e. TSM/-Enhanced (Alternative 1)

As mentioned in previous sections, a second transit service alternative was developed by augmenting Alternative 1 with a significantly enhanced bus system in the West Valley. Table 3-3.7 summarizes the estimated PM peak period patronage and the resulting estimate of vehicle trips to/from each station for this alternative. This alternative produced higher transit ridership on the Alternative 1 rail system and resulted in higher reductions of vehicle trips from the highway system compared to Alternative 1.

Table 3-3.7: PM Peak Hour
Station Access Vehicle Trips
TSM-Enhanced Alternative 1 (Year 2015)

Station	Park-and-Ride		Kiss-and-Ride	
	In	Out	In	Out
Sepulveda	NA	1304	559	559
Van Nuys	NA	208	89	89
Valley College	NA	11	5	5
Laurel Canyon	NA	16	7	7
TOTAL	NA	1539	660	660

Source: Meyer, Mohaddes Associates, 1997.

Table 3-3.6: Intersection Levels of Service - PM Peak Hour
Alternative 2 - Red Line Extension to I-405 via Oxnard Street

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.274	F	0.106
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.751	C	0.036
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	1.110	F	0.188
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	1.358	F	0.302
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	1.042	F	0.158
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	1.115	F	0.099
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.359	F	-0.033
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.442	F	0.018
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.455	F	0.037
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	1.119	F	0.135
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.490	F	0.020
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.790	C	0.036
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.805	F	0.350
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.239	F	-0.004
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.814	D	0.012
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.899	D	0.012
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.292	F	0.003
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.511	F	0.025
Weighted Average	0.873		1.192		1.275		0.083
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	1.094	F	-0.005
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	1.102	F	-0.024
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.241	F	-0.011
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.209	F	0.004

Table 3-3.6: Intersection Levels of Service - PM Peak Hour
Alternative 2 - Red Line Extension to I-405 via Oxnard Street

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	1.116	F	0.021
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.157	F	0.011
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.407	F	0.013
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.313	F	-0.012
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.238	F	-0.012
Weighted Average	0.846		1.210		1.210		-0.001
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	1.070	F	-0.014
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.221	F	-0.021
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.147	F	-0.006
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.816	D	-0.007
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	0.993	E	-0.018
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.952	E	-0.006
Weighted Average	0.793		1.064		1.051		-0.013
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.281	F	-0.049
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	1.215	F	-0.048
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.334	F	-0.011
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.421	F	-0.015
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.118	F	-0.003
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	1.024	F	-0.005
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.265	F	-0.034
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.795	C	-0.006
Weighted Average	0.886		1.242		1.218		-0.024

Source: Meyer, Mohaddes Associates, 1997.

For the TSM-Enhanced Alternative 1, a review of Table 3-3.8 shows that 33 intersections are projected to operate at LOS E or worse during the evening peak hour. Based on the significance criteria, compared to No Project conditions, five intersections are projected to be significantly affected by the station traffic for the TSM-Enhanced Alternative 1. These intersections are:

- Haskell Avenue/Victory Boulevard
- I-405 NB on-off ramps/Victory Boulevard
- I-405 SB on-off ramps/Burbank Boulevard
- Sepulveda Boulevard/Erwin Street
- Sepulveda Boulevard/Burbank Boulevard

It can be concluded that the addition of the west Valley TSM improvements results in the reduction of 4 of the 9 significantly affected intersections in Alternative 1. Three of these are near the Sepulveda station and one is near the Van Nuys station. The increased positive effects of the vehicle trip reductions for this alternative result in improvement of intersection conditions near all stations except Sepulveda. Even at the Sepulveda station, the overall weighted average V/C is improved despite significant impacts at the five intersections.

In summary, compared to No Project Alternative, with the TSM-Enhanced Alternative 1, 34 of the 41 study intersections would improve in operating conditions; one intersection would worsen, and one would remain unchanged. Both would not be significantly affected by the project traffic and 5 intersections would be significantly affected.

Table 3-3.8: Intersection Levels of Service - PM Peak Hour
Alternative 1 - Red Line Extension to I-405 via Southern Pacific w/ TSM in West Valley

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.168	F	0.000
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.660	B	-0.055
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	1.025	F	0.103
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	1.279	F	0.223
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	0.961	E	0.077
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	1.024	F	0.008
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.226	F	-0.166
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.285	F	-0.139
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.337	F	-0.081
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	1.047	F	0.063
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.319	F	-0.151
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.699	B	-0.055
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.668	F	0.213
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.065	F	-0.178
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.739	C	-0.063
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.816	D	-0.071
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.161	F	-0.128
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.372	F	-0.114
Weighted Average	0.873		1.192		1.159		-0.033
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	0.979	E	-0.120
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	0.944	E	-0.182
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.099	F	-0.153
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.104	F	-0.101

Table 3-3.8: Intersection Levels of Service - PM Peak Hour
Alternative 1 - Red Line Extension to I-405 via Southern Pacific w/ TSM in West Valley

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	0.984	E	-0.111
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.050	F	-0.096
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.266	F	-0.128
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.179	F	-0.146
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.108	F	-0.142
Weighted Average	0.846		1.210		1.083		-0.128
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	0.987	E	-0.097
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.082	F	-0.160
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.050	F	-0.103
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.722	C	-0.101
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	0.880	D	-0.131
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.883	D	-0.075
Weighted Average	0.793		1.064		0.951		-0.112
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.083	F	-0.247
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	0.991	E	-0.272
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.228	F	-0.117
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.249	F	-0.187
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.025	F	-0.096
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	0.891	E	-0.138
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.080	F	-0.219
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.725	C	-0.076
Weighted Average	0.886		1.242		1.065		-0.178

Source: Meyer, Mohaddes Associates, 1997.

f. TSM-Enhanced Alternative 2

Similar to the previous alternative, Alternative 2 was also augmented with an improved bus system in the West Valley. Table 3-3.9 summarizes the estimated PM peak period patronage and the resulting estimate of vehicle trips to/from each station for this alternative.

Table 3-3.9: PM Peak Hour Station Access Vehicle Trips TSM-Enhanced Alternative 2 (Year 2015)

Station	Park-and-Ride		Kiss-and-Ride	
	In	Out	In	Out
Sepulveda	NA	1553	666	666
Van Nuys	NA	83	36	36
Valley College	NA	0	14	14
Laurel Canyon	NA	68	29	29
TOTAL	NA	1704	745	745

Source: Meyer, Mohaddes Associates, 1997.

For the TSM-Enhanced Alternative 2, a review of Table 3-3.10 shows 32 intersections are projected to operate at LOS E or worse during the evening peak hour. Based on the significance criteria, compared to No Project conditions, 7 intersections are projected to be significantly affected by the station access vehicle trips generated by the TSM-Enhanced Alternative 2 station traffic. These intersections are:

- Woodley Avenue/Victory Boulevard
- Haskell Avenue/Victory Boulevard
- I-405 NB on-off ramps/Victory Boulevard
- I-405 SB on-off ramps/Burbank Boulevard
- I-405 NB on-off ramps/Burbank Boulevard
- Sepulveda Boulevard/Erwin Street
- Sepulveda Boulevard/Burbank Boulevard

It can be concluded that the addition of the West Valley TSM improvements results in the reduction of 4 of the 11 significantly impacted intersections in Alternative 2. Three of these are near the Sepulveda station and one near the Van Nuys station. The increased positive effects of the vehicle trip reductions for this alternative result in improvement of intersection conditions near all stations except Sepulveda. Even at the Sepulveda station, the overall weighted average V/C is improved despite significant impacts at the seven intersections.

Compared to the No Project Alternative, with the TSM-Enhanced Alternative 2, 34 of the 41 study intersections improve in operating conditions and 7 intersections are significantly affected.

Table 3-3.10: Intersection Levels of Service - PM Peak Hour
Alternative 2 Red Line Extension to I-405 via Oxnard Street w/ TSM in West Valley

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.190	F	0.022
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.668	B	-0.047
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	1.065	F	0.143
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	1.324	F	0.268
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	0.989	E	0.105
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	1.042	F	0.026
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.228	F	-0.164
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.288	F	-0.136
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.343	F	-0.075
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	1.077	F	0.093
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.334	F	-0.136
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.705	C	-0.049
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.735	F	0.280
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.070	F	-0.173
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.745	C	-0.057
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.821	D	-0.066
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.177	F	-0.112
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.381	F	-0.105
Weighted Average	0.873		1.192		1.178		-0.014
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	0.976	E	-0.123
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	0.947	E	-0.179
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.082	F	-0.170
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.090	F	-0.115

Table 3-3.10: Intersection Levels of Service - PM Peak Hour
Alternative 2 Red Line Extension to I-405 via Oxnard Street w/ TSM in West Valley

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	0.957	E	-0.138
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.032	F	-0.114
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.238	F	-0.156
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.166	F	-0.159
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.103	F	-0.147
Weighted Average	0.846		1.210		1.068		-0.142
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	0.985	E	-0.099
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.088	F	-0.154
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.049	F	-0.104
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.721	C	-0.102
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	0.888	D	-0.123
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.882	D	-0.076
Weighted Average	0.793		1.064		0.953		-0.111
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.106	F	-0.224
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	1.018	F	-0.245
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.243	F	-0.102
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.286	F	-0.150
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.021	F	-0.100
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	0.887	D	-0.142
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.099	F	-0.200
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.725	C	-0.076
Weighted Average	0.886		1.242		1.082		-0.161

Source: Meyer, Mohaddes Associates, 1997.

g. *Valleywide TSM Alternative*

The Valleywide TSM Alternative assumes a significantly improved bus transit system throughout the Valley in lieu of the extension of the Red Line transit project, as described in detail the previous sections. In contrast to the rail extension alternatives, this alternative, by design, does not have transit stations attracting automobile trips in large numbers. Passengers attracted to the improved bus system are assumed to use/reach the buses through conventional bus stops and existing or unofficial park-and-ride facilities. Therefore, this alternative does not have the impacts of the additional station access vehicle trips. However, it accounts for the reduction of vehicle trips from the highway system as a result of trips diverted to the improved bus service. A review of Table 3-3.11 shows 29 intersections are projected to operate at LOS E or worse during the evening peak hour. As can be seen, due to the overall reduction of traffic volumes, all intersections are expected to improve in operation compared to the No Project Alternative and there will be no adversely affected intersections. As discussed previously, this alternative forecasts the positive operational effects of the improved bus services on the highway system.

h. *Alternative 6*

As discussed previously, this alternative proposes a light rail transit (LRT) system operating between North Hollywood and Valley Circle Boulevard. The alignment would include aerial flyovers at major cross-streets. At secondary cross-streets, however, the system would operate at-grade or in an open-air subway. This section analyzes the effects of a proposed LRT system on the operations of the intersections that the system would cross at-grade in the East Valley (east of the I-405 Freeway) only. The effects of station-related traffic are not considered for this alternative. This is due to the fact that all light rail alternatives are projected to generate lower rail ridership and consequently less auto access trips to the stations compared to the heavy rail alternatives analyzed in the previous sections. Therefore, the previous alternatives (1 and 2) have already analyzed the "worst-case" conditions. Alternative 6, however, will have the following nine at-grade crossing intersections in the east Valley:

- Kester Avenue/Oxnard Street
- Hazeltine Avenue/Oxnard Street
- Ethel Avenue/Chandler Boulevard
- Chandler Boulevard (at track crossing)
- Coldwater Canyon Avenue/Chandler Boulevard
- Whitsett Avenue/Chandler Boulevard
- Laurel Canyon Boulevard/Chandler Boulevard
- Colfax Avenue/Chandler Boulevard
- Tujunga Avenue/Chandler Boulevard

Four of the above-listed intersections were analyzed as representative samples in this Draft Report. They are: Kester Avenue/Oxnard Street, Coldwater Canyon Avenue/Chandler Boulevard, Laurel Canyon Boulevard/Chandler Boulevard, Tujunga Avenue/Chandler Boulevard.

Table 3-3.11: Intersection Levels of Service - PM Peak Hour
Alternative 9 TSM/Enhanced Bus

	Existing		No Project		With TSM		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.005	F	-0.163
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.624	B	-0.091
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	0.788	C	-0.134
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	0.891	D	-0.165
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	0.813	D	-0.071
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	0.925	E	-0.091
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.232	F	-0.160
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.193	F	-0.231
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.241	F	-0.177
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	0.888	D	-0.096
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.295	F	-0.175
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.681	B	-0.073
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.317	F	-0.138
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.034	F	-0.209
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.722	C	-0.080
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.799	C	-0.088
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.133	F	-0.156
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.337	F	-0.149
Weighted Average	0.873		1.192		1.048		-0.144
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	0.923	E	-0.176
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	0.955	E	-0.171
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.042	F	-0.210
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.045	F	-0.160
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	0.958	E	-0.137
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.034	F	-0.112

Table 3-3.11: Intersection Levels of Service - PM Peak Hour Alternative 9 TSM/Enhanced Bus

	Existing		No Project		With TSM		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.244	F	-0.150
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.182	F	-0.143
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.115	F	-0.135
Weighted Average	0.846		1.210		1.056		-0.154
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	0.956	E	-0.128
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.102	F	-0.140
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.057	F	-0.096
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.736	C	-0.087
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	0.897	D	-0.114
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.884	D	-0.074
Weighted Average	0.793		1.064		0.954		-0.110
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.059	F	-0.271
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	1.028	F	-0.235
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.183	F	-0.162
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.272	F	-0.164
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.025	F	-0.096
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	0.907	E	-0.122
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.117	F	-0.182
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.730	C	-0.071
Weighted Average	0.886		1.242		1.068		-0.175

Source: Meyer, Mohaddes Associates, 1997.

At-grade rail systems can operate either with or without traffic signal priority at at-grade crossings. If there is no priority, LRT operations have negligible impacts on each intersection. With priority, however, LRT operations would tend to decrease delays on movements parallel to the LRT alignment and would increase delays on left- and right-turning movements and cross-street movements across the tracks.

A detailed methodology was applied to the analysis of at-grade intersections along the LRT alignment. The approach considered the worst-case situation of giving full signal pre-emption priority to the LRT. In order to calculate the number of signal cycles per hour affected by the LRT, an iterative process was utilized to determine the optimal signal timing with and without pre-emption. Overall intersection LOS was then calculated averaging the delay calculations for the number of cycles impacted by the LRT. The overall intersection LOS incorporates any changes in delay under LRT priority, to both parallel and conflicting traffic movements. The table indicates that at-grade crossings are possible at the selected study intersections without creating any significant traffic impacts. Furthermore, because of background trip reductions due to rail, future traffic conditions would be slightly better with the project than without the project.

Table 3-3.12 summarizes the results of these analyses for Alternative 6 and compares them to both existing and No Project conditions.

Table 3-3.12: Intersection Levels of Service - PM Peak Hour Alternative 6

	Existing		No Project		With Rail	
	V/C	LOS	V/C	LOS	V/C	LOS
Kester Ave./Oxnard St.	0.74	C	1.13	F	1.03	F
Coldwater Canyon Blvd./Chandler Blvd.	0.78	C	1.05	F	0.97	E
Laurel Canyon Blvd./Chandler Blvd.	0.77	C	1.03	F	1.01	F
Tujunga Ave./Chandler Blvd.	0.58	A	0.77	C	0.72	C

Source: Meyer, Mohaddes Associates, 1997.

3-3.4 Mitigation Measures

For this study, an intersection is considered to be significantly affected if project traffic will cause a deterioration in level of service to E or worse, or results in an increase in the volume-to-capacity ratio of 0.02 or more at an intersection projected to operate at LOS E or worse under No Project conditions. As discussed in the previous sections, using this standard results in mitigation requirements for 5 to 11 intersections, depending on the alternative considered.

Mitigation of traffic impacts to a level of insignificance may include a variety of measures, including most commonly used requirements for intersection geometrics improvements and/or acquisition of additional right-of-way and roadway widenings. However, the requirement to purchase street right-of-way to improve traffic conditions for automobiles using transit agency funds allocated for the provision of improved mass transit service may be deemed undesirable.

In each of the alternatives discussed previously, a great majority of the rail patrons were expected to reach the system at the Sepulveda Boulevard station. This was mainly due to the location of this station at the terminus of the line and its direct freeway access. As a result of this additional traffic, significant levels of congestion and adverse impacts were forecast at and around the Sepulveda station during the morning and evening peak hours. As discussed earlier, the negative impacts were expected to outweigh the positive trip-reduction impacts of the transit system near this terminal station.

In reality, however, a large number of the rail patrons may decide to utilize an alternate station to avoid this projected congestion around the Sepulveda station and the possible difficulty in finding on-site parking. Since a large portion of the transit access at the stations is directly dependent on the parking supply, as a potential mitigation measure it may be desirable to expand the parking supply at some of the other stations to relieve the auto access demand at Sepulveda. This strategy is a practical alternative approach to the potentially infeasible and high-cost physical mitigation measures which will be required near the Sepulveda station, as well as an attempt to find a solution to the inordinately high parking supply requirements at this station resulting from the large number of boardings.

Expanded parking supplies were assumed at the Laurel Canyon and the Van Nuys stations. Furthermore, an additional park-and-ride facility was assumed along Victory Boulevard east of Woodley Avenue, just west of the western terminus of the rail line. It was assumed that park-and-ride patrons at the latter location would reach the line at the Sepulveda station via a dedicated shuttle service which would run along the MTA rail right-of-way, until such time that the rail service was extended to the Woodley station. Within reasonable limits, some of the auto access trips were re-distributed from the Sepulveda station to these new locations to minimize the concentrated adverse traffic impacts at the Sepulveda station. Each of the rail alternatives was reanalyzed assuming the redistribution of auto access trips to stations. The original and revised parking supply proposed at each station is tabulated below in Table 3-3.13. The expected shift in trip generation at each station and resulting change in projected intersection impacts is discussed below for each of the four rail alternatives (1, 2, and TSM-Enhanced 1 and 2).

Table 3-3.13: Parking Reallocation

Station	Alternative 1 Red Line SP to I-405 Parking Spaces		TSM - Alternative 1 Red Line SP to I-405 (+ TSM West Valley) Parking Spaces		Alternative 2 Red Line Oxnard to I-405 Parking Spaces		TSM-Alternative 2 Red Line Oxnard to I-405 (+ TSM West Valley) Parking Spaces	
	Demand	Proposed Supply	Demand	Proposed Supply	Demand	Proposed Supply	Demand	Proposed Supply
Laurel Canyon	100	110	60	110	90	140	220	140
Valley College	80	80	80	80	0	0	0	0
Van Nuys	500	1250	480	1250	460	1250	190	1250
Sepulveda	2670	1610	2730	1620	2720	1580	3180	1800
Woodley	N.A.	300	N.A.	300	N.A.	300	N.A.	300
Total	3350	3350	3350	3360	3270	3270	3590	3490

Source: Meyer, Mohaddes Associates, 1997.

a. *Alternative 1 With Reallocated Parking*

Table 3-3.14 summarizes the estimated PM peak period patronage and the resulting estimate of vehicle trips to/from each station for Alternative 1 assuming the reallocation of parking supply as discussed above.

Table 3-3.14
PM Peak Hour Station Access Vehicle Trips
Alternative 1 with Reallocated Parking
(Year 2015)

Station	Park-and-Ride		Kiss-and-Ride	
	In	Out	In	Out
Woodley	NA	137	0	0
Sepulveda	NA	738	545	545
Van Nuys	NA	573	92	92
Valley College	NA	37	13	13
Laurel Canyon	NA	50	7	7
TOTAL	NA	1535	657	657

Source: Meyer, Mohaddes Associates, 1997.

For Alternative 1, a review of Table 3-3.15 shows 35 intersections are projected to operate at LOS E or worse during the evening peak hour. Compared to No Project conditions, 11 intersections are projected to be significantly affected by Alternative 1 station traffic, as modified for reallocated parking supply. These intersections are:

- Woodley Avenue/Victory Boulevard
- Haskell Avenue/Victory Boulevard
- I-405 NB on-off ramps/Victory Boulevard
- I-405 SB on-off ramps/Burbank Boulevard
- I-405 NB on-off ramps/Burbank Boulevard
- Sepulveda Boulevard/Erwin Street
- Sepulveda Boulevard/Burbank Boulevard
- Van Nuys Boulevard/Victory Boulevard
- Van Nuys Boulevard/Oxnard Street
- Van Nuys Boulevard/Burbank Boulevard
- Van Nuys Boulevard/101 WB on-off ramp

Table 3-3.15: Intersection Levels of Service - PM Peak Hour
Alternative 1 with Reallocated Parking
Red Line Extension to I-405 via Southern Pacific

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.294	F	0.126
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.750	C	0.035
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	1.070	F	0.148
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	1.277	F	0.221
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	0.986	E	0.102
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	1.086	F	0.070
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.354	F	-0.038
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.423	F	-0.001
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.434	F	0.016
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	1.064	F	0.080
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.486	F	0.016
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.784	C	0.030
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.697	F	0.242
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.239	F	-0.004
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.807	D	0.005
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.891	D	0.004
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.306	F	0.017
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.484	F	-0.002
Weighted Average	0.873		1.192		1.250		0.058
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	1.108	F	0.009
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	1.116	F	-0.010
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.259	F	0.007
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.235	F	0.030

Table 3-3.15: Intersection Levels of Service - PM Peak Hour
Alternative 1 with Reallocated Parking
Red Line Extension to I-405 via Southern Pacific

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	1.179	F	0.084
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.183	F	0.037
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.448	F	0.054
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.313	F	-0.012
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.253	F	0.003
Weighted Average	0.846		1.210		1.234		0.024
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	1.075	F	-0.009
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.231	F	-0.011
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.146	F	-0.007
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.818	D	-0.005
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	1.000	E	-0.011
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.951	E	-0.007
Weighted Average	0.793		1.064		1.055		-0.009
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.292	F	-0.038
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	1.226	F	-0.037
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.331	F	-0.014
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.414	F	-0.022
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.113	F	-0.008
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	1.025	F	-0.004
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.272	F	-0.027
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.791	C	-0.010
Weighted Average	0.886		1.242		1.220		-0.022

Source: Meyer, Mohaddes Associates, 1997.

The redistribution of auto access trips due to the reallocated parking supply results in an overall improvement of conditions near the Sepulveda station, when compared to the original results for Alternative 1. All but one intersection will either improve or remain unchanged, and one intersection will no longer be significantly affected by the station traffic. The redistribution of traffic to the Van Nuys station, however, will result in an overall worsening of conditions and three additional intersections will become significantly affected near this station. Conditions will slightly worsen near the Valley College and Laurel Canyon stations, but no intersections will be significantly affected at these locations.

b. *Alternative 2 With Reallocated Parking*

Table 3-3.16 summarizes the estimated PM peak period patronage and the resulting estimate of vehicle trips to/from each station for Alternative 2 assuming the reallocation of parking supply as discussed above.

Table 3-3.16: PM Peak Hour Station Access Vehicle Trips Alternative 2 with Reallocated Parking (Year 2015)

Station	Park-and-Ride		Kiss-and-Ride	
	In	Out	In	Out
Woodley	NA	142	0	0
Sepulveda	NA	746	568	568
Van Nuys	NA	590	86	86
Valley College	NA	0	17	17
Laurel Canyon	NA	66	7	7
TOTAL	NA	1544	678	678

Source: Meyer, Mohaddes Associates, 1997.

For Alternative 2, a review of Table 3-3.17 shows 35 intersections are projected to operate at LOS E or worse during the evening peak hour. Compared to No Project conditions, twelve intersections are projected to be significantly affected by Alternative 2 station traffic, as modified for reallocated parking supply. These intersections are:

- Woodley Avenue/Victory Boulevard
- Haskell Avenue/Victory Boulevard
- I-405 NB on-off ramps/Victory Boulevard
- I-405 SB on-off ramps/Burbank Boulevard
- I-405 NB on-off ramps/Burbank Boulevard
- Sepulveda Boulevard/Erwin Street
- Sepulveda Boulevard/Oxnard Street
- Sepulveda Boulevard/Burbank Boulevard
- Van Nuys Boulevard/Victory Boulevard
- Van Nuys Boulevard/Oxnard Street
- Van Nuys Boulevard/Burbank Boulevard
- Van Nuys Boulevard/101 WB on-off ramp

Table 3-3.17: Intersection Levels of Service - PM Peak Hour Alternative 2 with Parking Reallocation Red Line Extension to I-405 via Oxnard Street

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.294	F	0.126
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.751	C	0.036
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	1.074	F	0.152
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	1.275	F	0.219
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	0.996	E	0.112
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	1.095	F	0.079
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.359	F	-0.033
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.428	F	0.004
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.437	F	0.019
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	1.069	F	0.085
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.490	F	0.020
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.790	C	0.036
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.712	F	0.257
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.239	F	-0.004
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.814	D	0.012
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.899	D	0.012
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.296	F	0.007
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.496	F	0.010
Weighted Average	0.873		1.192		1.255		0.062
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	1.107	F	0.008
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	1.113	F	-0.013
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.260	F	0.008
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.234	F	0.029

Table 3-3.17: Intersection Levels of Service - PM Peak Hour Alternative 2 with Parking Reallocation Red Line Extension to I-405 via Oxnard Street

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	1.177	F	0.082
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.184	F	0.038
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.449	F	0.055
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.313	F	-0.012
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.245	F	-0.005
Weighted Average	0.846		1.210		1.233		0.023
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	1.071	F	-0.013
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.223	F	-0.019
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.147	F	-0.006
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.816	D	-0.007
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	0.996	E	-0.015
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.952	E	-0.006
Weighted Average	0.793		1.064		1.052		-0.012
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.283	F	-0.047
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	1.216	F	-0.047
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.344	F	-0.001
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.437	F	0.001
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.119	F	-0.002
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	1.024	F	-0.005
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.275	F	-0.024
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.797	C	-0.004
Weighted Average	0.886		1.242		1.224		-0.018

Source: Meyer, Mohaddes Associates, 1997.

The redistribution of auto access trips due to the reallocated parking supply results in an overall improvement of conditions near the Sepulveda station, when compared to the original results for Alternative 2. All but one intersection will either improve or remain unchanged, and one intersection will no longer be significantly affected by the station traffic. The redistribution of traffic to the Van Nuys station, however, will result in an overall worsening of conditions and three additional intersections will become significantly affected near this station. Conditions will slightly worsen near the Valley College and Laurel Canyon stations, but no intersections will be significantly affected at these locations.

c. TSM-Enhanced Alternative 1 with Reallocated Parking

Table 3-3.18 summarizes the estimated PM peak period patronage and the resulting estimate of vehicle trips to/from each station for TSM-Enhanced Alternative 1 assuming the reallocation of parking supply as discussed above.

Table 3-3.18: PM Peak Hour Station Access Vehicle Trips TSM-Enhanced Alternative 1 with Reallocated Parking (Year 2015)

Station	Park-and-Ride		Kiss-and-Ride	
	In	Out	In	Out
Woodley	NA	137	0	0
Sepulveda	NA	742	559	559
Van Nuys	NA	573	89	89
Valley College	NA	37	5	5
Laurel Canyon	NA	50	7	7
TOTAL	NA	1539	660	660

Source: Meyer, Mohaddes Associates, 1997.

For the TSM-Enhanced Alternative 1, a review of Table 3-3.19 shows 33 intersections are projected to operate at LOS E or worse during the evening peak hour. Compared to No Project conditions, four intersections are projected to be significantly affected by the TSM-Enhanced Alternative 1 station traffic, as modified for reallocated parking supply. These intersections are:

- Haskell Avenue/Victory Boulevard
- I-405 NB on-off ramps/Victory Boulevard
- I-405 SB on-off ramps/Burbank Boulevard
- Sepulveda Boulevard/Burbank Boulevard

The redistribution of auto access trips due to the reallocated parking supply results in an overall improvement of conditions near the Sepulveda station, when compared to the original results for the TSM-Enhanced Alternative 1. Most intersections will improve and one intersection will no longer be significantly affected by the station traffic. The redistribution of traffic to the Van Nuys station, however, will result in a slight overall worsening of conditions, but no intersections will be significantly affected near this station. Conditions will also slightly worsen near the Valley College and Laurel Canyon stations, but no intersections will be significantly affected at these locations.

Table 3-3.19: Intersection Levels of Service - PM Peak Hour
Alternative 1 with Parking Reallocation
Red Line Extension to I-405 via Southern Pacific w/ TSM in West Valley

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.185	F	0.017
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.660	B	-0.055
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	0.989	E	0.067
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	1.198	F	0.142
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	0.916	E	0.032
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	1.006	F	-0.010
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.226	F	-0.166
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.272	F	-0.152
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.319	F	-0.099
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	0.998	E	0.014
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.319	F	-0.151
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.699	B	-0.055
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.580	F	0.125
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.065	F	-0.178
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.739	C	-0.063
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.816	D	-0.071
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.165	F	-0.124
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.357	F	-0.129
Weighted Average	0.873		1.192		1.140		-0.053
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	0.989	E	-0.110
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	0.954	E	-0.172
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.116	F	-0.136
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.127	F	-0.078
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	1.042	F	-0.053

Table 3-3.19: Intersection Levels of Service - PM Peak Hour
Alternative 1 with Parking Reallocation
Red Line Extension to I-405 via Southern Pacific w/ TSM in West Valley

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.079	F	-0.067
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.306	F	-0.088
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.179	F	-0.146
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.117	F	-0.133
Weighted Average	0.846		1.210		1.105		-0.105
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	0.989	E	-0.095
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.087	F	-0.155
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.053	F	-0.100
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.723	C	-0.100
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	0.884	D	-0.127
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.885	D	-0.073
Weighted Average	0.793		1.064		0.954		-0.110
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.083	F	-0.247
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	0.993	E	-0.270
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.229	F	-0.116
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.250	F	-0.186
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.026	F	-0.095
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	0.892	E	-0.137
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.083	F	-0.216
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.727	C	-0.074
Weighted Average	0.886		1.242		1.066		-0.177

Source: Meyer, Mohaddes Associates, 1997.

d. TSM-Enhanced Alternative 2 With Reallocated Parking

Table 3-3.20 summarizes the estimated PM peak period patronage and the resulting estimate of vehicle trips to/from each station for TSM-Enhanced Alternative 2 assuming the reallocation of parking supply as discussed above.

Table 3-3.20: PM Peak Hour Station Access Vehicle Trips TSM-Enhanced Alternative 2 with Reallocated Parking (Year 2015)

Station	Park-and-Ride		Kiss-and-Ride	
	In	Out	In	Out
Woodley	NA	146	0	0
Sepulveda	NA	879	666	666
Van Nuys	NA	610	36	36
Valley College	NA	0	14	14
Laurel Canyon	NA	68	29	29
TOTAL	NA	1704	745	745

Source: Meyer, Mohaddes Associates, 1997.

For the TSM-Enhanced Alternative 2, a review of Table 3-3.21 shows 32 intersections are projected to operate at LOS E or worse during the evening peak hour. Compared to No Project conditions, six intersections are projected to be significantly affected by the TSM-Enhanced Alternative 2 station traffic, as modified for reallocated parking supply. These intersections are:

- Woodley Avenue/Victory Boulevard
- Haskell Avenue/Victory Boulevard
- I-405 NB on-off ramps/Victory Boulevard
- I-405 SB on-off ramps/Burbank Boulevard
- Sepulveda Boulevard/Erwin Street
- Sepulveda Boulevard/Burbank Boulevard

The redistribution of auto access trips due to the reallocated parking supply, results in an overall improvement of conditions near the Sepulveda station, when compared to the original results for the TSM-Enhanced Alternative 2. Most intersections will improve and one intersection will no longer be significantly affected by the station traffic. The redistribution of traffic to the Van Nuys station, however, will result in a slight overall worsening of conditions, but no intersections will be significantly affected near this station. Conditions will remain unchanged near the Valley College station and no intersections will be significantly affected. Finally, conditions will slightly worsen near the Laurel Canyon stations, but no intersections will be significantly affected.

Table 3-3.21: Intersection Levels of Service - PM Peak Hour Alternative 2 with Parking Reallocation Red Line Extension to I-405 via Oxnard Street w/ TSM in West Valley

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
Sepulveda Station							
1 Woodley Ave./Victory Blvd.	0.822	D	1.168	F	1.207	F	0.039
2 Haskell Ave./I-405 ramps/Haynes St.	0.503	A	0.715	C	0.668	B	-0.047
3 Haskell Ave./Victory Blvd.	0.694	B	0.922	E	1.022	F	0.100
4 I-405 NB on-off ramps/Victory Blvd.	0.825	D	1.056	F	1.230	F	0.174
5 I-405 SB on-off ramps/Burbank Blvd.	0.720	C	0.884	D	0.935	E	0.051
6 I-405 NB on-off ramps/Burbank Blvd.	0.819	D	1.016	F	1.018	F	0.002
7 Sepulveda Blvd./Sherman Way	1.023	F	1.392	F	1.228	F	-0.164
8 Sepulveda Blvd./Vanowen St.	0.998	E	1.424	F	1.272	F	-0.152
9 Sepulveda Blvd./Victory Blvd.	1.055	F	1.418	F	1.322	F	-0.096
10 Sepulveda Blvd./Erwin St.	0.699	B	0.984	E	1.019	F	0.035
11 Sepulveda Blvd./Oxnard St.	0.977	E	1.470	F	1.334	F	-0.136
12 Sepulveda Blvd./Hatteras St.	0.522	A	0.754	C	0.709	C	-0.045
13 Sepulveda Blvd./Burbank Blvd.	1.103	F	1.455	F	1.627	F	0.172
14 Sepulveda Blvd./Magnolia Blvd.	0.848	D	1.243	F	1.070	F	-0.173
15 Sepulveda Blvd./101 WB off ramp	0.573	A	0.802	D	0.745	C	-0.057
16 Sepulveda Blvd./101 EB on ramp	0.634	B	0.887	D	0.821	D	-0.066
17 Sepulveda Blvd./Ventura Blvd.	0.964	E	1.289	F	1.182	F	-0.107
18 Sepulveda Blvd./I-405 NB on-off ramp	1.061	F	1.486	F	1.364	F	-0.122
Weighted Average	0.873		1.192		1.154		-0.038
Van Nuys Station							
19 Kester Ave./Victory Blvd.	0.820	D	1.099	F	0.992	E	-0.107
20 Kester Ave./Oxnard St.	0.744	C	1.126	F	0.959	E	-0.167
21 Van Nuys Blvd./Vanowen St.	0.856	D	1.252	F	1.107	F	-0.145
22 Van Nuys Blvd./Victory Blvd.	0.877	D	1.205	F	1.121	F	-0.084

Table 3-3.21: Intersection Levels of Service - PM Peak Hour
Alternative 2 with Parking Reallocation
Red Line Extension to I-405 via Oxnard Street w/ TSM in West Valley

	Existing		No Project		With Rail		Difference
	V/C	LOS	V/C	LOS	V/C	LOS	
23 Van Nuys Blvd./Oxnard St.	0.702	C	1.095	F	1.040	F	-0.055
24 Van Nuys Blvd./Burbank Blvd.	0.850	D	1.146	F	1.068	F	-0.078
25 Van Nuys Blvd./101 WB on-off ramp	0.942	E	1.394	F	1.295	F	-0.099
26 Van Nuys Blvd./101 EB on-off ramp	0.895	D	1.325	F	1.116	F	-0.209
27 Hazeltine Ave./Burbank Blvd.	0.906	E	1.250	F	1.112	F	-0.138
Weighted Average	0.846		1.210		1.093		-0.117
Valley College Station							
28 Woodman Ave./Victory Blvd.	0.854	D	1.084	F	0.985	E	-0.099
29 Woodman Ave./Oxnard St.	0.863	D	1.242	F	1.088	F	-0.154
30 Woodman Ave./Burbank Blvd.	0.923	E	1.153	F	1.049	F	-0.104
31 Woodman Ave./Chandler Blvd.	0.619	B	0.823	D	0.721	C	-0.102
32 Fulton Ave./Oxnard St.	0.652	B	1.011	F	0.891	D	-0.120
33 Fulton Ave./Burbank Blvd.	0.739	C	0.958	E	0.882	D	-0.076
Weighted Average	0.793		1.064		0.953		-0.110
Laurel Canyon Station							
34 Whitsett Ave./Victory Blvd.	0.917	E	1.330	F	1.106	F	-0.224
35 Whitsett Ave./Oxnard St.	0.761	C	1.263	F	1.018	F	-0.245
36 Laurel Canyon Blvd./Victory Blvd.	1.071	F	1.345	F	1.245	F	-0.100
37 Laurel Canyon Blvd./Oxnard St.	1.003	F	1.436	F	1.286	F	-0.150
38 Laurel Canyon Blvd./Burbank Blvd.	0.907	E	1.121	F	1.023	F	-0.098
39 Laurel Canyon Blvd./Chandler Blvd.	0.765	C	1.029	F	0.887	D	-0.142
40 Route 170 NB on-off ramp/Oxnard St.	0.792	C	1.299	F	1.103	F	-0.196
41 Route 170 SB off ramp/Burbank Blvd.	0.646	B	0.801	D	0.726	C	-0.075
Weighted Average	0.886		1.242		1.083		-0.160

Source: Meyer, Mohaddes Associates, 1997.

3-3.5 Physical Roadway Improvements

Even with the assumption of a shift in parking supply and redistribution of station access traffic from Sepulveda station to Laurel Canyon and Van Nuys, and a potential parking area at Woodley Avenue, there would still be some increased congestion at study intersections around the Sepulveda station causing significant project-related impacts. In addition, the shift in parking to Van Nuys station would cause some additional intersections to experience significant project-related impacts around that station. These conditions were discussed in detail in the previous section.

As stated previously, an intersection is considered to be significantly affected if project traffic is projected to cause a deterioration in level of service to E or worse, or results in an increase in the volume-to-capacity ratio of 0.02 or more at an intersection projected to operate at LOS E or worse under No Project conditions. Using these criteria results in additional mitigation requirements (beyond parking reallocation) for four to twelve intersections, depending on the alternative considered.

The following conceptual physical intersection improvements were developed to mitigate the residual significant traffic impacts around the Sepulveda and Van Nuys stations after the reallocation of parking as described above. The final intersection V/C ratios with the assumed mitigation measures are also indicated with each description. It should be noted that at this stage, it has not been determined whether these mitigation measures can be accommodated within the existing right-of-way or they will require additional street widenings.

a. *Alternative 1*

Woodley Avenue and Victory Boulevard
- Restripe southbound approach to add second left-turn lane
(mitigated V/C = 1.154)

Haskell Avenue and Victory Boulevard
- Add fourth eastbound and westbound through lane; no feasible method to implement
(mitigated V/C = 0.937)

I-405 NB ramps and Victory Boulevard
- Add second eastbound left-turn lane; may require widening
- Add second westbound right-turn lane; may require widening
(mitigated V/C = 1.036)

I-405 SB ramps and Burbank Boulevard
- Add third westbound left-turn lane; may require widening
(mitigated V/C = 0.901)

I-405 NB ramps and Burbank Boulevard
- Add westbound right-turn lane; may require widening
(mitigated V/C = 0.971)

Sepulveda Boulevard and Erwin Street
- Restripe eastbound approach to add left-turn lane (mitigated V/C = 0.970)

Sepulveda Boulevard and Oxnard Street
- Add second westbound right-turn lane; may require widening (mitigated V/C = 1.263)

Sepulveda Boulevard and Burbank Boulevard
- Add second southbound right-turn lane; may require widening (mitigated V/C = 1.395)

Van Nuys Boulevard and Victory Boulevard
- Widen westbound approach to add right-turn lane (mitigated V/C = 1.202)

Van Nuys Boulevard and Oxnard Street
- Restripe eastbound approach to add right-turn lane (mitigated V/C = 1.107)

Van Nuys Boulevard and Burbank Boulevard
- Add second northbound left-turn lane; may require widening (mitigated V/C = 1.067)

Van Nuys Boulevard and US-101 WB ramps
- Add second northbound left-turn lane; may require widening (mitigated V/C = 1.414)

b. Alternative 2

This alternative would require the same physical intersection mitigation measures as Alternative 1 to mitigate the remaining residual congestion around the Sepulveda and Van Nuys stations after the reallocation of parking. Since the measures would be the same, only the mitigated volume/capacity ratios are listed below.

Woodley Avenue and Victory Boulevard
- (mitigated V/C = 1.153)

Haskell Avenue and Victory Boulevard
- (mitigated V/C = 0.942)

I-405 NB ramps and Victory Boulevard
- (mitigated V/C = 1.035)

I-405 SB ramps and Burbank Boulevard
- (mitigated V/C = 0.906)

I-405 NB ramps and Burbank Boulevard
- (mitigated V/C = 0.978)

Sepulveda Boulevard and Erwin Street
- (mitigated V/C = 0.976)

Sepulveda Boulevard and Oxnard Street
- (mitigated V/C = 1.268)

Sepulveda Boulevard and Burbank Boulevard
- (mitigated V/C = 1.407)

Van Nuys Boulevard and Victory Boulevard
- (mitigated V/C = 1.198)

Van Nuys Boulevard and Oxnard Street
- (mitigated V/C = 1.105)

Van Nuys Boulevard and Burbank Boulevard
- (mitigated V/C = 1.068)

Van Nuys Boulevard and US-101 WB ramps
- (mitigated V/C = 1.415)

c. TSM-Enhanced Alternative 1

Haskell Avenue and Victory Boulevard
- Add fourth eastbound and westbound through lane; no feasible method to implement (mitigated V/C = 0.866)

I-405 NB ramps and Victory Boulevard
- Add second eastbound left-turn lane; may require widening
- Add second westbound right-turn lane; may require widening (mitigated V/C = 0.965)

I-405 SB ramps and Burbank Boulevard
- Add third westbound left-turn lane; may require widening (mitigated V/C = 0.830)

Sepulveda Boulevard and Burbank Boulevard
- Add second southbound right-turn lane; may require widening (mitigated V/C = 1.295)

d. TSM-Enhanced Alternative 2

Woodley Avenue and Victory Boulevard
- Restripe southbound approach to add second left-turn lane
(mitigated V/C = 1.074)

Haskell Avenue and Victory Boulevard
- Add fourth eastbound and westbound through lane; no feasible method to implement
(mitigated V/C = 0.900)

I-405 NB ramps and Victory Boulevard
- Add second eastbound left-turn lane; may require widening
- Add second westbound right-turn lane; may require widening
(mitigated V/C = 0.984)

I-405 SB ramps and Burbank Boulevard
- Add third westbound left-turn lane; may require widening
(mitigated V/C = 0.828)

Sepulveda Boulevard and Erwin Street
- Restripe eastbound approach to add left-turn lane
(mitigated V/C = 0.929)

Sepulveda Boulevard and Burbank Boulevard
- Add second southbound right-turn lane; may require widening
(mitigated V/C = 1.324)

3-4 PARKING

With implementation of the San Fernando Valley East/West Transportation Corridor improvements, parking demand in the LACBD would be expected to decrease by the number of automobile trips diverted to transit. Conversely, there is the potential for increased parking demand at or in the vicinity of rail stations. Therefore, parking is relevant to the San Fernando Valley East/West Transportation Corridor extension in two ways:

- The rail project should reduce the need for parking facilities in the LACBD and other regional activity centers it serves.

- Rail patrons driving to and parking at a station may require increased parking in the local station vicinity.

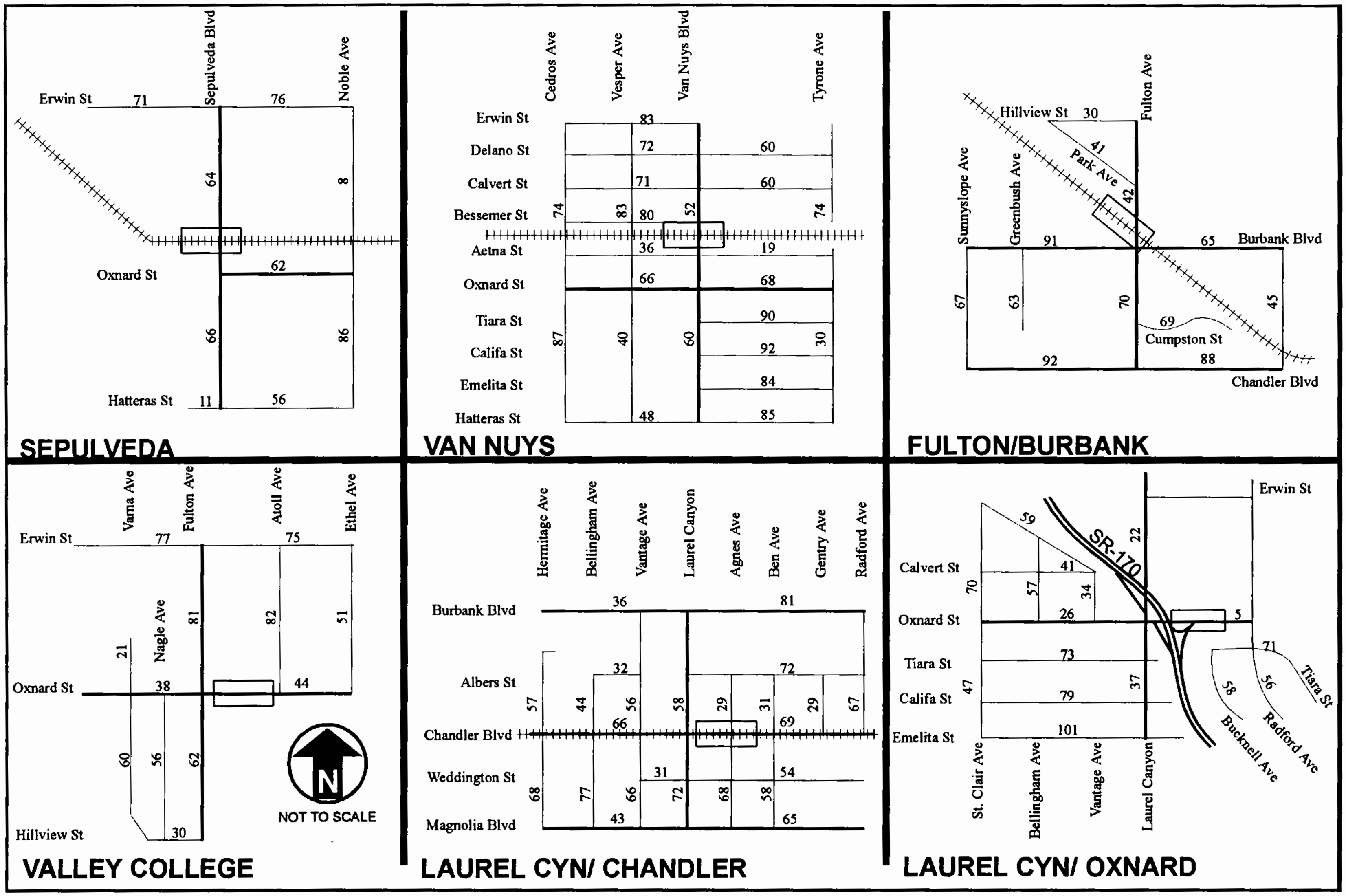
To evaluate current parking, a survey of on-street parking spaces and usage was conducted in January, 1997. The survey covered the immediate impact area around each rail station, generally within a one-quarter mile radius, which is the maximum distance transit patrons will typically walk. Information about the number of parking spaces and parking restrictions was gathered.

3-4.1 Existing On-Street Parking Conditions

There are a total of approximately 5,600 parking spaces within the San Fernando Valley East/West Transportation Corridor station impact areas. Average parking utilization in these areas is approximately 36 percent of the supply. The parking supply and utilization within the station areas under consideration in each alternative alignment vary from a low of 20 percent near the proposed Fulton/Burbank station to a high of 52 percent in the vicinity of the Van Nuys Government Center area. Table 3-4.1 summarizes current parking supply and utilization for each station area. Figure 3-4.1 illustrates the study locations and the estimated available on-street parking spaces.

On-street parking utilization counts were conducted on weekdays during the AM peak periods (7 AM to 9 AM) and included counting the number of parked vehicles on each street segment. A summary of the survey results are illustrated on Figure 3-4.2.

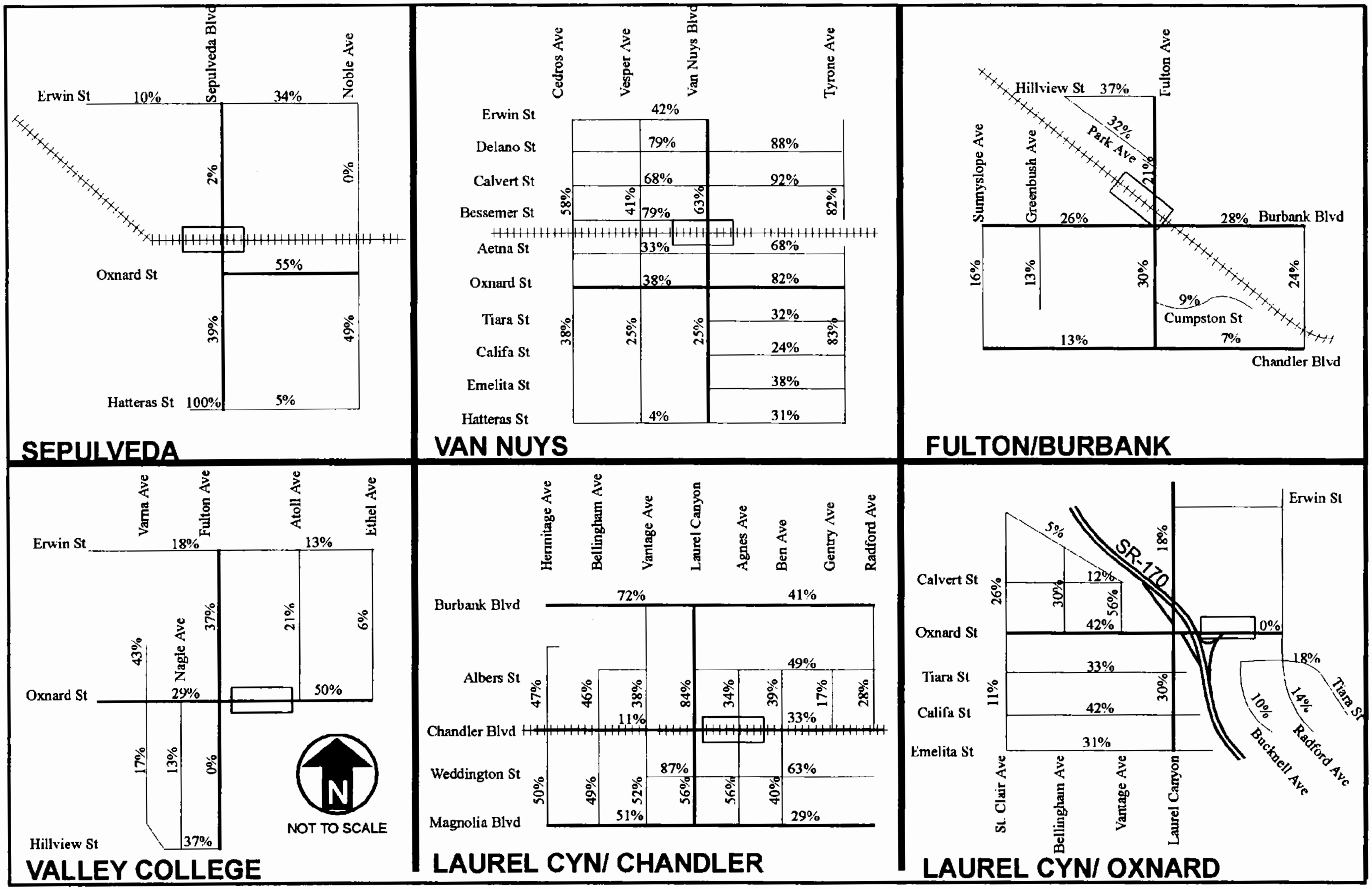
Laurel Canyon/Chandler Station area
On-street parking in the vicinity of the station's site is generally unrestricted. On-street parking in the vicinity of North Hollywood High School is limited to 1 or 2 hours. This area has approximately 1,300 on-street parking spaces and during the AM peak period approximately 46 percent of the available spaces are occupied.



SOURCE: Meyer, Mohaddes Associates, Inc.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 3-4.1
Available On-Street Parking Spaces



SOURCE: Meyer, Mohaddes Associates, Inc.

METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 3-4.2
On-Street Parking Utilization (AM Peak)

Table 3-4.1: Summary of Existing Parking Demand

Station	Total On-Street Spaces	Total On-Street Demand	Percent Occupancy
Laurel Canyon/Chandler	1329	611	46%
Laurel Canyon/Oxnard	836	208	25%
Fulton-Burbank	763	150	20%
Valley College	677	144	21%
Van Nuys	1514	782	52%
Sepulveda	500	150	30%
TOTAL	5619	2045	36%

Source: Meyer, Mohaddes Associates, 1997.

Laurel Canyon/Oxnard Station area
Existing on-street parking in the vicinity of the station location is primarily unrestricted with some segments restricted to No Stopping or No Parking Any Time. This area has 836 available on-street spaces with 25 percent AM peak period utilization.

Fulton/Burbank Station area
On-street parking in the neighboring area is primarily unrestricted, except for the streets near Los Angeles Valley College. This area has 763 available spaces and during the AM peak period experiences 20 percent utilization.

Valley College Station area
Most of the on-street parking in the area is restricted to No Parking with the exemption of Residents who possess a permit. Although primarily residential, permit restrictions are used due to the possible parking spill-over from Los Angeles Valley College. This area has 677 available spaces, of which 197 spaces are restricted for residents. The AM peak period utilization is approximately 21 percent.

Van Nuys Station area
Existing on-street parking in the vicinity of the station is primarily metered. The Valley Government Center is north of the proposed station. This area has 1,514 available on-street spaces with 52 percent AM peak hour utilization. Many blocks in this area experience full utilization during the AM peak period. The core area around the Valley Government Center experiences over 80 percent AM peak period utilization.

Sepulveda Station area
On-street parking in the vicinity of the station has approximately 500 available spaces. During the AM peak period 30 percent of the spaces are occupied.

3-4.2 Existing Off-Street Parking Conditions

The following is a description of current off-street parking areas at or around the station areas under consideration with the rail build alternatives.

North Hollywood Station
An at-grade station would be provided at this location with Alternatives 6a and 6b. Currently the area around the station site is developed with industrial uses. Scattered parking spaces are located in front or on the side of individual uses. No clearly defined parking lots currently exist. An approximately 850-900 space parking lot is currently under construction in conjunction with the North Hollywood Metro Rail Station.

Laurel Canyon/Chandler Station
Parking in proximity of the station site includes an approximately 110 space at-grade lot on the northeast corner of the Laurel Canyon Boulevard/Chandler Boulevard intersection and a four-story parking structure south of the station area on Laurel Canyon Boulevard. Both of these parking areas are currently used by office buildings in the vicinity of the station site. No parking spaces are currently located on the station site.

Laurel Canyon/Oxnard Station
The rail station proposed with this alternative would be located beneath Oxnard Street. Existing parking lots in the vicinity of the proposed station site include the approximately 100-space Caltrans park-and-ride lot and the parking lot of the Laurel Plaza shopping center. The park-and-ride lot is used on a daily basis by commuters. Shoppers and employees of Laurel Plaza utilize this parking area.

Fulton Burbank Station
A small number of parking spaces are currently provided to serve the small commercial center located south of the proposed station site. A large number of spaces are also provided by Valley College to serve the needs of the student population. Spaces located close to the main classroom area are highly desirable. No parking spaces are currently located on the actual station site.

Valley College Station
The station to be provided with this alternative would be located beneath Oxnard Street. A large parking area is located to the south of the station on Valley College property to serve the needs of the students. The northern portion of the campus is developed with a theater and administrative uses. As a result, the spaces in the northern lots are considered less desirable and are not always filled.

Van Nuys Station
The station site at this location is currently developed with industrial uses that feature small scattered parking areas for employees and visitors. Some portions of the station area are also used for storage of new cars by local auto dealers. To the east, an approximately 100 space lot is currently used by Continental Cable Vision for employee and service vehicle parking. No other large and clearly defined lots are currently present. Parking structures are located to the

north of the station site to serve employees of the Valley Government Center. These lots are typically filled to capacity during the work week. Generally, parking is considered to be in short supply in the vicinity of the Valley Government Center.

Sepulveda Station
The station site is currently used for vehicle and boat storage with several hundred vehicles randomly parked on the lot.

3-4.3 Parking Impacts

North Hollywood Station
Approximately 175 at-grade spaces would be provided in conjunction with the development of rail station at this site. The parking area would extend to the west of Lankershim Boulevard on right-of-way currently owned by the MTA.

Laurel Canyon/Chandler Station
The approximately 110-space at-grade parking lot to the north of the station will be needed as a staging area during construction of the station. Following the construction period the lot will be repaved and utilized for station parking. The approximately 110 spaces to provided exceeds the projected parking demand at this station by between 10 and 15 spaces.

Laurel Canyon/Oxnard Station
During the construction phase the approximately 100-space Caltrans park-and-ride lot will be used as a staging site. Following completion of station construction, the lot will be slightly expanded to approximately 140 spaces and used for station parking. This number of spaces exceeds projected demand at this station by about 50 spaces.

Valley College Station (Fulton-Burbank)
In conjunction with development of the rail station at this location, an approximately 60-space at-grade parking lot will be constructed in the MTA-owned right-of-way to the north of the rail station. The projected parking demand at this station exceeds the number of spaces by 20 spaces.

Valley College Station (Oxnard-Fulton)
No parking spaces are planned for this station site as the primary role of the station is to serve Valley College students and employees. Local residents will be able to walk to or be dropped off at the station. There is the potential in the future, if determined necessary, to develop an agreement to share parking with Valley College.

Van Nuys Station
To facilitate construction of the rail alignment and the aerial station at this location, the right-of-way would be cleared of existing uses from Hazeltine Avenue to Van Nuys Boulevard. A smaller area will also be cleared on the west side of Van Nuys Boulevard, extending to Cedros Avenue. Following construction, these areas would be developed as parking lots. Approximately 1,250 at-grade spaces would be provided. This would exceed projected demand by between 700 and 800 spaces, in order to accommodate anticipated spillover demand from the Sepulveda station.

Sepulveda Station

In conjunction with the development of the rail station, the area to the north of the rail right-of-way currently used for vehicle storage (formerly Sepulveda Drive-In) would be developed as a parking area and bus drop-off facility. Due to projected parking demand at this station, a portion of the parking lot will be striped for tandem parking. Attendants will be present at the station during rush hour periods to facilitate the parking and retrieval of vehicles and provide on-site security. A total of approximately 1,800 at-grade parking spaces would be provided. The projected demand for parking at this location is approximately 2,700 cars which exceeds the number of spaces to be provided by 900 spaces. As a result significant impacts could occur at this location.

Summary of Parking Impacts

The total number of parking spaces needed for the rail build alternatives is about 3,400 spaces. The combined total number of at-grade spaces to be provided in conjunction with the development of the rail alternatives is 3,395 with the SP Burbank/Chandler alignment and 3,365 with the Oxnard Street alignment (see Tables 3-4.2 and 3-4.3). As described above, all the stations except the Sepulveda Station provide parking at a level near to or exceeding projected demand. Experience with other rail systems, including the Blue Line, has shown that, to some degree, the availability of parking can affect the travel patterns of individuals traveling to rail stations. Stations with a larger number of available spaces or with easier access will often be chosen by drivers over a slightly closer station that is often full or difficult to reach. Consequently, it is reasonable to assume that transit patrons will choose to utilize the excess spaces provided at stations to the east, thereby reducing the excess demand at the Sepulveda station to approximately 1,800 spaces. To further reduce demand, an approximately 350-space at-grade parking lot will be developed in the right-of-way directly east of Woodley Avenue with access to the Sepulveda station by means of a frequently-operating shuttle system. Development of these spaces would increase the total parking supply to 3,715 and reduce demand at the Sepulveda station. While this does improve the parking situation to some degree, significant impacts would continue to occur prior to mitigation.

Table 3-4.2: Parking Spaces to be Provided

Burbank Chandler Alignment	
Station	**Estimated Spaces**
Sepulveda	1,800
Van Nuys	1,250
Fulton Burbank	60
Laurel Canyon/Chandler	110
North Hollywood	3,220
TOTAL	3,395

Source: Meyer, Mohaddes Associates, 1997.

Table 3-4.3: Parking Spaces to be Provided

Oxnard Street Alignment	
Station	**Estimated Spaces**
Sepulveda	1,800
Van Nuys	1,250
Valley College	0
Laurel Canyon/Oxnard	140
North Hollywood	3,190
TOTAL	3,365

Source: Meyer, Mohaddes Associates, 1997.

3-4.4 Mitigation Measures

The following mitigation program consists of three phases: 1) monitoring of actual parking demand at each station as system ridership grows, 2) implement demand management measures to maximize use of the at-grade parking areas provided at the individual stations, and 3) if determined necessary, construction of additional at-grade parking lots in the West Valley.

Phase 1: Beginning at opening day of the rail system, the MTA will monitor system ridership and parking demand at each of the individual station areas. Growth of ridership and increases in parking demand at each station will be documented in an annual report. This report shall be made available at MTA offices for review by residents and other citizens who may be affected by station access or spill-over parking effects.

Phase 2: The traffic and parking analysis assumes an average vehicle ridership (AVR) of 1.1. By increasing AVR to 1.5 (every other car carries two people) the demand for parking could be met at the lots to be provided at opening day. Reaching this AVR is considered to be a feasible goal based on experiences with other rail lines. When system ridership and/or parking demand reaches 70 percent of the level projected for the Sepulveda station, the MTA shall implement any combination of the following measures to increase vehicle occupancy to reach the 1.5 AVR target.

- Preferentially-located spaces designated for carpoolers in close proximity to the station platforms.
- A special vehicle drop-off and pick-up area for carpoolers at the Sepulveda station.
- Assigned, reserved spaces for consistent carpoolers.
- Information on these preferential options will be distributed to transit riders at each of the stations.

Phase 3: At the point when system ridership reaches 90 percent of projected ridership, the effectiveness of these measures will be assessed in terms of reaching the 1.5 AVR goal. If this goal has not been reached the following measures shall be implemented:

- Development of additional at-grade parking lots in the West Valley at the location of previously proposed rail station sites at Balboa Boulevard, Reseda Boulevard, Winnetka Avenue, and Topanga Canyon Boulevard. Approximately 400 spaces could be provide at each station site, resulting in a total of 1600 spaces. Development of these lots should substantially relieve parking demand at the Sepulveda station as a large number of transit patrons arriving at the Sepulveda Station are predicted to be originating in the West Valley. The development of these additional lots would result in the provision of a total of 5,315 spaces which exceeds the projected demand.

- Implementation of a frequently-running shuttle between these parking lots and the Sepulveda station.

Ongoing monitoring of parking demand at the rail stations shall be conducted to determine if these lots have effectively relieved parking demand, particularly at the Sepulveda station. If the provision of these additional lots are not determined to be effective the MTA shall also investigate development of remote parking lots in areas to the north and west of the San Fernando Valley.

CHAPTER 4

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF THE EAST VALLEY ALTERNATIVES

CHAPTER 4: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF THE EAST VALLEY ALTERNATIVES

Note: While the California Environmental Quality Act (CEQA) requires that each effect that has a "significant impact" be identified in an Environmental Impact Report (EIR), the National Environmental Policy Act (NEPA) does not. In this joint federal and state environmental document, reference to "significant impacts" is made to fulfill the requirement made under CEQA, pursuant to standards of California law. Evaluations of significance in this document do not represent assessments of the magnitude of such impacts under the requirements of federal law. Under NEPA, no such determination need be made for each environmental effect.

4-1 LAND USE AND DEVELOPMENT

4-1.1 Regional Context

The San Fernando Valley East-West Transportation Corridor project area is located in the central part of Los Angeles County, approximately 20 miles northwest of the Los Angeles Central Business District. The entire corridor begins at the North Hollywood Metro Red Line station and continues westward across the Valley terminating at Valley Circle Boulevard in the West Valley; however, major transportation investments are being considered for near-term implementation only in the East Valley portion of the corridor, which terminates at I-405. The entire corridor under consideration lies within the boundaries of the City of Los Angeles.

According to the Southern California Association of Governments (SCAG), approximately 68 percent of the land in the entire San Fernando Valley is residential in use. The residential character of the Valley varies depending on location. Generally, the southern half of the Valley is a mixture of lower density, single family homes, apartments, and condominiums. The northern half is characterized by predominantly single family residences.

Commercial development in the study area generally consists of older, lower-density strip commercial land uses located along major arterials. Laurel Plaza and Valley Plaza shopping centers, both located along Laurel Canyon Boulevard, are the major retail centers in the East Valley. Concentrations of industrial uses are found along the SP Burbank Branch from Hazeltine Avenue to I-405. Major public land uses include North Hollywood and Grant High Schools, Los Angeles Valley College (Valley College), and the Valley Government Center.

4-1.2 Existing Land Use Patterns

For the TSM Alternative, which involves improving transit service on major streets throughout the Valley, the study area would contain the generalized land uses described above. For the rail alternatives, the existing development pattern in the study area is described below, first within approximately one block (500 feet) of the two proposed rail alignments and secondly within a one quarter-mile (1,300 feet) radius of the proposed transit stations. This radius was chosen to correspond with a 10-minute, relatively slow walking distance from the station sites, which is considered the maximum distance the average person will walk to reach transit. The distance also corresponds with the "Primary Influence Area" identified in the *City of Los Angeles Transportation/Land Use* Policy.

a. SP Burbank Branch Alignment

The land uses located along this alignment are shown in Figure 4-1.1 and Figure 4-1.2 and are as follows:

- "WOW" Curve (see description in Chapter 2): Along this portion of the alignment, the area south of Burbank Boulevard is a mixture of single-family uses; between Burbank Boulevard and SR 170 is a municipal area and North Hollywood Park; and the area southwest of SR 170 is a mixture of single- and multi-family.

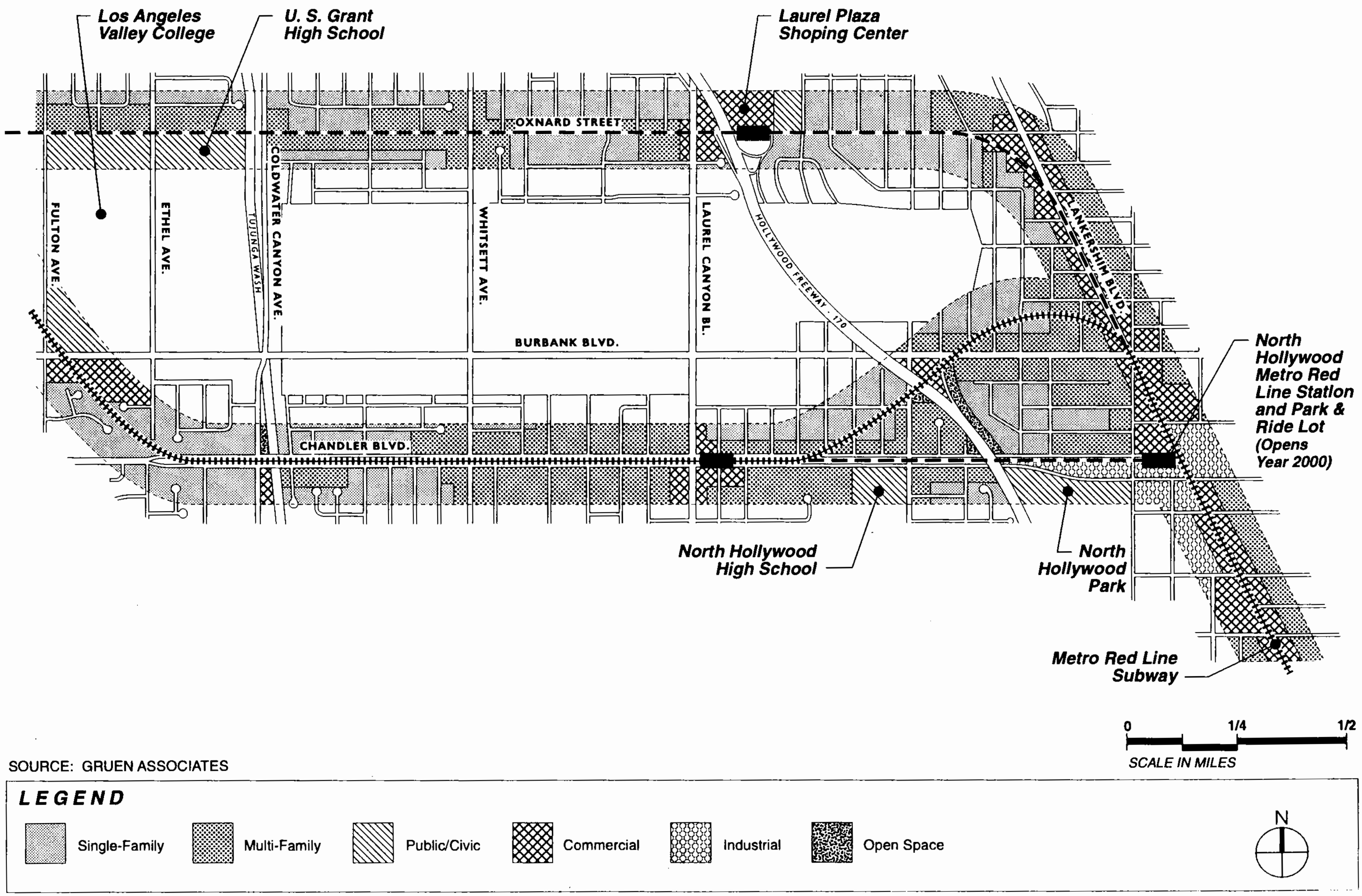
- North Hollywood Station to Chandler Boulevard Junction near Ethel Avenue: The existing rail right-of-way passes down the median of Chandler Boulevard, which is lined with a fairly even mixture of single-family and multi-family residences. Small sections of commercial uses are located at the intersections of major streets such as Laurel Canyon and Coldwater Canyon Boulevards. Two schools are located directly south of the alignment in this area, Emek Hebrew Academy, and North Hollywood High School. See Figure 4-1.3 for an aerial view of land uses west of the North Hollywood Station. An area of industrial uses is located on the south side of Chandler Boulevard between Lankershim Boulevard and SR 170.

- Chandler Junction to Hazeltine Avenue: The former SP Burbank Branch leaves the Chandler Boulevard median right-of-way in the vicinity of Ethel Avenue to assume a diagonal alignment to the northwest. This diagonal segment passes almost in its entirety along the backyards of single-family and multi-family residences. A small portion of this segment passes next to commercial uses clustered around the intersections of Fulton Avenue and Burbank Boulevard and Woodman Avenue and Oxnard Street. See Figure 4-1.4 for a view of land uses in the vicinity of Fulton Avenue and Burbank Boulevard.

- Hazeltine Avenue to I- 405: This portion of the alignment runs along the rear of commercial and industrial properties. See Figure 4-1.5 for a view of land uses east of Van Nuys Boulevard and Figure 4-1.6 for a view of land uses west of Van Nuys Boulevard.

b. Oxnard Alignment

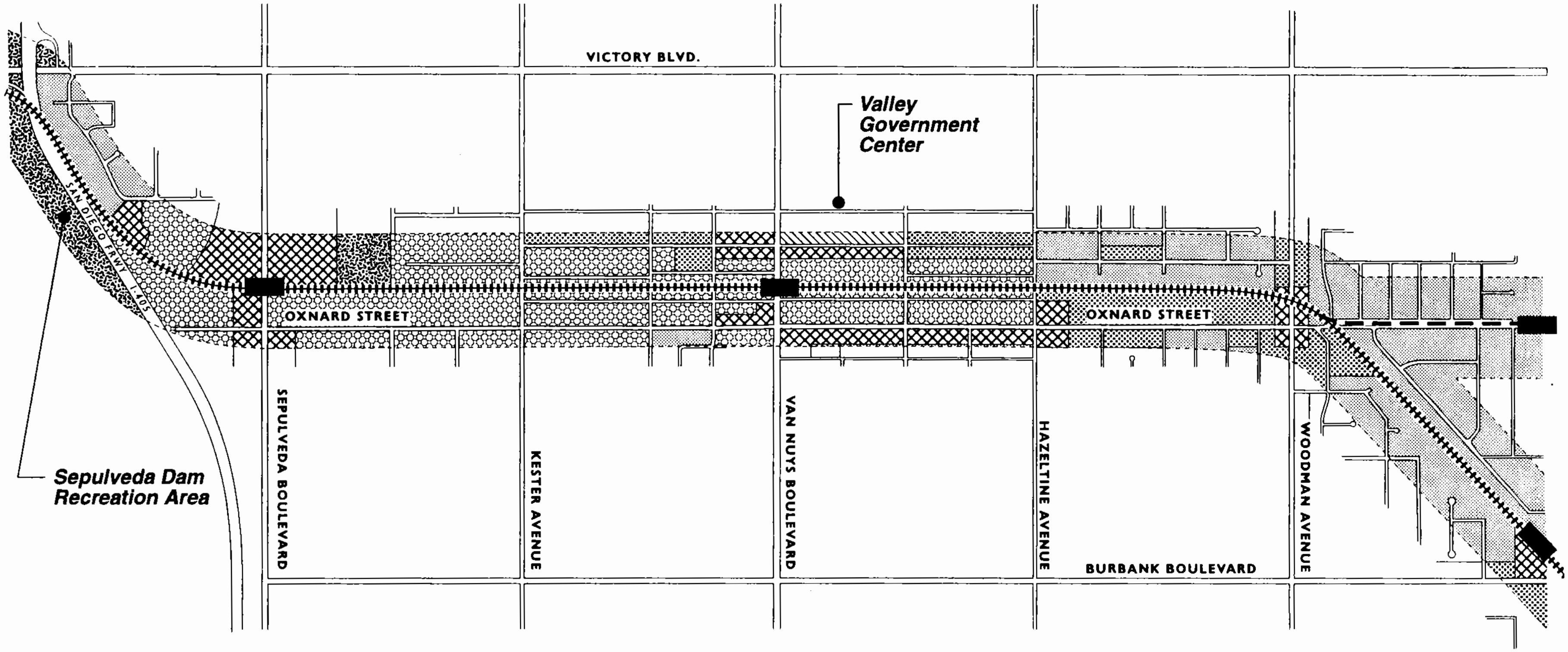
- North Hollywood Station to Woodman Avenue (see Figure 4-1.1 and Figure 4-1.2). This route follows Oxnard Street, which is a major east-west major arterial. Land uses along Oxnard Street are primarily multi-family residences and the campuses of Ulysses S. Grant High School (Grant High School) and Los Angeles Valley College (Valley College).



SOURCE: GRUEN ASSOCIATES, 1997.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-1.1
Existing Corridor Land Uses North Hollywood Red Line Station to Fulton Avenue



0 1/4 1/2
SCALE IN MILES

SOURCE: GRUEN ASSOCIATES

LEGEND

Single-Family · Multi-Family · Public/Civic · Commercial · Industrial · Open Space

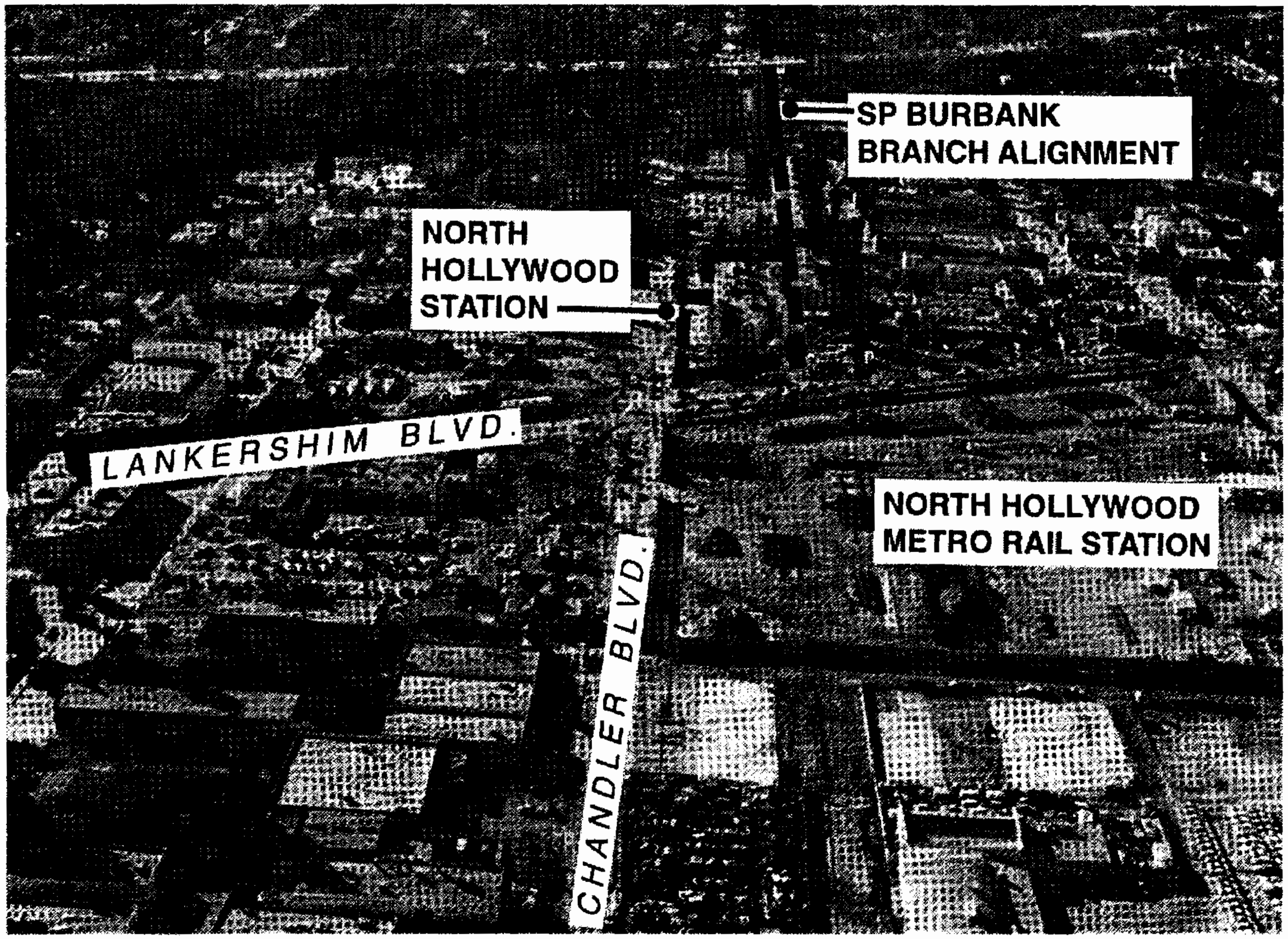
N

SOURCE: GRUEN ASSOCIATES, 1997.

METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

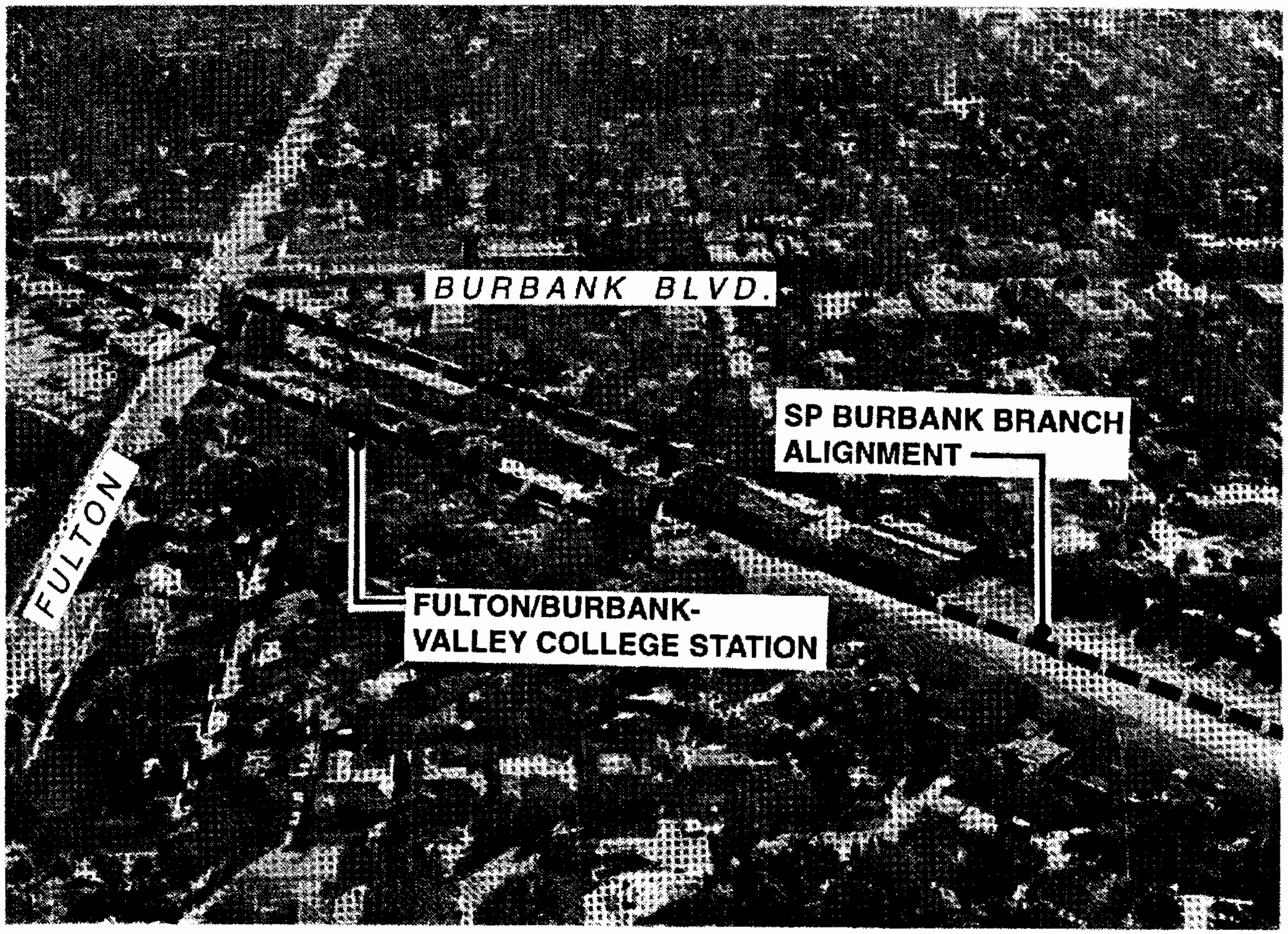
FIGURE 4-1.2
Existing Corridor Land Uses
Fulton Avenue to I-405



View looking west along Chandler Boulevard at Lankershim Boulevard. The area outlined in the right of the photo will be the future park and ride lot and Bus Transit Center to serve the Metro Red Line North Hollywood Station (scheduled to open in the year 2000)

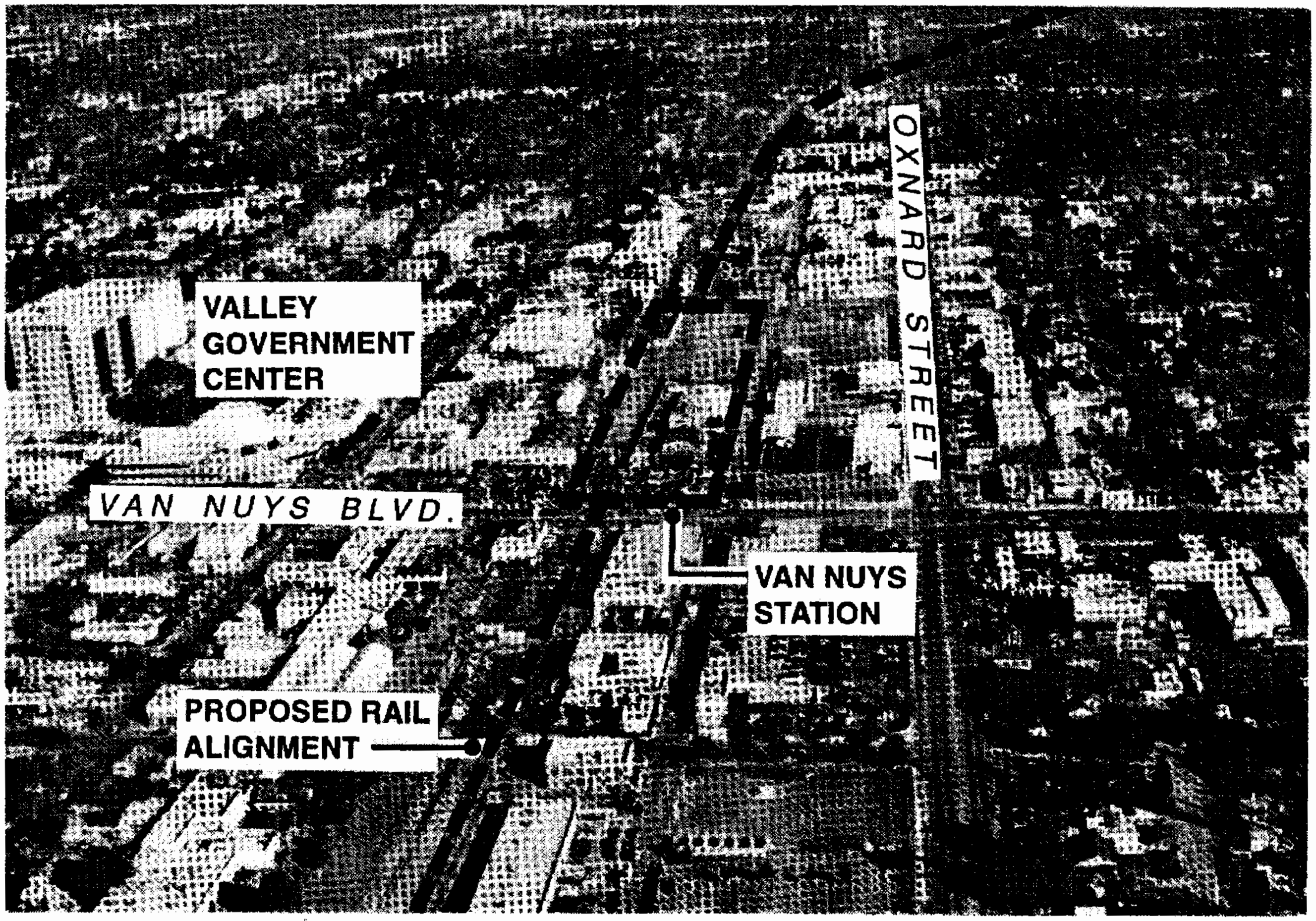
SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 4-1.3
View of Land Uses at North Hollywood Station



View looking south along Fulton Avenue at the proposed Valley College (Fulton-Burbank) Station. The site is presently leased to Neiman Reed Lumber Company and several commercial/industrial tenants. Adjacent land uses include Los Angeles Valley College and single-family residential neighborhoods.

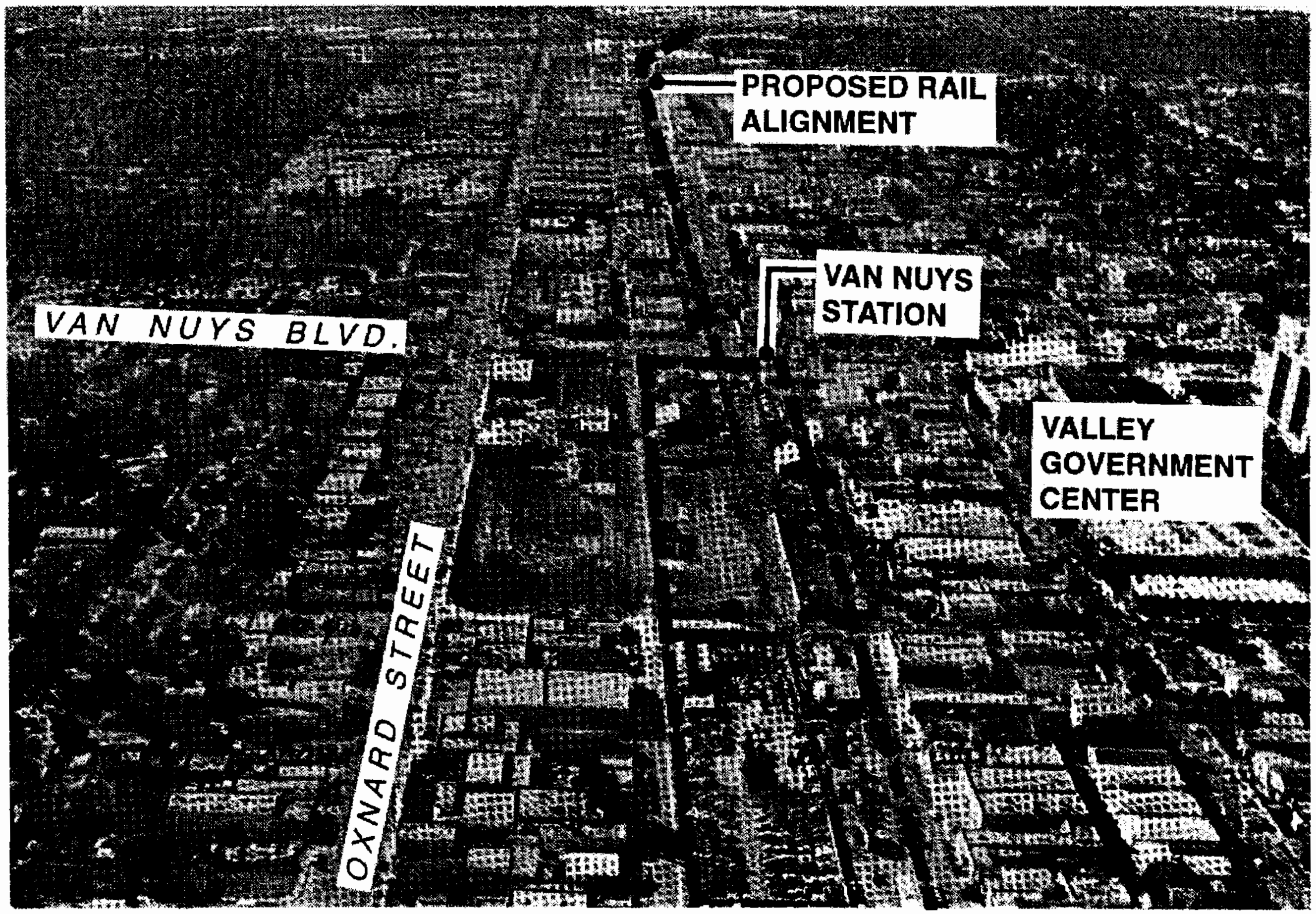
SOURCE: GRUEN ASSOCIATES, 1997.



View looking east along the rail alignment at the proposed Van Nuys Station. Land uses adjacent to the railroad line are prominantly industrial/commercial leases that were developed when the line was used for freight rail service. The San Fernando Valley Government Center is the predominant use in this area that would be served by the proposed station.

SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 4-1.5
View of Land Uses East of Van Nuys Boulevard



View looking west along the rail alignment at the proposed Van Nuys Station. Van Nuys Boulevard is one of the heaviest used bus routes in the San Fernando Valley and this station site will provide an important transfer point between these bus routes and the rail line.

SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 4-1.6
View of Land Uses West of Van Nuys Boulevard

Commercial uses are located at the intersections of major streets such as Laurel Canyon Boulevard, Coldwater Canyon Boulevard, and Woodman Avenue. See Figure 4-1.7 for a view of land uses on Oxnard Street east of Fulton Boulevard.

- Woodman Avenue to I-405: This portion of the alignment follows the SP Burbank Branch alignment along the rear of single- and multi-family dwelling to Hazeltine Avenue and behind commercial and industrial properties from Hazeltine Avenue to Sepulveda Boulevard.

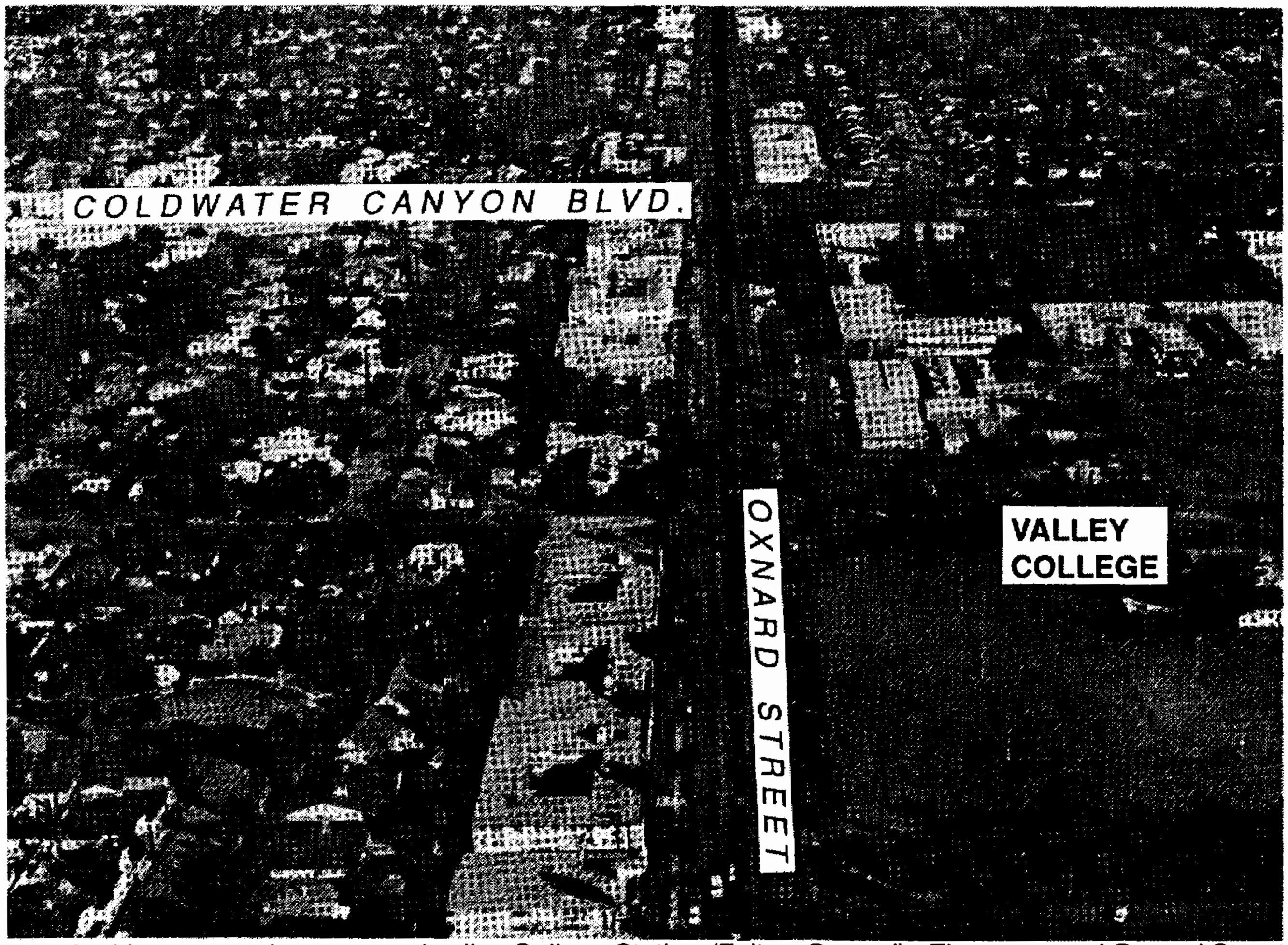
c. North Hollywood Station

Alternative 6: This alternative would locate a station in the Los Angeles County Metropolitan Transportation Authority (MTA) railroad right-of-way west of Lankershim Boulevard between the north and south roadways of Chandler Boulevard. On this site is the historic Toluca Railroad Depot, which would be retained and incorporated into the design of the station. One of the proposed alternatives would require a second station at North Hollywood to provide for a transfer between the Metro Red Line Subway Heavy Rail line and East-West Light Rail line. This station would not be required if one of the heavy rail extensions or bus options were selected for the project. Immediately adjacent to the site are several light industrial and storage uses. Located to the north and south along Lankershim Boulevard are storefront commercial uses. In the larger area around the station site are a wide mixture of uses including commercial, light industrial, multi-family residential and open space. Northeast of the station site, a large area has been converted from light industrial and commercial uses to the North Hollywood Metro Rail station. Southwest of the station site is North Hollywood Park and to the north several multi-family residential neighborhoods.

d. Laurel Canyon Station

Alternatives 1, 6, and 11: For these alternatives, a station would be located on the east side of the intersection of Chandler and Laurel Canyon Boulevards. Immediately adjacent to the site are a parking lot, parking garage, an office building, several small-scale retail stores and the recently-built Valley Village Senior Apartments. A series of small stores extends along Laurel Canyon Boulevard to the south, while multi-family residences and commercial uses are found to the north. Development along Chandler Boulevard in this vicinity consists mainly of two- to three-story apartment complexes. The campus of North Hollywood High School lies approximately one-third of a mile to the east. Northeast of the station area is a neighborhood of single-family homes (see Figure 4-1.8).

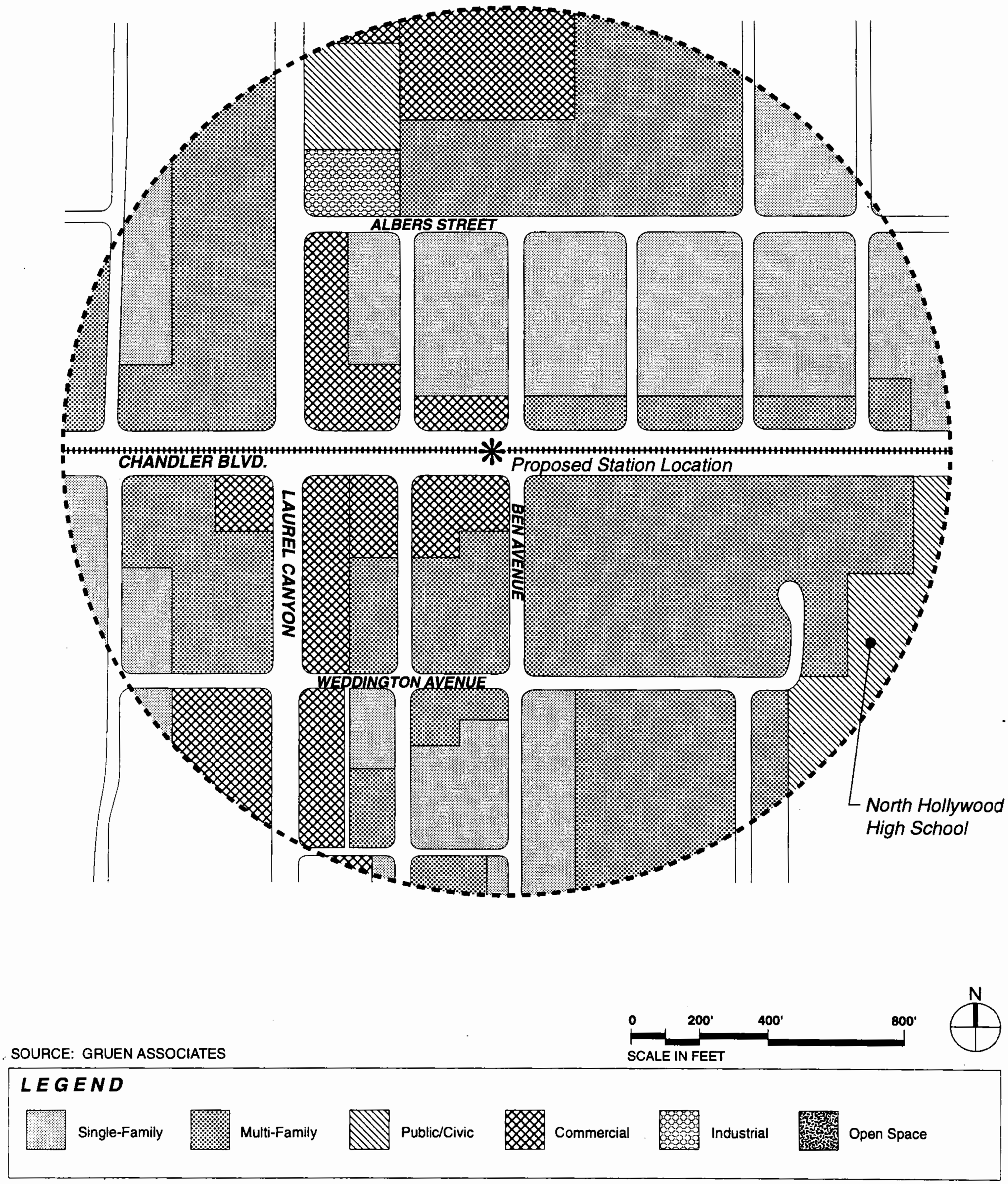
Alternative 2: For Alternative 2, a station would be located near the intersection of Oxnard Street and Laurel Canyon Boulevards on the east side of the Hollywood Freeway. A portal would be provided at the Caltrans park-and-ride lot and on the southern edge of the Laurel Plaza shopping center. Uses directly adjacent to the station area include parking lots, SR 170, Laurel Plaza (Robinsons-May Department Store), Emmanuel Lutheran Church, and Laurel Hall School. The intersection of Laurel Canyon Boulevard and Oxnard Street is characterized by auto-oriented uses, including a gas station, a car wash, and an auto body repair facility. A mix of single-family houses and multi-family apartment complexes are located to the south and west of the intersection. East and north of the station site are single-family neighborhoods. Beginning



View looking east at the proposed valley College Station (Fulton-Oxnard). The proposed Oxnard Street alternative would be configured in deep-bore subway under Oxnard Street with a station located on the Valley college property at the corner of Oxnard Street and Fulton Avenue.

SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 4-1.7
View of Land Uses on Oxnard Street East of Fulton Boulevard



SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 4-1.8
Laurel Canyon/Chandler Station
Area Land Uses

approximately one-quarter mile to the north of the station, Laurel Canyon Boulevard is lined by storefronts that extend to Victory Boulevard and Valley Plaza (see Figure 4-1.9).

e. Valley College Station

Alternatives 1, 6, 11: These alternatives would locate a station at Fulton Avenue and Burbank Boulevard, near the southwest corner of the Valley College campus. Small-scale retail stores and restaurants serving the campus population characterize the intersection. Several auto repair facilities are also found on the southwest side of the intersection. On the northwest quadrant of the intersection, a lumber yard currently occupies a portion of the right-of-way, via a lease from the MTA. Northeast of the station are the classroom buildings of Valley College and single-family homes are located to the northwest. Additional single-family neighborhoods are found south of the station site on Fulton Avenue, while several apartment complexes are located to the west along Burbank Boulevard (see Figure 4-1.10).

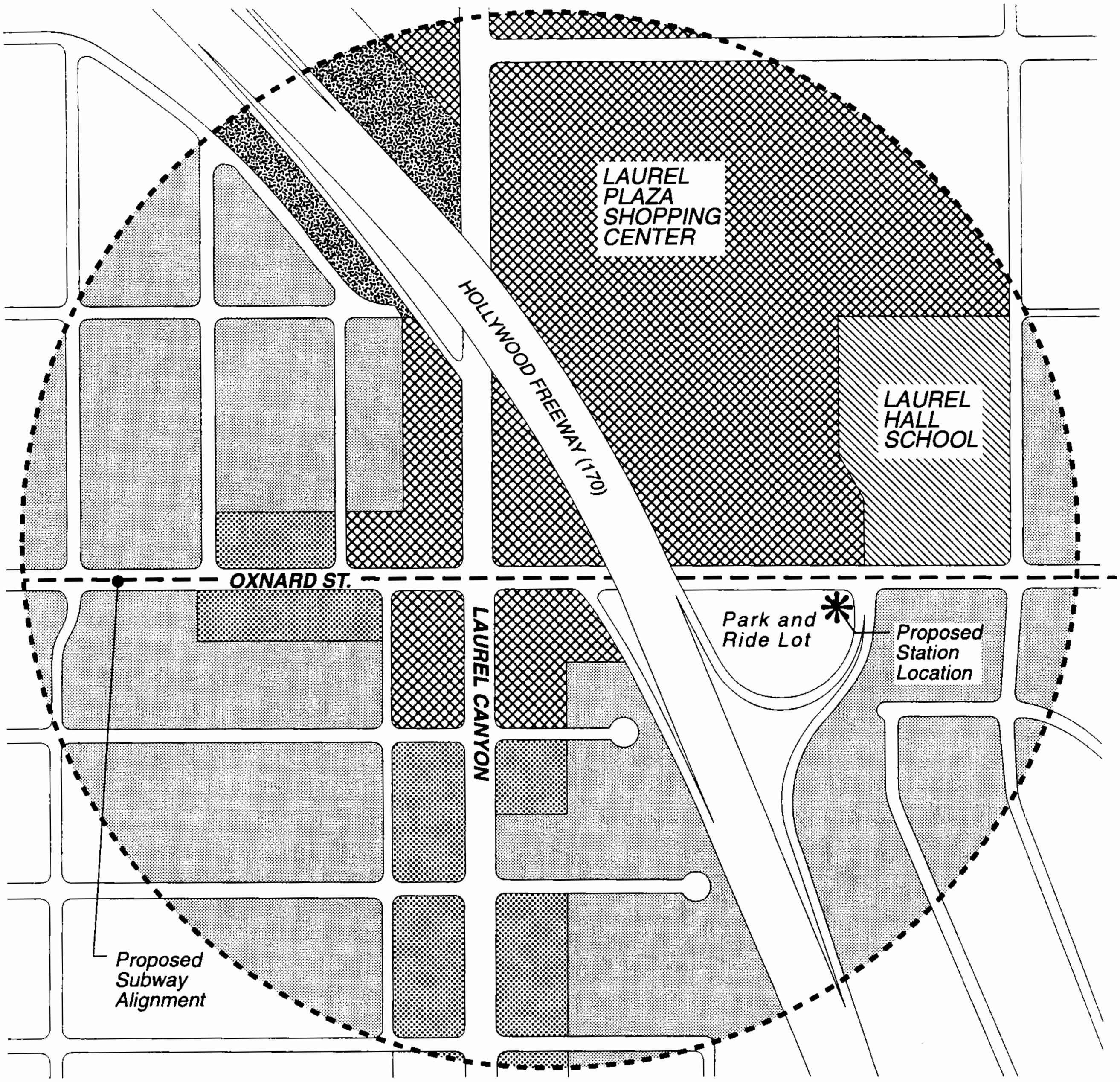
Alternative 2: Under Alternative 2, a station serving Valley College would be located at Oxnard Street and Fulton Avenue. Southeast of the station is the Valley College campus, and farther east along Oxnard Street lies Grant High School. With the exception of these two educational institutions, land uses within one-quarter mile of the station site are exclusively residential. Multi-family residences are concentrated along Fulton Avenue north of the proposed station, and single-family units are found west of the station along Oxnard Street and south along Fulton Avenue (see Figure 4-1.11).

f. Van Nuys Station

All of the proposed rail alternatives would locate an aerial station roughly at the corner of Van Nuys Boulevard and Aetna Street. The majority of station facilities would be located on the east side of the street with a smaller parking area to be provided on the west side of the Boulevard. On the east side of Van Nuys Boulevard, land uses immediately adjacent to the station site consist of a mix of industrial and large-scale commercial structures, including Valley Dodge and other car dealerships. Some of these dealerships currently occupy portions of the SP Burbank Branch right-of-way. Two blocks north of the station site are the office buildings and courthouses of the Valley Government Center, a major regional activity center. Across Van Nuys Boulevard from the Government Center, a series of small stores and restaurants extends north past Victory Boulevard. South of the station site, industrial buildings line Oxnard Street, while Van Nuys Boulevard is characterized by several car dealerships. Residential uses within one-quarter mile of the station are multi-family to the north and east and single-family to the south (see Figure 4-1.12).

g. Sepulveda Station

All of the rail alternatives would locate an aerial station at Sepulveda Boulevard, roughly two blocks south of Erwin Street. Vehicular access, parking, and other station facilities would be located on the west side of Sepulveda Boulevard. A small pedestrian plaza area with access to the station platforms would also be provided on the east side of the Boulevard. Sepulveda



SOURCE: GRUEN ASSOCIATES

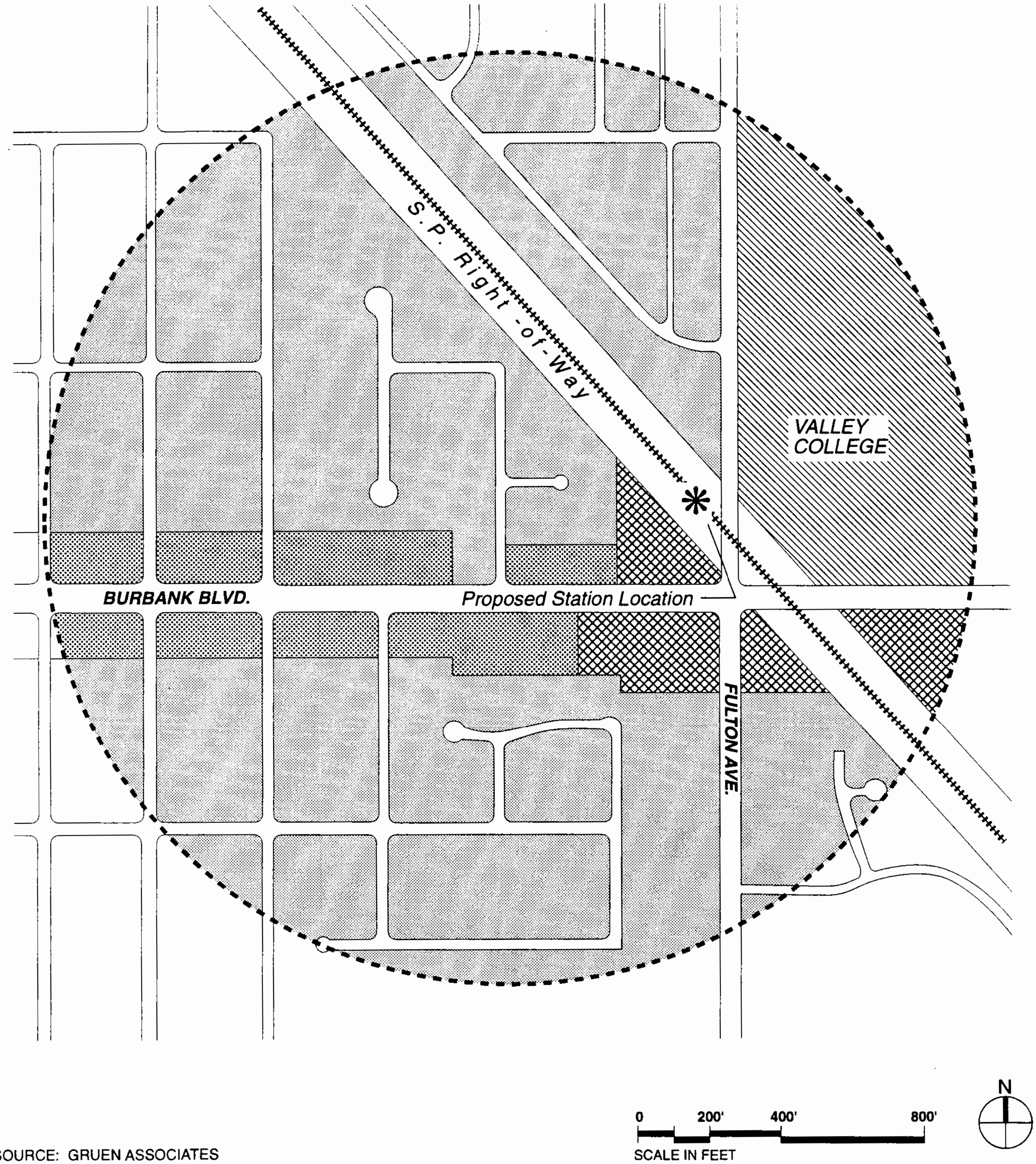
LEGEND

Single-Family | Multi-Family | Public/Civic | Commercial | Industrial | Open Space

SOURCE: GRUEN ASSOCIATES, 1997.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-1.9
Laurel Canyon/Oxnard Station
Area Land Uses

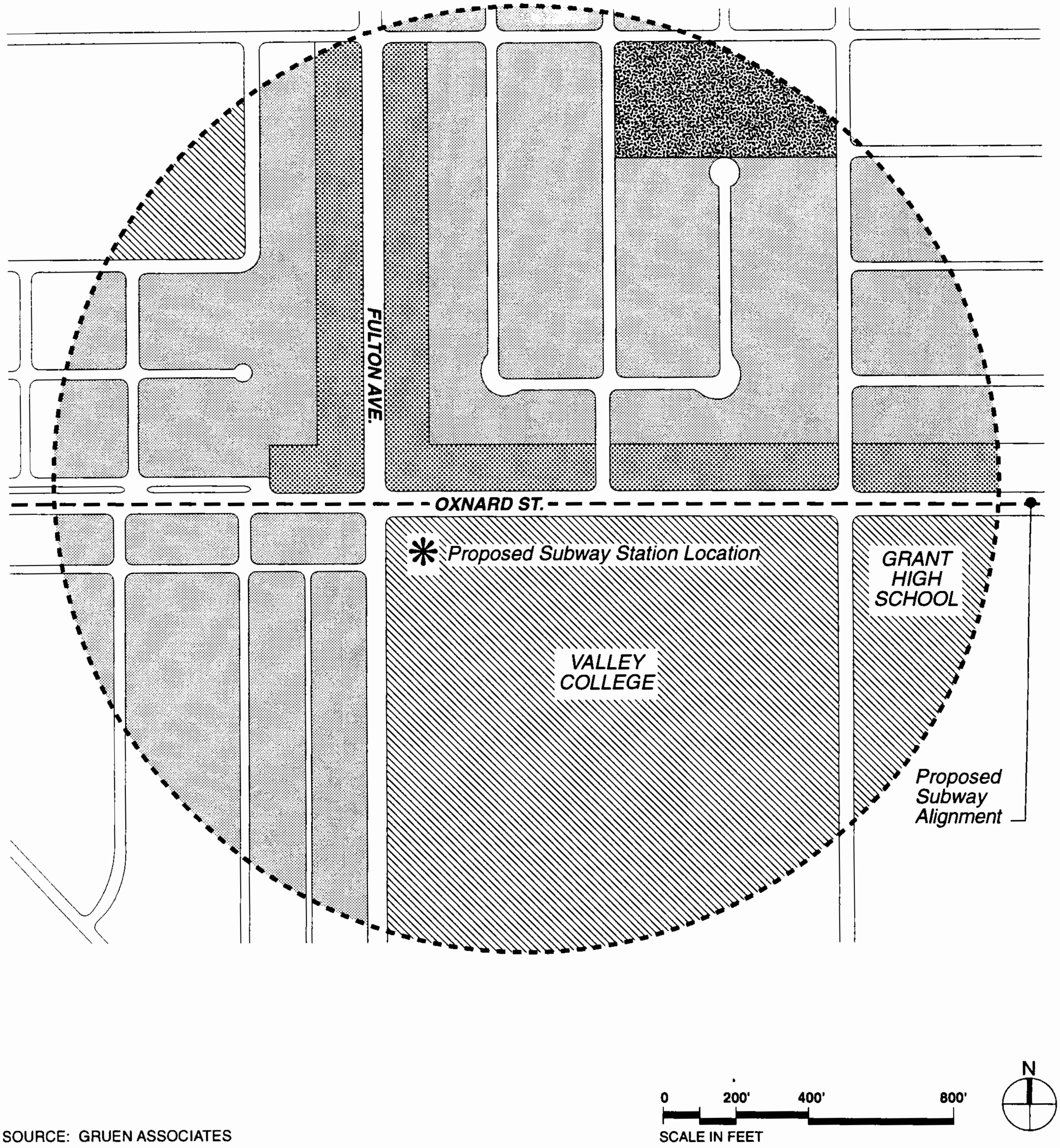


SOURCE: GRUEN ASSOCIATES

LEGEND

Single-Family
Multi-Family
Public/Civic
Commercial
Industrial
Open Space

SOURCE: GRUEN ASSOCIATES, 1997.



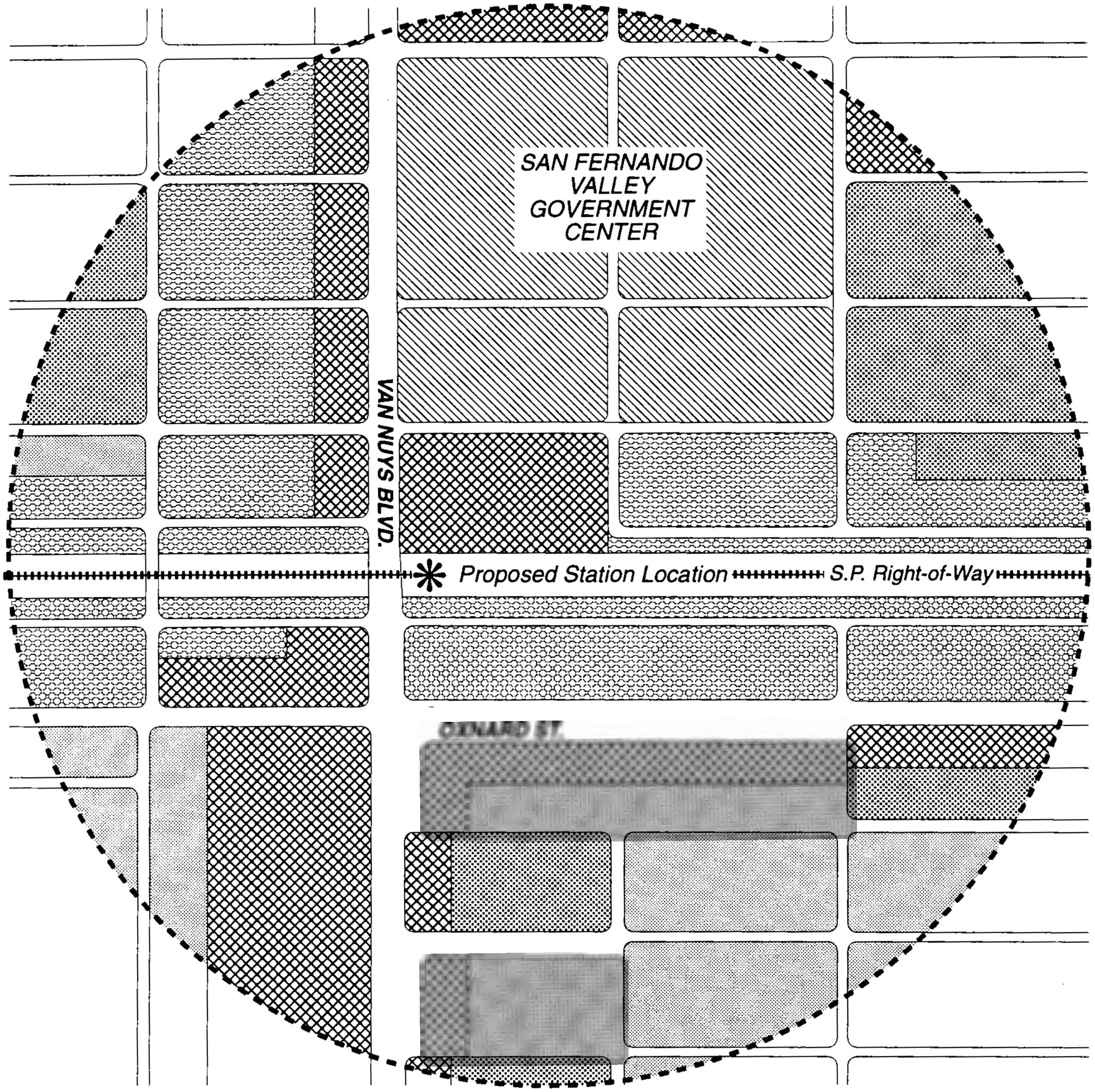
SOURCE: GRUEN ASSOCIATES

LEGEND

Single-Family | Multi-Family | Public/Civic | Commercial | Industrial | Open Space

SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 4-1.11
Fulton/Oxnard - Valley College
Station Area Land Uses



0' 200' 400' 800'
SCALE IN FEET

N

SOURCE: GRUEN ASSOCIATES

LEGEND

Single-Family | Multi-Family | Public/Civic | Commercial | Industrial | Open Space

SOURCE: GRUEN ASSOCIATES, 1997.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-1.12
Van Nuys Station Area

Boulevard in the immediate vicinity of the station site is lined with large-scale commercial structures including a Costco store, a Wickes Furniture showroom and warehouse, and two recently-constructed mid-rise office buildings. South of the station site are industrial uses and large-scale commercial buildings; to the north are smaller-scale commercial uses and fast-food restaurants. West of the station site, opposite the station's proposed park-and-ride lot, is a public rental storage facility. North of the park-and-ride lot is Cameron Woods, a single-family residential neighborhood (see Figure 4-1.13).

4-1.3 Planned Land Use

The relevant planning documents for the East Valley study area include the following:

- *City of Los Angeles General Plan Framework*
- *North Hollywood Community Plan*
- *Van Nuys-North Sherman Oaks Community Plan*
- *City of Los Angeles Land Use/Transportation Policy*

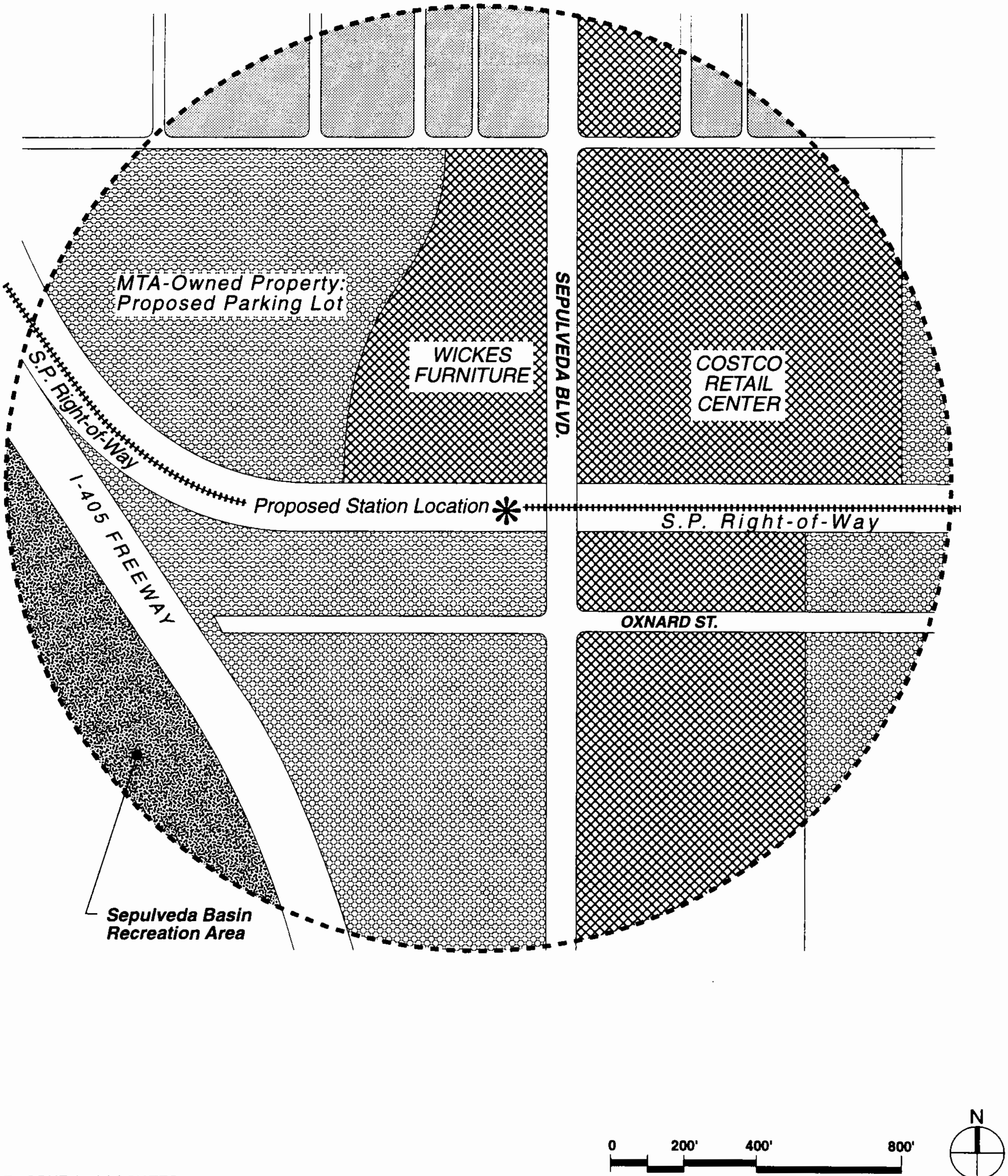
a. General Plan Framework

The Los Angeles General Plan Framework (Framework), adopted December 1996, is the citywide portion of the City of Los Angeles' General Plan, which is intended to guide the city's long-range growth and development through the year 2010. The *Framework* establishes citywide planning policies regarding land use, housing development, urban form and neighborhood design, open space and conservation, economic development, transportation, and provision of infrastructure and public services. Of particular relevance to the San Fernando Valley East-West Transportation Corridor are the policies concerning land use and transportation. The *Framework's* land use policies designate the number and type of existing activity centers as focal points for future growth. The categories of centers, in order of increasing size, are neighborhood districts, community centers, and regional centers. The *Framework* designates regional centers as hubs for bus and rail transit. Within the San Fernando Valley East-West Transportation Corridor, principal regional centers include the North Hollywood Business District, the Valley Plaza/Laurel Plaza shopping area, the Valley Government Center, and Warner Center.

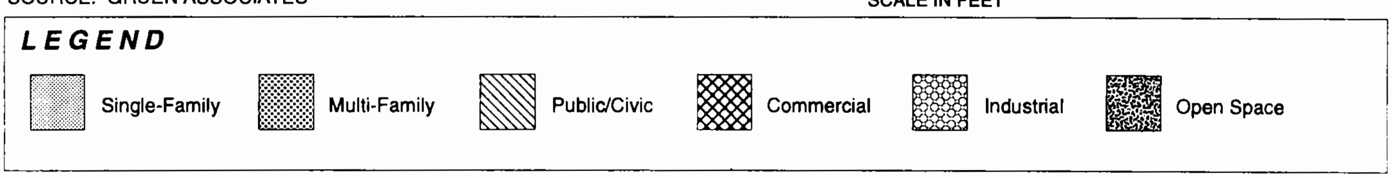
The *Framework's* transportation policies seek to develop transit alignments and station locations that maximize transit service in activity centers. Together, the *Framework's* land use and transportation policies encourage development in these "targeted growth areas" by allowing more intense development than in non-targeted areas and calling for streamlined traffic analysis and mitigation procedures. The purpose of these development modes is to allow the maintenance of lower-density land uses in existing neighborhoods that are not located next to public transit and reduce the pressures for upzoning in these areas.

b. Community Plans

For land use planning purposes, the City of Los Angeles is divided into 35 community planning districts. For each of these districts, a community plan has been prepared to establish land use



SOURCE: GRUEN ASSOCIATES



SOURCE: GRUEN ASSOCIATES, 1997.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-1.13
Sepulveda Station Area

designations, policies, and implementation programs. These individual plans are considered collectively to be part of the *Land Use Element* of *Los Angeles General Plan* and are a means through which citywide land use policies are applied to specific development proposals.
The SP Burbank Branch right-of-way passes through two community planning districts in the East San Fernando Valley: North Hollywood and Van Nuys-North Sherman Oaks.

The *North Hollywood Community Plan*, adopted March 1975 (updated in 1995), currently designates the SP Burbank Branch right-of-way along Chandler Boulevard as a "Major Scenic Highway," and proposes a bicycle and equestrian path along the right-of-way. Designated land uses along the SP Burbank Branch right-of-way are predominantly multi-family residential, with commercial uses clustered at Lankershim and Laurel Canyon Boulevards. Oxnard Street, which provides the right-of-way for Alternative 2, passes through districts designated as multi-family residential and commercial.

The *Van Nuys/North Sherman Oaks Community Plan*, adopted October 1977 (updated in 1991), currently designates the SP Burbank Branch right-of-way as a transit study corridor. Designated land uses along the right-of-way are a mix of commercial, industrial, and high/medium density residential. In addition, the *Plan* designates the portion of the right-of-way between Ethel and Coldwater Canyon Avenues as part of a Chandler Boulevard scenic corridor. A bikeway is proposed within the right-of-way between I-405 and Sepulveda Boulevard. This plan is currently being updated by the City Planning Department.

c. Land Use/Transportation Policy

The purpose of the *City of Los Angeles Land Use/Transportation Policy*, adopted November 1993, is to provide a framework to guide future development around transit station areas. It designates a "primary influence area" of a 1/4 mile radius from transit stations. Within these influence areas, the policy seeks to establish transit centers and station areas as places where the future growth of Los Angeles is focused. An objective is to concentrate mixed commercial/residential uses, neighborhood-oriented retail, employment opportunities, and civic uses around transit stations, while protecting surrounding low density neighborhoods from encroachment of incompatible land uses.

4-1.4 Localized Land Use Impacts

This section assesses how the proposed project would alter the existing land use pattern and overall development character of the study area. The potential impact area for this portion of the analysis is defined as approximately 300 feet (two parcel depths) to either side of the rail alignment and within a one quarter mile radius of the proposed rail stations.

a. Methodology and Significance Criteria

The introduction of expanded bus service under the TSM Alternative would have a relatively modest effect on land use patterns, and therefore no impact methodology has been undertaken. The introduction of fixed rail transit improvements in the corridor does have the potential to cause impacts related to the changed use of the corridor itself and from proximity impacts resulting from the alignment passing close to sensitive land uses. Table 4-1.1 summarizes sensitive land uses adjacent to each rail alternative. The greatest potential for impacts exists at the station areas, as these sites will be the focus of the additional activity generated by the project. Impacts to existing land uses were identified through a review of the engineering drawings prepared for the alternate alignments/profiles, conceptual station area site plans, and information regarding land acquisitions (see Section 4-2, below). Parcels that would be directly altered as a result of the proposed project were identified and the proposed future land use (for either the alignment or station) was analyzed in terms of its compatibility with uses on adjacent parcels.

For the purposes of determining compatibility, it is assumed that higher-density land uses (office, retail, industrial, and in some cases multi-family housing) would be compatible with a transit project, as these areas would not typically be adversely affected by the increased activity associated with operation of the project. Many, in fact, would benefit from improved accessibility and increased activity. In contrast, single-family residences, most multi-family housing, schools, and religious institutions are sensitive uses that are more likely to be disrupted by operation of a transit system. In areas designated for open space, it is assumed that the guideway can be appropriately buffered (through the use of landscaping) to be consistent with that designation, although other impacts related to noise and changes to the visual environment may occur.

A significant impact would also occur if construction of the rail alignment or stations would require the taking of residential property adjacent to the right-of-way and the resultant land use vacancy or expected in-fill replacement land use would not be compatible with the surrounding uses, or if the rail alignment is located directly adjacent (20 feet or less from backyards, 50 feet or less from front yards) to sensitive land uses. Impacts to existing land uses would also occur if the proposed project would result in the loss of a major portion of a particular land use within a specific area, thus altering the character of the area. An example would be the loss of a neighborhood commercial district in conjunction with the development of a station or the alignment. The following section first describes the localized impacts for the two candidate rail alignments and then discusses potential impacts at the rail station areas.

b. Environmental Impact Analysis

No impacts are anticipated under the No Project or the TSM Alternatives, and therefore the following discussion is directed to the rail alternatives.

(1) SP ROW Alignments (North Hollywood Station to Hazeltine)

For the following discussion, the alternatives along the SP Burbank Branch right-of-way are described first for the section of the alignment between the North Hollywood Metro Rail Station to Hazeltine Avenue as this is the area where the alternatives vary from each other. This is followed by a combined description of the alignment section between Hazeltine Avenue and I-405.

Table 4-1.1: Sensitive Uses Adjacent to Project Alternatives

Alternative	Sensitive Uses: Along Aerial or At-Grade Segments	Sensitive Uses: Along Open-Cut Segments	Potential Impacts
1a	5 residential blocks	n/a	Noise, visual, safety
1b	5 residential blocks	n/a	Noise, visual, safety
1c	5 residential blocks	64 residential blocks 2 schools: (Emek Hebrew Academy, L.A. Valley College)	Aerial/At-grade Segment: Noise, visual, safety Open-Cut Segment: Noise, safety
1d	69 residential blocks 2 schools: (L.A. Valley College, Emek Hebrew Academy) 1 church 1 fire station	n/a	Noise, visual, safety
2	5 residential blocks	n/a	Noise, visual, safety
6a	60 residential blocks 3 schools: (L.A. Valley College, Emek Hebrew Academy, N. Hollywood High School) 1 church 2 fire stations	12 residential blocks	Aerial/At-grade Segment: Noise, visual, safety Open-Cut Segment: Noise, safety
6b	5 residential blocks	67 residential blocks 3 schools: (North Hollywood High, Emek Hebrew Academy, L.A. Valley College,)	Aerial/At-grade Segment: Noise, visual, safety Open-Cut Segment: Noise, safety
11a	57 residential blocks 3 schools: (L.A. Valley College, Emek Hebrew Academy, N. Hollywood High School) 1 church 2 fire stations	12 residential blocks	Aerial/At-grade Segment: Noise, visual, safety Open-Cut Segment: Noise, safety
11b	5 residential blocks	64 residential blocks 2 schools: (Emek Hebrew Academy, L.A. Valley College,)	Aerial/At-grade Segment: Noise, visual, safety Open-Cut Segment: Noise, safety

Source: Myra L. Frank & Associates, Inc., 1997.

Alternative 1a - As the profile for this alternative is deep-bore subway, no acquisitions of sensitive uses would be required, adverse effects on residential areas would not occur, and changes or alterations to adjacent land uses along the alignment would not occur. This alternative would not materially alter the current appearance or use of Chandler Boulevard except that some above ground landscaping may be installed within Chandler Boulevard after the project is completed. This alternative would have no effect in this area.

Alternative 1b - A cut-and-cover profile, which, similar to Alternative 1a, has the trains running underground and therefore the alignment would have no effect on sensitive land uses along the route.

Alternative 1c - Under this alternative, rail vehicles would travel below grade in an approximately 35-foot wide open-trench. The trench would be constructed within the existing right-of-way. The open trench would be located approximately 70 feet from adjacent residential uses and provided with security fencing, lighting, and landscaping along its length. Access across the alignment would be provided at most cross streets. The open-trench configuration would preclude the use of the median for informal recreational activities in the area between Laurel Canyon Boulevard and Whitsett Avenue. These activities could continue west of Whitsett Avenue, although there would be a loss in the amount of open space available.

In some portions of the diagonal portion of the alignment between Chandler Boulevard and Oxnard Street, the guideway would pass within 50 feet of the back of single-family and multi-family residences. Twenty-two residential blocks would be so affected by the open-cut segment.

No acquisitions or alterations of sensitive uses would be required. The open-trench guideway would be constructed in the existing right-of-way, and the alignment would not be located in such close proximity to adjacent sensitive land uses such that significant adverse impacts would occur. However, the current use of the Chandler Boulevard median would be altered and the alignment's proximity to adjacent sensitive uses has the potential to result in increased noise and ambient lighting. As result of the changed use of the median and the potential for proximity impacts, prior to mitigation, land use-related impacts would be significant.

Alternative 1d - This alternative would result in the construction of an aerial guideway in the existing right-of-way. The existing right-of-way from the North Hollywood Station to Woodley Avenue is of sufficient width to accommodate the guideway. Along Chandler Boulevard, the distance from the right-of-way to houses to the north and south provides an approximately 70 foot separation between the guideway and adjacent uses. The area beneath the guideway would be landscaped and informal recreation uses could continue. In the diagonal portion of the alignment between Chandler Boulevard and Oxnard Street, the right-of-way would pass, in some instances, within 50 feet of the back of single-family residential uses. In the portion of the alignment between Woodman and Hazeltine Avenues, the alignment passes approximately 50 feet from the back of single-family houses to the north and multi-family uses to the south.

This alternative could potentially affect 69 residential blocks, three schools (Valley College, Emek Hebrew Academy, and North Hollywood High School), one church, and one fire station. The guideway would be located greater than 50 feet from adjacent sensitive land uses, property acquisitions of residences would not be required, and recreational uses could continue to occur in the median area. As a result, impacts in the Chandler Boulevard section of the alignment would be less than significant. However, this alternative could still have significant noise and visual impacts along aerial segments, especially along the diagonal segment between Woodman Avenue and Coldwater Canyon Avenue.

Alternative 6a - This alternative proposes an at-grade alignment following the SP right-of-way. Vehicles would travel at-grade from the North Hollywood Station in the median of Chandler Boulevard to Coldwater Canyon Avenue, and pass behind single-family homes in a shallow trench in section between Chandler Boulevard and Oxnard Street, and continue in an at-grade profile to Hazeltine Avenue. Grade separations would be provided at major intersections. Between major cross streets, the alignment would be fenced.

This alternative could potentially affect 72 residential blocks, three schools (Los Angeles Valley College, Emek Hebrew Academy, and North Hollywood High School), one church, and two fire stations. The required width for the rail alignment is similar to that of Alternative 1c and development of this alternative would preclude the use of the median for informal recreational activities in the area between Laurel Canyon Boulevard and Whitsett Avenue. Property acquisitions of residences would not be required. However, the alignment would pass sufficiently close to sensitive uses to result in significant impacts prior to mitigation.

Alternative 6b - The profile for this alternative is similar to Alternative 1c except that the alignment has an open-trench segment from SR 170 to the North Hollywood Station. In the Chandler Boulevard median section, the alignment could be built in the existing right-of-way. The median could continued to be used for informal recreation activities in the section between Coldwater Canyon Boulevard and Whitsett Avenue, but these activities could not occur between Whitsett Avenue and Laurel Canyon Boulevard. Access across the alignment would be provided at major cross streets. A distance of approximately 75 feet from adjacent sensitive uses would be maintained and no significant adverse impacts would occur in this area.

In the diagonal portion and the segment between Woodman Avenue and Hazeltine Avenue, the alignment would continue in an open-trench configuration, passing within 50 feet of the rear yards of adjacent single-family uses. Sixty-seven residential blocks, three schools (Los Angeles Valley College, Emek Hebrew Academy, and North Hollywood High School), one church, and two fire stations are located along the alignment. No acquisitions of sensitive uses would be required. While proximity impacts, such as increased noise and ambient lighting levels, may occur, the alignment maintains a distance and vertical separation from adjacent sensitive land uses such the rail system would be less intrusive and significant adverse impacts would not occur.

Alternative 11a - Between the North Hollywood Metro Rail station and Laurel Canyon Boulevard the alignment with this alternative would located below ground identical to Alternative 1a. West of Laurel Canyon Boulevard impacts for this alternative would be identical to those described for Alternative 6a. Significant impacts would occur prior to mitigation.

Alternate 11b - Between the North Hollywood Metro Rail station and Laurel Canyon Boulevard the alignment with this alternative would located below ground identical to Alternative 1a. West of Laurel Canyon Boulevard impacts for this alternative would be identical to those described for Alternative 6b. Significant adverse impacts would not occur under this alternative.

(2) Oxnard Alignment (North Hollywood Station to Hazeltine)

Alternative 2 - As the profile for this portion of this alternative is deep-bore subway, no significant impacts to adjacent land uses would occur.

(3) SP Burbank Branch and Oxnard Street Alignments (Hazeltine Avenue to I-405)

Alternatives 1, 2, 6, and 11 - Through this section of the corridor, the alternatives all follow the same aerial profile and horizontal alignment, with the exception that Alternatives 6 and 11 have an at-grade profile between the Van Nuys and Sepulveda stations. Adjacent land uses consist of industrial uses, with the exception of an office building located south of the right-of-way on the east side of Sepulveda Boulevard. As the aerial guideway would be built within the existing right-of-way and the adjacent land uses are not considered sensitive, no significant impacts would occur. West of the Sepulveda station, a section of tail and storage track would continue at-grade to a location east of Woodley Avenue. Although the majority of the tail track would pass adjacent to the rail station parking lot and a large storage facility, the section farthest to the northwest would pass within 70 feet of the rear fences of approximately 20 single-family residences. Land use impacts in this segment, under all alternatives, would be less than significant.

(4) Station Areas

The following is an analysis of the potential near-term land use impacts resulting from the development of the proposed stations. Impacts at station areas depend largely on the relationship of the station to its immediate surroundings and the change from existing land uses to station-related uses.

North Hollywood Station *(Alternative 6)* A station would be constructed in the MTA-owned right-of-way west of Lankershim Boulevard and between the north and south roadways of Chandler Boulevard adjacent to the historic Toluca Depot. A plaza would extend east of the station to Lankershim Boulevard with a new portal providing an underground connection to the North Hollywood Metro Rail station. The historic depot would be utilized for ticketing and possibly transit-supporting retail uses. Uses in the vicinity of the proposed station consist of light industrial, office, commercial, which would be supportive to a transit station at this site. The nearest sensitive use is North Hollywood Park, located approximately 500 feet from the proposed station. As no sensitive uses would be in close proximity to the proposed station, any resulting changes in land use occurring at this location would produce impacts that would not have an adverse effect on the area.

Laurel Canyon and Chandler Boulevard Station *(Alternatives 1, 6, and 11)* A station at this location could be constructed in the existing right-of-way owned by the MTA. Alternatives 1a, and 1b would result in the construction of a below-ground station with a portal located in the Chandler Boulevard median. Alternatives 1c, 1d, and 6b would construct an open air station with a roof canopy. Alternative 6a would construct an at-grade station on the east side of the Laurel Canyon and Chandler intersection.

Land uses on the north and south sides of Chandler Boulevard opposite the station area consist of commercial uses, two parking lots, a parking structure, a four-story office building, several multi-family structures, and one single-family residence. These uses would be supportive of a transit station at this location. The station would be located 60 feet from the only single-family residence in the vicinity. No adverse effects are anticipated.

Laurel Canyon and Oxnard Street Station *(Alternative 2)* would locate an underground station beneath Oxnard street adjacent to the existing Caltrans park-and-ride lot. Portals would be constructed to provide access to the park-and-ride lot and the southern edge of the Laurel Plaza shopping center. The existing Caltrans park-and-ride lot would be used for parking. Land uses adjacent to the potential portal location include SR 170, single-family houses, the Laurel Plaza shopping mall, and a private elementary school. The single-family houses and the school are located at least 100 feet from the station area. No adverse impacts are expected at this location.

Valley College - Fulton/Burbank Station *(Alternatives 1, 6, and 11)* include a station at this location. Alternatives 1a, and 1b would construct an underground station; the portals would be located on the northeast and northwest sides of the intersection in the existing right-of-way. Alternatives 1c, 1d, 6a, and 6b would locate a portal on the northeast side of the intersection and an open air station on the northwest side. Parking for Valley College is directly adjacent to the northeast portal. Land uses adjacent to the northwest portal and station site consist of a parking lot for a small commercial center and single-family homes. The lumber yard is located on leased land owned by the MTA and would be required to relocate. Three to four single-family uses would be located approximately 100 feet from the portal and 50 feet from the station parking area. As the station could be constructed in the existing right-of-way, and a sufficient distance will be maintained from sensitive land uses, adverse impacts would not occur.

Valley College/Oxnard Street Station - Under Alternative 2, an underground station would be constructed at the intersection of Fulton Boulevard and Oxnard Street. The station portal would be located on Valley College property on the southeast side of the intersection. Parking would potentially occur at the existing Valley College parking lot. Development of the station portal would require that an approximately 500 square foot area currently used for parking be converted into a plaza. This parking area is currently underutilized and the change in land use from parking to station-related uses, resulting in a loss of 3-5 parking spaces, would not severely impact the ability of the College to provide adequate parking. While Valley College as a whole is considered a sensitive land use, most classrooms are located in the southwestern portion of the campus. The portal would be approximately 400 feet from the nearest classroom, which would be a sufficient distance to avoid noise impacts. The College is considered to be a transit-supporting land use, due to the large numbers of people who travel to and from the campus everyday.

Multi-family residential uses are located along the north side of Oxnard Street. Single-family uses are located on the west side of Fulton Boulevard. Fulton Boulevard provides an approximately 80 foot separation between these uses and the potential portal location. No sensitive uses are located in close proximity to the station site. No adverse impacts are expected at this location.

Van Nuys Station - All the rail alternatives would result in the construction of an aerial station spanning Van Nuys Boulevard near the intersection with Aetna Street. In addition to the aerial station, a parking facility for approximately 750 cars would be provided. The majority of the parking area would be located on the east side of Van Nuys Boulevard with some additional parking provided on the west side. The station structure could be constructed in the existing right-of-way but construction of the parking area would require the acquisition of some parcels, which would require the acquisition of commercial and industrial uses. No sensitive land uses are located in proximity to the proposed rail station and transit-supporting land uses are located in proximity to the station. No adverse impacts are expected at this location.

Sepulveda Station - All of the rail alternatives would result in the construction of an aerial station spanning Sepulveda Boulevard. A 1,200-space parking lot would be located to the west of Sepulveda Boulevard. Commercial and industrial uses are located to the east, south, and west of the station site. To the north is a single-family neighborhood. A 25-foot landscaped buffer would be provided along the north edge of the station parking lot resulting in an approximately 75-foot separation between the parking lot and houses to the north. As the rail station and its related parking could be constructed within the right-of-way and on parcels currently owned by the MTA and the station and parking facilities are not located in close proximity to sensitive uses, adverse impacts would not occur at this location.

4-1.5 Consistency of Alternatives with Planning and Zoning

The following section discusses the consistency of the project alternatives with the stated land use and transit policies of each of the applicable community plans. Also considered is the compatibility of the project alternatives with the adopted land use classifications approximately 500 feet to either side of the rail line and within ¼ mile of the station areas.

a. Methodology and Significance Criteria

Impacts to planned land use are identified by comparing the proposed use of the alignment or station area under the project with the planned use as designated in applicable planning documents. It is assumed that transit stations located in areas with exclusively single-family residential classifications would be inconsistent with these documents. For land that must be acquired, the land use with the project is compared for consistency with the designated use. If the proposed project would result in land uses that are not consistent with adopted plans or policies, a significant adverse impact would occur.

b. Environmental Impact Analysis

(1) General Plan Framework

Implementation of any of the proposed build alternatives (both TSM and rail) would be consistent with the *General Plan Framework's* goals of connecting significant activity centers within the City of Los Angeles. Because the rail alternatives would involve the installation of fixed guideway and station components which would not occur under the TSM Alternative, the detailed analysis presented below focuses on them. In the Valley, the alignments for Alternatives 1, 6, and 11 would link the regional centers of North Hollywood and the Valley Government Center, and provide increased accessibility to Valley College. Alternative 2 along Oxnard Street would also provide transit connections between North Hollywood and Van Nuys and provide transit service to the Laurel Plaza Shopping Center in North Hollywood which is recognized as a significant activity center.

(2) Community Plans

Because the rail alternatives would involve the installation of fixed guideway and station components which would not occur under the TSM Alternative, the detailed analysis presented below focuses on them. The following discusses the consistency of the various project rail alternatives with the transit policy and land use designations of the applicable Community Plans.

North Hollywood Community Plan. The *North Hollywood Community Plan* calls for rapid transit to serve the North Hollywood Business District, including mini-bus shuttle service between the North Hollywood Business District and the Valley Plaza/Laurel Plaza shopping district. Designated land uses along the Burbank Branch right-of-way consist of a mixture of commercial and multi-family residential uses with one low density single-family residential area west of Whitsett Avenue. Designated land uses along Oxnard Street are a mixture of multi-family residential and commercial.

<u>Alternatives 1, 6, and 11</u>: All of the Chandler Boulevard alternatives would serve the North Hollywood Business District and none of the alternatives would preclude the Plan's objectives for bicycle and equestrian trails along the SP Burbank Branch right-of-way. Designated land uses along the right-of-way are compatible with the development of a transit alignment in the median. This would be a beneficial effect.

<u>Alternative 2</u>: The Oxnard Street alignment would create a rail link between the North Hollywood station and the Laurel Canyon station near Laurel Plaza of a higher quality than envisioned in the Plan. Land uses along Oxnard Street are compatible with a transit alignment. This would be a beneficial effect.

Van Nuys-North Sherman Oaks Plan. The *Van Nuys-North Sherman Oaks Plan* designates the SP Burbank Branch right-of-way as a transit study corridor, and indicates that a transit link between Van Nuys and Central Los Angeles should be implemented with a station in the vicinity of the Van Nuys Business District. The Plan also proposes a bikeway within the right-of-way between I-405 and Sepulveda Boulevard. Designated land uses along Burbank Branch right-of-way are multi-family residential and industrial. Designated land uses along Oxnard Street are a combination of multi-family residential and commercial.

<u>Alternatives 1, 6, and 11</u>: All of the alternatives are consistent with the transit policies of the Plan, as they would create a transit connection between Van Nuys and downtown Los Angeles. The station at Van Nuys Boulevard would fulfill another objective of the Community Plan by locating a transit station near the Valley Government Center, in the Van Nuys Business District.

The project alternatives being studied would also allow landscaping to occur along the Chandler Boulevard median, consistent with the scenic corridor designation. Development of a rail alignment in the Burbank Branch right-of-way would be compatible with the land use designations of adjacent areas. Effects related to these alternatives would be beneficial.

Alternative 2: This alternative would also support the Plan as it would provide a transit link to the Van Nuys Government Center and locate a station near the Van Nuys business district. East of Woodman Avenue, Alternative 2 would be in covered subway below Oxnard Street and would have very limited effect on land uses adjacent to Oxnard Street. Effects related to this alternative would be beneficial.

(3) Potential Impacts in Station Areas

Because the TSM Alternative would not result in fixed stations, the discussion presented below relates to the rail alternatives only.

North Hollywood Station *(Alternative 6)*
As shown in the *North Hollywood Community Plan*, the area around the proposed station is designated as commercial, which is compatible with the development of a rail station. Predominant uses within one quarter mile of the station are commercial, multi-family residential, and open space. The commercial and multi-family residential uses are potentially transit-supporting and would allow for additional development consistent with the *Transportation/Land Use Policy*. The potential effects would be beneficial.

Laurel Canyon/Chandler Station *(Alternatives 1, 6, and 11)*
The station would be sited at Laurel Canyon Boulevard and Chandler Boulevards. The designated land use at this intersection is neighborhood commercial, which is compatible with the proposed station. Within one-quarter mile of the station, the predominant land uses are neighborhood commercial and medium density multi-family residential. These uses are potentially transit-supporting and would allow for additional development consistent with the *Transportation/Land Use Policy*. As a result, effects would be beneficial.

Laurel Canyon/Oxnard Station *(Alternative 2)*
The station would be constructed beneath Oxnard Street adjacent to the existing Caltrans park-and-ride lot. While a rail station is not shown at this location in the Community Plan, a station would be compatible with the commercial designations of adjacent land uses to the north and west. The Caltrans park-and-ride lot is designated as open space although it is currently developed as a park-and-ride lot. The lot would continued to be used for parking in conjunction with the proposed rail station. Within a quarter-mile of the station the primary designated land uses are highway-oriented commercial at Laurel Plaza and along Laurel Canyon Boulevard, multi-family residential, and low/medium density multi-family residential. These designations would allow for future development consistent with the *Transportation/Land Use Policy*. The station is also consistent with the *Policy* due to its proximity to a major activity center. Effects would be beneficial.

Fulton/Burbank - Valley College Station *(Alternatives 1, 6, and 11)*
The Valley College station would be located at the intersection of Fulton Avenue and Burbank Boulevard. Land use designations at the Fulton/Burbank intersection are mostly highway-oriented commercial. Within a one-quarter mile radius is a substantial amount of land designated single-family residential. Surrounding the station site is a small commercial area that serves the Valley College campus population. The development of a rail station in this area would be consistent with the Community Plan as it would improve transit service to the College and serve adjacent commercial uses. Although the potential for additional development around the station area is limited, the possibility for increased commercial activity around the station allows this location to be generally consistent with the *Transportation/Land Use Policy* and impacts would be less than significant. However, the other goals of the policy, including encouraging higher density residential uses would be difficult to implement at this site. The effects would be moderately beneficial.

Fulton/Oxnard - Valley College Station *(Alternative 2)*
This alternative would locate a station at Fulton Avenue and Oxnard Street. The designated land uses at the Fulton/Oxnard site include the Valley College campus and low/medium density multi-family residential and very low density single-family residential. As the station portal would be the only above ground manifestation of the below ground rail station, the impact on the area designated as open space would be not be significant. However, a rail station is not currently shown in the Community Plan and a station would potentially be incompatible with the large amount of single-family residential uses within one quarter mile of the station. Furthermore, intensification at this site would not be practical and the location would not support the policies of the *Transportation/Land Use Policy*. The impacts are considered adverse, but not significant.

Van Nuys Station
All the alternatives would locate a station at Van Nuys Boulevard north of Oxnard Street. The most significant land use adjacent to the station is the Valley Government Center, recognized as a regional activity center in the *Los Angeles General Plan Framework*. Community Plan land use designations for the area within one-quarter mile of the station site are supportive of transit uses. Valley Government Center to the north is designated for regional commercial uses. To the south, the major land use designations are industrial and highway-oriented commercial. Development of a rail station within the right-of-way would be consistent with the adjacent land use designations. Land use designations within the one quarter mile radius of the proposed station could support and would benefit from higher intensity development as prescribed in the *Transportation/Land Use Policy*. The effects related to the development of a station at this location would be beneficial.

Sepulveda Station
All of the alternatives feature a station at Sepulveda Boulevard slightly north of Oxnard Street. Community Plan land use designations within a quarter-mile of the station are industrial and community commercial. These designations are compatible with the development of a rail station. The Community Plan designation of the parking area is industrial, which would be compatible with the development of the parking area. The surrounding area to the east and south along Sepulveda Boulevard could support increased development as envisioned by the

Transportation/Land Use Policy. The effects related to a station at this location would be beneficial.

4-1.6 Station Area Development Potential

Because the TSM Alternative would not result in fixed stations, the discussion presented below relates to the rail alternatives only.

a. Methodology and Significance Criteria

Although a direct causal link between the development of transit stations and an increase in development around those stations has not been established, the City of Los Angeles *Transportation/Land Use Policy* is based on the assumption that higher intensity development should occur in close proximity to regional transit nodes. Drafted through the collaboration of the City of Los Angeles Planning Department and the MTA, the *Transportation/Land Use Policy* seeks to establish transit centers and station areas as places where the future growth of Los Angeles should be focused. Under the Policy, the area within one-quarter mile of a transit station would be designated as a "primary influence area," within which mixed commercial/residential uses, neighborhood-oriented retail, employment opportunities, and civic uses would be concentrated. Low-density residential neighborhood would in turn be protected from encroachment of incompatible land uses. The *Transportation/Land Use Policy* also encourages bicycle and pedestrian access to transit stations and provision of park-and-ride facilities at more commuter-oriented stations.

The potential for the area proximate to transit stations to reach the concentration of development envisioned by the *Transportation/Land Use Policy* is dependent primarily upon the current zoning designation. Zoning maps for each station area were consulted to determine the maximum build-out possible under the existing zoning within a one-quarter mile of the proposed transit stations. Stations located in areas that are not currently developed to the extent possible under existing zoning, but yet are designated for commercial, industrial, or multi-family residential development, would have the greatest potential to accept increased growth. The following analysis identifies the potential for additional growth, based on the current zoning, and the compatibility of additional growth with the character and scale of surrounding areas.

If the potential for growth would result in an increased intensity of development around the stations that would be dramatically out of character with adjacent uses, e.g. major commercial or high density development adjacent to single-family neighborhoods, a significant adverse impact would occur.

b. Environmental Impact Analysis

(1) North Hollywood Station (Alternative 6)

The area within one quarter mile of the station extends from Burbank Boulevard to the north, Magnolia Boulevard to the south, Blakeslee Avenue to the west and Beck Avenue to the east.

A wide mixture of uses are found in the area including commercial, light industrial, multi-family residential and open space. Northeast of the station site a large area has been converted from light industrial and commercial uses to the North Hollywood Metro Rail station.

Multi-family uses are typically built out to the limits of the existing zoning. The street frontage along Lankershim Boulevard is fairly consistently developed with one and two-story commercial uses. However, the areas behind the commercial buildings are currently underutilized as storage areas or oversized parking lots. There is the potential for a moderate level of additional development to occur in these areas. Similarly, light industrial uses along the rail right-of-way to the west and east could be converted to more transit-supporting uses such as housing, commercial, and office. However, as these parcels are currently developed to a level consistent with the current zoning designation, the recycling of these uses would result in a large overall increase in development in the area. In addition, the proximity to the North Hollywood Metro Rail station would play at least an equal, if not greater, role in generating interest in new development in the area as the proposed light rail station. As potential new development in the vicinity of the station could be accommodated within the existing zoning without altering the established character of the area, impacts would be less than significant.

(2) Laurel Canyon/Chandler Station (Alternatives 1, 6, and 11)

The one quarter mile radius around this station extends from Magnolia Boulevard in the south to Burbank Boulevard in the north and from Radford Avenue in the east to Hermitage Avenue in the west. The predominant land use in this area is residential, with a fairly even mix of single- and multi-family uses. A four-story senior care facility has recently been constructed on the northwest side of the Laurel Canyon Chandler Boulevard intersection. One-story storefront commercial uses are located along Laurel Canyon Boulevard from Magnolia Avenue to Albers Street and a four-story office building is located on the south side of Chandler Boulevard directly east of the intersection with Laurel Canyon Boulevard.

The existing single-family neighborhoods are typically built out to the level permitted by the prevailing R-1 zoning and no future development would be expected in these areas. In the neighborhood to the southeast of the intersection, single-family homes are currently present on lots zoned for multi-family uses. Increased development would result in the replacement of these homes with multi-family units. This would alter the existing character of the area, but as the neighborhood would continue to be residential, and the area currently features a mixture of single-family and multi-family uses, the transition to higher-intensity land uses would not result in significant adverse impacts. Increased development could also occur on commercial parcels located along Laurel Canyon Boulevard, as existing uses could be developed as two or possibly three-story structures. As parking requirements would limit the amount of additional development possible on individual parcels, the development of higher-density projects would require that several existing lots be utilized. These parcels are currently developed with commercial uses and the level of additional development would not be substantially greater than what is currently present. New structures would be compatible in scale with adjacent multi- and single-family uses. As the changes represented by future growth potential in the area would not result in conditions incompatible with the existing development pattern, impacts would be less than significant.

(3) Laurel Canyon/Oxnard Station (Alternative 2)

Existing land uses around this station site consist of the Laurel Plaza shopping center, a private elementary school, a Caltrans park-and-ride lot, commercial uses along Laurel Canyon Boulevard, apartment buildings fronting Oxnard Street, and single-family residential. The single-family neighborhoods around the station are typically built out to the existing R-1 zoning. There is limited potential for the development of additional multi-family units along Oxnard Street. There is the potential for a moderate to major change in the level of commercial development around the station. Existing uses along Laurel Canyon Boulevard generally consist of one-story, low-intensity, auto-oriented uses that could be replaced with two to three story structures. Changes to the commercial uses in this area would not significantly alter the land use pattern or character of the area or be out of scale with the existing character of the surrounding area.

East of SR 170 there is greater potential for new development. Directly adjacent to the freeway, a strip of land is zoned for hotel, multi-family residential, and single-family residential. The remainder of the land around the Robinsons May store is zoned for parking and commercial. Increased development around the existing Robinsons May store would be compatible with the scale and character of the existing shopping center. Several proposals for the expansion of the shopping center have been put forward in recent years. The shopping center would continue to be separated from the surrounding neighborhoods by parking lots and adjacent roadways, however. As the development of a rail station would not alter the existing pattern of residential uses or lead to the potential establishment of a new development pattern that varies greatly from what is currently present, and because it could result in desired land use changes, the effects are considered beneficial.

(4) Fulton/Burbank - Valley College Station (Alternatives 1, 6, and 11)

Existing land uses within the station area consist of single-family residential, a limited amount of multi-family residential, a limited amount of commercial, and educational uses. The predominant land use is single-family residential. Multi-family uses are located along Burbank Boulevard to the west of Laurel Canyon Boulevard. Commercial uses are clustered around the intersection. The existing single-family neighborhoods are typically built-out to the limits of the R-1 zoning and no changes to these neighborhoods would be expected. There is minimal potential for increases in the intensity of multi-family uses in the station area as some single-family houses are currently located along Burbank Boulevard that is zoned for multi-family. Commercially-zoned properties in the station area are currently developed with one-story structures. There is the potential that these uses could be replaced by two or three story uses. However, the potential for increased development within the station area is limited by the existing level of development and current zoning designations, and impacts to this station area would be adverse, but less than significant.

(5) Fulton/Oxnard - Valley College (Alternative 2)

The existing land use pattern around this station site consists of single-family, multi-family and educational uses. All of the parcels around the station are currently built out with uses consistent with the highest level permitted under the existing zoning. As a result, any new development that would occur as a result of the proposed project would be replacement of existing development with new uses similar in character and intensity. Impacts would be adverse, but less than significant.

(6) Van Nuys Station

Development within a quarter mile radius of the Van Nuys Station includes a wide range of land uses including storefront commercial, auto sales lots, light industrial uses, local, county, and state government office and courts buildings, parking structures, multi-family residential, and single-family residential. Currently, the development pattern is somewhat irregular and features a high percentage of older structures with the bulk of new development focused in the Valley Government Center area. Generally, light industrial uses line both sides of the rail right-of-way, commercial uses are located along either side of Van Nuys Boulevard, and residential uses are located in the interior blocks to the east and west of the Boulevard. Multi-family uses are more typically located to the north of the right-of-way with single-family to the south.

The potential for increased development as a result of the proposed project is moderate. Single-family residential districts south of the right-of-way are built out and are not expected to experience a change in the intensity of development as a result of the proposed project. Multi-family residential areas to the north of the right-of-way are also fairly built out. However, many of these structures are older and were not originally built to the maximum level permitted by zoning. There is the possibility that, over time, development intensity in these areas could increase to a moderate degree. Much of the existing commercial and industrial development is aging or approaching obsolescence and often is built below the level permitted by the existing zoning. Much of the commercial frontage along the west side of Van Nuys Boulevard consists of one- or two-story buildings. The current zoning designation permits development of commercial uses up to six stories. Thus, there is potential for larger-scale development to replace entire blocks of the existing storefront commercial with commercial or mixed-use projects. Directly adjacent to the proposed rail station, there is the possibility for existing small-scale commercial and industrial uses to be replaced by higher-intensity commercial uses. As a result, the presence of industrial uses in proximity to the station may be reduced or eliminated over time. This would result in a moderate change in the intensity of development as existing one and two-story uses would be replaced by three-story uses.

Several plans have been developed for the Valley Government Center that have recognized the potential for a rail station to be constructed at Van Nuys Boulevard and call for new buildings to be constructed in the Valley Government Center area to meet projected future office space needs of City government. The more recent plan also recommends the construction of a new City Hall building. The development of the proposed project would support the realization of these plans. The potential effects of a station at this location would be beneficial.

(7) Sepulveda Station

The existing development pattern within the station area is dominated by industrial and large-scale commercial uses. Light-industrial uses line the right-of-way and heavy industrial facilities are located adjacent to I-405. To the north of Erwin Street, single-family uses are located behind small-scale storefronts along Sepulveda Boulevard. The underlying zoning of the majority of parcels around the station is industrial.

Because the existing development pattern is very sparse and of low-intensity as compared to the level permitted by the existing zoning, significant changes to the character of the area could occur. The construction of a rail station could potentially cause a transformation of the current industrial character to that of a much higher density and different use. The recent development of several office buildings directly to the south of the right-of-way on Sepulveda Boulevard demonstrates that there may be the potential for new development in this area. As a result of the disparity between the current level of development and level permitted by the current zoning designations, there is the potential for major changes to both the type and intensity of development currently featured in the station area. This new development could significantly alter the current character of the station and potentially, over time, result in impacts to the residential neighborhoods to the north of Erwin Street. Consequently, significant impacts could occur as a result of this alternative.

4-1.7 Mitigation Measures

a. Localized Impacts

(1) No project

No mitigation measures would be necessary.

(2) TSM

No mitigation measures would be necessary.

(3) Rail Alternatives 1a, 1b, 1d, 6b, and 11b

No significant impacts are foreseen and mitigation measures would not be necessary.

(4) Rail Alternatives 1c, 6a, and 11a

In final design, the feasibility of maintaining sufficient space for a jogging path or other recreational facility in the Chandler Boulevard median shall be examined.

(5) Rail Alternative 2

No significant impacts are foreseen and mitigation measures would not be necessary.

(6) Proposed Rail Stations

No significant impacts are foreseen and mitigation measures would not be necessary.

b. Planning and Zoning

(1) No Project

No mitigation measures would be necessary.

(2) TSM

No mitigation measures would be necessary.

(3) SP ROW Rail Alignment (Alternatives 1, 6, and 11)

To remain consistent with the North Hollywood Community Plan, those alternatives where the surface of the right-of-way will be altered during construction should be studied to determine the feasibility of implementing a bicycle and/or equestrian path within the right-of-way. If a bicycle path is not feasible within the right-of-way, the Plan should be revised to eliminate or relocate the bicycle path.

(4) Oxnard Rail Alignment (Alternative 2)

No significant impacts are foreseen and mitigation measures would not be necessary.

(5) Proposed Rail Stations

No significant impacts are foreseen and mitigation measures would not be necessary.

c. Station Area Development Potential

(1) No Project

No mitigation measures would be necessary.

(2) TSM

No mitigation measures would be necessary.

(3) Proposed Rail Station Areas

As impacts would be less than significant for all station areas except the Sepulveda station, mitigation measures are required only at that location.

A planning study should be conducted for the area within one quarter mile of the Sepulveda station. This study should address issues of maintaining compatibility between the existing single-family residential neighborhoods and new development that could occur on adjacent industrial-zoned parcels. Using the City of Los Angeles *Transportation/Land Use Policy* as a guide, the study should investigate potentially viable land use configurations for the area, opportunities for joint development, access, and circulation in a comprehensive fashion. Following mitigation, impacts would be less than significant.

4-2 ACQUISITIONS AND DISPLACEMENTS

4-2.1 Need for Acquisition and Displacement

a. Previous Acquisitions

The majority of the right-of-way for the rail-build alternatives (Alternatives 1, 2, 6, and 11) was purchased from the Southern Pacific Railroad Company in 1990. At that time, the Los Angeles County Transportation Commission (LACTC, predecessor agency to the MTA) purchased the 22-mile-long Southern Pacific Burbank Branch railroad line that extends from Chatsworth to downtown Burbank. Also in 1990, the LACTC purchased the former Sepulveda Drive-In movie parcel, located adjacent to the San Diego Freeway (I-405) for use as a future park-and-ride lot. This parcel is located adjacent to the proposed Sepulveda station.

b. New Acquisitions and Displacements

A limited amount of additional property acquisition will be required to construct the rail-build alternatives (Alternatives 1, 2, 6 and 11). No acquisition will be required for the non-rail alternatives (Alternatives 9 and 10). Additional acquisitions will be required at three locations:

- Construction Staging Site: The site is located at Lankershim Boulevard, bordered by Burbank Boulevard and Elmer Avenue and ½ block north of Killion Street. This 4.5-acre site is needed to stage construction for subway tunnels at the eastern edge of the project and is described in Chapter 5.

- Laurel Canyon Station: A small parking lot is required for construction staging at the northeast corner of Laurel Canyon and Chandler Boulevards.

- Van Nuys Station: A limited number of adjacent industrial, commercial, and vacant parcels will be required for construction staging and permanent station parking at this location.

4-2.2 Impact Analysis Methodology and Evaluation Criteria

Parcels to be acquired for the rail alternatives were identified using previously developed conceptual engineering plans that were modified to reflect the alternatives presently under consideration. These previously prepared plans included *San Fernando Valley East-West Rail Transit Project - SP Burbank Branch Alignment - Extended Metro Rail Solution - Pre-Preliminary Engineering Study*, MTA August 1994; and *San Fernando Valley East-West Rail Transit Project - Engineering and Design Technical Report*, MTA, October 1989. Land use characteristics of parcels subject to property acquisition were obtained from Damar, a CD-ROM-encoded real estate database by TRW-REDI Property Data and were supplemented by field surveys. The database records and field notes were then examined to distinguish land use, lot and improvements square footage, ownership, property taxes paid, and number of units on each parcel. In general, full property acquisitions were assumed if the project physically encroached on existing buildings, removed a substantial portion of the available parking such that a business would be unable to operate, or used the majority of a vacant lot (or would leave undevelopable land). The number of persons potentially subject to being relocated was then estimated using average persons-per-dwelling unit factors derived from 1990 U.S. Census data. The number of employees potentially subject to being relocated was estimated based on per-square-foot factors for retail, warehouse/industrial, and office buildings.[1]

All residential displacement is considered a significant adverse impact prior to mitigation. Business displacement is considered significantly adverse, prior to mitigation, if it would be difficult to relocate the business, due to the nature of the business itself, and/or the land use requirements or adjacency effects. Examples of such businesses would include industrial businesses no longer permitted under current air quality regulations, or businesses operating at sites under conditional use permits that would be difficult to obtain under present conditions.

4-2.3 Impacts

No properties are to be acquired under the No Project or TSM Alternatives and there are no partial acquisitions anticipated under any of the proposed alternatives.

Table 4-2.1 shows the properties that would be acquired for the proposed rail alternatives. These properties would be permanently acquired for right-of-way or construction purposes. There are two adjacent parcels of land currently being used as parking lots, located at the northwest corner of Chandler Boulevard and Agnes Avenue that would only be acquired under Alternatives 1 and 6. Parcels identified at the construction staging site would only be required for Alternatives 1, 2 and 6. The acquisitions are located in the following areas: (1) adjacent to existing right-of-way between Vesper Avenue and Hazeltine Avenue, (2) at the northwest corner of Chandler Boulevard and Agnes Avenue, and (3) at the southwest and southeast corners of Lankershim Boulevard and Burbank Boulevard.

a. Residential Acquisitions and Displacements

All of the proposed rail alternatives (1, 2, and 11) would require the acquisition of two residential parcels. One parcel is a duplex located on Burbank Boulevard near the southeast corner of Burbank Boulevard and Lankershim Boulevard. A second residential parcel, which is classified by Damar as "Stores and Residential," appears to have one residential unit adjacent to a small store. An estimated nine residents would be displaced. This is considered a significant adverse impact prior to mitigation.

[1]Estimated employee displacement was calculated using the following factors: office = 1:250 sq ft, retail = 1:500 sq ft, and industrial = 1:750 sq ft (Source: *The Fiscal Handbook,* Burchell and Listokin, 1988). To be conservative, the office factor of 1:250 sq ft was used for employee displacement at public/civic uses.

Table 4-2.1: Acquisitions Required for the Rail Alternatives						
Land Use	Assessor's Parcel Number	Location	Land Area (SQ. FT.)	Building Area (SQ. FT.)	Subject to Displacement	
					Residents	Employees
Residential	2350-008-013	1350 Burbank Bl.	7,165	(1)	Duplex = 6	0
	2350-008-017 (2)	11332 Burbank Bl.	8,585	(1)	SFR = 3	0
Stores and Restaurants	2241-027-003	6073 Van Nuys Bl.	4,991	2,988	0	6
	2350-008-011	5568 Lankershim Bl.	8,245	1,938	0	4
	2350-008-017 (2)	11332 Burbank Bl.	8,585	3,000	0	6
	2350-008-020	11316 Burbank Bl.	5,824	5,824	0	12
	2350-008-022	5560 Lankershim Bl.	5,209	3,000	0	6
Offices	2350-008-019	11320 Burbank Bl.	8,084	4,608	0	18
	2350-008-021	11354 Burbank Bl.	6,534	3,195	0	13
	2350-008-049	11328 Burbank Bl.	8,076	3,892	0	16
	2330-028-017	6000 Woodman Ave.	10,798	5,416	0	22
Warehouse and Garage	2240-008-005	14300 Bessemer St.	20,399	17,000	0	17
	2242-001-007	15460 Erwin St.	142,005	2,844	0	3
	2350-004-030	5553 Tujunga Ave.	17,602	2,730	0	5
	2350-008-008	5554 Lankershim Bl.	19,588	7,500	0	15
	2350-008-014	11348 Burbank Bl.	7,143	928	0	2
	2350-008-015	11342 Burbank Bl.	8,600	1,172	0	2
	2350-008-024	11338 Burbank Bl.	8,076	3,780	0	8
	2350-008-027	5551 Lankershim Bl.	6,028	1,440	0	3
	2350-008-028	5543 Lankershim Bl.	8,058	216	0	1
Parking Lot and Vacant	2240-008-002	11348 Bessemer St.	18,722	0	0	0
	2240-008-004	6050 Van Nuys Bl.	19,087	0	0	0
	2348-014-036 (3)	12033 Chandler Bl.	8,306	0	0	0
	2348-014-037 (3)	12033 Chandler Bl.	5,993	0	0	0
	2350-008-029	5535 Lankershim Bl.	10,336	0	0	0
Total	24 parcels	Alternatives 1, 6, & 11 = 367,740 sq ft (8.44 acres) Alternative 2 = 382,039 sq ft (8.77 acres)			9 residents	149 employees

Note:
(1) Building area not shown in DAMAR records.
(2) This parcel is classified as stores and residential and has both a residential component and a business component.
(3) Subject to acquisition under Alternative 2 only.

Source: Myra L. Frank & Associates, Inc., 1997.

b. Nonresidential Acquisitions and Displacements

All of the proposed rail alternatives would require the acquisition of 5 store and restaurant parcels (one of which also contains a residential unit), 4 office parcels, and 9 warehouse or garage parcels, and 3 parking lot or vacant parcels. This would result in an overall displacement of 18 businesses and an estimated 149 employees.

Alternatives 1, 6, and 11 would require the additional acquisition of 2 parking lot parcels at the northwest corner of Chandler Boulevard and Agnes Avenue. This would not result in any employee displacement but could have adverse affects upon the offices located on the south side of Chandler Boulevard that use this parking lot if the subsequent loss of parking results in inadequate parking facilities at this site. (See Section 3-4)

None of the businesses subject to displacement have unique locational considerations and none should have difficulty finding a suitable relocation site. As a result, the impacts associated with this displacement are considered adverse but not significant.

4-2.4 Leases

The MTA currently owns the (former) Southern Pacific right-of-way (SP ROW) on which the bulk of the proposed alternative alignments would be built. However, various businesses have acquired leases from the Southern Pacific Railroad and the MTA for the use of portions of this SP ROW property. In some instances this could result in the need to terminate such leases that would be required for the project. As part of the lease agreements, the MTA has reserved the right to reacquire any leased property and is not responsible for relocating businesses or residences that would be displaced. In many cases, these leases would be allowed to run out and would not be renewed.

Alternatives 1, 6, and 11 would involve the most extensive use of the existing SP ROW and would thus result in the requirement for the most leased property. Approximately 28 businesses and 16 residences have leased property within the SP ROW which would be reacquired. Twenty of the businesses are contained entirely upon leased property within the ROW and would therefore be displaced. For the residences, existing leases for backyard encroachments would be cancelled. None of these would result in relocation.

Under Alternative 2, the MTA would reacquire property from 22 businesses, 16 of which would be displaced as a result.

None of the reacquisitions of leased property, whether partial or complete are considered significant adverse impacts.

4-2.5 Mitigation Measures

Application of the mitigation measures discussed below would reduce the impacts associated with acquisitions to below the level of significance.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat.1894), as amended by the Uniform Relocation Act Amendments of 1987, Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-71, 101 Stat.246-256), and as incorporated by the 1991 Intermodal Surface Transportation Efficiency Act, mandates that certain relocation services and payments by the

Los Angeles County Metropolitan Transportation Authority (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 or businesses by federally assisted programs; and establishes uniform and equitable land acquisition policies.

The State of California's revised Government Code Section 7260, et seq. describes the California Relocation Act, which is in 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, where "fair market value" is considered to be:

> "...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, will and able to buy but under no particular necessity for so doing, each dealing with the other with the full knowledge of all available" (Code of Civil Procedure Section 1263-320a.)

Where acquisition and relocation are unavoidable, the MTA would follow the provisions of the Uniform Act and the 1987 Amendments 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..

The MTA would apply acquisition and relocation policies to assure compliance with the Uniform Act and Amendments. All real property acquired by the MTA would be appraised to determine its fair market value. An offer of just compensation, which shall not be less than the approved appraisal, would be made to each property owner. Each homeowner, renter, business, or nonprofit organization displaced as a result of the project would be given advanced written notice and would be informed of the eligibility requirements for relocation assistance and payments.

The Uniform Relocation Act requires that comparable, decent, safe and sanitary replacement housing which is within a person's financial means be made available before that person may be 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 may 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 sites;
- 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 provided by the MTA. If a displaced person decides not to accept the replacement housing 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. This mitigation applies only to the 2 residences subject to acquisition.

The MTA is not responsible for the relocation of properties displaced as a result of the reacquisition of leases within the SP ROW.

4-3 DEMOGRAPHICS AND NEIGHBORHOODS

This section is concerned with project impacts to study area residents—their demographics and neighborhoods. The setting is established by outlining the history of the San Fernando Valley and describing the pressures which led to the residential development patterns that exist today. The section continues with characterizations of present-day residential neighborhoods in the East Valley study area. Demographic patterns, particularly as they relate to transit dependency and environmental justice, are also identified for the study area. Neighborhood impacts, demographic changes, and environmental justice considerations potentially created by this project are then examined.

4-3.1 Setting

a. Historical Development of the San Fernando Valley

In 1769 the first party of Europeans, the Portola Expedition, crossed the San Fernando Valley en route to northern California. The diary kept by Father Juan Crespi, documenting his trip with this expedition, provides now well known descriptions of the natural history of Los Angeles and the San Fernando Valley before European settlement. It was not until about 25 years later that Europeans began to inhabit the San Fernando Valley. In 1795 Reyes Rancho was established in the northern part of the Valley, in what is now San Fernando, and two years later the San Fernando Rey Mission was founded. Through Christian conversion of the indigenous population, the mission began to have considerable authority throughout the Valley. Over the following years as the mission acquired livestock, planted crops, and put down infrastructure, the number of Indian converts grew as well. However, after the mission was secularized, which occurred in 1834, it began to have less influence on the Valley's residents.

During the Mexican War (1846-1848), in an effort to raise money for the defense of California against invading Americans, the California government under Pío Pico sold part of the San Fernando Rancho in 1846. However, in 1862 the land was conveyed to Pío Pico personally, who in turn sold it to the San Fernando Farm Homestead Association, a group of businessmen eager to acquire and sell real estate for homesteads.

By court decree the Association increased its holdings in 1871 and obtained title to the southern portion of the Valley as well, including areas later to become Van Nuys, North Hollywood, Reseda, Canoga Park, and Encino. Major players in the Association included Isaac Lankershim and I.N. Van Nuys. Both men grew wheat across what today is Van Nuys and North Hollywood. When the Association was dissolved in 1880 the property was distributed to its shareholders. California Senators Charles Maclay and George Porter gained control over the northern half of the Valley while Van Nuys and Lankershim remained prominent land holders in the south. Wheat continued to be grown extensively throughout the Valley. By the late 1870s the town of San Fernando had begun to expand and by 1874 Southern Pacific had rail service between downtown Los Angeles and San Fernando. The railroad connection began a period of rapid growth in the Valley. The Los Angeles Farm and Milling Company was organized in 1880 to succeed the San Fernando Farm Homestead Association. Wheat fields continued to be the predominant activity in both the northern and southern halves of the Valley until about 1915. Unable to agree on policy, Maclay and Porter (along with Porter's cousin) divided the land they held under the Farm and Milling Company. In 1888 the Lankershim Ranch Land and Water Company bought the eastern 12,000 acres (east of Whitsett Avenue) from the company. Lankershim's land was subdivided and it quickly grew into a town — Toluca, which later became Lankershim and then North Hollywood.

Over the next decade residential development accelerated in the Valley. The number of ranches and farms grew, agriculture expanded (particularly citrus and wheat), irrigation systems were put in, street railways were built, banks were organized, and in 1907 Los Angeles approved a bond issue to construct the Los Angeles Aqueduct to carry water from Owens Valley to the San Fernando Valley. The aqueduct proved to be a turning point in the Valley's history. It sparked intense land speculation and led to the annexation of the Valley to the city of Los Angeles. Possibly the greatest venture in subdivision in the Los Angeles area began in the Valley in 1909. Small lots suitable for houses and small farms were created throughout the Valley. The townsites of Van Nuys, Reseda (then called Marion), and Canoga Park (then called Owensmouth) were laid out. While tract homes made up most of the Valley's residential development, homes were nonetheless designed to capture an idyllic, rural quality that came to be characteristic of Valley living. Growth in the Valley decreased during the Depression but increased again during and after World War II. The Valley gained a state college, government center, and cross-Valley freeway over the course of several post World War II growth booms.

b. Neighborhood Characteristics

(1) Introduction

A large number of residential areas exist within the proposed project study area. Identifying distinct neighborhoods is difficult because no one definition has come into widespread acceptance. However, most sociologists agree that neighborhoods are composed of varying geographic scales defined by the their inhabitants. For example, an immediate neighborhood may be the small cluster of houses immediately surrounding one's own house. A homogeneous neighborhood may be the area in which the mix of housing types or values is similar. An institution-oriented neighborhood could be an area in which residents share a common relationship with a local institution, such as an elementary school or religious establishment. A regional neighborhood may be an entire suburb, township, or district within a metropolitan area.

For the purposes of this analysis, regional neighborhoods are the residential communities along the East-West Transportation Corridor. They are defined around the proposed station areas and have been identified primarily on the basis of information gathered during public participation and community outreach efforts for this project. Immediate or homogeneous neighborhoods are described within these regional neighborhoods, where relevant. Neighborhoods along the alignment are typified in terms of their character and perceived security.

Neighborhood Character

Like a neighborhood itself, a neighborhood's character is elusive and difficult to define. For purposes of this study, neighborhood character is the set of unique physical traits in a neighborhood that create a sense of cohesiveness and belonging. Individual neighborhoods are shaped over time by these traits as well as delineated from one another by them. Traffic patterns; street landscaping; pedestrian activity; architectural style, size and scale of the residences; and maintenance patterns of the residences, for example, all contribute to the definition of a neighborhood's character.

Neighborhood Security

Neighborhood security is the sense of safety and cohesiveness perceived by residential neighborhoods. Neighborhoods have a strong sense of place (i.e., identity and belonging). Consequently, changes to the trusted and familiar environment are often not welcomed by neighborhoods. Change represents a threat to the perceived security inherent in the way things are. Because their sense of place is greater, residents of isolated or strictly residential neighborhoods are often more resistant to change, accustomed to the status quo, and comfortable with their perception of safety and security than are residents of highly urban, mixed-use neighborhoods that have high rates of resident turn-over and that frequently undergo change and new development.

(2) Study Area Neighborhoods

Single family residence (SFR) neighborhoods are the predominant land use within the East Valley study area. While a substantial number of multifamily residence (MFR) buildings (both apartment complexes and condominiums) line the thoroughfares in the area, SFR neighborhoods persist between almost all major streets.

In outward appearance most of the neighborhoods in the East Valley study area are strikingly similar. All of them are mature neighborhoods established during similar time periods. They generally contain single-story tract houses built in the 1950s and early 1960s; however, many neighborhoods have isolated examples of houses that date back to the 1940s and a few examples of Period Revival style houses built in the 1920s.

Houses and street landscaping in most neighborhoods have retained their original design and components; however, almost all neighborhoods contain some houses which have been altered since their construction. Alterations include changes to the exterior finish material or roof material, the addition of security bars or new yard fencing, or the addition of rooms and upper stories.

Houses are mostly single-story and are comfortably set back from the street. Front yards are typically well manicured and most contain lawns. Front yard fences between properties are generally rare. However, some front yards have chain link fences enclosing them, while others have original low picket fences separating the yard from the street. The latter is typical of the

California Ranch style home, which itself is common in most all study area neighborhoods. Most of the residential streets are lined with mature street trees, and in many neighborhoods, trees (such as pepper trees, Chinese elm, and sweet gum) arch over the street and create a shady and rustic atmosphere. Sidewalks are present in many neighborhoods; however, some neighborhoods have no sidewalks or sidewalks only on one side of the street. The lack of sidewalks also gives a rural feeling to the neighborhood. Pedestrian activity (e.g., morning joggers, school children, and residents working in their yards) appears common in all the neighborhoods.

Multifamily residences often buffer SFR neighborhoods from commercial areas or from high-traffic corridors. Most SFR neighborhoods that abut major thoroughfares are shielded by one or two MFR structures. In several instances, MFRs have been built farther into neighborhoods which formerly contained only SFRs. These multifamily units introduce a different building scale among the single story residences; use the property to a greater degree leaving less landscaped space; and are of more modern architectural styles than surrounding houses. The following discusses the characteristics peculiar to the regional neighborhoods within the East Valley study area. These neighborhoods are:

- Chandler/Lankershim
- Chandler/Burbank
- Valley College
- Oxnard/Laurel Canyon
- Van Nuys
- Sepulveda

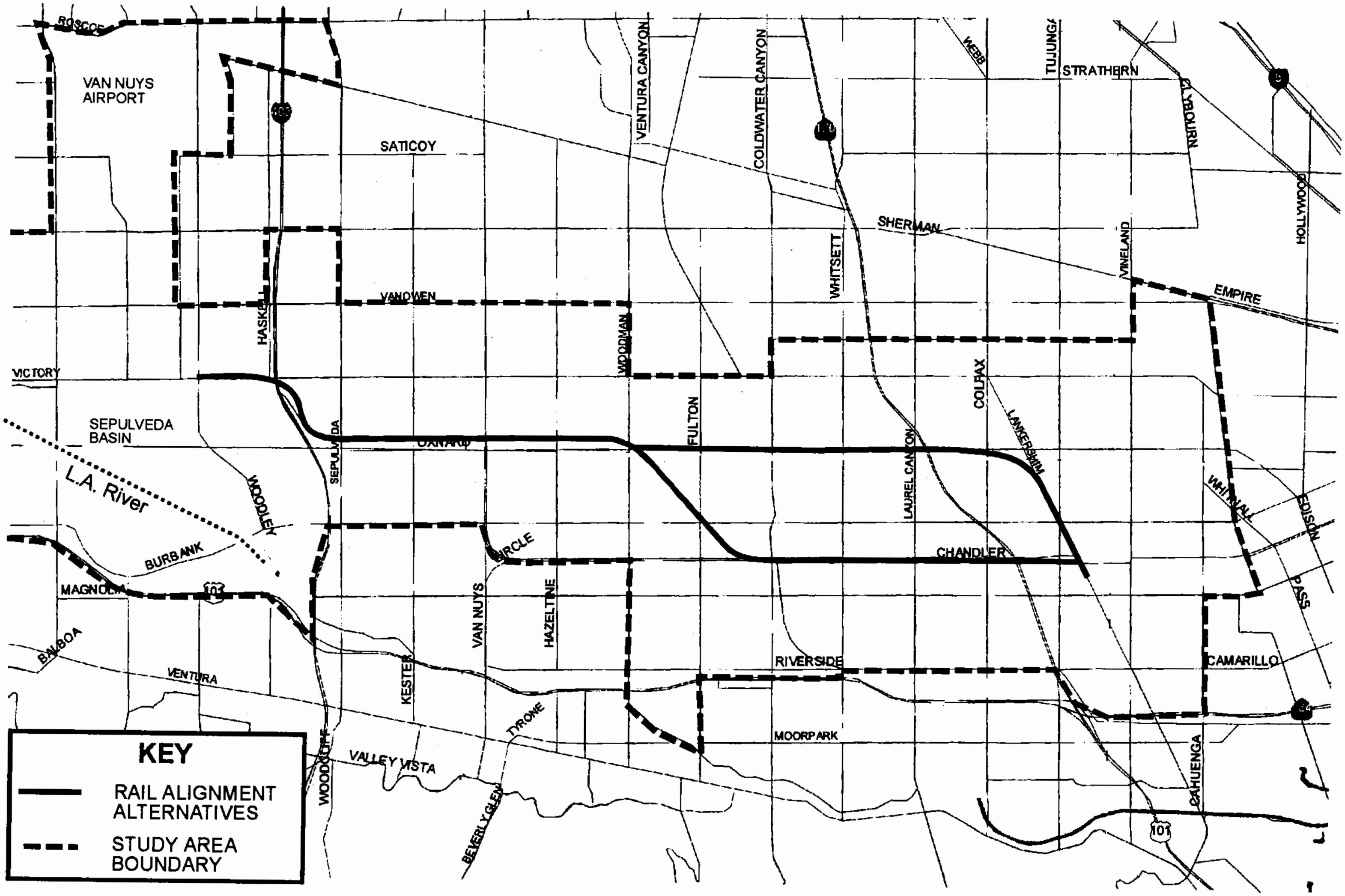
The study area boundary is shown on Figure 4-3.1. Boundaries of the regional neighborhoods contained in the study area are shown on Figure 4-3.2.

<u>Chandler/Lankershim</u>

This neighborhood encompasses North Hollywood Park and the North Hollywood Red Line station, and stretches as far west as Colfax Avenue. Residential neighborhoods within this area are predominantly comprised of single family, small tract homes built in the early 1950s. Streets are characterized by well maintained front yards with lawns and large street trees such as carob and Chinese elm. Some, but not all, streets have street lamps and sidewalks. There is also substantial nonresidential use in this area and therefore the pockets of residential use appear close-knit and cohesive. This residential isolation creates both a strong and weak sense of security: The perception of security is heightened by the neighborhood's cohesiveness and yet diminished by the neighborhood's fragmentation and by the extensive surrounding non-residential uses.

<u>Chandler/Burbank</u>

This neighborhood is a relatively large area stretching between Lankershim Boulevard and Fulton Avenue in North Hollywood. It includes Valley College, Laurel Plaza, and North Hollywood Park. Despite this area's large size, residential neighborhoods remain fairly consistent in style, landscape, and degree of home maintenance. Land uses on thoroughfares in the area are either

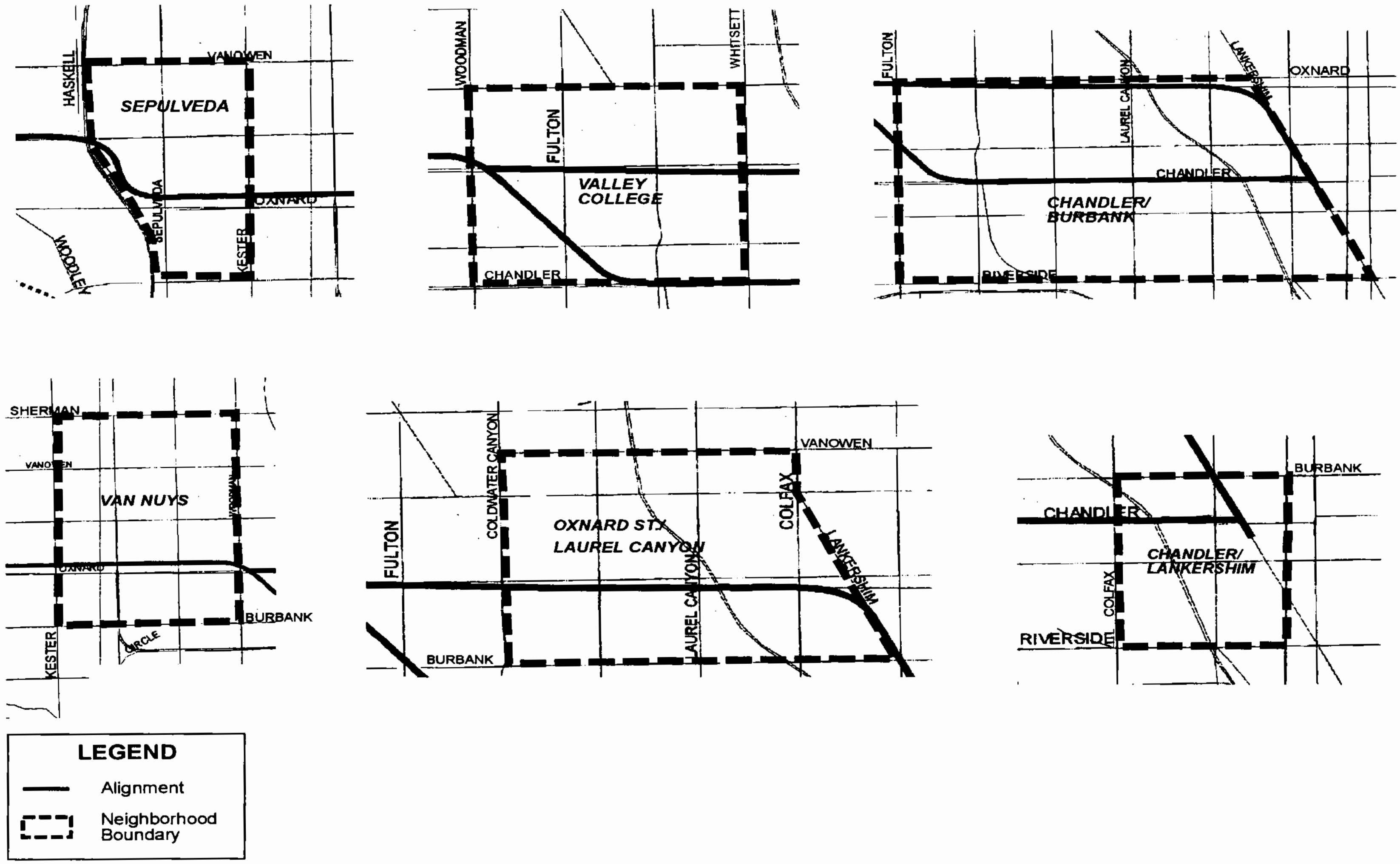


SOURCE: MYRA FRANK & ASSOCIATES, INC., 1996.

M METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-3.1
Study Area Boundary



SOURCE: CONSENSUS PLANNING, 1996; MYRA FRANK & ASSOCIATES, INC., 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-3.2
Boundries of Regional Neighborhoods in Study Area

commercial or MFR; however, some major streets in this area, such as portions of Fulton Avenue, Chandler Boulevard, and Oxnard Street, contain SFRs. The Southern Pacific (SP) right-of-way (ROW), now officially the MTA ROW, runs along a wide center median in Chandler Boulevard. The ROW contains large eucalyptus trees as well as scattered oleander bushes. Neighborhoods in the vicinity have developed along side the railroad, and until recently trains ran along this route. The ROW is an integral part of the neighborhood's character.

In the eastern corner of this area north of Burbank Boulevard, houses are relatively small and single story. Front yards are well kept and most have lawns, sidewalks, and large street trees such as carob and sweet gum. Some houses date back to the 1920s. West of the Hollywood Freeway (SR 170) and around the proposed Laurel Canyon/Oxnard station there are neighborhood pockets that have a distinctively rustic feeling: there are no sidewalks and street trees almost form a canopy across the street. MFRs adjoin SFR neighborhoods at major streets, such as Burbank Boulevard and Oxnard Street. South of Chandler Boulevard around the proposed Laurel Canyon/Chandler station, lot size as well as house size are relatively small. Most streets also contain mature street trees, such as Chinese elm. MFRs line Magnolia Boulevard and Chandler Boulevard as well as several smaller streets that join the two. South of Chandler Boulevard, in the vicinity of the proposed Valley College/Fulton-Burbank station, houses are relatively large compared to those in other East Valley neighborhoods. Streets are also wider and houses are set back farther from the street than in many other neighborhoods.

The Chandler/Burbank neighborhood is also recognized as being anchored by several Orthodox jewish institutions, including a synagogue, a pre-school, and other educational organizations. The groups are all located on Chandler Boulevard. Radiating out around them are the households of many observant Jewish families. This neighborhood has been built up over more than 30 years and its residents have a sense of being within a special enclave. The observant community has a unique pedestrian-oriented character. Religious law requires the Orthodox to walk, not drive, to synagogue on the Sabbath and some holidays.

The sense of perceived security appears high in this area because the numerous neighborhoods contained within it are outwardly quite similar, creating a strong sense of identity, permanence, and familiarity. Additionally, the presence of a major thoroughfare every several blocks adds to the sense of perceived security within the SFR areas because neighborhood traffic is kept primarily local and neighborhood intrusion minimal.

Valley College

This is a relatively small regional neighborhood encompassing those neighborhoods immediately surrounding Valley College. It extends between Whitsett and Woodman Avenues. Major arterials within this area, such as Fulton Avenue, Woodman Avenue, and Oxnard Street, contain many MFR buildings. Erwin Park, a grassy neighborhood park, creates an idyllic open feeling in the neighborhood just north of the college. Those neighborhoods west of Valley College contain relatively large lots and wider streets. Houses are also somewhat larger. Front yard landscaping, street trees, and housing style are similar to those in other parts of the study area. Perceived security within the immediate neighborhoods appears high due to the numerous cul-desacs and otherwise circuitous streets through the residential areas, and due to the numerous thoroughfares that carry regional traffic and effectively insulate the neighborhoods. The SP ROW runs through this regional neighborhood. Except where the ROW intersects Burbank Boulevard/Fulton Avenue and Woodman Avenue, where commercial uses predominate, land uses abutting the ROW are predominantly SFRs. Fences, together with dense and tall vegetation, create a barrier between the backyards of SFRs and the ROW. Valley neighborhoods developed together with the railway, and trains used these tracks throughout the Valley's history. Through backyard fencing and landscaping, these neighborhoods have effectively dealt with the perceived security issues involved in being located adjacent to a railroad ROW.

Oxnard/Laurel Canyon

This regional neighborhood is a large area encompassing numerous immediate neighborhoods stretching between Lankershim Boulevard and Fulton Avenue in North Hollywood. There is overlap with both the Chandler/Burbank and Valley College regional neighborhoods. Due to the overlap, the discussion of the character and perceived security of immediate neighborhoods above applies to this regional neighborhood as well. Within this area there are neighborhoods, such as east of Laurel Canyon and north of Oxnard Street, that contain numerous multifamily dwellings. Others are more typical of the SFR neighborhoods found across the Valley. Large street trees, such as sweet gum, line residential streets. Most streets have sidewalks, well maintained lawns, and tract homes built mainly during the 1950s.

Van Nuys

The regional neighborhood of Van Nuys extends between Woodman and Kester Avenues in the study area. Residential areas north of the SP ROW and west of Hazeltine Avenue are bordered on the south by light industrial and manufacturing uses. MFRs have taken the place of many SFRs in the neighborhoods north of the ROW and the streets are often mixed MFR and SFR. South of the ROW, SFRs still predominate and neighborhoods with broad front lawns and tree lined streets are similar to other neighborhoods in the Valley. South of the ROW, SFRs are buffered from commercial uses on Oxnard Street by MFRs. Both north and south of the ROW, perceived neighborhood security is enhanced by the fact that most local residential streets do not connect major thoroughfares, and thus do not provide easy access between regional routes. South of Oxnard Street, SFR neighborhoods are intact to a greater degree than north of Oxnard Street: nonresidential uses are not present and there are far fewer MFRs. Thus, neighborhood durability, cohesion, and land use homogeneity create a sense of perceived security. Immediately north of the ROW, perceived neighborhood security is diminished somewhat by the variety of land uses and changing development patterns.

Sepulveda

The Sepulveda regional neighborhood extends between Kester Avenue and the San Diego Freeway (I-405). North of the ROW, MFRs surround Delano Park. However, MFRs give way to traditional East Valley SFR neighborhoods farther north. A pattern of large street trees is less prominent than in other areas, and houses show greater variation in style and degree of alteration.

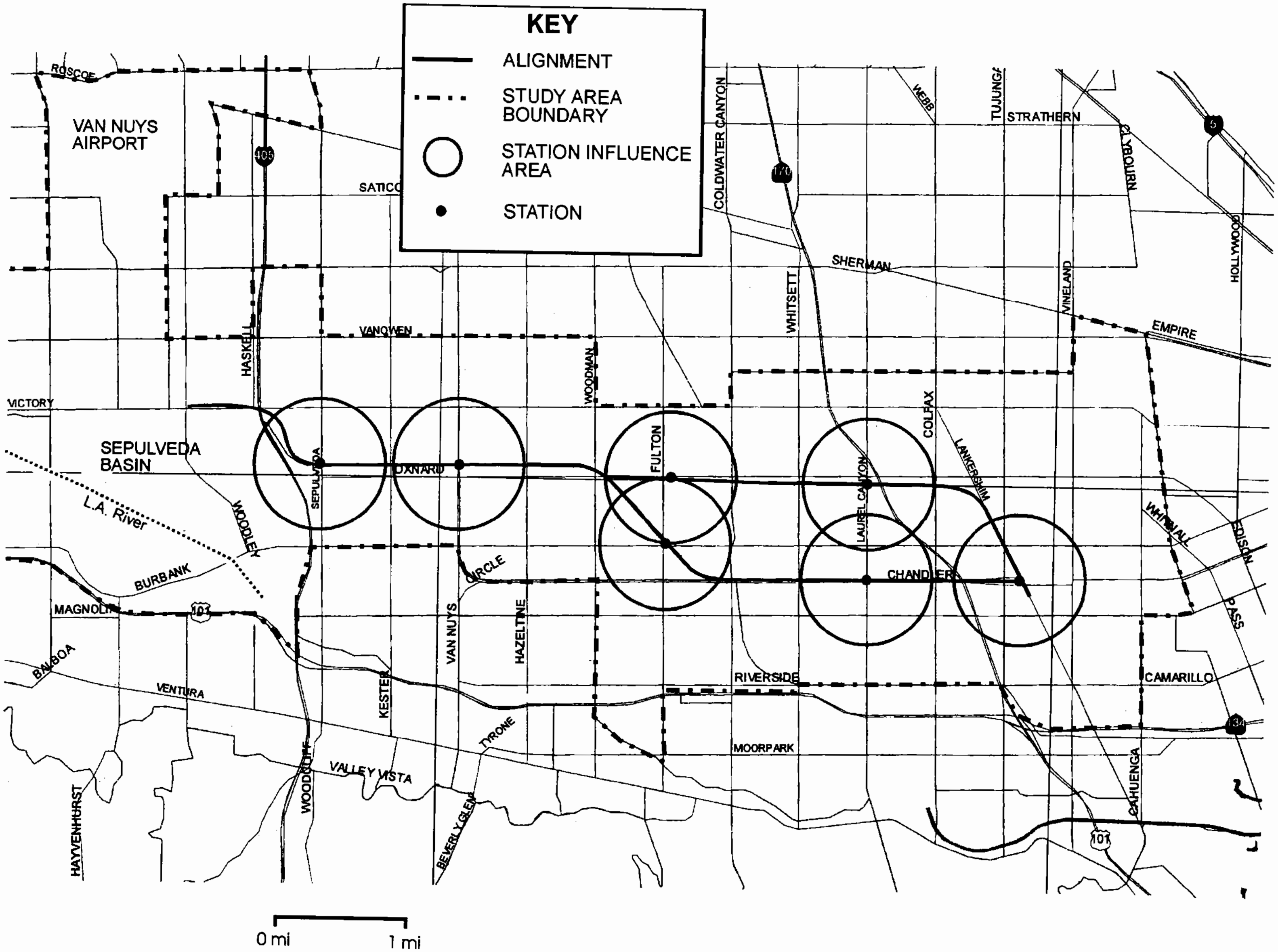
South of the ROW, SFR neighborhoods predominate and are similar to those elsewhere in the study area. Some houses are relatively large, and mature street trees, such as sweet gum, are common. The neighborhood west of Sepulveda Boulevard is effectively isolated from the rest of the regional neighborhood by high traffic on Sepulveda Boulevard. Residential streets are relatively wide and are lined with mature trees such as camphor and magnolia. Houses are uniformly set back from the street and most have lawns and some show alterations such as stucco refinishing. Homes along Erwin Street, facing the proposed MTA park-and-ride lot (former drive-in movie theater) are generally bordered by high fencing and landscaping. In the southwest corner of the neighborhood there is a large, modern storage facility which is out of character with the surrounding SFR neighborhood. The SP ROW runs along the southwest corner of this neighborhood behind the storage facility and parking lot. It also abuts the backyards of a row of houses on Blucher Avenue. The sense of perceived security in this neighborhood is likely fairly high due to the neighborhood's isolation, and uniform style and character. The storage facility may diminish this feeling somewhat.

c. Demographic Characteristics of the Study Area

Demographics are analyzed for the study area as a whole and for station influence areas. The study area includes parts of the North Hollywood and Van Nuys community plan areas, and encompasses those census tracts that adjoin the proposed alignments as well as those tracts immediately adjacent to the adjoining census tracts.

A station influence area is the area encompassed by a 0.5 mile radius around a station. It represents the largest probable pedestrian capture area for a transit station and corresponds to a walking time of about 10-15 minutes to a station. The study area and station influence areas are shown on Figure 4-3.3. Station influence areas are different from primary influence areas described in Section 4-1 (Land Use). As discussed in Section 4-1, land use impacts are not likely to extend beyond a few blocks, and thus an analysis covering quarter mile radii around stations is sufficient; however, because the pedestrian capture zone for a station could likely extend farther than a quarter of a mile, particularly in transit dependent neighborhoods, demographic data were gathered for this larger 0.5 mile radius station influence area (which contains the primary influence area). Demographic data for current conditions were obtained from the U.S. Census Bureau (the 1990 census).

Table 4-3.1 lists population, housing, and employment characteristics of the study area and of Los Angeles county. Comparison is made to the county because the study area is a part of the county and because the county is the service area of the MTA. The study area has a higher housing vacancy rate than the county, a slightly higher rate than the North Hollywood community plan area, and a lower rate than the Van Nuys community plan area. The percentages of single family residences and home ownership are substantially less in the study area than they are countywide, but they are comparable to those in the North Hollywood and Van Nuys community plan areas.



SOURCE: MYRA FRANK & ASSOCIATES, INC., 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-3.3
Study Area and Station Influence Areas

Table 4-3.1: Population, Housing, and Employment Characteristics, 1990

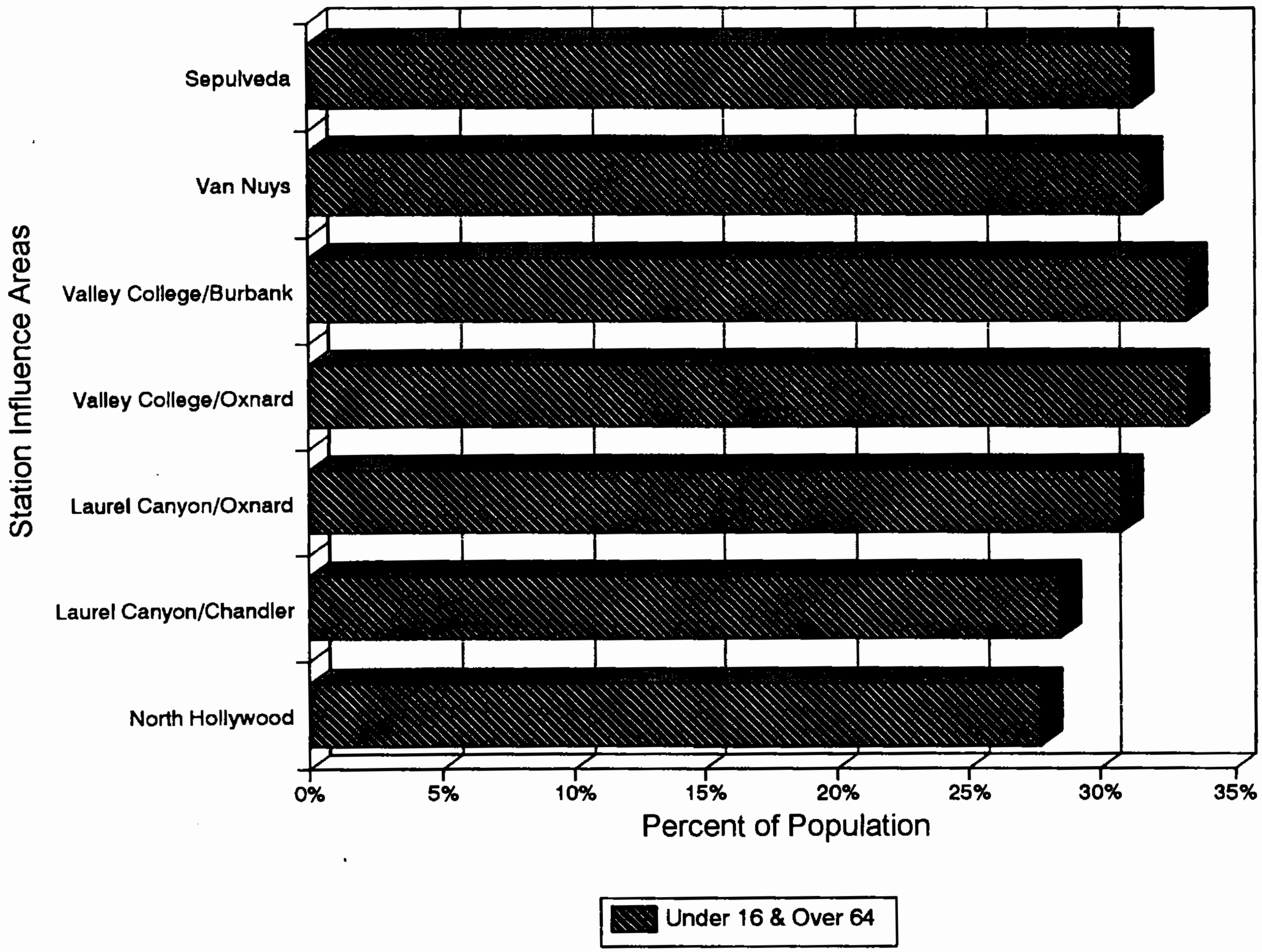
Locale	Population	Housing Units	Housing Vacancy Rate	Percent SFRs	Percent Who Own Home	Employment[1]
Los Angeles County	8,863,164	3,163,343	5.5%	50.2%	50.4%	4,203,792
North Hollywood Community Plan Area	85,905	38,258	6.3%	29.7%	31.4%	47,109
Van Nuys Community Plan Area	69,427	29,080	7.8%	34.4%	36.2%	36,606
East Valley Study Area	155,332	67,338	6.7%	31.7%	33.5%	83,715

Note:
(1) Employment data are from SCAG and represent employees working within the census tracts of the locale and not employees living within the census tract who are employed.

Source: U.S. Census Bureau, 1990.

Table 4-3.2 characterizes the study area in terms of transit dependency and compares this to the county. Transit dependency is characterized by the population unlikely to drive (those under 16 and over 64 years of age); the number of households without private transportation; and the number households below the poverty level.[2] The percentages of people under age 16 and over age 64 are similar between the study area, county of Los Angeles and the two community plan areas. People in these age groups are unlikely to drive their own vehicles and are thus likely to be transit dependent. The population unlikely to drive is shown for each station influence area on Figure 4-3.4. Compared to the county, the study area has a somewhat smaller percentage of households that do not have private transportation and a comparable proportion to the two community plan areas. People living in households that have no motor vehicles are another demographic group likely to be transit dependent. The study area has a lower proportion of such persons than does the county, and is comparable to the community plan areas. The percentage of households below the poverty level is also indicative of transit dependency. Los Angeles county has a slightly higher proportion of households below the poverty level (by about 1 percent) than does the study area but the proportion here is similar to that of the two community plan areas. Figure 4-3.5 compares the station influence areas in terms of the number of households without private transportation and the number of households below the poverty level. As a whole, county residents are more transit dependent than those in the study area.

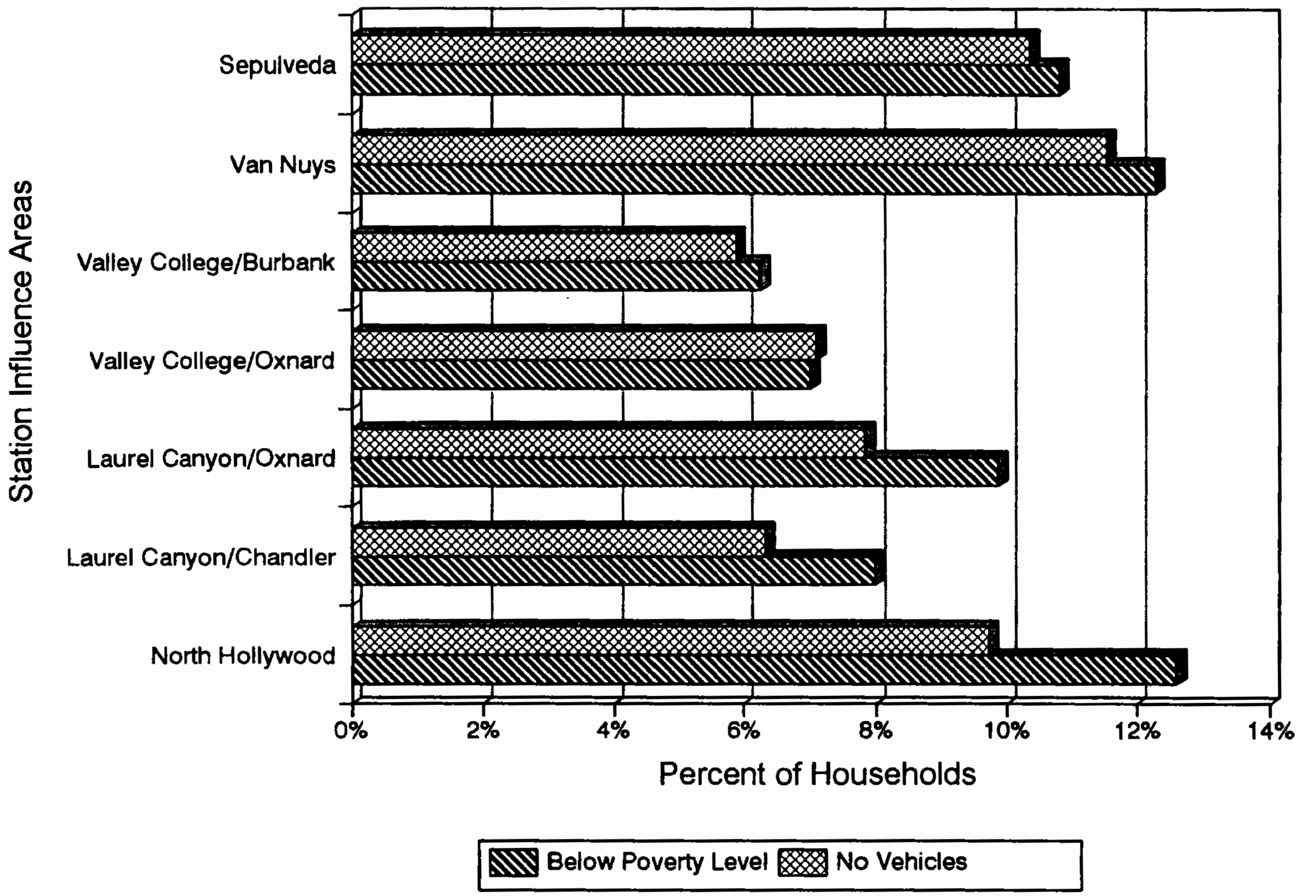
[2] The Census Bureau set the poverty level at $12,674 per year for a family of four in 1989 for use with the last census in 1990.



SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1996; U.S. CENSUS BUREAU, 1990.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-3.4
Population Unlikely to Drive



SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1996; U.S. CENSUS BUREAU, 1990.

FIGURE 4-3.5
Households Below Poverty Level
and Without Private Transportation

Table 4-3.2: Transit Dependency Characteristics, 1990			
Locale	**Percent of the Population Under Age 16 & Over Age 64**	**Percent of Households without Private Transportation**	**Percent of Households Below the Poverty Level**
Los Angeles County	33.2%	11.1%	11.2%
North Hollywood Community Plan Area	29.2%	8.7%	10.3%
Van Nuys Community Plan Area	31.2%	9.3%	9.7%
East Valley Study Area	30.1%	8.9%	10.0%

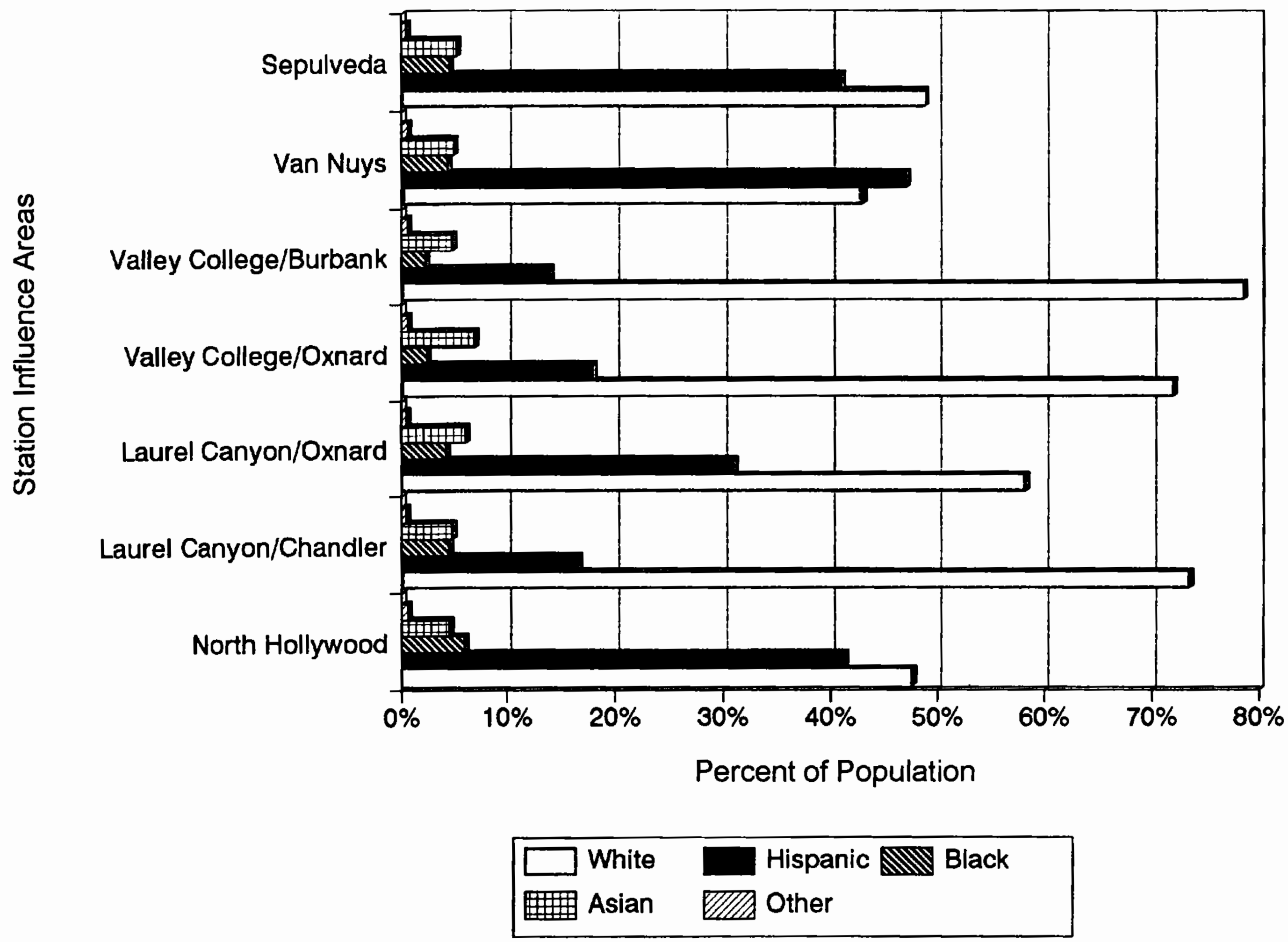
Source: U.S. Census Bureau, 1990.

d. Environmental Justice

Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations (*Environmental Justice*), Executive Order 12898, signed by the President on February 11, 1994, requires each federal agency, as part of its mission, to achieve environmental justice by identifying and addressing disproportionately high and adverse human health or environmental effects of its activities on minority and low income populations. When substantial federal action is involved in a project, the federal agency must collect and analyze data on race, national origin, and income for the populations surrounding the project and must assess environmental and human health risks borne by the populations of concern (i.e., minority and low income populations). The federal agency must ensure that its activities do not discriminate against persons or groups of persons on the basis of race, national origin, or income.

The median household income, the racial or ethnic[3] breakdown of the study area, as well as the foreign-born percentage of the population are shown in Table 4-3.3. The study area has a lower median household income than the county; however, it also has a lower percentage of households below the poverty level (see Table 4-3.2). When compared with the two community plan areas, the study area has a higher median income than North Hollywood but lower than Van Nuys. The median household income in the study area is about 9 percent less than it is countywide, while the county has about one percent more households below the poverty level than does the study area. The study area contains a slightly higher percentage of foreign-born persons than does the county but a comparable proportion to those of the two community plan areas. The study area also contains a higher percentage of whites and a lower percentage of the remaining racial and ethnic groups than does the county. The proportions are comparable to the two community plan areas. Figure 4-3.6 shows the ethnic and racial populations within the station influence areas.

[3] The Census Bureau considers "hispanic" an ethnic category, while it treats "white," "black," "Asian, and "Native American" as racial categories. Thus, in order to use exclusive categories in this analysis, no distinction is made among racial groups within the hispanic ethnic category.



SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1996; U.S. CENSUS BUREAU, 1990.

FIGURE 4-3.6
Ethnic and Racial Populations

Table 4-3.3: Environmental Justice Variables, 1990

Locale	Median Annual Household Income	Percent Foreign Born	Percent Racial/Ethnic Groups				
			White	Hispanic	Black	Asian	Other
Los Angeles County	$34,965	32.7%	41.0%	37.3%	10.7%	10.4%	0.6%
North Hollywood Community Plan Area	$31,123	35.0%	56.5%	32.9%	4.9%	5.2%	0.6%
Van Nuys Community Plan Area	$33,364	37.5%	55.6%	34.0%	4.5%	5.4%	0.6%
East Valley Study Area	$31,682	36.1%	56.1%	33.4%	4.7%	5.3%	0.6%

Source: U.S. Census Bureau, 1990.

4-3.2 Impact Analysis Methodology and Evaluation Criteria

a. Neighborhoods

(1) Neighborhood Security

A significant impact to a neighborhood's perceived sense of security could occur if the physical proximity of the alignment or transit stations to a residential neighborhood provides substantially enhanced access to or knowledge of the neighborhood by people who live outside the neighborhood. Safety and security to be provided by the project as well as impacts to personal safety caused by the project are addressed in Section 4-13.

(2) Neighborhood Access

If property acquisitions or the physical presence of the alignment or transit stations cause neighborhood division or substantially impaired access to and from a neighborhood a significant impact to neighborhood access could occur.

b. Environmental Justice

Ethnic composition, national origin, and income data are used to determine if the study area contains populations of concern (i.e., minority and low income populations) under Executive Order 12898, *Environmental Justice*. A qualitative discussion is provided to examine the potential for disproportionately high and adverse human health or environmental impacts on minority or low income populations.

4-3.3 Neighborhood Impacts

a. No Project Alternative

This alternative would not provide any new major physical improvements in the East-West Transportation Corridor. The alternative would, however, implement the improvements contained in the *San Fernando Valley Transit Restructuring Study*: bus stops would be enhanced, bus routes would be revised, and new buses would be deployed. No street widenings or new streets would be required. The deployment of new buses or alteration of existing bus routes would not create neighborhood impacts because it is assumed that new buses would be deployed or new routes established along major arterials which already offer bus service or a high demand for bus service. Bus service would be contained along major arterials and would avoid neighborhood areas. Neighborhood character, perceived security or access would not be adversely affected.

b. Enhanced Bus (TSM) Alternative

This alternative would enhance the existing bus system by increasing and improving bus operations. No new physical improvements would be introduced into the corridor. This alternative assumes the same bus routes and rail network as the No Project Alternative. The deployment of new buses would be focussed on several major arterials in the Valley which already offer bus service (refer to chapters 2 and 3). New buses would not travel through residential neighborhoods; thus, neighborhood character, perceived security, and access would not be adversely affected.

c. Rail Alternatives

The rail alternatives are divided into segments for the discussion of impacts. Refer to Chapter 2 for characteristics of the various proposed alternatives.

(1) Segment 1: SP ROW-North Hollywood Station to Laurel Canyon Boulevard

This segment runs through the Chandler/Lankershim and Chandler/Burbank regional neighborhoods. All variations of Alternatives 1 and 11 and Alternative 6b have guideways that would be below grade through this segment. Alternative 2 does not travel this segment. The Laurel Canyon station would also be below grade (either in a tunnel, as an open air station, or as an open air station with a roof). Because no portion of the alignment for these alternatives would intrude into any of the neighborhoods, no impact to neighborhood character would result. Because the Laurel Canyon station would be situated at a street corner surrounded by commercial uses, the station would also not create residential neighborhood impacts. Neighborhood security would not be adversely affected: the guideway would be below ground and thus provide no new views into neighborhoods and the station at Laurel Canyon would not provide any access directly into residential neighborhoods (the entrance would be in the Chandler Boulevard median). Neighborhood access would remain unchanged. Because the project through this segment would be below ground, it would not divide or impair access into any neighborhoods.

Alternative 6a proposes an at-grade station to connect to the below-ground North Hollywood Red Line station. No neighborhood impacts would occur as a result of a new at-grade station as long as the station's entrances were oriented away from adjoining neighborhoods such that no access by transit users would be provided directly into the neighborhoods. The guideway of Alternative 6a would run at-grade in the center median of Chandler Boulevard along this segment. Train usage of this median would be very much in character with the neighborhood because historically trains have run along this route. The wide median is currently unused and only partly landscaped. It is a dominant feature along Chandler Boulevard. Neighborhood security would not be affected by this alternative because no new views into adjoining neighborhoods would be created and because the Laurel Canyon station would not provide any direct access into adjoining residential areas. Chandler Boulevard is presently an east-west regional thoroughfare through North Hollywood. Unlike the adjacent residential neighborhoods to the north and south, Chandler Boulevard is not shielded from regional, nonlocal traffic. Thus, the reintroduction of rail transit along Chandler Boulevard would not substantially increase outsider knowledge of neighborhoods in the vicinity. The renewed use of the SP ROW for rail could affect pedestrian patterns and thus neighborhood access. Because both residential and community uses (e.g., religious and educational facilities) exist on both sides of Chandler Boulevard and because the SP ROW has been out of use for a number of years, it is likely that informal pedestrian crossings of the median occur frequently. Alternative 6a would eliminate these informal crossings, but would maintain all formal crossing points (i.e., crosswalks at signalized intersections) so that neighborhood division would not occur and access would not be adversely affected.

(2) Segment 2: SP ROW-Laurel Canyon Boulevard to Hazeltine Avenue

This segment traverses the Chandler/Burbank, Valley College, and Van Nuys regional neighborhoods. Alternative variations 1a, 1b, and 1c would all be below-grade through this segment and Alternative 2 would not travel this segment. Because these alternative variations would not introduce any new physical features into any of the neighborhoods, no effects on neighborhood character would occur. The station in this segment is the Fulton/Burbank station at Valley College. It would also be below ground (either in a tunnel or in an open air configuration with or without a roof). Neighborhood security would not be a concern through this segment. Because the guideway would be below ground, no new views into adjoining neighborhoods would be created. Furthermore, the entrances to the Fulton/Burbank station are directed toward the intersection and toward the college campus, and thus no direct access into the adjoining neighborhoods would be provided.

Alternative 1d would have an aerial guideway along this segment as well as an aerial station at Valley College/Fulton-Burbank. The guideway would be located within the Chandler Boulevard median as far as Coldwater Canyon Boulevard. Because the guideway would be located along the former Southern Pacific route, it would not be out of character with the neighborhood and its historical development. Furthermore, because Chandler Boulevard with its center median is very wide (varying between 60 and 100 feet), the aerial guideway would be substantially removed from the residential uses along Chandler Boulevard. The elevated train would not enhance any views into the neighborhoods behind Chandler Boulevard, primarily because the buildings on Chandler would block the line-of-sight into the neighborhoods. Refer to Section 4-6 for a full discussion of visual effects. West of Coldwater Canyon Boulevard, the SP ROW runs behind the residential backyards of several neighborhoods. As described under Neighborhood Characteristics (Section 4-3.1b), the backyards abutting the ROW are fenced and dense landscaping adds to this border. However, the aerial guideway (i.e., top of rail) would be about 23 feet above ground and a passenger standing within the train would be about 30 feet above ground. The elevation would be substantially higher than the backyard fences. The guideway would rise over a whole row of backyards and be visible from these yards, two-story homes and MFRs through this segment. It would introduce a substantially different scale into the neighborhood and consequently significantly adversely affect neighborhood character through this segment. Perceived neighborhood security would also be significantly adversely affected: given the height of the aerial structure, new and substantial views into residential backyards would be created. This alternative would not however affect neighborhood access and would not create neighborhood division.

The profile of Alternatives 6a and 11a would be the same and would vary considerably along this segment. From Laurel Canyon Boulevard until just east of Oxnard Street, the alignment for both alternatives would be either at-grade and run down the center median of Chandler Boulevard, or below-grade. As discussed above, no neighborhood impacts would occur over this stretch. Around Oxnard Street, the alignment for both alternatives would be at-grade within the SP ROW. It would run along the backyards of several houses. Given the extensive landscaping and fencing between these backyards and the ROW, the alignment would not be visible from any of the houses and thus would not adversely affect the character of the neighborhoods bordering the ROW east of Oxnard Street. Neighborhood security would not be compromised as no new views into residential neighborhoods would be created by this alternative; furthermore, the guideway would be fenced entirely as it travels past the residential backyards. This alternative would not affect neighborhood access because the at-grade portions of the guideway would be contained within the SP ROW. Just southeast of Oxnard Street the guideway for both alternatives would drop below grade. Around Matilija Avenue (west of Woodman Avenue) the guideway would resurface and remain at-grade through the rest of this segment. No neighborhood impacts would occur in this segment because the guideway would not be visible from neighborhoods due to existing fencing and landscaping.

Alternatives 6b and 11b would follow the same alignment and stay below grade from Laurel Canyon Boulevard until about 1,000 feet before Oxnard Street where it would surface and stay at-grade for about 600 feet. No neighborhood impacts would occur in this section for reasons described above. At Oxnard Street the alignment for both alternatives would drop below grade again and resurface west of Matilija Avenue. It would remain at-grade through the rest of this segment. Because the alignment for both alternatives would not be visible from, provide new views of, or divide any neighborhood, no neighborhood impacts would occur.

(3) Segment 3: SP ROW-Hazeltine Avenue to Sepulveda Boulevard

This section traverses both the Van Nuys and Sepulveda regional neighborhoods. Alternatives 1a, 1b, 1c, 1d, and 2 are aerial over this segment. Alternatives 6a and 6b are both at-grade west of Hazeltine except around the Van Nuys and Sepulveda stations, which are both aerial. Between

Hazeltine Avenue and Sepulveda Boulevard, there are no residential neighborhoods that abut the ROW; therefore, no neighborhood impacts would occur. The Van Nuys and Sepulveda stations are located entirely within commercial areas and would not affect neighborhood character, security, or access.

(4) Segment 4: SP ROW-Sepulveda Boulevard to Woodley Avenue

West of Sepulveda all alternatives are at-grade within the SP ROW. No neighborhood impacts would occur because the guideway would be contained within the ROW. Residential neighborhoods north of Victory Boulevard are separated from the ROW by commercial uses on Victory Boulevard and by a tree lined bicycle lane parallel to and just north of the ROW. No impacts to neighborhood character, neighborhood security, or neighborhood access would occur.

(5) Segment 5: Oxnard Street-North Hollywood Station to Hazeltine Avenue

This segment encompasses parts of the Oxnard/Laurel Canyon, Chandler/Burbank, Valley College, and Van Nuys regional neighborhoods. Alternative 2 traverses this segment in a below-grade configuration. The Laurel Canyon/Oxnard station would also be below grade. Because it would not travel through the neighborhoods, Alternative 2 would have no neighborhood impacts.

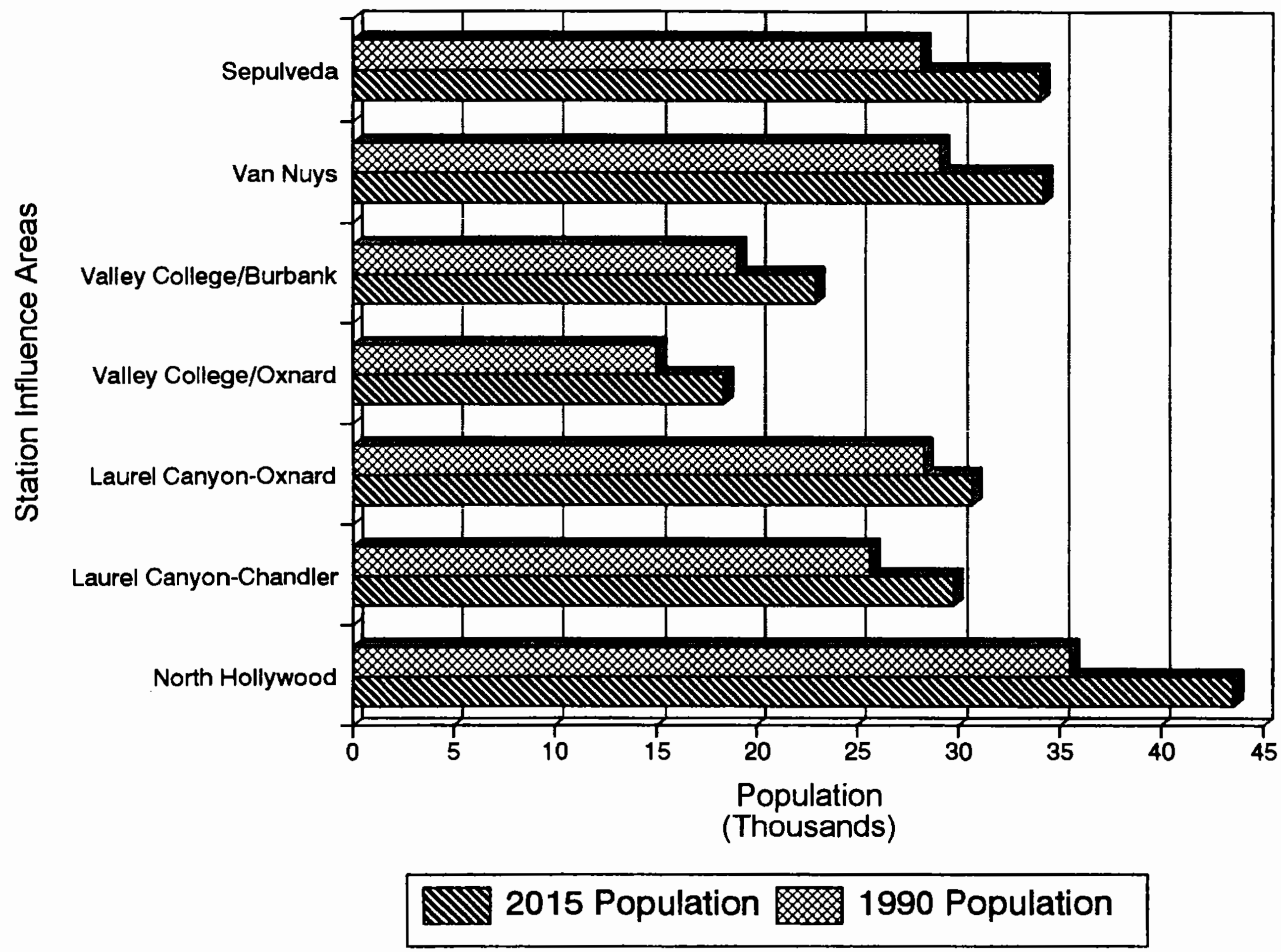
d. Increased Development Pressure in Station Areas for Rail Alternatives

For all rail alternatives, some proposed stations are adjacent to or very near residential neighborhoods. Adverse impacts on neighborhood character resulting from intensification of development around stations could occur if development is allowed that would be incompatible with the character of the surrounding neighborhood. Neighborhood character in these residential neighborhoods could be compromised if a nearby station induced development and new buildings, of a substantially different scale, use, and architecture were introduced into the neighborhoods. Presently, zoning should limit the potential for incompatible nonresidential development to occur in residential neighborhoods; however, market forces can significantly influence zoning decisions that in turn determine the type and density of development that occurs. Section 4-1 provides a discussion of potential development at each of the station areas and an assessment of land use compatibility related to that development.

4-3.4 Demographic Change

Data for future conditions were obtained from SCAG demographic projections to the year 2015, which is the project's horizon year.[4] Between 1990 and 2015, population, housing, and employment figures are expected to increase in the station influence areas. Figure 4-3.7

[4]1990 employment data were also obtained from SCAG so that comparisons between 1990 and 2015 could be made. SCAG employment data, unlike Census Bureau data, represent employment within the census tract (as opposed to the number of people living in the tract who are employed).



SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1996; SCAG, 1994; U.S. CENSUS BUREAU, 1990.

FIGURE 4-3.7
Change in Population

shows that population is expected to increase most substantially in the North Hollywood station area and grow the least around the Laurel Canyon/Oxnard station area. Figure 4-3.8 shows that the growth in the number of households mirrors projected population growth. The North Hollywood station area shows the greatest growth in the number of households. The Valley College/Oxnard station area reveals the least growth in the number of households over this 25 year period. As Figure 4-3.9 shows, employment is expected to change very little in comparison to population or housing. Employment is particularly high in the North Hollywood, Van Nuys, and Sepulveda station areas, and substantially lower in the other station areas, which are predominantly residential.

4-3.5 Environmental Justice

Compared to Los Angeles county as a whole, the study area contains fewer households living below the poverty level (as shown in Table 4-3.2) and is underrepresented in ethnic and racial minority populations (as shown in Table 4-3.3). Thus, the study area does not contain significant minority or low income populations, relative to the county—the region in which the study area is located and the region served by the MTA. The study area does contain between 3 and 5 percent more foreign-born residents than does the county; however, this difference is not significant. This project is not expected to adversely affect populations of concern under Executive Order 12898, *Environmental Justice*. Because all alternatives of this project increase transit accessibility, the project would in fact benefit the study area's transit dependent population. This segment of the population ranges between 9 and 30 percent of the total study area population, depending on the variable used to identify transit dependency.

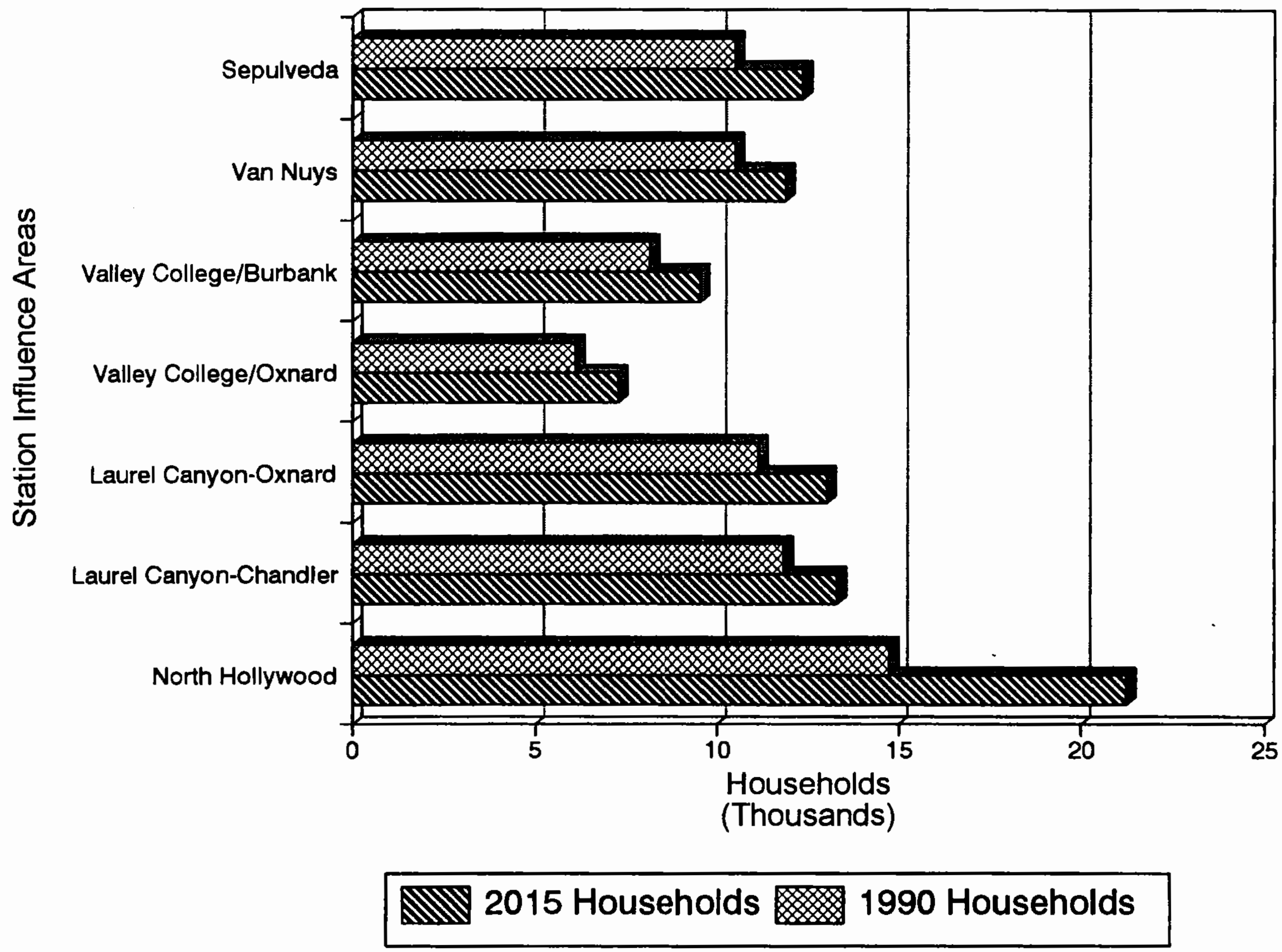
4-3.6 Mitigation Measures

a. Neighborhood Impacts

For Alternatives 1a-1c, 2, 6 and 11, mitigation measures are not required. For Alternatives 1a and 1b, the median along Chandler Boulevard could be landscaped even though it is not required.

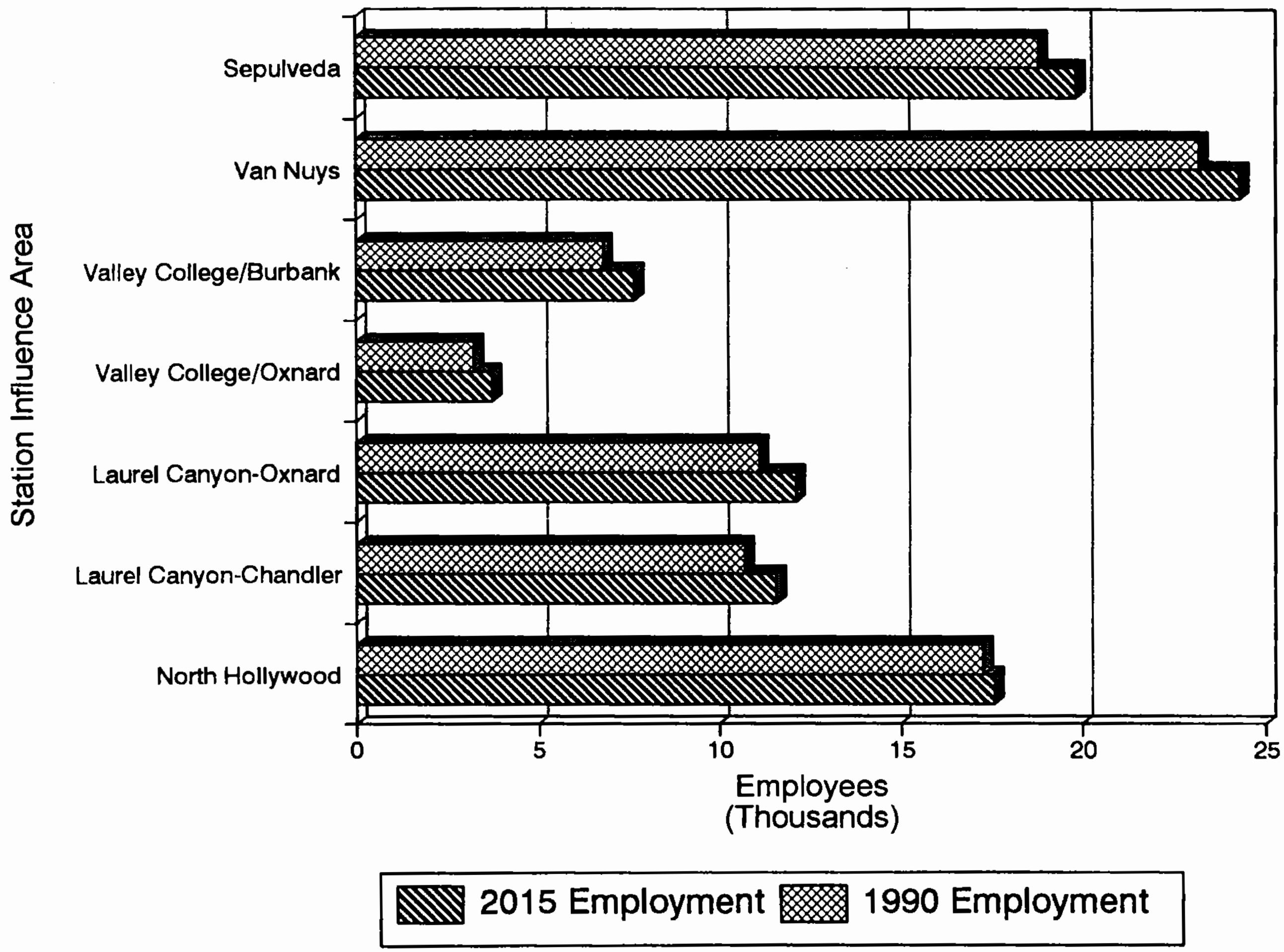
The height of the aerial structure of Alternative 1d along the backyards in Segment 2 (SP ROW from Laurel Canyon Boulevard to Hazeltine Avenue) would create significant neighborhood character and perceived neighborhood security impacts. The most effective mitigation would involve filling in gaps in dense vegetation so that backyards and second stories are shielded from the guideway by trees and shrubs. This measure would diminish the large scale of the guideway structure and would restore a sense of perceived security to the adjacent neighborhood. By planting additional large trees along the SP ROW, the guideway would become less dominant of a feature. To be effective in shielding backyards and second stories from the guideway, the trees would have to be over 20 feet in height. With this mitigation, the impacts would be reduced to below the level of significance.

Neighborhood character could also be significantly compromised if increased development pressure were to occur as a result of this project in the station influence areas. If it appears that development is beginning to intensify in station areas after the project is operational, specific



SOURCE: MYRA FRANK & ASSOCIATES, INC., 1996; SCAG, 1994; U.S. CENSUS BUREAU, 1990.

FIGURE 4-3.8
Change in the Number of Households



SOURCE: MYRA FRANK & ASSOCIATES, INC., 1996; SCAG, 1994; U.S. CENSUS BUREAU, 1990.

FIGURE 4-3.9
Change in Employment

plans could be developed for the station areas to provide a comprehensive set of policies, programs, and regulations for guiding and ensuring appropriate development. A Station Area Development Plan would offer the opportunity to combine zoning standards, detailed site development standards, and other regulatory devices to tailor a particular development program to a specific area. With this mitigation, the impacts would be reduced to below the level of significance.

b. Environmental Justice

No mitigation is required.

4-4 COMMUNITY FACILITIES AND SERVICES

4-4.1 Existing Facilities and Services

Community facilities and services within 1/4 mile of the proposed alternatives are listed in Table 4-4.1 and shown on Figure 4-4.1.

a. Fire Protection and Police Protection Services

Fire protection services for the City of Los Angeles are provided by the Los Angeles Fire Department (LAFD) in accordance with the Los Angeles Fire Code, the Los Angeles Municipal Code and the General Plan of Los Angeles. The Fire Protection and Prevention Plan (FPPP) guides various city departments and government agencies that operate fire protection facilities within the city. The FPPP also establishes standards for the distribution, design, construction, and location of fire protection facilities, including systems incorporated into private developments. These standards specify fire flow criteria, minimum distances to fire stations, public and private hydrant specifications, and the access provisions for the fire-fighting vehicles and personnel.

The proposed project alternatives are located within LAFD Division 3 and would be served by Battalions 10 and 14. The fire stations responsible for providing emergency response are:

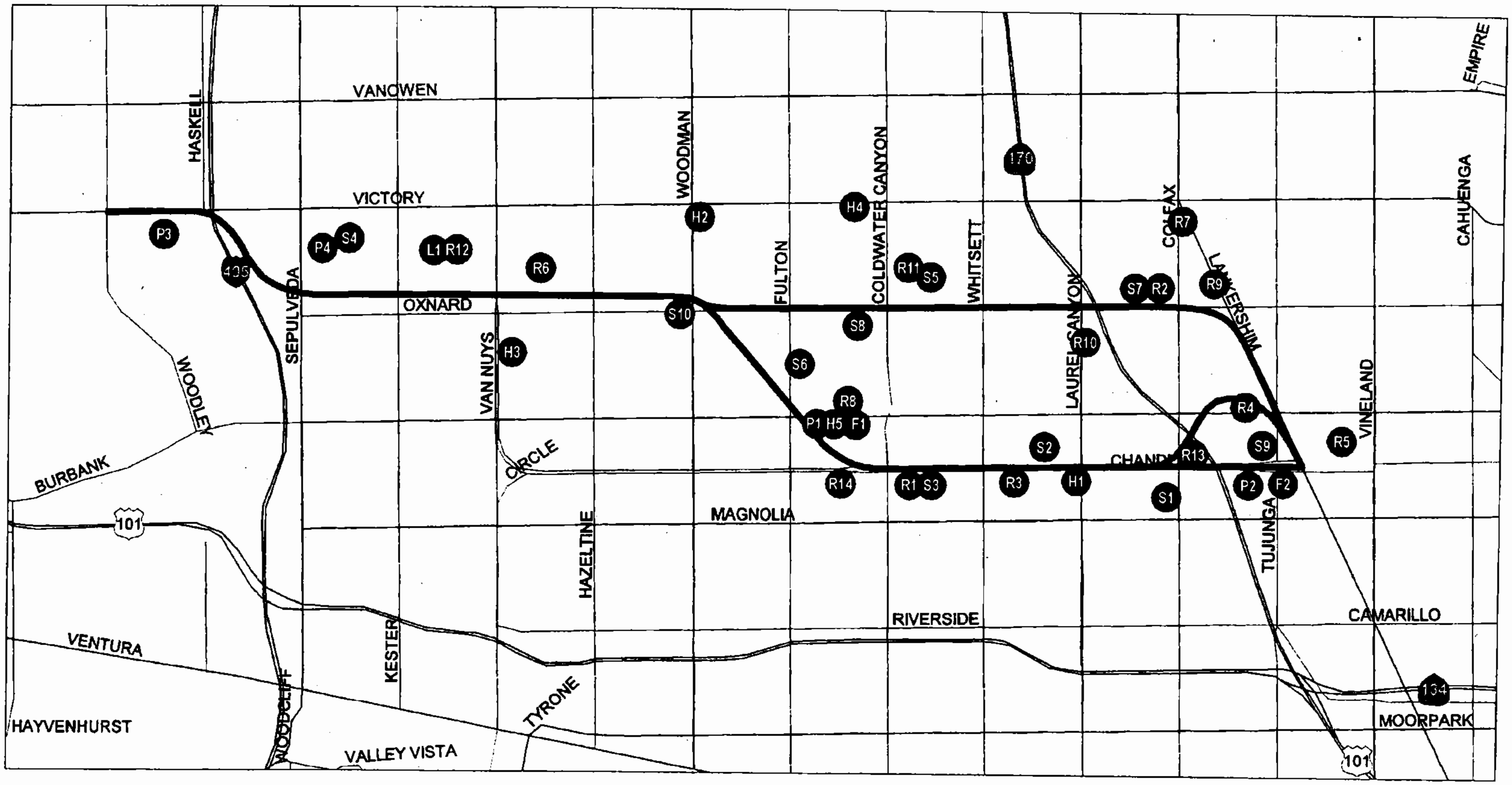
- Fire Station 39
  Task Force (Truck and Engine Company), Hazardous Materials Squad, Rescue Ambulance
  14415 Sylvan Street
  Distance from rail alignment - 0.4 mile

- Fire Station 60
  Task Force (Truck and Engine Company), Rescue Ambulance
  5320 Tujunga Avenue
  Distance from rail alignment - adjacent

- Fire Station 102
  Task Force (Truck and Engine Company)
  13200 Burbank Boulevard
  Distance from rail alignment - adjacent

Police protection for the City of Los Angeles is provided by the Los Angeles Police Department (LAPD). The proposed alternatives are entirely within the jurisdiction of the Valley Bureau of the LAPD. The stations serving the Valley Bureau are:

- Van Nuys Station
  6240 Sylmar Avenue



SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1997.

METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-4.1
Community Facilities and Services in the San Fernando Valley East-West Transportation Corridor Study Area

Table 4-4.1: Community Facilities Located within 1/4 mile of the Proposed Rail Alternatives

Type of Facility	Map No.	Name of Facility	Location	Distance from Rail Alignment (mile)
Fire Station	F1	Fire Station #102	13200 Burbank Boulevard	adjacent
	F2	Fire Station #60	5320 Tujunga Avenue	adjacent
Schools	S1	North Hollywood High School	5231 Colfax Avenue	adjacent
	S2	Burbank Boulevard Elementary	12215 Albers	0.15
	S3	Emek Hebrew Academy Pre-School	12732 Chandler Boulevard	adjacent
	S4	Sylvan Park Elementary	6238 Noble Avenue	0.15
	S5	Monlux Elementary	6051 Bellaire Avenue	0.20
	S6	Los Angeles Valley College	5800 Fulton Avenue	adjacent
	S7	Laurel Hall School	6020 Radford Avenue	adjacent
	S8	Ulysses Grant High School	13000 Oxnard Street	adjacent
	S9	North Hollywood Christian School	5616 Farmdale Avenue	0.05
	S10	Pixieland School and Kindergarten	5944 Woodman Avenue	0.10
Libraries	L1	Van Nuys Branch Library	6250 Sylmar Avenue	0.20
Religious Institutions	R1	Shaarey Zedek Congregation	12800 Chandler Boulevard	adjacent
	R2	Emmanuel Lutheran Church	6020 Radford Avenue	adjacent
	R3	Aish Hatorah	Southeast corner of Chandler Blvd and Wilkenson Ave	adjacent
	R4	Assemblies of God Church	11455 Burbank Boulevard	0.20
	R5	Fuente de Vida	11214 Cumpston Street	0.10
	R6	Iglesia de Dios 7 Dia Buenas Nuevas	6150 Tyrone Avenue	0.15
	R7	Victory Center Church of Christ	6226 Colfax Avenue	0.25
	R8	Church of Jesus Christ of Latter-Day Saints	13042 Burbank Boulevard	0.20
	R9	Iglesia Evangelica Bethel	6119 Lankershim Boulevard	0.10
	R10	Bethany Foursquare Church	5853 Laurel Canyon Boulevard	0.15
	R11	Cho Paul Ministries	6100 Goodland Avenue	0.15
	R12	Van Nuys Congregation	14659 Erwin Street	0.25
	R13	Jehovah's Witnesses	5440 Troost Avenue	0.05
	R14	Chabad of North Hollywood	13079 Chandler Boulevard	adjacent
Health Care Facility	H1	Chandler Convalescent Hospital and Residential Care Facility	5335 Laurel Canyon Boulevard	0.05
	H2	Crossroads School	6305 Woodman Avenue	0.25
	H3	Hollywood Community Hospital of Van Nuys	14433 Emelita Street	0.15
	H4	Laurelwood Convalescent Hospital	13000 Victory Boulevard	0.25
	H5	H.E.L.P. Group	13130 Burbank Boulevard	adjacent
Park or Recreational Facility	P1	Valley Cities Jewish Community Center	Burbank Boulevard	adjacent
	P2	North Hollywood Park	Southwest corner of Chandler Boulevard and Tujunga Avenue	adjacent
	P3	Sepulveda Dam Recreation Area	South of Victory between Woodley and I-405	adjacent
	P4	Delano Park	Southwest corner of Erwin Street and Noble Avenue	0.10

Source: Myra L. Frank & Associates, Inc., 1997.

- West Valley Area
  19020 Van Owen Street

- North Hollywood Station
  11480 Tiama Street

b. Schools and Libraries

The Los Angeles Unified School District (LAUSD, or District) serves the City of Los Angeles, all or portions of 16 other cities in the county, and numerous unincorporated areas of the County which surround the city of Los Angeles. The District comprises an area of over 700 square miles, with an estimated population of over 4.2 million.

As of the Fall of 1993, LAUSD's total K-12 enrollment was an estimated 639,687 students. Approximately 54 percent of these students attended the elementary school (K-6) level, 38.3 percent attended the middle/junior and high school levels, and 7.7 percent attended magnet schools and centers throughout the District (See Table 4-4.2).

Table 4-4.2: LAUSD K-12 Enrollment, FY 1991/92 TO FY 1993/94

GRADE LEVEL	1991/92 ENROLLMENT	1992/93 ENROLLMENT	1993/94 ENROLLMENT
Senior High School	126,547	126,955	124,973
Junior High School	121,177	119,876	118,920
Elementary School	347,607	347,676	346,811
Magnet Schools, Centers, and Other Facilities	44,368	46,699	48,983
Total (K-12) Enrollment	639,699	641,206	639,687

Source: LAUSD *Fingertip Facts*, 1991/92, 1992/93, 1993/94.

The schools, public and private, located within ¼ mile of the proposed rail alternatives are listed in Table 4-4.1. Alternatives 1, 6, and 11 would be adjacent to one LAUSD school (North Hollywood High School) and two non-LAUSD schools (Emek Hebrew Academy and Los Angeles Valley College). Alternative 2 would be adjacent to one LAUSD school (Ulysses Grant High School) and two non-LAUSD schools (Laurel Hall School and Los Angeles Valley College).

Libraries in the vicinity of the proposed alternatives are managed by the East Valley and West Valley regional offices of the Los Angeles Public Library. One library, the Van Nuys Branch Library at 6250 Sylmar Avenue, is located approximately 0.2 mile from the proposed rail alignments.

c. Parks and Recreational Facilities

Parks and recreational facilities located within 1/4 mile of the proposed rail alternatives are listed in Table 4-4.1. Parks and recreational facilities are managed by the City of Los Angeles Department of Recreation and Parks, or by private organizations. Alternatives 1, 6, and 11 would be adjacent to Valley Cities Jewish Community Center. Alternative 6 would be adjacent to North Hollywood Park. All of the alternatives would be adjacent to the Sepulveda Dam Recreation Area.

4-4.2 Impact Analysis Methodology and Evaluation Criteria

Community facilities and services adjacent to each alternative of the project were identified during field surveys using conceptual engineering plans. The locations and types of facilities adjacent to the proposed alternatives were mapped and tabulated, and a qualitative assessment of the project's impact to each facility was made. The potential impacts resulting from the project would vary depending upon the characteristics (e.g. type of construction) and proximity of the alternative selected. These impacts would be considered significant adverse impacts if: (1) community service facilities were to be acquired or (2) the facilities would be substantially impaired as a result of other impacts such as noise, air quality, safety, or impaired access. It should be noted that community facilities located in the vicinity of proposed transit stations may also benefit from improved transit accessibility.

4-4.3 Impacts on Community Facilities and Services

a. Fire Protection and Police Protection Services

The emergency response time of fire protection services depends upon both the distance from stations to areas served and the level of traffic congestion experienced en route. The LAFD's minimum distance criteria for availability of first-due emergency response is 0.75 mile for an engine company and 1 mile for a truck company. Fire Stations #102, #60, and #39 are within 0.75 mile of the proposed project alternatives and, thus, satisfy distance criteria specifications.

Increased traffic on local streets, particularly at intersections, may also affect emergency response times, although to a lesser degree than distance criteria. The LAFD considers intersections that operate at Level of Service (LOS) E or F (90% of capacity or greater) to decrease the level of fire protection and emergency services. According to traffic analyses performed for this document, 13 out of 18 study intersections would operate at LOS E or worse in the year 2015 under the No Project Alternative. For the TSM Alternative, the additional buses required to allow a headway of ten minutes during the peak-hour traffic period would not significantly affect congestion. For each of the proposed rail alternatives, 14 of the 18 study intersections would operate at LOS E or worse. This means that one additional intersection of those studied would operate at LOS E or worse after the proposed rail alternative is constructed. Since the number of intersections operating below LOS E would not significantly increase as a result of the project, the traffic resulting from the project would not have a significant impact upon the level of fire protection services.

Since fire-fighters would reside at stations during daytime and nighttime hours, fire stations may be adversely affected by noise when located adjacent to aerial or at-grade segments. Fire Station #102 would be adjacent to an aerial segment under Alternative 1d, and Fire Station #60 would be adjacent to an at-grade segment under Alternative 6a. A more detailed discussion of noise impacts and mitigation may be found in Section 4-9.

Impaired access could occur at a fire station located near an at-grade rail alignment. Fire Station #102 would not be adjacent to an at-grade alignment under any of the proposed alternatives; however, Fire Station #60 may be located adjacent to an at-grade segment under Alternative 6a. This at-grade rail alignment could cause an increase in response times if the emergency response required the fire-fighters to cross the rail alignment at a time when crossing protection has been activated. With adequate planning and consultation with the LAFD, potential increases to response times can be minimized and are not expected to be significant. The likelihood that an emergency response and the activation of crossing protection would occur at the same time is very low. This is not considered a significant adverse impact.

No police stations are adjacent to the proposed alternatives, and so no police station would be directly adversely affected by the project. Transit police officers will be responsible for security along the rail project alternatives to ensure the safety of riders, employees, and unattended vehicles. Local police departments would be needed only when back-up support is required, thereby minimizing the effect of the project upon police protection services. The same potential effects regarding police emergency response would pertain as discussed above regarding fire protection. No significant adverse impact would occur.

b. Schools and Libraries

The TSM Alternative would result in an increase in the number of buses in service and would, thus, improve transit access to schools and libraries along the proposed bus routes. This would have a beneficial effect.

The proposed rail alternatives would not result in increased student enrollment in the vicinity of the project, since it would not result in increased residential population. Thus, school student capacities would be unaffected by the project. However, other impacts may occur due to the project's proximity to individual schools along the proposed routes.

Schools located within 1/4 mile of the proposed rail alternatives would have safety concerns for students walking to and from school if an at-grade or open-cut rail segment would be located near a school, as under Alternatives 1c, 6a, and 11a. The schools located within 1/4 mile of these are North Hollywood High School, Emek Hebrew Academy (pre-school only), Burbank Boulevard Elementary, and Sylvan Park Elementary. Standard safety measures such as fencing, crossing protection at grade crossings, and required pedestrian crossings at designated crosswalks would mitigate these potential safety impacts. Safety impacts are discussed in further detail in Section 4-13.

As discussed in Section 4-9, potential noise impacts may occur at schools adjacent to the proposed rail alternatives if the segment located adjacent to the school is an at-grade or aerial segment. North Hollywood High School and Emek Hebrew Academy may have potential noise impacts under Alternatives 1d, 6a, and 11a. Los Angeles Valley College may have potential noise impacts under Alternative 1d. Laurel Hall School and Ulysses Grant High School would be located adjacent to a deep-bore subway segment under Alternative 2 and would not experience noise impacts. After mitigation no significant adverse noise impacts would occur at any school under any of the rail alternatives.

Accessibility to schools within 1/4 mile the proposed rail alternatives would improve, which would be a beneficial effect; however, at schools located adjacent to the at-grade segment under Alternative 6a, pedestrian accessibility across the rail alignment would be restricted to major intersections. North Hollywood High School is located adjacent to Colfax Avenue, a major north-south street where access across the alignment would be available, so that pedestrian access to this school would not be affected. Emek Hebrew Academy is not adjacent to a major intersection so that parents walking to pick up or drop off their pre-school children from the north side of Chandler Boulevard would need to walk to Coldwater Canyon Avenue or Bellaire Avenue to cross the alignment. This would not significantly lengthen walking time to and from the school and would not have a significant impact.

The Fulton-Burbank station at the Los Angeles Valley College campus may require a partial acquisition of property within the campus parking lot. This acquisition would be needed to construct pedestrian access between the station and the campus. Some parking spaces may be lost; however, the increase in transit ridership to and from the campus due to the proximity of the station would offset the adverse impacts of the lost parking.

Ulysses Grant High School and Laurel Hall School would be located adjacent to deep-bore tunnel segments under Alternative 2 and would not be adversely affected. These schools would, however, benefit from better transit accessibility, available via the Laurel Canyon and Fulton-Burbank/Valley College stations.

The Van Nuys Branch Public Library is located approximately 0.20 mile from the proposed rail alternatives and would not be adversely affected. Transit access to this library, which would be near the Sepulveda Station, would improve, and therefore there would be a beneficial effect in this regard.

c. Religious Institutions

The TSM Alternative would result in an increase in the number of buses in service and would, thus, improve transit access to religious institutions along the proposed bus routes. No adverse impacts would be associated with the increased service.

Under the proposed rail alternatives, religious institutions located within 1/4 mile of the proposed rail alternatives would benefit from the improved transit access that the rail alignment would provide. However, at religious institutions located adjacent to an at-grade segment under

Alternative 6a, pedestrian accessibility across the rail alignment may be restricted to major intersections. Aish Hatorah is located adjacent to Whitsett Avenue, a major north-south street where access across the alignment would be available, so that pedestrian access to this facility would not be affected. Shaarey Zedek Congregation is not adjacent to a major intersection and so persons walking to this church from the north side of Chandler Boulevard would need to walk to Coldwater Canyon Avenue or Bellaire Avenue to cross the alignment. However, this would not significantly lengthen walking time to and from this religious institution and therefore would not have a significant impact.

As discussed in Section 4-9, potential noise impacts may occur at religious institutions adjacent to the proposed rail alternatives if the rail segment has an at-grade or aerial construction. Aish Hatorah, Chabad of North Hollywood, and Shaarey Zedek Congregation may have noise impacts under Alternatives 1d, 6a, and 11a. Emmanuel Lutheran Church would be located adjacent to a deep-bore segment under Alternative 2 and would not experience noise impacts. After mitigation no significant adverse noise impacts would occur at any religious institution under any of the rail alternatives.

d. Health Care Facilities

The TSM Alternative would result in an increase in the number of buses in service and would, thus, improve transit access to health care facilities along proposed bus routes. No adverse impacts would be associated with the increased service.

The proposed rail alternatives, similar to the TSM Alternative, would improve transit access and benefit health care facilities located in the vicinity of the alignment. Convalescent hospitals such as the Chandler Convalescent Hospital and Residential Care Facility and the Laurelwood Convalescent Hospital would particularly profit from the nearby transit facility since a large number of the persons served by these hospitals may not be capable of driving.

The proposed rail alternatives would not be adjacent to a hospital or health care facility and are not expected to result in adverse impacts.

e. Parks and Recreational Facilities

The TSM Alternative would add to the number of buses in service and would, thus, improve transit access to parks along proposed bus routes. No adverse impacts are anticipated.

Under the proposed rail alternatives, parks located within 1/4 mile of the proposed rail alternatives would benefit from the improved transit access that the rail alignment would provide. However, along Chandler Boulevard under Alternative 6a, pedestrian accessibility across the at-grade rail alignment may be restricted to major intersections. North Hollywood Park is located adjacent to Tujunga Avenue, which is a major north-south street where a crossing would likely be located, and thus, pedestrian access to this park would not be significantly adversely affected.

As discussed in Section 4-9, potential noise impacts may occur at parks adjacent to the proposed rail alternatives if the rail segment has an open-cut, at-grade, or aerial construction. The Sepulveda Dam Recreation Area would not be adversely affected by noise impacts under any of the proposed rail alternatives. Valley Cities Jewish Community Center may be adversely affected by noise impacts under Alternatives 1d due to the aerial segment. North Hollywood Park may have noise impacts under Alternative 6a.

The Valley Cities Jewish Community Center (JCC) is currently leasing and has developed part of the MTA right-of-way for parking. To construct project alternatives 1, 6, and 11, the MTA would need to terminate this lease during construction. Since the land that would be required from the center is MTA property and the MTA has reserved the right to take back the land in the initial lease agreement, the reacquiring of this land is not considered to be an acquisition and is not considered to have an adverse impact. However, because such a loss of parking is considered significant by the JCC, MTA would work with the JCC to maintain parking during construction and on a permanent basis following the opening of the transit line.

4-4.4 Mitigation Measures

The proposed project alternatives would result in the partial acquisition of property at one community facility, Los Angeles Valley College. The construction of pedestrian access facilities from the Valley College station to the campus would be done with the cooperation of the college.

For some alternatives, as discussed previously, pedestrian accessibility could be reduced in locations where an at-grade alignment is present, in particular, along Chandler Boulevard for Alternatives 6a and 11a due to more limited accessibility across at-grade alignments. Pedestrian access across the at-grade portions of the alignment would be limited to locations where the alignment crosses large intersections such as Coldwater Canyon Avenue. Pedestrian safety would be maintained using right-of-way fencing and proper signalization at crosswalks. Other safety measures are discussed in Section 4-13. Mitigation measures for noise impacts, discussed in Section 4-9, would reduce noise impacts to below the level of significance.

4-5 FISCAL AND ECONOMIC CONDITIONS

4-5.1 Setting

a. Introduction

The setting describes baseline fiscal and economic conditions (i.e., local and regional employment levels and property tax revenues) by which the project alternatives are assessed in the impacts section. Data for the setting were obtained from the Southern California Association of Governments (SCAG), county and city of Los Angeles; U. S. Census Bureau; and the State Board of Equalization.

b. Employment and Economic Activity

(1) Regional Economy

The study area for the San Fernando Valley East-West Transportation Corridor is a part of the larger Southern California Association of Governments Region (SCAG Region) which encompasses Los Angeles, Orange, Imperial, Riverside, San Bernardino, and Ventura counties. However, most of the economic effects (e.g., property tax revenue losses) of the project would occur to jurisdictions in Los Angeles County where the project would be built.

The SCAG region experienced a loss of 466,000 jobs during the 1990 - 1993 recession. However, since its lowest level in the first quarter of 1994, total payroll employment in the region has risen. By the end of the fourth quarter of 1995, payroll employment in the six counties combined increased by 263,000 jobs, or 4.5 percent.[5] By May 1996, total payroll employment increased by 1.89 percent (114,000 new jobs) from the previous year.

With the increase in jobs, the region's unemployment rate has also improved. While the unemployment rate is still not at pre-recession levels, it has stayed below its worst recession levels. The region's weighted average unemployment rate dropped in May 1996 to 7.3 percent down substantially from its worst point of 10.3 percent during the recession.[6]

SCAG anticipates that regional employment will continue to improve at a modest annual pace. As shown in Table 4-5.1, the regional employment is forecast to increase by approximately 3 million jobs (43 percent increase) between 1990 and 2015. The forecasts indicate that approximately 45 percent of the regional employment increase will occur in the county and approximately 10 percent of the increase will occur in the city of Los Angeles.

[5] *1996 Regional Review & Outlook for Employment*, SCAG 1996.

[6] Ibid.

Table 4-5.1: Employment in the SCAG Region, 1990-2015				
Jurisdiction	**1990**	**2015**	**1990-2015 Change**	
			Absolute	**%**
SCAG Region	6,838,904	9,804,890	2,965,986	43%
County of Los Angeles	4,612,821	5,911,920	1,299,099	28%
City of Los Angeles	1,902,065	2,165,778	263,713	14%
San Fernando Valley Corridor Total	176,377	218,581	42,204	2,420
East Valley Corridor Census Tracts	70,038	75,023	4,985	7%

Notes: Estimates do not include the desert areas of Riverside, San Bernardino, and Imperial counties.
Estimates are from SCAG computer model assumptions of May 1994.

Source: SCAG, May, 1994.

(2) Local Economy

The local community directly affected by the project would be the San Fernando Valley in the city of Los Angeles. The East Valley corridor would connect major activity centers that include the North Hollywood Business District, Valley Government Center in Van Nuys, Universal City, Valley College, and the Sepulveda Basin Recreation Area. In addition, the East Valley Corridor would provide connections to the Los Angeles central business district and other points on the Metro Rail, Metro Bus, and Metrolink systems throughout Los Angeles County via the North Hollywood station connections.

In the 1980s major employment centers were built in the Valley. While in recent years the Valley lost many high-paying, skilled jobs in the aerospace and defense industry, it still has a large, diversified economic base.[7] If the Valley were a separate county, it would rank fifth (below San Diego, but above San Francisco) among California's 58 counties.[8] Two major industries in the Valley are entertainment and tourism which support the Valley studios at Warner Brothers, Disney and MCA/Universal Studios. By some accounts, approximately 70 percent of the entertainment companies are based in the Valley.[9] Other leading employment areas in the Valley are service jobs in health, business, engineering, and architecture; manufacturing; retail trade; finance; insurance; real estate; and wholesale trade. The projected increase in the Valley's employment by the year 2015 is expected to be primarily in entertainment and tourism. (See Table 4-5.1 for East Valley Corridor employment.)

[7] *About the Valley*, 1995.

[8] Ibid.

[9] Ibid.

c. Tax Sources & Revenues

This section describes the tax revenues generated in the county and city of Los Angeles. The tax revenues addressed are property taxes, sales taxes, and business license fees.

(1) Property Taxes

Some privately-owned residential and non-residential properties adjacent to the rail alignments would be acquired during rail construction. The affected properties are within the jurisdiction of the city and county of Los Angeles where property taxes are levied on the assessed value of all privately-owned property. The county levies property taxes at approximately one percent of the assessed property value. The property tax revenues are put into a countywide pool and then apportioned on a percentage basis to the local jurisdictions (e.g., county, cities, school districts, and special districts). In fiscal year 1995-1996 Los Angeles County levied $5.96 billion in property taxes. The allocation of this revenue was approximately 27 percent to the County, 9 percent to special districts, 17 percent to the cities, and 47 percent to the school districts.

(2) Sales Taxes

The gross receipts and sales tax revenues of individual businesses are confidential. The provisions of Section 21.17 of the Business Tax Ordinance, subject to certain exceptions, make it unlawful for the city to make known the business affairs, operations or information required of any person filing returns or paying taxes under the provisions of the Los Angeles Municipal Code. Thus, the actual loss in local sales tax revenues due to business disruption and acquisitions by the project alternatives can not be determined.

(3) Business License Fees

Section 3-1.2.2 of the Business Tax Ordinance states that the business affairs and operations of individual businesses are confidential and business taxes and payroll taxes can not be made public. Thus, the loss in local business license fee revenues due to business disruptions and acquisitions by the project alternatives can not be determined.

4-5.2 Impact Analysis Methodology and Evaluation Criteria

The impact section identifies the jobs generated for the operation of each alternative and the losses in local jobs and property tax revenues due to property acquisitions (see Section 4-2 for further discussion of job losses). The section also addresses the potential housing demand created by the projected new employment and the fiscal effects of future joint development activities at locations near the alignments and stations. An increase in housing demand above 1 percent of the area's supply, or a loss of jobs in excess of 1 percent of area employment, would be considered significant. Property tax losses in excess of 1 percent of the area tax base would be considered significant.

4-5.3 Impacts on Fiscal & Economic Conditions

a. Employment & Economic Activity

(1) Employment Loss

- **Enhanced Bus/TSM Alternative**

Development of the Enhanced Bus Alternative would not result in property acquisitions. As a result, the alternative would not displace jobs (see Table 4-5.2). Thus, the Enhanced Bus Alternative would have no adverse effect on the local and regional job supply.

- **Rail Alternatives**

Rail Alternatives 1, 2, and 11 would each result in the acquisition of a number of restaurants, warehouses, garages, offices, and retail buildings. Due to these acquisitions, each rail alternative would result in the loss of approximately 148 jobs (see Section 4-2), because the properties to be acquired would be the same.

Although the displacement would be potentially significant to individual businesses, it would not have a significant impact on the overall local and regional business climate because the numbers of businesses to be displaced would be relatively small in comparison to the total jobs in the region. As shown in Table 4-5.2, the job losses by alternative would be 0.2 percent or less of the existing or future jobs in the region, county, city, or East Valley Corridor. Since a job loss of less than one percent of the total jobs in an area is normally considered not significant, these job losses would have no significant impact on the local or regional economy. In the long term, the alternatives are expected to have beneficial economic effects because they would increase access to the remaining businesses which in turn could result in revenue gains.

(2) Employment Generated by Operation Expenditures

Operating expenditures generate direct (on-site and off-site) and indirect full-time equivalent employment (FTE). Direct, on-site FTE figures for the Enhanced Bus and rail alternatives were provided by the Operations Division of the Los Angeles Metropolitan Transportation Authority (MTA). Direct, off-site FTE and indirect FTE were derived by multiplying the estimated maintenance and operation costs by regional multipliers provided by the American Public Transit Association (APTA).

Direct, on-site FTE are the jobs generated to operate the bus system (e.g., bus drivers, road supervisors, maintenance workers, security personnel, and administrators and staff) and rail system (e.g., train operators, maintenance workers, controllers/line supervisors, security personnel, code compliance staff, and administrators and staff). Direct, off-site jobs are those jobs associated with the direct operation of the transit system and include employment in business services, insurance, motor vehicles, utilities, real estate, chemicals, petroleum/natural gas, and other industries. Indirect FTE jobs are the jobs required to support the direct employment and include employment in the service, restaurant, and hotel industries.

Table 4-5.2: Employment Loss in the SCAG Region, 1990-2015

Alternative	Jurisdiction	1990	2015	Job Losses From Property Acquisitions		
				No.	Job Loss as Percentage of Total Jobs in Jurisdiction	
					1990	2015
Enhanced Bus	SCAG Region	6,838,904	9,804,890	0	0%	0%
	Los Angeles County	4,612,821	5,911,920		0%	0%
	Los Angeles City	1,902,065	2,165,778		0%	0%
	East Valley Corridor Census Tracts	70,038	75,023		0%	0%
Rail[1]	SCAG Region	6,838,904	9,804,890	148[2]	0.002%	0.002%
	Los Angeles County	4,612,821	5,911,920		0.003%	0.003%
	Los Angeles City	1,902,065	2,165,778		0.01%	0.01%
	East Valley Corridor Census Tracts	70,038	75,023		0.2%	0.2%

Notes:
[1] Includes rail alternatives 1, 2, and 11.
[2] Rail alternatives 1, 2, and 11 would each result in acquisitions of private businesses and the loss of 148 jobs in the East Valley Corridor.

Source: SCAG, May, 1994; Myra L. Frank & Associates, Inc., 1997.

- **Enhanced Bus**

It is estimated that annual operation and maintenance expenditures for the Enhanced Bus Alternative would generate 256, direct, on–site FTE jobs. These employees could be hired from either the local area or from outside the county of Los Angeles (see Table 4-5.3).

Direct and indirect, off-site employment would also be required for the operation of the bus system. As shown in Table 4-5.3, the annual operation and maintenance expenditures for the Enhanced Bus Alternative are anticipated to generate 178 direct, off-site FTE and 592 indirect FTE jobs for a total of 1,026 FTE jobs.

The creation of these new jobs would be a beneficial effect to the local and regional economy.

- **Rail Alternatives**

Table 4-5.3 presents the anticipated jobs that would be generated annually by the operation and maintenance expenditures for the East Valley Corridor Alternatives 1, 2, and 11 and Cross-Valley Alternative 6. As shown in the table, Alternative 1 which is the most costly to operate and maintain would generate the largest number of jobs. Alternative 2 which is the second most costly would generate the second largest number of jobs. Alternative 6 which would be the least costly to operate and maintain because it would be essentially at-grade for its entire length would generate the fewest number of jobs.

Table 4-5.3: Employment Generated by Annual Operations and Maintenance Expenditures

FTE	Enhanced Bus (TSM) $18.3[1]	Rail Alt. 1 $17.7	Rail Alt. 2 $16.0	Rail Alt. 6 $3.3	Rail Alt. 11 $17.7
Direct, On-site	256	408	387	208	408
Direct, Off-site	178	172	156	32	172
Total Direct	434	580	543	240	580
Indirect	592	792	741	328	792
Total Annual FTE	**1,026**	**1,372**	**1,284**	**568**	**1,372**

Notes:

[1] Dollars are in 1996 million dollars and represent annual system operation and maintenance costs.

The Enhanced Bus (TSM) Alternative is a cross-valley alternative and operation and maintenance costs for the Enhanced Bus are cross-valley costs.

Estimates presented for Rail Alternatives 1 and 2 apply to Alternatives 1a, 1b, 1c, 1d, and 2 in the East Valley Transportation Corridor.

Estimates presented for Rail Alternative 6 apply to Alternatives 6a and 6b. Both Alternatives 6a and 6b are cross-valley alternatives and the operation and maintenance costs presented for these alternatives are cross-valley.

Estimates presented for Rail Alternative 11 apply to Alternatives 11a and 11b in the East Valley Transportation Corridor.

FTE (full time-equivalent employment) is an 8-hour, 40-hour work week regardless of the actual number of employees used to comprise that week, and is used to account for variations in weekly average work hours among industries.

Direct, on-site FTE was estimated by MTA and its consultants based on annual operation and maintenance expenditures.

Direct, off-site FTE is equivalent to the operation and maintenance costs multiplied by a regional multiplier of 972.04 that assumes $100 million in annual operations and maintenance expenditures. The regional multiplier was provided by the American Public Transit Association (APTA). Direct, off-site FTE includes jobs in business & professional services (24%), insurance (16%), transportation (8%), motor vehicles (8%), utilities (7%), real estate (6%), chemicals (6%), petroleum/natural gas (5%), and other industries (20%).

Total Direct FTE is the summation of direct, on-site FTE and direct, off-site FTE.

Indirect FTE is equivalent to the total direct FTE multiplied by a regional multiplier of 1.365 that was provided by APTA.

Source: Manuel Padron & Associates, MTA, 1997; American Public Transit Association, April 1, 1983.

The analysis shows that jobs would increase in direct proportion to the costs. It is anticipated that these jobs would be beneficial to the local and regional economy, just as they would be in the Enhanced Bus Alternative.

b. Tax Revenues

(1) Property Tax Revenue Losses

As stated above, construction of each rail alternative would result in the acquisition of 2 residential properties, 18 businesses, and up to 5 parking lot or vacant parcels. The businesses to be acquired are storage facilities, restaurants, warehouses, garages, retail establishments, and offices. No public/institutional facilities, such as schools, religious institutions, government buildings, and utilities, would be acquired.

The acquisitions of private property would result in property tax revenue losses to county and city agencies, school districts, and other special districts in the county of Los Angeles. The local property tax revenue losses would vary slightly by alternative because the properties taken would vary slightly by alternative (see Section 4-2).

Total property tax revenue losses by alternative are equivalent to a summation of the assessed property taxes of the private properties to be acquired. The property tax revenue losses by jurisdiction are equivalent to the total property tax revenue losses by alternative multiplied by a factor of .27 for the county, .17 for the cities, .47 for the school district, and .09 for other special districts.

The assessed property taxes of the acquired properties were obtained from the Los Angeles County Assessors records for fiscal year 1995-1996 as provided in Damar, a CD-ROM-encoded real estate data base for Los Angeles County and produced by TRW-REDI Property Data for 1995-1996.

- **Enhanced Bus**

As shown in Table 4-5.4, the Enhanced Bus would result in no property acquisitions and, thus, no property tax revenue losses. Thus, the Enhanced Bus Alternative would have no adverse effect on property tax revenues.

- **Rail Alternatives**

As shown in Table 4-5.4, property tax revenue losses would be $180,539 under Alternatives 1a, through 1d, 6a, and 6b; $176,387 under Alternative 2; and $178,127 under Alternatives 11a and 11b.

Table 4-5.4: Estimated Property Tax Revenue Loss By Jurisdiction

Alternative	Jurisdiction	Property Tax Revenue Allocation	Property Tax Revenue Loss by Jurisdiction	Loss As % of Property Tax Revenues
Enhanced Bus (TSM)	Los Angeles County	$1,610,146,101	$0	0%
	Cities	$1,013,795,693	$0	0%
	Schools	$2,802,846,916	$0	0%
	Special Districts	$536,715,367	$0	0%
Rail 1a, 1b, 1c, 1d, 6a, 6b	Los Angeles County	$1,610,146,101	$48,746	<0.0003%
	Cities	$1,013,795,693	$30,692	<0.0003%
	Schools	$2,802,846,916	$84,853	<0.0003%
	Special Districts	$536,715,367	$16,249	<0.0003%
Rail 2	Los Angeles County	$1,610,146,101	$47,624	<0.0003%
	Cities	$1,013,795,693	$29,986	<0.0003%
	Schools	$2,802,846,916	$82,902	<0.0003%
	Special Districts	$536,715,367	$15,875	<0.0003%
Rail 11a, 11b	Los Angeles County	$1,610,146,101	$48,094	<0.0003%
	Cities	$1,013,795,693	$30,282	<0.0003%
	Schools	$2,802,846,916	$83,720	<0.0003%
	Special Districts	$536,715,367	$16,031	<0.0003%

Notes:

Property tax revenues levied totaled $5.96 billion in the 1995 - 1996 fiscal year in Los Angeles County. Revenues were allocated according to the following schedule: 27 percent to the county, 17 percent to the cities, 47 percent to the school districts, and 9 percent to special districts.

Enhanced Bus (TSM) would result in no property takes and no property tax revenue loss.

Rail Alternatives 1a through 1d, 6a, and 6b would result in the acquisition of 148 properties in the East Valley Corridor and a total loss of $180,539 in property tax revenues.

Rail Alternative 2 would result in the acquisition of 148 properties and a total loss of $176,387 in property tax revenues.

Rail Alternative 11a and 11b would result in the acquisition of 148 properties and a total loss of $178,127 in property tax revenues.

Source: *Tax Payers' Guide 1995 - 1996*, County of Los Angeles; Tax Revenue Distribution Schedule for fiscal year 1995 - 1996, Office of the Auditor Controller, County of Los Angeles; Myra L. Frank & Associates, Inc., 1997.

The greatest loss in property tax revenues would occur to the school districts, followed by the county, cities, and special districts. However, the losses would total 0.0003 percent of the total property tax revenues allocated to any one group of jurisdictions. And, because the revenue loss would be distributed among the county and the many cities, special districts, and school districts, the actual loss to any one entity would not be significant. Hence, the alternatives would have no significant impact on property tax revenues of the jurisdictions.

(2) Housing Demand Generated by Operational Employment

It is possible that the new employment needed to maintain and operate the transit systems would seek housing in the area and, thus, create a demand for new housing. If a worst-case scenario is assumed in which each employee would result in a demand for one housing unit, the potential demand for new housing units would be 1,026 for the Enhanced Bus Alternative, 1,372 for Alternative 1 and 11, 1,284 for Alternative 2, and 568 for Alternative 6. This potential demand for new housing units would be 0.5 percent or less of the housing supply of either the region, county, or city. However, this percentage is not significant when considered in the context of the forecasted growth in the housing stock for the 10-year period from 1990 to 2015 for the City of Los Angeles, County of Los Angeles, and SCAG region (see Table 4-5.5). It is anticipated that not all of the employees would seek housing in the local area and some would not need to seek housing at all because they would already have a place of residence within commuting distance of the employment site. Given the expanding regional transit system, the new employees would be able to avail themselves of housing outside the local area. Therefore, the potential housing demand generated by the project would not have a significant impact on the regional or local housing supply.

(3) Joint Development

Joint development refers to actions taken to encourage the implementation of desirable land uses in and around the station areas or in air rights over or under the transit facility. Joint development is an important tool that can both compliment a transit system as well as contribute to overall funding and operation costs.

The potential for joint development at station sites could be explored by the MTA and local entities, with consideration given to such factors as local zoning ordinances and general plan goals. Although specific joint development activities are undefined at this time, selected projects would be those which are consistent with regional and local community policies and plans and which bring the greatest economic development potential to the MTA and the community. It is presumed that joint development, if it occurs, would result in beneficial economic effects that would include revenues from sales taxes and business license fees.

Table 4-5.5: Potential Housing Demand Generated by Annual Operation and Maintenance Employment by 2015

Jurisdiction	Housing Unit Growth (1990 - 2015)	Enhanced Bus (TSM) 1,026 FTE [1]	Rail Alt. 1 1,372 FTE	Rail Alt. 2 1,284 FTE	Rail Alt. 6 568 FTE	Rail Alt. 11 1,372 FTE
SCAG Region	2,101,000	0.05%	0.1%	0.1%	0.03%	0.1%
Los Angeles County	757,214	0.1%	0.2%	0.2%	0.1%	0.2%
Los Angeles City	260,097	0.4%	0.5%	0.5%	0.2%	0.5%

Notes:

[1] Anticipated annual total full-time equivalent (direct and indirect) employment during the operation and maintenance phase.

The Enhanced Bus (TSM) Alternative is a cross-valley alternative.

Estimates presented for Rail Alternatives 1 and 2 apply to Alternatives 1a, 1b, 1c, 1d, and 2 in the East Valley portion of the Corridor.

Estimates presented for Rail Alternative 6 apply to Alternatives 6a and 6b. Both Alternatives 6a and 6b are cross-valley alternatives.

Estimates presented for Rail Alternative 11 apply to Alternatives 11a and 11b in the East Valley portion of the Corridor.

Source: MTA and its consultants, 1997; American Public Transit Association, April 1, 1983; SCAG, May 1994.

4-5.4 Mitigation

Where acquisition and relocation are unavoidable, MTA will follow the provisions of the Uniform Relocation Act and the 1987 Amendments 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. (See Section 4-2, Acquisitions, Displacements, and Relocation for further discussion of relocation assistance.)

4-6 VISUAL AND AESTHETIC CONDITIONS

4-6.1 Setting

Because the TSM Alternative would not involve the construction of permanent fixed facilities, much of the setting and analysis sections that follow is devoted to the rail alternatives. Where appropriate, analysis findings are provided for the No Build and TSM Alternatives.

This section addresses the potential changes to the visual environment that could occur as a result of the proposed project. Generally, the visual environment of an area can be characterized by two types of physical features:

- Built environment features including development patterns, buildings, structures, parking areas and roads, utilities, and signs; and,
- Natural features such as hills, vegetation, rock outcroppings, drainages, and soils.

These features constitute the distinguishable, form, scale, color, and texture of a natural or urban setting and are instrumental in defining the visual environment in terms of its character, quality, intactness, and uniqueness.

The key issues to be addressed in the visual and aesthetic conditions analysis are:

- The compatibility of the proposed project with the existing character of adjacent neighborhoods, commercial areas, and industrial areas.
- Potential obstruction of views and scenic vistas from the public right-of-way and from properties adjacent to project elements (guideway or stations in the context of the rail alternatives).
- Potential for loss of landscaping, particularly mature trees.
- Potential for increases of light, glare, and shadow.

The study area is defined to include both landscape and cityscape views as seen from within a 0.25 mile radius of the rail alternative alignments and stations, and distant views of mountains, hills, and ridgelines of up to 5 miles.

The following descriptors are used to analyze and rank the overall quality of views in the study area:

- **View character** is described by features such as topography, general land use or development patterns, scale of development, and the presence of natural areas.

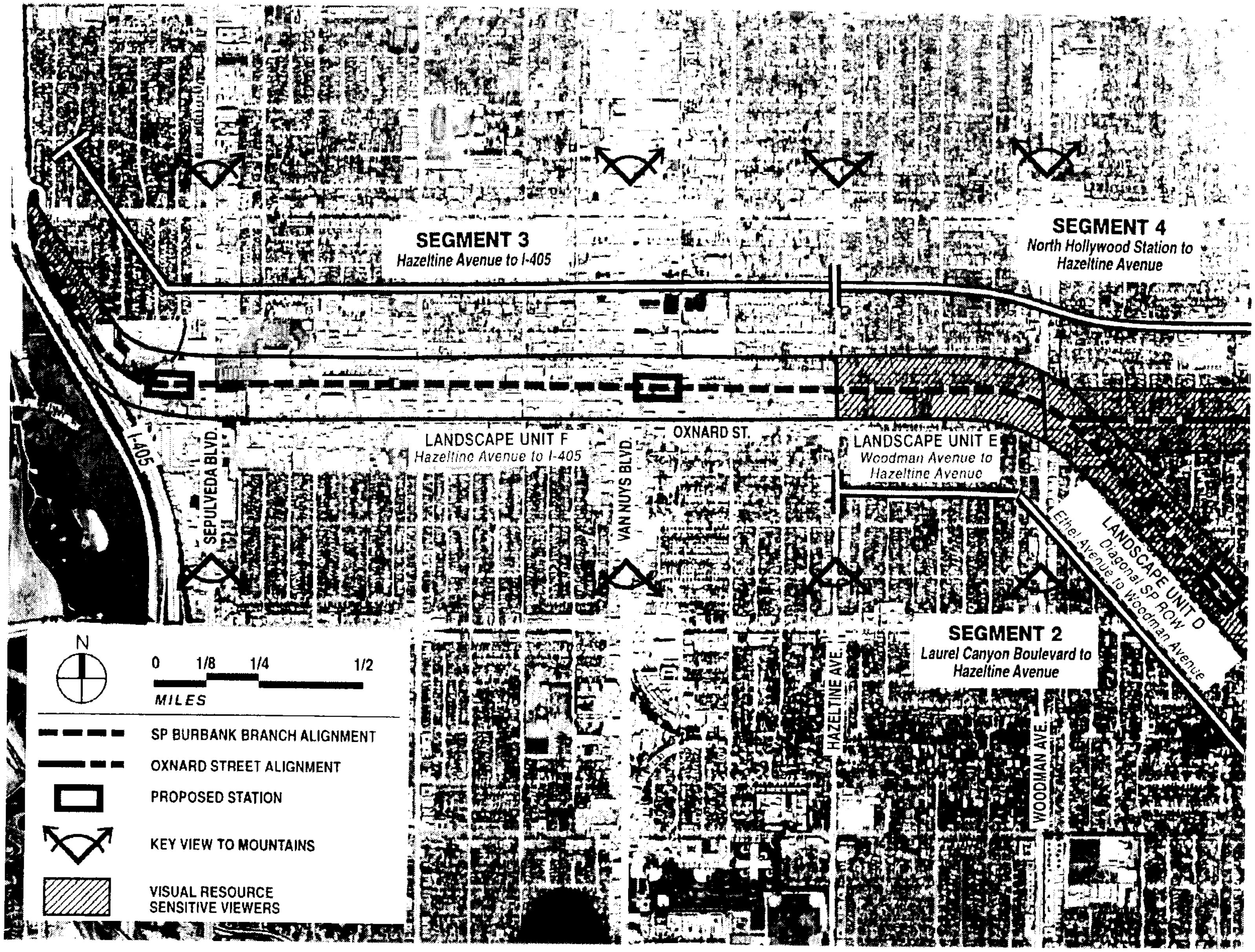
- **Visual Quality** refers to the general aesthetics of a view. This analysis attempts to assess the quality of a view in an objective fashion through the use of the following: vividness, intactness, and unity. Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive patterns; intactness is the visual integrity of the natural and built landscape and its freedom from encroaching elements; and unity is the visual coherence and compositional harmony of the landscape considered as a whole. This analysis evaluates visual quality using low, medium, and high rankings. Views of high quality have topographic relief, a variety of vegetation, rich colors, and unique natural and built features. Areas with medium visual quality have interesting, but minor landforms, some vegetative variety in color, and/or moderate scenery. Areas of low visual quality have uninteresting features, little variety in vegetation, minor color variations, uninteresting scenery, and/or common elements.

- **Visual resources** within a view may include unique views, views identified in local plans, views from scenic highways, or specific unique structures or landscape features.

- **Viewer groups and sensitivity** identifies who is most likely to experience the view and what is the associated sensitivity of the viewer. Residents are considered to have high sensitivity as a viewer group. Other high-sensitivity land uses are schools, religious institutions, and passive outdoor spaces including parks, playgrounds, and recreation areas. Motorists have varying sensitivity depending on the nature of their trip. Motorists on pleasure trips are generally considered to be more sensitive than commuters. Due to their travel speed and the large number of distractions posed by driving, for purposes of this analysis, motorists are ranked as having medium sensitivity. Occupants of office buildings are also considered to have medium sensitivity as a large portion of their time is spent focused on work tasks inside of buildings. Commercial or industrial building occupants are considered to have a low sensitivity as their primary focus is on work activities located inside.

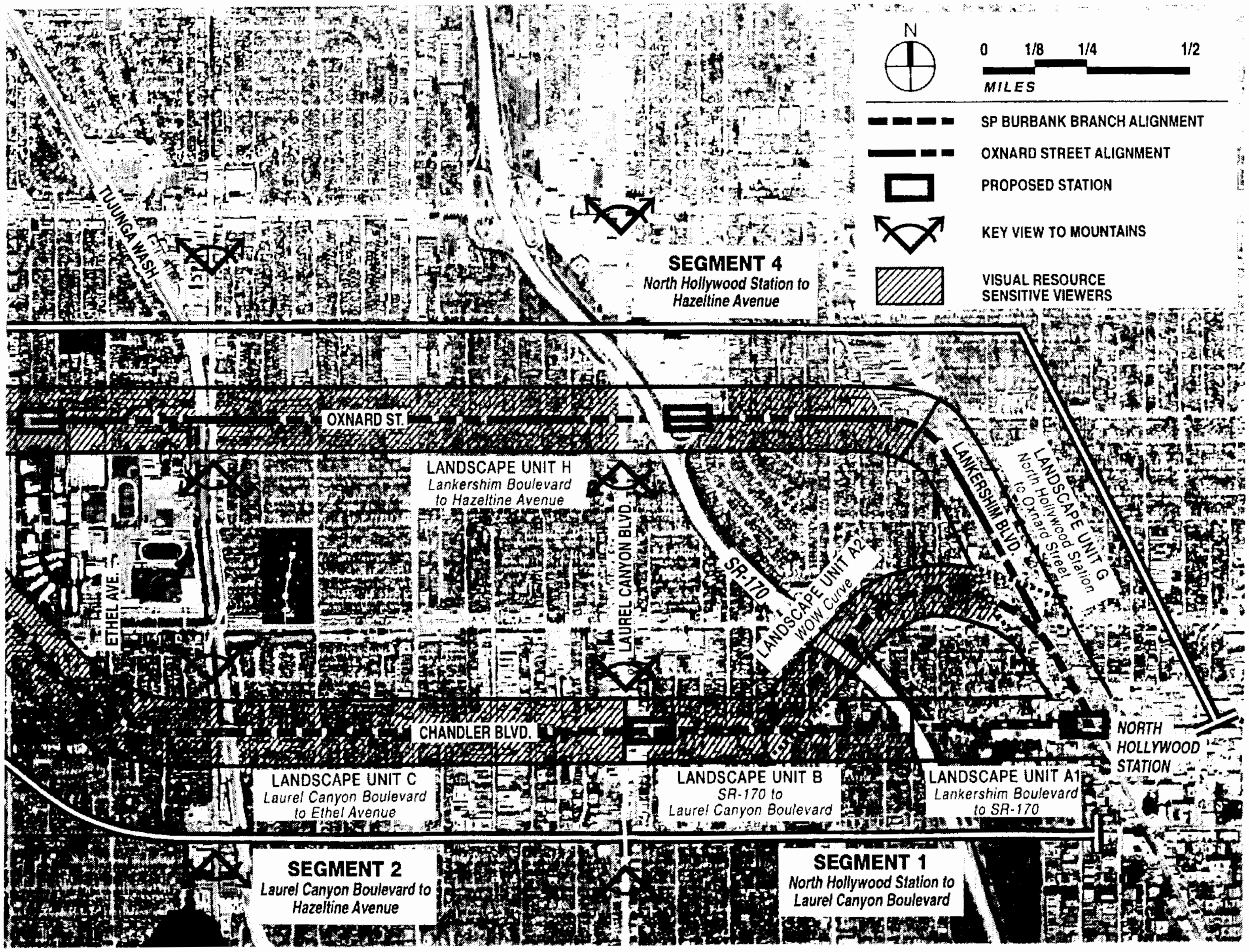
- **Duration of a view** refers to the amount of time that a particular view can be seen by a specific viewer group. Two duration categories are used in this analysis: fleeting or intermittent views (such as those experienced by motorists and cyclists) which are rated as low, and long-term or constant views (which include views from residences or office buildings) and are generally rated high.

The following sections provides a description of the existing character of the study area by alignment segment and, within each segment, by landscape unit. The topography of the San Fernando Valley is flat and there are no hills that would allow distant views of the alignments or stations. As such, the landscape units are assumed to create an outline around the proposed alignments and stations that extends one block or approximately 300 feet to either side of the right-of-way or station boundary. Existing features to be addressed in this section are visual character, viewer groups/sensitivity, key views, and visual resources. See Figure 4-6.1.



SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 4-6.1
Landscape Unit Map
(page 1 of 2)



SOURCE: GRUEN ASSOCIATES, 1997.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-6.1
Landscape Unit Map
(page 2 of 2)

a. SP Burbank Branch Alignment

Segment 1 (North Hollywood to Laurel Canyon Station)

Landscape Unit A1 *(Chandler Boulevard - Lankershim Boulevard to SR-170)*

Summary of Visual Character

Visual Quality	Viewer Group/Viewer Sensitivity	View Duration	Visual Resources
Medium	North Hollywood Park Users/High	Short	None

Beginning at Lankershim Boulevard, Chandler Boulevard is currently a four-lane roadway with the SP right-of-way separating the eastbound and westbound lanes. From Lankershim Boulevard to just east of Camellia Street the right-of-way is approximately 250 feet wide and currently developed with light industrial uses. Between Camellia Street and SR-170 the right-of-way narrows to 60 feet in width and is planted with mature eucalyptus trees. The majority of buildings with views of the alignment are industrial and therefore do not contain sensitive viewers. Users of North Hollywood Park, to the south of the alignment, do represent sensitive viewers. Park users are typically engaged in activities. They are able to see the right-of-way from the northwest corner of the park, but other views are blocked by existing buildings. There are no key views within this landscape unit. The Chandler SP median right-of-way currently has no lighting fixtures, but street lights are present on both sides of the street and at major intersections, providing background ambient light.

Landscape Unit A2 *(WOW Curve)*

Summary of Visual Character

Visual Quality	Viewer Group/Viewer Sensitivity	View Duration	Visual Resources
Medium	Residents/High	Short	None

The area above the WOW curve is developed with single-and multi-family dwellings. No key views are in this Landscape Unit and there are no visual resources. Mostly backyard views are included in this landscape unit.

Landscape Unit B *(Chandler Boulevard - SR 170 to Laurel Canyon Boulevard)*

Summary of Visual Character

Visual Quality	Viewer Group/Viewer Sensitivity	View Duration	Visual Resources
Medium	Residents/High	Long	Eucalyptus hedgerow

West of SR 170 the median right-of-way is exposed soil with a hedgerow of mature Eucalyptus trees is located along the northern edge of the median. Remnants of the previous rail operations, such as tracks, signals, and signs remain in the right-of-way. Two to three-story multi-family uses and one-story single-family uses on both sides of the alignment have views of the right-of-way from their front windows. North Hollywood High School extends from Colfax Avenue to Carpenter Avenue. The running track and tennis courts face the right-of-way but main campus buildings face south onto Magnolia Boulevard. A four-story office building near the intersection of Laurel Canyon Boulevard and Chandler Boulevard has views on the right-of-way from all floors. Highly sensitive viewers in this Landscape Unit are the residents of the single-family and multi-family dwellings. Workers in the office building and students and employees of North Hollywood High have medium sensitivity (i.e., they are not considered highly sensitive viewers due to the limited number of students who use the sports facilities and the presence of landscaping that blocks the view of the right-of-way).

Key views of the Santa Monica Mountains can be seen looking south at Laurel Canyon Boulevard and of the Santa Susana Mountains to the north. These views are considered high quality. The views can be seen by pedestrians and motorists on the Boulevard for up to 5 miles and thus have a high duration. Views cannot be seen from single-family homes fronting the right-of-way. Visual resources in this Landscape Unit consist of the eucalyptus hedgerow (see Figure 4-6.2).

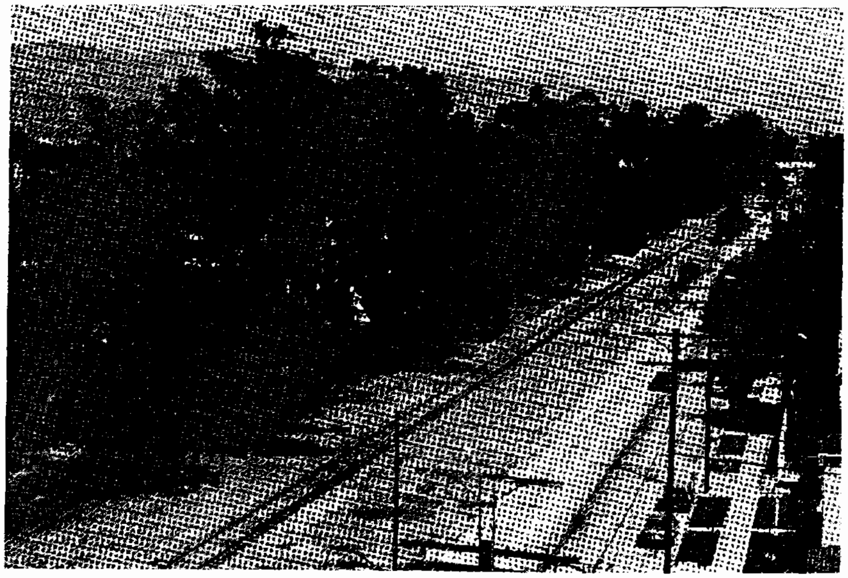
Segment 2 (Laurel Canyon Boulevard to Hazeltine Avenue)

Landscape Unit C *(Chandler Boulevard - Laurel Canyon Boulevard to Ethel Avenue)*

Summary of Visual Character

Visual Quality	Viewer Group/Viewer Sensitivity	View Duration	Visual Resources
Medium	Residents/High	Long	None

Between Laurel Canyon Boulevard and Whitsett Avenue, the right-of-way remains at 60-feet. West of Whitsett Avenue and extending to Coldwater Canyon Avenue, the width increases to 100 feet. The surface of the median is exposed soil with uneven rows of Oleanders on the north and south edges. No trees are present. Remnants of the previous rail operations, such as tracks,



SOURCE: GRUEN ASSOCIATES, 1997.

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FIGURE 4-6.2
Existing Eucalyptus Hedgerow

signals, and signs remain in some areas. Billboards are located in the median at Laurel Canyon and Coldwater Canyon Boulevards. Single- and multi-family residences front onto and have views of the right-of-way. Three religious institutions, Aish Hatorah, Chabad of North Hollywood, and Shaarey Zedek Congregation, and one school, Emek Hebrew Academy, are located in this area. Residents of the dwelling units and people visiting the religious institution and school are considered highly-sensitive viewers. A four-story office building on the southeast side of the Laurel Canyon Boulevard/Chandler Boulevard intersection faces the alignment and offers downward views of the right-of-way. Office workers are considered moderately-sensitive viewers. Key views of the Santa Monica and Santa Susana Mountains can be seen from Whitsett and Coldwater Canyon Boulevards. These views are of high quality and can be seen by pedestrians and motorists traveling on these streets for up to five miles. No visual resources are located in this landscape unit (see Figure 4-6.3).

Landscape Unit D *(Diagonal SP ROW - Ethel Avenue to Woodman Avenue)*

Summary of Visual Character

Visual Quality	Viewer Group/Viewer Sensitivity	View Duration	Visual Resources
Low	Residents/High	Short	None

The alignment transitions from the Chandler Boulevard median into an exclusive right-of-way that travels behind single-family dwellings. The right-of-way is primarily exposed soil with some unmaintained plants and shrubs currently present. Several homes located just south of Oxnard Street are leasing additional back yard space in the right-of-way. Mature trees and fencing are located in this area. Backyard fences prevent residents from viewing the right-of-way. Key views can be seen of the Santa Monica and Santa Susana Mountains by motorists and pedestrians travelling on Fulton Avenue. There are no visual resources in this Landscape Unit.

Landscape Unit E *(SP ROW - Woodman Avenue to Hazeltine Avenue)*

Summary of Visual Character

Visual Quality	Viewer Group/Viewer Sensitivity	View Duration	Visual Resources
Low	Residents/High	Short	None

Between Woodman Avenue and Hazeltine Avenue the alignment passes adjacent to the rear property lines of multi-family uses to the south and a single-family neighborhood to the north. The view of the right-of-way from the single-family houses and first floor apartments in the multi-family buildings is currently blocked by backyard fences. Residents of second and third floor units currently have views looking down onto the right-of-way. Single-family and multi-family residents are considered highly sensitive viewers. Key views of the Santa Monica and

SOURCE: GRUEN ASSOCIATES, 1997.

FIGURE 4-6.3
Existing Character of the Chandler Boulevard Median

Santa Susana Mountains can be seen by pedestrians and motorists travelling on Woodman and Hazeltine Avenues. No significant visual resources are located in this Landscape Unit.

Segment 3

Landscape Unit F

Summary of Visual Character

Visual Quality	Viewer Group/Viewer Sensitivity	View Duration	Visual Resources
Low	Workers/Low	Short	None

The visual character of this segment is dominated by the industrial uses lining the right-of-way. West of Sepulveda station, the alignment passes adjacent to the rear property line of approximately 20 single-family houses. View of the right-of-way is currently blocked by backyard fences and landscaping. Residents currently have filtered views of the I-405 Freeway from over their backyard fences. Key views can be seen of the Santa Monica and Santa Susana Mountains along Van Nuys and Sepulveda Boulevards. No visual resources are located in this Landscape Unit.

b. Oxnard Alignment

Segment 4 (Oxnard Street - North Hollywood Station to Hazeltine Avenue)

Landscape Unit G *(Lankershim Boulevard - North Hollywood Station to Woodman Avenue)*

Summary of Visual Character

Visual Quality	Viewer Group/Viewer Sensitivity	View Duration	Visual Resources
Medium	Workers and Visitors/Medium	Short	None

Lankershim Boulevard is developed with office and commercial uses. Individuals working in these buildings are considered to be of medium sensitivity. The visual character of this route from Lankershim Boulevard to Woodman Avenue is characterized by a large number of single-family dwellings that face onto the street, mixed with clusters of multi-family uses. These buildings face onto Oxnard Street. The alignment passes the campuses of Grant High School and Valley College as well as the Assemblies of God Church at Burbank Boulevard and Lankershim Boulevard. Small commercial buildings are located at Laurel Canyon Boulevard and Woodman Avenue. Residents of single-family and multi-family dwellings are considered to have high sensitivity; students at the two schools have medium sensitivity. Workers and patrons at commercial buildings have low sensitivity. Key views of the Santa Monica Mountains and Santa

Susana Mountains can be seen along Lankershim Boulevard and at major cross streets such as Laurel Canyon Boulevard, Coldwater Canyon Boulevard, Fulton Avenue, Woodman Avenue, Hazeltine Avenue, Van Nuys Boulevard, and Sepulveda Boulevard. No visual resources are located in this Landscape Unit. Existing lighting consists of street lights.

c. Station Areas

Laurel Canyon/Chandler Station

The visual character of the station area is dominated by one-story commercial uses, the four-story Valley Village Senior Apartments, a four-story office building, and, on the northeastern edge of the station, single-family homes facing the right-of-way. The station site is currently improved with no existing landscaping. Highly-sensitive land uses include the residential care facility and the single-family houses. Key views of the Santa Monica and Santa Susana Mountains can be seen from Laurel Canyon Boulevard. No lighting fixtures are currently located on the station site.

Laurel Canyon/Oxnard Station

The visual character of the station is established by Laurel Plaza Shopping Center, SR 170, and Laurel Hall School and Emmanuel Lutheran Church, both of which are on the north side of Oxnard Street to the east of the station at Redford. The proposed portal site is currently developed as a parking lot. No sensitive uses face the station area. Key views of the Santa Monica and Santa Susana Mountains can be seen along Laurel Canyon Boulevard. There are no significant visual resources at this location. Parking lot and security lighting is currently utilized in the parking lots during nighttime hours.

Valley College - Fulton/Burbank Station

The visual character of this station site is characterized by low-intensity commercial development around the Fulton/Burbank intersection and the landscaped western and southern edges of the Valley College campus and a lumberyard currently located on a portion of the station site. Five to six single-family dwellings back onto the right-of-way adjacent to the station. Backyard fences and landscaping currently block views of the right-of-way from these houses. Highly-sensitive viewers in proximity to the station consist of residents of these single-family houses. Key views of the Santa Monica and Santa Susana Mountains can be seen to the north and south along Fulton Avenue. No significant visual resources are present at this location. Security lighting is utilized by the lumberyard throughout the nighttime hours.

Valley College - Oxnard Street Station

The visual character is primarily defined by two-story, multi-family residential buildings lining Oxnard Street and the landscaped northern edge of the Valley College campus. Highly-sensitive uses in proximity to the station site consist of single-family residential neighborhoods to the north along Fulton Avenue and to the west along Oxnard Street. Key views of the mountains to the north and south can be seen along Fulton Avenue. No significant visual resources are found at this station location. Lighting is currently provided in the campus parking lot until approximately 10 PM on weekday evenings. Security lighting is provided around campus buildings throughout the nighttime hours on all days of the week.

Van Nuys Station

The visual character of the station area is dominated by adjacent industrial and commercial uses and, to the north, the eight to ten story buildings in the Valley Government Center. No visually-sensitive uses are located in proximity to the station. Key views of the Santa Monica and Santa Susana Mountains can be seen along Van Nuys Boulevard. No visual significant resources can be seen from the station site. Streetlights on Van Nuys Boulevard create a level of ambient lighting typical of a major commercial thoroughfare. The portion of the right-of-way on the east side of Van Nuys Boulevard that is currently used for automobile storage is lit throughout the nighttime hours by security lighting.

Sepulveda Station

The visual environment at the Sepulveda Station is characterized by large industrial and warehouse uses, a five-story office building, and the Cameron Woods neighborhood, which is located across the street from the station parking lot. No high-sensitivity uses are located in proximity to the station. A five-story office building on the southeast corner of Sepulveda Boulevard and the right-of-way represents a medium-sensitivity use within the station area. Key views can be seen of the Santa Monica and Santa Susana Mountains along Sepulveda Boulevard. No significant visual resources are located in the station area.

4-6.2 Impact Analysis Methodology and Evaluation Criteria

The process used in this visual impact assessment generally follows the FHWA guidelines for assessing visual impacts of transportation projects as outlined in *Visual Impact Assessment for Highway Projects*, FHWA, March 1981. This analysis is intended to satisfy the provisions of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), insofar as consideration of visual and aesthetic effects are concerned. NEPA states that it is the "continuous responsibility" of the federal government to "use all practical means" to "assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings."

For the following analysis, a significant visual impact would occur if the proposed project:

- Introduces a new visual element that would contrast with, be incompatible with, or be out of scale with the existing visual character of the study area.
- Introduce elements into the viewshed of highly-sensitive viewers.
- Alter or obstruct the character of key views.
- Obstruct the use of existing windows . If the proposed project introduces a guideway or other major physical structure so close to a residence or commercial building such that it would completely eliminate the view from that window, a significant impact would occur regardless of the quality of the view.
- Result in the loss of significant landscape materials, particularly mature trees.

- Result in light intrusion on residences, increased glare for motorists or pedestrians, or substantial shade or shadow on sensitive receptors such as residences, schools, parks, and residential care facilities.

4-6.3 Impacts on Visual and Aesthetic Conditions

a. No Project Alternative

The No Project alternative would not produce any of the impact conditions noted above, and therefore there would be no effect.

b. TSM

Implementation of the TSM alternative would not produce any of the impact conditions noted above, and therefore there would be no effect.

c. Alternative 1a

Segments 1 and 2

This alternative would travel below-grade in a deep-bore profile from the North Hollywood Metro Rail station to Hazeltine Boulevard. No existing visual conditions would be altered and impacts would be less than significant.

Segment 3

Landscape Unit F

West of Hazeltine Avenue, the alignment would transition to an aerial configuration. The transition section, from where the alignment reaches grade level to the point it reaches the required height of the aerial guideway, would be approximately 600 feet long. The transition section would consist of a berm of retained earth that would possibly be covered with concrete. At the point where the bottom of the alignment reaches approximately 9 feet above grade, the guideway could be supported by columns. The transition area would be fenced to restrict access. West of the transition, the guideway would be supported by columns to the Sepulveda station. West of the station, the guideway would drop to an-at grade profile along the edge of the 405 Freeway. The transition segment and aerial guideway would be compatible in scale and character with surrounding industrial uses.

The residents of single-family houses west of the Sepulveda station and adjacent to the right-of-way would be able to see the tops of rail vehicles as they travel at-grade in this area. As the residents of these houses represent highly-sensitive viewers, significant impacts would occur prior to mitigation. Key views at Hazeltine Avenue, Van Nuys Boulevard, and Sepulveda Boulevard would be altered by the aerial guideway. While the presence of the guideway may detract from the overall quality of the views, the mountains could continue to be seen beneath the guideway and would not be completely blocked at any time. Impacts to key views that would be less than significant. The aerial guideway would cast shadows on the right-of-way, and, to the north, onto adjacent industrial parcels. As industrial areas are considered to be low in sensitivity, potential increases in shade and shadow would be less than significant. Security lighting would be provided adjacent to the aerial guideway. Lighting would be focused on and around the guideway and at street crossings to prevent glare on adjacent parcels.

d. Alternative 1b

Segment 1

Landscape Unit A2
The alignment in this landscape unit would pass below grade in a deep-bore profile. The existing visual character, existing views, and existing landscaping would not be altered. No additional lighting would be added to this portion of the alignment. Impacts would be less than significant.

Landscape Unit B
Beginning at Carpenter Avenue, the alignment would be constructed with a cut-and-cover technique. The alignment would be below-ground and covered and no impacts to sensitive viewers or key views would occur. The cut-and-cover technique would disrupt the median and potentially require removal of the existing eucalyptus trees. If these trees must be removed, a significant impact would occur prior to mitigation. Additional lights would be located infrequently in the right-of-way and would be directed downward to prevent glare.

Segment 2

In the this segment, the rail line would be below ground in a cut-and-cover guideway. Existing visual conditions would not be altered. Lighting would be located infrequently in the median and would be directed toward the right-of-way to prevent glare. No light would be cast onto adjacent properties. Impacts in this alignment segment would be less than significant.

Segment 3

Impacts would be identical to those described for Alternative 1a.

e. Alternative 1c

Segment 1

Landscape Unit A2
Impacts would be identical to those described for alternative 1a.

Landscape Unit B
Beginning at approximately Carpenter Avenue, the alignment would transition to an open-trench profile. The trench would be approximately 20 to 35 feet in depth and rail vehicles would travel completely below grade level. A concrete portal, similar in appearance to a street undercrossing, would be located in the median at the point where the alignment transitions from deep bore to

the open-air subway. The sides of the trench would feature an approximately four-foot tall concrete wall topped with a six-foot fence. The wall would be made of natural color concrete block and the fencing of plastic-coated chain-link. Existing billboards in the median right-of-way would be removed.

The open-air guideway and its ancillary fencing would be consistent with the character of Chandler Boulevard as an urban roadway. Although the fencing along the right-of-way would be visible from single- and multi-family dwellings on the north and south sides of Chandler Boulevard, these uses are separated from the alignment by Chandler Boulevard. The open-air guideway would be visible from third and fourth floor windows of the office building directly east of Laurel Canyon Boulevard. Office workers are considered to be of medium sensitivity. As the features of the alignment would be compatible with the character of Chandler Boulevard and the alignment would not be located directly adjacent to sensitive uses, impacts would be less than significant. Development of the open-trench may result in the need to remove the existing eucalyptus trees along the north side of the median right-of-way. If these trees are removed, a significant visual resource would be removed and significant adverse impacts would occur. As this alternative features a below-grade profile, key views would not be affected. Lighting located along the open air profile would be directed into the subway to prevent glare.

Segment 2

Landscape Unit C
The open-air profile would continue through this landscape unit. With the open-air profile, neither the rail guideway or vehicles would be visible from adjacent single-family uses. Several two-story multi-family dwellings are located approximately 50 feet from the right-of-way. The distance between the dwellings and the rail alignment creates a viewing angle that would not provide a clear view into the trench of the rail vehicles. The security wall and fencing associated with this alternative are compatible with the character of Chandler Boulevard as heavily-travelled urban roadway. As the alignment does not pass directly adjacent to sensitive viewers and is compatible with the character of the Chandler Boulevard median, impacts would be less than significant. As the rail vehicles would travel below grade, key views would not be altered. Lighting adjacent to the open-trench would be directed into the trench and away from adjacent properties. Figure 4-6.4 shows a photo composite illustrating the general character that would be exhibited in the Chandler Boulevard median with this profile.

Landscape Unit D
The alignment would continue in an open-air profile through this landscape unit. Views of the rail vehicles, alignment, or ancillary fencing would not be visible above the backyard fences of adjacent single-family houses. As no sensitive viewers would be affected, impacts would be less than significant. There are no key views in this landscape segment. Lights adjacent to the right-of-way would be directed downward to the trains and away from adjacent properties.

Landscape Unit E
Between Woodman and Hazeltine Avenues, residents of single-family buildings would not be able to see the rail vehicles, guideway, or security above their backyard fences. Residents of two- and

After View

Before View

SOURCE: GRUEN ASSOCIATES, 1996.

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FIGURE 4-6.4
Composite Rendering of Chandler Boulevard with Open Trench Guideway

three-story multi-family dwellings would be able to see down into the trench and view the rail vehicles. However, the windows facing the guideway are typically rear windows, which substantially limits the potential frequency and duration of views. As a result, impacts would be less than significant.

Segment 3

Impacts would be identical to those described for Alternative 1a.

f. Alternative 1d

Segment 1

Impacts would be identical to those described for Alternative 1b.

Segment 2

Landscape Unit C
West of Laurel Canyon Boulevard, the profile would transition from below-grade to an aerial configuration. A concrete portal structure would be constructed in the median at approximately Bellingham Avenue. West of Bellingham Avenue, a gradually rising berm would be constructed to support the guideway as it transitions to a height of approximately 17 feet above grade. The berm would continue approximately 300 feet to a point opposite Hermitage Avenue. Between Laurel Canyon Boulevard and Hermitage Avenue, views across the median would be blocked. Views of the guideway could be seen from the front windows of single- and multi-family dwellings, commercial structures, and office buildings along Chandler Boulevard. Billboards in the Chandler Boulevard median would be removed (see Figure 4-6.5).

The construction of the guideway berm and aerial structure would add a visual element that is out of scale with the adjacent land uses on either side of Chandler Boulevard. Chandler Boulevard provides a minimum of a 70-foot separation between the aerial guideway and adjacent uses. The guideway would be compatible with the character of Chandler Boulevard as an urban roadway. As the aerial guideway would be located in the middle of a heavily- travelled urban roadway and would be physically separated from sensitive uses, impacts would be less than significant. The guideway would moderately alter, but not block, key views of the Santa Monica and Santa Susana Mountains for approximately one half mile to either side of Coldwater Canyon Boulevard. At a distance of greater than one half mile the guideway would blend in with other background features and cease to be an obtrusive visual element. As key views would not be blocked from view, impacts to key views would be less than significant. The aerial guideway would cast shadows onto the right-of-way but not onto adjacent private parcels. Lighting would be provided along the length of the guideway and at the base of the support columns and would be directed toward the support columns and upper guideway walls such that light would not be cast onto adjacent properties.

After View

Before View

SOURCE: GRUEN ASSOCIATES, 1996.

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FIGURE 4-6.5
Composite Rendering of Chandler Boulevard with Aerial Guideway

<u>Landscape Unit D</u>
In this portion of the alignment, the aerial guideway would pass adjacent to the rear property lines of single-family homes. Views of the aerial guideway and support columns could be seen over the back yard fences of adjacent single-family dwellings. The size and mass of the aerial guideway would be out of scale with the adjacent single-family neighborhoods. As incompatible visual elements would be added to the visual environment, and these elements would be seen by sensitive viewers, significant adverse impacts would occur. The aerial guideway would cast shadows onto the right-of-way. The 100 - 200 foot width of the right-of-way in this area provides sufficient distance such that shadows would not fall on adjacent residences. Lighting would be provided along the length of the guideway and at the base of the support columns and would be directed toward the support columns and upper guideway walls such that light would not be cast onto adjacent properties.

<u>Landscape Unit E</u> *(SP ROW - Woodman Avenue to Hazeltine Avenue)*
In this area, the aerial guideway would pass adjacent to the rear property line of single- and multi-family dwellings. Views of the guideway and rail vehicles could be seen from the rear windows of single-and multi-family dwellings. The guideway would add a visual element that is incompatible with the current residential character of the area. As the aerial guideway would be incompatible with the residential character of the surrounding neighborhoods, and would be seen by sensitive viewers, significant adverse impacts would occur. The guideway would moderately alter, but would not block, key views of the Santa Monica and Santa Susana Mountains for approximately one half mile to the north and south along Woodman and Hazeltine Avenues. At a distance of greater than one half mile the guideway would blend in with other background features and cease to be an obtrusive visual element. As key views would not be blocked from view or dramatically altered, impacts would be less than significant. Morning and afternoon shadows would fall onto the right-of-way which is of sufficient width to preclude shadows from falling on adjacent parcels. Lighting would be provided along the length of the guideway and at the base of the support columns and would be directed toward the support columns and upper guideway walls such that light would not be cast onto adjacent properties.

Segment 3

Impacts would be identical to those described for Alternative 1a.

g. Alternative 2

Segment 3

Impacts would be identical to those described for Alternative 1a.

Segment 4

The alignment would travel below grade in deep-bore alignment. Existing visual conditions above the alignment would not be altered. As no changes would occur to the existing visual conditions along the alignment, impacts would be less than significant.

h. Alternative 6a

Segment 1

Landscape Unit A1
Beginning at the North Hollywood station, this alternative would add two sets of tracks, overhead catenary wires and poles, fencing, lighting poles, and lighting fixtures to the right-of-way. It would retain such features as historically existed along this route when the line was operated by the Pacific Electric Railway Company prior to 1955. The addition of new tracks and rail equipment would be compatible with the existing visual character of the area and with the character of Chandler Boulevard as an urban roadway. Although the rail vehicles and catenary poles and wires could be seen by individuals at North Hollywood Park, the park is separated from the alignment by Chandler Boulevard. As the alignment would not pass directly adjacent to an area with sensitive viewers, impacts would be less than significant. Lighting would be added to the median adjacent to the rail alignment. These lights would be focussed downward to prevent glare.

Landscape Unit B
The rail alignment would continue at-grade from SR 170 to Laurel Canyon Boulevard. Residents of single-family dwellings on either side of the right-of-way would have views of alignment across Chandler Boulevard. The rail vehicles, catenary poles, and wires are compatible with the existing and historic character of Chandler Boulevard as an urban roadway. The rail alignment would retain such features as historically existed along this route when the line was operated by the Pacific Electric Railway Company prior to 1955. As the alignment would pass directly adjacent to sensitive viewers, impacts would be less than significant. The catenary wires would alter key views of the Santa Susana and Santa Monica Mountains at Laurel Canyon Boulevard. However, the catenary wires are thin and from a distance of greater than 500 feet, the wires would blend in with surrounding urban features. Views of the mountains would not be blocked and impacts to existing key views would be less than significant.

Segment 2

Landscape Unit C
The overhead catenary wires and support poles would add visual elements that are more industrial in quality than the existing character of the area. Residents of single-and multi-family dwellings along Chandler Boulevard, members of the religious institutions, and workers in adjacent office and commercial buildings would be able to see the rail line, catenary wires, and rail vehicles across Chandler Boulevard. These features of the rail alignment would be compatible with the character of Chandler Boulevard as an urban roadway. The alignment would be separated from sensitive uses by Chandler Boulevard. As the alignment would not travel directly adjacent to sensitive uses or sensitive viewers, impacts would be less than significant. The catenary wires would alter key views of the Santa Susana and Santa Monica Mountains at Coldwater Canyon Boulevard. However, the catenary wires are thin and from a distance of greater than 500 feet, the wires would blend in with surrounding urban features. Views of the mountains would not be blocked and impacts to existing key views would less than significant. Lighting to be

provided along the alignment would be directed toward the right-of-way to prevent glare or light being cast onto adjacent parcels.

Landscape Unit D
In this area, the rail line would remain approximately ten feet below grade. This profile would prevent views of the rail vehicles, fencing, and catenary wires from being visible over backyard fences. Impacts would be less than significant. No key views are located in this landscape unit. Lighting to be provided along the alignment would be directed toward the right-of-way to prevent glare or light being cast onto adjacent parcels.

Landscape Unit E
In this area, the alignment would travel at-grade and catenary wires and rail vehicles would be visible over the back fences of single-family dwellings to the north. To the south, residents of adjacent apartment buildings could see the alignment, catenary wires, and support poles from windows on the second floor and above. The addition of the catenary wires would add a visual element that is out of character with the adjacent residential development. As a incompatible elements would be added to the visual environment and these elements would be seen by sensitive viewers, significant adverse impacts related to changes in the visual environment would occur. The catenary wires would alter key views of the Santa Susana and Santa Monica Mountains at Woodman and Hazeltine Avenues. However, the catenary wires are thin and from a distance of greater than 500 feet, the wires would blend in with surrounding urban features. Views of the mountains would not be blocked and impacts to existing key views would less than significant. Lighting to be provided along the alignment would be directed toward the right-of-way to prevent glare or light being cast onto adjacent parcels.

Segment 3

Landscape Unit F
West of Hazeltine Avenue, the alignment would continue in an at-grade configuration to approximately 1,000 feet east of the Van Nuys station, where an aerial crossing of Van Nuys Boulevard would be provided. The alignment would transition back to an at-grade profile and continue westward to Sepulveda Boulevard, where a second aerial crossing would be constructed in conjunction with the Sepulveda station. The guideway, transition sections, catenary wires, support poles, and fencing would be compatible with the adjacent industrial character of the area and impacts would be less than significant. West of the Sepulveda station, the alignment would transition to an at-grade configuration and impacts would be identical to those described for Alternative 1a. The catenary wires would alter key views of the Santa Susana and Santa Monica Mountains at Van Nuys and Sepulveda Boulevards. However, the catenary wires are thin and from a distance of greater than 500 feet, the wires would blend in with surrounding urban features. Views of the mountains would not be blocked and impacts to existing key views would less than significant. Lighting to be provided with this alternative would be directed toward the right-of-way to prevent glare or light being cast onto adjacent parcels.

i. Alternative 6b

Segment 1

Landscape Unit A1
This alignment would begin at-grade at the North Hollywood Station and transition to an open-trench profile west of Tujunga Avenue. West of Tujunga Avenue a low wall topped with an eight-foot fence would be added to the median. The fence would be visible by sensitive viewers at North Hollywood Park. Although the introduction of the fence would alter the current view of the median, the change would be slight and is compatible with the existing character of the median. Lighting to be added along the alignment would be directed downward to prevent glare.

Landscape Unit B
Impacts in this landscape unit would be identical to those described for Alternative 1c.

Segment 2

Impacts in this segment would be identical to those described for Alternative 1c.

Segment 3

Impacts in this segment would be identical to those described for Alternative 6a.

j. Alternative 11a

Segment 1

Landscape Unit A2
Impacts would be identical to those described for Alternative 1a.

Landscape Unit B Impacts would be identical to those described for Alternative 6a.

Segment 2

Impacts would be identical to those described for Alternative 6a.

Segment 3

Impacts would be identical to those described for Alternative 6a.

k. Alternative 11b

Segment 1

Landscape Unit A2
Impacts would be identical to those described for Alternative 1a.

Landscape Unit B
Impacts would be identical to those described for Alternative 6b.

Segment 2

Impacts would be identical to those described for Alternative 6b.

Segment 3

Impacts would be identical to those described for Alternative 6a.

l. Station Areas

Laurel Canyon/Chandler Station *(Alternatives 1, 6, and 11)*
Alternatives 1a and 1b feature a below-grade station at this location. At grade level, a plaza would extend approximately 300 feet east of Laurel Canyon Boulevard to a stairway and escalator leading to the platform level. Ticketing and information kiosks, benches and landscaping would be located in the plaza. The station plaza and portal would be compatible in scale and design with the adjacent visual character. Creation of the plaza would change the current unlandscaped condition of the median to a more formal paved and landscaped condition, resulting in beneficial visual effects.

Alternatives 1c, 1d, 6b, and 11b feature an open-air station design. Similar to the covered station, most station operations would be located below grade. A roof canopy to be provided above the platform would be below grade level and would not be visible from nearby residences. A plaza would extend approximately 300 feet east of Laurel Canyon Boulevard to stairs and escalators leading to the platform level. Ticketing and information kiosks, landscaping, and benches would be located in the plaza. Landscaping would also be provided along the sides of the station. Creation of the plaza and addition of landscaping would resulting in beneficial visual effects. The scale and character of the above ground station structures and other fixtures would be compatible with the surrounding visual environment at the Laurel Canyon Boulevard/Chandler Boulevard intersection. Landscaping would screen views of the station from residential uses located on the eastern end of the station. As the station would be below grade with these alternatives, key views would not be changed. As sensitive viewers, key views, or visual resources would not be affected, impacts would be less than significant. Lighting would be provided at the station plaza and around the station perimeter would be directed onto the plaza and station area to prevent glare. Station lights would be visible from the four-story office building on the south side of Chandler Boulevard. However, direct views of the light source would not be visible and glare-related impacts would not occur.

Alternatives 6a and 11a would result in the construction of an at-grade station on the east side of the Laurel Canyon/Chandler intersection. Station components would be clearly visible with this type of station. A plaza extending approximately 300 feet east of the intersection, two platforms, ticketing and information kiosks, a roof structure, and catenary wires and poles would be constructed in the median area. The sides of the station would be landscaped to screen views from single-family residences to the east. As the station is physically removed from uses along Chandler Boulevard, compatible in scale with nearby buildings, and screened from the view of sensitive viewers, impacts would be less than significant. Key views would be altered but not blocked by the presence of catenary wires crossing Laurel Canyon Boulevard and no visual resources or mature landscaping would be affected as a result of this alternative. Lighting-related effects would be similar to those described above.

Laurel Canyon/Oxnard Station *(Alternative 2)*
The station proposed for this location (under Alternative 2) would be constructed below ground. Portals would be provided on both sides of Oxnard Street near the main southern entrance to the Laurel Plaza shopping center. Construction of the station portal and ancillary facilities would require that the Caltrans park-and-ride by utilized. Existing landscaping on the site does not represent a significant visual resource. Both portal sites would feature a low wall, stairs, and escalators, an approximately 15 foot tall sign identifying the station, and a small plaza. The station portal elements would be compatible with the established visual character of the area and the additional landscaping would result in beneficial visual impacts. Views would not be affected, as the station elements are below grade. Lighting to be provided at the station would be similar in intensity to what is currently utilized in the parking areas. Lights would be directed to the station and no light would be cast onto private parcels.

Valley College - Fulton/Burbank Station *(Alternatives 1, 6, and 11)*
Alternatives 1a, 1b, 1c, 6a, 6b, 11a, and 11b would result in the development of a below-grade station that could be either covered or open-air. Both a covered or open-air station would feature a small plaza on the northeast corner of the Fulton Avenue and Burbank Boulevard and a larger plaza on the west side of Fulton Avenue, north of Burbank Boulevard. The smaller plaza would include a low wall around the opening to stairs and escalators, and an approximately 15 foot tall sign. The portal would be compatible in scale with surrounding development. The west side of Fulton Avenue the plaza extend approximately 150 feet into the right-of-way, and feature an approximately 12 foot-tall elevator tower, a low wall around the stairs and escalators, and sign marking the station entrance. An approximately 50 space parking lot would be provided along the north side of the right-of-way. Visual signs of a covered station would end at the western edge of the plaza. As the station would be below grade, key views would not be altered. No visual resources are located in this area. Impacts related to the covered station would be less than significant.

An open-air station would extend the visible area altered by station construction approximately 500 feet to the west. West of the plaza the station platform would be visible. On the south side of the right-of-way, a landscaped slope would continue westward. On the north side a retaining wall would allow for the development of an approximately 50-space parking lot. As the majority of station elements would be below grade, it would be compatible with the smaller scale of development located around this intersection. Neither the station nor its parking lot would be visible above the back yards of residences to the north. As the station would be below grade, no key views would be altered. No visual resources are located in the station area. Lighting around the station would be directed toward the plaza area and the station platforms to preclude light from falling onto adjacent properties. Visual and aesthetic impacts related to an open-air station would be less than significant.

Alternative 1d features an aerial station located on the west side of Fulton Avenue. At the base of the station, a plaza featuring landscaping, benches, a sign marking the station entrance, and information and ticketing kiosks would be developed. The massive character of the aerial station and its supporting columns would be incompatible in size and scale with the low-intensity commercial and single-family residential uses in proximity to the station. The aerial station would be visible above the backyard fences of single-family houses on both sides of the right-of-way. As incompatible visual elements would be added to the visual environment and these elements would be seen by sensitive viewers, significant adverse impacts would occur prior to mitigation. The aerial guideway would alter key views to the north and south as it crosses Fulton Avenue (see Figure 4-6.6). However, views of the mountains would remain visible under the guideway and, at a distance of greater than 1,000 feet, the mountains could be seen above the guideway. Impacts to key views would be less than significant. No visual resources are located within the station area. The aerial station would cast shadows on the right-of-way and, during the late afternoon of winter months, onto the back yards of residential uses to the north. No shadows would fall on adjacent buildings and the current amount of sunlight hours experienced within the adjacent single-family dwellings would be unchanged. As the number of sunlight hours would not be changed, impacts would be less than significant. Lighting at the aerial station would be directed downward toward the platforms and would be located sufficient distance from adjacent residential uses such that light would not be cast onto adjacent yards or dwellings.

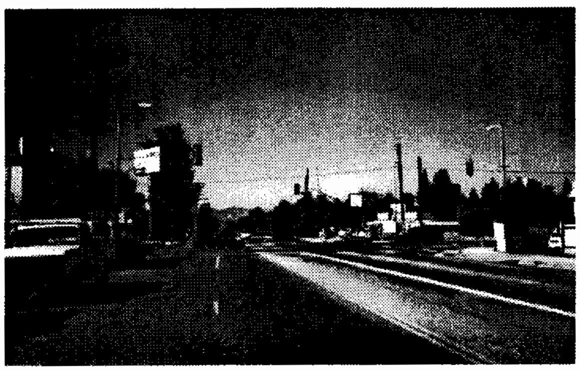
Valley College - Oxnard Street Station *(Alternative 2)*

Alternative 2 would result in the development of a covered, below-grade station near the intersection of Fulton Avenue and Oxnard Street. Above grade features would be limited to the station portal fixtures. The portal in the northwest corner of the Valley College property would be approximately 500 square feet and feature a plaza, low wall around the stair and escalator entrance/exit, a sign marking the station, and landscaping. Portal features would be consistent with the visual character of the Valley College parking lot. No mature trees would be removed as part of the station construction and no other visual resources are located in this area. As the station would be constructed below ground, key views to the north and south along Fulton Avenue would not be impacted. Lighting provided in conjunction with the station portal would be directed toward the station and no light would be cast onto adjacent properties. Visual impacts related to this station option would be less than significant.

Van Nuys Station

All of the proposed rail alternatives would result in the construction of an aerial station at this location. The station would span Van Nuys Boulevard with the majority of station facilities and parking provided on the east side of the boulevard. A plaza would be provided around the base of the station on the west side of the street with a larger plaza provided on the east side.

Before View



After View

SOURCE: GRUEN ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-6.6
Composite Rendering of Fulton/Burbank Station
Looking North

Information and ticketing kiosks, a sign marking the station entrance, and landscaping would be provided at the plazas. Stairs and escalators would provide access to the platform level. To the east and west of the station, parking lots with perimeter landscaping would replace the currently unimproved right-of-way. Development of the station area would have a beneficial effect on the appearance of the right-of-way. The aerial station would be compatible with the urbanized character of the Van Nuys area and scale and mass of nearby buildings.

The station would span Van Nuys Boulevard, thereby altering key views to the north and south to the Santa Susana and Santa Monica Mountains (see Figure 4-6.7). Existing key views would be altered but not blocked and further than one quarter mile from the station views of the mountains could be seen over the guideway structure. Impacts to key views would be less than significant. The aerial structure would cast shadows onto the right-of-way, the plaza area around the station, Van Nuys Boulevard, and adjacent industrial uses to the north and south of the station. Industrial buildings are not considered sensitive uses. Lighting would be provided around the station on the sidewalk level, in the parking lots, and on the station platforms. Lighting would be directed toward the station area and parking lots and no light would be cast onto adjacent properties.

Sepulveda Station

All of the rail alternatives would result in the development of an aerial station spanning Sepulveda Boulevard. with the majority of the station facilities located on the west side of Sepulveda Boulevard, south of the Wicke's Furniture Warehouse. A small plaza area around the base of the station would be developed on the east side of Sepulveda Boulevard. A larger plaza and drop-off area would be developed on the west side of the Boulevard. West and north of the proposed station, a large park-and-ride lot and a bus drop-off and layover facility would be constructed. Landscaping would be provided around the perimeter of the lot. An approximately 25-foot wide landscaped buffer would be provided along the northern edge.

The proposed station and its ancillary facilities, including the park-and-ride lot, would be compatible with the industrial character of the station area. The landscaped buffer along the northern edge of the property would effectively screen views of the station parking area from the single-family neighborhood to the north. The guideway would pass in close proximity to an office building located east of Sepulveda Boulevard and south of the right-of-way. The urban character of the transit system and its elements would be compatible the office building. However, workers in the second and third floors would be able to see the trains passing within 20 feet of their windows which may be distracting. Office workers are considered to have medium sensitivity. As the guideway and station would be compatible with the existing visual environment, impacts would be less than significant.

The aerial station facilities would span Sepulveda Boulevard, thus altering key views to the north and south (see Figure 4-6.8 and Figure 4-6.9). The views would altered, but not blocked. No visual resources are located in proximity to the proposed station and impacts to visual resources would be less than significant.

Before View

After View

SOURCE: GRUEN ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-6.7
Composite Rendering of the Van Nuys Station Looking North

After View

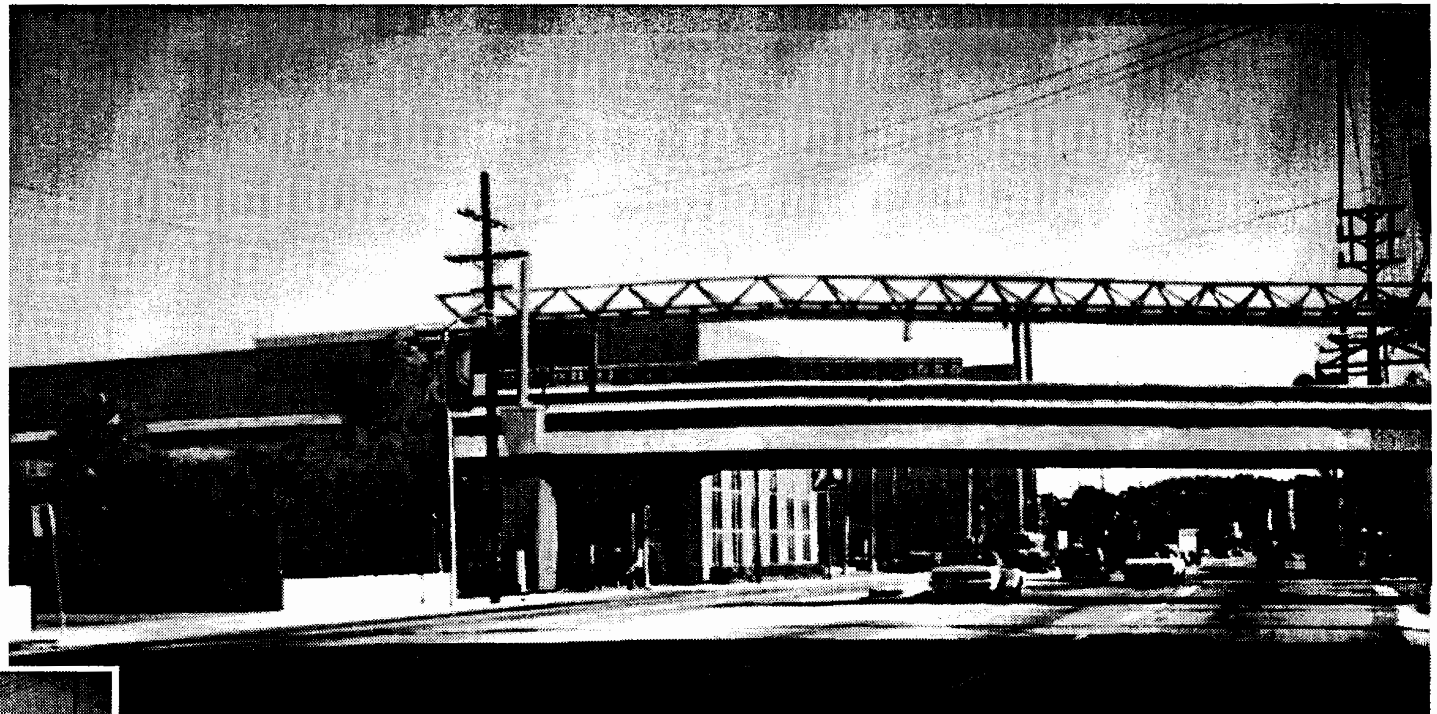
Before View

SOURCE: GRUEN ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-6.8
Composite Rendering of the Sepulveda Boulevard Station Looking North

Before View



After View

SOURCE: GRUEN ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-6.9
Composite Rendering of the Sepulveda Boulevard Station Looking South

The aerial guideway and station would cast shadows onto the right-of-way, Sepulveda Boulevard, and adjacent land uses throughout the day. Shadows would fall primarily to the north on the Costco parking lot, the station access road, and the park-and-ride lot. During the early morning and late afternoon hours, particularly in summer months, shadows would be cast to the southwest and southeast onto the office building on the west side of Sepulveda. These shadows would be cast onto the building during the early morning and late evening hours, during the part of the year when the days are longest. As a result the majority of workers would not experience the effects of increased shade and shadow and significant impacts would not occur. Lighting would be provided around the plaza areas and at the platform level. Lights would be directed toward the station plazas and platform.

4-6.4 Mitigation Measures

Alignment Alternatives 1b, 1c, 1d, 6a, 6b, 11a, and 11b

- During the preliminary engineering phase of the project, a certified arborist shall be retained to conduct a thorough inspection of the eucalyptus trees located between the North Hollywood Metro Rail Station and Coldwater Canyon Boulevard to determine the condition, quality, and estimated life span of the trees and to identify what measures should be adhered to in the engineering and construction phases to ensure that trees would be preserved. This report shall be submitted to the MTA Planning and Construction Divisions, and the City of Los Angeles Department of Public Works; Street Tree Division.

- In the event that the arborist or project engineers determine that implementation of the Locally Preferred Alternative (LPA) would prevent preservation of the trees, the trees shall be replaced in the Chandler Boulevard median with the same or other appropriate variety eucalyptus trees, or other tree of similar qualities (evergreen, vertical, fast-growing) of 48-inch box size or greater at the rate of three (3) new trees for every one (1) tree removed, to provide a similar level of lushness and vegetation.

Alignment Alternatives 1a, 1b, 1c, 1d, 2, 6a, and 6b

- If not currently in place, six foot tall wood or masonry block fences and a minimum ten-foot wide landscaped buffer shall be provided between the rear property lines of single-family dwellings located northwest of the Sepulveda station site. The landscape buffer shall be planted with trees featuring dense foliage to screen the majority of views of the rail vehicles over the fence.

Alignment Alternative 1d

- A landscape buffer shall be provided adjacent to residential dwellings on both sides of the guideway in the diagonal portion of the SP Burbank Branch right-of-way between Ethel Avenue and Woodman Avenue. Tall, dense trees of a minimum 24-inch box size shall be planted at an interval of not less than 40 feet on center along the length of this section. Additional landscaping should be provided adjacent to the guideway columns to soften the mass of the structure.

- A landscaped buffer shall be provided along both sides of the right-of-way in the area between Woodman and Hazeltine Avenues. Tall, dense trees of a minimum 24-inch box size shall be planted at an interval of not less than 40 feet on center.

Alternative 6a
- In the area between Woodman and Hazeltine Avenues, a minimum 10-foot wide landscaped buffer shall be provided along both sides of the right-of-way. Tall, dense trees of a minimum 24-inch box size shall be planted at an interval of not less than 40 feet on center.

Laurel Canyon/Burbank Station, Laurel Canyon/Oxnard Station, Valley College - Oxnard Street Station, Van Nuys Station, Sepulveda Station
- Impacts would be less than significant and no mitigation measures are required.

Fulton/Burbank Station
- To break down the scale of the aerial station and support columns, the guideway and support columns shall be articulated through the incorporation of recessed areas or patterns in the cast concrete that create shadows, and/or the addition of decorative tile. Shrubs and vines shall be planted at the base of support columns to soften their appearance.

- The perimeter of the station shall be planted with tall, dense trees to screen views of station from residences to the north.

Following mitigation, impacts would be reduced to a level that is less than significant.

A summary of visual and aesthetic conditions (setting, impacts, and mitigation) is provided in Table 4-6.1.

Table 4-6.1 San Fernando Valley East-West Rail Transit Project
Visual and Aesthetic Conditions - Setting, Impacts, and Mitigation

	Character	Visual Resources	Viewer Groups/Sensitivity	Duration of Views of the Right-of-way	Changes to Existing Visual Environment	Significant Impacts Prior to Mitigation	Mitigation Measures	Impacts Following Mitigation
Landscape Unit								
A1: SP ROW - North Hollywood to SR 170	Urbanized (industrial/open space)	None	Workers (low) and Park Users (high)	Short	Alts 1, 2, and 11: N/A	N/A	N/A	None
					Alt 6a: Introduction of catenary wires and poles in median right-of-way	None	N/A	None
					Alt 6b: Introduction of fence in median right-of-way	None	N/A	None
A2: WOW Curve	Urbanized (residential)	None	Residents (high)	Short	Alts 1 and 11: No changes would occur	None	N/A	None
B: SP ROW - SR 170 to Laurel Canyon Blvd	Urbanized (residential)	Eucalyptus Hedgerow	Residents (high)	Long	Alt 1a: No change	None	N/A	None
					Alt 1b: No change	None	N/A	None
					Alt 1c: Introduction of fence in median right-of-way	Potential loss of eucalyptus hedgerow in the median ROW	A certified botanist shall investigate the feasibility of preserving the trees, if the trees cannot be preserved, they shall be replaced in kind.	None
					Alt 1d: Introduction of fence in median right-of-way	Potential loss of eucalyptus hedgerow in the median ROW	A certified botanist shall investigate the feasibility of preserving the trees, if the trees cannot be preserved, they shall be replaced in kind.	None
					Alt 6a: Introduction of catenary wired and poles in median right-of-way	None	N/A	None
					Alt 6b: Introduction of fence in median right-of-way	Potential loss of eucalyptus hedgerow in the median ROW	A certified botanist shall investigate the feasibility of preserving the trees, if the trees cannot be preserved, they shall be replaced in kind.	None
					Alt 11a: Introduction of catenary wired and poles in median right-of-way	None	N/A	None

Table 4-6.1 San Fernando Valley East-West Rail Transit Project
Visual and Aesthetic Conditions - Setting, Impacts, and Mitigation

	Character	Visual Resources	Viewer Groups/Sensitivity	Duration of Views of the Right-of-way	Changes to Existing Visual Environment	Significant Impacts Prior to Mitigation	Mitigation Measures	Impacts Following Mitigation
B: SP ROW - SR 170 to Laurel Canyon Blvd, continued	Urbanized (residential)	Eucalyptus Hedgerow	Residents (high)	Long	Alt 11b: Introduction of fence in median right-of-way	Potential loss of eucalyptus hedgerow in the median ROW	A certified botanist shall investigate the feasibility of preserving the trees, if the trees cannot be preserved, they shall be replaced in kind.	None
					Alt 1a: No change	None	N/A	None
					Alt 1b: No change	None	N/A	None
					Alt 1c: Introduction of fence along median right-of-way	None	N/A	None
					Alt 1d: Introduction of aerial guideway in median right-of-way	None	N/A	None
					Alt 6a: Introduction of catenary wires and poles in median right-of-way	None	N/A	None
					Alt 6b: Introduction of fence along median right-of-way	None	N/A	None
					Alt 11a: Introduction of catenary wires and poles in median right-of-way	None	N/A	None
					Alt 11b: Introduction of fence along median right-of-way	None	N/A	None

Table 4-6.1 San Fernando Valley East-West Rail Transit Project
Visual and Aesthetic Conditions - Setting, Impacts, and Mitigation

	Character	Visual Resources	Viewer Groups/Sensitivity	Duration of Views of the Right-of-way	Changes to Existing Visual Environment	Significant Impacts Prior to Mitigation	Mitigation Measures	Impacts Following Mitigation
D: SP ROW - Ethel Street to Woodman Ave.	Urbanized (residential)	None	Residents (high)	Short	Alt 1a: No change	None	N/A	None
					Alt 1b: No change	None	N/A	None
					Alt 1c: No change	None	N/A	None
					Alt 1d: Aerial guideway added to views over backyard fences	Incompatible elements would be added to the visual environment that would be directly visible by sensitive viewers	The guideway shall be screened and softened with landscaping.	None
					Alt 6a: No change	None	N/A	None
					Alt 6b: No change	None	N/A	None
					Alt 11a: No change	None	N/A	None
					Alt 11b: No change	None	N/A	None
E: SP ROW - Woodman Ave. to Hazeltine	Urbanized (residential)	None	Residents (high)	Short	Alt 1a: No change	None	N/A	None
					Alt 1b: No change	None	N/A	None
					Alt 1c: Addition of open trench and fencing to second and third floor views.	Incompatible visual elements would be added to the visual environment that could be seen by sensitive viewers.	The right-of-way shall be landscaped to screen views.	None
					Alt 1d: Addition of aerial guideway to views over backyard fences and from second and third floor views.	Incompatible visual elements would be added to the visual environment that could be seen by sensitive viewers.	The guideway shall be screened and softened with landscaping.	None

Table 4-6.1 San Fernando Valley East-West Rail Transit Project
Visual and Aesthetic Conditions - Setting, Impacts, and Mitigation

	Character	Visual Resources	Viewer Groups/Sensitivity	Duration of Views of the Right-of-way	Changes to Existing Visual Environment	Significant Impacts Prior to Mitigation	Mitigation Measures	Impacts Following Mitigation
E: SP ROW - Woodman Ave. to Hazeltine, continued	Urbanized (residential)	None	Residents (high)	Short	Alt 6a: Addition of catenary wires and poles to views over backyard fences and second and third floor views.	Incompatible visual elements would be added to the visual environment that could be seen by sensitive viewers.	The right-of-way shall be landscaped to screen views of the alignment.	None
					Alt 6b: Addition of open trench to second and third floor views.	Incompatible visual elements would be added to the visual environment that could be seen by sensitive viewers.	The right-of-way shall be landscaped to screen views of the alignment.	None
					Alt 11a: Addition of catenary wires and poles to views over backyard fences and second and third floor views.	Incompatible visual elements would be added to the visual environment that could be seen by sensitive viewers.	The right-of-way shall be landscaped to screen views of the alignment.	None
					Alt 11b: Addition of open trench to second and third floor views.	Incompatible visual elements would be added to the visual environment that could be seen by sensitive viewers.	The right-of-way shall be landscaped to screen views of the alignment.	None
F: SP ROW - Hazeltine Ave. to Sepulveda Blvd.	Urbanized (industrial)	None	Workers (low)	Short	Alts 1, 2, 6 , and 11: Introduction of aerial guideway.	None	N/A	None
G: Oxnard Street - Lankershim Blvd to Woodman Avenue	Urbanized (commercial/ residential)	None	Shoppers (medium) and residents (high)	Long	Alt 2: No change	None	N/A	None

Table 4-6.1 San Fernando Valley East-West Rail Transit Project
Visual and Aesthetic Conditions - Setting, Impacts, and Mitigation

	Character	Visual Resources	Viewer Groups/Sensitivity	Duration of Views of the Right-of-way	Changes to Existing Visual Environment	Significant Impacts Prior to Mitigation	Mitigation Measures	Impacts Following Mitigation
Station Areas								
North Hollywood Station	Urbanized (industrial)	None	Shoppers (medium) and industrial workers (low)	Medium	Alts 6a and 6b: New plaza, portal and landscaping.	None	N/A	None
Laurel Canyon/Chandler Station	Urbanized (office/commercial/residential)	None	Office workers (medium) and residents (high)	Medium	Alts 1a, and 1b: New plaza and landscaping.	None	N/A	None
					Alts 1c, 1d, 6b, and 11b: New plaza, open air station and landscaping	None	N/A	None
					Alts 6a and 11a: New plaza, at-grade station and landscaping	None	N/A	None
Laurel Canyon/Oxnard Station	Urbanized (commercial, freeway)	None	Residents (high) and Students (medium)	Medium	Alt 2: New plaza and portals	None	N/A	None
Valley College - Fulton Burbank Station	Urbanized (commercial/residential)	None	Residents (high) and Shoppers (medium)	Medium	Alts 1a and 1b: New plaza, portal, parking lot, and landscaping.	None	N/A	None
					Alts 1c, 6a, 6b, 11a, and 11b: New plaza, open air station, parking lot, and landscaping.	None	N/A	None
					Alt 1d: New plaza and aerial station	Incompatible visual elements would be added that could be seen by sensitive viewers.	The guideway shall be screened and softened through the use of landscaping.	None

Table 4-6.1 San Fernando Valley East-West Rail Transit Project
Visual and Aesthetic Conditions - Setting, Impacts, and Mitigation

	Character	Visual Resources	Viewer Groups/Sensitivity	Duration of Views of the Right-of-way	Changes to Existing Visual Environment	Significant Impacts Prior to Mitigation	Mitigation Measures	Impacts Following Mitigation
Valley College - Oxnard Street Station	Urbanized (residential/institutional	None	Residents (high) and Shoppers (medium)	Medium	Alt 2: New plaza and landscaping	None	N/A	None
Van Nuys Station	Urbanized (commercial/office/light industrial)	None	Shoppers and Office Workers (medium) and Industrial Workers (low)	Short	All Alternatives: New plaza, aerial station, parking lot, and landscaping.	None	N/A	None
Sepulveda Station	Urbanized (industrial/residential)	None	Residents (high) and Industrial Workers (low)	Short	All Alternatives: New plaza, aerial station, parking lot, and landscaping.	None	N/A	None

Source: Gruen, 1997.

4-7 AIR QUALITY

This chapter provides a description of the South Coast Air Basin (SCAB) as well as an overview of the regulatory agencies responsible for air quality within the SCAB. Furthermore, an analysis to determine the potential impacts of each of the East Valley alternatives proposed under the San Fernando Valley East-West Transportation Corridor has been conducted. The assessment addresses the operations-related impacts of each alternative. An evaluation of construction-related air quality impacts is discussed in Section 5-6.

4-7.1 Regulatory Setting

a. Federal and State Clean Air Acts

Air quality in Los Angeles County is regulated by various agencies, including the United States Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), and the South Coast Air Quality Management District (SCAQMD). The USEPA is responsible for enforcing federal air quality regulations and ensuring state compliance, as established in the federal Clean Air Act (CAA). The CARB regulates mobile source emissions and is responsible for ensuring that local air quality agencies, such as SCAQMD, submit federally and state-required documentation; reviewing state-required documents; and submitting federally required documents (State Implementation Plan [SIP]) to the USEPA. SCAQMD is responsible for regulating stationary source emissions and submitting federally- and state-required documentation to the CARB. The SCAQMD is also responsible for achieving air quality goals within the SCAB.

In August of 1996, the SCAQMD submitted its *Air Quality Management Plan (AQMP)* to the CARB for inclusion in the SIP. The *AQMP* meets California Clean Air Act (CCAA) requirements, which are intended to bring the District into compliance with state air quality standards. The Plan focuses on ozone and carbon monoxide emissions, which would be reduced through public education, vehicle and fuels management, transportation controls, indirect source controls, and stationary source controls programs.

b. Regional Map

<u>1997 *AQMP*</u>. The 1997 Draft AQMP has been prepared to reflect the requirements of the 1990 Clean Air Act Amendments and is consistent with the approaches taken in the previous 1994 *AQMP*. The Plan is expected to replace in part or in whole, many of the proposed measures set forth in the SIP and anticipates the attainment of federal standards for some air pollutants by the end of this century, and of all standards by 2010.

The overall control strategy for the 1997 *AQMP* was designed to meet applicable state and federal requirements and to demonstrate attainment with ambient air quality standards. The 1997 *AQMP* is the first plan required by federal law to demonstrate attainment of the federal PM10 ambient air quality standards, and therefore places a greater focus on PM10.

c. *National and State Ambient Air Quality Standards for Criteria Pollutants*

Federal and state legislation have established ambient air quality standards to protect public health from air pollution. The National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for pollutants are shown in Table 4-7.1. The federal and state standards determine the parts per million or microns per cubic meter for air quality violations. The state standards are generally more stringent than the corresponding federal standards.

Table 4-7.1: Federal and State Air Quality Standards

Pollutant	Averaging Period	California Standard/a/	Federal Standard/b/	
			Primary/c/	Secondary/d/
Ozone	1 Hour	0.09 parts per million (ppm)	0.12 ppm	Same as primary
Carbon Monoxide	1 Hour	20 ppm	35 ppm	Same as primary
	8 Hours	9.0 ppm	9.0 ppm	
Nitrogen Dioxide	1 Hour	0.25 ppm	No Standard (NS)	NS
	Annual	NS	0.053 ppm	Same as primary
Sulfur Dioxide	1 Hour	0.25 ppm	NS	NS
	3 Hours	NS	NS	1300 micrograms per cubic meter (μg/m/c/)
	24 Hours	0.05 ppm	365 μg/m3/c/	NS
	Annual	NS	80 μg/m3/c/	NS
Suspended Particulate (PM10)	24 Hours	50 μg/m3/c/	150 μg/m3/c/	Same as primary
	Annual Arithmetic Mean	NS	50 μg/m3/c/	
	Annual Geometric Mean	30 μg/m3/c/	NS	NS
Lead	30 days	1.5 μg/m/c/	NS	NS
	Calendar Quarter	NS	1.5 μg/m3/c/	Same as primary
Sulfates	24 Hours	25 μg/m3/c/	NS	NS
Hydrogen Sulfide	1 Hour	0.03 ppm	NS	NS
Vinyl Chloride	24 Hours	0.010 ppm	NS	NS
Visibility/e/	8 Hours	Reduce visibility below 10 miles	NS	NS

Notes:

/a/ California standards for ozone, carbon monoxide, sulfur dioxide (1-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility are values that are not to be exceeded. The sulfur dioxide (24-hour), sulfates, lead, hydrogen sulfide, and vinyl chloride standards are not to be equaled or exceeded.

/b/ Federal standards, other than ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

/c/ National Primary Standards: the levels of air quality necessary to protect the public health with an adequate margin of safety.

/d/ National Secondary Standards: the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

/e/ This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range when relative humidity is less than 70 percent.

*ppm = parts per million; μg/m3 = micrograms per cubic meter
NS = Not Stated

Source: State of California, Air Resources Board *Air Quality Data: Annual Summary*, 1994.

d. South Coast Air Basin Attainment Status

Based on regional monitoring data, Los Angeles County has been designated as a non-attainment area by the U.S. Environmental Protection Agency (USEPA). Under the provisions of the Clean Air Act (CAA), the county is a non-attainment area for ozone, carbon monoxide, nitrogen dioxide and suspended particulate (PM10). The county is designated as an attainment area for sulfur dioxide.

Table 4-7.2: Attainment Status of South Coast Air Basin

Pollutant	California Attainment Status (CARB)	National Attainment Status (EPA)
Ozone	N	N
Carbon Monoxide	A/a/	N
Nitrogen Oxides	A	N
Sulfur Oxides	A	N
Particulate Matter (PM10)	N	N
Sulfates	A	Not Applicable
Lead	A	Not Applicable
Hydrogen Sulfide	U	Not Applicable
Visibility Reducing Particles	U	Not Applicable

Notes:

N = Non-Attainment, A = Attainment, U = Unclassified, U/A = Unclassified/Attainment

/a/ Three of the four counties within the SCAB are designated as attainment areas for carbon monoxide (Orange County, Riverside County and San Bernardino County). Los Angeles County is designated as a non-attainment area for carbon monoxide.

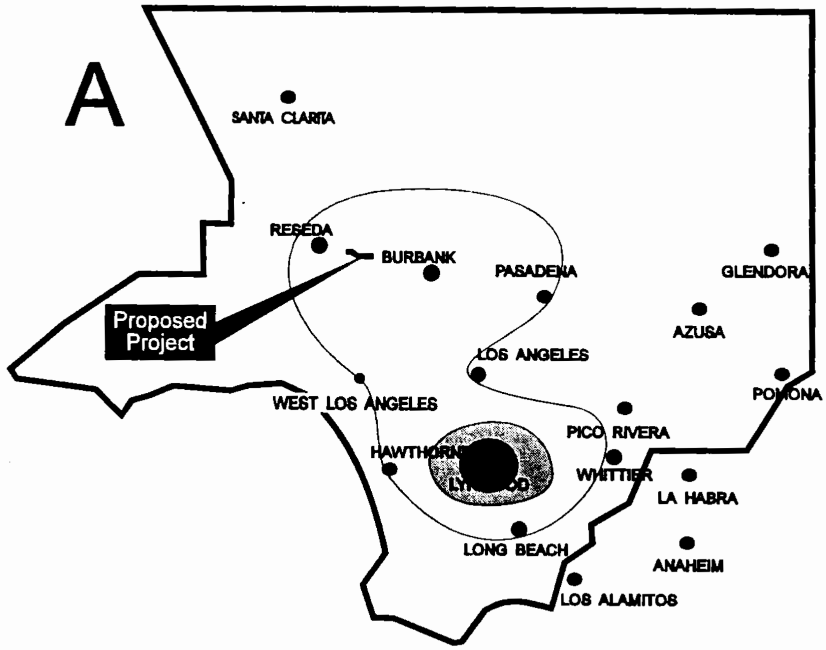
Source: *Proposed Amendments to the Designation Criteria and to the Area Designations for State Ambient Air Quality Standards, Attachment H, Maps of Area Designations for the State and National Ambient Air Quality Standards*, California Environmental Protection Agency, California Air Resources Board, November 1996.

Figure 4-7.1 and Figure 4-7.2 illustrate existing pollutant levels for the three pollutants (carbon monoxide, ozone, and particulate matter) which exceeded state and federal ambient air quality standards in the South Coast Air Basin in 1995. The proposed project is located outside the areas of significant pollutant concentration in the region with the exception of carbon monoxide. The proposed project is located in an area which currently indicates an exceedance of the federal standard of less than five days during 1995.

The overall control strategy in the AQMP provides a path to achieving emissions reductions and air quality goals. Short- and intermediate-term measures propose the application of technologies and management practices towards achieving attainment goals between the years of 1997 and 2005. To ultimately achieve ambient air quality standards, long-term measures which rely on the advancement of technologies and control methods that can reasonably be expected to occur between 2000 and 2010 would need to be implemented.

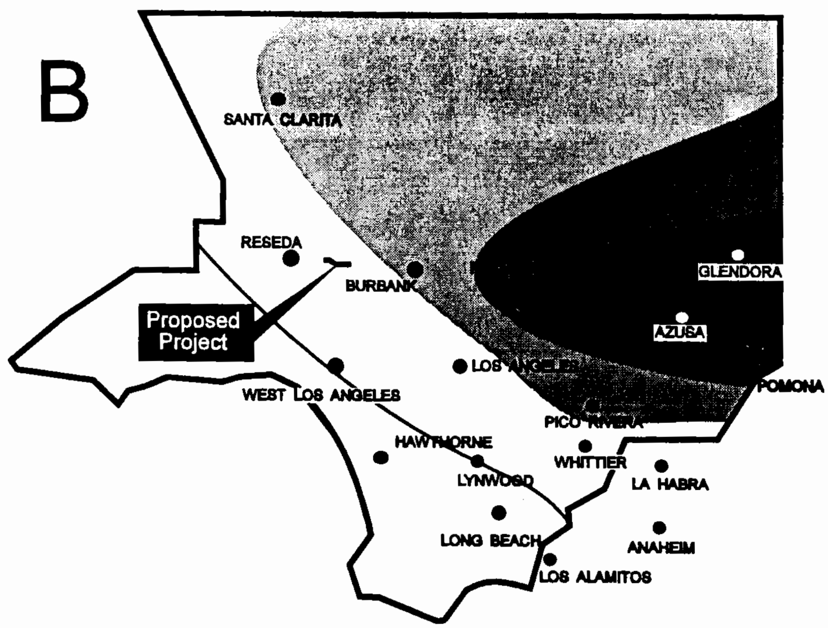
1995 CARBON MONOXIDE LEVELS

A



1995 OZONE LEVELS

B



LEGEND:

A # of Days Federal Standard was Exceeded

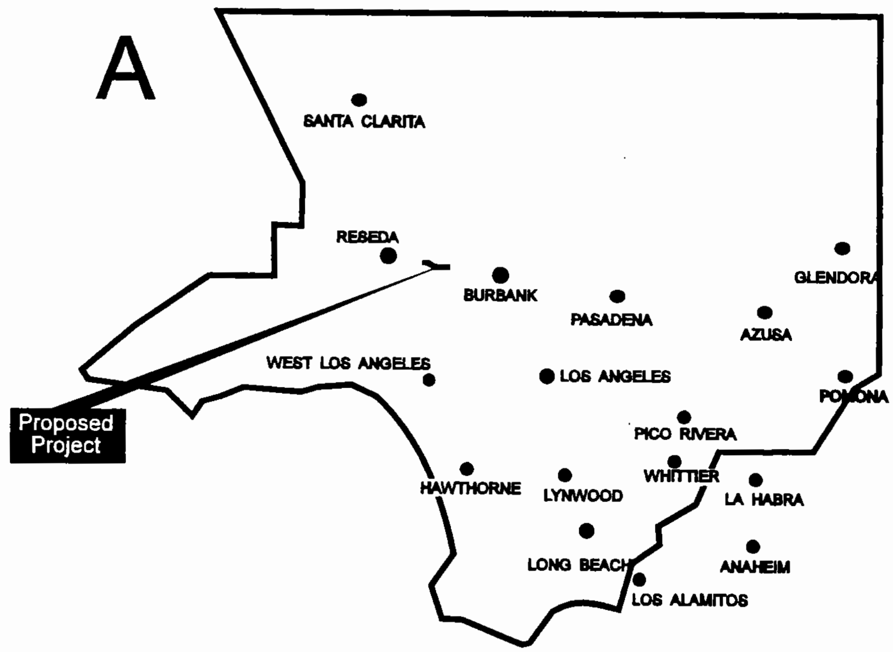
- <5
- 5 TO 10
- >10

B # of Days Federal Standard was Exceeded

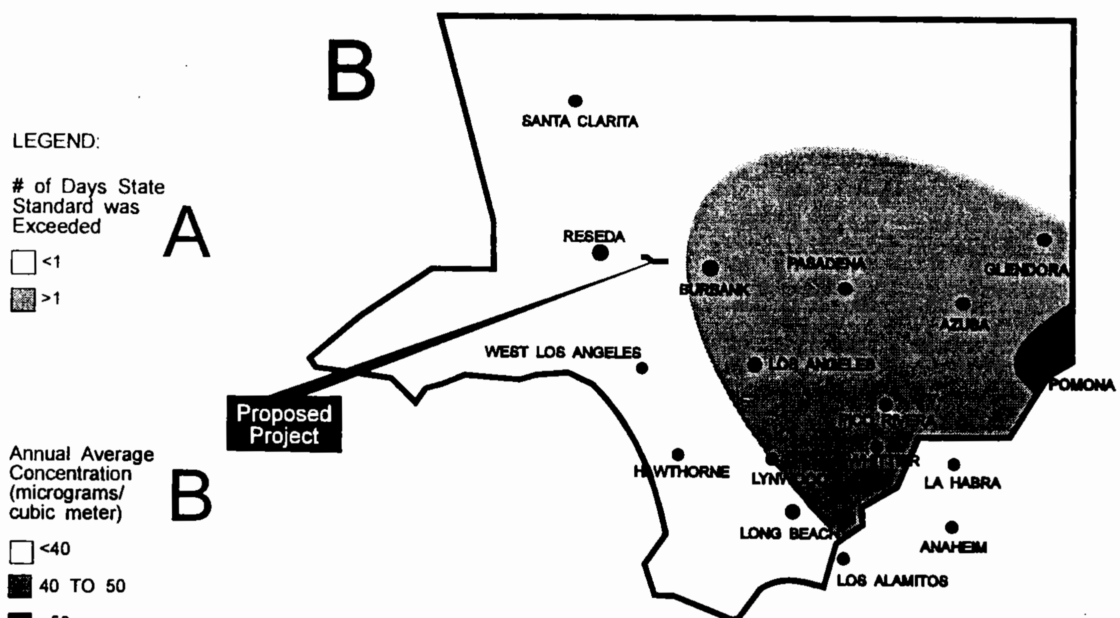
- <20
- 20 TO 40
- 40 TO 60
- 60 TO 70
- >70

SOURCE: SCAQMD, DRAFT 1997 AIR QUALITY MANAGEMENT PLAN, 1996.

1995 NITROGEN DIOXIDE LEVELS



1995 PARTICULATE MATTER LEVELS



SOURCE: SCAQMD, DRAFT 1997 AIR QUALITY MANAGEMENT PLAN, 1996.

4-7.2 Major Pollutants and Associated Health Effects

Both the federal and state governments have set health-based ambient air quality standards (NAAQS and CAAQS) for the following six pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), fine particulates of less than 10 microns in size (PM10) and lead (Pb). A brief discussion of the pollutants appears below. In addition, California has set standards for ethylene, hydrogen sulfide, sulfates, visibility and vinyl chloride. All but sulfates and visibility are controlled through permit requirements.

- **Ozone**. Ozone is formed by photochemical reactions between NO_x and reactive organic gases (ROG). Reactive organic gases are formed from the combustion of fuels and the evaporation of organic solvents. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in children.

- **Carbon Monoxide**. Carbon monoxide is formed by the incomplete combustion of fossil fuels and is produced almost entirely by automobiles. Exposure to carbon monoxide can cause dizziness and fatigue and can impair central nervous system function.

- **Nitrogen Oxides**. Nitrogen dioxide and nitric oxide are formed as a result of fuel combustion under high temperature or pressure. These compounds are referred to together as nitrogen oxides or NO_x. Nitrogen dioxide contributes to other pollution problems, including concentration of ozone, fine particulate matter, poor visibility and acid deposition. It decreases lung function and may reduce resistance to infection.

- **Sulfur Dioxide**. The combustion of sulfur-containing fossil fuel and smelting of sulfur-bearing metal ores used in industrial processes are the two major sources of sulfur dioxide (SO_2). The primary effects of SO_2 to human bodies are aggravation of respiratory diseases such as asthma and emphysema, reduced lung function and irritation of eyes. SO_2 contributes to reduced visibility and formation of PM10 when reacted with NO_2 in the atmosphere. SO_2 also causes injury to vegetation, and reacts and deteriorates other materials such as metals, textiles, leather, finishes and coatings.

- **PM10**. PM10 refers to small suspended particles that are 10 microns or less in diameter. Nitrates and sulfates, as well as dust particles, are major components. These small particles can be directly emitted as a by-product of fuel combustion, through abrasion (wear on tires or brake linings) or through wind erosion of soil. They can also be formed in the atmosphere through chemical reactions. These particles may carry carcinogens and other toxic compounds which adhere to the particle surfaces and can enter the lungs.

4-7.3 Existing Conditions

a. *Regional Setting*

The proposed project site is located within the SCAB a 6,600-square-mile basin encompassing all of Orange County, most of Los Angeles and Riverside Counties, and the western portion of San Bernardino County (see Figure 4-7.3). Ambient pollution concentrations recorded in Los Angeles County are among the highest in the four counties comprising the SCAB.

Within the SCAB, the project is located within source receptor areas No. 6 and 7. Source area No. 6 encompasses an area generally bounded by the Santa Susana Mountains on the north, the Santa Monica Mountains on the south, the Ventura/Los Angeles county line on the west and the San Diego (405) Freeway on the east. Area No. 7 is generally bounded by the San Gabriel Mountains on the north, the Santa Monica Mountains on the south, the San Diego (I-405) Freeway on the west and the Verdugo Mountains on the east (see Figure 4-7.4). The air quality monitoring stations which best represent the project area are the Burbank and Reseda stations. The Burbank station, located within Source Area No. 7 best represents the East San Fernando Valley while the Reseda station located within Source are No. 6 is more representative of the West San Fernando Valley.

As mentioned above, the proposed project lies within the boundaries of the Burbank and Reseda Air Quality Monitoring Station Areas. The Burbank station is located on Palm Avenue, approximately 3.5 miles northeast of the existing Universal City Metro Red Line station at the eastern end of the study corridor. The Reseda station is located at 18330 Gault Street which is about 4 miles northeast of the potential Valley Circle Transit station (Figure 4-7.4). The most recently available data from the Burbank and Reseda stations for the years 1990-1995 is shown in Table 4-7.3. Pollutants monitored at the Reseda air quality monitoring station included ozone, carbon monoxide, nitrogen dioxide. During the period between 1990 and 1995 the Reseda station recorded violation of carbon monoxide ranging from 3 to 11 days and ozone ranging from 7 to 108 days. Data for each of the criteria pollutants and non-criteria pollutants was recorded at the Burbank station. During the period between 1990 and 1995, the station recorded violations for ozone, PM10, carbon monoxide and nitrogen dioxide.

b. *Local Setting/Wind Conditions*

Wind speed and direction, as well as climate, directly affect local and regional air quality. Wind monitoring data used in association with the proposed project area was also recorded at the Burbank and Reseda stations. Wind profile data from the SCAQMD bulletin board system was used to determine the predominant wind direction and average recorded wind speeds in the east and west valleys. According to wind data from the Burbank station, the predominant wind direction in the East Valley is from a NE direction.[10] Wind data from the Reseda station

[10] Based on wind profile data from the SCAQMD bulletin board system.

LEGEND:

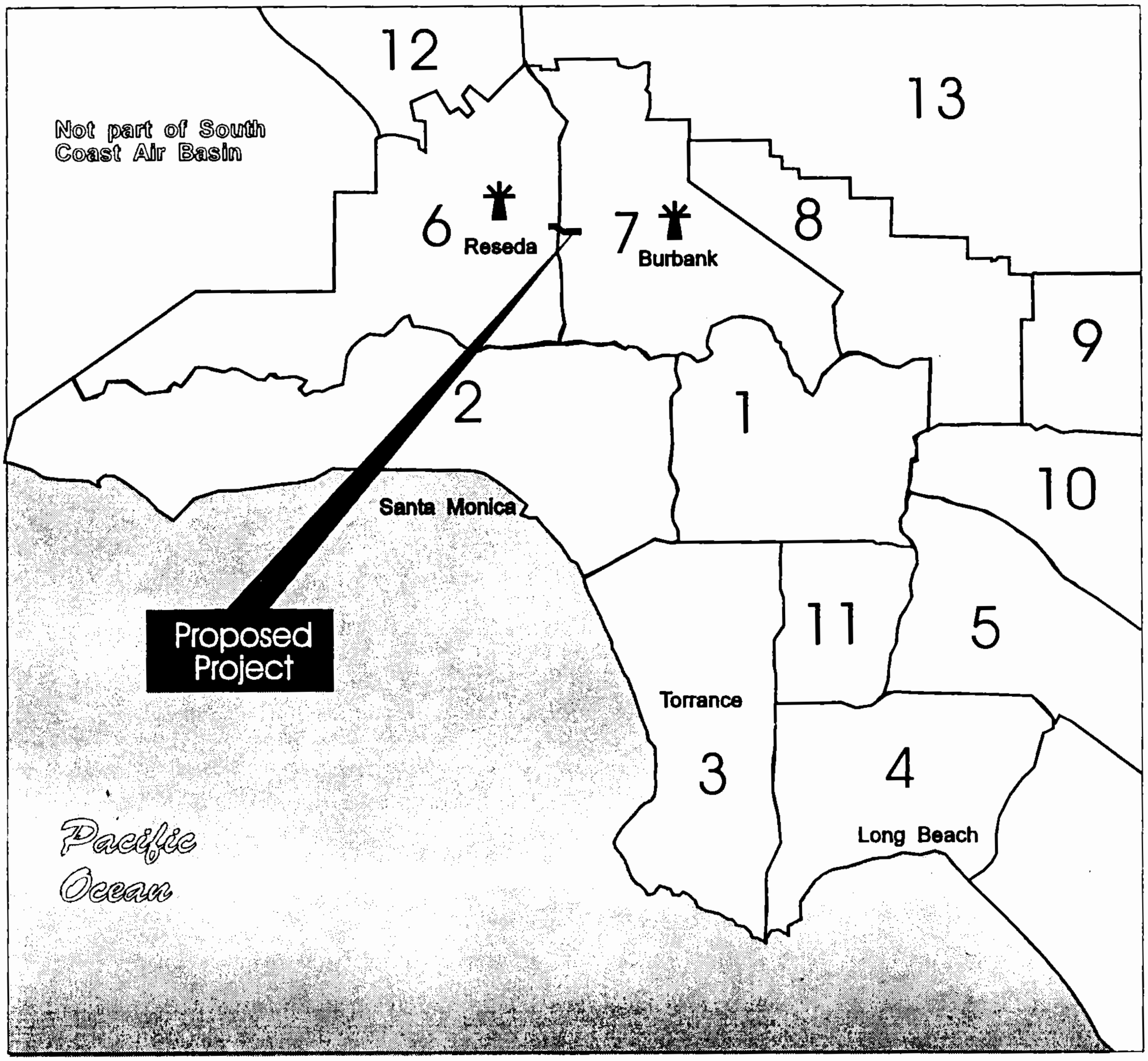
South Coast Air Basin

State of California

SOURCE: SCAQMD, DRAFT 1997 AIR QUALITY MANAGEMENT PLAN, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-7.3
South Coast Air Basin



LEGEND:

Proposed Project Location

Air Monitoring Areas in Los Angeles County:

Monitoring Station

1. Central Los Angeles
2. Northwest Coastal
3. Southwest Coastal
4. South Coastal
5. Southeast Los Angeles County
6. West San Fernando Valley
7. East San Fernando Valley
8. West San Gabriel Valley
9. East San Gabriel Valley
10. South San Gabriel Valley
11. South Central Los Angeles
12. Santa Clarita Valley
13. San Gabriel Mountains

SOURCE: SCAQMD, DRAFT 1997 AIR QUALITY MANAGEMENT PLAN, 1996.

FIGURE 4-7.4
SCAQMD Air Monitoring Stations

Table 4-7.3: Data From Source Receptor Areas No.6 and No.7

Pollutant	State Standard	National Standard	Year	RESEDA STATION (West Valley)		BURBANK STATION (East Valley)	
				Max. Level	Days Exceeding Standard	Max. Level	Days Exceeding Standard
Ozone	0.09 ppm for 1-hour	0.12 ppm for 1-hour	1990	0.19	108	0.20	95
			1991	0.22	100	0.22	101
			1992	0.17	82	0.22	115
			1993	0.19	79	0.18	45
			1994	0.14	51	0.17	65
			1995	0.14	7	0.17	18
Particulate (PM_{10})	50 μg/m³ for 24 hours	150 μg/m³ for 24 hours	1990	nm	na	161	28
			1991	nm	na	133	30
			1992	nm	na	222	18
			1993	nm	na	93	20
			1994	nm	na	114	11
			1995	nm	na	114	11
Total Suspended Particulates	No State Standard (μg/m³)	No Federal Standard (μg/m³)	1990	nm	na	191	na
			1991	nm	na	184	na
			1992	nm	na	563	na
			1993	nm	na	121	na
			1994	nm	na	179	na
			1995	nm	na	179	na
Carbon Monoxide	20 ppm for 1-hour	35 ppm for 1-hour	1990	19	0	16.0	0
			1991	16	0	13.0	0
			1992	13	0	13.0	0
			1993	10	0	12.0	0
			1994	16	0	13.0	0
			1995	14	0	13.0	0
Carbon Monoxide	9.1 ppm for 8-hours	9.5 ppm for 8-hours	1990	14.9	11	13.0	8
			1991	13.5	8	10.6	12
			1992	9.9	1	10.5	4
			1993	9.0	0	8.4	0
			1994	10.8	4	10.7	6
			1995	13	3	13.0	5
Nitrogen Oxides	0.25 ppm for 1-hour	0.0534 ppm annual average	1990	0.19	0	0.23	0
			1991	0.17	0	0.29	2
			1992	0.17	0	0.19	0
			1993	0.15	0	0.17	0
			1994	0.17	0	0.16	0
			1995	0.17	0	0.18	0
Sulfur Dioxide	0.05 ppm for 1-hour	0.14 ppm for 24 hours	1990	0.02	0	0.02	0
			1991	nm	na	0.01	0
			1992	nm	na	0.03	0
			1993	nm	na	0.02	0
			1994	nm	na	0.03	0
			1995	nm	na	0.03	0

Table 4-7.3: Data From Source Receptor Areas No.6 and No.7							
Pollutant	**State Standard**	**National Standard**	**Year**	**RESEDA STATION (West Valley)**		**BURBANK STATION (East Valley)**	
				Max. Level	**Days Exceeding Standard**	**Max. Level**	**Days Exceeding Standard**
Sulfates	25 μg/m^3 for 24 hours	No Federal Standard	1990	nm	na	25.9	1
			1991	nm	na	18.6	0
			1992	nm	na	12.9	0
			1993	nm	na	20.1	0
			1994	nm	na	16.3	0
			1995	nm	na	16.5	0
Lead	1.5 g/m^3 for 24 hours (1 month average)	1.5 μg/m^3 for 24 hours quarterly average	1990	nm	na	0.08	0
			1991	nm	na	0.10	0
			1992	nm	na	0.16	0
			1993	nm	na	0.05	0
			1994	nm	na	0.06	0
			1995	nm	na	0.06	0
Note: nm = no measurement; na=not applicable; Days= number of days State standard exceeded.							

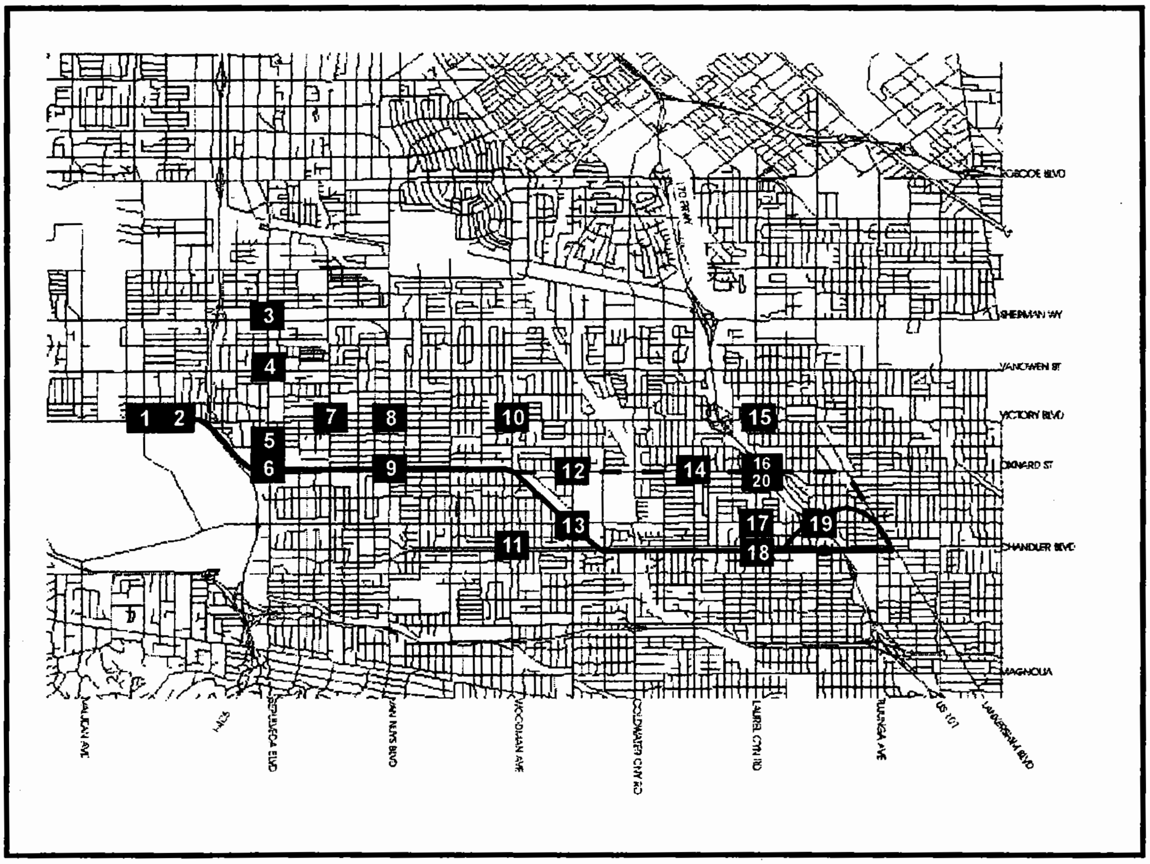
Source: South Coast Air Quality Management District, *Air Quality Data Summaries*, 1990-1995.

indicates that the predominant wind direction in the West Valley is from the SE. The average recorded pm peak period wind speeds at the Burbank and Reseda stations were meters per second (or 5.4 mph) at both locations. Wind recordings from the Burbank and Reseda stations indicate that worst case wind conditions (1 meter per second or less) occur 1 and 2 percent of the time during the p.m. peak hour, respectively. Worst case stability class levels (level "G") do not occur at either of the stations during the p.m. peak period.

c. *Sensitive Land Uses*

Certain land uses are considered to be more sensitive to air pollution as a result of the population groups or activities associated with that use. Sensitive population groups include the elderly, children, the acutely ill, and the chronically ill, particularly those with cardiorespiratory illnesses. Sensitive locations may also include residential units, schools, hospitals and sidewalks. For purposes of analyzing air quality impacts in the area, and providing a broad evaluation of the proposed project alternatives, 20 representative locations have been identified (see Figure 4-7.5). These receptors are as follows:

1. Woodley Avenue/Victory Boulevard (Van Nuys Golf Course)
2. Haskell Avenue/Victory Boulevard (Sepulveda Dam Recreation Area)
3. Sepulveda Boulevard/Sherman Way (University of Phoenix)
4. Sepulveda Boulevard/Vanowen Street (Valley Presbyterian Hospital)
5. Sepulveda Boulevard/Erwin Street (Delano Park/Sylvan Park Elementary School)
6. Sepulveda Boulevard/Oxnard Street (Delano Park/Sylvan Park Elementary School)
7. Kester Avenue/Victory Boulevard (Van Nuys High School)



LEGEND:

Proposed Project Route Alignments

▲ Sensitive Receptor Location

1. Van Nuys Golf Course
2. Sepulveda Dam Recreation Area
3. University of Phoenix
4. Valley Presbyterian Hospital
5. Delano Park; and Sylvan Park Elementary School
6. Delano Park; and Sylvan Park Elementary School
7. Van Nuys High School
8. Van Nuys Recreation Center; and Van Nuys Elementary School
9. Hollywood Community Hospital
10. Kittridge Mini Park and Kittridge Street Elementary School
11. Chandler Elementary School
12. LA Valley College; Ulysses Grant High School; and Erwin Park Elementary School
13. LA Valley College; Ulysses Grant High School; and Erwin Park Elementary School
14. Montux Elementary School
15. Residential
16. Residential
17. Burbank Boulevard Elementary School
18. Hollywood High School
19. Laurel Plaza
20. Hollywood High School and residential

NOT TO SCALE

N

SOURCE: TERRY A. HAYES ASSOCIATES, 1997.

FIGURE 4-7.5
Location of Sensitive Receptors

8. Van Nuys Boulevard/Victory Boulevard (Van Nuys Senior Citizens Center/ Van Nuys Elementary School)
9. Van Nuys Boulevard/ Oxnard Street (Hollywood Community Hospital)
10. Woodman Avenue/Victory Boulevard (Kittridge Mini Park/Kittridge Elementary School)
11. Woodman Avenue/Chandler Boulevard (Chandler Elementary School)
12. Fulton Avenue/Oxnard Street (LA Valley College/Ulysses Grant High School)
13. Fulton Avenue/Burbank Boulevard (Sidewalk)
14. Whitsett Avenue/Oxnard Street (Montux Elementary School)
15. Laurel Canyon Boulevard/Victory Boulevard (Sidewalk/Residential)
16. Laurel Canyon Boulevard/Oxnard Street (Sidewalk/Residential)
17. Laurel Canyon Boulevard/Burbank Boulevard (Burbank Boulevard Elementary School)
18. Laurel Canyon Boulevard/Chandler Boulevard (Hollywood High School)
19. Route 170 NB off-ramp/Oxnard Street (Laurel Plaza)
20. Route 170 NB off-ramp/Morella Avenue/Burbank Boulevard (Hollywood High School/Residences)

d. Existing and Baseline Carbon Monoxide Concentrations

Existing local carbon monoxide air quality conditions can be assessed using a carbon monoxide dispersion computer model. The model utilizes existing traffic volumes, worst-case meteorological conditions and roadway geometry as data inputs. The results of the model are added to the ambient background conditions to provide an estimate of existing local conditions. Based on recorded monitoring data at the Burbank and Reseda stations, the existing ambient background concentration is estimated to be 12.0 and 9.3 for 1-hour and 8-hour concentrations, respectively.[11] These levels represent the average of the second highest recorded concentrations at the Burbank and Reseda stations for last three years.

When traffic-related air emissions generated by the proposed project are added to ambient background carbon monoxide levels through the use of a dispersion model (such as CAL3QHC), carbon monoxide concentrations adjacent to roadways which is not reflected in regional monitoring data can be derived. Table 4-7.4 outlines existing carbon monoxide concentrations at the representative receptors previously identified.

The data indicate that the California Ambient Air Quality Standard (CAAQS) for the 1-hour carbon monoxide (20 ppm) concentration is not exceeded at any of the twenty locations studied (Table 4-7.4). Each of the 20 receptor locations exceed the 9 ppm 8-hour standard. The exceedance of the 8-hour standard ranges from 109 to 149 percent of the standard. According to the indices established by the South Coast Air Quality Management District and published daily in the *Los Angeles Times*, levels that are 101 to 200 percent of the 8-hour standard represent unhealthful conditions. From 201 to 275 percent is characterized as very unhealthful.

[11]Ambient conditions reflect the fact that 90 percent of the East Valley portion of the project area is located within the Burbank station area and 10 percent is located within the Reseda station area.

4-7.4 Impact Analysis Methodology and Evaluation Criteria

The San Fernando Valley East-West rail project air quality impact analysis was prepared in accordance with the procedural and conformity guidelines of the United States Environmental Protection Agency (USEPA), the South Coast Air Quality Management District (SCAQMD) and Southern California Association of Governments (SCAG).

The air quality analysis is based on the methods described in the USEPA Conformity Guidelines, the USEPA Guidelines for Air Quality Maintenance and Analysis, the SCAQMD California Environmental Quality Act (CEQA) Handbook (1993 edition) and the SCAG carbon monoxide modeling protocol document[12].

a. Evaluation of Impacts

The air quality impact evaluation consists of a program and a project level analysis. At the program level, a subregional daily emissions analysis has been conducted to estimate the emissions of the five criteria pollutants (reactive organic gas, carbon monoxide, nitrogen oxides, sulfur oxides and PM10). This is also referred to as a "burden" analysis. At the project level, local carbon monoxide concentrations have been estimated at sensitive receptor locations and compared with the state and federal standards.

Subregional Daily Emissions (Burden) Analysis

For the subregional burden analysis, daily vehicle miles traveled (VMT) on the project area roadway network, and emissions factors from EMFAC7F were used as input data to estimate the daily emissions (in pounds per day) generated by the No Project Alternative and each of the transportation strategies. The estimated emissions from the transportation strategies were then compared to the No Project Alternative as well as pollutant emissions thresholds established by SCAQMD.

Carbon Monoxide Analysis

The carbon monoxide (CO) analysis estimated concentrations at sensitive receptor locations adjacent to potential "hot spots" (i.e. stations, park and ride lots, residences, schools and hospitals), as represented by the previously identified sensitive receptors. The USEPA CAL3QHC line source CO dispersion model was used to estimate emissions at the receptor locations. The USEPA SCREEN3 area source dispersion model was used to estimate emissions from park and ride lots. For purposes of modeling, parking lots were treated as area sources.

[12] SCAG Carbon Monoxide Transportation Project Protocol, December 1992.

Table 4-7.4: Existing Carbon Monoxide Concentrations at Representative Locations (parts per million, ppm)

Key to Figure 4-7.6	Description	One-Hour Concentration (Standard = 20 ppm)	Eight-Hour Concentration (Standard = 9 ppm)
1	Van Nuys Golf Course	14.45	11.07*
2	Sepulveda Dam Recreation Area	13.19	10.19*
3	University of Phoenix	17.81	13.42*
4	Valley Presbyterian Hospital	15.13	11.55*
5	Delano Park/Sylvan Park Elementary School	12.78	9.90*
6	Delano Park/Sylvan Park Elementary School	13.87	10.67*
7	Van Nuys High School	13.93	10.71*
8	Van Nuys Senior Citizens Center/Van Nuys Elementary School	14.08	10.81*
9	Hollywood Community Hospital	13.19	10.19*
10	Kittridge Mini Park/Kittridge Elementary School	13.88	10.67*
11	Chandler Elementary School	12.72	9.86*
12	LA Valley College/Ulysses Grant High School/Erwin Park Elementary School	13.26	10.24*
13	Fulton Ave./Burbank Blvd. (Sidewalk)	13.67	10.53*
14	Montux Elementary School	13.04	10.09*
15	Laurel Canyon Boulevard/Victory Boulevard (Sidewalk/Residential)	15.58	11.86*
16	Laurel Canyon Boulevard/Oxnard Street (Sidewalk/Residential)	17.59	13.27*
17	Burbank Boulevard Elementary School	14.53	11.12*
18	Hollywood High School	13.30	10.26*
19	Laurel Plaza	13.34	10.03*
20	N. Hollywood High School/Residences	13.96	10.73*

Notes:

* Exceeds California Ambient Air Quality Standards.

Existing conditions computed by adding traffic-related CO concentrations from dispersion model to ambient background conditions. Based on monitoring data from the Burbank and Reseda Monitoring Stations, the ambient background is estimated to be 12.0 ppm for the 1-hour period and 9.3 ppm for the 8-hour period. CAL3QHC air quality model runs assume worst case meteorological conditions of 1.0 meter per second wind speed and stability class "E".

Source: Terry A. Hayes Associates, 1997.

Worst case scenario meteorological input data was used to predict 1-hour average CO concentration levels associated with mobile sources. The data consists of an average wind speed 1 meter per second, wind stability rating of "G". The CAL3QHC model would assign the worst case wind direction. Worst case meteorological data was used for both the USEPA approved CAL3QHC and SCREEN3 dispersion models.

The California Air Resources Board (CARB) and Environmental Protection Agency (EPA) approved EMFAC7F (version 1.1) emissions factors were used as input data. Future ambient background CO concentrations was estimated based on the EPA "rollback" Guidelines, November 1993[13]. The estimated CO concentrations at sensitive receptor locations were compared to state and federal standards to determine level of impact.

b. Significance Thresholds Criteria

Carbon Monoxide Emissions Thresholds

The California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) place great emphasis on the identification of potentially significant impacts and on remedies that would be required to substantially reduce or eliminate these significant impacts. Carbon monoxide is the primary pollutant associated with transportation improvements. A significant impact would result if the "build" alternatives would increase the number or severity of carbon monoxide violations of either the California or the Federal Ambient Air Quality Standards. The California standard for 1-hour carbon monoxide concentrations (20 ppm) is more stringent than the Federal standard (35 ppm).

Consistency with the Air Quality Management Plan (AQMP)

The project would be inconsistent with the *AQMP* if it: 1) results in an increase in the number or severity of the state and federal 1-hour standards 20 and 35 parts per million, 2) increases the number or severity of CO violations under the state and federal 8-hour standard of 9 parts per million, 3) increases the severity of existing 1- and 8-hour period exceedances by an increment greater than 1.0 and 0.45 ppm, respectively, and 4) is inconsistent with the General Plan or Air Quality Elements prepared by the affected local jurisdictions.

c. Conformity

The project conformance with the SIP according to EPA conformity guidelines 40 CFR Part 51 was determined. This determination was based upon increases in the number or severity of carbon monoxide violations of either the California or the Federal Ambient Air Quality Standards caused by the project, compared to the No Project Alternative. Proposed projects must be found to be in conformity if they are to receive federal sponsorship or financial support.

[13]Environmental Protection Agency. Federal Register. Volume 58, No. 223. Washington, D.C.: Wednesday, November 24, 1993, 40 CFR Parts 51, Subpart T, Section 51.392 (3).

4-7.5 Impacts

a. San Fernando Valley Subregional Air Quality from Traffic Operations

Traffic data for Regional Statistical Areas (RSAs) 12 and 13 was used to evaluate the emissions of motor-related pollutants within the San Fernando Valley subregion. Traffic data for each of the East Valley alternatives was compared to the No Project Alternative. The comparison indicated that each of the East Valley alternatives would reduce subregional vehicle miles traveled (VMT). Improvements to subregional VMT are less than 1 percent, however. It was also determined that travel speeds within the subregion would improve by a range of 1 to 2 percent and that vehicle hours traveled would be reduced by a range of two to three percent. A reduction in automobile vehicle miles of travel (VMT) in addition to an increase in travel speeds resulting from operation of the Enhanced Bus and Red Line Transit Alternatives would result in a lower subregional air-related pollutant burden.

Table 4-7.5 illustrates the differences in regional emissions between the No Project and East Valley alternatives for the year 2015. Compared to the No Project Alternative, each of the East Valley alternatives would result in a reduction of pollutants emitted within the subregion. As shown in this table, the reductions in emissions from the East Valley alternatives would range from 17 to 1,418 pounds per day. When viewed from the perspective of the incremental daily emissions change thresholds recommended by the SCAQMD, the emissions reductions from the East Valley Alternatives would be considered regionally significant for ROG, CO and NOX. Since all alternatives would reduce area emissions, this would constitute a beneficial effect.

b. Local Air Quality Impacts Resulting From Traffic Operations

To provide a direct comparison of the air quality impacts with state air quality standards, the CAL3QHC roadside carbon monoxide dispersion microcomputer model was run for the No Build, TSM Enhanced Bus, Red Line SP to I-405 (Alternative 1), Red Line Oxnard to I-405 (Alternative 2), LRT (Alternative 6), and the Red Line Dual Mode Vehicle alternatives (Alternative 11). Tables 4-7.6 and 4-7.7 compare carbon monoxide concentrations at the 20 representative receptor locations shown above in Figure 4-7.5.

<u>One-Hour Period Findings</u>. As shown in Table 4-7.6, there would be no exceedances of the 1-hour state standard of 20 ppm or the 1-hour federal standard of 35 ppm. CO concentrations for the alternatives would be as follows:

The No Project and TSM Enhanced Bus Alternatives would range from 3.6 to 3.9 ppm and 3.5 to 3.9 ppm for the p.m. peak hour, respectively.

Each of the Red Line transit alternatives would range from 3.6 to 3.9 ppm for the p.m. peak hour.

Table 4-7.5: San Fernando Valley East/West Corridor Alternatives Regional Statistical Area On-Road Emissions Comparison for the Year 2015 (pounds per day)

Pollutant	No Project (26,592,188)	Reductions in Pounds Per Day Compared to No Build Alternative				
		Enhanced Bus/TSM (26,494,011)	Red Line SP (Alt. 1) (26,437,132)	Red Line Oxnard (Alt. 2) (26,421,407)	LRT (Alt. 6) (26,458,595) /a/	Dual Mode (Alt. 11) (26,437,132)
Reactive Organic Gas	18,743	69	109	120	97	109
Carbon Monoxide	220,821	815	1,288	1,418	1,141	1,288
Nitrogen Oxide	176,305	651	1,028	1,132	911	1,028
Sulfur Oxide	4,686	17	27	30	24	27
Particulate Matter	4,100	15	24	26	21	24

Note:
/a/ Estimate based on Cross Valley Red Line to Cross Valley LRT auto VMT ratios.
Numbers in parentheses = Daily VMT in millions.
Emissions factors calculated using the EMFAC7F model run for the year 2015.

Source: Terry A. Hayes Associates, 1997.

Eight-Hour Period Findings As shown in Table 4-7.7 there would be no exceedances of the year 2015 8-hour state and federal standard of 9 ppm. CO concentrations for the alternatives would be as follows:

The No Project and TSM Enhanced Bus Alternatives would range from 2.8 to 3.0 ppm and 2.7 to 3.0 ppm for the p.m. peak hour, respectively.

Each of the Red Line Transit alternatives would range from 2.8 to 3.0 ppm for the p.m. peak hour.

c. Park-and-Ride Lot Carbon Monoxide Concentrations

Park-and-ride facilities are proposed at five locations. Commuter-oriented parking lots generally exhibit high carbon monoxide concentrations in the evening due to the large amount of vehicles exiting the facility in cold start mode and the low speed at which vehicles travel.

The estimated demand for peak period parking ranges from 110 spaces at the Laurel Canyon Station to 1,800 spaces at the Sepulveda Station. To determine air quality impacts from the proposed facilities, the USEPA approved SCREEN3 area source dispersion model was used. Calculated emissions from vehicle egress and ingress activity during the evening peak hour was assumed. The majority of vehicles were assumed to be the cold start mode. The results of the dispersion model were added to year 2015 background concentration levels. With reference to sensitive receptors, carbon monoxide estimates were calculated for distances ranging from 50 to 150 feet from each parking lot. Table 4-7.8 indicates that there would be no exceedances of the 1- nor the 8-hour standard of 20 parts per million and 9 parts per million, respectively.

d. Conformity

The Federal Clean Air Act requires that all plans, programs, and projects which are to be sponsored by the Federal Government must be in conformity with the Act. The San Fernando Valley East/West Corridor Transportation Improvement project is included in the adopted 1994 Regional Transportation Plan (RTP), prepared by the Southern California Association of Governments (SCAG). The RTP is a federal/state required long range transportation plan which has been found to conform with the Clean Air Act. The federal conformity criteria address states, such as California, that are not operating under an EPA-approved State Implementation Plan (SIP). All projects must then conform with an approved Transportation Improvement Program (TIP), as does the San Fernando Valley East/West Corridor Transportation Improvement Project. Several additional criteria then apply to determine conformity.

§51.412 *The conformity determination must be based on the latest planning assumptions.* All assumptions used in the microscale analysis are derived from the South Coast Air Quality Management District and the Southern California Association of Governments' most recent estimates of population, employment, travel, and congestion. Travel forecasts have been based on growth assumptions for 2015.

§51.414 *The conformity determination must be based on the latest emission estimation model available.* All emissions are based on the most recent version of CARB's emissions estimate model, EMFAC7F.

§51.416 *The MPO* [metropolitan planning organization] *must make the conformity determination according to the consultation procedures of this rule and the implementation plan revision required by §51.396.* The Southern California Association of Governments will make its conformity determination as stipulated by this rule.

§51.420 *There must be a currently conforming transportation plan and currently conforming TIP at the time of project approval.* A conforming transportation plan and TIP currently exist.

§51.422 *The project must come from a conforming transportation plan and program.* The San Fernando Valley East/West Corridor Transportation Improvement Project is included in the adopted 1994 Regional Transportation Plan, which has been found to conform with the Clean Air Act.

§51.424 *The FHWA/FTA project must not cause or contribute to any new localized CO or PM_{10} violations or increase the frequency or severity of any existing CO or PM_{10} violations in CO and PM_{10} non-attainment and maintenance areas.* The microscale CO analysis demonstrates that CO emissions violations would neither contribute to new violations nor increase the frequency or severity of existing violations. No model has been adopted by the EPA that estimates localized PM10 concentrations for either vehicular tailpipe emissions or tire wear.

Table 4-7.6: Year 2015 East Valley One-Hour PM Peak Hour Carbon Monoxide Concentrations (parts per million)

Receptor	No Project	Enhanced Bus/TSM	Red Line SP (Alt. 1)	Red Line Oxnard (Alt. 2)	LRT (Alt 6)[1]	Dual Mode (Alt. 11)
1. Van Nuys Golf Course	3.89	3.84	3.91	3.91		3.91
2. Sepulveda Dam Recreation Area	3.69	3.72	3.80	3.80		3.80
3. University of Phoenix	3.97	3.92	3.96	3.97		3.97
4. Valley Presbyterian Hospital	3.90	3.84	3.90	3.91		3.91
5. Delano Park/Sylvan Park Elementary	3.64	3.60	3.70	3.70		3.70
6. Delano Park/Sylvan Park Elementary	3.75	3.72	3.78	3.78		3.78
7. Van Nuys High School	3.79	3.68	3.79	3.79		3.79
8. Van Nuys senior Citizens Center/Van Elementary School	3.82	3.78	3.83	3.82		3.82
9. Hollywood Community Hospital	3.78	3.68	3.78	3.78		3.78
10. Kittridge Mini Park/Kittridge Street Elementary School	3.77	3.67	3.77	3.77		3.77
11. Chandler Elementary School	3.60	3.57	3.60	3.60		3.60
12. LA Valley College/Ulysses Grant High School/Erwin Park Elementary School	3.85	3.67	3.74	3.74		3.74
13. Fulton Ave./Burbank Blvd. (Sidewalk)	3.72	3.66	3.72	3.72		3.72
14. Montux Elementary School	3.77	3.72	3.76	3.76		3.76
15. Laurel Canyon Boulevard/Victory Boulevard (Sidewalk/Residential)	3.77	3.74	3.77	3.77		3.77
16. Laurel Canyon Boulevard/Oxnard Street (Sidewalk/Residential)	3.98	3.92	3.97	3.97		3.97
17. Burbank Boulevard Elementary School	3.79	3.76	3.78	3.79		3.79
18. Hollywood High School	3.75	3.66	3.74	3.75		3.75
19. Laurel Plaza	3.83	3.78	3.82	3.82		3.82
20. N. Hollywood High School/Residences	3.63	3.60	3.63	3.61		3.61

Notes:

(1) Traffic data not available.
Assumes 1-hour ambient of 3.51 ppm.
State standard = 20 ppm,
Federal standard = 35 ppm.

Source: Terry A. Hayes Associates, 1997.

Table 4-7.7: Year 2015 East Valley Eight-Hour PM Peak Hour Carbon Monoxide Concentrations (parts per million)

Receptor	No Project	Enhanced Bus/TSM	Red Line SP (Alt. 1)	Red Line Oxnard (Alt. 2)	LRT (Alt 6)[1]	Dual Mode (Alt. 11)
1. Van Nuys Golf Course	3.01	2.97	3.02	3.02		3.02
2. Sepulveda Dam Recreation Area	2.86	2.89	2.94	2.94		2.94
3. University of Phoenix	3.06	3.02	3.06	3.06		3.06
4. Valley Presbyterian Hospital	3.01	2.97	3.01	3.01		3.01
5. Delano Park/Sylvan Park Elementary	2.83	2.80	2.87	2.87		2.87
6. Delano Park/Sylvan Park Elementary	2.90	2.88	2.93	2.93		2.93
7. Van Nuys High School	2.94	2.86	2.93	2.93		2.93
8. Van Nuys senior Citizens Center/Van Elementary School	2.96	2.93	2.96	2.96		2.96
9. Hollywood Community Hospital	2.93	2.86	2.93	2.93		2.93
10. Kittridge Mini Park/Kittridge Street Elementary School	2.92	2.85	2.92	2.92		2.92
11. Chandler Elementary School	2.80	2.78	2.80	2.80		2.80
12. LA Valley College/Ulysses Grant High School/Erwin Park Elementary School	2.98	2.85	2.90	2.90		2.90
13. Fulton Ave./Burbank Blvd. (Sidewalk)	2.88	2.84	2.88	2.88		2.88
14. Montux Elementary School	2.92	2.89	2.91	2.91		2.91
15. Laurel Canyon Boulevard/Victory Boulevard (Sidewalk/Residential)	2.92	2.90	2.92	2.92		2.92
16. Laurel Canyon Boulevard/Oxnard Street (Sidewalk/Residential)	3.06	3.03	3.06	3.06		3.06
17. Burbank Boulevard Elementary School	2.93	2.92	2.93	2.93		2.93
18. Hollywood High School	2.90	2.84	2.90	2.90		2.90
19. Laurel Plaza	2.96	2.93	2.95	2.95		2.95
20. N. Hollywood High School/Residences	2.82	2.80	2.82	2.81		2.81

Notes:

(1) Traffic data not available.
Assumes 8-hour ambient of 2.74 ppm.
State standard = 9 ppm.
Federal standard = 9 ppm.

Source: Terry A. Hayes Associates, 1997.

Table 4-7.8: Park-and-Ride Lot Carbon Monoxide Concentrations (ppm)

Distance from Edge of Lot	Laurel Canyon	Valley College	Van Nuys	Sepulveda
One-Hour Concentrations				
50 Feet	3.57	3.53	3.67	3.92
100 Feet	3.58	3.54	3.67	3.92
150 Feet	3.58	3.54	3.68	3.83
Eight-Hour Concentrations				
50 Feet	2.91	2.89	2.98	3.16
100 Feet	2.92	2.90	2.98	3.16
150 Feet	2.92	2.90	2.99	3.09
Note: Background Concentrations = 3.51 for the 1-hour and 2.87 for the 8-hour measurement.				

Source: Terry A. Hayes Associates, 1997.

§51.426 *The FHWA/FTA project must comply with PM_{10} control measures in the applicable implementation plan.* The project would comply with all PM_{10} control measures in the implementation plan and in established SCAQMD rules.

When Federal Attainment Plans have been submitted to the EPA and prior to their approval, another conformity criterion applies. The SCAQMD has submitted to the EPA Federal Attainment Plans or Rate of Progress Plans for all criteria pollutants of concern in the South Coast Air Basin. Projects in the South Coast Air Basin are currently subject to the Transitional conformity criteria.

§51.434 *The FHWA/FTA project must eliminate or reduce the severity and number of localized CO violations in the area substantially affected by the project (in CO non-attainment areas).* No localized CO violations would be experienced in either the future without project scenario No-Build Alternative) or in either of the build scenarios, therefore, this criterion does not apply to the project.

e. Consistency with the Air Quality Management Plan (AQMP)

The project is consistent with the *AQMP*. It does not result in an increase in the number or severity of the state and federal 1-hour standards 20 and 35 parts per million. The project would not increase the number or severity of CO violations under the state and federal 8-hour standard of nine parts per million. Furthermore, the project would not increase the existing exceedances of the 8-hour period by an increment greater than 0.45 ppm.

4-7.6 Mitigation Measures

None required.

4-8 ENERGY

4-8.1 Existing Conditions

The high level of automobile use in Southern California and in Los Angeles County in particular greatly influences energy consumption, particularly the use of fossil fuels. It is estimated that approximately 3.1 billion gallons (291,514 billion BTU) are consumed in Los Angeles County under current conditions. By the year 2015, fuel consumption is projected to increase to approximately 3.4 billion gallons annually (approximately 321,784 billion BTU). The estimated 9.9 percent increase in future fossil fuel consumption compared with a 22.4 percent increase in vehicle miles traveled reflects anticipated higher market penetration rates of alternate fuels, as well as increased fuel economy of fossil fuel powered vehicles. According to estimates prepared by the California Air Resources Board, the fossil fuel consumption rate will decrease from 0.048 gallons per vehicle mile to 0.044 gallons per vehicle mile in Los Angeles County.[14]

4-8.2 Impact Methodology and Evaluation Criteria

The assessment of energy consumption impacts presented below is based on the method and factors described in the U.S. Department of Transportation publication entitled *Evaluating Urban Transportation System Alternatives*.[15] The method takes into account energy consumption from basic sources, including propulsion systems, construction and maintenance. Energy consumption factors, measured in British Thermal Units (BTU), are taken from various research studies conducted by the Congressional Budget Office and the Federal Highway Administration. An increase in energy consumption of 1 percent or more, when compared with the No Project Alternative, would be considered significant.

4-8.3 Impacts

The energy consumption characteristics of the East Valley Alternatives are shown in Table 4-8.1. As can be seen, the propulsion requirements, construction and maintenance elements of the rail alternatives show an increase above both the Enhanced Bus and the No Project Alternative. These increases are a function of propulsion and construction components of the rail transit systems. When energy from auto-related travel is taken into account, particularly the reductions in automobile vehicle miles of travel due to expanded transit service in the East Valley, it is evident that the Enhanced Bus Alternative would result in a slight energy reduction compared to the No Project condition. Other East Valley alternatives would result in a slight increase in consumption compared to No Project, ranging from 0.04 % to 0.4 %. When energy consumption is normalized to take into account the expected differences in transit passenger miles associated with each alternative, it can be seen that the East Valley alternatives would each represent a reduction in consumption compared to the No Project conditions on a BTU per passenger mile basis. The reductions from the No Project Condition would range from 3% to 6%.

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[14] California Air Resources Board, *Predicted California Vehicle Emissions, Ozone Planning Inventory, Los Angeles County*, 1994 and 2015, February 1997.

[15] U.S. Department of Transportation, *Evaluating Urban Transportation System Alternatives*, November 1978.

As shown in Table 4-8.1, the Red Line alternatives would result in a slight increase in energy consumption relative to the No Project condition. Alternative 11, however, would result in a net decrease in energy consumption. This because this alternative is forecast to achieve the greatest amount of automobile travel reductions. As shown in Table 4-8.2, the alternatives would result in energy reduction on a per passenger basis, for all alternatives.

Table 4-8.1: Annual Year 2015 Energy Consumption (Billion BTU's)

Alternative	Propulsion	Construction	Maintenance	Subtotal	Auto (P&M)	Total	Change From No Project	Percent Change From No Project
No Project	3,831	0	535	4,366	283,693	288,059	0	
Enhanced Bus	3,868	0	537	4,406	283,444	287,850	(209)	-0.07%
1a	4,116	1,313	600	6,029	283,196	289,225	1,166	0.40%
1b	4,116	1,235	600	5,951	283,196	289,147	1,088	0.38%
1c	4,116	1,218	600	5,934	283,196	289,131	1,072	0.37%
1d	4,116	835	600	5,551	283,196	288,747	688	0.24%
2	4,116	1,274	600	5,990	283,072	289,062	1,003	0.35%
6a	4,154	490	584	5,228	282,948	288,176	117	0.04%
6b	4,154	875	584	5,613	282,948	288,561	502	0.17%
11	4,153	0	602	4,755	283,196	287,952	(107)	-0.04%

Note:

P&M = Propulsion and Maintenance

Source: Terry A. Hayes Associates, 1997.

Table 4-8.2: Energy Consumption per Transit Passenger Mile

Alternative	BTU's (Billion)	Passenger Miles (Million)	BTU per Passenger Mile	Change From No Project	Percent Change From No Project
No Project	288,059	2,903	99,228		
Best Bus	287,850	2,986	96,400	(2,828)	-3%
Red SP (Subway)	289,225	3,041	95,100	(4,128)	-4%
Red SP (Cut Cover)	289,147	3,041	95,074	(4,154)	-4%
Red SP (Open Cut)	289,131	3,041	95,069	(4,159)	-4%
Red SP (Aerial)	288,747	3,041	94,943	(4,285)	-4%
Red Oxnard	289,062	3,053	94,676	(4,552)	-5%
LRT (At Grade)	288,176	3,071	93,838	(5,390)	-5%
LRT (Cut Cover)	288,561	3,071	93,963	(5,265)	-5%
Dual Mode	287,952	3,072	93,734	(5,494)	-6%

Note: Transit Passenger Miles for East Valley Alternatives were derived from Valley-wide transit passenger miles using the ratio of East Valley to Cross Valley daily transit boardings shown in the MIS transportation analysis, Table 3-1.1.

Source: Terry A. Hayes Associates, 1997.

4-8.4 Mitigation

No mitigation is required.

4-9 NOISE AND VIBRATION

This section summarizes the analysis of potential impacts from airborne noise and ground-borne vibration. Sections 4-9.1 through 4-9.3 discuss the assessment of noise impacts and Sections 4-9.4 through 4-9.6 summarize the assessment of ground-borne vibration and ground-borne noise impacts. The potential sources of airborne noise or ground-borne vibration impact from this project include:

1. Airborne noise from train operations. This is the typical noise from transit trains passing through communities. Train operations do not cause airborne noise when operating in subway except for localized areas near vent shafts and tunnel portals. The primary source of airborne noise is steel wheels rolling on steel rails. In addition, noise from transit vehicle auxiliary equipment, such as the air conditioning and motor ventilation systems, will sometimes be significant. Most of the noise impacts from train operations could be mitigated with sound walls along the rail right-of-way or at the edge of the aerial structure. There are some sections of the aerial structure where higher than normal sound walls would be needed to eliminate all of the noise impacts.

2. Audible warnings at grade crossings. Alternatives 6a and 11a would have several street-rail grade crossings. The standard procedure for grade crossings is for the bells to start ringing and the gates to lower 10 to 30 seconds before trains reach the crossing. In addition, at grade crossings it is required for the train operator to sound the train horn starting about 10 seconds before the train reaches the crossing. It has been assumed for this assessment that bells will ring for a total of 30 seconds for each train, but that train horns will not be required except in emergency situations.

3. Ground-borne vibration from train operations. The interaction of steel wheels rolling on rails create vibration that propagates through the track support system and the intervening ground to nearby buildings. The resulting building vibration is referred to as ground-borne or structure-borne vibration. The ground-borne vibration may be perceived by building occupants as the vibration of the floors or the rattling of windows, items on shelves, or items hanging on the walls. There are a number of areas where impact from ground-borne vibration is projected. In almost all cases, the impact could be eliminated through the use of relatively standard vibration control measures such as ballast mats or resiliently supported tie systems.

4. Ground-borne noise from train operations. Ground-borne noise results from ground-borne vibration. Noise radiated from vibrating floors, walls, and ceilings may sometimes be audible. Ground-borne noise is usually characterized as a low-frequency rumbling noise. Because of the low-frequency character of the noise, some people have trouble separating the rumble noise from the perceptible vibration. Since ground-borne noise is caused by ground-borne vibration, the projected impacts occur in the same areas as the ground-borne vibration impacts, and the same mitigation measures will mitigate both the ground-borne vibration and the ground-borne noise.

5. Ancillary equipment noise. The ancillary equipment noise can include noise from substations, subway vent shafts, and station ventilation equipment. Impacts from this type of equipment are limited to localized areas around specific pieces of equipment. Noise impacts from ancillary equipment have not been evaluated as part of this study since the system design is still at a conceptual stage and specific locations for ancillary equipment have not been defined. Any noise impacts from ancillary equipment can usually be controlled by including noise limits in the procurement specifications.

6. Construction noise and vibration. Construction noise and vibration are temporary impacts that do not have any long term effects on the quality of living or property values. The potential noise and vibration impacts from construction activities are discussed in Chapter 5.

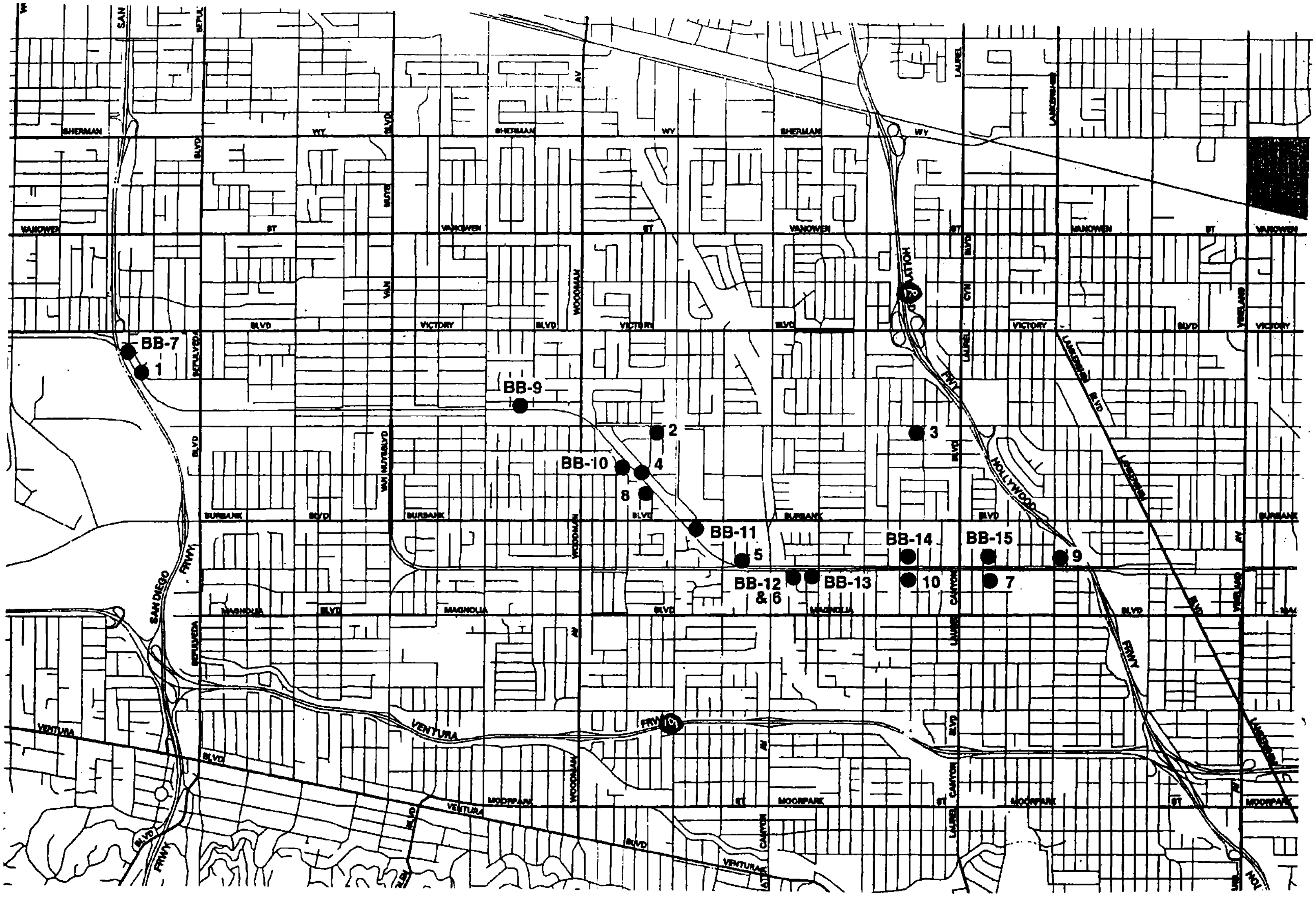
4-9.1 Existing Noise Conditions

The study area for this project begins at the Red Line North Hollywood station and extends westward to the Sepulveda Boulevard station. One corridor (Alternatives 1, 6, and 11) follows the SP ROW that runs in the median of Chandler Boulevard for the eastern half, and a block north of Oxnard Street for the western half. The second corridor (Alternative 2) runs north from the North Hollywood station to Oxnard Street and then turns west to run under Oxnard Street until it joins up with the SP ROW near Oxnard and Woodman. Noise sensitive land uses in these corridors include considerable amounts of single-family and multi-family residences, along with parks, schools, day-care centers, churches, and temples.

A noise monitoring program was performed to determine existing levels of noise exposure at noise sensitive receptors in the corridors. Estimating existing noise exposure is an important step in the noise impact assessment since, as discussed in Section 4-9.2.c, the thresholds for noise impact are based on the existing levels of noise exposure. A prior noise survey was performed in November 1987 as part of previous evaluations of east-west transit in the San Fernando Valley. Additional monitoring was performed in July 1996 to document present conditions. The measurements in 1987 and 1996 show similar levels of noise exposure. This is not surprising since traffic on freeways and busy arterials was the dominant source of noise exposure during both the 1987 and 1996 noise monitoring.

Most of the noise monitoring was performed using unattended monitors that were located at representative sites along the corridors. The monitors were left in place for 24 hours to obtain a picture of the variation of noise exposure over a complete day. The 24-hour monitoring was supplemented with short-term noise measurements, most of which were made along busy arterial streets. Traffic counts were made at the same time as the short-term measurements to provide a means of correlating traffic volumes with ambient noise levels.

All of the measurement sites were located in noise sensitive areas along one of the proposed alignments. The sites were selected to represent the range of noise conditions along the corridor. Figure 4-9.1 shows the general locations of the monitoring sites. Sites 1 through 10 represent the July 1996 measurements. Sites BB-7 through BB-15 are from the previous noise survey in



SOURCE: HARRIS MILLER MILLER AND HANSON, 1997.

METRO

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-9.1
Noise Monitoring Sites

1987. The measurement microphones were positioned to characterize the exposure of the site to the dominant noise source in the area, which was almost always vehicular traffic on freeways (the San Diego and Hollywood Freeways), busy arterials, or local streets. The measurement microphones were located at the approximate set-back lines of residences from the road and were positioned to avoid acoustic shielding by landscaping, fences, or other obstructions.

The Larson Davis Model LD870 monitors used for the survey meet all of the specifications in ANSI Standard S1.4 for Type 1, precision, sound measurement equipment. Field calibrations traceable to the U.S. National Institute of Standards and Technology (NIST) were carried out before and after each set of measurements. The monitors sample the A-weighted sound level 32 times per second and can be programmed to provide a wide variety of statistics. For this study, the monitors were programmed to collect hourly and daily noise statistics along with information about particularly loud noise events. The daily results are summarized in Table 4-9.1 in terms of the Day-Night Sound Level and the equivalent sound level over the daytime and nighttime hours. These terms are defined below:

A-Weighted Sound Level: Sound is measured using microphones that respond accurately to all audible frequencies. The human hearing system does not respond equally well to all frequencies. Low frequency sounds below about 400 Hz are progressively and severely attenuated, as are high frequencies above 10,000 Hz. To approximate the way humans interpret sound, a filter circuit with frequency characteristics similar to the human hearing system is built into sound measurement equipment. Measurements with this filter enacted are referred to as *A-weighted sound levels*, expressed in dBA. Community noise is almost always characterized in terms of A-weighted levels.

Equivalent Sound Level (Leq): Leq is a measure of sound energy over a period of time. It is referred to as the *equivalent sound level* because it is equivalent to the level of a steady sound which, over a referenced duration and location, has the same A-weighted sound energy as the fluctuating sound. Leq's for periods of one hour, the daytime or nighttime hours, and 24 hours are commonly used in environmental assessments. Because Leq is a measure of the total sound energy, any new community noise source will cause Leq to increase. To estimate how rail transit in the East-West San Fernando Valley corridors will increase Leq, it is necessary to know the existing Leq and add in the sound energy that would be created by all of the transit train operations. The more train operations and the longer and faster the trains, the more sound energy is added to the existing Leq.

Day-Night Sound Level (Ldn): Ldn, also abbreviated DNL, is a 24-hour Leq, but with a 10 dB penalty assessed to noise events occurring at night. Nighttime is defined as 10 pm to 7 am. The effect of this penalty is that, in the calculation of Ldn, any event during nighttime hours is equivalent to ten events during the daytime hours. This strongly weights Ldn toward nighttime noise to reflect most people being more easily annoyed by noise during the nighttime hours when both background noise is lower and most people are sleeping. Ldn is often used to characterize community noise when assessing community noise impacts. Almost all urban and suburban neighborhoods are in the range of Ldn 50 to 70. An Ldn of 70 dBA represents a relatively noisy area, which might be found near a freeway or a busy surface street. Residential neighborhoods that are not near major sound sources are usually in the range of Ldn 50 to 60 dBA. If there is a freeway or moderately busy arterial nearby, or any substantial nighttime noise, Ldn is usually in the range of 60 to 65 dBA.

Table 4-9.1: Noise Survey Results, 24-Hour Survey Locations

Site No.	Location	Start		Results, dBA		
		Date	Time	Ldn	Lday*	Lnight**
1	6253 Blucher Avenue	7/17/96	11:00	67	63	60
BB-7	6311 Blucher Avenue	11/16/87	15:00	71	68	64
2	5954 Nagle Avenue	7/18/96	17:00	70	68	62
3	12232 Oxnard Street	7/18/96	16:00	69	67	61
4	5805 Hillview Park Avenue	7/17/96	16:00	57	58	44
5	13001 Chandler Boulevard	7/17/96	12:00	64	64	54
6	5350 Alcove Avenue	7/18/96	15:00	65	64	56
BB-12	5350 Alcove Avenue	11/5/87	18:00	66	63	58
7	11956 Chandler Boulevard	7/22/96	13:00	67	65	59
8	13407 Collin Street	7/17/96	14:00	55	53	47
BB-9	14002-1/2 Costello Avenue	11/11/87	18:00	56	55	46
BB-10	13515 Emelita Avenue	11/9/87	13:00	57	56	48
BB-11	13164 Burbank Boulevard	11/10/87	15:00	63	55	56
BB-15	5405 Gentry Avenue	11/16/87	14:00	65	65	54

Note:

*Day: 7 a.m. to 10 p.m. **Night: 10 p.m. to 7 a.m.

Source: HMMH, 1997.

Table 4-9.2: Noise Survey Results, Short-Term Locations

Site No.	Location	Start		Leq (dBA)
		Date	Time	
BB-8	6200 Langdon Ave	11/6/87	14:50	64
2	5954 Nagle Avenue	7/19/96	13:31	69
3	12232 Oxnard Street	7/19/96	14:18	71
5	13001 Chandler Boulevard	7/18/96	11:35	64
BB-13	Emek Hebrew Academy	11/7/87	10:10	63
9	Chandler Blvd & Colfax Ave	7/19/96	17:25	68
9	Chandler Blvd & Colfax Ave	7/19/96	10:11	66
10	Chandler Blvd & Hermitage Ave	7/19/96	16:49	67
10	Chandler Blvd & Hermitage Ave	7/19/96	11:33	65
BB-14	12257 Chandler Boulevard	11/17/87	8:25	67

Source: HMMH, 1997.

One goal of the noise survey is to develop sufficient information on existing conditions so that existing Ldn can be estimated at all noise sensitive residences along the proposed alignments.

As part of this process, the corridors have been divided into six general areas with relatively uniform levels of existing noise exposure throughout each generalized area. The areas and the generalized Ldn's used for the noise impact assessment are summarized in Table 4-9.3 and discussed below.

Table 4-9.3: Community Areas and Generalized Measurement Results

Area	Measurement Sites in Area	Generalized Ldn
1. Blucher Avenue along the San Diego Freeway at the western terminus of this study.	1, BB7	67 dBA
2. Oxnard from Sepulveda to Woodman. Most of the land use along this corridor is commercial or industrial although there are residential land uses within a block of the corridor east of Hazeltine. Noise levels are relatively low since the area is one block north of Oxnard and is shielded from traffic noise from the east-west arterials.	BB-9	56 dBA
3. Diagonal section of the SP ROW between Oxnard and Chandler. Ambient noise levels are higher at the northern and southern ends because of traffic on Oxnard and Chandler. Noise levels are also higher in the mid section near the Burbank Blvd/Fulton Ave. intersection.	4, 8, BB-10, BB-11	55 dBA
4. Chandler Boulevard from Ethyl to Whitsett Avenue.	5, 6, BB-12	64 dBA
5. Chandler Boulevard from Whitsett Avenue to Lankershim Boulevard.	7, 9, 10, BB-15	65 dBA
6. Oxnard from Woodman to Lankershim.	2, 3	70 dBA

Source: HMMH, 1997.

Area 1. Blucher Avenue

The residences in this area are directly east of the San Diego Freeway. The rail line would run between the San Diego Freeway and the residences. The 1996 measurement at 6253 Blucher was Ldn 67 dBA and the measurement in 1987 at a residence several doors to the north was Ldn 71 dBA. For both measurements, freeway traffic was by far the dominant noise source. The 1987 site was closer to the freeway, which is partially responsible for the higher reading. For the impact assessment, noise exposure at all of the residences along Blucher Avenue has been assumed to be 67 dBA.

Area 2. Oxnard Street from Sepulveda Boulevard to Woodman Avenue

Most of the land use adjacent to the rail corridor in this area is commercial or industrial. However, at the eastern end there are a number of residences north of the alignment between Hazeltine and Woodman, and several residences on both sides of the alignment near Oxnard. The measured Ldn of 56 dBA at Site BB-9, which was located two blocks east of Hazeltine, has been used to characterize existing noise exposure for this area. Traffic on Oxnard and other nearby arterials is the dominant noise source. Even though much of the land use near the measurement site is industrial, existing noise levels are relatively low because of: (1) the distance from the arterials, (2) acoustic shielding provided by buildings, and (3) relatively low noise levels during the monitoring period from industrial activities.

Area 3. SP ROW Diagonal between Oxnard Street and Chandler Boulevard

This segment passes through relatively quiet residential areas. Much of the corridor is similar to Site 8 on Collins Street (Ldn 55 dBA), Site 4 on Hillview Street (Ldn 57 dBA), and Site BB-

10 on Emelita Avenue (Ldn 57 dBA). The noise sources at these sites included distant traffic on Oxnard, Chandler, Fulton, Burbank, and other busy arterials, along with local traffic. Hourly Leq levels were generally in the low to mid 50's during the day, dropping to the low 40's during late night and early morning hours. The measurement at Site 4 on Hillview Street had several daytime hours with relatively high noise levels that may not be representative of typical conditions. Without these hours the Ldn at Site 4 would have been about 55 dBA. Existing noise exposure has been assumed to be Ldn 55 dBA for all residential land uses in this area except for those close to Oxnard, the Fulton/Burbank intersection, and Chandler. As discussed below, the measured levels near Oxnard and Chandler were Ldn 70 dBA and 64 dBA respectively. The measured level was Ldn 64 dBA at Site BB-11 at the Valley Cities Jewish Community Center. Site BB-11 was located about 400 feet south of Burbank Boulevard.

<u>Area 4. Chandler Boulevard from Ethyl Avenue to Whitsett Avenue</u>
Both the north and south side of this section of Chandler contain primarily residential land uses. Existing noise exposure was characterized by measurements at 13001 Chandler (Site 5: Ldn 64 dBA) and 5350 Alcove Avenue (Site 6: Ldn 65 dBA and Site BB-12: Ldn 66 dBA). The one decibel difference between the 1987 and 1996 measurements at 5350 Alcove Avenue is within normal day-to-day sound exposure fluctuations. For the impact assessment it has been assumed that existing noise exposure is Ldn 64 dBA for all of the residences along Chandler in this area.

<u>Area 5. Chandler Boulevard from Whitsett Avenue to Lankershim Boulevard</u>
The measured Ldn values were 67 dBA at 11956 Chandler (Site 7) and 65 dBA at 5405 Gentry Avenue (Site BB-15), slightly higher than Area 4. In addition, short term daytime measurements were conducted on Chandler near Colfax (Site 9) and near Hermitage (Site 10). The Leq's for these short term measurements ranged from 65 to 68 dBA, which are consistent with the hourly Leq values measured at Site 7 and Site BB-15. Similar to Area 4, traffic on Chandler is the dominant noise source. The existing noise level in this area has been assumed to be Ldn 65 dBA for the impact assessment. This is a conservative estimate, since the measurements indicate that noise exposure for much of this area is two to three decibels higher.

<u>Area 6. Oxnard Street from Woodman Avenue to Lankershim Boulevard</u>
Oxnard Street is a busy arterial with a number of multi-family residential units along both sides. Noise impacts along Oxnard are unlikely since the only alternative affecting Oxnard, Alternative 2, would be entirely in subway. Measurements were conducted along Oxnard to provide a baseline for evaluating vent shafts, fan shafts or station ancillary equipment that could be located in this area. Site 2 was located at the corner of Oxnard and Nagle (5954 Nagle Avenue) and Site 3 was located near the intersection of Oxnard and St. Clair (12232 Oxnard). The measured Ldn at both sites was 70 dBA. In addition, short-term mid-afternoon measurements were Leq 69 dBA at Site 2 and 71 dBA at Site 3. Noise levels were dominated by traffic on Oxnard with the daytime Leq ranging from 65 to 70 dBA and the nighttime Leq dropping to a low between 3:00 AM and 4:00 AM of around 55 dBA. Existing noise exposure has been assumed to be Ldn 70 dBA for the residences facing Oxnard.

4-9.2 Noise Impact Analysis Methodology and Evaluation Criteria

a. *Approach*

The approach used to assess noise impact consists of combining the available data on the project design and planned operational characteristics with models of train noise to project future noise levels. Then, for sensitive receptors, the projections are compared with estimates of existing noise exposure. The process is shown schematically on Figure 4-9.2. The steps in the assessment are:

1. *Determine Study Area Characteristics*: This step includes identifying sensitive receptors through the review of design drawings, land use maps, and visits to the study area. The design drawings for each alternative are then used to measure distances between the receptors and the proposed track centerline.

2. *Determine Existing Noise Environment*: As discussed in Section 4-9.1, noise monitoring was performed at representative sites along the proposed corridors. The measurement results were generalized in order to estimate the existing Ldn at all noise sensitive receptors.

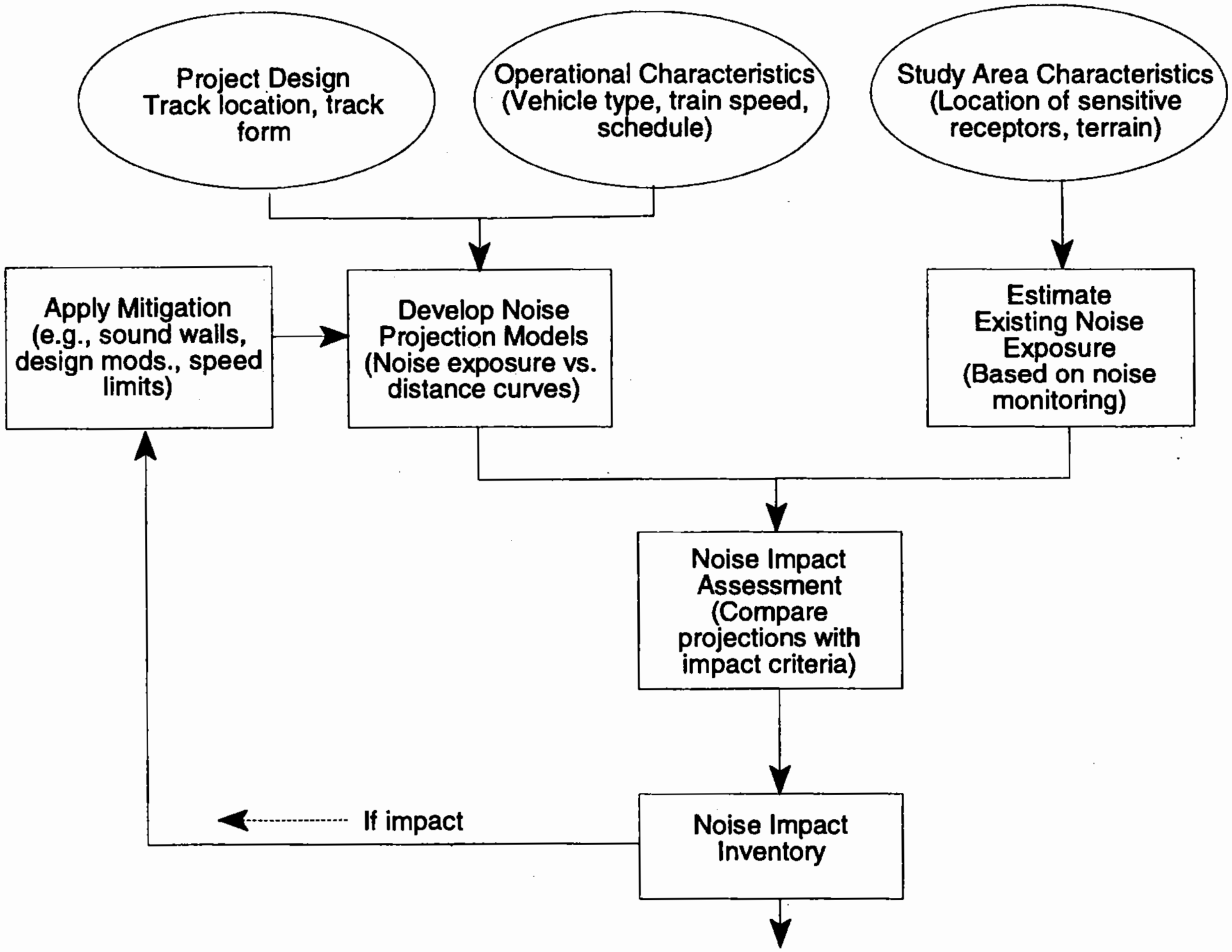
3. *Develop Noise Projection Models*: The models used to project noise from the proposed alternatives are based on measurement data from operational transit systems across the country, the noise limits included in the purchase specifications for MTA Red Line and LRT vehicles, and standard models of transit train noise. The noise projections for a specific location also require estimates of train speed, train length, and schedule.

4. *Perform Noise Impact Assessment:* For each sensitive receptor or group of sensitive receptors, the projected transit noise is compared to the thresholds for noise impact and severe noise impact. As discussed in Section 4-9.2.c, the impact thresholds vary based on estimates of existing noise exposure.

5. *Inventory Impact and Assess Mitigation Options:* The results from Step 4 are tabulated and for any area where either level of noise impact is projected, measures to minimize or eliminate the impact are evaluated. The goal is always to eliminate as much impact as possible. The primary mitigation measure for noise is use of sound walls that block the direct path from the noise source to the receivers. The final product of the noise assessment is a tabulation of impacts with and without mitigation and a list of mitigation required to minimize the impacts.

b. *Noise Prediction Models*

The two noise sources evaluated in this assessment are train operations and grade crossings. The models used for the assessment are described below. Other sources associated with rail transit include ancillary equipment such as substations, subway fan and vent shafts, and station ventilation equipment. The effects of these noise sources are very dependent on the specific



SOURCE: HARRIS MILLER MILLER AND HANSON, 1997.

FIGURE 4-9.2
Noise Impact Assessment Approach

locations and design since they affect very localized areas. The potential for these sources to cause community noise impact will be evaluated after more design details have been developed in subsequent design stages of the project. Noise impacts associated with ancillary equipment can generally be avoided by including noise limits in the purchase specifications for the equipment.

(1) Train Operations

The model used to project train noise is based on formulas given in the FTA Manual, *Transit Noise and Vibration Impact Assessment* (FTA Report DOT-T-95-16, April 1995), and the vehicle specifications used by Los Angeles County MTA for the purchase of Red Line and light rail vehicles. The specifications include limits for maximum wayside noise 50 ft from the vehicle while operating on tie and ballast track at specified speeds. The limit for Red Line vehicles is 82 dBA for a married pair operating at 70 mph and the limit for light rail vehicles is 77 dBA for a single articulated vehicle operating at 40 mph. Specification limits are usually achieved only under optimum conditions. Noise levels under normal revenue service conditions are typically 2 to 6 dBA higher than the limits in vehicle specifications.

Table 4-9.4 summarizes the reference levels used for the noise impact assessment. The specification noise limits for LRT and Red Line vehicles cannot be compared directly since they are for different speeds and train lengths. However, normalized to the same train speed and length, the noise limit for Red Line vehicles is about 2 dBA lower than the limit for LRT vehicles. The LRT specification limit has been found to be realistic, although vehicle suppliers sometimes have difficulty achieving this limit. Therefore, as shown in the table, the reference noise level used for LRT operations is 2 dBA higher than the LRT specification limit. Experience with the Blue Line vehicles has shown the reference level for revenue service trains to be realistic assuming that delivered vehicles meet the noise specification and MTA has a maintenance program of regular wheel truing and track grinding.

Since all existing Red Line operations are in subway, it is not possible to check wayside noise levels under revenue service conditions. The approach taken to develop projections for the Red Line extension options assumes that, under similar operating conditions, the Red Line and Dual Mode vehicles have the same noise emission characteristics, and that these characteristics are similar to those of the LRT vehicles. This avoids distorting the comparison of impacts with Red Line and LRT technologies even though it assumes that wayside noise levels for Red Line operations would be 4 dBA higher than the specification limit instead of the 2 dBA assumed for LRT operations.

Using equations in the FTA Manual, the reference parameters are combined to calculate a reference Sound Exposure Level (SEL), which is a measure of the sound energy at the reference conditions. The reference SELs are given at the bottom of Table 4-9.4.

Table 4-9.4: Train Reference Parameters Used for Noise Projections

Condition	Red Line Vehicles	Dual Mode Vehicles	LRT
Specification Noise Level (maximum sound level during train passby with SLOW sound level meter setting)	82 dBA	not defined	77 dBA
Reference Sound Level Used for Projections	86 dBA	86 dBA	79 dBA
Train Consist for Reference Noise Level	one married pair	two vehicles	one vehicle
Reference Length	150 ft	150 ft	75 ft
Train speed	70 mph	70 mph	40 mph
Distance from track centerline	50 ft		
Track configuration	Tangent tie-and-ballast track		
Calculated SEL			
Reference Conditions	88.0 dBA	88.0 dBA	81.9 dBA
<u>Standard train length, 55 mph</u>			89.4 dBA
4 cars, 300 ft for Red Line trains	88.9 dBA	88.9 dBA	--
3 cars, 270 ft for LRT trains	--	--	89.4

Source: HMMH, 1997.

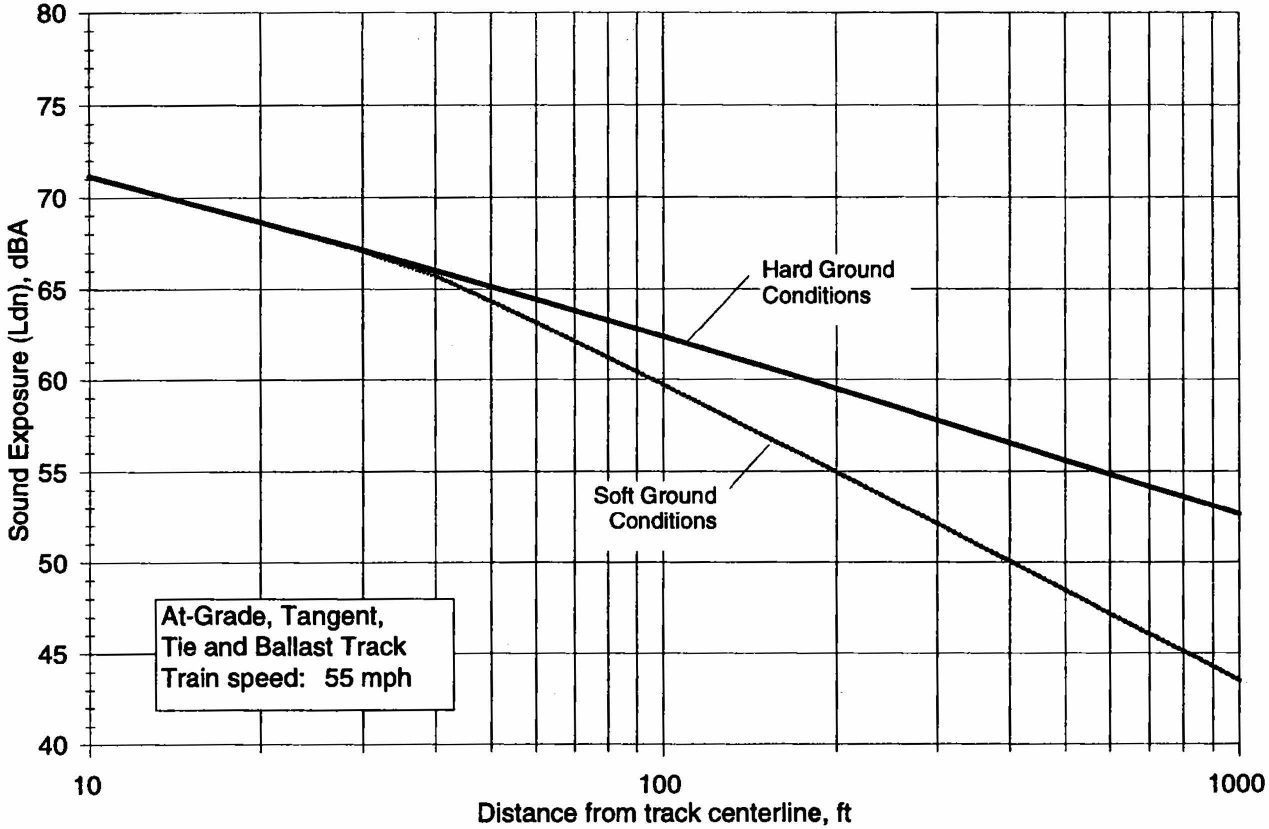
The other components of the noise projections are the number of trains per day and the distribution of trains between daytime and nighttime hours. In the calculation of Ldn, trains in the nighttime hours (10 pm to 7 am) are considered equivalent to ten daytime trains. This reflects people being more sensitive to noise during the nighttime hours when the noise may disturb their sleep. Table 4-9.5 summarizes the train schedule information that has been used for the projections. Figure 4-9.3 illustrates Ldn from train operations as a function of distance from the track centerline for at-grade track with both hard ground and soft ground conditions. Because LRT and Red Line/Dual Mode vehicles are assumed to have similar noise emission characteristics, the curves in Figure 4-9.3 are applicable to operations of either Red Line/Dual Mode or LRT vehicles. Add 3 dBA to the curves shown on Figure 4-9.3 to adjust for operation on aerial structure and subtract 10 dBA for operation in a retained fill section.

Table 4-9.5: Train Schedule used for Noise Projections

Mode	Number of Trains		Equiv.
	Daytime[1]	Nighttime[2]	Trains/Day[3]
Red Line: Equivalent 4 car trains	79.3	12.3	202.3
Dual Mode: Equivalent 4 car trains	79.3	12.3	202.3
LRT: Equivalent 3 car trains	77.0	10.4	181.0

[1] Daytime is defined at 7 am to 10 pm
[2] Nighttime is defined as 10 pm to 7 am
[3] Equivalent number of trains per day used for Ldn calculation (daytime trains plus 10×nighttime trains)

Source: SFV Rail Project Noise and Vibration Technical Report, October 21, 1989.



SOURCE: HARRIS MILLER MILLER AND HANSON, 1997.

FIGURE 4-9.3
Projected L_{dn} VS. Distance from Track Centerline

Figure 4-9.3 illustrates that at a distance of 100 feet from the track centerline, Ldn from at-grade train operations is projected to be approximately 60 dBA for soft ground conditions and 62 dBA for hard ground conditions. Hard ground propagation conditions are characterized by paved areas. For most of the rail alignments, noise propagation would be primarily over dirt, lawns, or landscaped areas. These conditions are more accurately modeled as propagation over soft ground.

(2) Grade Crossing Warning Bells

The provision of safety gates and warning bells was assumed for all at-grade crossings along the LRT alignments (Alternatives 6 and 11). For the noise model, it was assumed that bells will ring for approximately 30 seconds as the safety gates are closed prior to a train passing through. A reference noise level of 73 dBA at a distance of 50 feet from the center of the crossing was assumed for the bells; this is based on an average level obtained from noise measurements along existing light rail systems. At each grade crossing, two bells were assumed to be active, each positioned (typically) 25 feet from the near track facing the direction of traffic flow on either side of the crossing street. Stationary, monopole point sources located at each bell position were used to represent the noise source. The geometric spreading due to a point source is defined by the following equation:

$$L_p = L_{p\text{-}ref} + 10 \log [r_{ref}^2 \div r^2]$$

where L_p is the predicted noise level in dBA at a given receiver location a distance r feet from the source, and $L_{p\text{-}ref}$ and r_{ref} supply reference quantities for these variables, respectively. A penalty of 5 dB was also applied to bell noise, because it has been found that noises that have a pure-tone or impulsive character are often considered more annoying than broadband sound at the same A-weighted sound level. Although use of a 5 decibel penalty is a common approach to account for some sounds having potential to be intrusive, application of the 5 decibel penalty is usually based on judgement. It is used in this case to avoid overlooking any potential noise impacts.

The model shows that grade-crossing bells could be a significant part of the overall LRT noise near grade crossings. At 55 mph, the L_{dn} contribution from bells is 2 to 10 dBA higher than train noise itself, depending on the distance for the track. The result is that the model indicates an increased potential for noise impact near grade crossings.

Noise Impact Criteria

Although noise is a physical phenomena that can be accurately predicted and measured, the response of humans to the noise are strongly subjective and there is a wide variation in how individuals respond to environmental noise. 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. It is these studies that are relied upon when defining noise impact criteria. The overall goal of criteria for acceptable levels of community noise is not to eliminate all potential for community annoyance from the project noise. Rather, the goals are to:

1. Provide a means for objective comparisons of the noise impacts between different alternatives.

2. 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 sound walls should be installed.

3. Ensure that all reasonable steps are taken so that noise levels in the rail corridor will not be an unreasonable burden on residents and other noise sensitive receptors exposed to the noise. Basically, the goal is to define what noise environment will be acceptable to most people.

4. Provide a basis for evaluating isolated individual claims in proper perspective with statistically-based, integrated group responses. As must be expected in statistical studies of human annoyance, there are wide variations in the results of the studies and an even wider variation among individuals. Achieving the goal of no impact does not mean that there will be no community complaints about noise unless an unrealistically low noise impact threshold is used in the assessment.

Noise impact for this project is based on the FTA criteria as defined in the manual *Transit Noise and Vibration Impact Assessment*. The FTA noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although more transit noise is allowed in neighborhoods with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise.

The FTA Noise Impact Criteria group noise sensitive land uses into the following three categories:

Category 1: Buildings or parks where quiet is an essential element of their purpose.
Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches.

Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses such as parks and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility's operating period is used.

There are two levels of impact included in the FTA criteria. The interpretation of these two levels of impact are summarized below:

- Severe: Severe noise impacts are considered "significant" as this term is used in the National Environmental Policy Act (NEPA) and implementing regulations. Such impacts would also be considered significant under CEQA. Noise mitigation will normally be specified for severe impact areas unless there is no practical method of mitigating the noise.

- Impact: Sometimes referred to as moderate impact, in this range of noise impact, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.

The noise impact criteria are summarized in Table 4-9.6. The first column shows the existing noise exposure and the remaining columns show the additional noise exposure that would have to be caused by a transit project in order to result in 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.

4-9.3 Noise Impacts

a. Noise Impact Assessment

(1) Enhanced Bus

Noise impacts from the Enhanced Bus Alternative could result from the increased bus volume on road segments. For most roads and highways in the project area, the changes in traffic volume would not be sufficient to cause any measurable change in noise exposure. The procedures used to calculate the increased noise exposure that would result from changes in traffic patterns or increased bus traffic follow the procedures of the Federal Highway Administration (FHWA), [*Procedures for Abatement of Highway Traffic Noise and Construction Noise*, (23 CFR Part 772), Federal-Aid Highway Program Manual 7-7-3, August 1982]. The FHWA noise models are based on the volume of automobiles, medium trucks, and heavy trucks. Buses are usually modeled as heavy trucks, although it is preferable to use specific bus noise emissions when such data is available.

Table 4-9.6: FTA Noise Impact Criteria

Existing Noise Exposure Leq or Ldn (1)	Project Noise Exposure Impact Thresholds, Ldn or Leq,(1) dBA			
	Category 1 or 2 Sites		Category 3 Sites	
	Impact	Severe Impact	Impact	Severe Impact
<43	Amb.+10	Amb.+15	Amb.+15	Amb.+20
43	52	58	57	63
44	52	59	57	64
45	52	59	57	64
46	52	59	57	64
47	52	59	57	64
48	53	59	58	64
49	53	59	58	64
50	53	60	58	65
51	54	60	59	65
52	54	60	59	65
53	54	60	59	65
54	55	61	60	66
55	55	61	60	66
56	56	62	61	67
57	56	62	61	67
58	57	62	62	67
59	57	63	62	68
60	58	63	63	68
61	58	64	63	69
62	59	64	64	69
63	60	65	65	70
64	60	66	65	71
65	61	66	66	71
66	61	67	66	72
67	62	67	67	72
68	63	68	68	73
69	64	69	69	74
70	64	69	69	74
71	65	70	70	75
72	65	71	70	76
73	65	72	70	77
74	65	72	70	77
75	65	73	70	78
76	65	74	70	79
77	65	75	70	80
>77	65	75	70	80

Notes:

(1) Ldn is used for land uses where nighttime sensitivity is a factor; maximum 1-hour Leq is used for land uses involving only daytime activities.

Category Definitions:

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.

Source: FTA, 1995; HMMH, 1997.

In areas where the projections are that there would be a relatively small change in traffic volume, change in noise exposure can be estimated from the ratio of existing and future traffic volume as follows:

$$L_{dn}(\text{future}) = L_{dn}(\text{existing}) + 10\,log(\text{future volume} \div \text{existing volume})$$

Segments where the change was less than 2 decibels were not evaluated because:

1. Near roadways, a plus or minus 2-decibel variation in Ldn is common because of the normal variation in factors such as: volume and mix of vehicles using the road, and weather conditions.
2. A 2-decibel increase in noise exposure is often considered marginal.

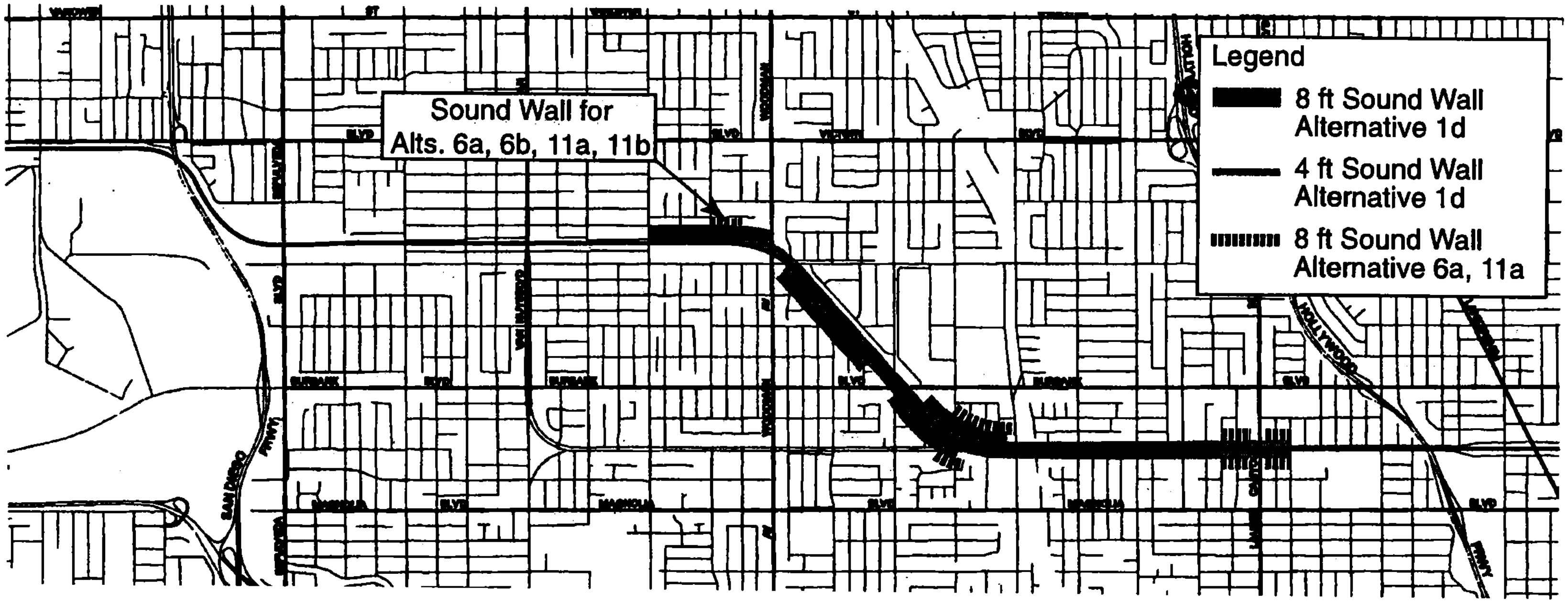
Although the Enhanced Bus Alternative could result in substantial increases in bus traffic on some of the major surface routes in the East Valley, the change in total traffic volume would result in only a small change in total noise exposure. As a result, no noise impacts are projected for the Enhances Bus Alternative.

(2) Rail Alternatives

The models of train noise previously discussed were applied to identify noise sensitive receptors where project noise could cause either moderate or severe noise impact. The results of the noise impact assessment are summarized in Table 4-9.7 and are shown on Figure 4-9.4. Shown for each alternative and variation are the number of moderate and severe noise impacts for single-family, multi-family, and other (parks, schools, and places of worship) land uses. Table 4-9.8 provides the dominant land use in the area, typical distance to the tracks, train speed, thresholds for both degrees of noise impact, representative projections for the areas, and the number of moderate and severe impacts. The potential noise impacts are discussed below for each alternative.

Alternative 1

West of Hazeltine
All the Alternative 1 variations are the same from the western terminus at the San Diego Freeway to Hazeltine Avenue. The only potential noise impacts west of Hazeltine Avenue would be along Blucher Avenue where the alignment would run between the residences and the San Diego Freeway. Levels of train noise would be somewhat higher than normal in this area because of special trackwork for a pocket track. This track section is west of the Sepulveda Station and would not be part of the revenue service system unless the system is extended to the West Valley (see Chapter 6). Prior to that, the track section between the San Diego Freeway and Blucher Avenue would be used only for train storage and shuttling trains between tracks. Noise impacts would not occur until this segment becomes part of the revenue service system.



SOURCE: HARRIS MILLER MILLER AND HANSON, 1997.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-9.4
Noise Impact Locations and Proposed Mitigation

Table 4-9.7: Summary of Noise Impact Assessment

Alternative	Number of Noise Impacts						Comments
	Moderate Impact			Severe Impact			
	SF	MF	Other	SF	MF	Other	
Alternative 1a, Deep Bore Alternative 1b, Cut & Cover	0	0	0	0	0	0	Only potential impact would be at western end, but would not occur until system is extended to west (see Chapter 6).
Alternative 1c, Open Air Trench	3	0	0	0	0	0	Same impact at western end as Alts. 1a and 1b. Three additional impacts along SP ROW diagonal. No residual impact with mitigation.
Alternative 1d, Aerial	111	65	3 SCH 1 POW	138	6	0	Impact projected at most of sensitive receptors facing aerial structure. No residual impact assuming 21,100 ft of 4 ft high wall and 7,900 ft of 8 ft high wall on aerial structure.
Alternative 2, Deep Bore under Oxnard	0	0	0	0	0	0	No impact.
Alternative 6a, Light Rail, At-Grade/Berm	21	21	1 POW	0	3	0	Most noise impact along at-grade sections or near grade crossings. Some residual impact due to grade crossing bells. Impact would be more extensive and severe if trains are required to sound horns before grade crossings.
Alternative 6b, Light Rail, Cut & Cover in Chandler median	8	0	0	0	0	0	Only noise impact is at western end. No residual impact with mitigation.
Alternative 11a, Dual Mode Vehicles, At-Grade/Berm	27	16	1 POW	0	1	0	Impact and mitigation similar to Alt. 6a.
Alternative 11b, Dual Mode Vehicles, Cut & Cover in Chandler median	14	0	0	0	0	0	No residual impact with mitigation.

Definitions
SCH: School
POW: Place of Worship

Source: HMMH, 1997.

Table 4-9.8: Detailed Summary of Noise Impact Assessment

Track Segment	Track Type	Typ Dist (ft)	Train Spd (mph)	Ldn, dBA				# Impacts				Comments
				Exist	Impact Thresh.		Proj.	Impact		Severe		
					Imp.	Sev.		SF	MF	SF	MF	
ALTERNATIVE 1												
Alternative 1, west end to Hazeltine												
Bessemer Ave., Sepulveda to Hazeltine	Aerial	--	--	--	--	--	--	0	0	0	0	All commercial or industrial land uses
Alternative 1a, Hazeltine to WOW												
	Bore	--	40-55	--	--	--	--	--	--	--	--	Subway, no noise impacts
Alternative 1b, Hazeltine to WOW												
	C&C	--	40-55	--	--	--	--	--	--	--	--	
Alternative 1c, Hazeltine to WOW												
Bessemer St., Hazeltine to Oxnard	OA	50	55	56	56	62	55	0	0	0	0	
Oxnard St. and Woodman Ave.	OA	50	55	70	64	70	55	0	0	0	0	
Diagonal, Oxnard St. to Burbank Blvd.	OA, C&C	50	55	55	55	61	55	0	0	0	0	
Diagonal, Burbank Blvd. & Fulton Ave. Area	OA Stn	125	40	64	60	66	49	0	0	0	0	
Diagonal, Burbank Blvd to Chandler Blvd.	OA	50	55	55	55	61	55	3	0	0	0	Impact at 3 residences close to edge of trench
Chandler, east of Coldwater Canyon	OA, C&C	75	55	64	60	66	55	0	0	0	0	
Chandler, Coldwater Canyon to Whitsett	OA, C&C	100	55	64	60	66	51	0	0	0	0	
Chandler, Whitsett to WOW curve	OA	75	55	65	61	66	53	0	0	0	0	
Alternative 1d, Hazeltine to WOW												
Bessemer St., Hazeltine to Oxnard	Aerial	50	55	56	56	62	68	11	0	45	1	Noise impact to most residences facing tracks
Oxnard St. and Woodward Ave.	Aerial	50	55	70	64	70	68	1	0	0	0	
Diagonal, Oxnard St. to Burbank Blvd.	Aerial	50	55	55	55	61	68	22	0	59	4	Some impacts remain with normal height sound wall
Diagonal, Burbank Blvd. and Fulton Ave.	Aerial	125	40	64	60	66	62	3	0	0	0	
Diagonal, Burbank Blvd to Chandler	Aerial	50	55	55	55	61	68	18	0	26	0	Plus one SCH Residual impact with normal SBW
Chandler, east of Coldwater Canyon	Aerial	75	55	64	60	66	68	24	0	8	0	
Chandler, Coldwater Canyon to Whitsett	Aerial	100	55	64	60	66	64	39	8	0	0	Plus impact at one SCH and one POW
Chandler, Whitsett to WOW curve	Aerial	75	55	65	61	66	66	3	57	0	1	Plus impact at one SCH
WOW Curves	Bore	--	40	--	--	--	--	--	--	--	--	Subway, no noise impacts

Table 4-9.8: Detailed Summary of Noise Impact Assessment

Track Segment	Track Type	Typ Dist (ft)	Train Spd (mph)	Ldn, dBA Exist	Ldn, dBA Impact Thresh. Imp.	Ldn, dBA Impact Thresh. Sev.	Ldn, dBA Proj.	# Impacts Impact SF	# Impacts Impact MF	# Impacts Severe SF	# Impacts Severe MF	Comments
ALTERNATIVE 2												
Bessemer St., Sepulveda to Hazeltine	AG/ Aerial	--	--	--	--	--	--	0	0	0	0	Commercial/industrial land uses
Oxnard and Woodman to N. Hollywood Stn	Bore	--	40-55	--	--	--	--	--	--	--	--	Subway, no noise impacts
ALTERNATIVE 6												
Alternative 6, west of Fulton-Burbank Stn.												
Blucher Ave. east of San Diego Freeway	AG	75	55	67	62	68	62	4	0	0	0	
Bessemer St., Sepulveda Blvd to Hazeltine Ave.	AG/ Aerial	--	--	--	--	--	--	0	0	0	0	Land use all commercial or industrial
Bessemer, Hazeltine Blvd. to Oxnard Blvd.	Berm	50	55	56	56	62	57	4	0	0	0	
Diagonal, Oxnard Blvd. to Burbank Blvd.	OA/ Berm	60	55	55	55	61	55	0	0	0	0	
Alternative 6a, east of Fulton-Burbank Sta.												
Diagonal, Burbank Blvd. and Fulton Ave.	OA/ OA Stn	125	55	64	60	66	46	0	0	0	0	
Diagonal, Burbank Blvd. to Chandler Blvd.	OA	50	55	55	55	61	55	0	0	0	0	
Chandler, east of Coldwater Canyon	AG	75	55	64	60	66	62	11	0	0	0	Plus one POW
Chandler, Coldwater Canyon Grade Xing	AG	100	55	64	60	66	67	0	2	0	1	Impact from grade crossing bells
Chandler, Coldwater to Whitsett Ave.	Berm	100	55	64	60	66	53	0	0	0	0	
Chandler, Whitsett Ave. Grade Xing	AG	100	55	64	60	66	67	0	1	0	0	Impact from grade crossing bells
Chandler, Whitsett to Laurel Canyon	AG/ Berm	75	55	65	61	66	62	0	7	0	0	Impacts are where track would be at-grade
Chandler, Laurel Canyon Crossing & Stn	AG	130	40	65	61	66	62	0	2	0	0	Impact from grade crossing bells
Chandler, Ben Ave. to Colfax Blvd.	AG/ Berm	75	55	65	61	66	62	2	4	0	0	Impacts are where track would be at-grade
Chandler, Colfax Grade Xing	AG	90	55	65	61	66	67	0	5	0	2	Impact from grade crossing bells
Chandler, Colfax to N. Hollywood Station	AG	--	--	--	--	--	--	0	0	0	0	Commercial and industrial land uses

Table 4-9.8: Detailed Summary of Noise Impact Assessment

Track Segment	Track Type	Typ Dist (ft)	Train Spd (mph)	Ldn, dBA				# Impacts				Comments
				Exist	Impact Thresh.		Proj.	Impact		Severe		
					Imp.	Sev.		SF	MF	SF	MF	
Alternative 6b, east of Fulton-Burbank Sta.												
Burbank Stn to Chandler Blvd. at Hollywood Fwy	C&C	--	--	--	--	--	--	0	0	0	0	Subway, no noise impacts
Chandler, Colfax to N. Hollywood Station	AG	--	--	--	--	--	--	0	0	0	0	Commercial and industrial land uses
ALTERNATIVE 11												
Alternative 11, west of Fulton-Burbank Sta.												
Blucher Ave. east of San Diego Freeway	AG	75	55	67	62	68	62	10	0	0	0	
Bessemer St., Sepulveda Blvd to Hazeltine Ave.	AG/ Aerial	--	--	--	--	--	--	0	0	0	0	Land use all commercial or industrial
Bessemer, Hazeltine Blvd. to Oxnard Blvd.	Berm	50	55	56	56	62	57	4	0	0	0	
Diagonal, Oxnard Blvd. to Burbank Blvd.	OA/ Berm	60	55	55	55	61	55	0	0	0	0	
Alternative 11a, east of Fulton-Burbank Sta.												
Diagonal, Burbank Blvd. and Fulton Ave.	OA/ OA Stn	125	55	64	60	66	46	0	0	0	0	
Diagonal, Burbank Blvd. to Chandler Blvd.	OA	50	55	55	55	61	55	0	0	0	0	
Chandler, east of Coldwater Canyon	AG	75	55	64	60	66	62	11	0	0	0	Plus one POW
Chandler, Coldwater Canyon Grade Xing	AG	100	55	64	60	66	67	0	2	0	1	Impact from grade crossing bells
Chandler, Coldwater to Whitsett Ave.	Berm	100	55	64	60	66	53	0	0	0	0	
Chandler, Whitsett Ave. Grade Xing	AG	100	55	64	60	66	67	0	1	0	0	Impact from grade crossing bells
Chandler, Whitsett to Laurel Canyon	AG/ Berm	75	55	65	61	66	62	0	7	0	0	Impacts are where track would be at-grade
Chandler, Laurel Canyon Crossing & Stn	AG	130	40	65	61	66	62	0	2	0	0	Impact from grade crossing bells
Chandler, Laurel Canyon Stn to WOW Curve transition	AG/ Berm	75	55	65	61	66	62	2	4	0	0	
Alternative 11b, east of Fulton-Burbank Sta.												
Burbank Station North Hollywood Station	C&C	--	--	--	--	--	--	0	0	0	0	Alignment entirely in subway, no noise impacts

Abbreviations

Track types:
- AG At-grade
- Aerial Aerial Structure
- OA Open Air Cut
- C&C Cut and Cover
- Bore Deep Bore

Land Use Categories:
- SF Single Family
- MF Multi-Family
- POW Place of Worship
- SCH School building

Source: HMMH, 1997.

East of Hazeltine
Alternative 1a: Alternative 1a is all deep bore subway and cut and cover stations with no surface or open air track sections. There is no potential for noise impacts.

Alternative 1b: Alternative 1b is all cut and cover, deep bore subway, or covered open-air stations from Hazeltine to the North Hollywood Station. There is no potential for noise impacts.

Alternative 1c: Alternative 1c is open cut for much of the section from Hazeltine until the WOW curve where the alignment curves off Chandler as a deep bore tunnel. The open cut would substantially reduce levels of community noise. The projections indicate noise impact at only three residences, all of which would be less than 50 feet from the edge of the cut. Because the design is still in a conceptual stage, relatively conservative estimates have been used for the attenuation provided by the trains being at the bottom of a 25 to 35 foot deep cut. Once additional design details are available, a more refined assessment may show that noise exposure would be below the impact thresholds.

Alternative 1d: This alternative consists of aerial structure from Hazeltine to east of the Laurel Canyon Station where the transition to the deep bore WOW curve starts. The projected impacts without mitigation are:

- Impact: 121 single family residences, 65 multi-family residences, two school buildings and one place of worship.
- Severe Impact: 138 single family residences, six multi-family residences, and one place of worship.

Mitigation will require sound walls on both sides of the aerial structure for virtually the entire length.

Alternative 2

West of Hazeltine
Alternative 2 is identical to Alternative 1 from the western terminus to Hazeltine. The only noise impacts would be along Blucher Avenue, but these impacts would not occur until the line was extended to the West Valley.

East of Hazeltine
There would not be any noise impacts in this area since Alternative 2 is subway from Hazeltine to the North Hollywood Station.

Alternative 6

West of Hazeltine
The two Alternative 6 options are the same from the western terminus at the San Diego Freeway to Hazeltine Avenue. It is assumed that the LRT alternatives would include both the West and

East Valley segments, although only the East Valley segment has been evaluated as part of this study. The affected land use along the corridor between Sepulveda and Hazeltine is almost exclusively industrial or commercial with no residential land uses immediately adjacent to the rail corridor. The only noise impacts in this area would be along Blucher Avenue where the alignment will run between the residences and the San Diego Freeway. As discussed below, these impacts can be eliminated with an 8 foot high sound wall at the rail right-of-way.

Hazeltine to Oxnard
After the Hazeltine grade crossing, the alignment runs in shallow trench with berms until it transitions to a deep open-air cut before Woodman. Four noise impacts were identified in this area: two severe impacts at the Hazeltine grade crossing and two on Ranchito Avenue along the berm section.

Oxnard to Hollywood Freeway
<u>Alternative 6a:</u> Alternative 6a is at-grade along Chandler. The track would be approximately 3 feet below grade with 5 foot berms on both sides of the tracks between grade crossings. All of the projected noise impacts occur at sections where the tracks would be at-grade. The impacts would be caused by either the train noise or the grade crossing bells. Moderate noise impact is projected at 13 single family residences and 21 multi-family buildings in this section. In addition, severe noise impact is projected at three multi-family buildings at grade crossing locations.

This alternative would pass approximately 200 feet north of Hollywood park. The park qualifies as a Category 3 land use according to the FTA noise impact criteria. Based on measurements at Sites 7, 9, and BB-15, daytime Leq in the sections of the park closest to Chandler Boulevard is estimated to be in the range of 65 to 67 dBA. The FTA criterion for moderate noise impact for Category 3 land uses is a maximum hourly Leq of 66 dBA when the existing Leq is 65 dBA. It is projected that, during peak-hour operations, the hourly Leq from LRT operations would be 58 dBA, well below the threshold for moderate impact.

<u>Alternative 6b:</u> Alternative 6b is cut and cover or deep open-air cut throughout this section. No noise impacts are projected.

Hollywood Freeway to North Hollywood Station
Land uses along this section are predominately commercial and industrial. No noise impacts are projected.

Alternative 11

Alternative 11 consists of using dual-mode vehicles on Red Line extensions on alignments that use one of the deep bore WOW curves and then match up with Alternative 6a or 6b just west of the Laurel Canyon Station. The noise impacts from the western terminus to Hazeltine are virtually identical to those of Alternatives 1 and 2. From Hazeltine to the WOW curve, the impacts would be the same as Alternative 6.

4-9.4 Noise Mitigation Measures

Table 4-9.9 summarizes the options for mitigating the projected noise impacts. In most cases, the projected noise impacts can be eliminated by sound walls located along the outside edges of aerial structures or adjacent to at-grade track sections. To be effective, sound walls must break the direct line-of-sight from the source to the receiver, have a minimum surface density of 4 lb/ft^2, and have no holes, drainage gaps or access openings that act as "sound leaks." Barriers on aerial structures are usually constructed of precast concrete panels, although lighter weight materials will have equivalent acoustical performance. Properly designed sound barriers on aerial structures that extend at least 3.5 feet above the top of rail can reduce wayside noise levels by approximately 8 dBA. Where required, the attenuation can be increased to 10 to 12 dBA by extending the barriers 8 feet above the top-of-rail and applying acoustical absorption treatment to the train side of the barrier.

Sound barriers for at-grade or sub-grade track usually require careful evaluation for each site. This is particularly true for at-grade track barriers, which are usually located 15 to 20 feet from the track to allow room for access to the track for maintenance. Barriers for at-grade track usually must be about 8 feet high to be effective. The specific height depends on the distance from the train, the elevation of the track above grade, and the elevation of the noise sensitive receptors.

Some options besides sound barriers that are can be used to reduce noise levels along rail transit systems are:

- Speed Reductions: Reducing the speed will reduce levels of train noise. This is usually an undesirable mitigation option because of the impact on system schedule and capacity, although there are times when speed reductions are an appropriate mitigation measure.

- Quieter Bells at Grade Crossings: The additional noise from warning bells at grade crossing can add substantially to the noise impacts in the immediate vicinity of the grade crossing. It has been assumed for this analysis that the train horns will *not* be sounded prior to grade crossings. Noise impacts near grade crossings will be substantially higher if train horns must be sounded prior to the grade crossings. This assumption should be re-evaluated based on MTA experience on other lines if one of the at-grade alignments is selected as the preferred alternative.

- Limited Duration of Bell Ringing at Grade Crossings: A typical procedure at grade crossings results in starting the bells just before lowering the gates and continuing to ring the bells until the train has passed and the gates are fully raised. Stopping the bells after the gates are lowered and starting them again before lifting the gates will considerably reduce the duration of bell ringing and the resulting noise exposure.

4-9.9: Noise Mitigation Options

Alternative	Location	Mitigation Options			Number Protected
		Option	Side	Civil Stations	
Alternative 1a, Deep Bore	None required				
Alternative 1b, Cut & Cover	None required				
Alternative 1c, Open Air Trench	None required				
	Burbank to Chandler	Extension to trench	WB	603+00 to 613+00	3 SF
		Acoustical treatment of walls	--	603+00 to 613+00	3 SF
Alternative 1d, Aerial Structure	None required				
	Hazeltine to transition to WOW Curve	4 ft SBW	Both	WB: 526+00 to 687+00 EB: 557+00 to 687+00	259 SF 71 MF 3 SCH 1 POW
	Hazeltine to Woodward	8 ft SBW	WB	526+00 to 553+00	23 SF 1 MF
	Oxnard to Emelita	8 ft SBW	EB	558+00 to 572+00	11 SF 2 MF
	Emelita to Fulton/Bur. Stn	8 ft SBW	EB	572+00 to 583+00	3 SF
	Burbank to Chandler	8 ft SBW	EB	597+00 to 610+00	13 SF
	Albers to Chandler	8 ft SBW	WB	602+00 to 616+00	8 SF
Alternative 2, Oxnard Deep Bore	None required				
Alternative 6a, At-Grade LRT	Blucher Ave.	8 ft SBW	WB	416+00-427+50	4 SF
	Hazeltine Grade Crossing	Quieter bells	--	--	2 SF
	Hazeltine to Woodman	4 ft wall on top of berm	WB	540+00 to 543+00	2 SF
	Chandler east of Coldwater Canyon	8 ft wall along AG section	Both	WB: 609+00 to 617+00 EB: 609+00 to 611+00	11 SF
	Coldwater Cyn. Grade Xing	Quieter bells	--	--	3 SF
	Whitsett Grade Crossing	Quieter bells	--	--	1 MF
	Chandler, Whitsett to Laurel Canyon	8 ft wall, end of berm to Laurel Cyn	Both	667+00 to 675+00	7 MF
	Laurel Canyon Grade Xing	Quieter bells	--	--	2 MF
	Chandler, Agnes and Ben Avenues	8 ft wall/berm	Both	682+00 to 686+00	6 SF
	Colfax Grade Crossing	Quieter bells	--	--	7 MF

4-9.9: Noise Mitigation Options

Alternative	Location	Mitigation Options			Number Protected
		Option	Side	Civil Stations	
Alternative 6b, Cut & Cover under Chandler median	Blucher Ave.	8 ft SBW	WB	416+00-427+50	4 SF
	Hazeltine Grade Crossing	Quieter bells	--	--	2 SF
	Hazeltine to Woodman	4 ft wall on top of berm	WB	540+00 to 543+00	2 SF
Alternative 11a, At-Grade, Dual Mode Vehicles	Blucher Ave.	8 ft SBW	WB	416+00-429+00	10 SF
	Hazeltine Grade Crossing	Quieter bells	--	--	2 SF
	Hazeltine to Woodman	4 ft wall on top of berm	WB	540+00 to 543+00	2 SF
	Chandler east of Coldwater Canyon	8 ft wall along AG section	Both	WB: 609+00 to 617+00 EB: 609+00 to 611+00	11 SF
	Coldwater Cyn. Grade Xing	Quieter bells	--	--	3 SF
	Whitsett Grade Crossing	Quieter bells	--	--	1 MF
	Chandler, Whitsett to Laurel Canyon	8 ft wall, end of berm to Laurel Cyn	Both	667+00 to 675+00	7 MF
	Laurel Canyon Grade Xing	Quieter bells	--	--	2 MF
	Chandler, Agnes and Ben Avenues	8 ft wall/berm	Both	682+00 to 686+00	6 SF
Alternative 11b, Cut & Cover under Chandler median, Dual Mode Vehicles	Blucher Ave.	8 ft SBW	WB	416+00-429+00	10 SF
	Hazeltine Grade Crossing	Quieter bells	--	--	2 SF
	Hazeltine to Woodman	4 ft wall on top of berm	WB	540+00 to 543+00	2 SF
Definition: SBW = sound barrier wall					

Source: HMMH, 1997.

- Quieter Vehicles: It is feasible to include noise limits in the vehicle specifications that require suppliers to reduce the vehicle noise emissions. Noise emissions can be reduced through the use of skirts to cover the wheels, sound absorption treatment in the undercar area, or other approaches. Requiring special low-noise vehicles could add substantially to the vehicle cost.

- Sound Insulation: Improving the exterior-interior sound insulation of buildings is an option in areas where other alternatives for noise mitigation are either impractical or not cost effective. This usually requires replacing or improving windows, weather stripping doors, and installing or upgrading air conditioning systems. Air conditioning is needed because opening windows for ventilation would be counterproductive to the sound insulation improvements. Sound insulation has seen only limited application at rail transit systems, although it has been used with great success in neighborhoods around airports.

- Improved Wheel and Rail Maintenance: The noise projections assume ongoing programs of wheel and rail maintenance that will keep wheel and rail surfaces in good condition. It is possible that modified maintenance procedures could further reduce noise emissions. The effectiveness of any proposed maintenance procedure would need to be demonstrated before it could be considered as a mitigation option.

- Sound Absorption Treatment: Sound absorption treatment applied to the sides of open air trenches and to the train side of sound walls can enhance noise attenuation. As discussed below, there is only one area where there is potential noise impact along an open air trench segment. Use of sound absorption treatment on the sides of the trench in this area is an alternative noise mitigation measure. Spray-on Portland cement based products are often used for this purpose because of their durability and low maintenance requirements. However, more standard acoustical absorption treatments such as fiberglass boards encased in plastic and protected perforated metal screen, are equally effective and less expensive.

Following are summaries of the noise mitigation options for each alternative:

<u>Alternatives 1a and 1b:</u> No mitigation is required.

<u>Alternative 1c:</u> Alternative 1c would be almost entirely in deep trench through residential neighborhoods. There is one segment where impact is projected for three residences. This impact can be eliminated through extending the sides of the trench to 8 feet above grade or by applying sound absorption treatment on the sides of the trench. Because the trench design is still conceptual, relatively conservative estimates have been used for the attenuation that would be provided by the trench, with the result that noise predictions would likely be lower once design details are available.

<u>Alternative 1d:</u> Alternative 1d would be on aerial structure from Hazeltine to the transition to the WOW curve west of the Laurel Canyon Station. Much of the noise impact, including all of the severe noise impact, can be eliminated with sound walls along the outside edge of the aerial structure. A total of 21,100 linear feet of 4 foot high barrier and 7,900 linear feet of 8 foot high barrier would be required to eliminate all of the noise impacts.

Alternative 2: Since Alternative 2 is subway through most of the residential area, the only noise impacts are the residences along Blucher Avenue at the western end. Mitigation of these impacts is the same as for Alternative 1.

Alternative 6a: Except at the western end along Blucher Avenue, the noise impacts for Alternative 6a all occur along Chandler Boulevard where the track is at-grade or in a shallow trench with a berm. Most of the moderate noise impact and all of the severe noise impact can be eliminated through use of quieter bells at grade crossings and either sound walls or berms along the at-grade sections. The projections show that with mitigation there would be residual impact at two single family residences near the Coldwater Canyon grade crossing and at part of one apartment complex near the Whitsett Avenue grade crossing.

Alternative 6b: Except at the western end along Blucher Avenue, Alternative 6b is either cut and cover subway or deep open air cut through residential areas. No residual noise impact is projected with the mitigation indicated in Table 4-9.9.

Alternative 11a: The projected noise impact with Alternative 11a is the same as for Alternative 6a except east of the Laurel Canyon Station where Alternative 11a joins the WOW curve. Most of the moderate noise impact and all of the severe noise impact can be eliminated through use of quieter bells at grade crossings and either sound walls or berms along the at-grade sections. As for Alternative 6a, with the mitigation indicated in Table 4-9.9, residual impact is projected for two single family residences near the Coldwater Canyon grade crossing and at part of one apartment complex near the Whitsett Avenue grade crossing.

Alternative 11b: Except at the western end along Blucher Avenue, Alternative 11b is either cut and cover subway or deep open air cut through residential areas. No residual noise impact is projected with the mitigation indicated in Table 4-9.9.

a. Existing Vibration Conditions

(1) Ambient Vibration

Common sources of perceptible ground-borne vibration are railroad or rail transit trains, construction activities such as blasting or pile driving, and industrial operations such as metal forming. Even when existing ground-borne vibration is not expected to be perceptible, documenting the existing levels of ground-borne vibration can help identify whether the local geology is prone to vibration problems. Ground vibration was measured at nine noise monitoring sites along the corridor. The measurements were for 10-minute durations, sufficient to give a good picture of normal vibration fluctuations.

The ambient vibration measurements were all made with high-sensitivity accelerometers mounted in the vertical direction on flat, paved surfaces. The acceleration signal was recorded using a digital audio tape (DAT) recorder. The tapes were analyzed using an integrator and graphic level recorder to obtain charts of root-mean-square (RMS) vibration velocity level. The results of the ambient vibration measurements are summarized in Table 4.9-10. Shown are the maximum vibration level, the typical vibration and the minimum vibration level for each measurement site. Some observations made from the ambient vibration results are:

- Existing levels of ground vibration are generally below the threshold of human perception.
- Vehicular traffic is the primary source of existing vibration in the project area.
- The highest measured vibration levels were caused by buses and occasional trucks on Chandler and Oxnard. These levels are not typical of the measurement sites, and the numbers in parentheses at these sites correspond to a more typical maximum at these locations.
- Ambient vibration levels are higher than normal at some sites. This is because many of the measurements were done within 10 feet of the roadways, while the typical residence is 40-50 feet from the roadways. This farther distance would correspond to lower levels than those reported in Table 4-9.10.

Table 4-9.10: Vibration Monitoring Results

No.	Site	RMS Vibration Velocity Levels (VdB referenced to 1 μin./sec)		
		Maximum	Typical Ambient	Minimum
1	6253 Blucher Road	55	45-50	43
2	5954 Nagle Avenue	67 (63)	45-50	42
3	12232 Oxnard Street	69 (63)	45-55	41
4	5805 Hillview Park Avenue	54	35-45	33
5	13001 Chandler Boulevard	75 (66)	45-55	39
6	5350 Alcove Avenue	68 (64)	45-55	34
8	13407 Collin Street	55	35-40	33
9	Chandler and Colfax	71 (65)	45-55	42
10	Chandler and Hermitage	70 (60)	40-50	39

Source: HMMH, 1997.

(2) Vibration Propagation Test Results

Measurements of vibration propagation are a key component of the projection procedure since they eliminate the need to approximate how a particular set of geologic conditions will affect levels of ground-borne vibration. The quantity used to characterize vibration propagation is *transfer mobility*, which describes the ground's response to a vibration input at a given distance away. The goal is to determine the difference between the transfer mobility measured at a *reference site* where trains are operating and the transfer mobility at a *new site* where similar trains are proposed. This difference is then used to adjust train vibration data from the reference site to the conditions of the new site.

The best available transfer mobility data for the San Fernando Valley come from a series of vibration propagation tests that were performed in October and November 1987 for the original San Fernando Valley Rail Project. These tests were limited to obtaining information on the area's general propagation conditions, and were not designed to evaluate site-specific propagation characteristics. All testing was conducted at the ground surface, although the results were used to develop a generalized curve of projection vibration level as a function of distance for both subway and at-grade configurations. More detailed testing would be performed during the final design phase of the selected alternative to improve the estimates of vibration propagation conditions in areas where mitigation measures may be needed.

Vibration propagation tests were performed at the following eight locations:

1. Median of Chandler Boulevard, west of Bellaire
2. Railroad ROW along Topham near Yolanda
3. South of Oxnard in SP Burbank Branch Route diagonal
4. End of Louise Avenue north of the SP Mainline
5. West of Reserve Training Center on Balboa Boulevard, south of Victory Boulevard
6. MTM/CBS Studios parking lot north of Los Angeles River
7. Bellaire Avenue, north of Los Angeles River
8. North Hollywood Park and Recreation Center, south of Chandler Boulevard

The results for three of these locations (Sites 1, 3 and 8), revealed relatively efficient vibration propagation at higher frequencies. Since these frequencies coincide with recent information on the vibration forces generated by the existing Red Line vehicles, the projected levels of ground-borne vibration using these vibration propagation conditions are relatively high. The remaining five locations represent more "typical" vibration propagation characteristics, with most of the vibration energy being transmitted at lower frequencies. This results in overall levels that are 5 to 10 dB lower than those predicted using the results from Sites 1, 3 and 8.

4-9.5 Vibration Impact Analysis Methodology and Evaluation Criteria

a. Approach

The approach taken to evaluate the potential for vibration impact from train operations more closely resembles a screening procedure than a detailed evaluation. Rather than use the vibration propagation test results to make site-specific projections of vibration based on geological variations, a generalized prediction model was developed to provide a relatively conservative, uniform estimate of the vibration levels along the project corridor. The development of this model is described below in Section 4-9.5b. The predicted levels were then compared to a set of vibration impact criteria (discussed in Section 4-9.5c) based on land use type and number of operations per day to determine the extent of vibration impact.

b. Vibration Projection Models

Once the project has been completed, only train operations would have any potential of causing perceptible ground-borne vibration or ground-borne noise. In order to accurately project ground-borne vibration and noise from trains information is required about the vibration source level, the ground propagation characteristics, and the receiving building characteristics. The projections for this study are based on data from the original San Fernando Valley rail study (LACTC, *San Fernando Valley East-West Rail Transit Project: Draft Environmental Impact Report*, November 1989) as well as other projects. Except for ambient vibration measurements, no special vibration testing has been performed since October 1987.

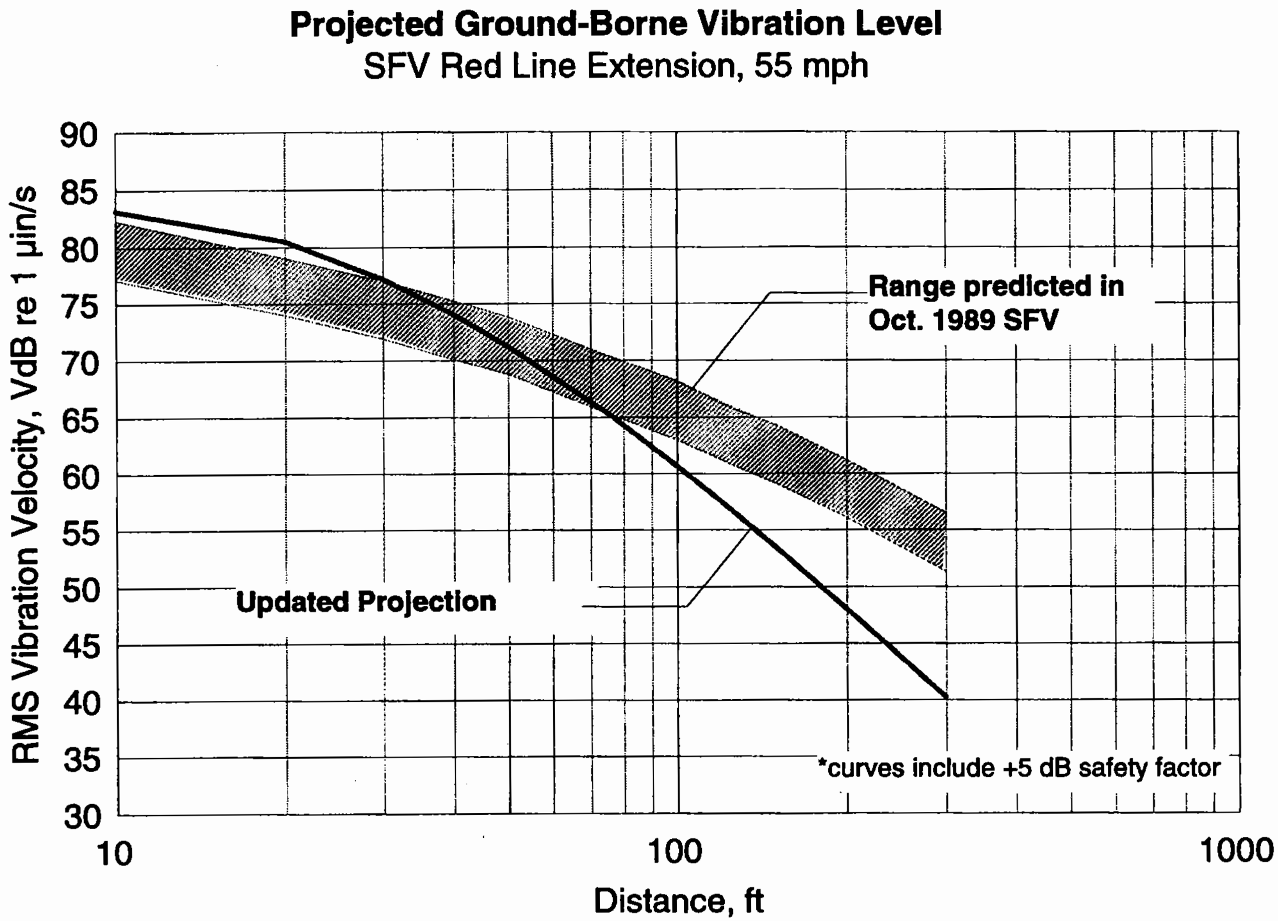
Following is a summary of the data used:

1. Force Density: The force density represents the energy put into the ground by the combination of the moving train, the track support system, and the transit structure. For this project available force density data were from the LA Red Line vehicles in a subway configuration, based on June 1996 measurements; no data was available for Red Line trains operating on at-grade track. The Red Line data was supplemented with force density data from November 1996 tests of new Dallas Area Rapid Transit (DART) light rail vehicles operating at-grade on tie-and-ballast track.

2. Vibration Propagation: As discussed in Section 4-9.4b, transfer mobility data from vibration propagation testing at eight locations in the San Fernando Valley in 1987 were used to develop a generalized propagation characteristic for the project corridor. The eight sites were first analyzed individually, then grouped according to the following characteristics: 1) efficient propagation, resulting in higher-than-normal levels of vibration at large distances, and 2) typical propagation. It was found that three of the sites fell into the "efficient" category while the remaining five sites were in the "typical" grouping.

3. Building Foundations: Levels of ground-borne vibration are generally lower in buildings with heavier foundations. The least attenuation of vibration, as it propagates from the ground into the foundation, occurs with lightweight frame construction, such as is used for most residential buildings. The approach used for the present analysis has been to develop projections based on worst case assumptions, and refine the projections only where potential for impact is indicated by this initial screening. The refinements are based on the adjustments included in the FTA manual, *Transit Noise and Vibration Impact Assessment*.

The vibration model for the San Fernando Valley rail corridor was developed using the available data and the methods described in the FTA Manual, and then simplified to a generalized screening curve of vibration level versus distance. The vibration screening curve is shown on Figure 4-9.5. The only adjustments made to this curve were to account for variations from the reference train speed of 55 mph assuming a 20*log* speed dependence.



SOURCE: HARRIS MILLER MILLER AND HANSON, 1997.

FIGURE 4-9.5
Ground-borne Vibration Projection Model

The curve shown on Figure 4-9.5 represents a combination of the following prediction components:

- the force density level of the LA Red Line train measured in subway;
- the "typical" transfer mobility characteristic obtained from a grouping of five of the eight original propagation test sites, as discussed above; and
- a +5-decibel safety factor.

The curve represents a somewhat conservative estimate of the expected train vibration levels for both subway and at-grade configurations. Also shown on Figure 4-9.5 for comparative purposes is the range of predicted vibration levels reported in the 1989 San Fernando Valley Rail Project DEIR. Up to about a distance of about 100 feet, the revised projection curve falls within the previously predicted range. This is not surprising, given that the same propagation test results were used to generated both sets of curves. However, the force density level used in the 1989 analysis was an estimate made prior to any train operations, while the updated curve incorporates the force density derived from actual measurements of Red Line trains. Thus, the difference in the propagation rate, or the slope, between the original 1989 curves and the updated curve is due to differences in both frequency content and magnitude of the assumed force densities.

Although the projection model estimates specific levels for a particular distance from the track centerline, it is normal to observe site-to-site fluctuations in levels of ground-borne vibration of up to 10 VdB, even when all track and geologic conditions appear to be the same. The fluctuation is generally assumed to be caused by sub-surface geologic conditions such as reflections off bedrock surfaces or large boulders, variations in soil stiffness, and soil stratification. These factors cannot be identified nor their effects quantified without extensive site-specific testing, and incorporating these factors into detailed projections of groundborne vibration is beyond the present state-of-the-art. The procedure used to evaluate potential impacts from ground-borne vibration and ground-borne noise is based on the available information on the vibration forces created by Red Line trains and the vibration propagation characteristics in the Valley. In putting the information together, an effort was made to estimate vibration force and propagation characteristics on the high side because of the wide variations in ground-borne vibration that are often observed. In addition, because the force and propagation information is still relatively general, a 5-decibel safety factor has been incorporated into the curves used for the vibration assessment to ensure that no potential impacts are overlooked. The result is that the projections developed for the San Fernando Valley East-West Transportation Corridor indicate what the high range of vibration will be; actual levels will most likely be lower than the projections, and may rarely be higher than the projections.

The ground-borne vibration levels are used to approximate radiated indoor ground-borne noise levels. The radiated noise level depends on a number of room-specific factors including the room geometry and the amount of acoustic absorption within the room. However, previous measurements have shown that average radiated ground-borne noise levels are approximately equal to the average room vibration velocity levels. Hence, given the indoor vibration velocity spectrum, ground-borne noise can be approximated by A-weighing the vibration level in each 1/3 octave band and summing the bands to an overall level, expressed in dBA. The resulting curve of overall A-weighted ground-borne noise level versus distance, based on the model for vibration level presented on Figure 4-9.5, is shown on Figure 4-9.6.

c. Ground-Borne Vibration Impact Criteria

Although there has been relatively little research into human response to building vibration, there is considerable experience with ground-borne vibration from rail systems and other common vibration sources. Some conclusions are:

1. Ground-borne vibration from transit trains should be characterized in terms of the RMS vibration velocity amplitude. A one-second RMS time constant is assumed. This is in contrast to vibration from blasting and other construction procedures that have the potential of causing building damage. When looking at the potential for building damage, ground-borne vibration is almost always expressed in terms of the peak particle velocity (PPV).

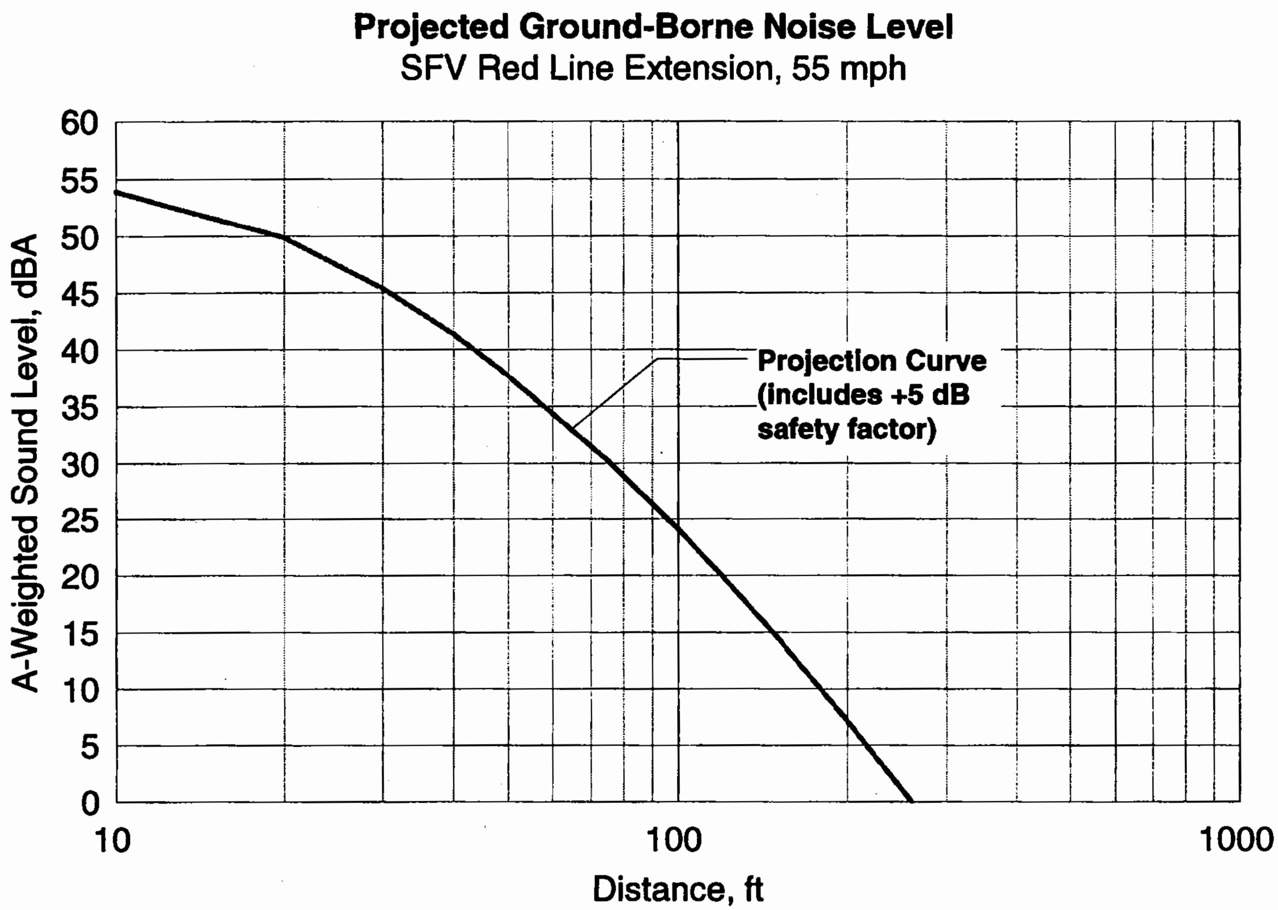
2. The threshold of vibration perception for most humans is around 65 VdB, levels in the 70 to 75 VdB range are often noticeable but acceptable, and levels in excess of 80 VdB are often considered unacceptable.

3. For urban transit systems with 10 to 20 trains per hour throughout the day, limits for acceptable levels of residential ground-borne vibration are usually between 70 and 75 VdB.
4. For human annoyance, there is some relationship between the number of events and the degree of annoyance caused by the vibration. Because of the limited amount of information available, there is no clear basis for defining this tradeoff.

5. It is very rare that ground-borne vibration from any type of train operations is high enough to cause any sort of building damage, even minor cosmetic damage. The only real concern is that the vibration will be intrusive to building occupants or interfere with vibration sensitive equipment.

Tables 4-9.11 and 4-9.12 summarize the FTA impact criteria for ground-borne vibration and ground-borne noise. These criteria are based on previous standards, criteria, design goals including ANSI S3.29 (*American National Standard: Guide to the Evaluation of Human Exposure to Vibration in Buildings*, ANSI S3.29-1983, Acoustical Society of America, 1983), and the noise and vibration guidelines of the American Public Transit Association (*Guidelines for Design of Rail Transit Facilities*, APTA 1981).

There are some buildings, such as concert halls, TV and recording studios, and theaters, that can be very sensitive to vibration and noise but do not fit into any of the three categories. Because of the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a transit project. Table 4.9-12 gives criteria for acceptable levels of ground-borne vibration and noise for various types of special buildings.



SOURCE: HARRIS MILLER MILLER AND HANSON, 1997.

FIGURE 4-9.6
Ground-borne Noise Projection Model

Table 4-9.11: Ground-Borne Vibration and Noise Impact Criteria

Land Use Category	Ground-Borne Vib. Impact (VdB re 1 micro inch/sec)		Ground-Borne Noise Impact (dB re 20 micro Pascals)	
	Frequent[1] Events	Infrequent[2] Events	Frequent[1] Events	Infrequent[2] Events
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[3]	65 VdB[3]	-[4]	-[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	83 VdB	40 dBA	48 dBA

Notes:
1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category
2. "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
4. Vibration-sensitive equipment is not sensitive to ground-borne noise.

Source: FTA, 1995.

Table 4-9.12: Ground-Borne Vibration and Noise Impact Criteria for Special Buildings

Type of Building or Room	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec)		Ground-Borne Noise Impact Levels (dB re 20 micro-Pascals)	
	Frequent[1] Events	Infrequent[2] Events	Frequent[1] Events	Infrequent[2] Events
Concert Halls	65 VdB	65 VdB	25 dBA	25 dBA
TV Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

Notes:
1. "Frequent Events" is defined as more than 70 vibration events per day. Most transit projects fall into this category.
2. "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. If the building will rarely be occupied when the trains are operating, there is no need to consider impact. As an example consider locating a commuter rail line next to a concert hall. If no commuter trains will operate after 7 pm, it should be rare that the trains interfere with the use of the hall.

Source: FTA, 1995.

d. Vibration Impacts

The train vibration model previously described was applied to the various project alignment alternatives to identify noise sensitive receptors where ground-borne vibration or noise from train operations could cause impact. These impacts were then examined on a site-specific basis for potential mitigation measures, and the estimated effectiveness of various forms of vibration control was applied. Table 4-9.13 is an overall summary of the vibration impact assessment with and without mitigation. This table also provides a comparison among the different project alternatives in terms of both baseline (before mitigation) and residual (after mitigation) impacts. As discussed in the following sections, the projected levels for most of the residual impacts exceed the impact threshold by only a small amount. The number of residual impacts could be substantially lower when more precise projections can be developed using additional project design details and more detailed information on propagation conditions along the preferred alternative. It should be possible to eliminate any remaining impacts through use of appropriate vibration mitigation measures.

Table 4-9.13: Summary of Vibration Impact Before and After Mitigation

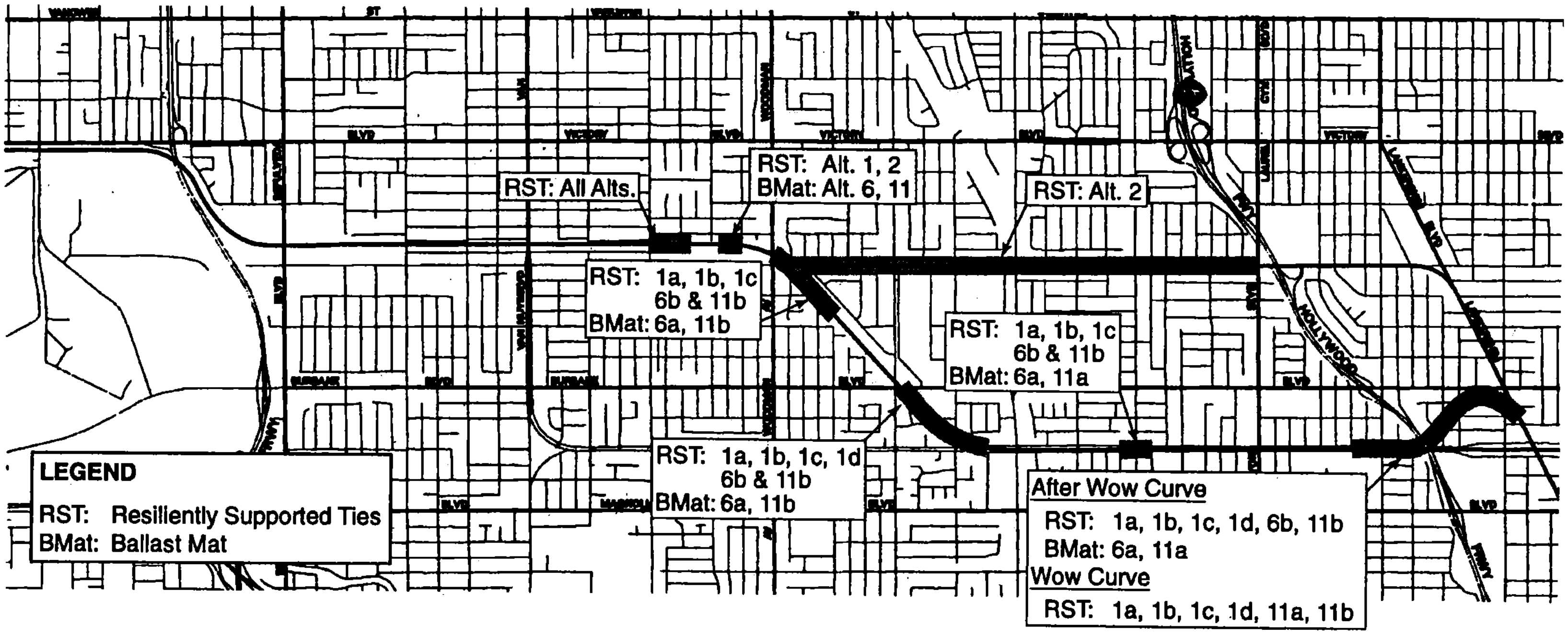
Project Alternative	Number of Ground-Borne Vibration and Ground-Borne Noise Impacts (Residential Buildings)							
	Without Mitigation				With Mitigation(3)			
	Vibration Impacts(1)		Noise Impacts(1)		Vibration Impacts(1)		Noise Impacts(1)	
	SF	MF	SF	MF	SF	MF	SF	MF
Alternative 1a(2)	33	3	62	14	0	0	5	0
Alternative 1b(2)	33	6	77	49	0	0	13	3
Alternative 1c(2)	35	6	77	51	0	0	14	3
Alternative 1d(2)	15	4	51	32	0	0	2	1
Alternative 2	63	23	114	24	0	0	13	8
Alternative 6a	23	4	45	50	8	1	14	6
Alternative 6b	23	4	45	50	8	1	14	6
Alternative 11a(2)	38	6	83	57	8	1	16	3
Alternative 11b(2)	38	6	83	57	8	1	16	3

(1) number of residential buildings
(2) The counts for Alternatives 1 and 11 are for the short-radius WOW curve. The long-radius WOW curve would result in 1 to 2 fewer impacts
(3) If all available mitigation measures were employed, including floating slab track beds (see Section 4-9.6b), the impacts would be effectively eliminated. The specification of precise mitigation measures to be used at all impact locations will be determined in final design.

Source: HMMH, 1997.

The location of vibration impacts is shown on Figure 4-9.7.

The sections that follow provide details on both the vibration impacts (Section 4-9.6.a) and mitigation measures (Section 4-9.6.b).



SOURCE: HARRIS MILLER MILLER AND HANSON, 1997.

FIGURE 4-9.7
Vibration Impact Locations & Proposed Mitigation

e. Vibration Impact Assessment

A detailed listing of the projected ground-borne noise and vibration impacts prior to any mitigation is given in Table 4-9.14. Shown for each alternative and variation are the typical distance to the tracks, train speed, representative maximum vibration and ground-borne noise projections for the area, and the number of impacts by land use type. The potential vibration impacts are discussed below for each alternative.

(1) Alternative 1

West of Hazeltine Avenue
The only vibration impacts projected west of Hazeltine are along Blucher Avenue where the alignment will run between a row of single-family residences and the San Diego Freeway. Vibration and ground-borne noise levels from train passbys will be higher in this area because of special trackwork for a pocket track. The impact assessment assumes that eventually the

4-9.14: Summary of Vibration Impact Assessment

Track Segment	Track Type	Train Speed (mph)	Track near closest residences: Horiz. dist (ft)	Track near closest residences: Subway depth (ft)	Typical Projected Levels: GB Vib. (dBV)	Typical Projected Levels: GB Noise (dBA)	# Ground-Borne Vib. Impacts: GB Vib. SF	GB Vib. MF	GB Noise SF	GB Noise MF
ALTERNATIVE 1										
Alternative 1, west of Hazeltine										
Blucher Ave. east of San Diego Fwy	AG	55	75	--	76	41	8	0	10	0
Bessemer Ave., Sepulveda Stn. To Hazeltine	AG	--	--	--	--	--	0	0	0	0
Alternative 1a, Hazeltine to WOW										
Bessemer Ave., Hazeltine to Oxnard	Bore	55	50	45	74	40	5	0	7	1
Diagonal, Oxnard to Burbank Blvd.	Bore	40-55	50	50	73	36	1	2	4	2
Diagonal, Burbank Blvd. to Chandler	Bore	55	50	50	72	38	10	0	11	0
Chandler, Coldwater Canyon to Whitsett	Bore	55	100	60	65	28	0	0	0	0
Chandler, Whitsett to WOW curve	Bore	55	75	55	72	35	0	2	0	9
Alternative 1b, Hazeltine to WOW										
Bessemer Ave., Hazeltine to Oxnard	C&C	55	50	39	74	40	5	0	7	1
Diagonal, Oxnard to Burbank Blvd.	C&C	40-55	50	35	75	41	2	2	9	2
Diagonal, Burbank Blvd. to Chandler	C&C	55	50	35	75	41	11	0	21	0
Chandler, Coldwater Canyon to Whitsett	C&C	55	100	33	66	29	0	0	0	0
Chandler, Whitsett to WOW curve	C&C	55	75	30	72	35	0	3	0	44
Alternative 1c, Hazeltine to WOW										
Bessemer Ave., Hazeltine to Oxnard	OA	55	50	39	74	40	5	0	7	1
Diagonal, Oxnard to Burbank Blvd.	OA, C&C	40-55	50	35	75	41	4	2	9	2
Diagonal, Burbank Blvd. to Chandler	OA, C&C	55	50	35	75	41	11	0	20	0
Chandler, Coldwater Canyon to Whitsett	OA, C&C	55	100	33	66	29	0	0	0	0
Chandler, Whitsett to WOW curve	OA, C&C	55	75	30	71	35	0	3	0	46
Alternative 1d, Hazeltine to WOW										
Bessemer Ave., Hazeltine to Oxnard	Aerial	55	50	--	68	35	0	0	5	0
Diagonal, Oxnard to Burbank Blvd.	Aerial	55	50	--	68	35	0	0	1	2
Diagonal, Burbank Blvd. to Chandler	Aerial	55	50	--	68	35	0	0	5	0
Chandler, Coldwater Canyon to Whitsett	Aerial	55	100	--	57	21	0	0	0	0
Chandler, Whitsett to WOW curve	Aerial, Ret. Fill	55	75	--	72	37	0	3	0	28
WOW Curve - short radius	Bore	40	10	55	71	37	7	1	30	2
WOW Curve - long radius	Bore	40	10	55	71	37	6	0	28	1
ALTERNATIVE 2										
Blucher Ave. east of San Diego Fwy	AG	55	75	--	76	41	8	0	10	0
Bessemer Ave., Sepulveda Station to Hazeltine	Aerial	--	--	--	--	--	0	0	0	0
Oxnard, Hazeltine to North Hollywood Station	Bore	40-55	60	40	73	39	55	23	104	24
ALTERNATIVE 6										
Alternative 6, west of Fulton-Burbank Station										
Blucher Ave. east of San Diego Fwy	AG	55	75	--	76	41	0	0	2	0

4-9.14: Summary of Vibration Impact Assessment

Track Segment	Track Type	Train Speed (mph)	Track near closest residences		Typical Projected Levels		# Ground-Borne Vib. Impacts			
							GB Vib.		GB Noise	
			Horiz. dist (ft)	Subway depth (ft)	GB Vib. (dBV)	GB Noise (dBA)	SF	MF	SF	MF
Bessemer Ave., Hazeltine to Oxnard	Berm	55	50	--	78	45	7	1	9	1
SP ROW, Oxnard to Burbank Blvd.	OA, Berm	55	50	27	76	43	4	2	9	2
Alternative 6a, east of Fulton-Burbank Station										
SP ROW Diagonal, Burbank Blvd to Chandler	AG	55	50	--	78	45	12	0	25	0
Chandler, Coldwater Canyon to Whitsett	AG		100	--	67	31	0	0	0	0
Chandler, Whitsett to No. Hollywood Station	AG	55	75	--	72	37	0	1	0	47
Alternative 6b, east of Fulton-Burbank Station										
SP ROW Diagonal, Burbank Blvd to Chandler	C&C	55	50	17	77	44	12	0	25	0
Chandler, Coldwater Canyon to Whitsett	C&C	55	100	20	67	30	0	0	0	0
Chandler, Whitsett to No. Hollywood Station	C&C	55	75	22	77	37	0	1	0	47
ALTERNATIVE 11										
Alternative 11, west of Fulton-Burbank Station										
Blucher Ave. east of San Diego Fwy	AG	55	75	--	76	41	8	0	10	0
Bessemer Ave., Hazeltine to Oxnard	Berm	55	50	6	78	45	7	1	9	1
SP ROW, Oxnard to Burbank Blvd.	OA, Berm	55	50	27	76	43	4	2	9	2
Alternative 11a, east of Fulton-Burbank Station										
SP ROW Diagonal, Burbank Blvd to Chandler	AG	55	50	--	78	45	12	0	25	0
Chandler, Coldwater Canyon to Whitsett	AG, Berm	55	100	--	67	31	0	0	0	0
Chandler, Whitsett to WOW Curve	AG Bore	55	75 60	-- 55	72	37	0	2	0	52
Alternative 11b, east of Fulton-Burbank Station										
SP ROW Diagonal, Burbank Blvd to Chandler	C&C	55	50	17	77	44	12	0	25	0
Chandler, Coldwater Canyon to Whitsett	C&C	55	100	20	67	30	0	0	0	0
Chandler, Whitsett to WOW Curve	C&C Bore	55	75 60	22 55	72	37	0	2	0	52
WOW Curve - short radius	Bore	40	10	55	71	37	7	1	30	2
WOW Curve - long radius	Bore	40	10	55	71	37	6	0	28	1

Abbreviations

Track types:
AG At-grade
Aerial Aerial Structure
Berm Shallow trench with berm
OA Open Air Cut
C&C Cut and Cover
Bore Deep Bore

Land Use Categories:
SF Single Family
MF Multi-Family
POW Place of Worship
SCH School building

Source: HMMH, 1997.

system will be extended farther to the West Valley. As with noise impacts, there would not be any vibration impacts until the system is extended and the segment west of the Sepulveda station becomes part of the revenue service system. Prior to that, the section between the San Diego Freeway and Blucher would be used only for train storage and shuttling trains between tracks.

The projections show 8 to 10 residences would be exposed to ground-borne noise and vibration impacts in this area. By moving the pocket track special trackwork, the number of impacts would be reduced to two residences. Additional mitigation of these impacts would require a 1,100 ft long section of ballast mat, running between civil station 417+00 and 428+00.

Hazeltine Avenue to WOW Curve

Alternative 1a: Most of the ground-borne noise and vibration impacts identified in this segment under Alternative 1a are located west of Laurel Canyon. A total of 16 single-family residences and 4 multi-family residences are projected to experience ground-borne vibration impact, while 22 single-family and 12 multi-family residences are projected to experience ground-borne noise impact.

Mitigation would require resiliently-supported ties along much of the alignment beginning at civil station number 526+00 and extending up to 674+00. Resilient ties would also be required from station 704+00 to 708+00 for the portion of the tunnel leading into the WOW curve. With the assumed 5 dB reduction achieved with mitigation, the projected ground-borne noise still exceeds the impact threshold at three single-family residences between Hazeltine and Oxnard.

Alternative 1b: The extent of ground-borne noise and vibration impacts in this segment under Alternative 1b is similar to Alternative 1a, except that the cut-and-cover design calls for a shallower depth to top-of-rail (T/R) than the deep bore tunnel. This results in shorter distances between the trains and residences at the surface, and thus more ground-borne noise and vibration impacts from the cut-and-cover option following the same horizontal alignment as the deep bore option. A total of 18 single-family and 5 multi-family vibration impacts, and 37 single-family and 47 multi-family ground-borne noise impacts were identified in this segment.

Mitigation would require resilient ties along much of the alignment from station 526+00 to 708+00. This would be sufficient to remove all vibration impacts and all but 11 single-family and 3 multi-family ground-borne noise impacts from the inventory. Cut-and-cover subway construction is generally substantially heavier and stiffer than bored tunnels and results in vibration levels that are 3 to 5 decibels lower than for bored tunnels. Since the design is still in a conceptual stage, this additional attenuation has not been incorporated into the vibration impact assessment.

Alternative 1c: Alternative 1c is open cut for most of the section from Hazeltine to the WOW curve, where the alignment curves off Chandler into a deep bore tunnel. While the open cut would substantially reduce levels of airborne noise, the number of ground-borne noise and vibration impacts are projected to be the highest of the Alternative 1 variations due to the shallower depth to the top-of-rail compared to the two tunnel options. Nevertheless, the number and location of impacts are very similar to those of Alternative 1b.

Ground-borne vibration and noise impacts can be mitigated using the same measures prescribed for Alternative 1b, and are sufficient to eliminate all but 12 single-family and 3 multi-family residual ground-borne noise impacts.

Alternative 1d: This alternative runs on aerial structure from Hazeltine to Laurel Canyon Station, where it becomes tunnel near the transition to the deep bore WOW curve. Due to the additional vibration attenuation provided by the aerial structure, the fewest number of impacts are projected for this design variation. In this segment, only 3 multi-family buildings are projected to experience vibration impact, all of which are in the tunnel transition section. This section also contains 28 multi-family buildings which will be exposed to ground-borne noise impact. In the western segment between Hazeltine and Chandler, 11 single-family and 2 multi-family residences are projected to be subject to ground-borne noise impact.

Despite the impacts identified under this alternative, it is not likely that any mitigation will be required, due to the significantly lower levels of vibration and ground-borne noise generated by trains on aerial structure. The only extra precaution should be in placing the support columns as far away from these identified impacts as possible.

WOW Curve

The short radius and long radius options for the WOW curve segment of Alternative 1 are nearly identical in terms of the projected ground-borne noise and vibration impact. The number of impacted residences is estimated to be 6 to 8 for ground-borne vibration, and 29 to 32 for ground-borne noise. These residences are located in the residential area directly above the WOW curves.

At a minimum, resiliently-supported ties should be used for the entire WOW curve. A more detailed assessment of potential vibration impacts in this area would be performed during the design phases. It is likely that more extensive vibration mitigation measures, such as floating slab trackbed will be required to ensure acceptable levels of ground-borne vibration and ground-borne noise inside residences above the WOW curve.

(2) Alternative 2

West of Hazeltine Avenue

Alternative 2 is identical to Alternative 1 from the western terminus to Hazeltine. As described above, the only vibration impacts projected in this segment are along Blucher Avenue where the alignment would run between a row of single-family residences and the San Diego Freeway. These impacts would not occur until the line was extended to the west. Eight to ten affected residences were identified in this area, primarily due to the presence of special trackwork. Without the crossovers the number of impacts would be reduced to two residences. Mitigation of these impacts would require a 1,100 ft long section of ballast mat, from civil station 417+00 and 428+00.

East of Hazeltine Avenue
To the east of Hazeltine, Alternative 2 splits from the SP ROW and follows Oxnard. Extensive vibration impacts are projected for this segment, totaling 55 single-family and 23 multi-family residences with projected vibration impact, and 104 single-family and 24 multi-family residences with projected ground-borne noise impact.

Mitigation of the impacts would require resiliently-supported ties for the entire section of track from station 526+00 to 703+00. With this mitigation, 11 single-family and 3 multi-family residences would remain in the ground-borne noise impact zone. These areas would be evaluated in detail during the final design phase to determine the most cost-effective means of mitigating the impact.

(3) Alternative 6

West of Fulton-Burbank Station
Alternative 6 assumes a LRT system following the SP ROW from Lankershim and Chandler to a terminus in the West Valley. Only the East Valley segment has been evaluated in this study. The two variations, 6a and 6b, are identical west of the Valley College/Fulton-Burbank station, with the guideway primarily at-grade. In this segment, two areas of vibration impact were identified: 1) along Blucher Ave where the alignment would run between a row of single-family residences and the San Diego Freeway, and 2) along Bessemer between Hazeltine and Woodman, where the alignment would run south of a residential area.

The Blucher Ave impact area involves the same row of residences as discussed under Alternatives 1 and 2, but Alternative 6 does not assume special trackwork in this area for the pocket track. As such, there were only two single-family residences identified as ground-borne noise impacts. These impacts could be mitigated with a short ballast mat section.

The second impact area along Bessemer contains one multi-family and seven single-family ground-borne vibration impacts, and one multi-family and nine single-family ground-borne noise impacts. These residences are all located north of the alignment along Bessemer. A ballast mat between station 526+00 and 553+00 would eliminate most of these impacts. The projected residual impact is groundborne vibration at 3 single-family residences and groundborne noise at 5 single-family residences.

East of Fulton-Burbank Station
<u>Alternative 6a</u>: Under Alternative 6a the track will be primarily at-grade east of Fulton-Burbank Station, with a few sections in open cut. In this segment 16 single-family and 3 multi-family residences were identified with ground-borne vibration impact, and 34 single-family and 49 multi-family residences with ground-borne noise impact. These impacts are located along the diagonal between Oxnard and Chandler, and along Chandler between Whitsett and the Hollywood Freeway.

Vibration mitigation in the form of ballast mats between stations 559+00 to 573+00, 598+00 to 620+00, 635+00 to 676+00, and 683+00 to 703+00 would eliminate most of the projected impact. Residual ground-borne vibration impacts would remain for five single-family residences. Residual ground-borne noise impacts would remain at nine single-family and three multi-family residences.

Alternative 6b: Instead of at-grade, Alternative 6b is a cut-and-cover guideway for the segment east of Fulton-Burbank Station. Despite the difference in track geometry, there is no difference in the extent of ground-borne noise or vibration impacts between Alternative 6a and 6b. Instead of ballast mats, however, the recommended mitigation treatment is resiliently-supported ties due to the tunnel geometry. Resilient ties are assumed to provide about the same amount of vibration and noise reduction as ballast mats.

(4) Alternative 11

West of Colfax Avenue

Alternative 11a: West of Colfax, Alternative 11a is identical to Alternative 6a. The same number of ground-borne noise and vibration impacts are identified for this segment as for the entire Alternative 6a alignment. The recommended mitigation requirements are also identical to those of Alternative 6a.

Alternative 11b: West of Colfax, Alternative 11b is identical to Alternative 6b. The same number of ground-borne noise and vibration impacts are identified for this segment as for the entire Alternative 6b alignment. The recommended mitigation requirements are also identical to those of Alternative 6b.

Colfax Avenue to WOW Curve

Alternatives 11a and 11b are identical east of Colfax, which is the transition to deep bore tunnel for the final WOW curve segment. In this segment, one multi-family residence is projected to experience vibration impact, and five multi-family residences are projected to experience ground-borne noise impact. A few of these residences are situated directly above the proposed tunnel, and all are located between Colfax and the Hollywood Freeway. With resiliently-supported ties between stations 704+00 and 708+00 as mitigation, nearly all of these impacts should be eliminated.

WOW Curve

The WOW curve alignments for Alternative 11 are identical to those of Alternative 1.

Vibration Mitigation Measures

Some of the measures commonly used to control ground-borne vibration and ground-borne noise are:

Resiliently-Supported Ties: Resiliently supported ties consist of concrete half-ties supported by rubber blocks. With proper design, this type of system has been found be an effective means of reducing levels of ground-borne vibration and noise. The system requires concrete slab track. It is most often used for subway installations, although it can be equally effective for at-grade or aerial structure track.

Ballast Mats: Ballast mats consist of special elastomer mats that are placed under ballast. They have been used by a number of rail transit systems to reduce levels of ground-borne vibration. Concrete slabs have been used for most at-grade installations with the ballast mat and ballast placed on top of the concrete slab. The mats have been placed directly on compacted subgrade, layers of asphalt, or cement stabilized subgrade for some recent installations. Initial indications are that this approach can successfully mitigate ground-borne vibration.

Enhanced Maintenance: The projections assume that wheels and rail will be maintained in good condition. There are indications that improved maintenance procedures, such as truing wheels and grinding rail more often, or optimizing the wheel and rail profiles, can lead to significant reductions of ground-borne vibration. The effectiveness of proposed changes in maintenance procedures would need to be demonstrated before enhanced maintenance could be considered a mitigation measure.

Floating Slab Trackbed: For a floating slab trackbed, the rails are placed on top of concrete slabs that are suspended on resilient pads. Most floating slab installations in recent years have used a discontinuous floating slab design originally used by the Toronto Transit Commission. Testing has shown floating slabs to be very effective at controlling ground-borne vibration at frequencies above the fundamental resonance of the system. Efforts are often made to avoid floating slabs because of the costs associated with installation and maintenance.

In assessing mitigation options for areas where ground-borne vibration or noise impact is projected, it has been assumed that ballast mats would be used for at-grade track and resiliently supported ties would be used for all track in subway. It has been assumed that these measures would reduce levels of ground-borne noise and vibration by at least 5 dB. This is a relatively conservative estimate. During final design this estimate will be revised, if necessary, to reflect site-specific conditions. For example, if there are favorable vibration propagation conditions, these vibration control treatments can achieve up to 10 dB reduction with careful design and installation procedures.

The specific areas, types, and extent of preliminary vibration mitigation requirements are summarized in Table 4.9-15. The table also indicates any residual ground-borne noise and vibration impacts that may remain even with the assumed mitigation treatments in place. Most of the residual impacts are ground-borne noise related, and nearly all of these impacts are less than 1 decibel above the impact threshold of 35 dBA. In such cases additional mitigation may not be necessary, since the projections are on the conservative side. In any case, the residual impact areas will be re-evaluated in the final design phase to better determine if, and how much, additional mitigation is necessary.

4-9.15: Summary of Vibration Mitigation Requirements

Location	Mitigation	Station	Residual GB Vib. Impact with Mitigation	Residual GB Noise Impact with Mitigation
ALTERNATIVE 1				
Alternative 1, west of Hazeltine				
SF residences on Blucher Ave east of San Diego Fwy	Ballast mat; move pocket track east	417 - 428	No impact	Two SF residences, ~1 dB above impact threshold
Alternative 1a, Hazeltine to WOW curve				
SF residences on Bessemer between Hazeltine and Oxnard	Resilient ties	526 - 529 544 - 551	No impact	Three SF residences, less than 0.5 dB above impact threshold
MF residences on Buffalo, SF on Allott Ave (diagonal east of Oxnard)	Resilient ties	558 - 570	No impact	No impact
SF residences along diagonal between Burbank and Chandler	Resilient ties	598 - 615	No impact	No impact
MF on both sides of Chandler, between Hermitage and Laurel Cyn	Resilient ties	664 - 674	No impact	No impact
Beginning of WOW curve between Colfax and Hollywood Freeway	Resilient ties	704 - 708	No impact	No impact
Alternative 1b, Hazeltine to WOW curve				
SF residences on Bessemer between Hazeltine and Oxnard	Resilient ties	526 - 529 539 - 551	No impact	Five SF residences, less than 0.5 dB above impact threshold
MF residences on Buffalo, SF on Allott Ave (diagonal east of Oxnard)	Resilient ties	558 - 572	No impact	One SF, two MF residences, ~1 dB above impact threshold
SF residences along diagonal between Burbank and Chandler	Resilient ties	598 - 617	No impact	Five SF residences, less than 2 dB above impact threshold
MF on both sides of Chandler, between Whitsett and Laurel Canyon	Resilient ties	655 - 674	No impact	One MF residence, less than 2 dB above impact threshold
MF along Chandler between Gentry and Colfax, plus beginning of WOW curve between Colfax and Hollywood Freeway	Resilient ties	685 - 708	No impact	No impact
Alternative 1c, Hazeltine to WOW curve				
SF residences on Bessemer between Hazeltine and Oxnard	Resilient ties	526 - 529 539 - 551	No impact	Five SF residences, less than 0.5 dB above impact threshold
MF residences on Buffalo, SF on Allott Ave (diagonal east of Oxnard)	Resilient ties	558 - 572	No impact	One SF, two MF residences, ~1 dB above impact threshold
SF residences along diagonal between Burbank and Chandler	Resilient ties	598 - 617	No impact	Five SF residences, less than 2 dB above impact threshold
MF on both sides of Chandler, between Whitsett and Laurel Canyon	Resilient ties	654 - 674	No impact	One MF residence, less than 2 dB above impact threshold
MF along Chandler between Gentry and Colfax, plus beginning of WOW curve between Colfax and Hollywood Freeway	Resilient ties	685 - 708	No impact	No impact

4-9.15: Summary of Vibration Mitigation Requirements

Location	Mitigation	Station	Residual GB Vib. Impact with Mitigation	Residual GB Noise Impact with Mitigation
Alternative 1d, Hazeltine to WOW curve				
SF residences on Bessemer between Hazeltine and Oxnard	None	--	Since careful placement of the aerial structure supports in these areas will ensure that any impacts are unlikely, no mitigation is recommended	
MF residences on Buffalo, SF on Allott Ave (diagonal east of Oxnard)	None	--		
SF residences along diagonal between Burbank and Chandler	None	--		
MF near beginning of WOW curve between Colfax and Hollywood Freeway (tunnel)	Resilient ties	687 - 708	No impact	One MF residence, less than 0.5 dB above impact threshold
WOW Curves (short and long radius)				
SF/MF along Lankershim	Resilient ties	708 - 730	No impact	No impact
ALTERNATIVE 2				
SF residences on Blucher Ave east of San Diego Fwy	Ballast mat or move pocket track to east	417 - 428	No impact	Two SF residences, ~1 dB above impact threshold
SF residences on Bessemer between Hazeltine and Oxnard	Resilient ties	526 - 529 539 - 542 548 - 551	No impact	Two SF residences, less than 0.5 dB above impact threshold
SF/MF on Oxnard between Woodman and Lankershim	Resilient ties	553 - 703	No impact	Nine SF, eight MF residences, 1-3 dB above impact threshold
ALTERNATIVE 6				
Alternative 6, west of Fulton-Burbank Station				
SF residences on Blucher Ave east of San Diego Fwy	Ballast mat or move pocket track to east	417 - 428	No impact	No impact
SF residences on Bessemer between Hazeltine and Oxnard	Ballast mat	526 - 535 540 - 543 546 - 553	Three SF residences, ~1 dB above impact threshold	Five SF residences, 2-5 dB above impact threshold
Alternative 6a, east of Fulton-Burbank Station				
MF residences on Buffalo, SF on Allott Ave (diagonal east of Oxnard)	Ballast mat	559 - 573	No impact	Two SF, two MF residences, 1-4 dB above impact threshold
SF both sides of diagonal between Burbank and Chandler	Ballast mat	598 - 620	Five SF residences, up to 1 dB above impact threshold	Seven SF residences, 1-5 dB above impact threshold
MF on both sides of Chandler, between Whitsett and Laurel Canyon	Ballast mat	655 - 676	One MF residence, ~1 dB above impact threshold	One MF residence, ~5 dB above impact threshold
SF/MF on both sides of Chandler, between Ben and Colfax	Ballast mat	683 - 703	No impact	No impact
Alternative 6b, east of Fulton-Burbank Station				
MF residences on Buffalo, SF on Allott Ave (diagonal east of Oxnard)	Resilient ties	559 - 573	No impact	Two SF, two MF residences, 1-4 dB above impact threshold
SF both sides of diagonal between Burbank and Chandler	Resilient ties	598 - 620	Five SF residences, up to 1 dB above impact threshold	Seven SF residences, 1-5 dB above impact threshold

4-9.15: Summary of Vibration Mitigation Requirements

Location	Mitigation	Station	Residual GB Vib. Impact with Mitigation	Residual GB Noise Impact with Mitigation
MF on both sides of Chandler, between Whitsett and Laurel Canyon	Resilient ties	655 - 676	One MF residence, ~1 dB above impact threshold	One MF residence, ~5 dB above impact threshold
SF/MF on both sides of Chandler, between Ben and Colfax	Resilient ties	683 - 703	No impact	No impact
ALTERNATIVE 11				
Alternative 11, west of Fulton-Burbank Station				
SF residences on Blucher Ave east of San Diego Fwy	Ballast mat or move pocket track to east	417 - 428	No impact	Two SF residences, ~1 dB above impact threshold
SF residences on Bessemer between Hazeltine and Oxnard	Ballast mat	526 - 535 540 - 543 546 - 553	Three SF residences, up to 1 dB above impact threshold	Five SF residences, 2-5 dB above impact threshold
Alternative 11a, east of Fulton-Burbank Station				
MF residences on Buffalo, SF on Allott Ave (diagonal east of Oxnard)	Ballast mat	559 - 573	No impact	Two SF, two MF residences, 1-4 dB above impact threshold
SF both sides of diagonal between Burbank and Chandler	Ballast mat	598 - 620	Five SF residences, up to 1 dB above impact threshold	Seven SF residences, 1-5 dB above impact threshold
MF on both sides of Chandler, between Whitsett and Laurel Canyon	Ballast mat	655 - 676	One MF residence, ~1 dB above impact threshold	One MF residence, ~5 dB above impact threshold
SF/MF on both sides of Chandler, between Ben and Colfax	Ballast mat	683 - 703	No impact	No impact
MF near beginning of WOW curve between Colfax and Hollywood Freeway (tunnel)	Resilient ties	704 - 708	No impact	No impact
Alternative 11b, east of Fulton-Burbank Station				
MF residences on Buffalo, SF on Allott Ave (diagonal east of Oxnard)	Resilient ties	559 - 573	No impact	Two SF, two MF residences, 1-4 dB above impact threshold
SF both sides of diagonal between Burbank and Chandler	Resilient ties	598 - 620	Five SF residences, up to 1 dB above impact threshold	Seven SF residences, 1-5 dB above impact threshold
MF on both sides of Chandler, between Whitsett and Laurel Canyon	Resilient ties	655 - 676	One MF residence, ~1 dB above impact threshold	One MF residence, ~5 dB above impact threshold
SF/MF on both sides of Chandler, between Ben and Colfax	Resilient ties	683 - 703	No impact	No impact
MF near beginning of WOW curve between Colfax and Hollywood Freeway (tunnel)	Resilient ties	704 - 708	No impact	No impact
WOW Curves (short and long radius)				
SF/MF along Lankershim	Resilient ties	708 - 730	No impact	No impact

Source: HMMH, 1997.

4-10 GEOTECHNICAL CONSIDERATIONS

4-10.1 Existing Conditions

a. Topography

The proposed alignment crosses the southeastern portion of the San Fernando Valley from the Los Angeles River and Sepulveda Basin at the western terminus to about ½-mile east of the central branch of Tujunga Wash at the eastern terminus. The San Fernando Valley is a broad alluvial valley with very low topographic relief. Existing topography slopes gently to the southeast and locally (in the vicinity of Tujunga Wash flood control channel) to the south. The overall gradient of the ground surface in the vicinity of the project corridor is approximately 1 percent and 5 percent locally on either side of the Tujunga Wash flood control channel and the central branch of Tujunga Wash. This locally gently sloping topography on either side of the channels is a result of a localized erosion in the vicinity of both drainage features prior to development.

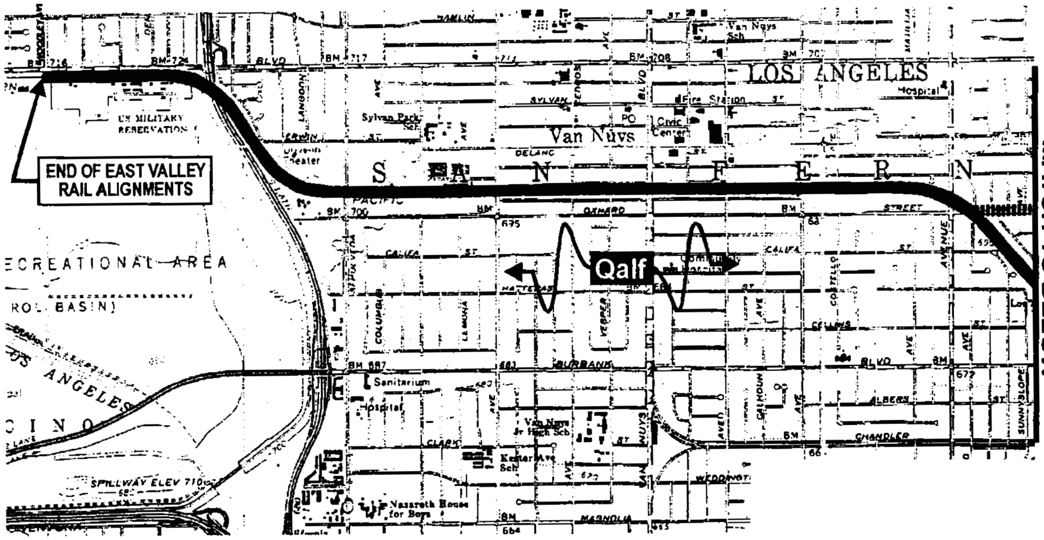
The ground surface elevations in the vicinity of the project corridor generally decreases from west to east. Existing ground surface elevations along the project corridor range from about 724 feet above mean sea level at the western terminus (near the intersection of Woodley Avenue and Victory Boulevard), to about 620 feet above mean sea level at the eastern terminus in the vicinity of Lankershim Boulevard and Killion Street. The topography in the vicinity of the alignments is shown in Figure 4-10.1.

b. Geology Setting

The project corridor is in the southeast portion of the San Fernando Valley, approximately 2 miles north of the Santa Monica Mountains. The San Fernando Valley is an elliptically shaped structural depression filled with sediments derived from the surrounding upland areas which include the Santa Monica Mountains on the south, and the San Gabriel Mountains, Santa Susana Mountains, Simi Hills, and the Verdugo Mountains on the northeast, northwest, west and east, respectively.

The project corridor is in the Transverse Ranges geomorphic province. This province is characterized by east-west trending geologic structures. The trend of the San Fernando Valley reflects the overall trend of the Transverse Ranges, where the east-west orientation of major structural features are in contrast to the northwest-southeast trend which dominates the rest of California.

The San Fernando Valley is an area of compression between the San Gabriel Mountains on the north and the Santa Monica Mountains on the south. Exposed bedrock areas bordering the valley have been folded, faulted and uplifted. The bedrock underlying the alluvial sediments in the valley consists of a series of anticlinal and synclinal folds that reflect the north-south trending compressive stress regime of the Transverse Ranges geomorphic province. Current deformation involves southward-directed crustal shortening, uplift of the mountains, and basin infilling.



EXPLANATION

Qalf — HOLOCENE AGE ALLUVIUM (predominantly fine-grained deposits)

Qalc — HOLOCENE AGE ALLUVIUM (predominantly coarse-grained deposits)

GEOLOGIC CONTACT - (approximate)

U ? D — FAULT - dashed where approximate, queried where uncertain; U- upthrown side, D - downthrown side

SOURCE: LAW/CRANDALL, 1997

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-10.1
Local Geology

The project area is not within a known oil producing area, and the project corridor is not located within a designated oil field as indicated by maps published by the California Division of Oil and Gas (CDOG). However, several dry abandoned wells are adjacent to the proposed Chandler Alignment (CDOG, 1977).

c. Soils

(1) Background and Stratigraphy

This section presents the soil conditions along the project corridor based on site-specific subsurface data (borings and cone penetration tests) from the following sources: California Division of Mines and Geology, California Department of Transportation (Caltrans), Earth Technology Corporation (ETC), Converse Ward Davis Dixon, and Law/Crandall. Subsurface information for the eastern portion of the Oxnard Alignment (Alternative 2), between Woodman Avenue and Laurel Canyon Boulevard is lacking because the alignment in this area traverses through a residential neighborhood and geotechnical data is generally unavailable.

The proposed alignments are predominantly underlain by Holocene age alluvial deposits. The subsurface materials encountered in previous borings along the project corridor consist of localized shallow zones of fill soils underlain by Quaternary age alluvial deposits. The depth to bedrock along the project corridor ranges from about 200 feet at the western terminus of the project corridor to about 600 feet at the eastern terminus (vicinity of the North Hollywood Station). The alluvium encountered in previous explorations indicates alluvial deposits that are laterally and vertically non-uniform.

(2) Artificial Fill and Alluvium

Artificial fill has been locally encountered in previous explorations along the proposed alignments to a maximum depth of 7 feet. Fill soils were variable in composition and ranged from well compacted to loose or soft. The depth of fill along the project corridor could vary considerably.

The Chandler Alignment (Alternatives 1, 6, and 11) and the Oxnard Alignment (Alternative 2) are coincident between Woodley Avenue and Woodman Avenue. In this area, the alluvium consists predominately of soft to very stiff clay, sandy clay and silt of low to high plasticity interlayered with loose to very dense silty sands, clayey sands, and poorly graded sands with varying amounts of medium to coarse gravel (ETC, 1993). The alluvial deposits are primarily fine-grained to a depth of 25 to 35 feet and interlayered with granular materials. A previous boring drilled by Caltrans in 1963 in the vicinity of the San Diego Freeway and Victory Boulevard indicates the alluvium in this area consists of medium stiff sandy silt interlayered with loose to dense sands and silty sands with varying amounts of gravel. Below a depth of 60 feet, dense sand and gravel layers were encountered.

East of Woodman Avenue, the proposed alignments diverge and approximately parallel each other in an east-west direction, approximately ¾-mile apart until Lankershim Boulevard, where the two project corridors join at the North Hollywood Station. In this area, the alluvial deposits are also non-uniform. The alluvial deposits beneath the Chandler Alignment in this area are coarser than the deposits encountered to the west (there is no available data for the Oxnard Alignment in this area). The alluvial deposits encountered in previous borings along this portion of the Chandler Alignment consist of predominantly loose to very dense silty sand, gravelly sand, clayey sand, poorly graded sand, and medium to coarse gravel interlayered with medium stiff to stiff sandy silts, silts, and clays (ETC, 1993). Previous explorations by Caltrans (1961) in the vicinity of Chandler Boulevard and the central branch of Tujunga Wash indicate that the alluvium consists of loose to dense fine to coarse-grained sands and sandy silts to a depth of approximately 40 feet; these materials are underlain by dense to very dense coarse sands and gravel (ETC, 1993). Previous work performed in the vicinity of Lankershim Boulevard at the eastern terminus of the segment indicates that the upper 45 to 50 feet consist primarily of sand, silty sand, and gravelly sand with some cobbles and boulders, and a few isolated layers of clay, silt and clayey sand. Below a depth of 50 feet, the alluvial deposits consist of gravelly sand and sandy gravel with cobbles and boulders (1 to 4 feet in diameter). Minor raveling occurred from 10 to 15 feet and significant caving occurred below 50 feet (Converse Ward Davis Dixon, 1984).

(3) Bedrock

The bedrock units exposed in the bordering mountain ranges generally range in age from Pre-Tertiary crystalline basement rocks to Tertiary age sedimentary and volcanic rocks. The differences in the range of composition of these bordering bedrock materials is reflected in the range of composition and grain size of the alluvial sediments in the San Fernando Valley.

In the vicinity of the proposed alignments, the alluvial deposits are underlain by Tertiary age sedimentary bedrock units of the Modelo Formation. The Modelo Formation is locally exposed on the north flank of the Santa Monica Mountains in the Studio City area, approximately two miles south of the project corridor. The bedrock in this area generally strikes east-west and dips 23 to 65 degrees to the north. This north-dipping bedrock represents the northern limb of an anticline formed during uplift of the Santa Monica Mountains.

d. Seismicity

(1) Faults

Southern California includes numerous active, potentially active, and inactive faults.[16] By definition, an active fault is one that has had surface displacement within the last 11,000 years. A potentially active fault is a fault that has had surface displacement within the last 1.6 million years. Inactive faults have not had surface displacement in the last 1.6 million years. A list of nearby active and potentially active faults with the distance in miles between the project corridor and the nearest point on the fault is presented in Table 4-10.1. This table also indicates the maximum credible earthquake and the estimated slip rate for each fault.

[16] The criteria for these major groups are based on criteria developed by the California Division of Mines and Geology (CDMG) for the Alquist-Priolo Earthquake Fault Zoning Program (Hart, 1994).

The project corridor is not within an Alquist-Priolo Earthquake Fault Zone for surface fault rupture. The nearest Alquist-Priolo Earthquake Fault Zone, established along the Mission Wells segment of the San Fernando fault zone, is located approximately 6.8 miles north of the project corridor. Figure 4-10.2 shows active and potentially active faults in the vicinity of the project corridor.

- **Active Faults**

The known active faults within 10 miles of the project corridor are discussed below. Additionally, the San Andreas fault is discussed below because it is considered a significant source of ground shaking along the project corridor. Table 4-10.1 lists these and other active faults in the Southern California area.

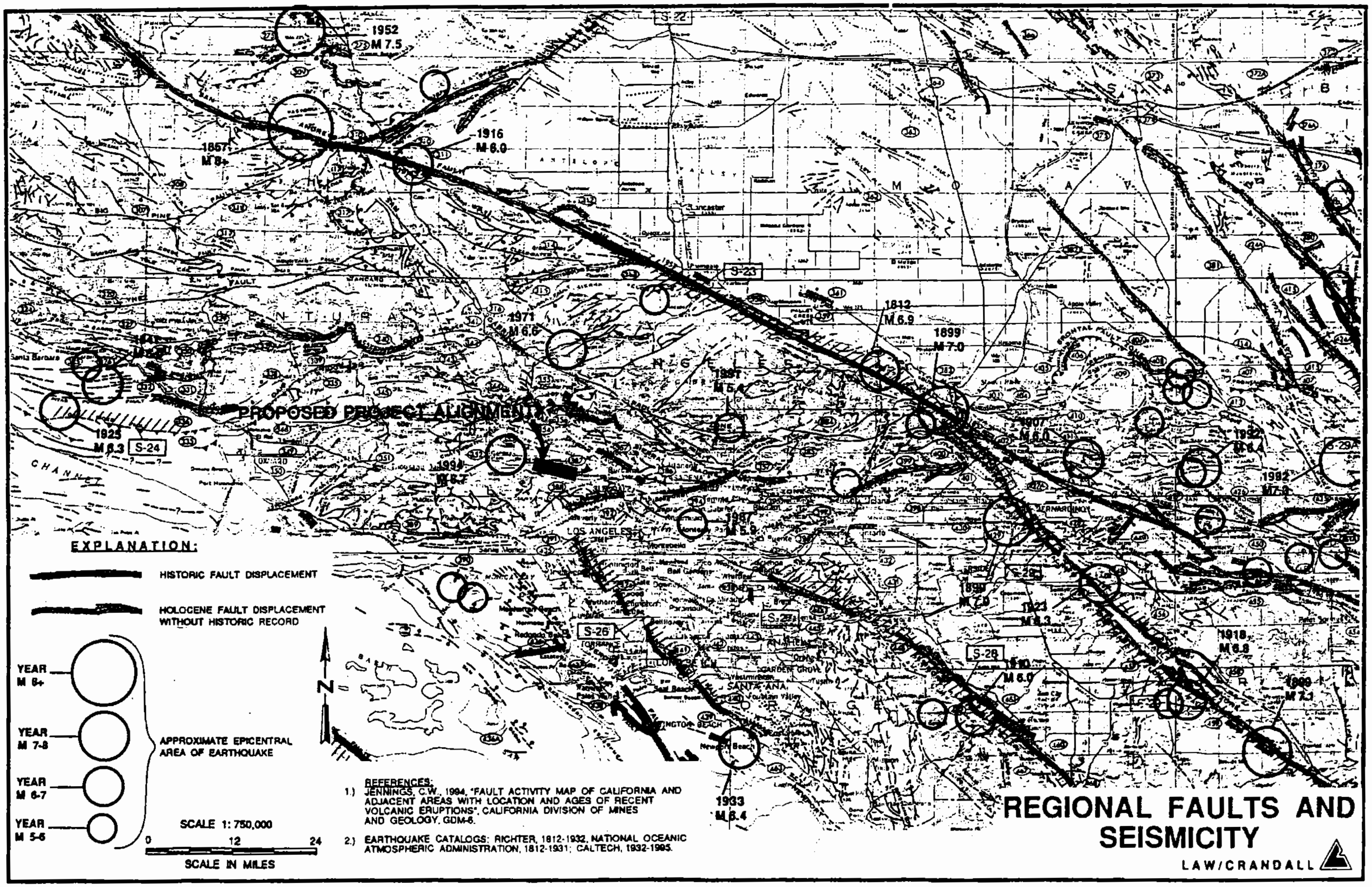
Verdugo Fault: The closest active fault is the Verdugo fault located 3.1 miles northeast of the project corridor. The Verdugo fault zone is composed of several faults including the Verdugo fault, San Rafael fault, and the Eagle Rock fault. The Verdugo fault has a defined maximum credible Richter magnitude of 6.75 (Mualchin and Jones, 1992). An Alquist-Priolo Earthquake Fault Zone has not been established for the Verdugo fault by the California Division of Mines and Geology. However a fault rupture hazard zone has been designated by the City of Burbank for the Verdugo fault. Therefore, the Verdugo fault should be considered active for planning purposes.

Santa Monica-Hollywood Fault Zone: The Hollywood fault is located approximately 4.3 miles south-southeast of the project corridor. The Hollywood fault is the easterly branch of the Santa Monica-Hollywood fault zone, and is located at the southerly base of the Santa Monica Mountains. The Hollywood fault extends easterly from the West Beverly Hills Lineament in the West Hollywood-Beverly Hills area (Dolan and Sieh, 1992) to the Los Feliz area of Los Angeles.

No known historical ground surface-rupturing earthquakes have occurred along this fault and the Hollywood fault has not been zoned as active under the Alquist-Priolo Earthquake Fault Zoning Act. However, based on the data from recent studies, this fault should be considered active. The Santa Monica-Hollywood fault zone has a defined maximum credible Richter magnitude of 7.0 (Dolan et al., 1995).

San Fernando Fault Zone: The Mission Hills segment of the San Fernando fault zone is located about 6.9 miles north of the site. The San Fernando fault zone comprises one of a number of left lateral/reverse frontal faults bounding the southern margin of the San Gabriel and Santa Susana Mountains. Surface rupture occurred along the Tujunga, Sylmar, and Mission Wells segments of the San Fernando fault zone during the February 9, 1971 San Fernando earthquake. The San Fernando fault zone has a defined maximum credible Richter magnitude of 7.3 (Dolan et al., 1995).

Raymond Fault: The Raymond fault is located 8.3 miles east-southeast of the project corridor. The fault is a high-angle reverse fault, thrusting basement rocks north of the fault, over alluvial sediments south of the fault. Within the last 36,000 years, eight separate earthquake events have occurred along the Raymond fault (Crook et al., 1987). The most recent fault movement



SOURCE: LAW/CRANDALL, 1997

San Fernando Valley
East-West Transportation Corridor
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FIGURE 4-10.2
Earthquake Faults in the Region

occurred sometime between 2,160 and 1,630 years ago (LeRoy Crandall and Associates, 1978; Crook et al., 1987). The Raymond fault has a defined maximum credible Richter magnitude of 6.9 (Slemmons, 1979).

Newport-Inglewood Fault Zone: The Newport-Inglewood fault zone is about 8.6 miles south of the project corridor. This fault zone is composed of a series of discontinuous northwest-trending en echelon faults extending from the southern edge of the Santa Monica Mountains southeastward to the area offshore of Newport Beach. The 1933 Long Beach earthquake has been attributed to movement on the Newport-Inglewood fault zone. Based on apparent historic earthquakes generated by fault movement, the fault zone is considered active, and has a defined maximum credible Richter magnitude of 7.0 (Mualchin and Jones, 1992).

San Andreas Fault Zone: The San Andreas fault zone, California's most prominent geological feature, trends generally northwest for almost the entire length of the state. The southern segment, closest to the project corridor, is approximately 280 miles long and extends from the Mexican Border to the Transverse Ranges west of Tejon Pass. The San Andreas fault zone is approximately 30 miles northeast of the alignments at the nearest point on the fault. Wallace (1968) estimated the recurrence interval for a magnitude 8.0 earthquake along the entire fault zone to be between 50 and 200 years. Sieh (1984) estimated a recurrence interval of 140 to 200 years. The 1857 Fort Tejon earthquake was the last major earthquake along the San Andreas fault zone in Southern California. This fault has a defined maximum credible Richter magnitude of 8.2 (OSHPD, 1995).

- **Blind Thrust Faults**

The Elysian Park Fold and Thrust Belt, originally defined by Hauksson (1990), was postulated to extend northwesterly from the Santa Ana Mountains to the Santa Monica Mountains, extending westerly and paralleling the Santa Monica-Hollywood and Malibu Coast faults. The Elysian Park Fold and Thrust Belt is now thought to consist of two components known as the Santa Monica Mountains Thrust and the Elysian Park Thrust (Lamar, 1970). The Santa Monica Mountains Thrust extends approximately 47 miles from the western edge of the Santa Monica Mountains to the Verdugo Mountains on the east. The axial trace of the Elysian Park Thrust extends approximately 12 miles through the Elysian Park-Repetto Hills from about Silver Lake on the west to the Whittier Narrows on the east (Lamar, 1970). The Santa Monica Mountains Thrust is located beneath the project corridor. The Elysian Park Thrust is located 6 miles southeast of the project corridor.

These thrust faults are not exposed at the surface and do not present a potential surface rupture hazard; however, the Elysian Park Fold and Thrust Belt should be considered an active feature capable of generating future earthquakes. Dolan et al. (1994) suggest that the Santa Monica Mountains Thrust may be capable of producing earthquakes as large as magnitude 7.2. Based on an approximate length of axial trace of 12 miles, a maximum credible earthquake of magnitude 7.1 on the Elysian Park Thrust, as proposed by Dolan et al. (1994) has been assigned.

Table 4-10.1: Major Faults in Southern California

Fault (in alphabetical order)	Maximum Credible Earthquake			Slip Rate (mm/yr)	Distance From Corridor (Miles)	Direction From Corridor
	Mag.[1]	Source	Type[2]			
Active (a)						
Compton-Los Alamitos Thrust	7.2	(e)	RO	(e)	RO	1.4
Cucamonga	7.0	(f)	RO	(f)	RO	5.0
Elsinore Zone	7.5	(f)	SS	(f)	SS	5.0
Elysian Park Thrust	7.1	(e)	RO	(e)	RO	1.7
Glen Helen-Lytle Creek-Claremont	7.0	(h)	SS	(h)	SS	7.5
Malibu Coast	6.9	(e)	RO	(e)	RO	1.5
Newport-Inglewood Zone	7.0	(f)	SS	(f)	SS	1.0
Oakridge	7.5	(f)	RO	(f)	RO	1.3
Palos Verdes	7.2	(e)	SS	(e)	SS	3.0
Raymond	6.7	(h)	RO	(h)	RO	0.4
San Andreas (Mojave Segment)	8.2	(g)	SS	(g)	SS	30.0
San Cayetano	7.0	(e)	RO	(e)	RO	7.5
San Fernando Zone	7.3	(e)	RO	(e)	RO	4.0
San Gabriel	7.5	(f)	SS	(f)	SS	1.0
San Jacinto Zone	7.5	(b)	SS	(b)	SS	2.5-12.0
Santa Monica-Hollywood	7.0	(e)	RO	(e)	RO	1.5
Santa Monica Mountains Thrust	7.2	(e)	RO	(e)	RO	4.0
Simi-Santa Rosa	6.9	(h)	RO	(h)	RO	0.9
Verdugo	6.75	(f)	RO	(f)	RO	0.5
Whittier	7.1	(d)	SS	(d)	SS	3.0
Potentially Active (a)						
Charnock	6.5	(a)	SS	(a)	SS	0.1
Chino	7.0	(d)	NO	(d)	NO	1.0
Clamshell-Sawpit	6.6	(e)	RO	(e)	RO	0.5
Coyote Pass	6.7	(c)	RO	(c)	RO	0.1
Duarte	6.7	(a)	RO	(a)	RO	0.1
Holser	6.6	(h)	RO	(h)	RO	
Indian Hill	6.6	(c)	RO	(c)	RO	0.1
Los Alamitos	6.2	(c)	SS	(c)	SS	0.1
MacArthur Park	5.7	(d)		(d)		3.0
Northridge Hills	6.6	(h)	SS	1.2	4	N
Norwalk	6.7	(a)	RO	0.1	24	SE
Overland	6.0	(a)	SS	0.1	9.5	S
San Jose	6.7	(e)	RO	0.5	33	ESE
Santa Susana	6.9	(e)	RO	6.2	8.2	NNW
Santa Ynez (Eastern Segment)	7.5	(b)	SS	1.0	50	NW
Unnamed Fault	5.7	(c)	RO	0.1	0	---

Notes:
(a) Slemmons, 1979
(b) Greensfelder, CDMG Map Sheet 23, 1974.
(d) Blake, 1995
(c) Mark, 1977
(e) Dolan et al., 1995
(f) Mualchin & Jones, 1992
(g) OSHPD, 1995
(h) Wesnousky, 1986
[1] Richter Magnitude
[2] SS Strike Slip
[2] NO Normal Oblique
[2] RO Reverse Oblique

Source: Law/Crandall, 1997.

- **Potentially Active Faults**

The known potentially active faults within 10 miles of the project corridor are discussed below. Table 4-10.1 lists these and other potentially active faults in the Southern California area.

Unnamed Fault: The closest potentially active fault to the project corridor is an unnamed fault previously mapped by Weber (1980). The fault trace trends in an east-northeast direction, south of and subparallel to the Chandler Alignment (Alternatives 1, 6, and 11) from about Tujunga Wash on the west to about Cahuenga Boulevard on the east. The fault does not cross the project corridor but is mapped as traversing the North Hollywood Station, approximately 240 feet south of the northern contract limit of the North Hollywood Red Line station. A defined maximum credible Richter magnitude of 5.7 has been assigned to this fault (Mark, 1977).

Northridge Hills Fault: The Northridge Hills fault is located about 4 miles north of the project corridor. The Northridge Hills fault is a high-angle fault and its location is based primarily on the numerous oil exploration wells which have been drilled in the Northridge Hills. A maximum credible Richter magnitude of 6.6 has been assigned to this fault (Wesnousky, 1986).

MacArthur Park Fault: The MacArthur Park fault, located approximately 7 miles southeast of the site, has been recently identified west of downtown Los Angeles. The fault is approximately 5 miles long, extending northwest from the Pershing Square area, through MacArthur Park to the Paramount Studios area in Hollywood. Current information suggests the fault is potentially active, with a maximum credible Richter magnitude of 5.7 (Blake, 1995).

Santa Susana Fault: The Santa Susana fault is located 8.2 miles north-northwest of the project corridor. The Santa Susana fault extends northeastward from the Santa Susana Mountains across San Fernando Pass and into the San Gabriel Mountains. This fault has a defined maximum credible Richter magnitude of 6.9 (Dolan et al., 1995).

Overland Fault: The Overland fault is about 9.5 miles south of the project corridor. The Overland fault trends northwest and lies between the Charnock fault and the Newport-Inglewood fault zone. The fault extends from the northwest flank of the Baldwin Hills to Santa Monica Boulevard in the vicinity of the Overland Avenue. This fault has a defined maximum credible Richter magnitude of 6.0 (Slemmons, 1979).

(2) Historic Earthquakes

The seismicity of the region surrounding the site was determined from earthquake data compiled by the California Institute of Technology for 1932 to 1996 and data for 1812 to 1931 compiled by Richter and the U.S. National Oceanic and Atmospheric Administration (NOAA). Within 100 kilometers (62 miles) of the project corridor 412 earthquakes of Richter magnitude 4.0 and greater have occurred between 1932 and 1996; one earthquake of magnitude 6.0 or greater occurred between 1906 and 1931, and one earthquake of magnitude 7.0 or greater occurred between 1812 and 1905. The approximate locations of moderate to great earthquakes (Richter magnitudes greater than 5.0) in the Southern California area are shown on Figure 4-10.2.

Several earthquakes of moderate to large magnitude have occurred in the Southern California area within the last 60 years that have produced significant ground shaking in the vicinity of the project corridor. The earliest of these was the March 10, 1933 magnitude 6.4 Long Beach earthquake. The epicenter of this earthquake was located about 47 miles southeast of the corridor.

The epicenter of the February 9, 1971 San Fernando earthquake, magnitude 6.6, was about 16 miles north of the corridor. Surface rupture occurred on various strands of the San Fernando fault zone as a result of this earthquake, including the Tujunga and Sylmar faults.

The magnitude 5.9 Whittier Narrows earthquake occurred on October 1, 1987, on a previously unrecognized fault, now believed to be the Elysian Park Thrust. The earthquake epicenter was located about 22 miles east-southeast of the corridor.

The Sierra Madre earthquake occurred on June 28, 1991 along the Sierra Madre fault zone. The epicenter of the magnitude 5.8 earthquake was located in the San Gabriel Mountains about 25 miles east of the corridor.

On June 28, 1992, two major earthquakes occurred east of Los Angeles. At 4:58 a.m., a magnitude 7.5 earthquake occurred in the High Desert region and is known as the Landers earthquake. The epicenter was located about 111 miles east of the corridor. The second event occurred at 8:04 a.m. near Big Bear Lake and had a magnitude of 6.6; the epicenter was about 92 miles east of the corridor.

Most recently, on January 17, 1994, a magnitude 6.7 earthquake occurred in the San Fernando Valley. The earthquake, named for its epicenter beneath the city of Northridge, began as a rupture on a buried thrust fault at a depth of about 17.5 kilometers (km). The fault rupture propagated upward and northwestward along a previously unidentified fault plane. The rupture terminated at a depth of about 7 km beneath the north San Fernando Valley. The Northridge earthquake was not associated with any previously known surficial geologic structures. There was no surface fault rupture because the fault rupture terminated at a depth of about 7 km beneath the northern portion of the San Fernando Valley. Studies to date have indicated that the fault geometry is not a single plane but a very complex geologic structure. The structure is thought to dip about 40 degrees to the south-southwest and is between 5 and 19 km beneath the ground surface. At this time, the structure is still not named and is still poorly understood by scientists. Studies are still ongoing to ultimately define this complex structure.

(3) Ground Shaking

Significant ground shaking could occur along one or more of the proposed alignments as a result of earthquakes on any of the nearby active or potentially active faults. These include but are not limited to the Santa Monica Mountains Thrust, the Verdugo fault, the Santa Monica-Hollywood fault zone, and the San Andreas fault zone.

Several postulated design earthquakes were selected for study based on the proximity and estimated magnitude for nearby faults. These earthquakes, their associated faults, estimated Richter magnitudes, distance from the site, estimated ground acceleration levels, and estimated duration of strong shaking at the site are indicated in Table 4-10.2. The duration of strong shaking is defined as that time period during which the acceleration is greater than 0.05g.

Table 4-10.2
Estimated Ground Shaking from Faults Near the Study Area

Fault	Proximity to Corridor	Estimated Magnitude	Distance From Fault to Corridor (miles)	Ground Acceleration (g) [1,2]		Estimated Duration of Strong Shaking (seconds)
				Peak	Sustained	
Maximum Credible Earthquakes						
San Andreas	Distant	8.2	30	0.22	0.16	28
Santa Monica Mountains Thrust	Local	7.2	0	0.69	0.43	>28
Verdugo	Local	6.75	3.1	0.43	0.25	>22
Santa Monica-Hollywood	Local	7.0	4.3	0.43	0.26	>26
Elysian Park Thrust	Local	7.1	6.0	0.38	0.23	27
Maximum Probable Earthquakes						
Santa Monica Mountains Thrust	Local	6.6	0	0.51	0.28	>20

Notes:
[1] The peak acceleration was estimated using the mean attenuation relations of Boore et al., 1993.
[2] The sustained ground accelerations were reduced using a method developed by Idriss and Sun (1992).

Source: Law/Crandall, 1997.

A maximum credible earthquake is defined as the largest earthquake a given fault is considered capable of generating. A maximum probable earthquake is defined as the earthquake a given fault is considered likely to generate, on average, within a given time period. In this case, the time period for the maximum probable earthquake was taken as 60 years.

e. Hazardous Materials

Existing hazardous waste conditions along the proposed Chandler (Alternatives 1, 6, and 11) and Oxnard (Alternative 2) alignments presented below were developed based on a review of environmental reports; review of sites within 500 feet of the project corridor that were identified by regulatory environmental records as having known soil and/or groundwater contamination or a potential to have contamination; review of California Division of Oil and Gas Wildcat Well maps within 500 feet of the project corridor; and review of U.S. Geological Survey topographic maps in the area of the project corridor. The regulatory databases reviewed included: National Priorities List of the U.S. Environmental Protection Agency (NPL); the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List; the Emergency Response Notification System (ERNS) List; the Site Enforcement Tracking System (SETS) List; the Resource Conservation and Recovery Act Violators (RCRA-V) List; the Annual Work Plan (AWP) List (previously known as the Bond Expenditure Plan); the CALSITES List; the Leaking Underground Storage Tank (LUST) List; the Solid Waste Information System

(SWIS) List; the Solid Waste Assessment Test (SWAT) List; the Toxic Releases List; the Toxic Pits List; the RCRA Generators (RCRA-G) List; the RCRA Treatment, Storage, and Disposal (RCRA-TSD) List; the permitted Underground Storage Tank (UST) List; and the Hazardous Waste Information System (HWIS) List.

In general, there is potential for encountering hazardous waste along the project corridor due to the known presence of contaminated properties and hazardous or potentially hazardous waste sites. The proposed Oxnard and Chandler alignments are not within the boundaries of an oil field; however, there may be unreported wildcat oil and gas wells within 500 feet of the project corridor.

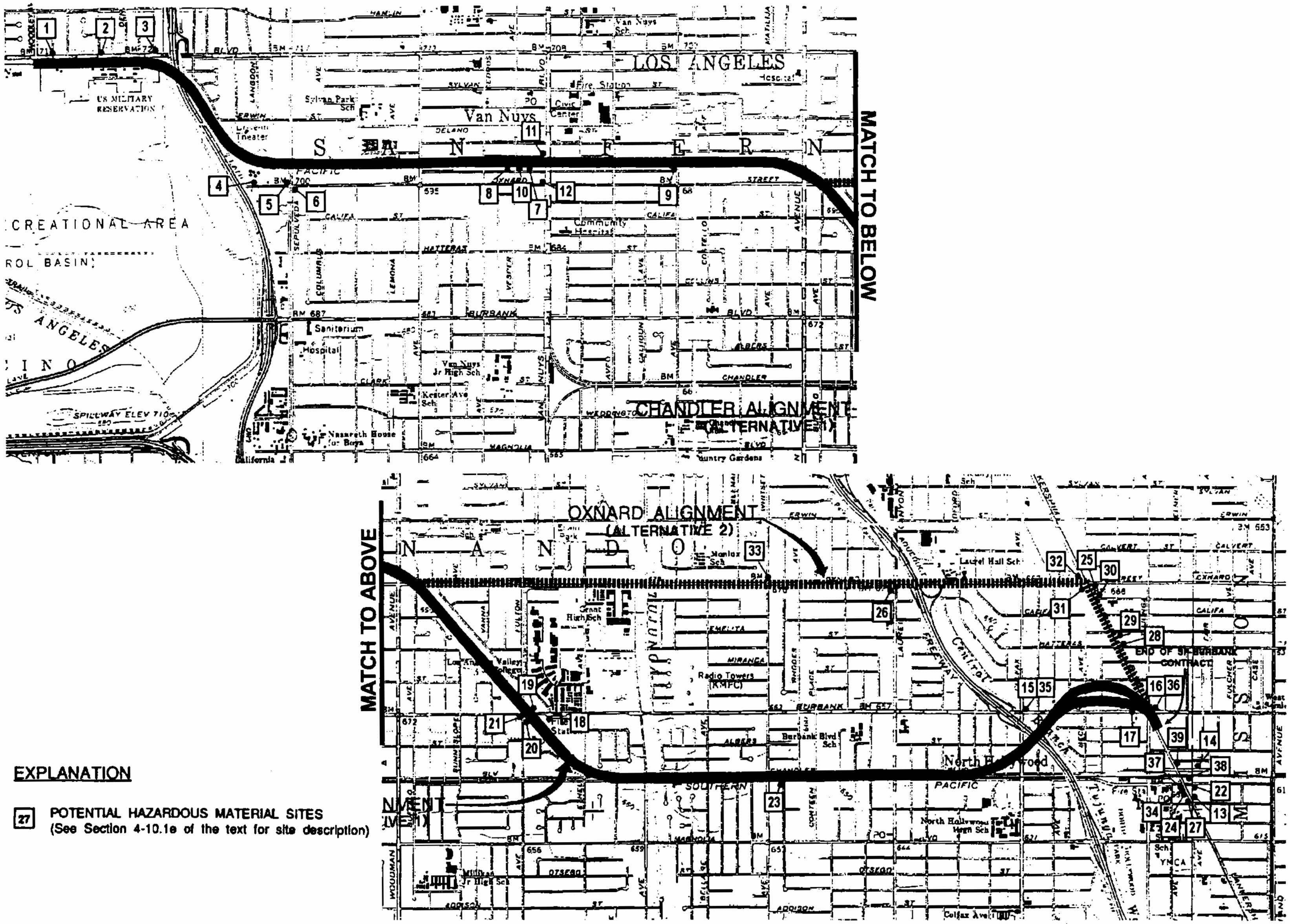
Twelve (12) locations along the Oxnard and Chandler alignments have been identified as having known contamination and twenty-one (21) locations as having a potential for hazardous substances/waste. Identified locations have been assigned high, moderate and low rankings as to their potential for environmental impact. Rankings are based on previously identified contamination, the regulatory agency lists, and the reported type of business. In general, the sites were ranked according to the following criteria: high indicates soil contamination has been discovered on a property and remediation has not been completed; moderate indicates there is on-going remediation; and low indicates contamination has been removed from the property and clean-up has been completed or the type of business and regulatory agency list the property is identified on indicates a potential for contamination. A summary of the findings organized by geographic area is provided below.

For the purpose of the discussion below, the project corridor was reviewed from the west to east starting at Woodley Avenue and moving east to the North Hollywood Metro Rail station. From Woodley Avenue to Hazeltine Avenue both alternatives follow the course of the SP Burbank Branch. At Hazeltine Avenue the project corridor diverges to either an alignment continuing along the SP Burbank Branch (Alternatives 1, 6, and 11) or along Oxnard Street and Lankershim Boulevard (Alternative 2). The locations of the actual or potentially contaminated sites along the alignments and their corresponding site location numbers are shown on Figure 4-10.3 and listed in Table 4-10.3.

(1) Woodley Avenue to Sepulveda Boulevard-Alternatives 1, 2, 6, and 11

Light industrial, warehouse operations, retail gasoline service stations, automotive repair facilities and retail stores exist adjacent to the segment from Woodley Avenue to Sepulveda Boulevard along the project corridor. North of this is commercial development and low density residential development. Locations 1 through 6 pertain to this segment.

Based on either known or potential contamination, the locations that appear to be of most significance are the Arco service station (location 3), the Sepulveda Air National Guard (location 2) and the Chevron Van Nuys Terminal (location 4).



SOURCE: LAW/CRANDALL, 1997

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-10.3
Potential Hazardous Materials Site Location Map

Table 4-10.3: Hazardous Materials Sites in the San Fernando Valley East-West Transportation Corridor

Map No.	Facility	Address	Potential Impact Ranking	Status *
1	German Auto Repair	16039 Victory Boulevard	Low	1
2	Sepulveda Air National Guard	15980 Victory Boulevard	High	1
3	Arco Service Station	15711 Victory Boulevard	High	3
4	Chevron Van Nuys Terminal	Oxnard Street and Sepulveda Boulevard	High	1
5	Mobil Oil Station	6100 Sepulveda Boulevard	Low	3
6	Vons Truck Center	Oxnard Street and Sepulveda Boulevard	Low	3
7	Duralgo Painting	Vesper Avenue and Aetna Street	High	1
8	Standard Oil Tank Facility (former)	Cedros Avenue and Aetna Street	Moderate	2
9	L.T. Sawyer Bulk Fuel Facility	Hazeltine Avenue and Aetna Street	High	1
10	Van Nuys Maintenance Yard	15145 Oxnard Street	High	1
11	Bob Faeber Volkswagen	6115 Van Nuys Boulevard	High	1
12	Oxnard/Van Nuys Disposal Site	Oxnard Street and Van Nuys Boulevard	Moderate	2
13	Terry Lumber Storage Yard	5360 Lankershim	High	1
14	Chandler Cleaners	11223 Chandler Boulevard	High	1
15	Mobil Oil	11680 Burbank Boulevard	High	1
16	Unocal	11407 Lankershim Boulevard	High	1
17	Telesis Auto Works	11434 Burbank Boulevard	Low	3
18	Fire Station 102	13200 Burbank Boulevard	Low	3
19	Lankershim Corporation	13218 Lankershim Boulevard	Low	3
20	Karsteck Imports	13250 Burbank Boulevard	Low	3
21	Serlin Trust	13321 Burbank Boulevard	Low	3
22	Capitol Insulation Contractors	11211 Chandler Boulevard	Low	3
23	Unocal #9638	12444 Chandler Boulevard	Low	3
24	Backstage Car and Truck Rental	5401 Lankershim Boulevard	Low	3
25	Mobil Oil Station	6000 Lankershim Boulevard	High	1
26	Unocal Station	5969 Laurel Canyon Boulevard	High	1
27	Pep Boys #21	5356 Lankershim Boulevard	Low	3
28	Rick's Texaco	5809 Lankershim Boulevard	Low	3
29	Robertson Toyota	5838 Lankershim Boulevard	Low	3
30	Gary Buick	5949 Lankershim Boulevard	Low	3
31	North Hollywood Subaru	5969 Lankershim Boulevard	Low	3
32	Mark West, Inc.	6039 Lankershim Boulevard	Low	3
33	Glo Tone Cleaners	12508 Oxnard Street	Low	3
34	Terry Lumber Storage Yard	5360 Lankershim Boulevard	High	1
35	Mobil Oil Station	11680 Burbank Boulevard	Low	3
36	Unocal Station	11407 Burbank Boulevard	Low	3
37	Backstage Car and Truck Rental	5401 Lankershim Boulevard	Low	3
38	Crossroads Mazda	5430 Lankershim Boulevard	Low	3
39	Allan Kane Ford	5500 Lankershim Boulevard	Low	3

Status Key: 1) Known contamination 2) Ongoing remediation 3) Operating permit; no known contamination

Source: Law/Crandall, 1997.

(2) Sepulveda Boulevard to Hazeltine Avenue-Alternatives 1, 2, 6, and 11

Commercial warehouses, automotive repair facilities, rental yards, car dealerships, storage yards, and retail stores exist along the segment from Sepulveda Boulevard to Hazeltine Avenue. Scattered residential properties exist to the north of Aetna Street and south of Oxnard Boulevard. Locations 7 through 12 pertain to this segment.

The locations that appear to be of most significance are the Van Nuys Maintenance Yard (location 10), the Oxnard/Van Nuys disposal site (location 12), and the L.T. Sawyer Bulk Fuel Facility (location 9).

(3) Hazeltine Avenue to Laurel Canyon Boulevard-Alternatives 1, 6, and 11

The properties along this segment consist primarily of light industrial, retail, gasoline service stations, automotive facilities, and commercial. Residential properties are typical to the north and south of these properties. Locations 13 through 24 pertain to this segment.

The properties that appear to be of most significance are Terry Lumber Storage Yard (location 13) and Chandler Cleaners (location 14).

(4) Hazeltine to North Hollywood Station-Alternative 2

The properties along this segment consist primarily of light industrial, automotive facilities, retail, gasoline service stations, and commercial warehouses. Residential properties are typical to the north and south of these properties. Locations 25 through 33 pertain to this segment.

The properties that appear to be of most significance are the Mobil station (location 25) and the Unocal station (location 26).

(5) The WOW Segment (Laurel Canyon Boulevard to the North Hollywood Station) Alternatives 1, 6, and 11

The properties along this segment consist of residential and commercial properties, light industrial facilities, and automotive facilities. Locations 34 through 39 pertain to this segment.

The properties that appear to be most significant are the Terry Lumber Storage Yard (location 34), the Mobil Oil service station (location 35), and the Unocal service station (location 36).

4-10.2 Impact Analysis Methodology and Criteria

Potential impacts associated with geotechnical considerations have been identified by reviewing available published and unpublished geotechnical literature pertinent to the proposed project. These include but are not limited to the safety elements of the general plans for the city and county of Los Angeles, aerial photographs, Alquist-Priolo Earthquake Fault Zone Maps, geologic and topographic maps and other publications by the California Division of Mines and Geology, U.S. Geological Survey, California Division of Oil and Gas, Wildcat Oil and Gas Maps, and available geotechnical and environmental reports pertinent to the project. Additionally, an updated environmental records search has been performed to identify sites along the proposed alignment that have known soil and/or groundwater contamination or a potential to have contamination.

The criteria for determining if potential geotechnical impacts are significant are as follows:

- Disruption of a unique geologic feature of unusual scientific value or significant landform alteration.
- Loss of the availability of mineral resources that would be of future value.
- Exposure of people or property to geologic hazards (including surface fault rupture, landslides or mudflows, subsidence or other types of ground failure).
- Exposure of people or property to seismic hazards (such as ground shaking, liquefaction, lateral spreading, and seismic settlement).
- Increases in wind or water erosion and changes in topography or ground surfaces.
- Exposure of people or property to existing soil or groundwater contamination.
- Accumulation of hazardous gases.

4-10.3 Geotechnical Impacts

The following section discusses the potential geotechnical impacts of the East Valley Alternatives during the operational phase of the project. Neither the No Build or the TSM Alternatives would introduce new physical improvements which would be subject to potential impacts associated with soil conditions or seismicity. Neither of these two alternatives would require earth movement, and therefore, landform alteration, loss of mineral resources, and exposure to hazardous materials would not occur. As a result, the discussion presented below is focused on the rail alternatives.

a. Landform Alteration

The proposed rail alignments traverse a relatively flat to locally gently sloping portion of the San Fernando Valley and topographic relief across the project corridor is very low. The deep bore, cut/cover, or open air segments of the proposed alignments would not be visible at the ground surface and there would be no significant landform alteration resulting from their construction. Additionally, there would be no significant landform alteration associated with the aerial guideway and at-grade segments of the proposed alignments.

Locally, retained fill slopes up to 15 feet high could occur where the alignments transition between aerial guideway and at-grade segments. Fill slopes are planned for Alternatives 1a, 1b, 1c, 2, and 11 at the following locations:

- Between Blewett Avenue and Densmore Avenue.
- Between Erwin Street and Sepulveda Boulevard
- Between Tyrone Avenue and Sylmar Avenue.

Alternative 1d includes the previous locations, and the additional following location:

- Between Gentry Avenue and Radford Avenue.

These retained fill slopes would extend along the track for up to 800 feet. Although there would be changes in the local landscape, the retained fill slopes would not be of sufficient magnitude to constitute a significant impact on the existing landforms.

b. Loss of Mineral Resources

There are no known petroleum resources in the vicinity of the project corridor. All of the proposed alternatives are underlain by geologic materials such as sand and gravel that might be considered mineral resources, which could be used as construction aggregate. However, these materials have not been previously mined in the area because they are generally deep and overlain by finer grained materials so as not to be considered suitable for construction materials. Additionally, the low mineral value of these materials and their proximity to fully urbanized areas (predominantly residential areas) makes mining these materials uneconomical. No significant loss of mineral resources is anticipated as a result of the project.

c. Soils

(1) Subsidence

Subsidence of the ground surface can result from several causes including extraction of petroleum, gas, and groundwater, and from on-going tectonic activity. According to a study by Weber (1980), there is documented subsidence in the easternmost portion of the proposed Chandler Alignment (east of Tujunga Avenue). This subsidence is attributed to either groundwater withdrawal or ongoing tectonic folding in the subsurface (on-going downwarping of the San Fernando Valley). However, the subsidence has occurred over a very broad area and there has been no reported damage to surface structures associated with the subsidence.

If the subsidence is related to past groundwater extraction, it is unlikely to be occurring now or in the future because groundwater withdrawal in the San Fernando Valley is currently regulated so that the groundwater levels will not significantly change over time. Alternately, the reported subsidence could be related to active tectonic folding at depth; however, this subsidence would occur over a very broad area and has not been demonstrated to adversely affect any existing subsurface or surface structures.

There is no evidence that subsidence is currently occurring in the vicinity of the proposed alignments; subsidence is not expected to have a significant impact on the proposed alignments.

(2) Settlement

Based on previous geotechnical investigations along the proposed alignments, poorly compacted fills or soft surficial soils that are unsuitable for foundation support occur locally along the proposed aerial guideway (portions of all alternatives) and at-grade segments (Alternatives 6 and 11) of the proposed project. There is also a potential for compressible soils at depth along the entire length of the proposed alignments. The potential for settlement of the unsuitable foundation soils and the resulting structural damage to MTA structures could be a significant impact during the operational phase of the project prior to mitigation.

(3) Slope Stability

Localized retained fill slopes up to 15 feet high are required where the project corridor transition between aerial guideway and at-grade segments. The locations of these slopes are discussed in Section 4-10.3a. Additionally, retained cut slopes are planned at transitions between at-grade segments and cut/cover, open air, and deep bore segments. If the cut and fill slopes are not properly designed, the potential for gross instability of these slopes could have a significant impact on the proposed alignments.

(4) Corrosive Soils

Based on previous investigations, most of the soils encountered in explorations along the proposed alignments were found to be non-corrosive to mildly corrosive to concrete (sulfate content ranging from 32 to 187 ppm, chloride content ranging from 92 to 505 ppm, and pH ranging from 6.8 to 7.4). Therefore, corrosive soils are not expected to have a significant impact on the proposed alignments.

d. Seismicity

(1) Surface Fault Rupture

The closest fault to the proposed alignments is an unnamed fault previously mapped by Weber (1980). The fault trace trends in an east-northeast direction, south of and subparallel to the Chandler Alignment (Alternatives 1, 6 and 11) from about Tujunga Wash on the west to about Cahuenga Boulevard on the east. The fault does not cross the proposed alignments but is mapped as traversing the North Hollywood Station, approximately 240 feet south of the northern contract limit of the Red Line North Hollywood Station.

The location and the activity level of the fault is not well defined, but based on aerial photographs and geomorphic evidence, surface fault rupture is not considered a significant impact along the proposed alignments.

(2) Ground Shaking

Significant ground shaking could occur along the proposed alignments as a result of earthquakes on any of the nearby known or unknown active or potentially active faults. Potential ground shaking could result in moderate to strong ground accelerations (0.22 to 0.69g) in the vicinity of the proposed alignments as indicated in Table 4-10.2. This could result in structural damage from localized liquefaction (where perched groundwater is present) and seismic settlement where loose soils are locally present.

(3) Liquefaction and Seismically Induced Settlement

Liquefaction potential is greatest where the groundwater level is shallow, and loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases as grain size and clay and gravel content increase. As ground acceleration and shaking duration increase during an earthquake, liquefaction potential increases.

There are several areas along the proposed alignments where the groundwater is locally perched above the regional groundwater table or has been relatively shallow in the past. The *County of Los Angeles Safety Element* (1990) has identified the following portions of the proposed alignments as being within potentially liquefiable areas:

- Between Woodley Avenue and Woodman Avenue (all alternatives).

- Between approximately Hatteras Street and Tujunga Wash flood control channel (along Chandler Boulevard in the vicinity of Los Angeles Valley College; Alternatives 1, 6, and 11).

Additionally, Reconnaissance Seismic Hazard Maps recently published by the California Division of Mines and Geology (1996) indicate that the entire corridor is within "areas that may contain liquefiable materials." These maps were prepared to identify potentially seismically unstable areas. However, as indicated in the publication, these maps "only indicate areas where there is an increased likelihood of encountering sites susceptible to liquefaction; the maps should not be used to regulate land use or they should not be used as a substitute for site-specific geotechnical investigations." As discussed below, a preliminary site-specific investigation was performed for the project.

A preliminary geotechnical investigation was performed along the proposed alignments in 1993. The results of the investigation indicate that potentially liquefiable layers of silty sands and poorly graded sands in conjunction with localized perched groundwater occur along both the Chandler and Oxnard alignments. The potentially liquefiable layers were estimated to be up to 15 feet thick and are typically between 30 to 55 feet deep (ETC, 1993). The areas with a potential for liquefaction (which would pertain to all alternatives) identified include:

- Vicinity of Woodley Avenue
- Sepulveda Station
- Van Nuys Station

All alternatives in these areas are planned as aerial or at-grade segments. Sepulveda and Van Nuys stations are planned as aerial structures. Liquefaction could be a significant impact to the proposed alignments in these areas.

Liquefaction is not considered to be a significant impact east of Tujunga Wash flood control channel along either the Chandler or Oxnard alignments due to the deep groundwater in this area (greater than 100 feet beneath the existing ground surface) and the lack of observed perched groundwater.

Seismic settlement is often caused by loose to medium-dense granular soils densified during ground shaking. Uniform settlement beneath a given structure would cause minimal damage; however, because of variations in distribution, density, and confining conditions of the soils, seismic settlement is generally non-uniform, and therefore can cause serious structural damage. Dry and partially saturated soils as well as saturated granular soils are subject to seismically-induced settlement. Generally, differential settlements induced by ground failure such as liquefaction, flow slides, and surface ruptures would be much more severe than those caused by densification alone.

Based on the previous geotechnical investigations along the proposed alignments, there may be localized layers of soils subject to seismic settlement along the entire length of the proposed alignments. Therefore, seismic settlement could have a significant impact on the proposed alignments.

(4) Seismically Induced Landslides

Seismically-induced landslides and other slope failures are common occurrences during or soon after earthquakes. However, the proposed alignments are in a gently sloping area, and no landslides have been identified in the vicinity of the proposed alignments. Therefore, seismically-induced landslides are not anticipated to have a significant impact on the proposed deep bore segments or aerial guideway segments of the project corridor (the entire length of the Oxnard Alignment and Alternatives 1a and 1d of the Chandler Alignment). However, permanent graded slopes will exist as part of the open air segment (Alternatives 1c and 11a of the Chandler Alignment between Hazeltine Avenue and Colfax Avenue) or the open cut or cut/cover segments (Alternatives 1b and 11b of the Chandler Alignment between Hazeltine Avenue and Colfax Avenue). There is a potential for instability of the permanent slopes adjacent to the proposed cut/cover and open air segments of the Chandler Alignment. Therefore, slope instability could significantly impact the proposed alignments.

(5) Earthquake-Induced Inundation

Earthquake-induced inundation is caused by the failure of dams and/or reservoirs due to earthquakes. Based on a review of the *Los Angeles County Safety Element* (1990), the proposed alignments are within a potential inundation area for Los Angeles Dam, Lopez Dam, and Hansen Dam. However, these dams/reservoirs, as well as others in California, are continually monitored by various governmental agencies (such as the State of California Division of Safety of Dams and the U.S. Army Corps of Engineers) to guard against the threat of dam failure. The possibility of dam failures during an earthquake has been addressed by the California Division of Mines and Geology in the earthquake planning scenarios for a magnitude 8.3 earthquake on the San Andreas fault zone (Davis et al., 1982) and a magnitude 7.0 earthquake on the Newport-Inglewood fault zone (Toppozada et al., 1988). As stated in both reports, catastrophic failure of a major dam as a result of a scenario earthquake is unlikely. Current design and construction practices, and ongoing programs of review, modification, or total reconstruction are intended to ensure that all dams are capable of withstanding the maximum credible earthquake (MCE) for the site. Therefore, earthquake-induced inundation is not expected to have a significant impact on the Oxnard or Chandler Alignments.

(6) Seiches

Seiches are wave oscillations in an enclosed or semi-enclosed body of water as a result of ground shaking. These waves can overtop dams or reservoirs and flood down gradient areas. A review of topographic maps by the U.S. Geological Survey indicate there are no water retaining structures located immediately up gradient of the proposed alignments. Any water that might over top other water retention structures such as Hansen Dam, Lopez Dam, or Los Angeles Dam is not considered to be a potential hazard to any portion of the proposed alignments, due to the great distance of these dams to the proposed alignments (over 6 miles). Therefore, seiches are not anticipated to have a significant impact on the proposed alignments.

e. Hazardous Materials

Impacts associated with hazardous waste affect human health and wildlife. A hazardous waste impact would occur when project operational activities encounter hazardous wastes, expose the public to hazardous wastes, or increase the likelihood of hazardous waste migration. Limited impacts from operational activities along the proposed Chandler and Oxnard alignments are anticipated, and would include public exposure to soil and/or groundwater contamination and accumulation of gases in operating deep bore, cut/cover, and open air segments.

(1) Exposure to Contaminated Soil and/or Groundwater

There is a potential for public exposure to contaminated soil and/or groundwater due to operational activities in the proposed deep bore and cut/cover segments of the proposed alignments and in the areas of cut/cover stations. In these areas (affecting portions of all alternatives, except 6a), or in other areas where volatile organic compound (VOC) contaminants are likely to collect, subway operations could encounter pockets of contamination. VOC contaminants in the soil and/or groundwater in the immediate vicinity of subway operations could potentially infiltrate through cracks in the concrete lining or joints of the deep bore and cut/cover segments of the proposed alignments and cut/cover stations.

The potential for public exposure to contaminated soil and/or groundwater along the open air (Alternatives 1a, 6, and 11), aerial guideway (portions of all alternatives), and at-grade segments (westernmost portions of all alternatives; eastern portions of Alternatives 6 and 11) of the proposed alignments is anticipated to be not significant.

(2) Accumulation of Gases

Based on California Division of Oil and Gas Well maps, the proposed alignments are not within an oil and gas field. However, there is a remote potential for unreported wildcat oil and gas wells to exist along the proposed alignments. If any unreported wells exist in the immediate vicinity of the proposed alignments, there would be a potential for accumulation of flammable and toxic gases to occur in deep bore and cut/cover segments of the proposed alignments or other high or low areas where gases are likely to collect such as cut/cover stations.

The potential for public exposure to the accumulation of gases along the open air, aerial guideway, or at-grade segments of the proposed alignments is not significant.

4-10.4 Mitigation Measures

a. Landform Alteration

Many of the proposed alignments would be underground for up to 3½ miles of their 6½-mile total length. The aerial guideway and at-grade segments would be located and designed to minimize landform alteration including fill slopes. No long-term significant impacts to existing landforms are anticipated. Therefore, no mitigation measures are necessary.

b. Loss of Mineral Resources

Significant loss of mineral resources is not anticipated. Therefore, no mitigation is necessary.

c. Soils

(1) Subsidence

Subsidence is not expected to have a significant impact on the proposed alignments. Therefore, no mitigation is necessary.

(2) Settlement

Based on previous geotechnical investigations along the proposed alignments, there are compressible soils near the surface in localized areas along the entire length of both the proposed Chandler and Oxnard alignments.

Piles or caissons may be required to support the aerial stations and aerial guideway segments of the proposed alignments due to the presence of soft, compressible soils and high structural loads. Different pile types will be required in different areas because of the heterogeneous nature of the soils underlying the proposed aerial segments of the project alignments. Additional detailed soil information and design data will be required before site specific pile design can be provided. A comprehensive geotechnical investigation should be performed along the aerial guideway and at-grade segments of the Chandler and Oxnard Alignments to better delineate the presence of soils unsuitable for foundation support.

The details of mitigation measures to address settlement along the proposed alignments will be developed in the design phase of the project using proper engineering design and conformance with current building code requirements. Potential impacts that could affect the proposed alignments as a result of settlement can be reduced to a level of nonsignificance with implementation of these measures.

(3) Slope Stability

A comprehensive geotechnical investigation will be necessary prior to final design of proposed slopes or retaining walls. Retained fill embankments should be constructed by placing compacted fill on subgrade prepared in conformance with current Uniform Building Code requirements. Embankments should consist of nonexpansive materials compacted to a minimum of 90 percent relative compaction. Unretained fill slopes should be graded no steeper than 2:1 (horizontal to vertical gradient).

Retained fill embankments will require construction of retaining walls up to approximately 15 feet high. Pile foundations may be required for the retaining wall foundations. Retaining wall and pile design should incorporate site specific soil data from the comprehensive geotechnical investigation. Alternately, near vertical fill slopes may be constructed by using reinforced earth materials. Typically, these types of slopes are constructed by using non-expansive soils and geosynthetic fabric with concrete facing to protect the slope face.

Localized retained cut slopes will require permanent retaining walls or other means of support. An alternative would be to construct retaining walls using soil nails. Soil nail walls are constructed by installing closely spaced, small diameter grouted rebars perpendicular to the vertical slope face. A concrete face is then placed on the slope face to protect against sloughing and raveling.

Mitigation for slope instability due to unfavorable soil conditions will be achieved in the design phase of the project. A comprehensive geotechnical investigation will be necessary prior to final design of proposed slopes (cut or fill) or retaining walls. Potential impacts that could affect the proposed alignments as a result of slope instability can be reduced to a level of nonsignificance with proper engineering design and conformance with current building code requirements.

(4) Corrosive Soils

Previous geotechnical investigations along the proposed alignments indicate that the soils are non corrosive or mildly corrosive. However, additional corrosivity tests (including corrosivity to metals) should be performed along the selected alternative prior to construction to determine the appropriate design requirements needed for proposed structures, particularly the underground stations and concrete tunnel liners. The potential impact of the corrosivity of the soils along the proposed alignment can be mitigated to a level of non-significance by the use of the appropriate corrosion protection measures.

d. Seismicity

(1) Surface Fault Rupture

The closest fault to the proposed alignments is an unnamed fault previously mapped by Weber (1980). A comprehensive fault rupture hazard investigation should be performed to determine if the fault exists. If it is determined that the fault exists, the investigation should determine the activity level of the fault and if the fault traverses the proposed alignments.

(2) Ground Shaking

Mitigation of the potential effects of ground shaking will be achieved in the design phase of the project. All stations, tunnels, aerial guideways, and other critical structural elements will be designed and built to resist strong ground motions approximating the Maximum Design Earthquake (MDE) and the associated ground accelerations expected to occur in the vicinity of the proposed alignments. Potential impacts that could significantly affect the proposed alignments as a result of ground shaking can be reduced to a level of nonsignificance with proper engineering design and conformance with current building code requirements.

(3) Liquefaction and Seismically Induced Settlement

All of the effects of liquefaction or seismic settlement due to ground shaking can be mitigated to a level of nonsignificance by proper engineering design and construction in conformance with current building code regulations. All stations, tunnels, aerial guideways, and other critical structural elements will be designed and built to resist strong ground motions approximating the MDE and the associated ground accelerations expected to occur in the vicinity of the proposed alignments. Prior to design and construction of the proposed project, a comprehensive geotechnical investigation should be performed to delineate specific areas of potential liquefaction and seismic settlement and to provide site specific detailed information for foundation design. If liquefiable soils or soils subject to seismic settlement are found, more conservative site preparation and foundation design measures would be taken. Depending on the specific conditions encountered, such measures would include compaction of the soils, permanent lowering of the groundwater table, special foundations such as caissons or piles, and deepening the deep bore segments to avoid problematic soils. The potential for liquefaction or seismic settlement adversely impacting the proposed alignments can be mitigated to a level of nonsignificance by proper engineering design and construction in conformance with current building codes.

(4) Seismically Induced Landslides

There is a potential for instability of permanent slopes associated with the open air and cut/cover segments of the proposed alignments as a result of ground shaking. Permanent slopes should be designed to withstand the maximum ground accelerations anticipated to occur beneath the proposed alignments. The potential for instability of any permanent slope can be mitigated to a level of non significance by proper engineering design and construction. Methods to improve the stability of permanent slopes might include retaining walls, permanent tie-back systems, soil nailing, or permanent shoring systems such as soldier piles and lagging. Mitigation of potential slope instability will be achieved in the design phase of the project. Any potential impacts from groundshaking can be mitigated to a level of nonsignificance by proper engineering design and conformance to current building code requirements.

(5) Earthquake-Induced Inundation

Earthquake-induced inundation is not expected to have a significant impact on the proposed alignments. Therefore, no mitigation is necessary.

(6) Seiches

Seiches are not expected to have a significant impact on the proposed alignments. Therefore, no mitigation is necessary.

e. *Hazardous Materials*

(1) Exposure to Contaminated Soils and/or Groundwater

There is a potential for public exposure to contaminated soil and/or groundwater due to operational activities along the proposed deep bore and cut/cover segments of the proposed alignments and cut/cover stations. Mitigation of the potential for public exposure will include removal of existing contamination during the construction phase of the project. A high density polyethylene (HDPE) barrier should be used in critical areas to prevent the migration of hydrocarbons from the surrounding soil into the subway segments. Procedures should be followed for sealing potential leaks in the membrane by use of collars, clamps and gaskets.

The potential for public exposure to contaminated soil and/or groundwater (and associated vapors) along the deep bore and cut/cover segments of the proposed alignments or at cut/cover stations can be mitigated to a level of nonsignificance by proper engineering design and construction. Assuming implementation of these mitigation measures, impacts would be reduced to below the level of significance.

(2) Accumulation of Gases

Proper engineering design and subway construction should be performed to prevent accumulation of potential flammable or toxic gases in or near operating deep bore or cut/cover segments, cut/cover stations, or other areas where gases are likely to collect. Mitigation measures such as the following would be used to reduce the potential impacts of gas accumulation to a level of nonsignificance:

- Providing natural ventilation and ventilation created by train movements.
- Installation of emergency ventilation fans.

- Following MTA procedures by control room operators for the activation of emergency ventilation fans.

- Collecting and testing of air samples on a continuous basis from underground areas or other areas where gases are likely to collect to monitor flammable and toxic gases before harmful or explosive concentrations can accumulate.

Assuming implementation of these mitigation measures, impacts would be reduced to below the level of significance.

4-11 BIOLOGICAL RESOURCES

4-11.1 Regulatory Setting

a. Endangered Species Regulation

The Federal Endangered Species Act of 1973 (16 U.S.C. §§ 1531-1543) provides a program for the conservation of endangered and threatened species and for the ecosystems upon which they depend. Section 7(a)(2) of the Act requires every federal agency, in consultation with and with the assistance of the Secretary of the Interior or of Commerce, to insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species of fish, wildlife, or plants (listed species) or results in the destruction or adverse modification of critical habitat.

The California Endangered Species Act (CESA) is modeled after the Federal Endangered Species Act. Like the federal Act, CESA regulates activities that affect species listed as endangered or threatened. CESA prohibits the taking of any species listed by the Fish and Game Commission. The California Department of Fish and Game (CDFG) administers the Act. The CDFG has interpreted the term "take" to include habitat disturbance.

CESA requires that state agencies consult with CDFG to ensure that their actions do not jeopardize a listed species. Parallel provisions of the California Environmental Quality Act (CEQA) require that local agencies consult with CDFG when a project may have an adverse impact on a listed species.

b. Clean Water Act and California Streambed Alteration Agreement

Section 404 of Federal Water Pollution Control Act (referred to as the Clean Water Act) requires a permit from the U.S. Army Corps of Engineers (USACOE) for a direct discharge of dredged material or grading which could lead a discharge to jurisdictional wetlands or waters of the United States. A Memorandum of Understanding between the USACOE, U.S. Environmental Protection Agency (USEPA), Federal Highway Administration, Federal Transit Administration, U.S. Fish and Wildlife Service, and Caltrans (signed February 1994) addresses procedures and information needed during the environmental process and culminating in a permit.

CDFG has jurisdiction over all lands within the 100-year floodplain, according to Section 1603 of the Fish and Game Code. A State of California, Department of Fish and Game Code Section 1603 Streambed Alteration Agreement is required for any impacts to wetland, streamside, or riparian habitat due to the project. All streamside habitat within the floodplain in areas that are delineated as wetlands is regulated by this legislation. CDFG usually marks its jurisdictional limit at the top of a stream or lake bank or at the outer edge of the riparian vegetation, whichever is wider. Since riparian habitats do not always support wetland hydrology or hydric soils, federal Section 404 wetland boundaries sometimes include only portions of the riparian habitat adjacent to a river, stream,or lake. Therefore, jurisdictional boundaries under Sections 1603 may encompass an area greater than under Section 404.

4-11.2 Existing Conditions

a. *Study Area Fauna*

Wildlife in the San Fernando Valley East-West Transportation Corridor Study area is generally limited to species that have adapted to a disturbed urbanized environment. Examples include pigeons, gulls, mockingbirds, scrub jays, possums, and house mice.

An exception to this is the Sepulveda Basin at the west end of the East Valley area where wildlife areas have been established that provide habitat for a variety of species. Habitats include agricultural fields and riparian areas located along basin drainages and wildlife areas. Species occurring within the Sepulveda Basin include desert cottontail, raccoon, striped skunk, and gopher snakes. In addition, more than 200 species of birds including waterfowl, songbirds, and raptors have been observed within the basin.

Species observed in the vicinity of the SP ROW (now officially MTA ROW) within the Sepulveda Basin include scrub jay, mourning dove, fox squirrel, and western fence lizard.

b. *Study Area Flora*

The Los Angeles region is primarily urbanized and dominated by paved surfaces and landscaping. Typical of a Mediterranean climate, the region is arid with highly seasonal rainfall occurring primarily in winter. Native vegetation in the San Fernando Valley area has been largely replaced by urban landscaping and exotic weedy species. Native vegetation occurs on hillsides surrounding the valley as well as within the Sepulveda Basin. In undeveloped but disturbed urban areas, flora consist of native and non-native species that are tolerant of disturbances.

Surveys that were conducted along the proposed East Valley alignments did not reveal any native plant communities. Significant landscaping was observed along the alignments including eucalyptus trees along the SP ROW adjacent to Chandler Boulevard.

A survey was also conducted along a drainage ditch located south of the SP ROW within the Sepulveda Basin. The ditch was dominated by ruderal species such as annual grasses, Russian thistle, common sunflower, and tree tobacco. Also located within the drainage ditch were several ash and California walnut trees.

c. *Threatened and Endangered Species*

The Natural Diversity Data Base (NDDB) published by the CDFG listed four species, the California gnatcatcher (*Polioptila californica*), San Diego horned lizard (*Phrynosoma coranatum blainvillei*), southwestern pond turtle (*Clemmys marmorata pallida*), and Plummer's mariposa lily (*Calochortus plummerae*), as having occurred in the vicinity of the East Valley alignments. The San Diego horned lizard and California gnatcatcher both inhabit coastal sage scrub habitats. The southwestern pond turtle inhabits permanent or nearly permanent bodies of water. Plummer's mariposa lily, is found in coastal sage scrub, chaparral, grassland, and woodland habitats.

Appropriate habitat for these species was not found within the immediate vicinity of any of the East Valley alignments. The southwestern pond turtle could occur within riparian areas of the Sepulveda Basin, outside the immediate project area.

4-11.3 Impact Analysis Methodology and Impact Evaluation

Biological resources were identified based upon a literature review and field surveys along the proposed alternative alignments. Existing environmental documents completed for the proposed project was also examined. The NDDB was used to determine a list of sensitive species potentially inhabiting the study area.

Locations potentially supporting native plant communities were surveyed in greater detail. The sites were walked, allowing for the identification and mapping of plant communities. In addition, species identified in the field were noted. Particular attention focused on assessing the potential for the sensitive plants and animals in the project area. Vegetation was mapped on conceptual engineering plans developed for the project.

Impacts to biological resources (flora, fauna, vegetation communities and habitats) observed or expected in the project area are determined to be significant based upon sensitivity of the resource and the extent of the impact. Biological resources are generally considered sensitive if they are limited in distribution and their ecological role is critical within a regional and local context. Habitats supporting rare, endangered, or threatened species (as listed by the agencies that enforce the California or federal Endangered Species Acts) are also regarded as sensitive. In addition, habitats not inhabited by a sensitive species but meeting the following criteria are also determined to be sensitive:

- natural areas, communities and habitats of plant and animal species that are restricted in distribution;
- habitat that is critical to species or a group of species for feeding, breeding, resting, or migrating;
- buffer zones to protect significant resources; and
- corridors or areas that link significant wildlife habitats.

Biological resources for which impacts would generally be considered significant include vernal pools, oak woodlands, wetlands (all types), sage scrub, and native grasslands.

A significant impact to a sensitive resource may be direct or indirect. An impact is regarded as direct when the primary effects of the project result in loss of habitat that would cause a reduction in the density or diversity of biological resources within the region. An indirect impact occurs from a secondary effect of the project.

The extent of the impact to the resource must also be considered in determining its significance. For certain highly sensitive resources (e.g., an endangered species) any impact would be significant. Conversely, other resources that have a low sensitivity (e.g. species with a large, locally stable population but which may be declining elsewhere) could sustain a relatively large impact to habitat or population loss and not result in a significant impact.

Impacts during operation of the proposed project would be limited to secondary effects associated with light and glare, noise, and water quality impacts associated with runoff from project facilities.

4-11.4 Impacts to Biological Resources

Potential impacts during operation of East Valley alternatives, including both the rail and Enhanced Bus alternatives, could include an increase in noise levels during operation, lighting effects, and increased surface runoff. Potential impacts would be limited to the vicinity of the Sepulveda Basin, the only location of habitats, or potential species of concern. These potential impacts would be minor since significant habitats are not found in the vicinity of the of the East Valley alignment within the Sepulveda Basin. A significant increase in surface water runoff into the Sepulveda Basin is not anticipated since there would not be a substantial increase in impervious surfaces at the western terminus of the East Valley alignment. All of these potential impacts are considered less than significant.

4-11.5 Mitigation Measures

No mitigation measures are necessary.

4-12 WATER RESOURCES

4-12.1 Setting

Precipitation in the San Fernando Valley area is characterized by intermittent rain during winter months and negligible rain during summer months; 85 percent of the annual precipitation occurs from November to March. Although precipitation normally occurs as rainfall, winter snow is common in the higher elevations of the San Gabriel Mountains. As is typical of many semi-arid regions, the Los Angeles area experiences wide variations in monthly and seasonal precipitation totals.

Precipitation may flow into surface reservoirs or groundwater basins or run off to the ocean. Short-term water storage is in surface reservoirs and long-term storage is in groundwater basins. The amount of infiltration to groundwater basins is dependent upon the slope, the soil type, and the intensity and duration of rainfall. Because most of Los Angeles is either paved and developed or steeply sloped, a great deal of runoff occurs. Structures have been constructed to channel the water safely through inhabited areas to minimize flooding and to aid in recharging water storage units.

a. Surface Water Resources

The proposed San Fernando Valley East-West Transportation Corridor is located within the Los Angeles River Basin. The Los Angeles River Basin, as defined in the Basin Plan of the State Water Resources Control Board (SWRCB), involves the coastal areas of Los Angeles County south of the divide of the San Gabriel Mountains and Santa Susana Mountains, plus a small part of the coastal portion of Ventura County south of the divide of the Santa Monica Mountains. This basin is drained by four major streams: the Los Angeles River, the Rio Hondo River, Ballona Creek, and the San Gabriel River. Numerous tributaries discharge into these major drainages, most of which have intermittent flow. Except for a few rivers in the mountainous areas, most have been converted to flood control channels lined with concrete and stone rip-rap. Surface water resources located in the vicinity of the East Valley alternatives include the Los Angeles River and the Tujunga Wash (see Figure 4-12.1).

The Los Angeles River, which is channelized for flood control purposes, flows from the southwest side of the San Fernando Valley through the Los Angeles Coastal Plain to San Pedro Bay. It is located approximately 0.75 miles south of the western terminus of the East Valley alignments within the Sepulveda Basin. For the most part, the river drains the central Los Angeles area. From the beginning of the river in Calabasas in the San Fernando Valley to the opening between the Santa Monica and Verdugo Mountains, the Los Angeles River is called the Upper Los Angeles River Area (ULARA). In this area, the river is mainly an unlined channel. In some areas the sides are concrete but the bottom is cobble and sand. This permeable bottom allows some water in the river to permeate to underlying groundwater basins. The river is fed by Arroyo Calabasas, Bell Creek, Aliso Wash, Browns Canyon Wash, Chatsworth Creek, Pacoima Wash, Tujunga Wash, and Verdugo Wash. These washes and creeks are primarily concrete-lined within the urban areas.

SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1997.

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FIGURE 4-12.1
Surface Water Resources

The capacity of the Los Angeles River channel increases with distance from its origin. For example, the design capacity of the Los Angeles River increases from approximately 84,000 cubic feet per second (cfs) above the Arroyo Seco north of downtown Los Angeles to approximately 110,000 cfs in the vicinity of Firestone Boulevard in the city of South Gate. Flows in the Los Angeles River are highly variable. Dry season flows are comprised chiefly of excess irrigation water applied in urban areas, controlled release of reservoirs, and municipal and industrial wastewater including effluent from the Tillman and Los Angeles-Glendale sewage treatment plants. During the wet season, flows in the Los Angeles River are augmented by storm water runoff which varies with storm duration, intensity, and frequency. Storm water runoff from the first storm of the season tends to contain high levels of contaminants; contaminant levels decrease in the storm water runoff as the number of storms increase.

The Los Angeles River is partially regulated by the Sepulveda Dam and the Flood Control Basin. Both are owned by the U.S. Army Corps of Engineers, who constructed the facilities in 1941 following the passage of the Flood Control Act of 1936. The Sepulveda Dam is an earthfill structure consisting of an earth embankment with a concrete spillway near the center. The dam is 15,444 feet long and has a maximum height of 57 feet. The basin has a storage capacity of 17,425 acre feet at the crest of the raised spillway, which is located at an elevation of 710 feet above sea level.

Another major surface water resource in the vicinity of the project corridor is the Tujunga Wash. The Tujunga Wash drains an area of approximately 150 square miles, including approximately 75 square miles within the San Gabriel Mountains. The Tujunga Wash is regulated by the Hansen Dam and Flood Control Basin which is located approximately 5 miles north of the East Valley alignments. The Tujunga Wash crosses both East Valley alignments in the vicinity of Coldwater Canyon. Downstream of Hansen Dam, the wash is contained in a concrete lined channel. It joins the Los Angeles River in Studio City.

b. Groundwater

Fresh water permeates soils to varying degrees, depending on the composition of the soil. Coarsely grained, sandy, or gravelly strata comprise individual aquifers. These water-bearing deposits are readily capable of absorbing, storing, transmitting and yielding water to wells. Fine-grained sediments, such as silts and clays, are interbedded with the aquifers and form aquicludes which limit the transmission of water out of the aquifer. The aquicludes form discrete boundaries, and the aquifers may merge and coalesce with adjacent aquifers.

Groundwater basins are underlain by one or more permeable layers. Basin boundaries do not necessarily coincide with drainage basins and are derived from political boundaries, surface features, and/or geologic features such as faults, non-waterbearing rocks, and natural or artificial divides in the water table surface. The elevation of groundwater varies with the amount of pumping and the amount of recharge occurring. Groundwater basins may be recharged naturally through percolation of precipitation or artificially with imported or reclaimed water. Artificial recharge with imported water is practiced as a means of offsetting declining groundwater levels and providing storage for use in times of drought.

The East Valley alternatives are located within the lowland basin of the San Fernando Valley which is part of the ULARA. The ULARA encompasses all of the watershed of the Los Angeles River and its tributaries above the Arroyo Seco. There are four groundwater basins located in the ULARA: the San Fernando, Sylmar, Verdugo, and Eagle Rock basins (see Figure 4-12.2). The San Fernando Basin is the largest of the four. The East Valley alternatives are located entirely within the San Fernando Basin. Beneficial uses of groundwater in the San Fernando Basin are municipal water supply and agriculture.

Groundwater flow in the eastern San Fernando Valley is generally southeastward towards the Los Angeles River narrows. Local flow patterns are influenced by groundwater extraction for water supply.

Groundwater depths along the East Valley alternatives are greater than 100 feet below ground surface. Historically, groundwater in the eastern San Fernando Valley once occurred at much shallower depths; however, pumping from water-supply well fields in this area has resulted in declining water levels.

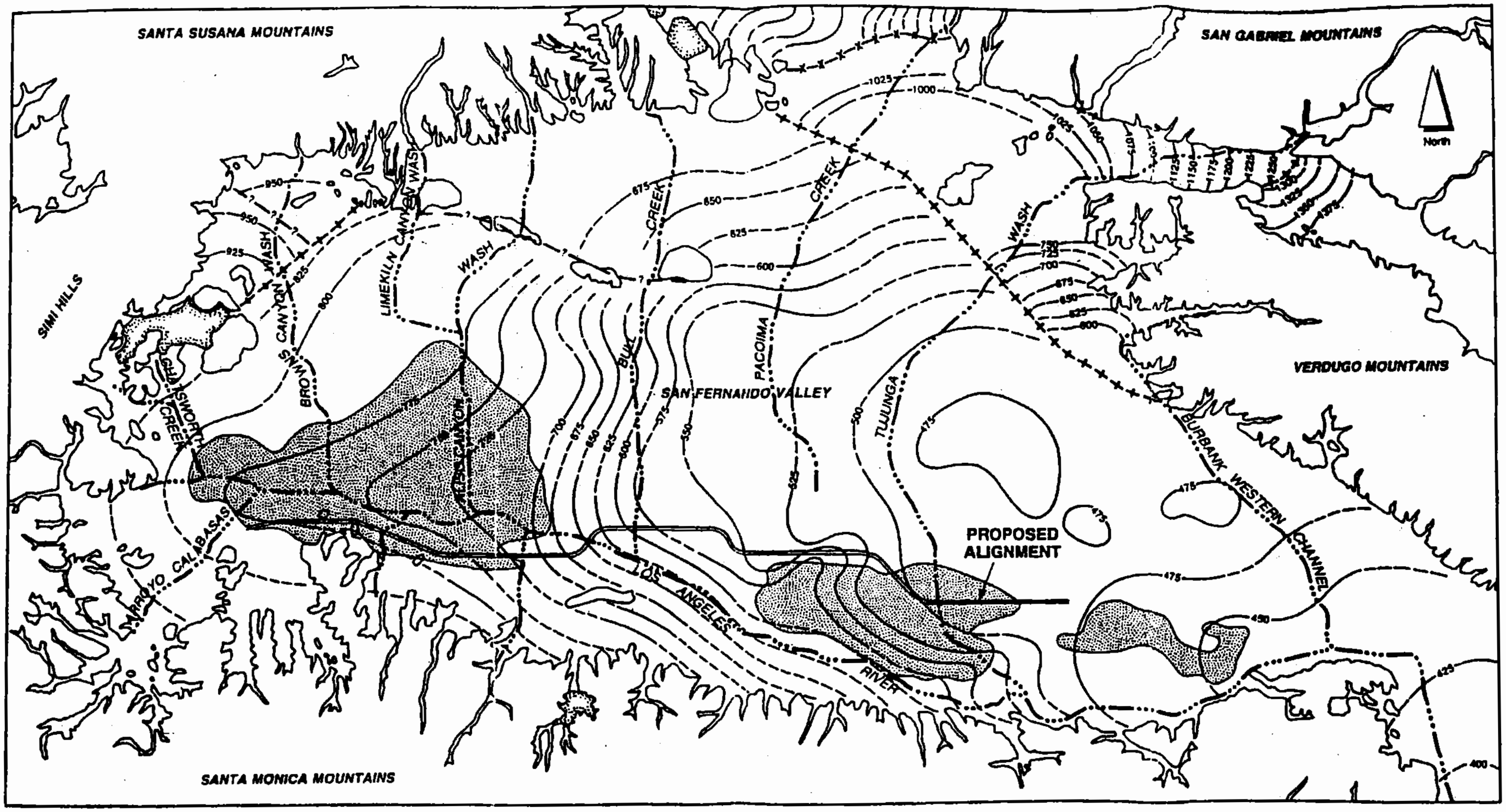
c. Floodplains

Two sources identifying floodplains within the project area were reviewed: Flood Insurance Rate Maps (FIRMs) prepared by the Federal Emergency Management Agency (FEMA) and the *Los Angeles County Drainage Area Review* (LACDA) study completed by the United States Army Corps of Engineers (USACOE).

A review of the FEMA FIRMs for the East Valley indicate that the proposed corridor is entirely contained within Zone C, which is defined as an area of minimal flooding. No 100- or 500-year floodplains identified by FEMA would be crossed.

According to the LACDA study, in the vicinity of the SP ROW (now officially MTA ROW), the area in the immediate vicinity of the Tujunga Wash is located within a 100-year floodplain (see Figure 4-12.3). The potential for flooding along the corridor diminishes to a 200-year floodplain between Whitsett Avenue and Radford Avenue and to a 500-year flood zone east of Radford Avenue. Along Oxnard Boulevard the area between Fulton and Goodland Avenue lies within the 100-year flood zone, while the area east of approximately Whitsett Avenue lies within the 500-year flood zone.

USACOE maps show average flood depths for relatively large areas to for the purpose of estimating the financial cost of potential flood damage and also to assist in determining the cost effectiveness of alternative flood control improvements considered in the LACDA study. The FEMA FIRMs consider more specific flood depths for smaller areas in order to make certain that the flood insurance rates one would pay are consistent with the risk one would face. Hence, between the two, the USACOE maps are likely to be more conservative, or identify greater risks, when compared to FEMA's maps.



Explanation:

—— 400 — — GROUNDWATER ELEVATION CONTOUR, IN FEET

-X-X-X-X-X-X- IMPEDIMENT TO GROUNDWATER FLOW

+ + + + + GROUNDWATER CASCADE

—— ? —— ? —— QUESTIONABLE GROUNDWATER IMPEDIMENT OR CASCADE

—••—••—••— MAJOR DRAINAGE

—— LIMIT OF YOUNG VALLEY FILL ALLUVIUM

AREAS OF HISTORICALLY HIGH GROUNDWATER, LESS THAN 10 FEET DEPTH

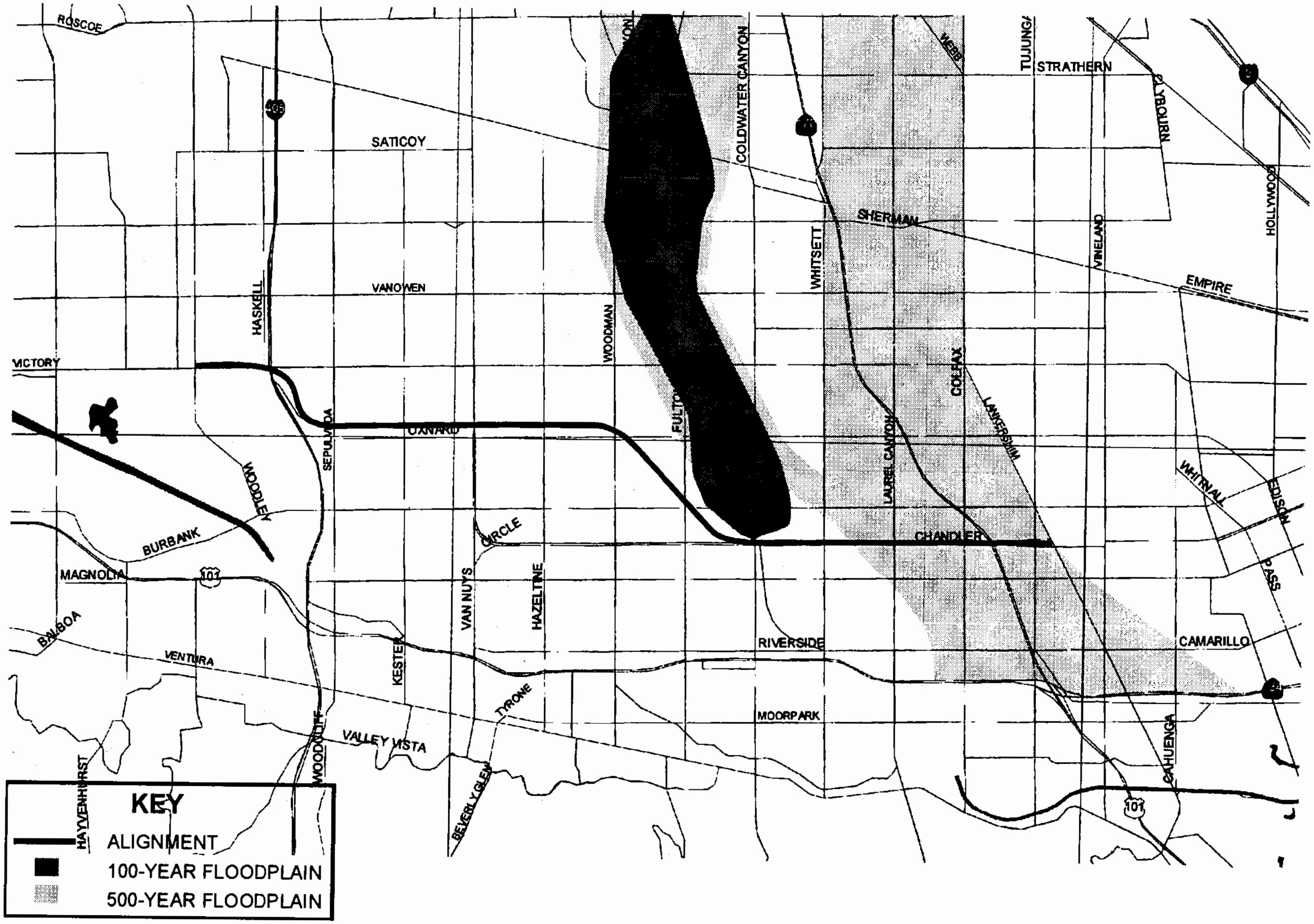
RESERVOIR

Sources:
1. Groundwater Data Adapted From ULARA Watermaster Report (May 1993).
2. Limits of Young Valley Fill Alluvium from Dibblee (1991 A,B,C,D; 1992 A,B,C,D).

0 2 4 Miles

Scale 1:100,000

FIGURE 4-12.2
Groundwater Contours Spring 1992



SOURCE: USACOE, 1986

San Fernando Valley
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FIGURE 4-12.3
Floodplains

According to the LACDA study, strong storms in 1980 revealed that the LACDA flood control system is seriously deficient in some areas of the main Los Angeles and Rio Hondo channels. On the Los Angeles River, problems were greatest downstream from downtown Los Angeles. This report recommended improvement of the Rio Hondo channel south from the Whittier Narrows Dam to its intersection with the Los Angeles River and then continuing southward on the Los Angeles River to San Pedro Bay. Improvements to the Tujunga Wash flood control channel were not proposed.

4-12.2 Impact Analysis Methodology and Evaluation Criteria

Operational impacts to surface waters were assessed with regards to degradation of water quality and changes in surface water flow. Effects on future water quality were estimated based on the potential for runoff to reach surface water resources and the types of pollutants anticipated. Anticipated impacts were examined with regards to applicable water quality standards and permit requirements.

Section 402 of the Clean Water Act regulates the discharge of pollutants to surface water bodies through National Pollutant Discharge Elimination System (NPDES) permits, which are administered by the State Water Resources Control Board and the nine Regional Water Quality Control Boards.

Previously prepared environmental and technical reports for the project were reviewed to determine the local groundwater setting.

Maps prepared by FEMA, as well as the LACDA study, were examined to determine the potential for floodplain impacts.

Project alternatives would have significant impacts during operation if the project would result in any of the following conditions:

- create storm water volumes that exceed the capacity of existing drainage facilities;
- deplete or contaminate a groundwater aquifer;
- place new development in areas susceptible to 100-year flooding;
- create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code.

4-12.3 Impacts on Water Resources

a. Surface Water Resources

The introduction of new impervious surfaces resulting from facility (parking lots, access roads) paving and construction would increase runoff and associated contaminants, potentially resulting in degradation of downstream water quality. Potential contaminants include oil and grease. The addition of hydrocarbons into an aquatic environment can have direct toxic affects on aquatic organisms. Hydrocarbons can also indirectly affect aquatic organisms by depleting dissolved oxygen during bacterial degradation. This impact would be greatest following the first significant rainfall of the season because long dry periods common to California allow greater accumulation of compounds on paved surfaces than during periods of more frequent rainfall. The highest concentration of these pollutants in surface waters occurs early (first flush) in a given rainfall event.

Water quality impacts associated with operation of a East Valley alternative (e.g., rail or Enhanced Bus) would be minor because the watershed within the San Fernando Valley is essentially urban, and the amount of new impervious surface that would be added and the resulting and additional runoff would be small as compared to the amounts in the watershed as a whole. The parking lots proposed at the station sites would be constructed on developed or paved surfaces, already having high runoff.

b. Groundwater

Since groundwater depths in the vicinity of the East Valley are greater than 100 feet below ground surface, groundwater is not anticipated to be significantly affected by operation of any of the East Valley alternatives. Once constructed, the East Valley alternatives would be separated from the water table and would have no significant effects on groundwater resources or beneficial uses of groundwater in the San Fernando Basin.

c. Floodplains

The Enhanced Bus alternative would not be significantly affected by floodplains since improvements would be limited to signal improvements and at-grade improvements to major arterials. Of the rail alternatives, alternatives 1a, 1b, and 2 would not encroach on floodplains identified in the USACOE *Los Angeles County Drainage Area Review* study. The remaining alternatives would encroach on floodplains as described below.

- From approximately Whitsett Avenue to the transition to deep bore tunnel, including the Laurel Canyon station, the alignment would be within a 500-year floodplain.

- The aerial portion of Alternative 1d would cross the 100-year floodplain in the immediate vicinity of the Tujunga Wash. In addition, the aerial and open air alignment, including the Laurel Canyon Station would be located within the 500-year floodplain east of Whitsett Avenue.

- The at-grade section of the alignment in the immediate vicinity of Coldwater Canyon Avenue would be located within the 100-year floodplain. From approximately Whitsett Avenue to the North Hollywood station the alignment would be located at-grade within the 500-year floodplain.

- The Laurel Canyon station would be located within the 500-year floodplain for Alternative 6b. The remainder of the alignment would be constructed cut-and-cover in the vicinity of floodplains and would be located below the ground surface.

- The at-grade section of the alignment between in the vicinity of Coldwater Canyon Avenue would be located within the 100-year floodplain. From approximately Whitsett Avenue to the transition to deep bore tunnels the alignment would be located at-grade or within an open cut within the 500-year floodplain. In addition, the Laurel Canyon station would be located within the 500-year floodplain.

- The Laurel Canyon station would be located within the 500-year floodplain for Alternative 11b. The remainder of the alignment would be constructed cut-and-cover in the vicinity of floodplains and would be located below the ground surface.

The potential for flooding would be a concern along open air segments of Alternatives 1c, 6a, and 11a as well as for open air stations included as part of Alternatives 1c, 1d, 6b, and 11b. Flood depths in the vicinity of the alignments is estimated to average less than 2 feet. In the event of a flood, water could enter the trench or station and pose a potential hazard to passengers.

Water entering the trainway in the event of a flood could become contaminated and require treatment. This is not considered to be a substantial impact since collection and treatment facilities, including oil-water separators, will be provided as part of the project.

Alternatives 1d, 6a, and 11a would require crossing the Tujunga Wash. This may require temporary access within the wash during construction.

4-12.4 Mitigation Measures

a. Surface Water Resources

Since no significant impacts associated with operation of any of the East Valley alternatives are anticipated, no mitigation measures are proposed. Oil-water separators should be included as necessary at proposed parking lots to further improve water quality of storm water runoff.

b. Groundwater

It is recommended that additional piezometers be installed and monitored prior to final design of the chosen East Valley alternative to better establish groundwater conditions along the chosen alignment.

c. Floodplains

Upon the selection of an alternative, more detailed coordination with the USACOE and the Los Angeles County Department of Public Works will be completed to establish flood design parameters for final design of the project.

Design of the open air guideway and stations located in floodplains identified in the LACDA study would include provisions to minimize flood hazards. Potential measures could include barriers along the open trench to a height sufficient to prevent flood waters from entering the trench. As stated previously, flood depths in the vicinity of the alignments is estimated to average less than 2 feet. Coordination with the USACOE would be completed during design of the chosen alternative to further identify and minimize potential flood hazards.

Construction within the Tujunga Wash would be completed during the dry season to minimize potential flood hazards. No permanent structures would be placed within the concrete lined channel.

4-13 SAFETY AND SECURITY

4-13.1 Existing Conditions

Safety and security measures are already in place to serve current bus transit operations and related pedestrian activities near existing bus stops in the San Fernando Valley. Existing safety and security measures include transit police surveillance, non-uniformed police inspectors on transit buses and at major transfer nodes, and an emergency radio system to ensure quick response to emergencies.

4-13.2 Impact Methodology and Evaluation Criteria

A qualitative comparison was made of the proposed action in comparison with the No Project Alternative. If a substantial increase in accident or crime potential were to occur, that would constitute a significant impact.

4-13.3 Safety and Security Impacts

Safety refers to the prevention of accidents to the riding public, employees or others present near rail and bus facilities. Such accidents may be caused by events such as fires, faulty equipment or improper boarding and alighting of the transit vehicles. Fire/life safety deals with emergency preparedness for all types of major incidents, including fires or other major disasters. Fire/life safety considerations involve preventive design criteria and those that provide protection for people and property in the event of an emergency.

Security refers to the prevention of unlawful acts resulting in harm to persons or damage to property. In a broader sense, it also implies freedom from threats or uncertainty about the likelihood of threatening acts. Crime and anti-social behavior are potential problems in any public environment.

The proposed alternatives for rail transit service to the San Fernando Valley would carry with them the potential for safety and/or security incidents along the alignments and near and within the rail stations. Such incidents would potentially occur within rail stations and at entrances, along open trenches or stations, and at park-and-ride lots and amenities located at street level. Of particular concern would be the safety and security of passengers on board the trains.

Private auto travel is inherently a more accident-prone mode of travel than public transit. By reducing the level of auto traffic in the corridor, the rail transit alternatives would be expected to have an overall beneficial effect on accident rates and resulting injuries. The one area in which the potential for accidents may increase would be at at-grade rail crossings of streets with the light rail alternatives, which would increase the number of vehicular traffic-train conflicts. With appropriate measures, this potential accident risk can be reduced to a level of no significance.

The Legislature of the State of California made public grade crossing safety the responsibility of the California Public Utilities Commission (CPUC), and no other State or local agency may usurp its authority. The Commission has stated its desire for no additional grade crossings and has noted that any proposed new grade crossings would require careful scrutiny prior to issuance of a permit. There are State and Federal standards for grade crossing warning devices. Local agencies are not permitted to deviate from their minimums, unless a specific order is issued by the governing agency. Any new grade crossings would be signalized.

Delays to cross traffic at grade crossings under the surface rail alternative could potentially adversely affect emergency services delivery. The impact is not expected to be severe, however. Unlike freight trains, which can block a crossing for an extended period of time, the projected interruption of arterial cross traffic due to passing light rail trains is similar to that caused by a traffic signal. Light rail trains are not nearly as long as freight trains, so that alternate crossings will be available at relatively short distance, even where an emergency vehicle encounters an light rail train. Finally, there are emergency services on both sides of the light rail alignments.

The No Project and TSM alternatives would not result in safety and/or security impacts.

4-13.4 Mitigation

By the time a rail transit alternative into the San Fernando Valley would open for revenue service, rail safety and security procedures will have been tested for several years along the prior segments of the Los Angeles County rail system (Red, Blue and Green Lines), and this experience should be transferable to a San Fernando Valley rail system.

Similar to the programs developed for the operating segments of the Red, Blue and Green Lines, the following mitigation measures would be taken to ensure the safety and security of San Fernando Valley rail transit operations. It is expected that the potential for adverse safety and security effects would be reduced to an acceptable level as a result of the mitigation measures discussed below. MTA will:

- Design station entrances and surrounding areas so that there would be minimal conflicts involving bus and auto traffic generated by the rail alternative, passenger access and egress, and general auto or pedestrian traffic. Adequate lighting and landscaped and/or fenced buffers from adjacent streets will be provided, and walkways will be designated for pedestrians. Clear, explicit signs will be provided to create a high level of visibility between pedestrians and vehicle drivers.

- In the stations, provide adequate lighting, slip-resistant walking surfaces, open and well-lit station entrances and fail-safe train control apparatuses. For open trenches or stations, provide fencing and landscaping to prevent trespassing or potential falls into the open trench or station.

- Develop operational design criteria to focus on protection of people and property through adequate emergency exits, standby electrical power and emergency response and communications systems. Communications systems would include closed circuit television monitors, a public address system and emergency telephones.

- Use non-combustible materials or materials with low combustibility to the maximum extent possible. Where low-combustion materials are used, they would also be low-smoke and non-toxic fume producing.

- In all facility designs, incorporate fire sprinklers and stand pipes, smoke/gas detectors and alarm systems throughout the stations; and adequate tunnel and station ventilation systems for underground alternatives. Adequate exits and other emergency provisions such as safety evacuation walkways and tunnel cross-passages would also be provided.

- Install appropriate security provisions at all stations. Station interiors would be open and clearly lighted; clear sight lines would be maintained; and low ceilings, excessive use of columns and darkened areas would be avoided. Designs will seek to eliminate blind spots or potential hiding places for vandals and criminals. Access paths to the streets (inclusive of stairs, escalators and elevators) would receive particular attention. Stair passages would generally be kept straight and wide enough so that their entire lengths can be readily seen, thus reducing conflicts with activities by other potential users of the public space.

- Provide intercoms on each train cab so that patrons can use them to report disturbances to the train operator. The train operator would then alert transit security people to board and/or otherwise intercept any suspects at the next station. Transit police would also be assigned to routine patrols on board the trains and within the station areas.

- Develop and implement emergency response procedures for operating personnel and local agencies, including periodic and extensive training.

- Augment the transit police force and security staff for the Red, Blue and Green Line operations as new stations are added. The security force would work cooperatively with other local law enforcement agencies. This interagency law enforcement would include extensive communications systems, as well as detection and alarm response apparatuses.

- A well-trained and adequate police force will be provided to assure passenger safety to the fullest extent possible.

- Provide crossing protection devices, including signing, crossing gates, and signals/alarms for surface rail alternative at-grade crossings. Monitoring and maintenance of at-grade protection would be the responsibility of the MTA. Operators would be responsible for the safety of train operation and be required to proceed with caution or stop the train in the event of an emergency, such as guideway obstructions (vehicles, pedestrians or other intrusions) or system failures.

- MTA will coordinate with emergency service providers to develop alternative routes and adjust service areas as necessary to ensure responsiveness following implementation of any surface rail alternatives.

4-14 CULTURAL RESOURCES

4-14.1 Setting

a. Historical Overview

The proposed project is situated in a zone known prehistorically to have comprised a portion of the prehistoric Canaliño culture area. Historically it falls within the ethnographic territory of the Takic-speaking Gabrielino; specifically the Fernandeño dialect of Gabrieleno. Although contact was made between the indigenous Gabrielino and the Spanish with the arrival of the Cabrillo (1542), Vizcaino (1602), and Portola (1769) expeditions, European settlement in the region did not begin until establishment of the Mission San Gabriel Archangel in 1771 and the pueblo at Los Angeles in 1781. Settlement and use of the San Fernando Valley lagged behind the growth of the pueblo. Francisco Reyes, alcade of the pueblo from 1793 to 1795 built a house in the valley. Reyes kept livestock at this ranch with Comelio Avila, and that effort consequently established the foundation for the Mission at San Fernando in 1797. Mexican independence in 1821 subsequently led to secularization of the missions in 1833, and Lt. Antonio del Valle became administrator of the mission and its lands. For over 20 years following the American acquisition of California in 1846, the valley lands were under the control off Eulogio de Delis, Pio Pico, Andres Pico, and Juan Manso.

In 1869 the southern 60,000 acres of the Valley, (the project area—North Hollywood, Van Nuys, Reseda, and Canoga Park) were purchased for $115,000 from Pio Pico by the San Fernando Farm Homestead Association, financed by Issac Lankershim. Lankershim hired future son-in-law Issac Newton Van Nuys to manage the ranch, which began to prosper after 1873 when the Southern Pacific built 25 miles of track northwest from Los Angeles along San Fernando Road. The price of valley wheat was no match for the price of real estate about 1888, and Lankershim's heirs began subdivision of 12,000 acres of the ranch into a community first known as Toluca, then Lankershim, and finally North Hollywood. Southern Pacific introduced the Chatsworth Park Branch line in 1893 through Toluca, along what is now Chandler Boulevard. The rapid process of subdivision and development began in earnest after the remaining 47,500 acres of the Lankershim ranch were sold to the Los Angeles Farming and Milling Company in 1909 for $2.5 million. This syndicate of 30 men including H.J. Whitley, Harry Chandler, and Harrison Gray Otis anticipated the benefits of the completion of the Owens Valley Aqueduct. Census figures indicate that the valley population increased from 3,300 occupants in 1910 to over 200,000 by 1940, and the predominant community character had completed its transition from agricultural to suburban. (A more detailed history of the project area is contained within the *Phase I Archaeological Survey/Class III Inventory* technical document prepared for this project.)

b. Legislative Background

The proposed project is subject to compliance with the National Historic Preservation Act (NHPA) of 1966, as amended through 1992 (*16 U.S.C. 470*) and CEQA, as amended through 1992 (*PRC §21084.1)*. Consequently, historic properties (as defined in *16 U.S.C. 470w[5]*) were evaluated for significance under both federal and state criteria: the *National Register of Historic*

Places (*36 CFR §60.4*) and the *California Register of Historical Resources* (*PRC §5024.1*). All resources that have been determined eligible for the *National Register* are also eligible for the *California Register*, but the latter also may include additional resources that have been identified by historical resources surveys or that have been designated as a result of a local landmark ordinance. The historic properties identification effort undertaken for the San Fernando Valley East-West Transportation Corridor found no properties eligible for the *California Register* that were not also eligible for the *National Register*.

In this section the term "historic properties" (defined in *16 U.S.C. 470w[5]*) may refer to resources of archaeological, cultural, historic, or architectural significance under federal and state criteria. Paleontological resources, however, are not eligible for the *National Register* and are discussed only with regard to construction impacts under CEQA in Section 5-15 of this document.

c. Area of Potential Effects

An Area of Potential Effects (APE) was established in order to identify significant historic properties along each of the project alternatives. The APE was defined to satisfy the requirements of Section 106 of the NHPA (*36 CFR 800.4*), and also provides an adequate study area for compliance with CEQA.

For archaeological resources, the APE is limited to the area that would be disturbed during construction. For historic and architectural resources, the APE includes: all property to be acquired for project purposes; all property along the proposed project alignment(s), including existing street and railroad right-of-way; and the next row of buildings beyond the properties included above.

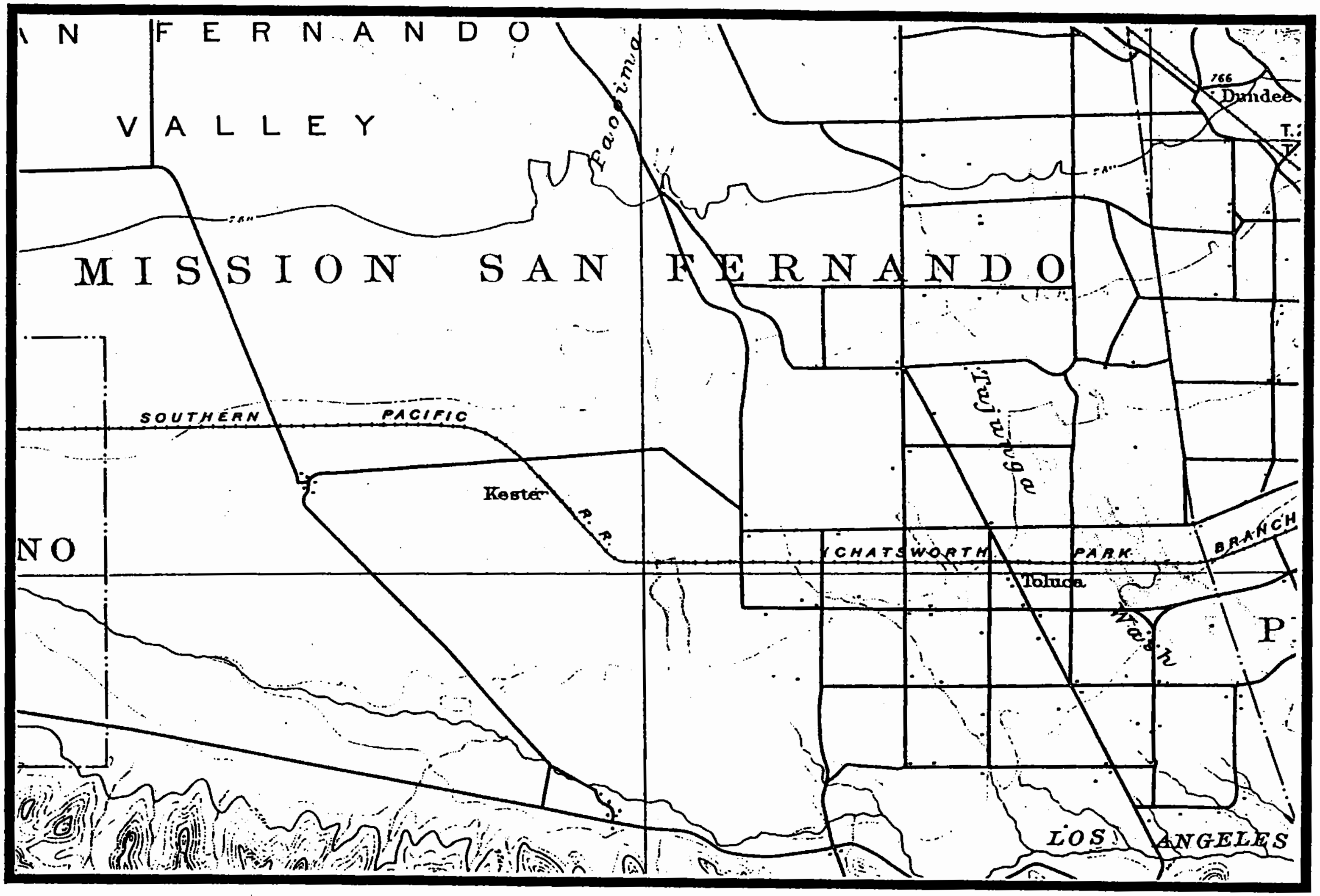
d. Identification of Archaeological Resources

A complete description of background research and field investigation results are contained in the *Phase I Archaeological Survey/Class III Inventory* completed for this project under separate cover.

(1) Archival Records Search

An archival records search of archaeological site maps, records and files was conducted at the UCLA Institute of Archaeology, Archaeological Information Center (AIC) by the AIC staff. Site files at the AIC indicate that the transportation corridor study area had never been systematically surveyed by archaeologists. Furthermore, no prehistoric archaeological sites had been recorded within or adjacent to the APE.

In addition to the records search conducted by the AIC, period maps and local histories were also examined to further clarify the potential for extant cultural resources within the transportation corridor study area. The 1898 U.S.G.S. Santa Monica (See Figure 4-14.1) shows the Chatsworth Park Branch rail line in-place before the turn-of-the-century. The route of this early rail line



SOURCE: W & S CONSULTANTS, 1996.

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FIGURE 4-14-1
SPRR Chatworth Park Branch as shown in the 1898 USGS

serves as a portion of all project alternatives. Rail sidings are labeled at Toluca and Kester. The Toluca siding extends from Lankershim westwards past Tujunga approximately to present day SR 170. This area comprises the project starting point for both alternative routes. The Kester siding is located alongside the modern Los Angeles Valley College, falling within the LA Valley College Station area.

A road network is also indicated as present in skeletal form by 1898. The density of buildings and structures in this portion of the valley in 1898 was, however, extremely low. A structure of some kind is shown near the northeast corner of Lankershim and Burbank Blvd. Alternative routes 1a-d and 11a-b pass near this area. As indicated on the map, no other structures over 100 years of age were constructed in areas corresponding to the alternative transportation corridor routes.

A review of the history of this portion of the San Fernando Valley suggests that the potential for historical cultural resources will be greatest in the following areas: along Lankershim Boulevard, the earliest developed area in this portion of the valley; along Chandler Blvd, especially near its eastern end approaching Lankershim, as this was the initial major east-west roadway through the San Fernando Valley; in the Van Nuys section of the route, because Van Nuys was the first townsite subdivided and sold in the southern half of the valley, after Toluca (now North Hollywood); and, finally, along the SP ROW itself, since this served as the initial east - west access corridor through the valley. In particular, the areas of historical sidings have the greatest likelihood of maintaining associated historical remains along the SP ROW, since these are known areas of use. As noted above the sidings at Toluca and Kester were constructed prior to 1898. In addition, another siding was built at Van Nuys prior to 1912. A period photo of this siding shows an associated structure alongside the rail track (see Jorgensen 1982:121). This appears to be located in the vicinity of present day Hazeltine Boulevard, and therefore is at or near to the proposed Van Nuys station.

As implied by the record search, no prehistoric sites are known within or in the vicinity of the two alternative routes. Given the general nature of the terrain within which these routes occur (flat valley bottom), the likelihood of encountering prehistoric sites does not appear high. However, the routes do cross-cut a series of drainages which are shown on historical maps. These include Pacoima Wash (renamed Tujunga Wash on more recent maps, located near Coldwater Canyon Boulevard, and a series of minor North-South tributaries of the Los Angeles River lying between Coldwater Canyon and Lankershim boulevards. Although it is impossible to assess in any absolute sense the archaeological sensitivity of these specific areas given how little is known about prehistoric San Fernando Valley settlement patterns, relatively speaking the sensitivity of the areas near to these former water courses should be higher than for other portions of the route vis-a-vis the potential for prehistoric sites.

(2) Field Reconnaissance

In accordance with *36 CFR§800.4(b)*, a Phase I archaeological survey/Class III inventory was conducted of the APE in November 1996 by an archaeologist meeting the *Secretary of the Interior's Professional Qualifications Standards* (*FR 190:44738-44739*). This involved background studies of the prehistory, ethnography, and land-use history of the APE; an archival records search of published and unpublished books, articles, photographs, maps, site forms and documents; and an intensive on-foot survey of the subject property.

As a result of the intensive on-foot survey, the study area was found to be very highly urbanized/suburbanized, and therefore disturbed, effectively throughout its entire length. West of I-405, to its terminus at Woodley Avenue, the corridor sits within an area of rail and parallel pipeline right-of-ways. Groundsurface in the immediate SP ROW has been graded and covered with fill and/or gravel; the groundsurface within the area of the pipeline corridors has been heavily disturbed by the trenching for these pipes. East of the San Diego Freeway, to about Woodman Avenue, both alternatives follow the SP ROW. This is surrounded by high-density commercial and light industrial establishments that have been built right up to the property line of the SP ROW. This portion of the route has also been graded, covered with gravel, and subjected to various forms of abuse (such as the illicit dumping of trash) since this rail line was taken out of service a number of years ago. Numerous examples of cultural remains were noticed within this section of the route, such as broken glass and cans, but nothing that could be identified as historical in nature or age. The original groundsurface has been obscured throughout this section of the corridor.

From approximately Woodman Avenue east, Alternatives 6a and 6b follow the SP ROW southeastward to Chandler Boulevard, and then runs down the middle of Chandler Boulevard essentially to Lankershim Boulevard at the eastern terminus. Alternatives 1a-d and 11a-b follow most of this same alignment to about Radford Avenue. The SP ROW within these alternative routes has been subjected to the same sorts of disturbance as has been described above, with the groundsurface also obscured. Period structures were noted in the neighborhood around Chandler Boulevard, particularly in the immediate vicinity of Ethel Street and Chandler Boulevard. These included an old board and batten ranch house abutting the SP ROW, and a series of nearby California bungalows. All of these indicate development prior to roughly 1925. Given the proximity of the board and batten house to the SP ROW, it is possible that historical activities and remains associated with this structure may have encroached onto the SP ROW.

Chandler Boulevard retains its original 1911 lay-out, consisting of a central median strip containing a rail track separating two roadbeds. Portions of the original landscaping appear to be present within sections of this street, including examples of Monterey pine and palm trees. However, any buildings originally fronting this street have been replaced by modern apartment complexes.

Alternative 2 leaves the SP ROW at approximately Woodman Avenue and heads east, down Oxnard Blvd. At Lankershim Boulevard it turns south to connect with the existing North Hollywood terminal at about Chandler Boulevard. The entirety of this portion of this roadway, and the groundsurface could not be observed during the field reconnaissance.

No previously recorded sites, prehistoric or historic, were found to exist within the APE, and there is no documentary evidence for the prehistoric or ethnographic Native American use of this area, although, in the archaeologist's opinion, it is likely that such use occurred. Present conditions are such that any extant remains of a prehistoric or historical nature within the study area would have been effectively impossible to identify in the field. Consequently, there is a possibility that construction impacts on unknown resources may occur and appropriate mitigation measures are discussed in Section 5-15.

e. Historic and Architectural Resources

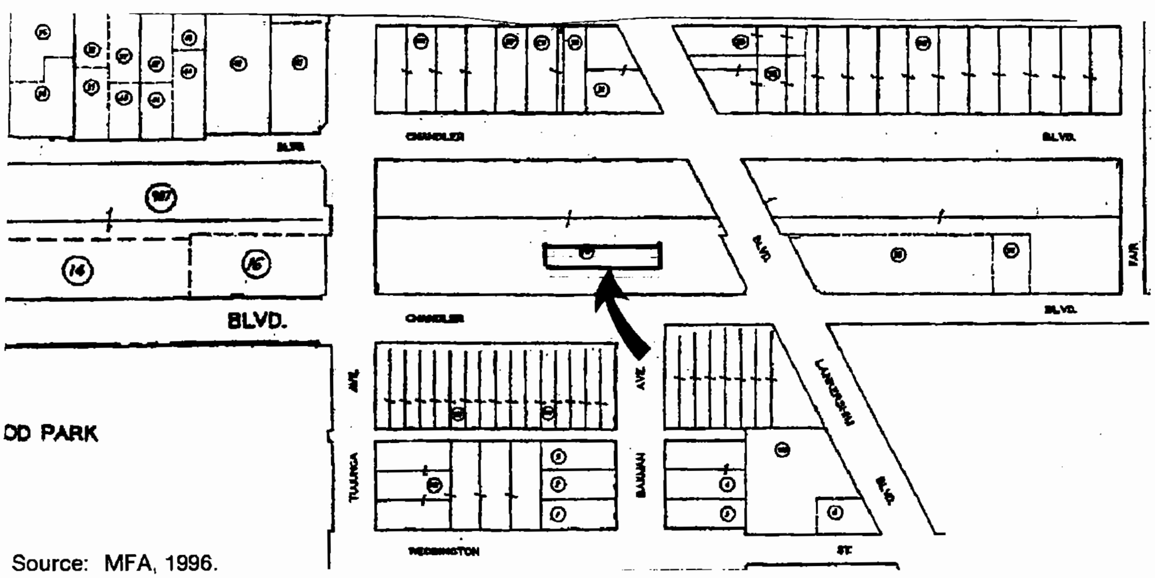
A complete description of background research and field investigation results are contained in the *Request for Determination of Eligibility Report* completed for this project under separate cover.

National, state, and local historic resource inventories were reviewed and a field survey was undertaken of the APE in November 1996 by an architectural historian meeting the *Secretary of the Interior's Professional Qualifications Standards* (*FR 190:44738-44739*). Within the APE for all alternatives, a total of three historic and architectural resources were identified as listed on, determined eligible to, or appearing eligible for inclusion in the *National* and *California Registers.*

- The *Lankershim (Toluca) Southern Pacific Depot, 11275 Chandler Boulevard* was determined eligible for the *National Register* on May 24, 1983 as a result of a study conducted for an earlier Metro Rail project. Consequently, it is also on the *California Register.* The depot was constructed in 1896 by the Southern Pacific Railroad on the Chatsworth Park Branch line to serve the agricultural needs of the Lankershim Ranch and passenger needs of the community of Toluca (later known as Lankershim and North Hollywood). From 1911 to 1952 this one-story wood frame building also provided passenger service with the Pacific Electric Railway as part of its San Fernando Valley Line. In later years it was used for lumber storage by Hendrick's Builders Supply Company and is currently on property purchased in 1991 by LACTC (now MTA). The building is significant for its association with the early growth and subsequent settlement of North Hollywood and as a relatively unaltered example of a rare type–a wood frame nineteenth century railroad depot in Southern California. It is also one of the only non-adobe structures in the Valley constructed in the nineteenth century (See Figure 4-14.2.)

  The *Lankershim (Toluca) Southern Pacific Depot* is located in the wide median of Chandler Boulevard, immediately west of Lankershim Boulevard on property owned by LACTC (now MTA) since 1991.

- The *Residence for S.B. Gleason, 5404 Bellingham Avenue* appears eligible for the *National* (Criterion C) and *California* (Criterion 3) *Registers* for the quality of its Streamline Moderne style by Los Angeles architect Milton J. Black. Architect Black was one of Los Angeles' most prolific designers of the Streamline Moderne style during its period of popularity in the mid-1930s. The vast majority of his work was undertaken in the Hollywood-West Hollywood area, and the 1936 Residence for S.B. Gleason is Black's only known design in the Valley. Black's most important Streamline Moderne designs may be found in a group of about 10



Source: MFA, 1996.

SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1997.

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FIGURE 4-14.2
Lankershim (Toluca) Southern Pacific Depot, built 1896

apartment buildings constructed in 1935-1936 near Kings Road and 1st Street. This is regarded as the finest grouping of Streamline Moderne residential buildings in Los Angeles. Black's other significant designs include the Westwood-Ambassador Apartments (1940) at 10427 Wilshire; the Cernitz House (1938) at 601 Amalfi; and a Moderne interpretation of the Spanish Colonial Revival styled El Cadiz Apartments (1936) located at 1721-1731 N. Sycamore (See Figure 4-14.3).

The *Residence for S.B. Gleason* is located at the northeast corner of Chandler Boulevard and Bellingham Avenue, about two blocks west of Laurel Canyon Boulevard.

- The *DWP Building, 14601 Aetna Street* is a good example of the PWA Moderne architectural style, a style that was commonly used for utilitarian public buildings and structures during the 1930s. Generally, intact examples of the PWA Moderne style are becoming increasingly rare, however those constructed for the DWP are still evident throughout Los Angeles and appear eligible for the *National* (Criterion C) and *California* (Criterion 3) *Registers* as a thematic group. This particular DWP building (See Figure 4-14.4) was constructed about 1940 and would be eligible as a contributor to this thematic group.

  The *DWP Building* is located at the northwest corner of Aetna Street and Vesper Avenue, one block west of Van Nuys Boulevard.

4-14.2 Impacts

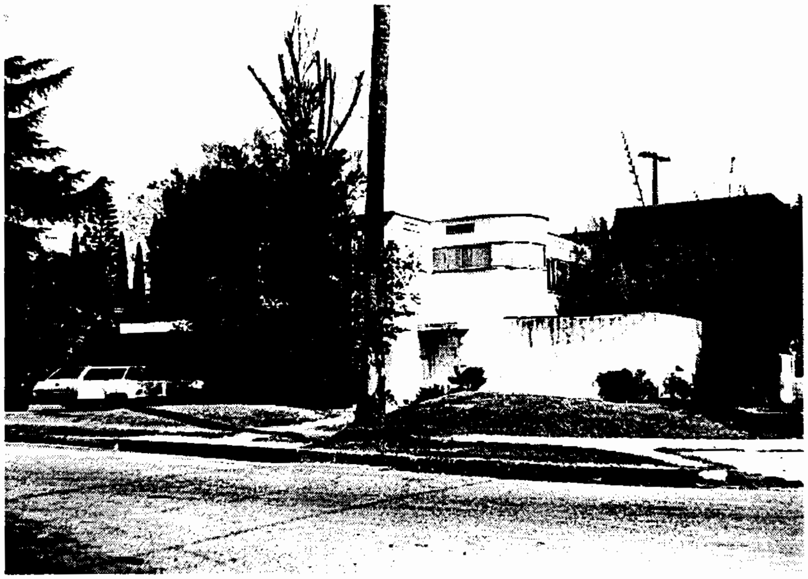
a. Impact Criteria

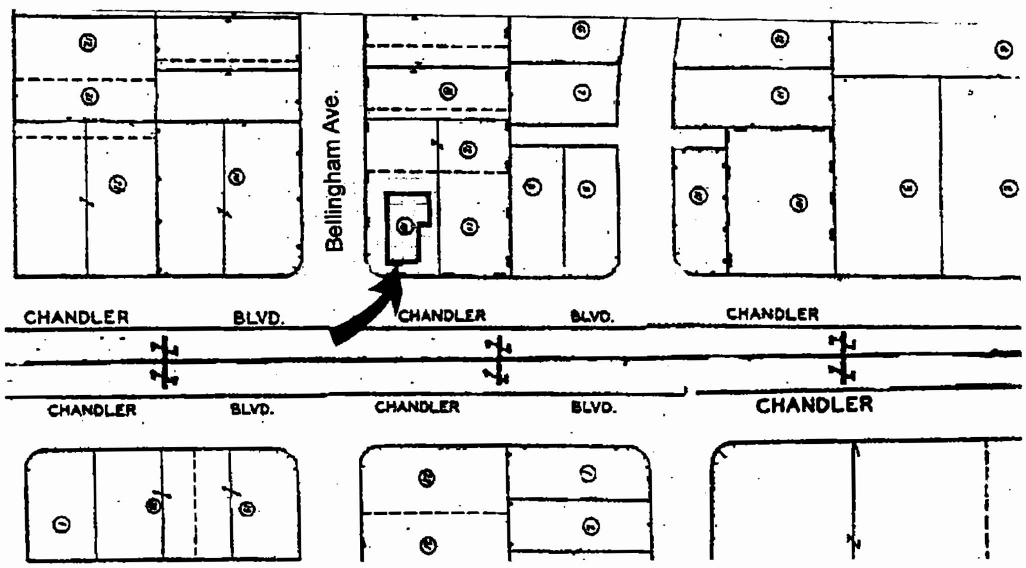
(1) NHPA Criteria of Effect and Adverse Effect

The criteria for evaluating effects on cultural resources used in this document were developed by the Advisory Council on Historic Preservation (ACHP) as part of the regulations governing implementation of Section 106 of the NHPA. These criteria (*36 CFR §800.9*) are defined as follows:

(a) Criterion of Effect:

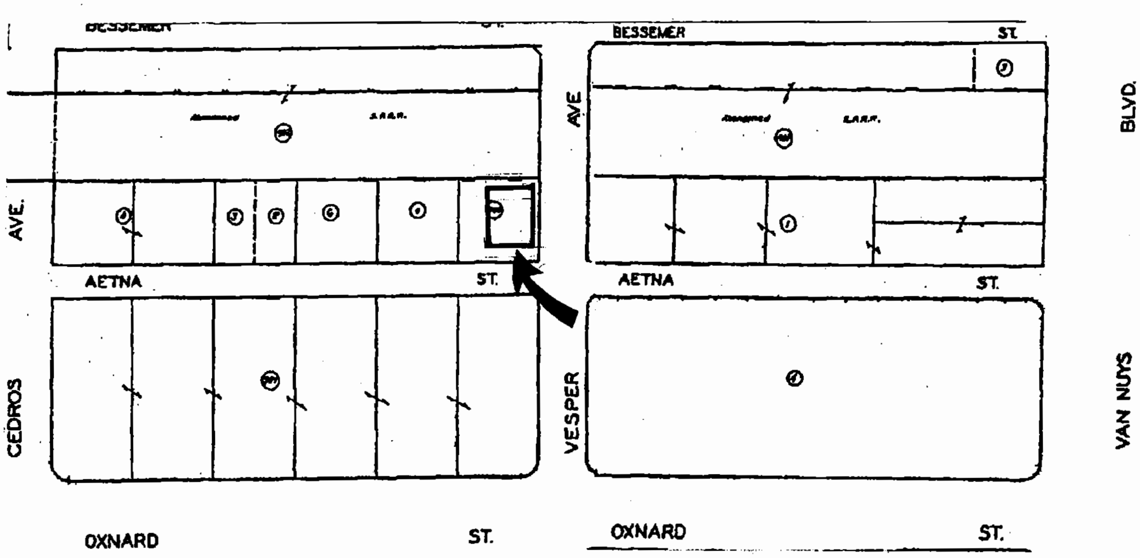
An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting or use may be relevant depending on a property's significant characteristics and should be considered.





SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1997.

FIGURE 4-14.3
Residence for S.B. Gleason, designed by Milton J. Black, built 1936



SOURCE: MYRA L. FRANK & ASSOCIATES, INC., 1997.

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FIGURE 4-14.4
Department of Water and Power Substation, built 1940

(b) Criteria of Adverse Effect:

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.

(2) CEQA Threshold for Significant Effect

The NHPA *Criteria of Effect and Adverse Effect* are more stringent than the CEQA threshold for significant effect on cultural resources. CEQA states that 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 (State CEQA Guidelines,* Appendix G, section j) [or if it] *may cause a substantial adverse change*[17] *in the significance of an historical resource (PRC §21084.1).*

However, CEQA does not explicitly define thresholds of significant effect to determine 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". Therefore, the more explicit NHPA *Criteria of Effect and Adverse Effect* have been used for the impact assessment for this project.

b. Impact Assessment

(1) Archaeological Resources

Although no pre-historic or historic archaeological resources have been identified, the possibility exists that unknown resources may be encountered during construction (See Section 5-15).

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17 "Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired (*PRC §5020.1[q]*).

(2) Historic Resources

Three (*36 CFR §800.9[b][1, 4 and 5]*) of the five *Criteria of Adverse Effect* described above do not apply to potential project impacts because there would be no direct physical contact, loss of access, or property exchange that would occur with any of the historic properties. The geotechnical analysis in Section 4-10 concludes that settlement can be reduced to a level of non-significance with proper engineering design and conformance with current building code. Therefore, no damage to historic resources is anticipated as an indirect result of operational settlement, provided that the necessary mitigation is achieved in the design phase of the project. Furthermore, if the proposed groundborne noise and vibration mitigation measures are implemented as proposed in Section 4-9, there would be no significant groundborne noise and vibration impacts on nearby properties, including those of historic nature.

However, the introduction of a new structure to replace an existing at-grade rail configuration would change the visual setting in the vicinity of each of the historic properties. This change in setting therefore requires application of the remaining two criteria [*36 CFR §800.9(b)(2 and 3)*], and a discussion follows for each of the historic properties identified within the APE.

- The *Lankershim (Toluca) Southern Pacific Depot*, 11275 Chandler Boulevard

The Lankershim (Toluca) Southern Pacific Depot is out of the APE for Alternatives 1a-d, 2, and 11a-b. It is located about 850 feet south of the nearest construction for each of these alternatives which would begin at the north end of the existing Red Line North Hollywood station (under construction).

The historic depot is located adjacent to the proposed at-grade North Hollywood Station for LRT Alternatives 6a and 6b. Although station plans have not been provided in detail, it appears that the historic depot would be immediately south of the new station platform. The railroad tracks would be at-grade and in or near their historic alignment near this station. However, the proposed new at-grade station would be constructed using modern design and materials. The new construction would be compatible in scale, non-obtrusive in plan and placement, but easily differentiated from the historic depot. Although the proposed station would introduce a change in the setting of the historic depot, it would not be an adverse effect because the depot itself and its integrity of setting were substantially altered during its most recent use as a lumber storage facility from the 1960s until the 1990s. The property, including the abandoned SP ROW (now officially MTA ROW), was purchased by LACTC (now MTA) in 1991.

As a beneficial effect, a station at this location would reintroduce the historic use of rail passenger service to the property. Passenger service at this facility began with the Southern Pacific about 1896 and dual operation with the Pacific Electric occurred from 1911 to 1952. Passenger service did not return to the property after its conversion to lumber storage. If the Lankershim (Toluca) Southern Pacific Depot is restored and returned to regular rail passenger use as illustrated in Chapter 2, the result would effectively override any potential adverse impacts that might be introduced by the construction of the new platform. Restoration work that would be required to provide ticket sales, MTA literature, newspapers, etc. would arrest deterioration, avoid future neglect, create higher public awareness of the historic depot, and provoke new interest in the history of the Valley.

- The *Residence for S.B. Gleason*, 5404 Bellingham Avenue

The Residence for S.B. Gleason is located about 60 feet from proposed alternatives 1a-d, 6a-b, and 11a-b, about two blocks west of the proposed Laurel Canyon Station. Each of those alternatives would be located within the Chandler Boulevard SP ROW, but the exact configuration and construction method varies greatly, as detailed below. It is out of the APE for Alternative 2.

1a) A midline vent shaft and below ground traction power substation serving the deep bore (46 feet below ground surface) Red Line tunnel would be located about 60 feet from the nearest portion of the Residence for S.B. Gleason. The historic building would be about 450 feet west of the proposed modular type station which would be located at a depth of 47 feet deep below Laurel Canyon Boulevard.

1b) Identical distance relationship as in 1a, however the Red Line tunnel would be cut-and-cover construction at a depth of 30 feet and the station (34 feet below Laurel Canyon Boulevard) would be open air with a roof.

1c) A below ground traction power substation serving the 30-foot deep open air Red Line tunnel would be located about 60 feet from the nearest portion of the Residence for S.B. Gleason. The historic building would be about 450 feet west of the proposed open air station and 550 feet west of Laurel Canyon Boulevard.

1d) The aerial structure for the Red Line would be 24 feet above ground at this location and about 60 horizontal feet from the nearest portion of the Residence for S.B. Gleason. The historic building would be about 870 feet away from the proposed aerial station which would be located to the east of Laurel Canyon Boulevard.

6a) The at-grade LRT configuration at this location would be identical with that of the former SP railroad tracks, which are about 80 feet from the nearest part of the Residence for S.B. Gleason. The historic building would be about 830 feet away from the proposed at-grade station which would be located to the east of Laurel Canyon Boulevard.

6b) Identical distance relationship as in 6a, however the LRT would be cut-and-cover construction at a depth of 20 feet and the station would be open air with a roof about 850 feet away from the historic building.

11a/11b) The effects would be identical to those discussed for Alternatives 6a and 6b.

Alternatives 6a and 11a are essentially the same as the historic at-grade rail configuration with modern catenary poles. Because the rail configuration is unchanged, and catenary poles were present during the Pacific Electric operation (1911-1952) the setting change would be negligible. Given the additional buffer provided by Chandler Boulevard, no effect would occur on the historic building if either of these alternatives was implemented.

Alternative 1d is the only alternative replacing the at-grade railroad tracks with an aerial structure near the Residence for S.B. Gleason. Alternative 1d would not isolate the historic building from or alter the characteristics that qualify it for the *National Register* because it is the building's architectural features and not the setting provided by adjacent properties, including the railroad, that qualify it for the *National Register*. Alternative 1d would not introduce out-of-character visual elements because its location within the Chandler Boulevard median would leave views toward the Bellingham or Chandler elevations unchanged. Furthermore, railroad traffic on the adjacent property and its associated audible and atmospheric elements have always been associated with the Residence for S.B. Gleason's historic setting, and therefore its proposed change from an at-grade to aerial configuration would not constitute a significant alteration to that setting.

The remaining alternatives (1a-c, 6b, and 11b) would all be below ground near the historic building, and therefore would not isolate the property from or alter its setting and would not introduce out-of-character visual elements. The removal of the SP railroad tracks from the historic setting would not result in an impact because they did not contribute to the eligibility of the Residence for S.B. Gleason. Finally, any associated noise or vibration impacts would be mitigated, and would not be out of character with those historically generated by at-grade railroad traffic along this former Southern Pacific Railroad route.

- The *DWP Building, 14601 Aetna Street*

The DWP Building is located over 750 feet from the western end of the proposed Van Nuys Station for alternatives 1a-d, 6a-b, and 11a-b. For all of these alternatives, an aerial structure within the former SP ROW would be located about 50 feet to the rear of the building. The aerial structure would be 25 feet above ground to top-of-rail for alternatives 1a-d and would be about 2 feet higher for alternatives 6a-b and 11a-b. It is out of the APE for Alternative 2.

Because it is primarily the DWP Building's architectural features and not the setting provided by adjacent properties that qualify it for the *National Register*, the replacement of an at-grade railroad with an aerial configuration on a neighboring property would not isolate the DWP Building from or alter the characteristics that qualify it for the *National Register*.

Because the DWP Building has always had an industrial appearance and utilitarian use, its historic character is not sensitive to the "visual, audible, or atmospheric elements" that would be introduced by an aerial structure 50 feet to its rear. Views to the main elevation on Aetna Street would not be obscured by the aerial structure, which would appear in the background as a clearly disassociated modern visual element. Furthermore, railroad traffic on the adjacent property and its associated noise and emissions have always been associated with the DWP Building's historic setting, and its change from an at-grade to aerial configuration would not constitute a significant alteration to that setting.

(3) Conclusions: Finding of No Effect

In conclusion, the operational phase of any of the proposed project alternatives would not result in an effect on a historic property within the APE because the results of the application of the Criteria for Adverse Effect are negligible and because it would not alter the characteristics of a property that qualify it for the National Register. Correspondingly, in CEQA terms, the project would not cause a "substantial adverse change in the significance of an historical resource".

4-14.3 Mitigation Measures

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]). That MOA, as amended in December 1994, is still in effect, but may be subject to modification for specific impacts anticipated for this segment of the project. As requested by the SHPO, the project has developed design guidelines to ensure compatibility of station plans with adjacent historic resources. In accordance with the conditions of the MOA, every attempt shall be made by the MTA to ensure that new construction would be compatible with the remaining historic properties in terms of scale, massing, color, and materials employed and station entrances shall be designed for compatibility with the existing urban environment.

Restoration of the Lankershim (Toluca) Southern Pacific Depot and reinstatement of rail passenger services shall be undertaken in accordance with the procedures stipulated in the MOA.

4-15 DRAFT SECTION 4(f) EVALUATION

4-15.1 Application of Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966 (49 USC 1653, now 49 USC 303) declares it a national policy to make a special effort to preserve the natural beauty of the countryside, including public parks and recreation land, wildlife and waterfowl refuges, and historic sites. According to 23 CFR 771.135 (e), which is part of the Department of Transportation's Section 4(f) guidelines, historic sites are those currently eligible for or listed in the *National Register of Historic Places*. Section 4(f) prohibits the Federal Transit Administration (FTA) from approving projects which require the use of resources protected under Section 4(f) unless two criteria are met: (1) there is no feasible and prudent alternative to such use and (2) the project includes all possible efforts to minimize harm resulting from such use. Because the San Fernando Valley East-West Transportation Corridor Project is a transportation project involving federal funds, it is subject to compliance with Section 4(f).

A Section 4(f) use occurs when one of the following conditions is met:

(a) a protected resource is permanently acquired for a transportation project;
(b) a temporary use of the protected resource is considered adverse (i.e., preservation of the resource would be impeded);
(c) or there is a constructive use of the protected resource.

a. *Permanent Acquisition*

The physical and permanent taking of a protected resource for use by a transportation project is known as an actual use.

b. *Temporary Use*

Short-term, temporary use (e.g., for a construction easement) of a Section 4(f) resource would not constitute a use under Section 4(f) as long as the following conditions are met: occupancy of the resource is temporary (i.e., shorter than the construction period for the entire project) and there is no change in ownership; changes or effects to the resource are minimal; there are no permanent adverse impacts resulting from the temporary use; and there is a documented agreement between relevant jurisdictions regarding temporary use of the resource.

c. *Constructive Use*

A constructive use occurs when a project does not incorporate land from a protected resource but when the project generates impacts due to proximity (e.g., noise or visual impacts) and these impacts are so severe they impair preservation or utility of the protected resource. Constructive use occurs when the project negatively affects the purposes for which the resource is of value to the public (i.e., its activities, features, or attributes); in other words, a constructive use determination considers the present use of the resource by the public as well as the attributes which made the resource valuable in the first place. Constructive use resulting from increased noise applies only when the protected resource is "noise sensitive" and derives some of its value and use from its relatively quiet setting. To constitute a constructive use, the noise increase must not only be detectable to the human ear (i.e., greater than 2-3 dBA) and exceed the FTA abatement criteria, but it must be severe enough to impair enjoyment of the Section 4(f) resource. Constructive use based on visual intrusion occurs when there is substantial impairment to the features, setting, or attributes of a protected resource when those features, setting, or attributes are important contributing elements to the value of the resource. A constructive use does not occur if compliance with Section 106 of the National Historic Preservation Act and 36 CFR part 800 (discussed in Section 4-14) results in a finding of *no effect* or *no adverse effect* on a historic site.

4-15.2 Section 4(f) Properties in Study Area

The following recreational and cultural resources are located within the East-West Transportation Corridor. The locations of these resources are shown on Figure 4-15.5.

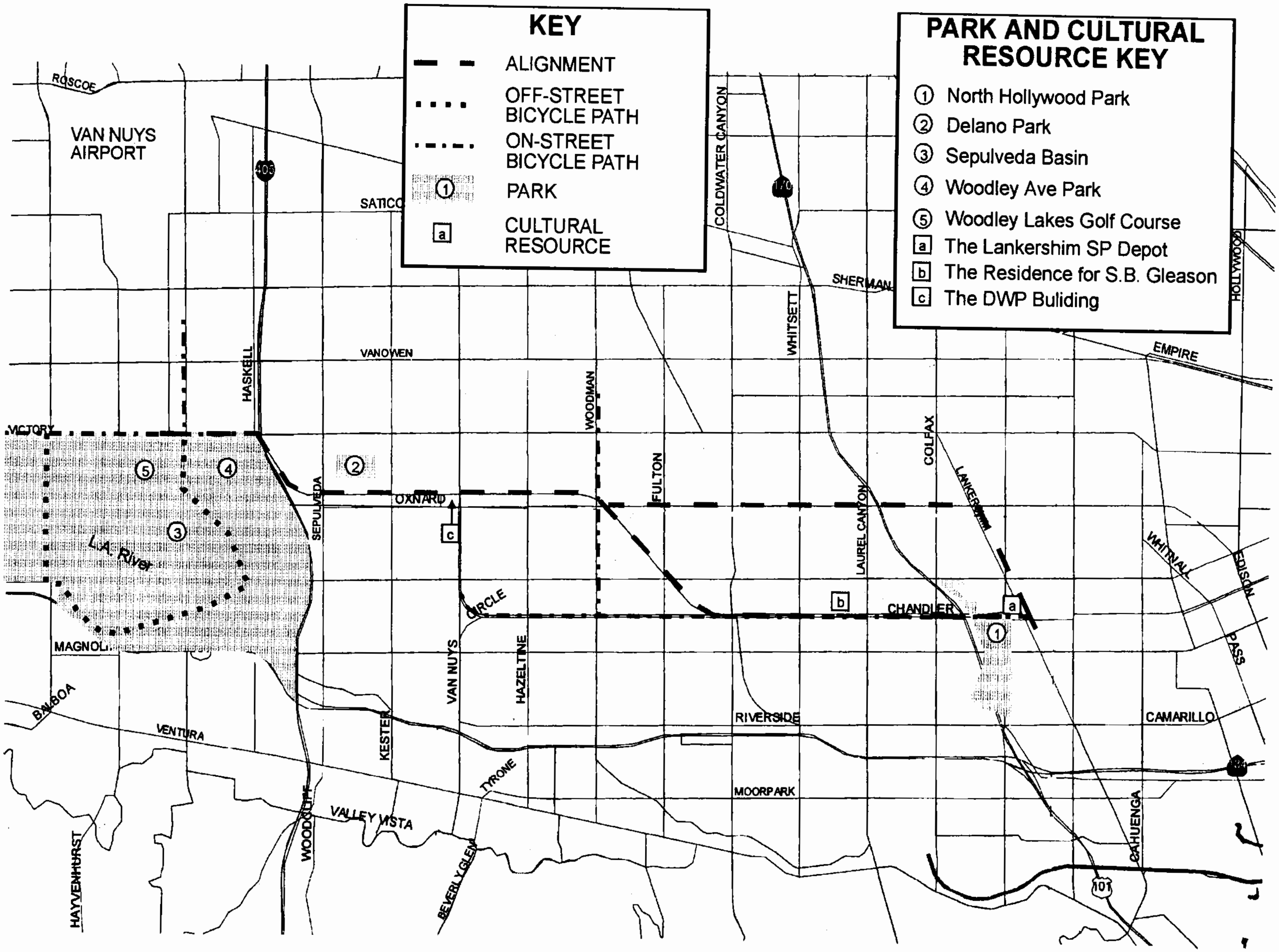
a. Recreational Resources

(1) Parks

North Hollywood Recreation Center (5301 Tujunga Avenue, North Hollywood). This 58 acre park straddles Chandler Boulevard in North Hollywood. Recreational features include a gym, ball fields, tennis courts, a swimming pool, picnic and playground facilities and trails. Access to the southern part of the park is continuous along Chandler Boulevard; however, access to the northern part is provided from the residential neighborhood to the north of Chandler Boulevard, and not from Chandler Boulevard itself.

Delano Park (15100 Erwin Street, Van Nuys). This is a 4.4 acre neighborhood park in Van Nuys, located about a block from the SP ROW. The park offers ball fields, a playground, and basketball courts.

Sepulveda Dam Recreation Area (17017 Burbank Boulevard, Encino/Van Nuys). This is a regional recreational area encompassing 2,030 acres south of Victory Boulevard and west of the I-405. The recreation area is contained within the basin of the Sepulveda Dam. Recreational resources within the basin include a wildlife refuge, a lake, numerous paths, ball fields, gardening plots, and a model airplane field. The recreation area abuts the SP ROW to the south. Between I-405 and Woodley Avenue, non-recreational uses, including the Donald C. Tillman Water Reclamation Plant, and U.S. Army Reserve and National Guard facilities, separate recreational uses from SP ROW. Access to the recreation areas in the study area is provided from Woodley Avenue.



SOURCE: MYRA FRANK & ASSOCIATES, INC., 1997; THOMAS BROTHERS, 1995.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 4-15.1
Section 4(f) Resources im East-West Transportation Corridor

Woodley Park (6350 Woodley Avenue, Encino/Van Nuys). Woodley Park is a 46 acre park within the Sepulveda Basin. It provides picnic areas, an archery range, and cricket field. The park is separated from the SP ROW by the Tillman Water Reclamation Plant and National Guard facilities. Access is provided to this park from Woodley Avenue.

Woodley Lakes Golf Course (6331 Woodley Avenue, Encino/Van Nuys). This 18 hole, 72 par golf course is part of the Sepulveda Basin, and is located south of the U.S. Army Reserve facilities west of Woodley Avenue. Access to the golf course is provided off Woodley Avenue.

(2) Bicycle Paths

Chandler Boulevard On-Street Bicycle Route. A city of Los Angeles-designated on-street bicycle route exists on both sides of Chandler Boulevard for the entire length of the street through North Hollywood and is accommodated within the right lane of traffic. The route parallels the SP ROW.

Woodman Avenue On-Street Bicycle Route. A city of Los Angeles-designated on-street bicycle route exists along Woodman Avenue. The route crosses the SP ROW.

Victory Boulevard Off-Street Bicycle Path. A city of Los Angeles-designated off-street bicycle path parallels Victory Boulevard and the SP ROW west of I-405. The path is about five feet wide and lined with trees for most of its length.

Woodley Avenue Bicycle Path/Route. The city of Los Angeles-designated bicycle route/path along Woodley Avenue is an on-street facility north of Victory Boulevard and an off-street bicycle-only path through the Sepulveda Basin south of Victory Boulevard. It crosses the SP ROW as an off-street facility.

b. Cultural Resources

Cultural resources are those with archaeological, historic, or architectural value. In the East-West Transportation Corridor, the following cultural resources have been identified:

- The Lankershim (Toluca) Southern Pacific Depot
- The Residence for S.B. Gleason, 5404 Bellingham Avenue
- The DWP Building, 14601 Aetna Street

These resources are described in detail in Section 4-14.

c. Other Section 4(f) Resources

There are no other resources such as scientific research areas or wildlife or waterfowl refuges within the study area that are protected under Section 4(f).

4-15.3 Section 4(f) Effects

a. Actual 4(f) Use

(1) Recreational Resources

None of the proposed alternatives would require any permanent acquisitions from recreational resources protected under Section 4(f) and thus the project would not result in use under Section 4(f).

(2) Cultural Resources

Because the proposed project would not result in permanent acquisition of any cultural resources the project would not result in any use under Section 4(f). Refer to Section 4-14.

b. Constructive Use

(1) Recreational Resources

Constructive use to recreational resources would occur if access, noise, or visual impacts were so severe that the use of a recreational resource were impaired. As discussed below, no constructive use is predicted to occur at any recreational resources along the corridor.

(2) Access Impacts

Access to all corridor recreational resources would be maintained. None of the project alternatives would directly abut a recreational resource and thus none would impair access. If an at-grade alternative is chosen, standard traffic control devices would ensure that access to the bicycle paths that cross the rail alignment would be maintained. Traffic control devices that would be employed include railroad crossing arms and flashing lights. No constructive use due to impaired access would occur as a result of the project.

(3) Noise Impacts

There is only one recreational resource that is located close enough to the alignment for noise impacts to be a concern. Unlike other parks in the study area, North Hollywood Park faces the Chandler Boulevard alignment and is located about 200 feet from it. The noise level (L_{eq}) at this park would be 58 dBA during peak-hour operations. This is well below the 66 dBA criterion set by FTA for this land use type. Refer to Section 4-9 for a thorough discussion of noise impacts. No constructive use is expected to result from noise impacts at North Hollywood Park or at any other recreational resource in the project corridor.

(4) Visual Impacts

North Hollywood Park is the only recreational resource located within viewing distance of any of the alternatives. Alternative 6a, the only alternative that would run adjacent to the park, would not create any visual impacts that would translate into constructive use. Chandler Boulevard is a wide, urban roadway that currently has unused railroad tracks running along the center median. The project would reintroduce rail service along this median. Because rail service would become part of the general level of traffic activity along Chandler Boulevard and because views of passing rail vehicles would only be intermittent, no visual impacts at North Hollywood Park are anticipated. Refer to Section 4-6 for a thorough discussion of visual impacts.

(5) Cultural Resources

Pending concurrence with the State Historic Preservation Officer, a finding of no effect is anticipated regarding impacts to the historic resources. With a finding of no effect, constructive use would not occur under Section 4(f) (see Section 4-15.1). The finding of effect is discussed in Section 4-14 of this document.

c. Temporary Use

(1) Recreational Resources

No temporary, construction-phase use of any recreational resource would be required under any of the proposed alternatives. Construction on the segment north of the Sepulveda Basin, west of I-405 would also be contained entirely within the SP ROW. However, the Victory Boulevard Off-Street Bicycle Path is approximately 25 feet from the SP ROW. Because the path is relatively close to a construction area, it is possible that during construction the path could be exposed to construction materials and debris. Because the level of potential disruption to the path is extremely minimal, temporary use would not likely occur.

Likewise, no temporary use is expected to occur during construction and paving of the 300 overflow parking spaces planned for the SP ROW near Woodley Avenue. It is anticipated that construction of the parking lot would be contained within the ROW.

(2) Cultural Resources

None of the alternatives would require temporary use of any of the identified cultural resources.

4-15.4 Avoidance Alternatives

Because no Section 4(f) use is expected, no avoidance alternatives are required.

4-15.5 Efforts to Minimize Harm

a. Recreational Resources

Even though a Section 4(f) use would not occur, there is a small potential for construction-phase impacts to the Victory Boulevard bicycle path. The bicycle path will remain open during construction. If path usage warrants it, standard work zone traffic control measures would be employed to ensure bicyclist safety. These measures may include construction zone signage, the use of a flag person directing bicyclists past active construction sites and frequent path sweeping or wetting. Following construction the path would be cleared and restored to its former condition. These measures would be sufficient to avoid any use of the bicycle path under Section 4(f). No other impacts are expected.

b. Cultural Resources

Refer to Section 4-14 for a discussion of mitigation to reduce impacts on cultural resources resulting from this project.

4-15.6 Coordination

Since no Section 4(f) effects are anticipated, coordination is not required.

4-15.7 Section 6(f) of the Land and Water Conservation Fund Act

Section 6(f) of the Land and Water Conservation Fund Act (*Public Law 88-578*) requires that recreation land acquired or developed with assistance under this section remain in use exclusively for public outdoor recreation. It may not be converted to other uses without the approval of the National Park Service. Consultation with the National Park Service revealed that assistance under Section 6(f) was provided to acquire land in the Sepulveda Basin; however, the land within the SP ROW was not part of this land. Because no acquisitions within the basin are proposed and because the project will be contained within the right-of-way, no conflicts under Section 6(f) are expected.

4-16 OTHER IMPACT CONSIDERATIONS

4-16.1 Cumulative Impacts

Cumulative impacts refer to those effects that:

> result from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

In attempting to address cumulative impacts in the context of the San Fernando Valley East/West Transportation Corridor and the build alternatives being considered for implementation in that corridor, the related projects identified in Section 2-4 of this EIS are used to represent the past, present, and reasonably foreseeable future actions referred to in the definition above. These projects include:

- development of other portions of the *MTA Long Range Plan*, including extensions to the Red and Blue Lines described in Appendix I;
- recommendations of the *San Fernando Valley Transit Restructuring Study*, including transit centers in Sylmar, Burbank, Chatsworth, Warner Center, and Universal City;
- planned highway capital improvements, including freeway interchanges and HOV lanes at various locations;
- multimodal capital improvements, including the Alameda Corridor, various park-and-ride transit centers, and regional bikeway improvements;
- traffic signal system improvements throughout the Valley such as ATSAC;
- continued operation of the regional Metrolink system; and
- various local related development and planning projects, as described in Table 2-2. Prominent among these would be: (1) Price Club/Costco development (in the vicinity of the Sepulveda station), (2) Van Nuys Government Center Revitalization project (near the Van Nuys station), (3) Laurel Plaza expansion (in the vicinity of the Valley College/Oxnard station), and (4) North Hollywood Redevelopment project (surrounding the North Hollywood Red Line station).

The discussion presented in the following sections is intended to be viewed in the context of the above-identified related projects. Impact assessments presented below are made under the assumption that mitigation proposed for the TSM or Rail alternatives is in place.

a. Transportation

Implementation of any of the proposed project alternative would have the beneficial effects of increasing transit ridership and correspondingly reducing automobile usage. Depending upon the alternative selected, daily county-wide rail boardings would be increased from 50,000 to 60,000. Countywide transit trips would increase from 13,600 to 32,600. Bus boardings would also be increased from 0.6 percent to 3.2 percent above the No Build condition. Countywide daily vehicle trips would decrease as a result of the new transit service, with reductions from 0.04 percent to 0.10 percent being expected. County daily vehicle miles of travel would also decrease, from 0.07 percent to 3.17 percent. Average speeds on the countywide roadway system would improve as a result of the increased transit service, from a No Build speed of just under 25 miles per hour to as much as 27 miles per hour. Overall, therefore, implementation of any of the proposed alternatives would have beneficial cumulative effects on transportation, in terms of accessibility and mobility, both in the San Fernando Valley and Los Angeles County as a whole.

When the local street system is brought into the picture, however, there are some adverse consequences that would occur. Because the new rail transit service would attract riders to the four new stations, automobile traffic would increase in the vicinity of those stations. As a consequence of this, local street intersections in the vicinity would experience increased traffic which, when taken into account along with background traffic growth (from the related projects and general traffic growth), would result in undesirable levels of service (LOS) at various locations.

Of the 41 intersections examined in the transportation analysis, 14 are presently operating at an unacceptable LOS (level "E" or worse). By the year 2015, the No Build condition would increase the number to 34 intersections, at LOS E or worse. When the rail alternatives are included, the number of intersections experiencing unacceptable LOSs range from 29 to 35, indicating that some locations would improve whereas others would degrade. Of the intersections affected, between 7 and 11 of them would experience a sufficient decrease in LOS to be considered a significant adverse impact under local traffic measurement criteria, thus requiring some form of mitigation to be applied.

A reallocation of parking supply among the rail stations would greatly improve local traffic conditions by attracting transit users to areas with better traffic characteristics, but not all of the adverse effects would be eliminated. It would be necessary to implement physical improvements at some intersections, including 259 restriping, adding through lanes and adding turn lanes, and even after this is done, there will remain some locations for which an unacceptable LOS will still be the case. The cumulative effect on the local street system would therefore be adverse at some locations, but improved at others.

In addition to vehicular traffic, there will be an increase in demand for parking at the various rail stations. Taking into account reallocated parking supply at the stations in order to spread the demand as much as possible, and recognizing that the rail system would make it possible to reduce the need for parking at the Los Angeles Central Business District and other regional centers, there will remain some excess of demand over supply at some locations. Most of the excess demand would be on the order of 10 to 50 spaces, but in the vicinity of the Sepulveda station, as many as 900 spaces could be demanded in excess of available supply. Excess parking demand would create spill-over parking into uncontrolled areas, including nearby commercial and residential areas, which would constitute an adverse cumulative impact. A three-phase mitigation program would be put into place, with the specific intention of addressing the situation at the Sepulveda station, that would eventually result in a supply of parking spaces that would meet the demand, but in the interim cumulative impacts would still potentially occur.

b. Land Use and Development

All build alternatives have been developed in the context of the planned public transportation and roadway improvements, and the land use plans and policies of the city of Los Angeles. The alternatives have therefore resolved potential cumulative impacts during that development process. It is believed that potential inconsistencies have been eliminated and therefore there are no adverse cumulative land use or development impacts. The rail alternatives more strongly support land use plans than the TSM Alternative, because of the greater potential influence of fixed facilities. The land uses surrounding proposed rail station locations are generally compatible with the proposed stations and development likely to arise in the future around those stations, and therefore the proposed action would not contribute to cumulative adverse local land use impacts that could result from development of the surrounding areas. The proposed action, and the rail alternatives in particular, would reinforce and therefore would contribute in a beneficial cumulative sense to land use and development.

c. Acquisitions and Displacement

Required property acquisitions would be relatively minor, and would be essentially identical for all rail alternatives (the TSM Alternative would result in no acquisitions). The required takings may occur in some areas in which other related projects may also be taking property, but implementation of the proposed action would not enlarge the area of property acquisition or result in broader displacement of persons and businesses beyond that occurring as a result of the related projects. The proposed action would therefore produce an adverse cumulative impact, in the sense that it would contribute to property acquisition to be undertaken by other related projects, but the degree of this cumulative impact would not be significant, because it would not result in more takings than would otherwise occur by the individual related projects themselves.

d. Demographics and Neighborhoods

The proposed action would not result in significant adverse impacts with regard to neighborhood character, security or access, except in the area west of Coldwater Canyon Avenue under Alternative 1d. In this area, the aerial guideway would produce adverse character and possibly security impacts, prior to mitigation. None of the alternatives would produce adverse neighborhood access impacts. When viewed in the context of the related projects, both transportation projects and local developments, none of the proposed alternatives would produce effects which on their own would be significant and none, when added together with other related projects, would result in significant adverse impacts. Neighborhood character would not likely be adversely affected by individual related projects, since local planning and zoning requirements would be adhered to, and therefore there would not be adverse cumulative impacts in this regard.

Insofar as neighborhood security is concerned, the conclusion would be the same as described above. While there could be some perceived decrease in neighborhood security, either from the elevated guideway or from individual development projects, these effects would not be cumulative. In no case would neighborhood access be adversely affected, either by an individual related project or by several projects taken together.

The analysis for environmental justice concluded that no disproportionately high and adverse human health or environmental effect would occur on minority or low income populations, from any of the proposed project alternatives. It is not anticipated that such effects would occur from any of the related projects, as well. Therefore, no adverse environmental justice impacts are judged to occur on a cumulative basis.

e. Community Facilities and Services

Neither the TSM nor the rail alternatives would cause an adverse effect on schools, medical facilities, religious institutions, libraries, parks and recreation facilities, or other public facilities. On the contrary, transit access would be improved to all such facilities and therefore this would be considered a beneficial cumulative effect, since the addition of new transit connections would broaden the range of accessibility at the system level.

Both the TSM and rail alternatives would result in improved access via transit to community services and facilities located throughout the corridor. To the extent that other related transportation projects (transit centers, HOV lanes, extensions of the MTA rail system, connections with Metrolink, etc.) act to further increase accessibility through the corridor and to destinations in other locales, a beneficial cumulative effect would occur.

f. Fiscal and Economic Conditions

The proposed action would contribute to the displacement of an estimated 149 employees for the rail alternatives. This is not regarded as a significant adverse impact in and of itself, due to the relatively small number of employees affected, and due to the high probability that the displaced employees would be able to locate substitute employment. No employees would be displaced by the TSM Alternative. Other related public transportation projects may also result in the displacement of employees, as a result of right-of-way acquisition requirements. Local related projects could also result in some displacement of employees.

It is assumed, as a result of the large economy that exists in southern California, that employees subject to relocation will be able to either relocate with the affected business or will be able to find other suitable employment in the general area. No jobs would be displaced that are of such a unique type that an ability to relocate would not be reasonably expected. Consequently, it is determined that a significant adverse cumulative impact on employment would not occur.

The proposed action would result in the loss of annual property tax revenues and business license fees. While the amounts of such losses would be minor in the context of total revenues collected in the city of Los Angeles, the losses would nonetheless be additive to other such losses occurring as a result of some of the related projects, in particular the public transportation projects which would require right-of-way acquisition that would remove private properties from the tax rolls. However, some of the related development projects, in particular the North Hollywood Redevelopment, Van Nuys Government Center, and the many other commercial projects, would likely add significantly to the revenue base (including property taxes, business license fees and sales taxes) in the corridor, and it is very likely that such beneficial effects would far outweigh the small losses resulting from the public projects. On balance, it is reasonable to conclude that a beneficial cumulative effect would accrue to the related projects when taken together.

g. Visual and Aesthetic Conditions

The TSM Alternative would not produce cumulative effects, since there would be no fixed facilities created under this alternative. The rail alternative above ground guideways and proposed stations would be generally compatible with their surroundings and other related projects in the vicinity, with the exception of the portion of Alternative 1d between Coldwater Canyon Boulevard and Woodman Avenue, which would introduce an aerial guideway along the rear of single family residential properties, and the Valley College/Fulton-Burbank station under Alternative 1d, which would also be aerial. This would be isolated to that particular alternative, however; no other related project would contribute to an adverse impact in this location. No other related project would introduce a visual change in the immediate vicinity of the SP ROW (Alternatives 1, 6, and 11) for that matter, and Alternative 2 would be entirely underground until reaching Woodman Avenue, and therefore it too would not contribute to an adverse cumulative visual impact. No other related projects would create additional above ground elements, which when taken into consideration with the rail alternatives, would result in an adverse cumulative visual impact.

h. Air Quality

The TSM and rail alternatives would reduce daily regional emissions of criteria pollutants in the corridor. The various public transportation related projects should result in additional emissions reductions, corresponding with the increase in public transit ridership, HOV usage and travel speeds that would occur. The related development projects would generally attract travel, most of which would be by automobile, and therefore these projects would contribute to increased emissions at the corridor level.

Neither the TSM nor the rail alternatives would result in additional violations of state or federal standards for carbon monoxide (CO); therefore no contribution to adverse cumulative impacts would occur.

Because the proposed action would contribute to reduced emissions at the corridor level and would not produce additional exceedances of state or federal CO standards, it is determined that the proposed action would have a beneficial cumulative effect on air quality.

i. Energy

Related projects would result in increases in energy consumption. The project alternatives would consume more propulsion energy for transit vehicles on a daily basis than the No Build Alternative. This additional energy consumption would only marginally tax existing and projected energy sources. The degree of this effect is judged not to be significant, however, since projections indicate adequate energy supplies into the foreseeable future. However, when the effects on automobile travel are included, beneficial effects result for some alternatives. The Enhanced Bus and Dual Mode alternatives would result in a slight decrease in overall energy consumption, but the remaining alternatives would have slight, but not significant, increase in consumption. Implementation of any of the proposed alternatives would reduce vehicle miles of automobile travel such that there would be a net savings in energy consumption. This would be a cumulative beneficial effect.

j. Noise and Vibration

Noise levels in the corridor would be increased slightly by the presence of the TSM or rail alternatives. The related projects would also increase noise because they all would result in increased travel. The rail alternatives would produce vibration in some areas that would require mitigation, but with such mitigation in place, no residual vibration impact would be experienced. There are no locations at which the proposed action would result in adverse noise or vibration impacts after mitigation. As a result, it is determined that there would be no cumulative adverse impacts regarding noise or vibration.

k. Geotechnical Considerations

The effects related to geology and seismicity would produce potential impacts at various locations and areas within the project corridor, at proportions that would be less than significant. All of the potential impacts have bearing on the stability of fixed facilities, or on operations in the event of an incident such as an earthquake. However, none of the potential impacts would produce effects that would affect other projects or areas, and none would produce additive effects on general geology and seismicity concerns for the corridor or the San Fernando Valley. As a result, it is concluded that no adverse cumulative impacts would occur for this category.

l. Biological Resources

There are no sensitive plant or animal species in the project corridor and there are no indications that such species would be found in the vicinities of other related projects. It is determined that there would be no adverse cumulative impacts on biological resources.

m. Water Resources

The rail alternatives could produce increased runoff which could potentially result in degradation of downstream water quality. The degree of this potential effect would be small, however, because the watershed within the San Fernando Valley is essentially urban, and therefore the amount of new impervious surfaces added would be small compared to the corridor and the region as a whole. The various related projects would also potentially add to this, but again, the nature of the watershed and the amount of additional impervious surfaces would be small; the related projects are located in areas that are already developed.

Groundwater in the project corridor is located at substantial depth below the surface and it is not likely that the project alternatives or the related projects would have an adverse effect on such resources.

There are some portions of the project rail alternatives that would encroach into 100- and 200-year floodplains, as defined by the U.S. Army Corps of Engineers (USACOE). These encroachments are minor, however, and coordination with the USACOE should produce mitigation to be incorporated into the design of any project to be implemented, such that no residual impact would occur. The various related projects may also have some encroachment potential, but the area is highly urbanized and it is likely that little or no new encroachment would occur beyond what has already occurred in the past.

Because the project alternatives would add marginally to impervious surfaces, would have no likely effect on groundwater, and would have only a minor encroachment into floodplain areas, it is determined that there would be no adverse cumulative impact on water resources.

n. Safety and Security

The rail alternatives would produce local traffic conditions around station sites that could marginally increase the number of accidents involving vehicles, owing to the increased number of vehicles travelling to the location. However, the accident rate would not be increased in the context of background growth, and moreover, increased transit service is expected to yield a mode shift away from autos and toward public transportation. This latter effect can be argued to reduce cumulative accident potential, rather than add to it. Implementation of any of the alternatives would not increase safety and security impacts resulting from the related projects. On balance, a determination is made that no adverse cumulative impact would occur.

With regard to crime prevention, the addition of four new rail stations would add to the number of locations in the corridor at which crimes involving public transportation could occur, however, with proper surveillance, the likely number of increased crimes occurring at such locations would be small. Neither the TSM nor rail alternatives would increase the likelihood of crimes occurring at the related projects.

o. Cultural Resources

There are no adverse effects expected on historic or archaeological resources and therefore no cumulative adverse impacts are expected. There is a potential for encountering paleontological resources during excavation for the rail alternatives, and to the extent that other related projects also encounter paleontological resources during development that leads to their destruction, it would constitute an adverse cumulative effect, as it would reduce the available body of information regarding paleontology. By putting appropriate mitigation measures into place during construction to reduce the negative consequences as much as practicable, the contribution of the rail alternatives to adverse cumulative impacts would not be significant.

p. Section 4(f) Properties

There are no properties in the corridor subject to protection under Section 4(f) of the Department of Transportation Act for which an impact would occur under any of the project alternatives, and therefore there would be no adverse cumulative impacts in this regard.

4-16.2 Unavoidable Significant Adverse Impacts After Mitigation

Insofar as operational effects are concerned, only transportation may result in unavoidable significant adverse impacts after mitigation. As is noted in section 4-16.1.a, while the new transit service to be implemented would have beneficial effects on a cumulative basis, there would remain adverse traffic conditions at several street intersections and there would be excess parking demand at some locations resulting in spill-over parking into adjacent neighborhoods. These effects may not be able to be mitigated completely, and if they cannot, unavoidable adverse impacts would therefore remain.

With the exception of the potential adverse impacts regarding transportation noted above, no other operational significant adverse unavoidable impacts are expected, after the application of appropriate mitigation measures.

Construction noise may be produced in some areas in proximity to residential units which, because of site topography or other reasons, may not be able to be sufficiently shielded to reduce noise to below annoyance levels. This would be a temporary situation, but could be perceived as a significant problem by the affected residents. To the extent that such construction noise cannot be sufficiently reduced, and to the extent that such noise is experienced during times of the day or night when a substantial annoyance would occur, this also would be regarded as an unavoidable significant adverse impact. Efforts will be made to reduce construction noise as much as possible through appropriate mitigation measures, but it is likely that some significant adverse impacts would remain.

4-16.3 Irreversible and Irretrievable Commitment of Resources

Construction of the proposed action would result in the use of nonrenewable resources and energy sources, including fossil fuels, electricity, and natural gas. Fossil fuels would be used to power construction equipment, delivery, and employee vehicles. Electricity and natural gas would be used by construction equipment operating during the construction period. The use of these energy sources would be considered an irretrievable commitment of resources. A variety of materials would be used during the construction process, including steel, wood, concrete, and fabricated materials. Once these materials and fuels are used for purposes of construction, the commitment of such materials and fuels would be considered irreversible.

Once operational, the TSM or rail alternatives would consume slightly more energy on a daily basis than the No Project Alternative, when compared with the No Project Alternative, except for the TSM and Dual Mode Alternatives. When viewed in terms of energy efficiency, however, all alternatives would result in a slight reduction in energy consumed.

Financial resources committed to the proposed action cannot be recovered and therefore commitment of those resources would be considered irretrievable. Human resources expended to design, construct, and operate either of the proposed alternatives would not be recoverable. The commitment of land resources for stations or guideway right-of-way would be then unavailable for other uses, with the exception of areas which may be used for joint development purposes.

4-16.4 Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

There are a number of east-west traffic routes through the San Fernando Valley, for which capacity cannot be practically increased. Therefore, the implementation of additional passenger carrying capacity via either the TSM or rail alternatives would improve overall person travel capacity through the corridor. This would constitute an improvement in long-term productivity, insofar as persons are drawn to the system, patrons continue to use the San Fernando Valley East-West link in the total MTA system, and patronage on the system increases over time. Between the alternatives under consideration, the rail alternatives would provide for the greater enhancement of long-term productivity, because they (along one alignment) would create a grade-separated facility that can continue at its level of design efficiency over time without the interference of general purpose traffic on the local street system and nearby freeways. The TSM Alternative cannot avoid this competition for space. On balance, therefore, all alternatives, but the rail alternatives in particular, would produce a short-term use of the environment that would result in a long-term enhancement of productivity.

4-16.5 Growth Inducement

The TSM Alternative is not anticipated to result in substantial growth occurring around existing or planned bus stations. The rail alternatives are not expected to cause overall growth within the corridor, but may redirect or focus a small portion of anticipated growth around the station areas. Pressures for new residential and/or commercial development associated with transit stations could occur, primarily in areas within walking distance of a station.

In addition, potential areas of joint development (although no specific plans have been developed) along the San Fernando Valley East-West corridor could include surface and/or airspace development at transit stations, on the right-of-way, or at any other property owned or under the control of the MTA, which may be used without interference to the operation of the rail system. Under a joint use or joint development project, MTA could lease property rights owned or under its control to another agency or individual for the development of any use that is compatible with the public transportation use. Development would be carried out with the active participation of MTA.

Overall, the types of potential growth anticipated in areas surrounding the stations, i.e., commercial, retail and/or residential, would not conflict with current planning policies and objectives for these areas. In fact, some stations, such as the Van Nuys station, would support development plans for the vicinity. It is also expected that development pressures created by the proposed transit stations can generally be accommodated within current zoning restrictions.

4-16.6 Environmentally Superior Alternative

The No Build Alternative would not involve substantial construction that would not also be common to all other alternatives, and therefore it would avoid adverse impacts associated with such construction, including acquisitions and displacements, safety and security concerns, potential interference with cultural resources, noise and vibration, and construction pollutant emissions. However, the No Project Alternative would not offer the benefits of increased transit availability, improved mobility and transportation system capacity improvement, and it would not support land use plans in the area. The No Project Alternative would also not generate a demand for either construction or operational employment. For these reasons, the No Project Alternative is judged to be inferior to either the TSM or rail alternatives.

The TSM, when compared with the rail alternatives, would result in no adverse impacts in the areas of acquisitions and displacements, visual quality and aesthetics, noise and vibration, and overall construction impacts. The rail alternatives would result in adverse impacts in all these areas.

The rail alternatives would result in several beneficial effects which the TSM Alternative would not achieve. Among these are:

- Increased transit patronage - The rail alternatives would result in up to 32,600 more daily person trips made by transit in Los Angeles County in the Year 2015.

- Reliability - The rail alternatives would be constructed in an exclusive right-of-way. As a result, operation of these alternatives would have increased reliability over the TSM Alternative.

- Consistency with local plans - The rail alternatives would provide a higher level of support to local land use and redevelopment plans.

- Transit opportunities to transit dependent persons - The rail alternatives would provide better connections throughout the remainder of the MTA system, at higher travel speeds and to a greater number of locations than would the TSM Alternative.

- Employment opportunities - The rail alternatives would generate between 2,000 and 4,000 annual construction jobs over the course of the construction period, whereas the TSM Alternative would generate only approximately 200 such jobs.

With regard to the adverse impacts associated with the rail alternatives, adequate mitigation measures have been proposed to reduce the impacts to acceptable levels. For the reasons stated above, the rail alternatives are judged to be environmentally superior to either the No Project or TSM alternatives.

Among the rail alternatives, the following findings are made:

- All alternatives would support local land use plans and policies generally to the same degree.

- All alternatives would require essentially the same amount of private property for right-of-way purposes.

- None of the alternatives would have a significant adverse impact on demographics and neighborhoods, although a portion of Alternative 1d could be perceived as having an adverse impact on neighborhood character and security.

- All of the alternatives except Alternative 6 would result in the displacement of an estimated 148 employees, as a result of property acquisition for right-of-way purposes.

- Alternatives 1, 2 and 11 would generate an estimated 1,300 to 1,400 full time equivalent direct and indirect employees in the region for ongoing operations, assuming American Public Transit Association (APTA) multipliers. Alternative 6 would generate an estimated 600 such employees. (For comparison purposes, the TSM Alternative would generate an estimated 1,000 such employees.)

- All alternatives would generate substantial construction employment during course of the construction process.

- All of the alternatives would construct an aerial guideway in the area west of the Van Nuys station that would be compatible with its surroundings.

- Some of the alternatives (Alternatives 1c, 6, and 11) would have portions of the guideway in open cut guideway that would be generally compatible with their surroundings.

- Alternative 1d would have one portion (between Coldwater Canyon Boulevard and Woodman Avenue) of its guideway in an aerial configuration that would produce adverse visual impacts on its surroundings.

- Alternatives 1a, 1b, and 2 would have a substantial portion of their alignments in subway, which would have no adverse visual impact on their surroundings.

- All of the alternatives would have a slightly beneficial effect on corridor emissions of criteria pollutants.

- All alternatives would have a beneficial effect on energy consumed per passenger mile.

- All alternatives would result in noise and vibration impacts at some locations, all of which can be successfully mitigated.

- None of the alternatives have geotechnical concerns that cannot be accommodated through the design process.

- None of the alternatives have impacts of significance with regard to either biological or water resources.

- None of the alternatives would produce safety or security concerns of significance.

- None of the alternatives would result in adverse impacts on cultural resources or resources protected under Section 4(f) of the Department of Transportation Act. Alternative 6 offers an opportunity to adaptively reuse a National Register-eligible historic resource (the Toluca Station).

Taking into consideration the above findings, the following is concluded:

- Alternative 1d, because of its adverse effects on both neighborhood and visual issues, is considered less environmentally desirable than the remaining alternatives.

- Alternatives 1c, 11a, and 11b would not have a positive effect with regard to visual and historic issues, and are therefore considered less desirable than those alternatives which would have such a positive effect.

- Alternatives 1a, 1b, and 2 have positive effects with regard to visual issues, and are therefore considered environmentally superior to the remaining alternatives. Alternatives 6a and 6b, because of their positive effects with regard to historic resources, would also be considered environmentally superior to the remaining alternatives.

- Among the alternatives identified above (Alternatives 1a, 1b, 2, 6a, and 6b), no one alternative can be clearly identified as the environmentally superior alternative.

CHAPTER 5

CONSTRUCTION IMPACTS

CHAPTER 5: CONSTRUCTION IMPACTS

5-1 PRE-CONSTRUCTION ACTIVITIES AND CONSTRUCTION METHODS

Project construction activities would occur with the "build" alternatives and would not occur for the No Project Alternative. Even though project construction activity would be relatively short-term and geographically limited, potential construction impacts will be an important factor in the selection of the proposed project. Given that project construction impacts are of concern to the community, this section describes proposed construction activities and methods. Sections 5-2 through 5-15 describe potential impacts and mitigation measures for construction of the build alternatives.

5-1.1 Pre-Construction Activities

Pre-construction activities that would occur prior to construction of a "build" alternative include:

- Preparation of final design drawings, specifications, and construction contracts,
- Preparation of worksite traffic control plans,
- Building data survey,
- Detailed geotechnical investigation,
- Pre-construction business survey,
- Development of construction-related community information/outreach program, and
- Acquisition of property and easements.

Each of these activities is discussed briefly below.

a. Design and Development of Construction Contracts

Detailed design elements would be developed during preliminary and final design, including geotechnical and subsurface investigations. MTA would work during this design phase with property owners of existing and planned structures along the alignment to understand physical constraints and private property conditions that would need to be accommodated during the construction process. Final design profiles and details would be prepared. Standard specifications would be received and tailored to the specific project being built.

Contract packaging would also be developed during the design phase. Different contracts are likely to be let to construct different portions of the build alternative, e.g., separate contracts likely would be let to construct the line sections, the stations, utility relocation, and building demolition.

b. *Vehicular and Pedestrian Traffic Plans*

Construction of a build alternative could temporarily interfere with the normal flow of traffic, causing some lanes and streets to be closed to vehicles for various durations. No permanent street closures are anticipated under any alternative.

During final design, worksite traffic control plans would be developed in cooperation with the City of Los Angeles (traffic, police , and fire departments) to accommodate required pedestrian, traffic, and emergency vehicle movements. To the extent practical, traffic lanes would be maintained in both directions, particularly during peak traffic hours.

c. *Building Data Survey*

A pre-construction structural survey would be completed to determine the integrity and condition of existing buildings adjacent to (and over for the subway alternatives) the proposed alignment. This survey would be used to develop final detailed construction techniques along the alignment and as the baseline for monitoring construction impacts during and following construction. The survey may identify specific buildings requiring pre-construction grouting or structural support. During construction, MTA would monitor buildings for movement and, if detected, take immediate action to control the movement.

d. *Detailed Geotechnical Investigation*

During final design, additional sampling and analyses of subsoil conditions would be used to detail the excavation and tunnel support systems, as applicable, for the open cut, cut-and-cover, and deep-bore subway portions of the selected alternative. Additional geotechnical surveys (drilling, core samples) would be conducted as part of this effort. Subsurface data from sampling conducted for the *SP Burbank Branch Alignment, Extended Metro Rail Solution, Pre-Preliminary Engineering Study*, August 1994 report has been used to identify the proposed construction techniques presented in this section.

e. *Pre-Construction Business Survey*

Prior to construction, the MTA would contact and interview individual businesses along the alignment to gather information and develop an understanding of how these businesses carry out their work. This survey would identify business usage, delivery / shipping patterns, and critical times of the day or year for business activities. The survey would assist in: (a) identification of possible techniques during construction to avoid interfering with critical business activities, (b) analysis of alternative access routes for customers and deliveries to these businesses, (c) development of worksite traffic control plans, and (d) development of final construction practices.

f. *Establishment of Construction Community Information/Outreach Program*

A community construction coordination program would be developed to establish dialogue between the MTA and the affected community regarding construction impacts and possible mitigation measures. The program would include dedicated personnel, and an outreach office in the construction area to facilitate construction coordination. An important element of this program would be the dissemination of information in a timely manner regarding anticipated construction activities.

g. Land and Easement Acquisition

A number of privately owned properties would need to be acquired prior to construction. In addition, temporary property easements may need to be obtained. Long-term subsurface easements would be required for properties located directly above proposed subway segments. Short-term construction easements would be needed for those contractor worksites not anticipated to be used for long-term facilities. See Section 4-2 for a detailed discussion of these acquisitions and easements, including a discussion of relocation assistance that would be provided.

5-1.2 Construction Activities

Construction activities that would occur under the build alternatives include: (1) underground utility relocation, (2) demolition of aboveground structures, and (3) construction of line segments and stations. Items related to the construction activities include: (1) contractor work areas, (2) haul routes, and (3) construction duration. Each of these activities and items are discussed briefly below.

a. Underground Utility Relocation

Underground portions of the build alternatives have been located to avoid, to the extent possible, conflicts with major utilities. In certain instances, the positioning of the underground alignment, station, and ancillary facilities would require that some utilities be relocated.

Relocation of utilities to a new permanent location so that they would not be affected by the transit alignment or station construction would generally be performed prior to construction of the transit line or station. Construction equipment typically required for utility relocation and ground/pavement restoration includes: excavator/backhoes, trenchers, trucks, and generator/compressors. Cement trucks, pavers, rollers, and power compactors are typically required for street restoration.

Utilities, such as high-pressure water mains and gas lines, that are not to be permanently relocated away from the worksite, would be temporarily removed from the construction area. For these relocations, brief disruption (less than a day) could occur to utility service, if at all. The utilities would be relocated temporarily at the early stages of construction and reset in essentially their original locations during the final backfilling of underground construction.

Utilities within the subsurface construction area that do not need to be relocated, either permanently or temporarily, would be uncovered during the early stages of excavation. These buried utilities, with the possible exception of sewers, which may be deeper, are generally found within several feet of the surface. They would be reinforced, if necessary, and supported by hanging from deck beams over the construction excavation.

For the alternatives using the Southern Pacific (SP) right-of-way, design and construction considerations (either temporary or permanent relocation or maintained in place) for utilities will primarily occur at the cross streets. Cross streets usually have utilities running longitudinally within their rights-of-way. The most consideration for utilities would occur with the open cut and cut and cover construction methods, with some consideration being required for at-grade construction. In general, conflicts with most utilities can be avoided by adjusting the profile of the alternative. One exception to this would occur at Fulton Avenue where it is proposed to keep the profile high so that the Valley College (Fulton/Burbank) station can be closer to the surface. At this time no utilities that run longitudinally in the SP right-of-way have been identified.

The portions of the Oxnard Street alternative alignment would have to accommodate the utilities running longitudinally in both rights-of-way (including three 230kV high pressure, oil-filled pipe-type cables under Oxnard Street) and utilities crossing at the cross streets. Although utility consideration will be required along the route, most consideration will be required for the cut and cover construction to complete the pocket track on the north end of the North Hollywood station and the cut and cover construction for the Laurel Canyon and Valley College stations on Oxnard Street.

b. Demolition of Aboveground Structures

The build alternatives have been selected to minimize, to the extent possible, building demolition. However, some properties will need to be acquired for parking facilities or construction staging areas, and structures on these properties would need to be demolished. Building demolition would occur prior to initiation of subsurface construction.

Equipment typically involved in demolition includes: crawler cranes, crawler dozer/loaders, pavement breakers, rubber-tired loader/bob cats, trucks, excavator/backhoes, generator/ compressors, and water trucks for dust control.

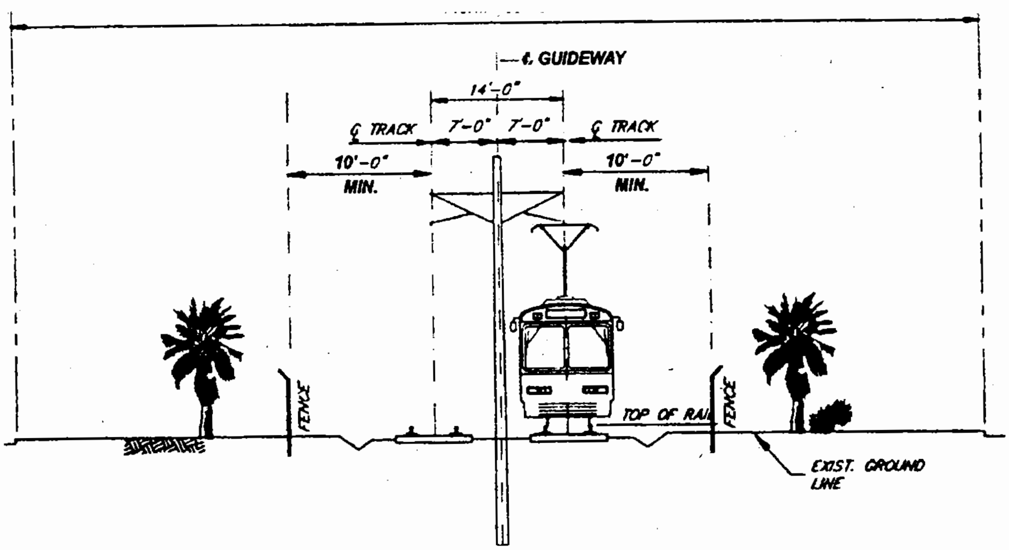
c. Transit System Construction

The following sections describe the various construction methods that may be used. For a description of where these methods would be applied, see the profiles discussion in Chapter 2.

(1) At-Grade Construction

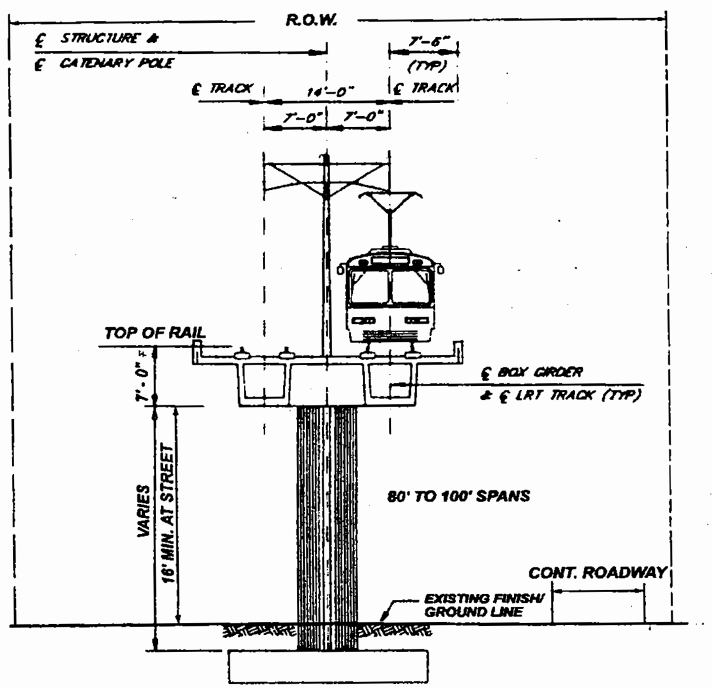
Surface construction would first entail removal of existing tracks and clearing/grubbing of the worksite. Some grading and drainage work could be required to prepare the track bed and improve the ROW or repair/install culverts. Track-laying would then occur using a track-laying machine. Fencing would be installed along the surface right-of-way, and signalization, train control, and other finish work would be performed. A typical at-grade section is shown on Figure 5-1.1.

At-grade stations are proposed at North Hollywood (Alternatives 6a and 6b) and at Laurel Canyon Boulevard and Chandler Boulevard (Alternative 6a).



NOTE: CATENARY AND PANTOGRAPH SYSTEM APPLIES TO ALTERNATIVES 6 AND 11.

TYPICAL AT-GRADE SECTION



NOTE: CATENARY AND PANTOGRAPH SYSTEM APPLIES TO ALTERNATIVES 6 AND 11.
ALTERNATIVES 1, 2, AND 11 COULD ALSO TAKE POWER FROM THIRD RAIL ON AERIAL SECTIONS

TYPICAL AERIAL SECTION

SOURCE: DELEUW, CATHER, & ASSOCIATES, 1997.

(2) Aerial Construction

Aerial structures would be constructed to allow street traffic to pass under the structure. Aerial structures must therefore be constructed a minimum of 15' 6" above the street and parking lots. During construction the vertical clearance to bottom of falsework will be a minimum of 14' 0". Spacing of columns that support an aerial structure would vary to accommodate local conditions but generally would be 80 to 100 feet apart. Columns typically would be 4 to 6 feet in diameter.

Aerial structures are generally constructed in four stages. The first stage involves clearing the worksite and installation of piles that would support the weight of the structure, called "dead load," and the weight of the trains, called "live load." The piles generally would be steel "H" beams that are installed in pre-drilled holes and filled with concrete. The second stage is the installation of the pile cap, which joins all of the piles. The pile cap would be constructed of reinforced concrete approximately 4 to 5 feet thick.

The third stage would involve construction of the columns. Columns would be constructed of reinforced concrete that would be poured inside a reusable form. The shape of the column can vary, however, a circular column approximately 4 to 6 feet in diameter is generally used.

The fourth and final stage of construction involves the placement of the superstructure. The placement of the superstructure would begin after the column concrete has cured for a sufficient time, approximately 14 days. The superstructure could be pre-cast concrete segments that would be fabricated at some other location (perhaps at a location along the SP right-of-way) and brought to the construction site by truck. Pre-cast segments would be lifted into place by large cranes and secured to the columns. Alternatively the superstructure could be cast-in-place. Forms would be placed, reinforcement placed and concrete poured into the form. After the superstructure concrete has gained sufficient strength, the forms are removed. A combination of cast-in-place and pre-cast construction could be used. For example, pre-cast could be used at street crossings where either vertical clearances are limited or where street or lane closures must be held to a minimum. Cast-in-place could be used for the segments between street crossings. Once the superstructure is complete, track laying, construction of catwalks, train signalization, and other details would be completed. A typical aerial section is shown on Figure 5-1.1.

Stations at Valley College (Fulton/Burbank) (for Alternative 1d), at Van Nuys (for all alternatives), and at Sepulveda (for all alternatives) are proposed to be aerial. Similar construction methods would be used, although there would be more site grading and preparation and a greater construction effort to build the station platform, stairways, and escalators, parking lots, and other amenities. Following construction, landscaping would be installed around the station areas.

(3) Open Cut (Open Air) Construction

Generally, open-air subways have vertical wall trenches; however, open-cut or open-air subway construction is a method where earth is removed from the surface and hauled away, thereby forming a depressed trench or guideway in which the railroad alignment can operate. Trains operate below the surface, thus providing many of the perceived environmental advantages of subway, while at the same time often being faster and less costly to construct than deep-bore subway.

A construction method that lays back the earth in lieu of building vertical support walls is also being considered for the alternatives that use the SP right-of-way. Because of sandy soil conditions, only limited locations along the SP right-of-way provide sufficient right-of-way width combined with a shallow profile to make this construction method feasible.

The first step in open cut construction is to assure support for foundations of buildings adjacent to the excavation. One process is underpinning of the foundations, i.e., supporting the building foundations themselves. The support of adjacent structures can also be accomplished by use of excavation support systems, which in conjunction with proper excavation and bracing procedures, can provide adequate protection for adjacent structures. An excavation support system could include interlocking sheet piling, reinforced concrete cylinders, soldier piles and timber lagging, and in-situ soil-cement walls. During construction, MTA will monitor adjacent buildings for movement, and, if detected, take action to control the movement.

It is likely that a soldier pile and timber lagging system would be selected for open cut construction. This is due to the soil conditions known to exist along the route and the economy offered by the soldier pile and timber lagging system. The first step involves drilling of auger holes and placement of large vertical steel beams (called soldier piles) at regular intervals. Pre-drilling of holes is necessary to reduce construction noise that would be much higher with pile driving. Within the SP right-of-way, the contractor would be able to install both lines of soldier piles with one pass along the alignment. Lagging would then placed between these beams as excavation occurs.

At the cross streets, the soldier piles would be designed and placed to receive a pre-built bridge that would be dropped into place to span the excavation during the period of open cut construction. A shallow excavation of approximately 8 feet is made at the bridge location. This excavation is designed to uncover buried utilities and to provide room for continuing the excavation below the bridge. This bridging method would require closing traffic for one weekend. If necessary, this method could be used in a manner that only one half of the street is closed at a time.

Alternatively, a deck beam system would be designed and placed between the soldier piles that would receive temporary decking. At each soldier pile location, lateral trenches would be excavated across the alignment from one side wall to the other to permit installation of deck beams. These trenches would be excavated during the nighttime or weekends and covered to permit normal traffic flow during the weekday. When a sufficient number of deck beams has been installed, a shallow excavation of approximately 8 feet between the deck beams can be made to uncover buried utilities and to provide room for continuing the excavation below the decking.

The utilities that can remain in the trench area (e.g., telephone, traffic, electric) would be cradled and hung from the underside of the temporary bridge or deck beams. Sewer lines may exist at this shallow depth and likewise would be hung from the bridge or deck beams during the initial excavation stage. Utilities located deeper would be uncovered fully after additional depth of excavation has been accomplished. Sometimes heavy utilities such as large sewer pipes are supported by an auxiliary set of beams spanning between the side walls rather than hanging them from the deck beams.

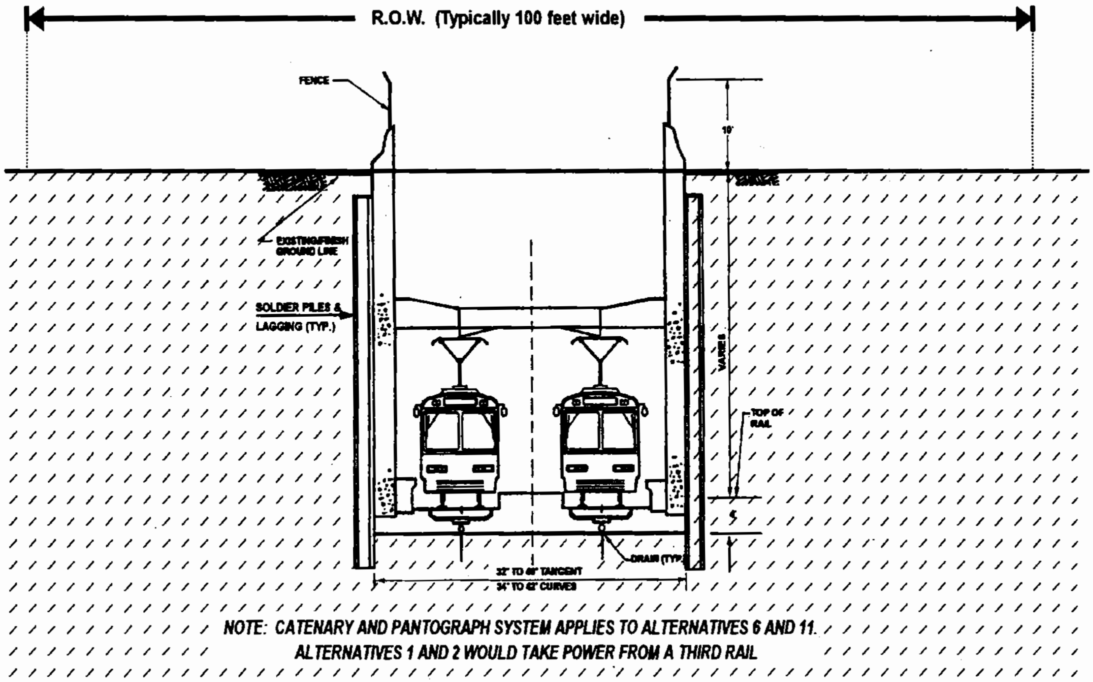
When utilities cannot be relocated outside the excavation or when they are being moved, there is a small chance of damage during excavation, causing a utility outage that can last for a few minutes to a few days. Most of the risk of hitting utilities is caused by actual utility locations being different from those shown on construction drawings. Utility service will be returned as quickly as possible after an outage.

Once the soldier piles are in place on both sides of the alignment, excavation can begin from the surface. As the excavation progresses down, timber lagging is placed between the soldier pile to retain the soil. Also as the excavation progresses downward a haul road would be developed in one direction out of the excavation following the open cut alignment. Once the excavation reaches the design depth, the excavation would proceed forward by shaving the top off the sloped haul road. Excavated material would be removed using heavy earth moving equipment and would be hauled away from the open cut segment job site via trucks. This activity would progress along the open cut construction segment until the excavation was complete.

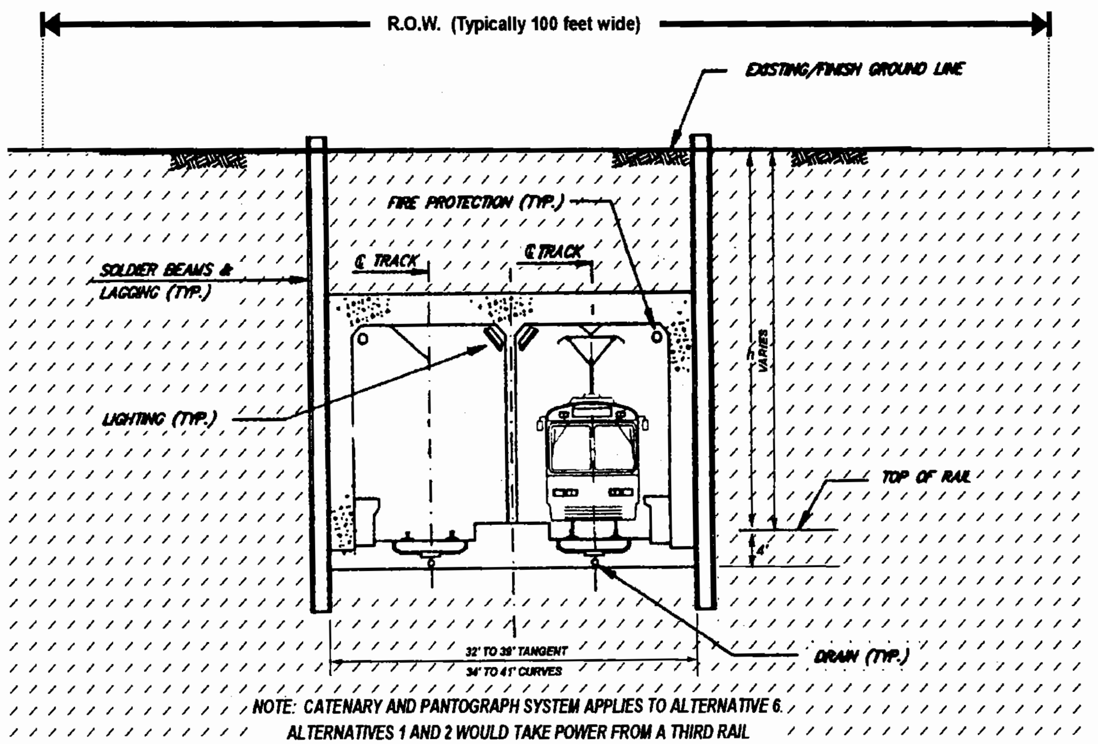
At specified depths either horizontal cross-bracing (called struts) between the walls or tie backs (rods anchored into the soil) would be placed as excavation occurs to counter the pressure of the retained earth. Groundwater that may seep from below and under the sidewalls and rainfall would be pumped from the low point of excavation.

Following excavation, the final structure floor, also known as the invert or base slab, and final side walls (placed inside the soldier pile and lagging soil support walls) would be poured using steel reinforced concrete. In-situ soil-cement walls could be used at some locations where geology or groundwater issues dictate. The in-situ soil-cement walls can be used not only for soil stabilization and excavation support but also for groundwater cutoff, a critical concern in areas exhibiting high ground water levels. In the future the water table in the East Valley may return to historic levels. However, at the present time, the water table is nearly 60 feet below the bottom of the open section and is not an issue. The track bed and track would then be put in place. A typical open cut guideway section is shown on Figure 5-1.2.

At the street crossings, a cut-and-cover section is proposed. The temporary bridge or decking system would be removed, the cut-and-cover section would be backfilled, permanent utility restoration would occur, and the permanent street would be installed. With restoration of roadway pavement and vehicular traffic, the surface work at the street crossing would be



TYPICAL OPEN CUT SECTION



TYPICAL CUT AND COVER SECTION

SOURCE: DELEUW, CATHER, & ASSOCIATES, 1997.

completed and continuing activity involving open cut finishes and equipment installations (e.g., installation of tracks, power, signals, and communication systems) could continue with minimal disruption to street use by vehicles and pedestrians. Cut-and-cover is discussed further below.

Open air stations (possibly with roof coverings) are proposed at Laurel Canyon station (for Alternatives 1b, 1c, 1d, 6b, 11a, and 11b); at Valley College/Fulton-Burbank station (for Alternatives 1a, 1b, 1c, 6 and 11).

(4) Cut and Cover

Cut-and-cover construction is similar to open cut construction described above with the following additions and modifications.

For station construction along Oxnard Street and pocket track construction on Lankershim Boulevard, the contractor would typically first occupy one side of the alignment to install one line of soldier piles, and then move to the opposite side. This would minimize lane closures on the adjacent streets.

For station and pocket track structure construction, decking over the excavated area would be installed in progressive stages. Braces between these walls would be arranged in a manner that would allow for installation of a temporary deck. At each soldier pile location, lateral trenches would be excavated across the alignment from one side wall to the other to permit installation of deck beams. For under-street and cross-street segments, these trenches would be excavated during the nighttime or weekends and covered to permit normal traffic flow during the weekday. When a sufficient number of deck beams has been installed, a shallow excavation of approximately 8 feet in between the deck beams would be made. This excavation is designed to uncover buried utilities and to provide room for continuing the excavation below the erected decking. For under street segments, it is proposed that the decking be set flush with the existing street and sidewalk levels.

Utilities would be accommodated in the same manner described for open cut construction.

The next step in cut-and-cover construction is excavation and bracing. The major excavation work would proceed in short segments along with the street decking. Excavated material would be removed using equipment on the deck above and would be hauled away from the cut-and-cover segment job site via trucks. This activity would progress along the cut-and-cover construction segment until the excavation was complete and the deck fully installed.

The next step is to construct the subway box. The subway floor, also known as the invert or base slab, would be installed first. After a reasonable length of continuous base slab was completed, the installation of exterior walls and any interior column elements would proceed up to the underside of the top slab level that is to be supported by the walls and/or columns. The top (roof) slab would then be poured.

In some areas, where existing cross streets may be decked during construction, decking would be removed, the cut-and-cover section would be backfilled, permanent utility restoration would occur, and the permanent street would be installed. With restoration of roadway pavement and vehicular traffic, the surface work on the structure would be completed and continuing activity involving tunnel finishes and equipment installations (e.g., installation of tracks, power, signals, and communication systems) could continue beneath the surface with minimal disruption to street use by vehicles and pedestrians. A typical cut-and-cover guideway section is shown on Figure 5-1.2. Typical construction methods are shown on Figure 5-1.3.

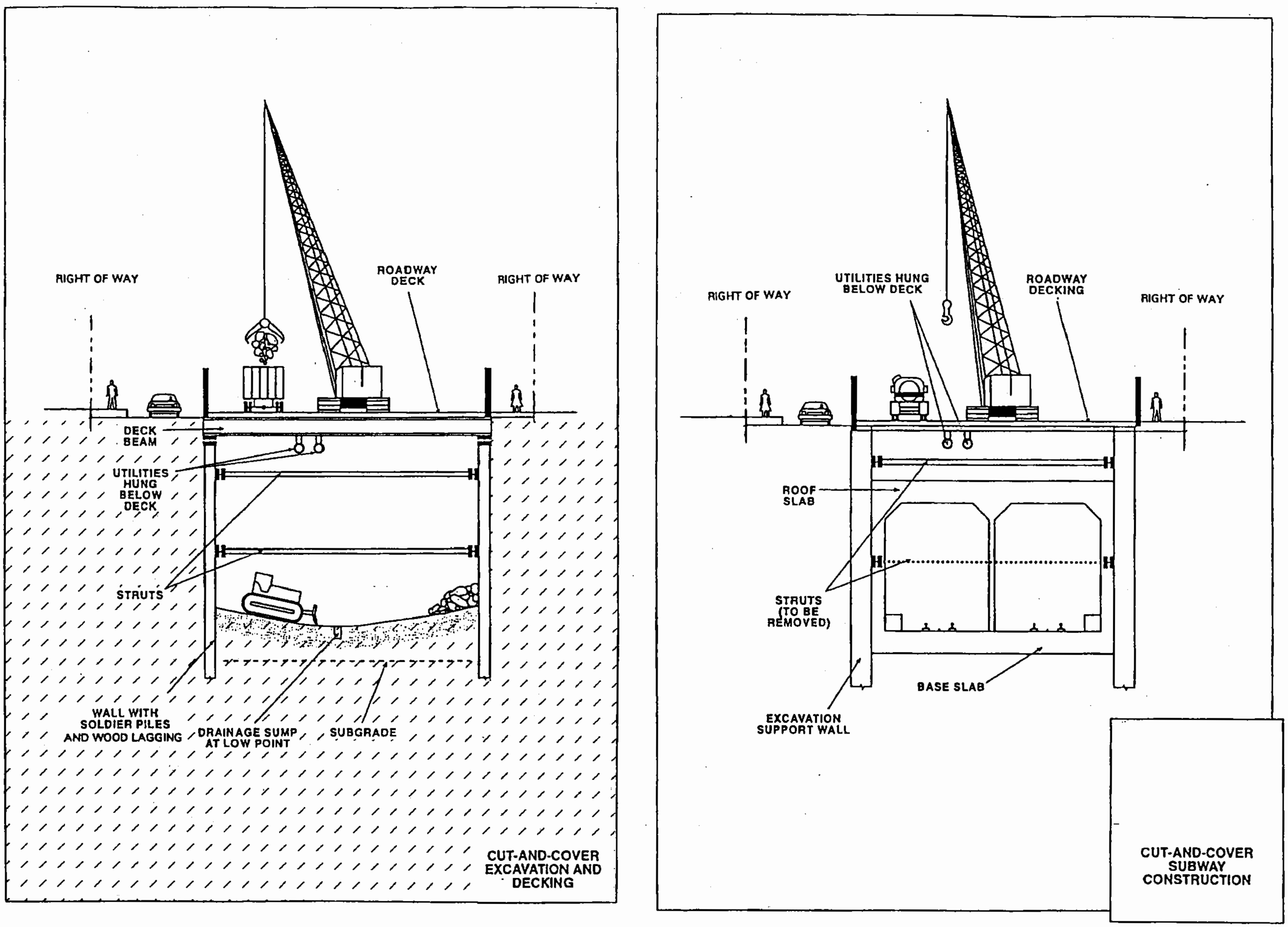
Cut-and-cover stations are proposed at the Laurel Canyon station and at Valley College/Fulton-Burbank (for Alternative 1a), and along Oxnard at Laurel Canyon and at Valley College (for Alternative 2). These would be constructed similar to open cut as described above, with the addition of construction of the roof slab and backfilling operation.

(5) Deep Bore Subway Construction

Twin bored tunnels connecting the stations would be constructed using a mechanized tunnel boring machine(s). An earth pressure balance (EPB) or "positive face control" machine(s) is currently proposed given its capabilities for better control of movement of excavated material from the tunnel face into the tunnel, thereby reducing the likelihood for subsidence at the surface. See Section (6) below. The EPB includes a plate the size of the tunnel face behind the cutting face. The excavated material between this plate and the cutting edge is used as a support medium for the tunnel face and can be made into a slurry for increased control. If a slurry machine is used, a slurry processing plant is needed at the surface of the shaft site for constitution and recycling of slurry components. Excavated material is removed from a excavation chamber via a conveyor belt through a door in the pressure plate. This material is loaded into "muck" cars at the rear of the TBM and transported back to the shaft site, where it is conveyed to the surface and stored in a pile until it is trucked away. The "muck train" is also used to bring supplies to the TBM.

As part of the trailing gear of the machine, tunnel liner devices would erect precast concrete segments comprising a temporary tunnel lining in the form of rings of precast concrete 3 feet to 4 feet wide and approximately 20 feet in inside diameter. These rings serve to support the earth and rock during the installation of a permanent tunnel lining. The tunnel machines advance by thrusting against previously placed tunnel liner rings. Advance rates for the earth pressure balance machines are estimated to be between 15 and 50 feet per 16 hour day (typically operating in two shifts).

Current expectation is that the tunnel boring machines would be placed into the ground in the area immediately north of the North Hollywood Metro Rail station, on a parcel of land east of Lankershim Boulevard and south of Burbank Boulevard, for all tunneling alternatives. A tunnel staging site will be established at this location for tunnel liner storage; spoil removal, storage and loading facilities; and construction personnel facilities and offices. A slurry plant, if required, would also be established at this location. Private property acquisitions needed to establish this construction site are identified in Section 4-2.



SOURCE: DELEUW, CATHER, & ASSOCIATES, 1997.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 5-1.3
Cut-and-Cover Construction Methods

Upon completion of tunnel excavation and permanent lining, the cross-passages between the twin tunnels would be constructed by hand mining methods from openings in the tunnel liners. In addition, tunnel openings to ventilation shafts and low-point drainage sumps would be constructed. Following these activities, first stage track bed construction would be carried out, together with the construction of an emergency evacuation walkway along the side of each tunnel. Final details and train control would then be constructed. A typical tunneling operation is illustrated on Figure 5-1.4.

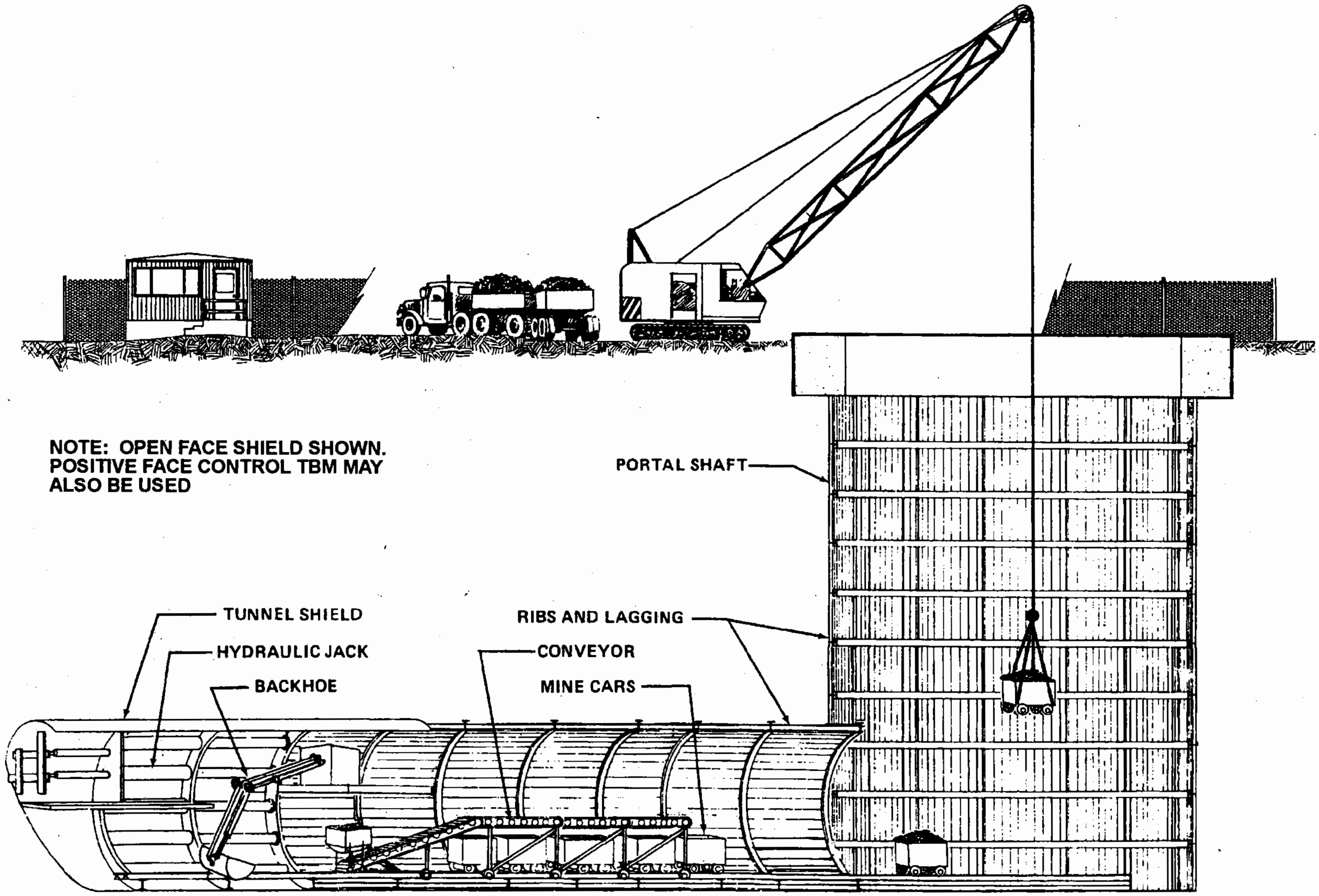
No stations would be constructed under any alternative using deep bore construction. Even with deep-bore tunnels, because of their size and complexity, stations must be constructed using cut-and-cover methods.

(6) Tunnel Boring Machine

In general, a tunnel boring machine (TBM) is composed of a cutter head and shield as wide in diameter as the tunnel, and a long "train" of support and installation equipment. Behind the tunnel shield itself is the motor to turn the cutter head against the tunnel face and equipment to remove the excavated material (muck) from the face and out from the tunnel. This equipment is typically a screw conveyor which then deposits the muck into small hopper cars. These muck cars are formed into a train to take the muck to the shaft site where it is moved to the surface. Also following the TBM 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 surface as the machine advances. The entire TBM, from cutter head to the end of the trailing gear is on the order of 300 feet long.

To date, tunneling for the MTA rail construction program has employed open face tunnel shields. Recent MTA construction experience with open face methods has resulted in surface settlements between 1.5 and 2 inches along public rights-of-way. Use of a TBM with positive face control has the benefit of assuring control of the ground, resulting in much less surface settlement than occurs with open face methods. In addition, it is not necessary to dewater the ground except at access shaft sites, eliminating most of the problems associated with treatment and disposal of groundwater. As the initial lining put in place by the TBM forms the permanent structural lining of the tunnel, it may be practical, where ground conditions allow, to avoid installation of a second inner tunnel lining.

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 and thereby better maintaining stability and reducing settlement. In conjunction with the positive face control TBMs, bolted, gasketed segmental linings are installed within the shield. As these segments emerge from the machine, grout is pumped between the segments and excavated ground. This provides more immediate ground support than the expanded segments that have typically been used with the open face machine, and further reduces potential for ground losses and associated settlements.



SOURCE: NORTH OUTFALL REPLAEMENT SEWER DEIR, 1988.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE 5-1.4
Typical Tunnelling Operation

There are two types of positive face control machines: earth pressure balance (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 briefly described below. The choice of technology and machine will be left to the selected construction contractor, but for purposes of this environmental 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. The plastic soil is mixed in a muck chamber immediately behind the cutter head and squeezes past the cutter head to the tunnel face. Pressure on the face is controlled by thrust on the cutter and controlled removal of spoil through a screw conveyor behind the muck chamber. EPB machines operate most effectively in soils having a high percentage of fine grained particles. The EPB cutter head, when moving against these soils, causes the excavated soil to develop a plastic consistency. However, successful operation through soils with a lower percentage of fine grained particles can be achieved through the addition of bentonite or foams to create a plastic consistency within the muck chamber. An Earth Pressure Balance Machine is illustrated on Figure 5-1.5.

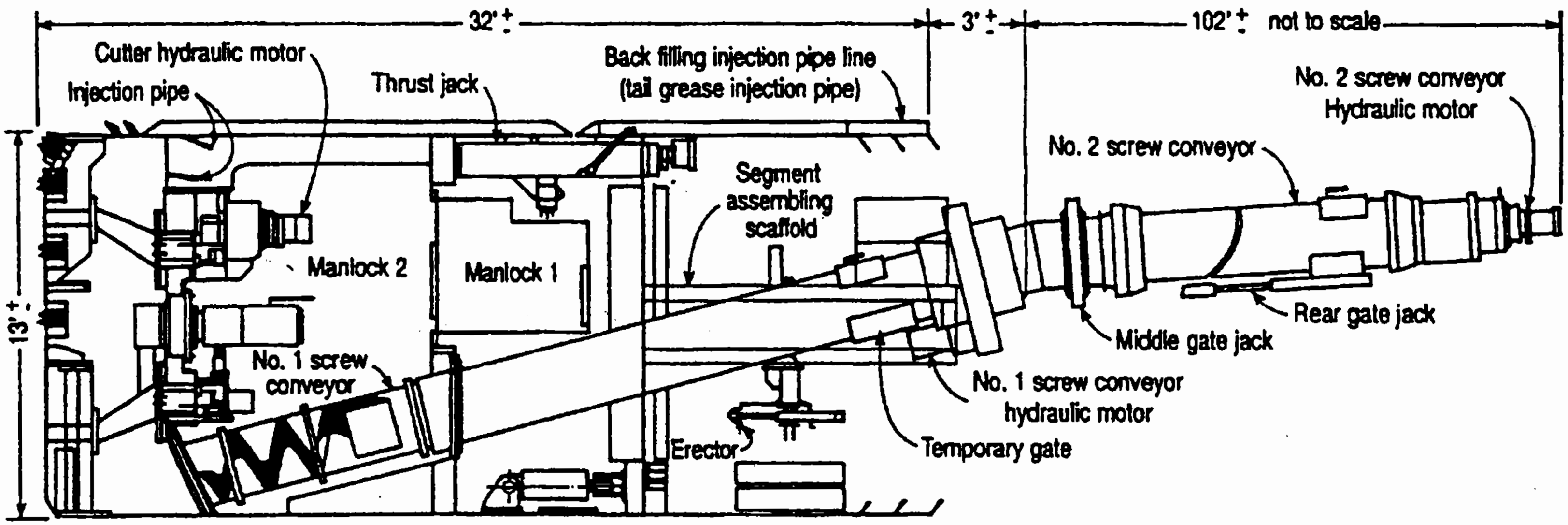
EPB machines can handle cobbles (up to 8 inches) through the screw conveyor (for a typical 24 inch solid-stem screw). Larger stones can sometimes be broken by cutters on the cutter head, a stone crusher, or worked to the side of the tunnel but may require stopping the machine to remove, thereby stopping the progress of the machine.

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 and excavated muck, and contractor offices, 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 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 in a compressed air reservoir immediately behind the cutter head. Pressure on the face is controlled by controlling the pressure in the air chamber; the positive face pressure is derived solely by air pressure using the slurry as a transfer fluid. The slurry also carries the excavated material away from the cutter head and can be pumped directly to the surface, eliminating the need for muck cars. Slurry machines perform best in coarse-grained cohesionless soils and are advantageous in mining through gassy or contaminated ground conditions because the tunnel working environment can be isolated from these hazards with a closed loop slurry delivery and removal system. The



SOURCE: *CIVIL ENGINEERING.* FEBRUARY 1996.

FIGURE 5-1.5
Earth Pressure Balance Tunnel Boring Machine

result, however, is that the muck and slurry typically become and remain contaminated, if contaminated soil conditions are encountered. In this case the slurry can not be separated from the soil and reused.

Slurry machines can pass soil particles up to 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 fragments, cobbles, and boulders for passage through the slurry system. Depending on the design specifics, particles as large as 1 to 3 feet can be broken down by the stone crusher. In some cases manual removal, involving stopping the machine, may be required.

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 is usually located at the shaft portal, however a primary slurry separation plant can be included in the trailing gear of the TBM and move with it. In this case, a secondary plant aboveground would still be required. 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.

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

5-1.3 Estimated Construction Periods

Based upon the current level of engineering detail that has been accumulated, it is estimated that between 47 and 75 months (or roughly between 4 and 6 years) would be required to complete construction of the various alternatives in the East Valley. If the West Valley portion of Alternative 6 is built sequentially after the construction of the East Valley option, then an additional 51 months is estimated. However, if East and West Valleys are built concurrently, then the Cross Valley guideway construction time is estimated to be 51 months for Alternative 6.

A portion of the guideway construction time is for heavy construction. Heavy construction includes such items as utility relocation of support, excavation, and concrete work. For the various alternatives it is estimated that between 15 and 43 months would be required to complete the heavy construction work, which is between 1/3 and 2/3 of the time required to complete the construction overall.

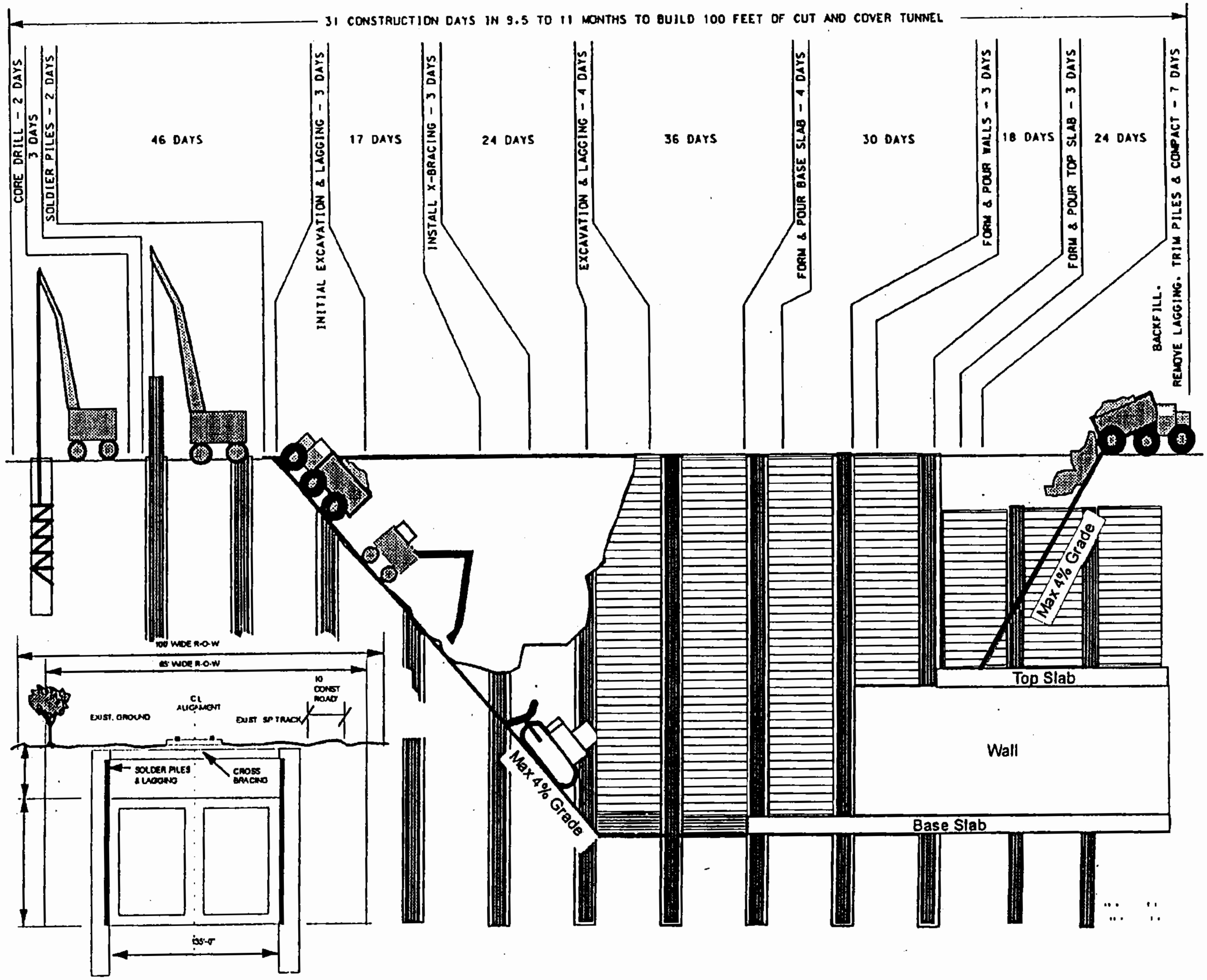
Station construction is expected to be concurrent with the guideway construction. It is estimated that guideway construction for the various alternatives will require between 20 months for light rail transit (LRT) aerial stations and 44 months for heavy rail transit (HRT) stations with cross over structures used with deep bore tunnel guideways. The heavy construction at the station is estimated to be within 8 months for LRT aerial stations and 32 months for HRT stations with cross over structures.

Both the total construction time and the heavy construction time estimated for stations used with cut-and-cover and open-air HRT guideway alternatives is less than the time required for deep-bore stations. The stations used with the cut-and-cover and open-air guideway alternatives do not include underground mezzanines and their vertical alignments are not as deep. As a consequence, the amount of excavation and concrete work is less. The total construction time is estimated to be 35 months, with a heavy construction time of 23 months for stations with crossover structures.

It is estimated that the total construction and heavy construction time for the stations without crossover structures will be 5 months less, or 30 months and 18 months, respectively. It is estimated that for deep-bore stations without a crossover structure, the total construction and heavy construction times will be 9 months less, or 35 months and 23 months, respectively.

Although there is a 20 to 30 percent reduction is construction time at stations with the cut-and-cover and open-air guideway alternatives compared to stations used with the deep-bore guideway alternatives, the cut-and-cover and open-air guideway does introduce the neighborhood to direct exposure to the construction while the deep-bore guideway does not. Figure 5-1.6 is a graphic depicting the sequence of construction activities marching from right to left to construct a cut-and-cover underground tunnel.

The bottom portion of the graphic is schematic; there is no scale (in either the horizontal or vertical directions) in either liner or time units. At the top of the graphic is a time scale depicting the time to complete 100 linear feet of cut-and-cover underground tunnel guideway, which is estimated to be between 9.5 and 11 months, depending on whether the 100-foot segment is a the end or at the beginning of a 1-mile long tunnel contract. The time scale also shows that a total of 31 heavy construction days out of the 9.5 to 11 months is required to construct the 100-foot segment. No heavy construction would be occurring during the remaining 8 to 9.5 months along the 100-foot segment, although from time to time it is likely that supply and spoil trucks would pass by.



SOURCE: DELEUW, CATHER, & ASSOCIATES, 1997.

5-2 TRANSPORTATION AND CIRCULATION

5-2.1 Impact Analysis Methodology and Evaluation Criteria

Because the San Fernando Valley East-West Transportation Corridor will be routed through urban areas, motorists and pedestrians will at times be delayed and inconvenienced during the construction period. These impacts will be felt most acutely in areas of cut-and-cover construction in city streets. In the impact discussion that follows, a qualitative assessment has been made of the potential impacts, including temporary lane and nighttime street closures, impacts from trucks moving excavated material, other street impacts, cumulative impacts, and impacts on parking. Impacts would be considered significant if they would substantially degrade the operation of the street system in the vicinity of the construction sites.

5-2.2 Impacts

The degree of traffic disruption during construction of the San Fernando Valley East-West Transportation Corridor will depend on whether a station is built on- or off-street, how large the construction activity area is, which method of construction is used, and how long the construction phase will last. In some locations, streets may be closed temporarily during nighttime hours or lanes may be closed temporarily. In addition to construction impacts due to changes in existing street geometrics, the traffic generated by construction workers and trucks hauling excavated material may also cause traffic impacts.

Table 5-2.1 summarizes the anticipated characteristics of each alternative including number and type of stations, whether the stations are to be located on- or off- street and whether the guideway itself is to be subway, aerial, cut-and-cover, or at-grade.

Review of Table 5-2.1 shows that all of the alternatives include aerial segments and aerial stations. These are to occur at Sepulveda and Van Nuys. Alternative 1d will have one additional aerial station at Fulton-Burbank.

All other stations, with the exception of one location, are to be either subway or open air stations (with or without a roof). Alternative 6a will have two at-grade stations at Laurel Canyon and North Hollywood. In each alternative, two stations (including the terminus station) are to incorporate crossovers. Stations which include crossovers require a greater excavation area, and therefore, represent a potentially greater impact on traffic circulation and parking during the construction phase.

Cut-and-cover construction would be the method selected for both on-street and off-street stations. Off-street stations would generally have less impact on traffic circulation. Vehicular circulation would be impaired whenever cut-and-cover construction crosses a street, occurs along a street or removes traffic or parking lanes.

Table 5-2.1: Summary of System Characteristics

Alternative	1a	1b	1c	1d	2	6a	6b	11a	11b
No. of Stations	4	4	4	4	4	5	5	4	4
Aerial	2	2	2	3	2	2	2	2	2
At-Grade	0	0	0	0	0	2	1	0	0
Open-Air (w/ or w/o roof)	0	2	2	1	0	1	2	2	2
Subway	2	0	0	0	2	0	0	0	0
No. of Stations with Crossovers (a)	2	2	2	2	2	2	2	2	2
Guideway Miles (b)									
Subway	4.0	1.3	1.3	1.3	3.6	0	0	0.9	0.9
Aerial	1.4	1.4	1.4	4.2	1.6	1.2	1.2	1.2	1.2
Cut	0.4	3.1	3.1	0.3	0.4	1.2	3.4	1.6	2.7
At-Grade	0.9	0.9	0.9	0.9	0.9	4.2	2.0	3.0	1.9
Total	6.7	6.7	6.7	6.7	6.5	6.6	6.6	6.7	6.7

Notes:
(a) Includes terminus Sepulveda and Fulton-Burbank/Valley College Stations for all alternatives.
(b) One-way after rounding.

Source: Meyer, Mohaddes Associates, 1997.

a. *Temporary Lane and Night-time Street Closures*

No permanent street closures are anticipated under any circumstances. Temporary lane and night-time street closures will be required. With the cut-and-cover method, the construction of most on-street stations and some segments of off-street stations, will occur directly beneath arterial streets which are vital to access and traffic circulation of the station area. Traffic flow on these streets cannot be permanently disrupted for the entire duration of the project. Therefore, decking will be installed to maintain vehicular traffic flow on these streets during the construction period while work will be proceeding below. Deck installation will require lane and night time street closures at several of the stations. These temporary lane and night-time street closures are listed in Table 5-2.2. Duration of these typically range from 3-7 months, depending on the particular station site, at the beginning of construction and at the end for site restoration. After installation of the deck, full street traffic can be maintained for the duration of construction.

There will be overall impacts to the efficiency of traffic flow on decked streets. The decking will be set flush with the existing street. However, traffic operation will be impaired and capacity will be reduced somewhat on decked sections as a result of such items as: rougher driving surfaces, slower speeds, narrower lanes and lateral clearances, visual distractions and physical obstructions related to construction activity, irregular lane markings, or minor elevation changes at the points where the decking will join the existing street.

Most of the streets affected by temporary lane closures are four-lane arterials with two-way left turn medians and/or left turn pockets at intersections. Temporary closure of two of the lanes for deck installation or construction equipment will cause a 50 percent reduction in traffic capacity. In some cases it may be possible to maintain three lanes, thereby limiting the capacity impacts to one direction only. Most of these arterials have peak hour traffic volumes, which cannot be handled with only one lane, without significant delay and adverse impacts. Therefore, to the extent practical, traffic lanes will be maintained in service during peak hours. Temporary lane reductions should be for short periods of time and should be limited to night time and off-peak periods to minimize impacts. When only one lane of traffic is maintained, left-turns (and right-turns if heavy pedestrian activity exists) should be prohibited at the main intersections to avoid lane blockages.

Complete closures of major arterials would be avoided, if possible. If full closures are absolutely necessary, they would be limited to night time only. In such cases, through traffic on these arterials would be detoured via other arterial streets to avoid impacts to residential neighborhoods. Decking at cross streets will be installed in stages to allow at least half of the existing lanes to be maintained. After installation of the deck, full cross street traffic can be maintained for the duration of construction. Therefore, it is not anticipated that any cross streets will be closed entirely at any time.

During final design, site and street specific Worksite Traffic Control Plans will be developed in cooperation with the City of Los Angeles Department of Transportation (LADOT) to accommodate required pedestrian and traffic movements. These impacts are not considered significant.

Table 5-2.2: Temporary (Weekend and Nighttime) Lane and Street Closures

Alternative	1a	1b	1c	1d	2	6a	6b	11a	11b
Lankershim Blvd.	X	X	X	X	X			X	X
Tujunga Ave.	X	X	X	X		X	X	X	X
Colfax Ave.						X	X		
Oxnard St. for Laurel Cyn. Station					X				
Chandler Blvd. for Laurel Cyn. Station	X	X	X		X		X	X	X
Laurel Canyon Blvd.		X	X	X		X	X	X	X
Corteen Pl.		X	X	X		X	X	X	X
Whitsett Ave.		X	X	X		X	X	X	X
Bellaire Ave.		X	X	X		X	X	X	X
Coldwater Canyon Ave.		X	X	X		X	X	X	X
WB Chandler Blvd. near Ethel Ave.		X	X	X		X	X	X	X
Ethel Ave.		X	X	X		X	X	X	X
Burbank Blvd.		X	X	X		X	X	X	X
Fulton Ave.		X	X	X		X	X	X	X
Oxnard St. for Fulton-Burbank/ Valley College Station		X	X	X	X	X	X	X	X
Woodman Ave.		X	X	X		X	X	X	X
Hazeltine Ave.		X	X	X		X	X	X	X
Van Nuys Blvd.	X	X	X	X	X	X	X	X	X
Vesper Ave.	X	X	X	X	X	X	X	X	X
Kester Ave.	X	X	X	X	X	X	X	X	X
Sepulveda Blvd.	X	X	X	X	X	X	X	X	X

Source: Meyer, Mohaddes Associates, 1997.

b. Trucks Removing Excavated Material

Trucks removing excavated material from the tunneling and station construction operations have the potential to cause traffic impacts, if the number of trucks on a particular route causes congestion or if the routes utilized by the trucks are inappropriate (e.g., primarily residential in nature). Table 5-2.3 identifies the estimated number of truck trips required to haul the material excavated at each station. Excavation of each station area is estimated to take six to eight months. Removal of tunnel excavation material would also occur at various stations along the alignment. The timing of the estimated number of daily truck trips would be dependent on environmental considerations (e.g., noise, traffic, air quality, business disruption) at each station. Trucks could potentially operate from 8 to 24 hours a day, depending on the nature of the construction operation and the location involved.

Table 5-2.3: Estimated Amount of Daily Truck Trips for Station Construction

Alternative	1a	1b	1c	1d	2	6a	6b	11a	11b
Sepulveda	0	0	0	0	0	0	0	0	0
Van Nuys	0	0	0	0	0	0	0	0	0
Valley College (Fulton/Burbank)	624	354	554	0		655	266	655	266
Valley College (Fulton/Oxnard)					558				
Laurel Canyon	552	354	354	354	582	0	266	310	310
TOTAL	1,176	708	408	354	1,140	655	532	965	576

Source: Meyer, Mohaddes Associates, 1997.

c. Other Impacts

A minor on-going impact will be associated with traffic on the decking installed atop the station construction areas. Once fully installed, the decking can be striped to resemble a city street with the same number of lanes as previously in place on the street. In theory, the street will then possess the same traffic carrying capacity as it did prior to installation of the decking. In actuality, however, the effect of the decking on drivers' behavior will likely be to slow traffic to less than its pre-construction speed. This is only a marginal impact and the effect is not significant, but it could result in the perception of more congestion through the construction zone, as traffic drives at slower speeds across the decking, or it could cause a small percentage of drivers to seek alternate routes. This would not be considered a significant impact.

Drop holes will be used for purposes of adding concrete to tunnel sections. These holes will occur between station/tunnel excavation sites due to the limitation in distance that concrete can be feasibly pumped. Although the exact locations of the holes is not known at this time, some may occur on local residential or collector streets. In general, it is recommended that complete street closures not occur. If complete closures are required, they should be limited to off-peak traffic hours (i.e., avoid morning and evening peaks) and should never block cul-de-sac streets or driveways. It is not expected that limited lane or street closures on local or collector streets will have a significant impact on traffic. Detour routes, signing, turnarounds and other work site traffic control elements should be coordinated with the city of Los Angeles for all drop hole locations.

d. Cumulative Impacts

There are two types of cumulative construction impacts that could occur if the construction contracts are not well coordinated with one another or with other major construction projects in the vicinity of this project.

The construction schedule and the packaging of contracts will be defined during final design. In order to avoid cumulative construction impacts, construction contracts should be packaged so that multiple excavation efforts are not happening in close proximity to one another with trucks from more than one excavation project attempting to use the same haul route at the same time. The area is traversed by three freeways making it relatively easy to design haul routes from each station to a freeway via different arterial streets, thus minimizing the potential for cumulative impacts on any arterial street.

Since the precise construction scheduling and construction packages are not known at this time, it is not possible to comprehensively identify other specific development projects or public infrastructure improvement projects that might be under construction at the same time. MTA will continue to work with other jurisdictions and entities (e.g., utility companies) to identify other major construction projects in the vicinity and coordinate construction activities, particularly haul routes, during the period of the construction contracts.

e. Parking

As identified previously in Section 3-4.1, there are a total of 5,620 parking spaces within the San Fernando Valley Corridor station impact areas. Average parking utilization in these areas is approximately 36 percent of the supply. The parking supply and utilization within the various station areas in each alternative alignment are fairly uniform. Table 3-4.1, presented in Chapter 3, Section 3-4, provides a summary of parking supply and utilization within the station areas.

Section 3-3 identified potential ultimate parking impacts associated with the operation of the San Fernando Valley Corridor and its stations. However, interim parking impacts are anticipated during the construction of the San Fernando Valley East-West Transportation Corridor. These impacts are the result of parking being eliminated through actual construction along roadways which presently provide on-street parking, as well as construction activities which require limiting access to areas which are presently used for parking. This latter impact could involve on-street parking in the immediate vicinity of station construction, or off-street parking in areas which are required for construction staging.

It is unlikely that the elimination of spaces during construction would cause an overall parking shortfall. However, localized impacts and parking shortages or shortages of convenient parking may occur in the area immediately surrounding a proposed station. Additionally, not all the parking spaces for a given alternative would be eliminated at the same time. Parking restrictions would occur only when actual station construction was to commence and remain in place until station completion.

5-2.3 Mitigation Measures

The following measures are identified to mitigate the potential impacts of station construction on traffic circulation in the San Fernando Valley East-West Transportation Corridor study area.

- Cut-and-cover construction would be minimized on city streets and used only at stations and other special structure locations.

- Decking, constructed to close tolerances, will be used for temporary travel surfaces in areas of cut-and-cover construction as a means of maintaining traffic flow. Decking can be made of wood or precast concrete depending of the design requirements.

- Before the start of construction, possibly during final design, Worksite Traffic Control Plans (WTCP), including identification of detour requirements, would be formulated in cooperation with the City of Los Angeles and other affected jurisdictions (County, State).

- The WTCPs would be based on lane requirements and other special requirements defined by the Los Angeles City Department of Transportation (LADOT) for construction within the city and from other appropriate agencies for construction in those jurisdictions. The excavation and decking of arterials streets crossing the rail alignment will be phased so that the capacity of these streets is not reduced unnecessarily.

- During construction, contractors will be required to follow the Worksite Traffic Control Plan (WTCP) for each site as approved by LADOT.

- Barring unforeseen circumstances, no designated major or secondary highway will be closed to vehicular or pedestrian traffic except at night or on weekends. No collector or local street or alley will be completely closed, allowing local vehicular or pedestrian access to residences, businesses and other establishments.

- Comprehensive bus rerouting and detour plans will be adopted.

- LADOT traffic control officers will be utilized as part of the WTCP at intersections affected by cut-and-cover construction.

- The MTA will develop preferred haul route plans for each construction package which entails removal of excavated material. The haul route plans shall prohibit the use of local residential streets. The haul route plans shall also avoid utilizing streets on which schools are located. In the case of a potential haul route past a school, trucks shall be prohibited from hauling past the school during normal school hours.

- Minimize trucking hauling activities in the PM peak traffic hour.

- Develop a truck haul route plan that distributes the trucks over more than one arterial street route to/from the freeways, but avoids use of any local residential streets.

- To the extent possible, hauling operations should be spread over more than one shift (not concentrated in an eight-hour period) and should not allow hauling during peak hours of adjacent street traffic.

- The MTA will coordinate with other major construction projects within a one-mile radius of the construction site to avoid, to the maximum extent possible, overlapping haul routes with other public or private construction projects.

- Prior to initiating construction on each station, the MTA will develop and adopt a site specific parking plan which identifies off-site replacement parking for all on-street parking lost during construction.

5-2.4 Haul Routes

The proposed haul routes for station excavation material are summarized below. As stated previously, the haul routes shall avoid the use of local residential streets. In general, the haul routes were developed to provide the shortest route to freeway access via major arterials.

a. Alternative 1

Fulton-Burbank Station: Burbank Boulevard, east to Route 170 or west to I-405.

Laurel Canyon Station: Chandler Boulevard, west to Laurel Canyon Boulevard, north to Burbank Boulevard, east to Route 170.

b. Alternative 2

Valley College Station: Oxnard Street, east to Route 170.

Laurel Canyon Station: Oxnard Street, west to Route 170.

c. *Alternative 6*

Fulton-Burbank Station: Burbank Boulevard, east to Route 170 or west to I-405.

Laurel Canyon Station: Chandler Boulevard, west to Laurel Canyon Boulevard, north to Burbank Boulevard, east to Route 170.

North Hollywood Station: Lankershim Boulevard north to Burbank Boulevard, west to Route 170.

d. *Alternative 11*

Fulton-Burbank Station: Burbank Boulevard, east to Route 170 or west to I-405.

Laurel Canyon Station: Chandler Boulevard, west to Laurel Canyon Boulevard, north to Burbank Boulevard, east to Route 170.

5-3 EFFECTS ON BUSINESS

5-3.1 Impact Analysis Methodology and Evaluation Criteria

Potential construction impacts to businesses would include: annoyances affecting normal business activity (i.e., noise, vibration, and dust), reduced accessibility due to street or lane closures, temporary loss of parking, and reduced visibility of retail businesses resulting from the presence of construction activity or equipment. A qualitative assessment has been made of the likely effects of construction activities on local businesses. A significant adverse impact would occur if the continued viability of a business would be threatened or if a substantial reduction in business patronage could be expected.

5-3.2 Impacts

a. Enhanced Bus Alternative

Construction of fixed facilities under this alternative would be minimal, and therefore no adverse effects on businesses are expected.

b. Rail Alternatives

During the construction phase, construction activities associated with the rail alternatives could have temporary impacts on businesses near the construction sites. These businesses would not experience long-term impacts, but could undergo potentially substantial impacts during the construction period because of their close proximity to the construction sites. Some locations (such as adjacent to extended open cut segments or deep bore mucking sites) could experience effects from construction over an extended period of time. Typical businesses near or adjacent to the construction sites would be industrial uses, fast food establishments, restaurants, neighborhood shopping centers, gas stations, retail shops, and office buildings.

The numbers of businesses adjacent to construction areas for each proposed rail project alternative are shown in Table 5-3.1. As shown in this table, Alternatives 1a and 2 would have the fewest number of businesses adjacent to construction areas, whereas the remaining alternatives would have substantially higher numbers of businesses subjected to construction activities.

Disruptions that could occur from construction activity would include: traffic disruption; increased noise and possibly vibration; dust; modified vehicular and pedestrian traffic patterns; reduced visibility of commercial signs and buildings; and utility disruptions. Temporary street and lane closures would also affect businesses. Sidewalk space could be taken temporarily for construction purposes, thereby reducing business access.

Table 5-3.1: Number of Businesses Adjacent to Construction Areas										
Rail Alternatives										
Adjacent to Above Ground Construction	Aerial	6	6	6	30	6	6	6	6	6
	At-Grade	0	0	0	0	0	14	0	14	0
	Subtotal	6	6	6	30	6	20	6	20	6
Adjacent to Below Ground Construction	Open Cut	0	0	32	0	0	18	18	18	18
	Cut & Cover	0	32	0	8	0	0	14	0	14
	Deep Bore Mucking Site	14	14	14	14	14	0	0	14	14
	Subtotal	14	52	52	52	20	18	32	32	46
TOTAL		20	58	58	82	26	38	38	52	52

Source: Myra L. Frank & Associates, Inc., 1997.

These construction impacts may in turn produce short-term economic impacts to commercial establishments. Businesses most likely to be affected include those dependent on pedestrian and vehicular traffic, on-street parking, and impulse buying (i.e., fast food restaurants, thrift shops, etc.). Businesses which serve other businesses, provide unusual services, or sell unique items (i.e., offices, antique shops, etc.) are less likely to be affected. Businesses that are sensitive to noise and vibration, such as motels and theaters, are also likely to be affected by construction activities. A loss of off-street parking could also have a substantial impact upon a business if alternative parking is unavailable.

Open-cut, cut-and-cover, and aerial construction would likely be more disruptive to businesses than at-grade and deep-bore construction, except for the immediate vicinity of muck-out sites. Businesses located adjacent to the construction of an at-grade segment would likely experience fewer impacts during construction than those located adjacent to an aerial segment because the aerial segment would have more steps involved in its construction process.

In the areas adjacent to station construction sites, construction activities would produce effects that would be similar irrespective of the alternative, since all below ground stations would be constructed with cut-and-cover techniques. The exception to this would be at-grade stations, which would be confined to Alternative 6 at the North Hollywood and Laurel Canyon sites.

Given the nature of construction impacts to be expected for the alternatives under consideration and past MTA experience, it is not expected that continued viability of any business in a construction area would be threatened. It is also not expected that a substantial reduction in business patronage would occur for any businesses. As a result, a significant adverse impact on businesses as a whole, from construction activity, is not expected. There would be isolated instances, however, in which an individual business could experience a significant adverse impact.

5-3.3 Mitigation Measures

The following mitigation measures would be implemented to reduce the potential adverse impacts of the business disruption that could occur during the construction phase.

- **Loss of Parking**

Construction activities for the Enhanced Bus (TSM) and rail alternatives could temporarily result in restricted access to parking that serves businesses near or adjacent to the construction sites. MTA will consult with those businesses whose parking would be affected during construction. If a negative economic impact can be established, some level of compensation may be provided. If space is available in another location, alternate parking spaces may be provided as mitigation.

- **Community Input**

Prior to and during construction of the selected alternative, MTA staff will contact and interview individual businesses potentially affected by construction activities. Interviews with commercial and industrial businesses will provide knowledge of how these firms conduct their businesses and identify business usage, delivery and shipping patterns, frequented travel routes of customers and clients upon entering and exiting the business establishment, parking requirements, hours of operation, and critical times of the day and year for business activities. Information gathered from these interviews will be used to develop the construction traffic control plans and alternate access routes to maintain critical business activities. MTA will inform the public of its progress in implementing the measures selected through periodic project newsletters sent to businesses, residents, and property owners within close proximity to the project. MTA staff will be assigned to work directly with the public to provide project information and resolve construction-related problems.

- **Construction Site and Field Offices**

During construction of the selected alternative, MTA staff will establish an MTA information field office(s) near the construction site(s). The field office(s), in conjunction with other MTA staff, will serve the following multiple purposes:

- Provide the community and businesses with a physical location where information pertaining to construction can be exchanged,
- Enable MTA to better understand community/business needs during construction,
- Allow MTA to participate in local events 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 (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks),
- Provide literature and presentations on the project to the public,
- Respond to phone inquires,
- Coordinate business outreach programs,

- Schedule promotional displays, and
- Participate in community committees.

The MTA information office(s) will be open during the work week for the duration of the construction period. A schedule will be developed before construction begins.

- **Information Line**

An information telephone number will be available to provide community members and businesses the opportunity to express their views regarding construction. MTA staff would review and forward calls to the appropriate party for action. Community involvement specialists will be available to provide information such as current project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints, and general information.

- **Signage**

Appropriate signage will be developed and displayed by MTA to direct both pedestrian and vehicular traffic to businesses via alternate routes.

- **Traffic Disruption**

Traffic management plans will be developed to maintain access to all businesses along the alignment and at station sites. Appropriate sidewalks will be installed during the construction phase. Daily cleaning of work areas will be performed by contractors for the duration of the construction period. Construction contracts will contain provisions to require the maintenance of driveway access to businesses to the extent feasible. Handicapped access shall be maintained during construction where feasible.

- **Construction Site Maintenance**

Construction sites shall be maintained in an orderly and well-kept manner.

5-4 NEIGHBORHOODS, COMMUNITY FACILITIES AND SERVICES

5-4.1 Impact Analysis Methodology and Evaluation Criteria

Construction activities were analyzed in the context of adjacent neighborhoods. Adverse impacts would include impaired access and physical intrusions such as noise and dust. If substantially impaired access would affect a neighborhood for an extended period of time, that would constitute a significant impact. Overall exposure to combined impacts (noise, dust, etc.) for an extended period of time would also constitute a significant impact.

Community facilities and services adjacent to each alternative of the project were identified during field surveys using conceptual engineering plans. The locations and types of facilities adjacent to the proposed alternatives were mapped and tabulated, and a qualitative assessment of the impact to each facility during the construction of the project was made. The potential impacts resulting from the project would vary depending upon the characteristics (e.g. type of construction) and proximity of the alternative selected. Impaired accessibility and construction noise and dust could have an adverse impact upon public services.

5-4.2 Impacts

a. Neighborhoods

Impacts could include impaired neighborhood access and short-term deterioration of neighborhood character. Perceived neighborhood security would not be a substantial issue, because construction would not provide the public with new access to or knowledge of any residential neighborhoods. Impaired neighborhood access would occur if construction staging, traffic detours, closed streets, or easement acquisitions restricted access into or out of a residential neighborhood. Areas where this could occur would be in the immediate vicinity of the at-grade and aerial segments along the SP ROW. Construction-phase deterioration of neighborhood character would occur if construction staging or construction work itself (e.g. grading, bulldozing, etc.) compromised the safety and orderliness of the construction site.

There is the potential that street or lane closures, construction staging areas, or the use of construction easements could effect neighborhood access. However, the details of this potential occurrence will not be known until the final design stage of the project when the traffic control plans and staging locations would be finalized.

b. Community Facilities and Services

Table 5-4.1 lists the public services adjacent to the proposed alternative alignments. The potential construction impacts to these facilities are discussed in further detail below.

(1) Fire Protection and Police Protection Services

Increased traffic on local streets, particularly at intersections, may adversely affect emergency response times. Street and lane closures would likely increase traffic congestion. To minimize the effect of these closures, staging/detour plans during construction would be reviewed with emergency personnel prior to construction. Notification of road or lane closures would be distributed to ensure no disruption of service. Furthermore, emergency vehicle access shall be included in construction specifications. At all street closures, an attempt would be made for one lane in each direction for emergency vehicle use to be maintained at all times.

(2) Schools and Libraries

During construction, schools located adjacent to the proposed project alternatives may be subject to adverse impacts. Potential vibration impacts (see Section 5-9) could occur at schools located adjacent to subway segments. Potential construction noise (see Section 5-9) and air quality impacts (see Section 5-7) could occur at schools located adjacent to open-cut, cut-and-cover, at-grade, or aerial segments. These impacts can be mitigated by adhering to local and state codes and ordinances regarding construction.

Student safety during the construction period (see Section 5-13) could be a concern at schools located adjacent to construction sites. Construction specifications are written to reduce potential construction hazards. Construction crews are required to attend a safety course to learn about safety requirements and procedures. California Occupational Health and Safety requirements must be met by the contractor. The contractor would be required to secure construction sites to avoid creating an "attractive nuisance" and to prohibit unauthorized entry.

There are no libraries located adjacent to the proposed alternatives, and so libraries would not be affected by the construction of the project.

(3) Religious Institutions

Religious facilities may experience short-term disruptions due to construction activities. Emmanuel Lutheran Church would be adjacent to Alternative 2, which would be deep-bore tunnelled at this location and could have potential vibration impacts but no accessibility impacts. At Shaarey Zedek Congregation, Aish Hatorah, Chabad of North Hollywood, and Assemblies of God Church, the construction of the proposed project alternatives may cause temporary noise and air quality impacts (see Sections 5-9 and 5-7), although these impacts would be minimized by adhering to local and state codes and ordinances regarding construction. Construction of Alternatives 1b, 1c, 1d, 6a, 6b, 11a, and 11b could limit pedestrian access to Shaarey Zedek Congregation to specific crosswalk locations across Chandler Boulevard.

(4) Health Care Facilities

Alternatives 1, 6, and 11 would be constructed in proximity to two health care facilities: the H.E.L.P. Group (a health care facility for disadvantaged children) and Chandler Convalescent Hospital. These facilities could be inconvenienced by noise, dust, and local traffic congestion.

Table 5-4.1: Community Facilities and Services Adjacent to Proposed Rail Alternatives					
Alternative	**Fire or Police Station**	**School or Library**	**Religious Institution**	**Health Care Facility**	**Park or Recreational Facility**
1a	Fire Station #102	North Hollywood High School, Emek Hebrew Academy, Los Angeles Valley College	Shaarey Zedek Congregation, Aish Hatorah, Chabad of N. Hollywood, Assemblies of God Church	H.E.L.P. Group	North Hollywood Park, Valley Cities Jewish Community Center, Sepulveda Dam Recreation Area
1b	Fire Station #102	North Hollywood High School, Emek Hebrew Academy, Los Angeles Valley College	Shaarey Zedek Congregation, Aish Hatorah, Chabad of N. Hollywood, Assemblies of God Church	H.E.L.P. Group	North Hollywood Park, Valley Cities Jewish Community Center, Sepulveda Dam Recreation Area
1c	Fire Station #102	North Hollywood High School, Emek Hebrew Academy, Los Angeles Valley College	Shaarey Zedek Congregation, Aish Hatorah, Chabad of N. Hollywood, Assemblies of God Church	H.E.L.P. Group	North Hollywood Park, Valley Cities Jewish Community Center, Sepulveda Dam Recreation Area
1d	Fire Station #102	North Hollywood High School, Emek Hebrew Academy, Los Angeles Valley College	Shaarey Zedek Congregation, Aish Hatorah, Chabad of N. Hollywood, Assemblies of God Church	H.E.L.P. Group	North Hollywood Park, Valley Cities Jewish Community Center, Sepulveda Dam Recreation Area
2	None	Ulysses Grant High School, Laurel Hall School, Los Angeles Valley College	Emmanuel Lutheran Church		Sepulveda Dam Recreation Area
6a	Fire Station #102 Fire Station #60	North Hollywood High School, Emek Hebrew Academy, Los Angeles Valley College	Shaarey Zedek Congregation, Aish Hatorah, Chabad of N. Hollywood, Assemblies of God Church	H.E.L.P. Group	North Hollywood Park, Valley Cities Jewish Community Center, Sepulveda Dam Recreation Area
6b	Fire Station #102 Fire Station #60	North Hollywood High School, Emek Hebrew Academy, Los Angeles Valley College	Shaarey Zedek Congregation, Aish Hatorah, Chabad of N. Hollywood, Assemblies of God Church	H.E.L.P. Group	North Hollywood Park, Valley Cities Jewish Community Center, Sepulveda Dam Recreation Area
11a	Fire Station #102	North Hollywood High School, Emek Hebrew Academy, Los Angeles Valley College	Shaarey Zedek Congregation, Aish Hatorah, Chabad of N. Hollywood, Assemblies of God Church	H.E.L.P. Group	North Hollywood Park, Valley Cities Jewish Community Center, Sepulveda Dam Recreation Area
11b	Fire Station #102	North Hollywood High School, Emek Hebrew Academy, Los Angeles Valley College	Shaarey Zedek Congregation, Aish Hatorah, Chabad of N. Hollywood, Assemblies of God Church	H.E.L.P. Group	North Hollywood Park, Valley Cities Jewish Community Center, Sepulveda Dam Recreation Area

Source: Myra L. Frank & Associates, Inc., 1996.

(5) Parks and Recreational Facilities

Parks and recreational facilities may potentially be affected by the construction of the proposed project alternatives. Potential impacts include noise (see Section 5-8), dust (see Section 5-7), accessibility, and safety. These impacts can be mitigated by adhering to local and state codes and ordinances regarding construction. These impacts are expected to be significant.

Safety during the construction period (see Section 5-13) could be a concern at parks located adjacent to aboveground construction sites. Construction specifications are written to reduce potential construction hazards. Construction crews are required to attend a safety course to learn about safety requirements and procedures. California Occupational Health and Safety requirements must be met by the contractor. The contractor is required to secure construction sites to avoid creating an "attractive nuisance" and to prohibit unauthorized entry.

5-4.3 Mitigation

a. Neighborhoods

To reduce the potential for restricting neighborhood access during construction, the MTA would implement the following:

- A review of final design plans to ensure that road closures, staging areas, or construction easements that reduce access in residential neighborhoods have been minimized. If neighborhood access would be reduced during construction, alternatives to restricting access would be explored and the chosen action would be justified in writing.

To reduce the potential for negatively affecting neighborhood character during construction, the MTA would implement the following:

- Establish a construction community information/outreach program to provide information and receive comments regarding construction issues.

- Require the construction supervisor to prepare performance surveys (e.g., in checklist format) on a weekly basis to document the condition in which the construction sites are maintained and to document the corrective measures needed and/or taken. Items covered could include graffiti, noise, dust, parking of construction vehicles, and other items such as this. Performance surveys would be kept with the construction community information/outreach program for public review.

b. Community Facilities and Services

MTA will consult with neighborhood residents and community facility operators adjacent to construction sites regarding the construction process and planning to provide for the least intrusive construction process feasible. At construction sites local and state construction standards will be implemented to minimize noise, air quality, safety, and accessibility impacts. A public information program would be put in place to facilitate communication among MTA staff, construction contractors and affected parties along the various alignments. One central purpose of this program would be to identify problems as they occur and implement corrective actions as quickly as possible.

5-5 EMPLOYMENT AND HOUSING

5-5.1 Impact Analysis Methodology & Evaluation Criteria

The impacts section identifies the jobs and economic benefits generated by construction expenditures and the potential housing demand created.

Construction spending would generate jobs throughout the region and elsewhere depending upon where the goods and services are purchased to construct the project. This would constitute a beneficial effect.

Direct construction employment was derived from calculations used to estimate direct employment for the Los Angeles East Side Corridor (see *Final Environmental Impact Report Los Angeles Eastside Corridor*, June 1994). The number of jobs produced by construction expenditures for the rail alternatives was estimated by dividing the total construction costs (costs for stations, guideways, and systems, excluding vehicle fleet procurement and right-of-way acquisitions) by an estimated annual construction salary (construction full-time equivalents, or FTEs) of $50,000 to $60,000.

In addition to creating construction jobs, construction spending would produce indirect economic benefits. This was estimated assuming a 1.74 regional multiplier that is consistent with the 1991 Southern California Association of Governments (SCAG) Input/Output Model and that was also used in the Los Angeles East Side Corridor analysis. The Los Angeles region would receive approximately 74 cents in additional indirect economic benefits (i.e., additional income, employment, and economic output) for each dollar invested in new transit construction.

Housing demand generated from construction employment was analyzed on a qualitative basis. Given the vast size of the southern California economy, it is likely that all (or nearly all) of construction jobs needed could be filled by area residents.

5-5.2 Impacts

a. *Direct Employment and Indirect Economic Benefits Generated by Construction Expenditures*

Table 5-5.1 presents the anticipated annual construction jobs and indirect economic benefits that would be generated by annual construction expenditures for rail Alternatives 1a through 1d, 2, and 11a and 11b in the East Valley Corridor, and for the Enhanced Bus and rail Alternatives 6a and 6b in the Cross Valley Corridor. As explained in Chapter 2, it would be necessary to construct a light rail transit system across the entire valley in order to be operationally feasible, and therefore the entire cross valley cost estimates have been used to calculate economic benefits. As shown in Table 5-5.1, focusing on the East Valley alternatives only, Alternatives 1a and 2 would generate the largest number of jobs, but Alternatives 1c and 11b would result in the greatest amount of indirect economic benefits. Alternative 1b would generate the least number of jobs and indirect economic benefits.

Table 5-5.1: Estimated Annual Direct FTE Jobs and Indirect Economic Benefits Generated by Annual Capital Construction Costs (all dollars in 1996 millions)

Economic Benefits	Enhanced Bus (TSM) $25.0[1]	Rail 1a $901.0	Rail 1b $611.6	Rail 1c $755.1	Rail 1d $644.5	Rail 2 $872.7	Rail 6a $1,068.3	Rail 6b $1,268.6	Rail 11a $616.2	Rail 11b $721.1
Total Direct FTE[2]	420 to 500	15,020 to 18,020	10,200 to 12,230	12,585 to 15,100	10,740 to 12,890	14,545 to 17,454	17,805 to 21,370	21,145 to 25,370	10,270 to 12,325	12,020 to 14,425
Annual, Direct FTE[2]	140 to 170	2,400 to 2,885	1,630 to 1,960	2,015 to 2,420	1,720 to 2,065	2,330 to 2,800	2,850 to 3,420	3,385 to 4,060	1,645 to 1,975	1,925 to 2,310
Annual, Indirect Economic Benefits[3]	$6.16	$106.67	$100.57	$124.17	$105.98	$107.63	$201.84	$216.63	$109.43	$123.14
Ratio of Annual Indirect Economic Benefits/Total Construction Costs[4]		0.118	0.164	0.164	0.164	0.123	0.189	0.171	0.178	0.171

Note:
[1] Total construction costs over the entire construction phase.
[2] Direct construction employment was derived from calculations used to estimate direct employment for the Los Angeles East Side Corridor (see *Los Angeles Metro Rail Red Line East Side Extension FEIR*, June 1994).
[3] This number was estimated assuming a 1.74 regional multiplier that is a constant in the 1991 SCAG Input/Output Model that was also used in the Los Angeles East Side Corridor analysis.
[4] Differences in ratios of annual indirect economic benefits to construction costs are due to differences in construction time schedule.

Annual, Direct FTE jobs are based on the following construction time schedule:
Enhanced Bus (TSM): 36 months for the bus maintenance facility;
Rail 1a: 75 months;
Rail 1b, 1c, and 1d: 54 months;
Rail 2: 72 months;
Rail 6a: 47 months for the East Valley and 51 months for the West Valley portion; the calculations assume construction of both corridors would occur simultaneously;
Rail 6b: 52 months for the East Valley and 51 months for the West Valley portion; the calculations assume construction of both corridors would occur simultaneously;
Rail 11a: 50 months;
Rail 11b: 52 months.

Direct FTE is the direct, full time-equivalent employment required to construct the alternatives.

The total capital cost for the Enhanced Bus Alternative is $87.12 million which includes $25 million for the construction of a bus maintenance facility and $62.12 million for vehicle procurement. The jobs and economic benefits are derived from the $25 million costs for the construction of the bus maintenance facility and not from the costs for vehicle procurement.

The total capital costs for the rail alternatives include the costs for rail stations, guideways and systems and exclude costs for rail fleet procurement and right-of-way acquisitions.

Direct FTE estimates assume annual construction salaries of $50,000 to $60,000.

Source: Myra L. Frank & Associates, Inc., 1997.

As shown in Table 5-5.1, the Cross Valley Alternatives 6a and 6b would generate the most jobs and economic benefits of any alternative. This is due to the fact that these two alternatives would assume substantially more costs as cross-valley rail lines.

The Enhanced Bus Alternative is also a Cross Valley alternative. As shown in Table 5-5.1, as the least costly alternative, the Enhanced Bus Alternative would generate the least number of jobs and economic benefits of all the alternatives.

b. *Housing Demand Generated by Construction Employment*

Construction workers would not be expected to relocate their households as a consequence of the construction work opportunities offered by the proposed alternatives. In general, the construction industry differs from most other industries in several important ways that minimize the need for new housing:

- Construction workers commute to a job site that changes many times during the year. Thus, there is no regular work place and construction workers tend to commute to and from the various job sites.
- Many construction workers are highly specialized (e.g., crane operators, steel workers, masons) and move from job site to job site as dictated by the demand for their skills.
- The work requirements of most construction projects are highly specialized, and workers remain at a job site only as long as their skills are required for the construction process.

Therefore, it is reasonable to assume that most (if not all) construction workers for the Enhanced Bus Alternative and rail alternatives would not relocate their households as a consequence of working on the project. Thus, it is anticipated that project-related construction employment would result in a minimal increase, if any, in the demand for new housing and, the project construction would not result in a significant impact to housing.

5-5.3 Mitigation Measures

MTA staff will work with community residents, local officials, local businesses, and community organizations to tailor the mitigation program to best meet individual business and community needs. Taking into consideration the potentially adverse impacts that construction activities may have on businesses, both standard and site-specific mitigation will be implemented to mitigate impacts.

a. *Construction Employment*

No mitigation is required for the increases in construction employment as it would have a beneficial effect on the economy.

b. *Increase in Housing Demand*

Any housing demand generated by construction employment would be minor and would not result in a significant impact to housing. Thus, no mitigation is required.

5-6 VISUAL AND AESTHETIC CONCERNS

5-6.1 Impact Analysis Methodology and Evaluation Criteria

Construction of the proposed rail alternatives would result in temporary disruptions to the visual character of the study area. Such disruptions could include blockage of key views, shade and shadow, increases in ambient light levels, and glare. The same impact methodology and significance criteria used in Section 4-6: Visual and Aesthetic Concerns were used to conduct this analysis. Because the TSM Alternative would involve only minimal fixed facility construction, it is presumed that no impacts of significance would occur. The following is a description of the potential impacts associated with construction of each of the proposed rail alternatives.

5-6.2 Impacts

a. *Alternative 1a (SP ROW)*

The below ground tunnels for this alternative would be constructed with deep-bore technology. Potential impacts would be limited to two main staging and construction areas at North Hollywood in the vicinity of the North Hollywood Red Line station (east of Lankershim Boulevard and south of Burbank Boulevard) and directly west of Hazeltine Avenue in the existing MTA ROW. Large-scale construction equipment including bulldozers, cranes, and conveyor belts would remain on the staging sites for the majority of the construction period (approximately 3 to 4 years). Staging areas would be fenced to restrict views of the sites. Construction equipment may extend above the height of the wall and be visible to pedestrians, motorists, and residents of these areas. Although these elements would be out of scale and character with the surrounding visual environment, they would be confined to the staging areas. Following completion of the construction period, the equipment would be removed and construction-related impacts would cease. As potential changes to the visual environment would be isolated and temporary, impacts would be less than significant.

West of Hazeltine, the alignment transitions to an aerial profile. Adjacent areas are primarily industrial in character with some commercial uses at major intersections. Construction equipment and activities would be compatible with the character of adjacent uses and impacts would be less than significant.

b. *Alternative 1b (SP ROW)*

This alternative would require in the construction of the WOW segment between Lankershim Boulevard and Chandler Boulevard using deep-bore technology, and a cut-and-cover alignment beginning approximately 1000 feet east of Laurel Canyon Boulevard and extending westward along the SP ROW. The main staging and construction material storage area for the deep-bore segment would be located near the intersection of Lankershim and Burbank boulevards. A second staging area would be located in the right-of-way west of Hazeltine Avenue. With the cut-and-cover technique, a segment of the right-of-way is excavated from the surface, a tunnel structure is constructed, and the right-of-way covered back over. Large-scale construction equipment, including drilling rigs used to bore holes for and insert soldier piles, cranes, digging and earth removal equipment, and haul trucks would be located both at the staging areas and at different locations along the ROW. Construction of the cut-and-cover alignment is expected to take 4.5 years overall, and approximately 2 years in any given section and, while work would not be underway during the entire two-year period, construction equipment may be located at any given location in the right-of-way throughout the construction period.

Potential impacts include disruption of the existing condition of the median, and loss of visual open space in those segments under construction. Residents of the area between Laurel Canyon and Coldwater Canyon boulevards would have views of construction activities from the front windows of their houses. Residents in the diagonal portion of the right-of-way between Chandler Boulevard and Oxnard Street would see the boring rig, cranes, and other large pieces of construction equipment above their backyard fences. Although construction activities and equipment would be unsightly, they would be temporary and would occur on a segment by segment basis. Thus, since the construction-related impacts would be temporary (duration of 12 to 14 months) and confined to segments, they would not be significant.

West of Hazeltine, the alignment transitions to an aerial profile. Adjacent areas are primarily industrial in character with some commercial uses at major intersections. Construction equipment and activities would be compatible with the character of adjacent uses and impacts would be less than significant.

c. Alternative 1c (SP ROW)

This alternative utilizes an open trench profile that would be constructed in a fashion similar to the cut-and-cover subway in Alternative 1b. The main difference is that trench would not be covered by a concrete lid and then backfilled with earth. The duration of the construction period would be essentially the same as Alternative 1b. Although the construction activities and equipment would be unsightly, they would be temporary and would occur on a segment by segment basis. Thus, since the construction-related impacts would be temporary and confined to segments, they would not be significant.

West of Hazeltine, the alignment transitions to an aerial profile. Adjacent areas are primarily industrial in character with some commercial uses at major intersections. Construction equipment and activities would be compatible with the character of adjacent uses and impacts would be less than significant.

d. Alternative 1d (SP ROW)

This alternative utilizes a deep bore profile in the WOW section between Lankershim Boulevard and the Chandler Boulevard median, a cut-and cover profile from approximately 1000 feet east of Laurel Canyon Boulevard to approximately 500 feet west of Laurel Canyon Boulevard, and an aerial profile west of Laurel Canyon Boulevard. Major staging sites would be located in the immediate vicinity of Lankershim Boulevard and Burbank Boulevard and in the right-of-way west of Hazeltine Avenue. Construction of this alternative would be of essentially the same duration as Alternative 1b. As the deep bore section would be constructed below ground, construction equipment would be stored at fenced staging sites, and any views of construction activities or equipment would be temporary, impacts related to construction of the deep bore section would be less than significant.

West of Laurel Canyon Boulevard, the aerial guideway would be constructed by first casting the support columns in the right-of-way, constructing the forms for the guideway members in steel and wood, and finally casting the concrete for the guideway in place. Grading and earthmoving equipment would be used to excavate the footings for the columns, and cranes would be used to erect the columns and guideway sections. The cranes used to assist in constructing the guideway segments would be out of character with the surrounding visual environment and could be seen from the front yards of houses along Chandler Boulevard and from the rear yards of houses along the diagonal section. However, cranes and other large-scale equipment would be used for relatively brief periods in any particular section of right-of-way and would not have a lasting impact on the visual environment or perception of the area. As a result, visual impacts during the construction period would be less than significant.

e. Alternative 2 (Oxnard Street)

This alignment would be constructed using deep-bore tunneling machines, over an estimated 6-year period. Heavy construction activities would extend for 3 to 4 years. Staging sites would be located in North Hollywood along Lankershim Boulevard, at the Caltrans park-and-ride lot at Oxnard Street and Laurel Canyon Boulevard, and in the right-of-way west of Hazeltine Avenue. The North Hollywood site is adjacent to residential uses to the east and equipment may be visible from the houses and apartments. The remaining staging sites are not adjacent to sensitive uses. These staging areas would be fenced with approximately 15-foot high screening material to restrict views into these sites. Impacts to the visual environment would be isolated to staging areas. Large-scale equipment may be visible over the fencing for brief periods of time during the construction period. However, impacts to sensitive uses adjacent to staging areas would be intermittent and temporary. As all other construction activities would take place below ground, impacts would be less than significant.

West of Hazeltine, the alignment transitions to an aerial profile. Adjacent areas are primarily industrial in character with some commercial uses at major intersections. Construction equipment and activities would be compatible with the character of adjacent uses and impacts would be less than significant.

f. Alternative 6a (SP ROW)

This alternative features an at-grade profile, which allows for a shorter construction period (approximately 4 years total time or 12 to 18 months for at-grade station construction) and less extensive construction operations as compared to the other alternatives. The existing Chandler Boulevard right-of-way would be cleared of existing tracks and graded. New roadbed and tracks, signal equipment, poles, and catenary wires would be installed along the length of the right-of-way. Medium-size earth moving equipment may be used as well as a drilling rig to bore footings for the catenary suspension poles. The required construction equipment would be of a smaller scale than that used for other alternatives. Views of construction equipment could be seen from the front windows of houses and other sensitive uses located along Chandler Boulevard, potentially over the back yard fences of houses in the diagonal section between Chandler Boulevard and Oxnard Street, and over backyard fences and from second story windows of the houses and apartment buildings located west of Woodman Avenue. However, these views would be intermittent and short-term and would cease to occur following completion of an alignment segment. As potential impacts would be short-term and temporary, impacts would be less than significant.

g. Alternative 6b (SP ROW)

This alternative utilizes an at-grade and open-trench profile east of SR-170, a cut-and-cover profile between SR-170 and Coldwater Canyon Boulevard, an open-trench profile in the diagonal portion between Chandler Boulevard and Oxnard Street, and between Woodman Avenue and Hazeltine Avenue, and, west of Hazeltine Avenue, an at-grade alignment with aerial flyovers at Van Nuys and Sepulveda Boulevards. Approximately 4.5 years would be required to construct this alternative. Impacts for the Chandler Boulevard segment would be identical to those in Alternative 1b. Northwest of Coldwater Canyon Boulevard, impacts would be identical to those described for Alternative 1c. West of Hazeltine Avenue, construction equipment and activities would be compatible with the industrial character of adjacent uses.

East of SR 170, large-scale construction equipment would be used to drill holes, place pilings, and extract earth. The primary staging site would be on Lankershim Boulevard, but equipment and materials would also be located in the median for the duration of the construction period. The character of surrounding development in this area is more industrial than in the areas to the west of the freeway. Thus, the presence of construction equipment would not be incompatible with the character of this area. As the equipment and construction materials would not be incompatible with the surrounding visual character and construction activity would be intermittent and temporary, impacts would be less than significant.

h. Alternative 11a (SP ROW)

Construction-related visual impacts for this alternative would be identical as those described for Alternative 6a, with the addition of deep bore tunnel construction of the WOW segment. Approximately 4.3 years would be required to construct this alternative.

i. Alternative 11b (SP ROW)

Construction-related visual impacts for this alternative would be identical as those described for Alternative 6b, with the exception of deep bore tunnel construction of the WOW segment. Approximately 4.5 years would be required to construct this alternative.

5-6.3 Station Construction

a. Laurel Canyon/Chandler Station (Alternatives 1, 6b, and 11)

This station would, depending on the profile alternative selected, be constructed as either open-air or cut-and-cover. In either case, drilling rigs would be required to install the soldier piles along the outside edge of the station box. Large-scale digging equipment and haul trucks would remove earth from the station area. Concrete mixers would travel to and from the site during the period when the station box is cast. These activities would bring large-scale equipment to the station site for an approximately 2-year period.

Construction activities and equipment would be clearly visible from the commercial, office, residential units located adjacent to the station area. Construction activities would also be visible from commercial uses and the three-story senior housing building on the west side of Laurel Canyon Boulevard. However, the majority of construction-related changes to the visual environment would be noticed by occupants of commercial and office uses who focus on work activities and, thus, are not considered highly-sensitive viewers. Pile drilling equipment would be visible to residences of nearby houses who are considered to be sensitive viewers. However, the boring and placement of soldier piles represents a minor portion of the entire construction period and this impact would occur for a relatively short period. The majority of other construction activities would take place below ground and would not be visible from street level. In addition, the station construction would take place in the Chandler Boulevard median which provides some separation from adjacent sensitive uses. As alteration to the visual and aesthetic environment would be short-term and relatively isolated and sensitive viewers would not be significantly affected, impacts would be less than significant.

b. Laurel Canyon/Oxnard Station (Alternative 2)

This station would be constructed using a cut-and-cover approach. The existing Caltrans park-and-ride lot would be used during the construction period for staging and construction of the station. This site would be screened from public view by temporary construction fencing. Construction activities would remain visible to drivers on the SR 170 Freeway and occupants of adjacent commercial uses. The surrounding visual environment, which is dominated by parking lots and large-scale commercial uses, does not include sensitive uses and is generally compatible with the large-scale equipment used for construction of a rail station. As the majority of construction activities would be screened from pedestrians and no sensitive uses are located in proximity to the site, and the existing visual environment would not be disrupted by the presence of construction equipment in the area and impacts at this location would be less than significant.

c. Valley College-Fulton/Burbank Station (Alternatives 1, 6, and 11)

This station could be constructed using a cut-and-cover, open-air, or aerial design. The cut-and-cover and open-air designs would require a drilling rig and crane to drill and place the soldier piles. These tall pieces of equipment could be seen from the Valley College campus and adjacent residential area. Other construction equipment, such as large-scale digging and earth removal equipment, could be visible over the backyards of three to four houses located adjacent to the station area. The presence of this equipment would disrupt the existing visual character of the area and would negatively affect adjacent sensitive viewers. However, the duration of these impacts would constitute a short portion of the total station construction period and the majority of construction activities would occur below grade level. As a result, impacts would be less than significant.

With the aerial station alternative, the support columns and the majority of the station elements would be framed and cast in-place. The aerial station, during framing, would temporarily block views of the Santa Susana and Santa Monica Mountains from pedestrians and motorists within an approximately 500 foot area. As the loss of this view would be temporary and limited to the construction period, impacts to existing views would be less than significant.

Construction of the aerial station would also require the use of cranes throughout the construction period to bring construction materials, roof sections and other ancillary equipment to the station level. These large pieces of construction equipment would be incompatible with the existing visual character of the area and would be visible from Valley College and over the backyards of houses within 500-700 feet of the station area. However, the view of this equipment would be intermittent and limited to the construction period. As a result, impacts would be less than significant.

d. Valley College-Oxnard Station (Alternative 2)

This station would be constructed using a cut-and-cover method. Staging for station construction would take place in the existing Valley College parking lot on the south side of Oxnard Street. This site would be fenced and screened during the construction period to restrict views of construction equipment and activities from the sidewalk, Valley College, and apartment buildings on the north side of Oxnard Street. In the first stages of station construction, a drilling rig and crane would be used to install soldier piles. Large-scale digging and earth removal equipment would excavate the surface of Oxnard Street to an approximate 10-foot depth. Steel cross members would be attached to the soldier piles and temporary bridging would be placed over the excavated area to allow the street to remain in use. After the short period required to deck over the street, the majority of the station construction would be conducted below ground. Although the underground station would be located in close proximity to adjacent multi-family residential uses on the north side Oxnard Street, the use of Valley College property would allow for construction equipment to be screened from adjacent residences. As station construction equipment and activities would be out of view for the majority of the construction period, impacts would be less than significant.

e. Van Nuys Station (All alternatives)

All of the proposed alternatives would result in the construction of an aerial station at this location. Construction of the aerial station would take place in the existing 100 foot right-of-way. Future station parking areas to the east of Van Nuys Boulevard could also be used for additional staging and storage areas. As surrounding uses are primarily industrial in character, the presence of construction equipment and materials at this location would be compatible with the existing visual character of the area. Views of the mountains to the north and south may be temporarily blocked by the framing material used to construct the station over Van Nuys Boulevard. As station construction activities and the presence of construction equipment would be compatible with the visual character of the area and other potential impacts would be temporary and short-term, impacts would be less than significant.

f. Sepulveda Station (All alternatives)

An aerial station would be constructed at this location under all of the proposed alternatives. Construction activities would take place in the existing right-of-way and in the MTA-owned lot to the north. The presence of construction equipment and materials at this location would be compatible with the industrial character of the adjacent areas to the south, and east, and the I-405 to the west. Views of this site are limited by the bulk of Wickes Furniture Warehouse and a large scale industrial use to the south. Given the existing setting and arrangement of land uses, construction activities would not be visible to large numbers of people. Construction activities in proximity to the Cameron Woods single-family neighborhood to the north, an area with highly-sensitive viewers, would be limited to paving and striping of the parking lot and installing lighting and the landscaped buffer. Existing trees that currently screen views of the MTA-owned lot from this neighborhood would remain in place. Views of the Santa Susana and Santa Monica Mountains to the north and south may be blocked by the framing material used to construct the station spanning Sepulveda Boulevard. However, the view of the mountains from this industrial location is not considered an important view. As construction activities and equipment would be compatible with adjacent industrial uses, and the extent of construction activities in the residential area would be limited, impacts would be less than significant.

5-6.4 Mitigation Measures

Although not required as a result of significant impacts, the following measures would be employed.

- All staging and construction sites shall be screened from public view with temporary fencing and walls of a minimum of 15 feet in height.

- The MTA A-R-T Community Advisory Group will work in collaboration with the local community to develop a construction period arts program in an effort to limit the negative disturbances during construction and to explain to the public the role the project will play in the regional transportation network. The construction period artwork will be displayed along the periphery of all station and major staging sites as a vehicle by which to inform the public and to improve the urban streetscape during the construction period. The program will include special fencing, lighting and landscaping to mark safe passage for pedestrians and vehicles through the construction areas and detours. Artwork will be used to alert pedestrians and motorists of detours, transportation alternatives, and information resources. Temporary walkways, barriers, signs, and street furniture will create an environment that is both informative and visually appealing to pedestrians and community residents.

Construction Impacts

- Visual impacts to the pedestrian environment will be mitigated by the creation of pedestrian paths, bridges, and other landscape or architectural amenities and open spaces. Construction barrier walls will be designed to be compatible with the surrounding environment.

5-7 AIR QUALITY

This section addresses the potential emissions impacts of construction of the East Valley transit alternatives. No emissions estimates were prepared for the Enhanced Bus Alternative because no major capital improvements are anticipated. The assessment therefore focuses on the impacts of the rail alternatives.

5-7.1 Impact Analysis Methodology and Evaluation Criteria

This assessment estimates daily emissions for the East Valley alternatives. Emissions are calculated for carbon monoxide (CO), reactive organic gas (ROG), nitrogen dioxide (NO_X), sulfur dioxide (SO_X) and particulates less than 10 microns in size (PM10). Emissions estimates are compared to daily emissions thresholds recommended by the South Coast Air Quality Management District in its 1993 CEQA Air Quality Handbook. These construction daily emissions thresholds are as follows:

Carbon Monoxide	550 pounds per day
Reactive Organic Gas	55 pounds per day
Nitrogen Dioxide	75 pounds per day
Sulfur Dioxide	150 pounds per day
PM10	150 pounds per day

Emissions for each of the pollutants were calculated based on activity-specific construction emissions factors developed by the US Environmental Protection Agency (USEPA) and the SCAQMD. USEPA-based emissions factors come from several sources. SCAQMD emissions factors are taken from the 1993 CEQA Air Quality Handbook..

Construction emissions estimates have been prepared for the following elements of transit construction:

- Excavation (cut and cover, open cut)
- Grading and Moving Excavated Material (at grade sections and parking lots)
- Material Handling (loading from storage piles, conveyors, or trucks)
- Heavy truck trackout from unpaved surfaces
- Operations of heavy duty diesel equipment (cranes, dozers, scrapers, lifts, etc.)
- Exhaust emissions from heavy duty trucks
- Exhaust emissions from construction worker vehicles.

The deep bore tunnel portions of alternatives were analyzed assuming that an earth pressure balance technology is used. The slurry option was assumed as worst case to capture the larger number haul trucks necessary to export heavier mined materials because the materials are saturated with the slurry solution containing bentonite. It was also assumed that the use of bentonite (a fine clay material) would require that contracts fully enclose the bentonite batching plant as well as truck loading areas, conveyors and separation areas to comply with applicable SCAQMD regulations, particularly Rule 403 and its Implementation Handbook.

5-7.2 Impacts

Table 5-7.1 illustrates in pounds per mile the intensity of construction-related pollutant emissions as well as worst case daily maximum pollutant concentrations for each of the East Valley alternatives. The table indicates that, with exception to NO_X, the daily pounds per mile generated by the project would not exceed SCAQMD daily construction emissions thresholds. The emissions threshold for NO_X would be exceeded under each of the alternatives. These emissions would range from a minimum of 184 pounds per mile per day under the aerial alternative to a maximum of 468 pounds per mile per day under the open-cut alternative. The exceedances of the threshold for NO_X would range from 84 to 368 pounds per mile per day.

Table 5-7.1 also indicates that, under daily worst case conditions, three out of the five pollutants (CO, ROG, and NO_X) evaluated would exceed SCAQMD daily construction emissions thresholds. Thresholds for CO, ROG and NO_X would be exceeded by 5 or more of the East Valley alternatives. CO concentrations would exceed the threshold by 5 of the 7 alternatives, ROG concentrations would exceed the thresholds under 6 of the 7 alternatives and the NO_X threshold would be exceeded under each of the 7 alternatives. Concentrations of SO_X and PM10 would not exceed the thresholds under any of the alternatives.

Worst case daily PM10 concentrations for each of the alternatives would range from approximately 89 to 141 pounds per day. These concentrations would represent a range of about 59 to 94 percent of the SCAQMD PM10 daily threshold. Separately, these concentrations would not exceed the threshold. However, presuming that two or more construction profile segments (example: cut and cover and deep bore) were to be under construction at the same time, the cumulative effect of PM10 concentrations could exceed the SCAQMD threshold.

5-7.3 Mitigation Measures

The following mitigation measures are prescribed by the SCAQMD.

AQ1 Spray debris covered chutes to assure proper dust control.

AQ2 Require all trucks hauling dirt, sand, soil, or other loose substances and building materials to be covered, or to maintain a minimum freeboard of two feet between the top of the load and the top of the truck bed sides.

AQ3 Utilize street sweeping equipment on all adjacent streets used by haul trucks or vehicles that have been on-site.

AQ4 Construction equipment will be shut off to reduce idling when not in direct use. Diesel engines, motors, or equipment shall be located as far away as possible from existing residential areas. Low sulfur fuel should be used for construction equipment.

Table 5-7.1: Summary of Construction Emissions										
Alternative	**PM10**	**Impact**	**CO**	**Impact**	**ROG**	**Impact**	**NOX**	**Impact**	**SOX**	**Impact**
Daily pounds per mile										
Red SP Subway	64	N	284	N	49	N	397	Y	22	N
Red SP Cut Cover	59	N	266	N	46	N	371	Y	21	N
Red SP Open Cut	75	N	334	N	58	N	468	Y	26	N
Red SP Aerial	29	N	135	N	23	N	184	Y	11	N
Red Oxnard	63	N	281	N	49	N	394	Y	22	N
LRT at Grade	44	N	181	N	30	N	245	Y	15	N
LRT Cut Cover	57	N	203	N	34	N	277	Y	16	N
LRT Dual Mode at Grade	47	N	208	N	35	N	283	Y	17	N
LRT Dual Mode Cut Cover	60	N	230	N	39	N	316	Y	18	N
Worst Case Daily Maximum										
Alternative	PM10	Impact	CO	Impact	ROG	Impact	NOX	Impact	SOX	Impact
Red SP Subway	141.5	N	604.1	Y	106.1	Y	858.3	Y	46.5	N
Red SP Cut Cover	130.1	N	552.2	Y	97.0	Y	784.6	Y	42.5	N
Red SP Open Cut	130.1	N	552.2	Y	97.0	Y	784.6	Y	42.5	N
Red SP Aerial	130.1	N	552.2	Y	97.0	Y	784.6	Y	42.5	N
Red Oxnard	132.3	N	563.9	Y	99.0	Y	801.2	Y	43.4	N
LRT at Grade	128.5	N	537.1	N	94.3	Y	763.2	Y	41.4	N
LRT Cut Cover	89.0	N	257.4	N	45.2	N	365.7	Y	19.8	N
LRT Dual Mode at Grade	128.5	N	537.1	N	94.3	Y	763.2	Y	41.4	N
LRT Dual Mode Cut Cover	89.0	N	257.4	N	45.2	N	365.7	Y	19.8	N

Source: Terry A. Hayes Associates, 1997.

AQ5 If required, haul truck staging areas shall be approved by the Department of Building and Safety. Haul trucks shall be staged in non-residential areas away from school buildings and playgrounds.

AQ6 Pave or chemically treat all unpaved road surfaces.

AQ7 Pave or chemically treat unpaved parking lots and vehicle staging areas.

AQ8 Pave construction access roads as soon as access roads are created. Paving must extend from the paved roadway into the construction area at least 120 feet in length, and must be cleaned at the end of each work day.

AQ9 Establish dirt-removal programs to remove visible dirt accumulations from paved road surfaces.

AQ10 Phase grading to prevent the susceptibility of large areas to erosion over extended periods of time.

AQ11 Cover the road surface with material of lower silt content or soil stabilizer, whenever possible.

AQ12 Suspend grading operations during first and second stage smog alerts, and during high winds, i.e. winds greater than 25 miles per hour.

AQ13 Comply with SCAQMD's rule 1403, which pertains to asbestos emissions from renovation or demolition.

AQ14 Water or chemically treat all active project sites with multiple daily applications to assure proper dust control.

AQ15 Prohibit parking on unpaved or untreated parking lots.

AQ16 Maintain construction equipment engines by keeping them tuned.

AQ17 Utilize existing power sources (e.g. power poles) or clean-fuel generators rather than temporary power generators as feasible and practical.

AQ18 Use low emission on-site stationary equipment (e.g., methanol powered internal combustion engines) as feasible and practical.

AQ19 A barrier of sufficient height (minimum 20 feet) to limit wind blown dust shall be erected around the perimeter of the site, beginning in the first stages of the demolition phase and shall be maintained until the site excavation phase is completed.

AQ20 Require a phased schedule for construction activities to minimize daily emissions as much as possible.

AQ21 Configure parking to minimize traffic interference.

AQ22 Minimize obstruction of through-traffic lanes.

AQ23 Provide a flag-person to guide traffic and ensure safety at construction sites.

As shown above, construction emissions were compared to SCAQMD's recommended significance thresholds. For PM10 and NO_X, these thresholds may be exceeded during the period of construction, depending upon specific circumstances. These emissions are not considered significant by the lead agency (pursuant to Section 15064 of the *CEQA Guidelines*) because of the following considerations:

- The impacts would be temporary and short-term.
- No one area along the route would be exposed to emissions for long durations because construction activity would shift geographically as work progresses.
- Best available control and best management practices abatement and mitigation techniques would be used to reduce emissions to the lowest levels possible.

5-8 ENERGY

5-8.1 Impact Analysis Methodology and Evaluation Criteria

The analysis of construction energy consumption was based on the method and factors described in *Evaluating Urban Transportation System Alternatives* (USDOT 1978). Impacts would be considered significant if consumption of energy would tax the existing supply of energy in the area surrounding the proposed construction sites.

5-8.2 Impacts

The energy consumption characteristics of the East Valley alternatives are shown on Table 5-8.1. As can be seen, increases in short-term energy consumption from construction elements would range from a minimum of 490 billion British thermal units (BTUs) under the LRT (at grade) alternative to a maximum of 1,313 billion BTUs under the Red SP (subway) alternative. The table also indicates that construction-related energy consumption under the East and Cross Valley alternatives would increase above both the Enhanced Bus and the No Project Alternatives. Existing supply would not be taxed by these consumption levels and therefore there would be no significant impact.

Table 5-8.1: Construction Energy Consumption (Billion BTUs)

Alternative	Energy Consumption
No Project	0
Enhanced Bus	0
Red SP (subway) (Alt. 1a)	1,313
Red SP (cut and cover) (Alt. 1b)	1,235
Red SP (open cut) (Alt. 1c)	1,218
Red SP (aerial) (Alt. 1d)	835
Red Oxnard (Alt. 2)	1,274
LRT (at grade) (Alt. 6a)	490
LRT (cut and cover) (Alt. 6b)	875
LRT Dual Mode (at-grade) (Alt. 11a)	597
LRT Dual Mode (cut and cover) (Alt. 11b)	932

Source: Terry A. Hayes Associates, 1997.

5-8.3 Mitigation Measures

No mitigation is required.

5-9 NOISE AND VIBRATION

Construction noise and vibration are temporary impacts. However, since transit system construction usually extends over several years and will sometimes require extensive nighttime activity, without special control measures, the resulting noise and vibration can be a significant intrusion on nearby communities. It is standard practice to leave specific decisions about construction procedures and equipment to the contractor's discretion, allowing each contractor to develop their most cost effective approach. This means that only preliminary estimates of construction noise and vibration can be developed at the present stage of project development.

The potential for impact from construction vibration is much more limited. Assuming restrictions on use of impact pile driving near residential areas, there is little potential for impact from construction of at grade, aerial, open cut, or cut and cover segments. The most likely impacts would result from short-term activities such as demolition and vibratory compaction.

The potential vibration intrusion from deep-bore construction is somewhat higher. Both tunnel boring machines (TBMs) and muck trains have potential to cause intrusive ground-borne vibration and noise inside buildings directly, or almost directly, above the tunnel. In neither case should the vibration be sufficient to cause even minor cosmetic building damage. The vibration from the tunnel boring machine should not be perceptible more than a day or two at any building. It is usually sufficient to controlling community intrusion from tunnel boring machines through an information program to alert people when the TBM will be in their neighborhood and how long the vibration will last. Controlling the vibration intrusion from muck trains can be achieved by either: (1) requiring that conveyors be used to transport material from the tunnel face to the portal, (2) restricting the hours that muck trains can be operated, or (3) requiring that, if community complaints arise, the contractor will modify the support system for the muck train track in a manner that reduces the vibration and noise in residences above the tunnel.

5-9.1 Construction Noise Impact

a. Impact Analysis Methodology and Evaluation Criteria

It is reasonable to expect that substantial potential for impact from construction noise, particularly where nighttime construction must be carried out in residential areas and where there would be cut-and-cover construction in close proximity to residences. The means of controlling construction noise include requiring the contractor to construct sound walls, prohibiting or limiting construction during nighttime hours, limiting the use of particularly noisy activities such as impact pile driving and jack hammering, and requiring construction to be performed in compliance with specific noise limits.

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. 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. This is particularly true of engines without sufficient muffling. For special activities such as impact pile driving and pavement breaking, noise generated by the actual process dominates.

(1) Assessment Approach

Table 5-9.1 summarizes some of the available data on noise emissions of construction equipment from the FTA Guidance Manual. Shown are representative Lmax values at a distance of 50 feet. The noise levels in the Table 5-9.1 represent averages for the category of equipment, there are wide fluctuations in noise emissions within a category. For example, the sound level for a relatively new derrick crane that has very effective mufflers can be as low as 75 dBA, substantially lower than the 88 dBA value shown in Table 5-9.1. Correspondingly, an older derrick crane in need of new mufflers might cause noise levels substantially higher than the 88 dBA shown in Table 5-9.1.

Table 5-9.1: Typical Construction Equipment Noise 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
Pile Driver, Impact	101
Pump	76
Roller	74
Truck	88

Source: FTA, 1995.

Construction noise at a given location depends on the magnitude of noise during each construction phase, the duration of the noise, and the distance from the construction activities. 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 5-9.1, it is then possible to estimate an hourly or multi-hourly Leq or a 24-hour Ldn at various distances from the construction site. Although projections during the environmental assessment phase of a project are very preliminary, they can indicate how much noise mitigation will be required.

Table 5-9.2 provides an example of noise projection for equipment typically used for tie-and-ballast track construction. In the calculation, it is assumed that all the equipment is located at the geometric center of the construction work site. Based on this scenario, an 8-hour Leq at a distance of 50 feet from the geometric center of the work site would be 85 dBA. This calculation assumed no noise mitigation measures and no limits on how much noise can be made. The value at 50 feet can be scaled to other distances using the relationship:

$$\text{Leq(Dist)} = \text{Leq(50 ft)} - 20 \times \mathit{log}(\text{Dist}/50)$$

Based on this relationship and a typical distance separation distance of 100 feet from construction areas to the closest residences, the projected Leq at the closest residences would be about 80 dBA, substantially higher than existing ambient noise levels in any part of the project corridor.

Table 5-9.2: Typical Equipment List, At Grade Track Construction

Equipment Item	Typical Maximum Sound Level at 50 ft (dBA)	Equipment Utilization Factor (%)*	Leq (dBA)
Air Compressor	83	20%	76
Backhoe	80	15%	72
Crane, Mobile	83	10%	73
Dozer	85	15%	77
Generator	81	50%	78
Loader	85	15%	78
Shovel	80	10%	70
Dump Truck	88	15%	80
Total workday Leq at 50 feet (8-hour workday)			85

Note: *Equipment utilization factor is estimated percentage of an 8-hour shift that the equipment will be operating at maximum power.

Source: HMMH, 1997.

Using the approach outlined above, following are estimates of 8-hour Leq at a distance of 50 feet from the geometric center of the construction site for the general types of construction:

At Grade Construction	85 dBA
Aerial Structure Construction	85 dBA
Open Air Trench Construction	88 dBA
Cut and Cover Construction	88 dBA
Deep Bore Construction *(station areas and tunneling shaft locations)*	89 dBA

For deep-bore construction, these noise levels would only occur near staging areas and portals since all other activities would be underground. The generalized estimates can be used to estimate the amount of noise mitigation that will be required to meet specific noise limits. The actual levels of construction noise will vary greatly depending on the equipment used, how the site is laid out, and the specific construction activities during each shift.

(2) Construction Noise Criteria

Impact from construction noise usually requires that the noise be substantially higher than existing ambient noise levels and the impact criteria for construction noise are almost always substantially higher than the impact criteria for permanent noise sources. For example, the construction noise impact criteria for residential areas included in the FTA Manual are an 8-hour Leq of 80 dBA daytime and 70 dBA nighttime. The equivalent limits for an LRT system would be at least 10 dBA lower. The higher limits are considered appropriate because: (1) the noise impact is not permanent (although it can go on for an extended period of time for a large project), and (2) projections of construction noise tend to be for the worst case, whereas averaged over the duration of construction, noise exposure is often about 5 dBA lower than the projections.

Following are the noise impact limits have been used to develop estimates of the degree of impact from construction noise:

Daytime (7 am to 10 pm)	The higher of an average noise level (Leq) of 70 dBA or existing noise levels (Leq) + 5 dBA
Nighttime (10 pm to 7 am)	Existing noise levels (Leq) + 5 dBA

The average noise levels (Leq) are for an 8-hour shift. These limits are applicable to all residences, schools, and places of worship in the corridor. They are based on the requirements of the City of Los Angeles Municipal Code and the existing ambient noise levels in the communities that would be affected by construction noise.

Construction of the East Valley alternatives would need to be in compliance with the requirements Sections 112.03 and 41.40 of the city of Los Angeles Municipal Code and any variances to the Code issued by the city. The city regulations basically prohibit construction between 9 pm and 7 am without a variance. The regulations do not include specific daytime noise limits, although they do state construction or repair work shall not be performed "... in such a manner that the noise created thereby is loud, unnecessary and unusual and substantially exceeds the noise customarily and necessarily attendant to the reasonable and efficient performance of such work."

The city of Los Angeles issued a noise variance for Metro Red Line construction along Wilshire Boulevard that allowed construction between 9 p.m. and 7 a.m., as long as: (1) construction noise did not exceed the ambient noise level by more than 5 decibels, and (2) construction noise did not result in substantial community complaints being registered with the city.

Table 5-9.3 summarizes the noise impact thresholds for the different community areas in the East Valley portion of the corridor. The limits are based on the noise monitoring summarized in Section 4-9.2 and the construction impact limits given above. The daytime limits are all around 70 dBA, but the nighttime limits that are based on existing ambient range from 50 to 68 dBA. As discussed above, the nighttime limit is based on the variance that was issued by the city for construction along Wilshire Boulevard.

Table 5-9.3: Construction Noise Impact Thresholds		
Area	Impact Threshold, 8-hour Leq (dBA)	
	Daytime (7 am to 9 pm)	Nighttime (9 pm to 7 am)
SP ROW, Chandler	70	60
SP ROW, Diagonal	70	50
SP ROW, Bessemer between Woodman and Hazeltine	70	50
Alt. 2, Oxnard	73	68
Blucher Ave.	70	65

Source: HMMH, 1997.

b. Impacts

The estimates of 8-hour Leq for different phases of construction and the noise impact thresholds for different parts of the corridor have been used to estimate the noise impact zone around construction sites in different parts of the corridor. These are summarized in Table 5-9.4. It is clear from the preliminary noise impact distances given in Table 5-9.4 that, without mitigation, there would be substantial impacts from construction noise throughout the corridor. This is particularly true for any construction that would need to be performed during nighttime hours.

Table 5-9.4: Approximate Impact Distances for Construction Noise		
Area	Approximate Impact Distances, ft	
	Daytime (7 am to 10 pm)	Nighttime (10 pm to 7 am)
SP ROW, Chandler	300 to 400	800 to 1,300
SP ROW, Diagonal	300 to 400	2,500 to 4,000
SP ROW, Bessemer between Woodman and Hazeltine	300 to 400	2,500 to 4,000
Alternate 2, Oxnard Blvd.	200 to 300	400 to 500
Blucher Ave.	300 to 400	400 to 700

Source: HMMH, 1997.

The distances in Table 5-9.4 are approximate and will vary considerably depending on the specific construction activities. Also, impact out to distances of 4,000 ft is extremely unlikely because of acoustic shielding that would be provided by intervening buildings. However, the distances show that impact from construction activities will be difficult to avoid where nighttime construction would be required.

c. Mitigation Measures

Impacts from construction noise are likely when ever a construction site would be located within about 300 feet of residences, schools, or places of worship. The impact distances increase substantially for any construction that must be performed during nighttime hours. As discussed above, nighttime construction will require that the City of Los Angeles issue a variance.

Two of the primary steps in controlling the noise impacts from construction are: (1) requirements for specific noise mitigation measures, such as sound walls around construction sites, in the contract documents, and (2) residential property line noise limits in the construction specifications that the contractor cannot exceed. Approaches to ensure that construction is performed in compliance with property line noise limits include:

- Noise monitoring by the construction management firm. Regular noise monitoring should be done in areas where it is expected that the contractor will have trouble meeting the property line noise limits. This type of monitoring is usually the contractor's responsibility, although communities may put more credence in monitoring performed by, or under the direction of, the construction management firm. The monitoring can be weekly spot checks supplemented with monitoring to respond to complaints. Continuous monitoring using automated, unattended monitors is sometimes justified in particularly sensitive areas.

- Require contractors to prepare noise control plans. The goal of the noise control plan is to ensure that contractors consider community noise when designing construction sites, selecting construction procedures and equipment, and determining work schedules.

- Limit the noisy construction activities, particularly during nighttime hours. Example restrictions are: requiring pre-drilled piles, limiting pile driving to daytime hours, limiting the use of jackhammers and other pneumatic and impact devices, and restricting muck removal in residential areas to daytime hours.

- Requiring contractors to have temporary barriers stockpiled that can be used at the Resident Engineer's discretion to immediately address any noise complaints or exceedances.

General procedures that contractor's should be required to employ to minimize noise impacts are:

1. Perform all construction in a manner to minimize noise. The contractor should be required to select construction processes and techniques that create the lowest noise levels. Examples are using predrilled piles in place of pile driving, mixing concrete off site instead on onsite, and using hydraulic tools instead of pneumatic tools.

2. Use equipment with effective mufflers. Diesel motors are often the major source of noise on construction sites. All equipment should be required to have the most effective commercially available mufflers installed.

3. Minimize the use of backup alarms. Because of the particularly piercing nature of backup alarms, they are often the primary source of complaints about construction noise even though they are not the loudest noise. Approaches to reducing annoyance caused by backup alarms are: lay out construction sites to minimize the need for backup alarms; use strobe lights in place of backup alarms at night; use flagmen to keep the area behind maneuvering vehicles clear; and use ambient controlled backup alarms. Ambient controlled backup alarms adjust the alarm loudness up and down depending on ambient noise. Safety implications of any procedure for reducing backup alarm noise will be carefully reviewed before the procedure is implemented.

4. Select haul routes and schedules that minimize intrusion to residential areas.

5. Layout construction sites such that the noisiest activities are as separate as possible from noise sensitive receptors. Sometimes it is even possible to gain acoustical benefits by locating temporary construction offices or other barriers between construction activities and residential areas. There are even examples of locating muck storage piles so they act as sound barriers.

5-9.2 Construction Vibration

a. Impact Analysis Methodology and Evaluation Criteria

A qualitative assessment based on past experience was conducted. Significant impacts would occur where indicated impact thresholds are exceeded.

b. Impacts

It is expected that ground-borne vibration from construction activities would cause only intermittent, localized intrusion along the corridor. The construction activities most likely to cause vibration impacts are:

- Heavy construction equipment. Although all heavy, mobile construction equipment has the potential of causing at least some perceptible vibration when operating close to buildings, the vibration is usually short term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as bulldozers, front end loaders or cranes would operate close enough to any residences to cause vibration impact.

- Jack hammers and vibratory compaction equipment. This type of equipment would be used for relatively short periods of time during the demolition phase, preparation of the subgrade, and during final site restoration. If residents complain about intrusive vibration, the contractor will be required to modify the procedure or arrange to complete the task in a manner that will cause the minimum amount of hardship for the affected residents.

- Impact pile driving. Impact pile driving should be prohibited at distances less than 250 feet from any residence. If no other approach is acceptable, the contractor will be required to monitor vibration levels at the residence and modify the procedures if the vibration exceeds a threshold of 0.04 in/sec (peak particle velocity).

- Tunnel boring machines. There is relatively little information on the levels of ground-borne vibration caused by tunnel boring machines. Experience has shown, however, that the levels can be sufficiently high to generate complaints from people living above the tunnels. Measurements of Red Line tunneling under Wilshire Boulevard taken in 1993 showed that: (1) all vibration related to tunneling was well below any damage criterion, and (2) tunnel boring machine created low-frequency vibration that would probably be perceived inside some buildings, but did not exceed typical acceptability criteria. Since tunnel boring machines constantly move forward, the vibration is rarely perceptible for more than one or two days.

- Muck trains. The trains used to haul muck (excavated material) from the tunnel face to portals cause ground-borne vibration or ground-borne noise in buildings above the tunnel that residents will sometimes find intrusive, particularly when the muck trains operate during nighttime hours. Although it is feasible to reduce levels of muck train vibration through use of elastomer supports or rubber mats under the track, it is more common for mitigation to consist of limiting the hours that muck trains can operate.

- Blasting. Of all construction activities, blasting is the one most often associated with accidental building damage. Because of the soft alluvial nature of soils in the Valley, it is not anticipated that blasting would be required for construction of any of the East Valley alternatives.

- Trucks. Trucks hauling excavated material from construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. The problem can almost always be eliminated by fixing the bumps and potholes.

c. Mitigation Measures

Impacts from construction vibration should be controlled through: (1) including specific vibration limits in contract documents, (2) limiting where and when high vibration activities such as pile driving can take place, and (3) requiring vibration monitoring for any construction process that is could cause intrusive or damaging vibration.

Construction of the Red Line Extension into the East Valley has the potential to cause intrusive vibration to residences within about 100 feet of the construction sites or the tunneling operations. Although there are likely to be times when the vibration is intrusive, in no case is the construction vibration expected to cause building damage. The strategy that will be used to minimize intrusive vibration during construction is:

1. The construction specification will include specific vibration limits. Should the contractor exceed these limits, he will be required to take positive steps to reduce the levels of

vibration. Table 5-9.5 summarizes the vibration limits that will be included in the specifications.

2. The contractors will be required to perform periodic vibration monitoring to verify that vibration levels do not exceed the limits.

3. Any time the monitoring indicates that the vibration limits are being exceeded, the contractors will be required immediately to take steps to reduce the vibration levels. Steps the contractors could take include: (a) scheduling restrictions on construction near residential areas during nighttime hours, (b) using alternative methods (e.g., predrilling holes for piles in place of pile driving, using rubber-tired equipment in place of tracked equipment), and (c) using conveyors in place of muck vehicles.

Table 5-9.5: Vibration Limits

Type of Vibration	Definition	Limit*
Intermittent and short-term vibration	Vibration that is intermittent and will not last for more than 3 days (e.g., tunnel boring machines).	O.2 in/sec
Long-term vibration	Vibration that will occur over an extended period of time or will last for a long time when it occurs (e.g., muck trains moving excavated material to the tunnel portal or a large generator running for an extended period of time).	10 p.m. to 7 a.m. 0.01 in/sec 7 a.m. to 10 p.m. 0.02 in/sec

Note: *Limits are in terms of peak particle velocity (ppv) measured in any of three triaxial directions at ground surface at affected buildings.

Source: HMMH, 1997.

5-10 GEOTECHNICAL CONSIDERATIONS

5-10.1 Impact Analysis Methodology and Evaluation Criteria

Potential geotechnical impacts resulting from construction have been identified by reviewing available published and unpublished geotechnical literature pertinent to the proposed project. These include but are not limited to the safety elements of the general plans for the city and county of Los Angeles, available recent and historical aerials photographs, Alquist-Priolo Earthquake Fault Zone Maps, geologic and topographic maps and other publications by the California Division of Mines and Geology and the U.S. Geological Survey, pertinent maps by the California Division of Oil and Gas, and Wildcat Oil and Gas Maps, and available geotechnical and environmental reports. Additionally, an updated environmental records search has been performed to identify sites along the proposed alignment that have known soil and/or groundwater contamination or a potential to have contamination. Based on the review of available information, the effects of the proposed construction on the existing topography, geology, soils, seismicity, and hazardous materials have been evaluated. Likewise, the effects of the existing topographic, geologic and seismic conditions, and existing hazardous materials on the construction of the proposed project have been evaluated.

The criteria for determining if potential geotechnical construction impacts are significant are based on the significance thresholds in the *State CEQA Guidelines* and those identified by local jurisdictions. Significant geotechnical impacts relative to the construction phase of the project are defined by CEQA to include:

- Disruption of a unique geologic feature of unusual scientific value,
- Potential for known mineral resources to be rendered inaccessible by construction,
- Surface settlement related to tunneling or construction dewatering,
- Potential for failure of construction excavations due to the presence of loose saturated sand or soft clay,
- Water related hazards such as flooding and inundation,
- Potential for hazardous conditions from high concentrations of methane, hydrogen sulfide, or other oil well products encountered during construction,
- Potential for exposure of people to hazardous gases,
- Handling and disposal of contaminated soils and groundwater encountered during construction,
- Handling and disposal of hazardous materials resulting from building demolition,
- Project discharges into existing water supplies or groundwater tables from construction activities.

The TSM Alternative would not involve construction of fixed facilities, and therefore the analysis of impacts is confined to the rail alternatives.

5-10.2 Impacts

The following section discusses the potential geotechnical impacts along the proposed Chandler and Oxnard Alignments during the construction phase of the project.

a. Surface Settlement

There is a potential for settlement of surface structures as a result of excessive loss of ground during construction of the deep bore segments of the alignments or lateral deflection of excavations planned as part of the cut/cover, and open air segments of the alignments. Additionally, excavations planned in portal areas or required during construction of cut/cover stations also have a potential for lateral deflection.

(1) Deep Bore Segments

The following areas of the proposed alignments will be constructed as deep bore segments:

- East of Hazeltine Avenue (Alternatives 1a and 2)
- East of Laurel Canyon Boulevard (Alternatives 1 and 11)

The depth of the proposed tunnel crown below the existing ground surface ranges from approximately 20 to 40 feet. Based on previous geotechnical investigations along the proposed alignments, there is a potential for running conditions[1] in the vicinity of Woodman Avenue, Tujunga flood control channel (both of which would affect Alternatives 1a and 2), and the central branch of Tujunga Wash (which would affect all alternatives except Alternative 6). Running conditions may also be expected in the vicinity of the WOW, where poorly graded sands and gravel are locally present, potentially affecting Alternatives 1 and 11. There is also a potential along the entire deep bore segment for slow raveling conditions in areas where silty sands and clayey sands are encountered.

During construction of the deep bore segments, excessive loss of ground (raveling or running conditions at the tunnel face) could potentially result in a disturbed zone of soil extending up and out from the tunnel heading. In some cases, the disturbed zone can reach the ground surface causing the settlement of existing structures, such as utilities, buildings or roadways, directly above or adjacent to the centerline of the tunnel excavation. Specific areas where the potential for surface settlement could result in damage to existing structures include:

- WOW segment of the Chandler Alignment (Alternatives 1 and 11) where there is a potential for running conditions and the centerline of the tunnel is directly below residential structures.

- In the vicinity of Tujunga flood control channel (Oxnard Alignment [Alternative 2] and Alternative 1a of the Chandler Alignment) where there is the potential for encountering running sands and cobbles.

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[1]Running conditions refer to soil that does not hold a firm face while tunneling is proceeding, but rather gives way at the face of the tunneling machine within a short time.

- East of the central branch of Tujunga Wash (potentially affecting Alternatives 1 and 11), where there is the potential for encountering running sands and cobbles.

- In the immediate vicinity of the Hollywood Freeway (potentially affecting Alternatives 1 and 11), where there is a potential for the tunnel excavations to be in the zone of influence of overhead structural foundations for the Hollywood Freeway.

In all of the areas identified above, the potential exists for significant adverse impact, prior to mitigation.

(2) Cut/Cover and Open Air Segments

Excavations for cut/cover and open air segments of the Chandler Alignment range from 25 to 50 feet beneath the existing ground surface. The cut/cover or open air stations and portal areas will require excavations on the order of 40 feet beneath the existing ground surface. There is a potential for lateral deflection of vertical excavation walls during construction of these segments that could result in differential settlement of existing structures. This would be a potentially significant impact prior to mitigation, and it would pertain to the following:

Open Air or Cut and Cover Guideway Segments

- Alternative 1a 1,900 feet
- Alternative 1b 16,500 feet
- Alternative 1c 17,000 feet
- Alternative 1d 1,600 feet
- Alternative 2 2,300 feet
- Alternative 6a 6,100 feet
- Alternative 6b 16,800 feet
- Alternative 11a 9,200 feet
- Alternative 11b 14,900 feet

Open Air or Cut and Cover Stations

- Laurel Canyon/Chandler Boulevard (all Chandler alternatives except 6a)
- Laurel Canyon/Oxnard Street (Alternative 2)
- Valley College/Fulton-Burbank (all Chandler alternatives except 1d)
- Valley College/Oxnard Street (Alternative 2)

Portal Construction Shaft Area

- North of the North Hollywood Red Line station, in an area south of Burbank Boulevard and east of Lankershim Boulevard.

b. Slope Stability

Construction of cut/cover and open air stations and portal areas for the Chandler Alignment and the Oxnard Alignment require temporary excavations up to 40 feet beneath the existing ground surface and temporary excavation support. These areas would be the same as described above.

There is a potential for instability of excavation slopes during construction of the cut/cover or open air stations, or at the portals. Construction methods would typically involve temporary excavation slopes. Where granular alluvial soils are exposed in the excavation, there is a potential for sloughing and erosion. Also, if localized perched groundwater is encountered, the potential for instability of the excavation walls is substantially higher. Potential areas of shallow perched groundwater are identified in Section 4-10.

c. Hazardous Materials

Impacts with regard to hazardous waste from construction activities along the proposed Chandler and Oxnard alignments are not anticipated to be significant because they can be mitigated to a level that is less than significant in accordance with applicable hazardous waste laws, statutes and regulations in conjunction with the use of hazardous material detection and best management practices.

Construction activities are most likely to encounter pre-existing hazardous waste at the following locations:

- Rail station and deep bore tunnel shaft locations that would require closure of underground storage tanks or hazardous waste generators (gasoline stations, auto repair facilities)

- Critical locations of known or potential contamination that are in the direct path of the proposed alignments (see Section 4-10).

- Locations of partially characterized subsurface contamination.

However, there is a potential for construction activities to encounter unknown existing hazardous waste anywhere along the proposed alignments. Additionally, the proposed construction of the alignments may increase the likelihood of hazardous waste migration due to the disturbance of existing hazardous waste. Potential impacts associated with construction of the proposed rail alignments are discussed below.

(1) Exposure to Contaminated Soil and/or Groundwater

Deep bore, cut-and-cover, and open air construction operations may encounter pre-existing hazardous materials/wastes. The most significant impact associated with encountered hazardous materials is the potential for exposure to construction workers or the public. Table 5-10.1 summarizes the number of potentially contaminated sites by geographic area which were identified as a result of both past field reconnaissance and a current environmental regulatory agency records review. The sites have been ranked as having a high, medium or low potential for pre-existing hazardous waste. The locations of the actual or potentially contaminated sites along the alignments are shown on Figure 4-10.3.

Table 5-10.1: Potential Pre-Existing Hazardous Waste Sites in the Vicinity of Construction Sites

Geographic Area	Number of Sites	Degree of Potential		
		High	Medium	Low
Woodley Ave. to Sepulveda Blvd. (all alternatives)	9	3 (3)(4)	1 (3)(4)	5 (3)(4)
Sepulveda Blvd. to Hazeltine Ave. (all alternatives)	30	7 (4)	0	23 (4)
Hazeltine Ave. to Laurel Canyon Blvd. along the Chandler Alignment (Alternative 1)	14	2(1)(2)(3)(4)	0	12 (1)(2)(3)(4)
Hazeltine to N. Hollywood Station along the Oxnard Alignment (Alternative 2)	8	2 (2)	0	6 (2)
The WOW; Laurel Canyon Blvd. to N. Hollywood Station along the Chandler Alignment (Alternatives 1 and 11)	7	0	1 (2)	6 (2)

Notes:
[1]Refers to number of sites in vicinity of cut-and-cover.
[2]Refers to number of sites in vicinity of deep bore tunnel.
[3]Refers to number of sites in vicinity of at-grade.
[4]Refers to number of sites in vicinity of aerial guideway.

Source: Law/Crandall, 1997.

There is also a potential for exposure of construction workers and the public to hazardous materials generated by the construction operations themselves. During the construction phase of the proposed alignments, various types of hazardous materials are often stored on-site. Typical hazardous materials commonly stored on construction sites include: detergents; petroleum products such as fuel, oil, and grease for the operation and maintenance of construction equipment; and chemicals such as paving coating materials, concrete curing materials, acids, glues, paints, and solvents. Storage of these products on-site can pose the following impacts: exposure and potential injury to workers or the general public; soil contamination, and/or groundwater pollution, and storm water pollution. This impact is not considered significant, given the application of best management practices.

(2) Handling and Disposal of Contaminated Soil and/or Groundwater

Special handling and disposal of contaminated soil and/or groundwater will be required if hazardous materials are encountered during construction. Substantial volumes of soil will be excavated during construction and, at some locations, the soil and possibly the groundwater may contain manmade hydrocarbons or chemicals that have leached into the soil from underground storage tanks or hazardous waste storage/disposal sites. Additionally, portions of the alignments may pass through areas of heavy hydrocarbon, metals contamination, or priority pollutant groundwater contamination. Contaminated soil or groundwater will require special handling and disposal.

If groundwater is encountered during deep bore or cut-and-cover operations, the construction activity would be subject to Order No. 91-092, "General National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges of Groundwater to Surface Waters in Los Angeles River and Santa Clara River Basins," adopted by the California State Water Resources Control Board. Additionally, dewatering and subsequent discharge from construction activities is also covered under these requirements.

These impacts would be potentially significant prior to mitigation.

(3) Shallow Oil or Gas

Deep bore, cut/cover and open air construction operations may encounter areas of shallow oil or gas along the proposed alignments. However, based on California Division of Oil and Gas (CDOG) maps, the proposed alignments are not within a known oil and gas field. Based on previous borings drilled along the proposed alignments, tar sands are not expected to be encountered during construction. Therefore, shallow oil or gas is not anticipated to be a significant impact along the proposed alignments during the construction phase of the project.

(4) Abandoned Oil and Gas Wells During Construction

Unreported wildcat oil and gas wells may be located in the construction zone of the proposed alignments. Commonly, unreported oil and gas wells are abandoned and plugged dry holes. These wells are often not abandoned according to current CDOG practices. The most significant impact associated with encountering abandoned oil and gas wells during construction would be encountering flammable and toxic gases associated with these wells. If abandoned oil and gas wells are encountered, the wells would need to be abandoned to current CDOG standards. If abandoned oil and gas wells are encountered during construction, the impacts could be mitigated to a level of non-significance.

5-10.3 Mitigation Measures

With the exception of highly unusual circumstances (that are not anticipated under any of the alternatives being considered) the application of standard construction practices would reduce impacts to below the level of significance. Tables 5-10.2, 5-10.3, and 5-10.4 summarize the standard construction practices and the expected level of impact significance according to the three types of construction for which impacts may be expected.

Table 5-10.2: Geotechnical Construction Impacts and Mitigation Measures - Deep Bore Segments

Anticipated Impacts	Standard Construction Practices	Level of Significance Using Standard Practices	Additional Mitigation Required	Level of Significance After Mitigation
1) *Surface Settlement*	1) Comprehensive geotechnical investigation prior to construction to define anticipated tunneling conditions. 2) Sensitive structure survey to identify structures that might need additional foundation support. 3) Monitoring of ground surface prior and during construction.	Potentially Significant	1)More extensive sensitive structure survey in areas of potential ground loss 2)Videotaping of sensitive structures prior to construction 3)More extensive monitoring of ground surface prior and during construction 4)Additional foundation support or grouting for sensitive structures	Not Significant
2) *Hazardous Waste* a) Encountering hazardous materials during construction	1) Additional exploration in known affected areas ahead of the tunnel face. 2) Use of EPB tunneling method to minimize infiltration of hazardous vapors and to allow for segregation of affected soils. 3) Monitoring for hazardous materials during construction. 4) Use of high density polyethylene liners in affected areas.	Not Significant	None Required	Not Significant
b) Contamination of soil/groundwater as a result of construction practices	1) Installation of secondary containment for hazardous materials. 2) Use of drip pans under heavy equipment. 3) Storage of reactive, ignitable, or flammable liquids in compliance with local fire codes. 4) Hazardous materials handling training for employees.	Not Significant	None Required	Not Significant
c) Encountering abandoned oil/gas wells	1) Use of magnetometer ahead of the tunnel face during construction to detect presence of abandoned wells. 2) Installation of toxic gas warning system on excavating equipment. 3) Use of high density polyethylene liners in affected areas.	Not Significant	None Required	Not Significant

Source: Law/Crandall, 1997.

Table 5-10.3: Geotechnical Construction Impacts and Mitigation Measures - Cut and Cover Segments

Anticipated Impacts	Standard Construction Practices	Level of Significance Using Standard Practices	Additional Mitigation Required	Level of Significance After Mitigation
1) *Surface Settlement*	a) Horizontal monitoring devices established and monitored prior and during construction. b) Appropriately designed shoring.	Potentially Significant	Additional foundation support or grouting for critical structures	Not Significant
2) *Slope Stability*	a) Comprehensive geotechnical investigation prior to construction to better define anticipated conditions. b) All slopes to be approved by geotechnical engineer.	Not Significant	None Required	Not Significant
2) *Hazardous Waste* a) Encountering hazardous materials during construction	1) Additional exploration in known affected areas ahead of the excavation face. 2) Monitoring for hazardous materials during construction. 3) Excavation and segregation of hazardous materials encountered during construction. 4) Use of high density polyethylene liners in affected areas.	Not Significant	None Required	Not Significant
b) Contamination of soil/groundwater as a result of construction practices	1) Installation of secondary containment for hazardous materials. 2) Use of drip pans under heavy equipment. 3) Storage of reactive, ignitable, or flammable liquids in compliance with local fire codes. 4) Hazardous materials handling training for employees.	Not Significant	None Required	Not Significant
c) Encountering abandoned oil/gas wells	1) Use of magnetometer ahead of the excavation face during construction to detect presence of abandoned wells. 2) Installation of toxic gas warning system on excavating equipment. 3) Use of high density polyethylene liners in affected areas.	Not Significant	None Required	Not Significant

Source: Law/Crandall, 1997.

Table 5-10.4: Geotechnical Construction Impacts and Mitigation Measures - Open Air Segments

Anticipated Impacts	Standard Construction Practices	Level of Significance Using Standard Practices	Additional Mitigation Required	Level of Significance After Mitigation
1) *Surface Settlement*	a) Horizontal monitoring devices established and monitored prior and during construction. b) Engineer designed shoring.	Potentially Significant	Additional foundation support or grouting for critical structures	Not Significant
2) *Slope Stability*	a) Comprehensive geotechnical investigation prior to construction to better define anticipated conditions. b) All slopes to be approved by geotechnical engineer.	Not Significant	None Required	Not Significant
3) *Hazardous Waste* a) Encountering hazardous materials during construction	1) Additional exploration in known affected areas ahead of the excavation face. 2)Monitoring for hazardous materials during construction. 3) Excavation and segregation of hazardous materials. 4) Use of ventilation system.	Not Significant	None Required	Not Significant
b) Contamination of soil/groundwater as a result of construction practices	1) Installation of secondary containment for hazardous materials. 2) Use of drip pans under heavy equipment. 3) Storage of reactive, ignitable, or flammable liquids in compliance with local fire codes. 4) Hazardous materials handling training for employees.	Not Significant	None Required	Not Significant
c) Encountering abandoned oil/gas wells	1) Use of magnetometer ahead of the construction face to detect presence of abandoned wells. 2) Installation of toxic gas warning system on excavating equipment.	Not Significant	None Required	Not Significant

Source: Law/Crandall, 1997.

5-11 BIOLOGICAL RESOURCES

5-11.1 Impact Analysis Methodology & Impact Evaluation

The reader is referred to Section 4-12 for a discussion of the methodology used to determine impacts to biological resources.

Impacts to biological resources (flora, fauna, vegetation communities, and habitats) observed or expected in the project area are determined to be significant based upon sensitivity of the resource and the extent of the impact. Biological resources are generally considered sensitive if they are limited in distribution and their ecological role is critical within a regional and local context. Habitats supporting rare, endangered, or threatened species (as listed by the agencies that enforce the California or federal Endangered Species Acts) are also regarded as sensitive. In addition, habitats not inhabited by a sensitive species but meeting the following criteria are also determined to be sensitive:

- natural areas, communities and habitats of plant and animal species that are restricted in distribution;
- habitat that is critical to species or a group of species for feeding, breeding, resting, or migrating;
- buffer zones to protect significant resources; and
- corridors or areas that link significant wildlife habitats.

Biological resources for which impacts would generally be considered significant include vernal pools, oak woodlands, wetlands (all types), sage scrub, and native grasslands.

A significant impact to a sensitive resource may be direct or indirect. An impact is regarded as direct when the primary effects of the project result in loss of habitat that would cause a reduction in the density or diversity of biological resources within the region. An indirect impact occurs from a secondary effect of the project.

The extent of the impact to the resource must be considered in determining its significance. For certain highly sensitive resources (e.g., an endangered species) any impact would be significant. Conversely, other resources which have a low sensitivity (e.g. species with a large, locally stable population but which may be declining elsewhere) could sustain a relatively large impact to habitat or population loss and not result in a significant impact.

In the section that follows, the discussion of construction impacts is confined to the rail alternatives, since the TSM Alternative would not involve the construction of fixed facilities.

5-11.2 Impacts to Biological Resources

The San Fernando Valley is highly urbanized and has been for many years. Consultation of the Natural Diversity Data Base (NDDB) and a survey conducted for the proposed project area indicate that no state or federally listed sensitive species are found in the immediate vicinity of the East Valley alignments. None of the East Valley alternatives (e.g., TSM or rail alternatives) are expected to create or affect any habitats for sensitive species, and therefore would not result in any significant impacts to biological resources.

The construction of a given alternative would result in impacts that would be limited to the removal of some existing landscaping and common urban vegetation during construction of the stations. Under CEQA, this is not a significant impact to biological resources. The habitat provided by such vegetation can be found throughout the Los Angeles Basin. Construction of the chosen alternative is not anticipated to result in the removal of the walnut trees located adjacent to the SP ROW within the Sepulveda Basin.

5-11.3 Mitigation Measures

No mitigation measures are necessary.

5-12 WATER RESOURCES

5-12.1 Impact Analysis Methodology & Evaluation Criteria

The reader is referred to Section 4-12 for a discussion of the methodology used to determine hydrology and water quality impacts.

Project alternatives would have significant impacts during construction if the project would result in any of the following conditions:

- create storm water volumes which exceed the capacity of existing drainage facilities;
- deplete or contaminate a groundwater aquifer;
- place new development in areas susceptible to 100-year flooding;
- create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code.

The discussion presented below is confined to the rail alternatives since the TSM Alternative would not involve the construction of fixed facilities.

5-12.2 Impacts on Water Resources

a. Surface Water Resources

Potential water quality impacts resulting from construction of any of the East Valley alternatives would primarily be associated with sediment loadings on the storm water and/or surface water (Los Angeles River, Tujunga Wash) systems. This would be a concern in the vicinity of the Sepulveda Basin because of the biological resources located within the basin. Sediment sources would include erosion of unstabilized, exposed soil at excavations, drainage from stockpiles of excavated materials and dewatering activities. Impacts would be considered potentially significant prior to mitigation.

b. Groundwater

Since groundwater depths in the vicinity of the East Valley alignments are greater than 100 feet below ground surface, groundwater is not anticipated to significantly affect construction of any of the East Valley alternatives. However, there is a potential for a large increase in groundwater levels in this area over the long term, if pumping/recharging patterns change. In addition, there is also a potential for encountering perched groundwater. This impact is regarded as potentially significant prior to mitigation.

c. Floodplains

Construction activities within the Tujunga Wash (Alternatives 1d and 6a) would be scheduled to occur during the dry season (April 15 to October 15) to avoid potential hazards to workers in the event of a storm. If construction must be conducted during the wet season, best management practices would be employed.

5-12.3 Mitigation Measures

Implementation of the mitigation measures discussed below would reduce potentially significant impacts to below the level of significance.

a. Surface Water Resources

Compliance with building codes, permit conditions, and other regulatory requirements would ensure that discharge of surface water runoff from construction sites during construction activities will not result in increased erosion or siltation discharge to existing drainage facilities and would mitigate impacts to surface waters.

In compliance with National Pollutant Discharge Elimination System (NPDES) General Construction Permit, implementation of pollution control methods associated with construction activities would be required. As a component of the General Construction Permit, a Storm Water Pollution Prevention Plan (SWPPP) would specifically identify best management practices (BMPs) to mitigate water quality impacts on receiving waters due to surface water runoff from the project site. The implementation of BMPs or pollution and erosion control measures may include the placement of sandbags around basins, construction of a berm to keep runoff from flowing into the construction site, and keeping motor vehicles at a safe distance from the edge of excavation. Additional measures include the use of proper grading techniques; appropriate sloping, shoring, and bracing of the construction site; and covering or stabilizing topsoil stockpiles. Construction industry standard storm water BMPs can be found in the *State of California Storm Water Best Management Practice Handbook, Construction Activity.*

b. Groundwater

As stated in Section 4-12, it is recommended that additional piezometers be installed and monitored during final design of the chosen East Valley alternative to better establish groundwater conditions along the chosen alignment.

In the event that groundwater is encountered in soils during construction, it would be necessary to remove water (dewatering) from these materials before and possibly during construction to avoid the engineering and environmental problems associated with excavating or tunneling in soils below the perched or permanent water table. This is generally done by advancing slotted pipes into the saturated soils and then pumping or allowing water to flow from the pipes, thus lowering the water table locally. The feasibility, design and cost of the dewatering system will depend upon the hydraulic head and level of groundwater contamination, if any. Alternatively, groundwater may be removed by pumping from shallow ditches or sumps within an excavation.

When any dewatering activities occur, they would be limited to the immediate excavation area, thus avoiding potential ground subsidence or differential settlement of adjacent structures. At times, alternatives to dewatering may be appropriate, such as freezing, the use of impervious materials or slurry wells.

c. Floodplains

No mitigation measures are necessary.

5-13 SAFETY AND SECURITY

5-13.1 Impact Analysis Methodology and Evaluation Criteria

A qualitative assessment was made of potential safety and security impacts. The TSM Alternative would not involve the construction of fixed facilities, and therefore the analysis of impacts is confined to the rail alternatives.

5-13.2 Impacts

Construction activities would potentially expose the public to safety hazards from construction operations and the use of heavy equipment. The presence of construction sites in close proximity to residential areas could result in a perceived diminution of security in the areas affected. These potential impacts are not considered significant.

5-13.3 Mitigation Measures

Best construction management practices would be required to be in place to ensure the safety of construction workers, local residents and employees during construction of any of the San Fernando Valley rail alternatives. Fencing and lighting of construction and staging areas, and recognized safety practice requirements for the utilization of heavy equipment and the movement of construction materials would be implemented to contain construction activities and avoid accidents. During construction, the Project Coordinator would be responsible for job site safety and security. As usual, emergency personnel within the city and county would be available for immediate response on an as-needed basis.

5-14 UTILITIES

5-14.1 Impact Analysis Methodology and Evaluation Criteria

An investigation was conducted to identify existing utilities in the vicinity of potential excavation sites and areas, using previously prepared engineering data. Utilities were evaluated by type, horizontal and vertical proximity to construction areas, and susceptibility to damage or severity of consequences in the event of a mishap. Impacts would be considered significant if: (a) the continued operation of a utility would be compromised for a substantial period of time, (b) a utility of substantial physical proportion or magnitude would require relocation, or (c) a large number of customers would be adversely affected. The TSM Alternative was not evaluated because it would not involve the construction of fixed facilities.

5-14.2 Impacts

Utilities that may be encountered along or crossing the project include telephone, cable TV, fiber optics, overhead and underground distribution and transmission electric lines, gas, water, sanitary sewer, storm drains, oil lines, and others. Sanitary sewers and storm drains are gravity lines that are generally sloped at minimum grades from their source to their outfall. The pipe size and depth beneath the surface varies depending upon the ground topography and where on the utility network the sanitary sewer or storm drain is encountered. Along this project, pipe depth varies from several feet to several tens of feet. Most other utilities are not dependent upon gravity and are usually buried at shallow depths, generally within the first eight feet below the ground surface.

Construction may require significant modification of gravity utilities, potentially affecting construction duration and project design. Other utilities, such as gas, overhead and underground high voltage electric transmission lines, and oil lines, will not necessarily require significant modification but will affect construction because there is potential for great danger if damaged and, there, they require vigilant protection during construction. Telephone and other communication lines and water lines must also be protected because of the inconvenience to the community when the service is interrupted.

There are no gravity utilities running along the SP Burbank Branch railroad right of way within the study area. There are storm drains and sanitary sewers crossing the right of way, however, at every street crossing and occasionally between street crossings. Pacific Bell, water, sanitary sewer, gas and street lighting lines run longitudinally in Lankershim Blvd. Water, sanitary sewer and three 230 kV underground transmission lines run longitudinally in Oxnard Street. based on an examination of utilities in proximity to construction areas, it is concluded that no significant impacts would occur. None of the utilities to be encountered would have its continued operation compromised. No utilities of substantial proportion would require relocation. It is not anticipated that a large number of customers would be subject to potential adverse effects.

a. Deep Bore Tunnels

Bored tunnels are generally at sufficient depth that utilities will not affect their construction. For exceptionally deep utilities, the profile alignment would be designed so that the tunnels will be sufficiently below the utility so that the bored tunnel construction would not have an effect on the utility.

b. Cut and Cover

Cut and cover construction requires a long open excavation in which the project is built. Utilities within the excavated area could interfere with construction. Gravity utilities within or crossing the construction envelope can result in more significant interference with to the construction than non-gravity utilities.

c. Open Cut

The impacts and mitigation of utilities in open cut construction are the same as for cut and cover except that permanent support structures must be provided for utilities crossing the open cut.

d. Aerial Structures

Aerial structures are above ground and are supported on columns at regular intervals. Both overhead and underground utilities can interfere with aerial structures. Overhead utilities can constrain the height and profile of the aerial structure. If the project uses a catenary system for vehicle traction power (such as in Alternatives 6 and 11) then the required overhead clearances must consider the catenary system. Also vertical clearance constraints beneath the aerial structure, such as at street crossings, must be satisfied. If it is not possible to satisfy both constraints then the overhead utility will either have to be raised or put underground.

Underground utilities can interfere with the aerial structure foundation system. Underground utilities running along the alignment may have the same alignment as the discrete foundation locations and could potentially affect many foundations.

Underground utilities crossing the aerial structure alignment have less potential impact than utilities running along the alignment. In most instances a crossing utility will not conflict with a column footing. However, when there is a conflict, the footing arrangement can be adjusted to clear the crossing utility. It is unlikely that a footing arrangement cannot be found to clear the crossing utility, but if it cannot, then it will be necessary to relocate the utility crossing.

e. At-Grade

At-grade guideway construction can be adversely affected by both overhead and underground utilities. When there is not sufficient clearance for overhead utilities then the utility can be raised, shifted or placed underground. If the project uses a catenary system for vehicle power then the required overhead clearances will be larger.

Along the SP Burbank railroad right of way where railroad operations have occurred in the past, most underground utilities should be at a sufficient depth and should have sufficient strengths so as not to interfere with or be affected by at-grade construction. Some utilities may have to be strengthened with a concrete or steel sleeve. Where streets are crossed at grade, there may be surface drainage structures at the edge of the crossing street that will interfere with the at-grade construction. Modifications to the surface drainage system will be necessary. Also, underground utilities can interfere with the catenary pole foundation.

5-14.3 Mitigation Measures

One or more of five types of construction may be required to complete the project depending on the alternative chosen: deep bore tunnels, cut and cover, open cut, aerial, and at-grade. Each can be affected by utilities that are within the construction area. Impacts would be mitigated by design and construction techniques. During design, the impact of the utility is mitigated by locating the construction clear of the utility, by relocating the utility or, for gravity utilities, by providing lift pumps or siphons. During construction mitigation includes temporary and permanent relocation and precautions and protection from damage. During design and construction, there will be coordination with all utility providers in order to identify all impacts to the construction and to identify the proper mitigation. When utilities are relocated or replaced a disruption of service may be necessary. The construction will be scheduled so that the disruption will be local and of short term. Affected properties will be given prior notification of temporary service disruption.

The impacts to non-gravity utilities, both overhead and underground, will generally be mitigated in the following ways.

- Utilities are rerouted either to locate the utilities outside of the tunnel envelope, to protect the utilities, to provide adequate clearance for ease of construction, or several of the above.
- Rerouting may be either permanent or temporary.
- For utilities remaining within the excavated area, support and protection of the utilities must be provided during construction. Support is provided from beams that are part of the excavation system or from auxiliary beams.

Gravity utilities have potentially greater impacts on cut and cover construction because the mitigation is more involved than for non-gravity utilities. The mitigation is more involved when the tunnel envelope and the utility conflict. The mitigation is more involved because rerouting of gravity systems is limited by gravity flow requirements. The mitigation would be as follows.

- Lower the profile of the structure and increase the depth of excavation in the vicinity of interfering utility, or
- Make lengthy adjustments to the utility so as to relocate the utility while maintaining flow requirements, or
- Introduce lift pumps or siphons into the utility system, or
- A combination of the above.

Lift pumps or siphons may offer an initial low capital cost mitigation, but they would create ongoing operation and maintenance costs. This must be considered in determining the mitigation.

Gas lines, high voltage electric transmission lines and oil lines require protection whenever construction activities are occurring. In cut-and-cover construction, utilities above the excavation would be buried and supported by the cover.

Mitigation to be employed in aerial guideways would include:

- Adjust the aerial structure alignment so that the foundations are clear of the utility, or
- Relocate the utility so that it is clear of the foundations, or
- A combination of both.

Mitigation measures in the vicinity of at-grade guideway segments would be similar to those employed in the vicinity of aerial foundations.

5-15 CULTURAL RESOURCES

5-15.1 IMPACT ANALYSIS METHODOLOGY AND EVALUATION CRITERIA

a. Background

As shown in Section 4-14, no above ground historic properties would be altered, damaged, or acquired prior to the operational phase. Section 4-14 also indicated that no archaeological resources were identified within the Area of Potential Effects (APE). Consequently, the discussion in this section is not resource specific, and is confined to the likelihood of encountering unknown archaeological resources during construction, and their subsequent treatment. A brief discussion of paleontological resources is also included in this section.

b. Likelihood for Encountering Unknown Archaeological Resources

An intensive Phase I archaeological survey and Class III inventory were conducted for the San Fernando Valley East-West Transportation Corridor, Los Angeles County, California. This involved background studies reviewing the prehistory, ethnography, and historical land-use of the study area; an archival records search to determine whether any prehistoric or historical archaeological sites had been recorded or were known to exist on this property; and an intensive on-foot survey of the study area.

Background studies failed to demonstrate existing knowledge of any prehistoric or ethnographic occupation or use of the study area, per se. Historical (i.e., Euro-American) use, on the other hand, is well documented and has been substantial. Portions of the proposed transportation corridor served as the first east-west rail line as well as roadway through the San Fernando Valley. The earliest commercial and residential development of this region, dating between about 1895 to 1915, clearly followed these same routes.

Whether or not historical development along this transportation corridor resulted in the deposition of any cultural remains (beyond the rail and road infrastructural remains per se) within the alternative routes is unknown, although it seems likely. No such remains were observed during the surface survey of the alternative routes. Ground surface disturbance, however, was extreme, and it is unlikely that any such remains (if still extant within the study corridor) would be currently visible on the ground surface. Moreover, the identification of period residential structures adjacent to the SP ROW increases the likelihood that extant remains may be present within the study area.

c. Methodology

According to the stipulations set forth in the Memorandum of Agreement (MOA) for Metro Rail Red Line projects, as amended through 1994, archaeological properties are evaluated by a qualified professional through a program of research, subsurface archaeological testing, and project monitoring for those areas considered to have a reasonable potential for the presence of significant archaeological resources. The purpose of research, testing and monitoring is to identify properties eligible for inclusion in the National Register of Historic Places (36 CFR §60.4) within project impact areas. The resulting identification study reports are submitted to the SHPO for review.

If necessary, preliminary treatment plans are developed prior to construction in consultation with the SHPO. The preliminary treatment plan will define the actions to be taken upon the discovery of archaeological resources and will include consultation requirements, delineation of conditions that determine when construction may or may not be stopped, provisions for expeditiously conducting needed archaeological field work and a schedule for completing any required field work.

d. Evaluation Criteria

The criteria for evaluating effects on cultural resources used in this document were developed by the Advisory Council on Historic Preservation (ACHP) as part of the regulations governing implementation of Section 106 of the NHPA. These criteria (*36 CFR §800.9*) are described in Section 4-14.2 of this document. However, the following exception to the criteria of adverse effect (*36 CFR§800.9(c)(1)*) pertains to archaeological sites:

> *Effects...may be considered as being not adverse...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.*

5-15.2 IMPACTS

a. Archaeological Resources

There are no known archaeological resources within the APE. Any unknown archaeological resources that might be disturbed by construction of the project would be subject to the identification study and treatment plan described in the MOA. The MOA requires that these tasks be performed by a qualified professional and under consultation with the SHPO. Therefore, if the terms of the MOA are properly executed, the research value of any unknown site can be substantially preserved and, according to *36 CFR§800.9(c)(1)*, the construction effect would not be adverse.

b. Aboveground Resources

As described in Section 4-14, no construction impacts are anticipated on historic buildings or structures. However, unanticipated effects could occur as a result of excessive vibration or unforeseen soil settlement.

c. Paleontological Resources

The proposed alignments are located in the southern part of the San Fernando Valley which represents a structural depression filled with alluvial sediments and is located within the Transverse Range physiographic province. The San Fernando Valley is a faulted, synclinal trough. Exposed bedrock units in the adjacent Santa Monica Mountains range in age and composition from pre-Tertiary crystalline basement to pre-Tertiary through Quaternary sediments and volcanic deposits. Alluvium has been deposited in the basin through erosion of bordering bedrock. Alluvial deposits in the eastern portion of the San Fernando Valley consist predominantly of coarse granular materials derived from erosion of granite and metamorphic basement rocks of the western San Gabriel Mountains and Verdugo Mountains. In the western portion, alluvial deposits are generally finer grained, having been derived primarily from sedimentary rocks in the Santa Monica Mountains.

Fossils usually are found in sedimentary material and rock. Thus, fossils in younger alluvium must have been eroded and transported from their original locations. Young alluvium typically contains no fossil remains and has a low potential for yielding such remains in the project area.

Because of this low sensitivity, no impacts on paleontological resources are anticipated for any of the alternatives, however, standard mitigation measures would be in effect.

5-15.3 MITIGATION MEASURES

a. Archaeological Resources

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.

In general, the procedure to be followed during excavation monitoring is straightforward and involves the construction contractor, the resident engineer, MTA personnel, and the qualified project archaeologist (construction monitors). Excavation activities affecting archaeological resources shall cease upon the discovery of such resources and the RE shall 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 shall 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 of the resource. The SOWAPM details the appropriate range of actions, such as: 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 shall be developed in consultation with the California State Historic Preservation Officer.

b. Aboveground Resources

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 dB threshold for damage to fragile historic buildings. Sensitive structures would be fitted with geotechnical instrumentation and monitored during construction. If required, grouting would also be used to minimize the potential for soil settlement around the alignment. This mitigation should minimize the potential for unanticipated impacts on the historic buildings and structures identified in Section 4-14.

c. Paleontological Resources

The following measures shall be implemented by MTA for the duration of construction to reduce potential impacts on paleontological resources from cut-and-cover or open cut excavation activities to a level of insignificance. 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 the cut-and-cover or open cut 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 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. 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 placed 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.

CHAPTER 6

ENVIRONMENTAL CONSEQUENCES OF THE CROSS VALLEY STRATEGIES

CHAPTER 6: ENVIRONMENTAL CONSEQUENCES OF THE CROSS VALLEY STRATEGIES

As is noted in Chapter 2, the East Valley alternatives could be extended westward beyond the I-405 freeway into the West Valley, terminating as far west as Valley Circle Boulevard. As a Cross Valley strategy, these alternatives would extend the corridor at-grade along the SP right-of-way to Valley Circle Boulevard. West of the I-405 Freeway, the profile would continue at-grade along the existing railroad right-of-way that parallels Topham and Oxnard Streets to Canoga Avenue. Intersections of the right-of-way and major streets would be grade-separated with the rail line passing above the street on an aerial guideway. At approximately Canoga Avenue, the alignment would transition to an aerial configuration and enter Warner Center in the median of Victory Boulevard. The alignment would travel south along either Owensmouth or Topanga Canyon Boulevard and then turn west along the Ventura Freeway (U.S. 101), continuing to Valley Circle Boulevard. Potential rail alternative station locations would include Woodley Avenue, Balboa Boulevard, White Oak Avenue, Reseda Boulevard, Tampa Avenue, Winnetka Avenue, Victory/Owensmouth, Topanga/Oxnard, Fallbrook Avenue, and Valley Circle Boulevard. The technology choices that could be made for this extension of service would include enhanced bus service, light rail vehicles, and Dual Mode Metro Red Line vehicles.

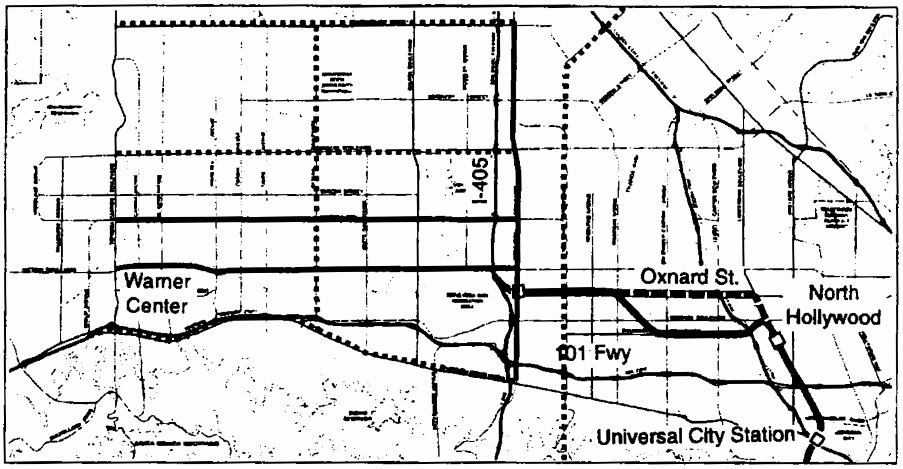
Potential impacts associated with the Cross Valley alternatives are discussed in a programmatic fashion. At such time as Cross Valley alternatives become projects for implementation, appropriate additional environmental analyses will be conducted.

For purposes of describing the potential impacts that may be associated with the Cross Valley strategies, the discussion has been divided into two sections. In the first section, impacts that are reasonable to assume to be significant or potentially significant are discussed. In the following section, impacts not likely to be found significant are discussed. The No Project Alternative is discussed only if a change from present conditions would be expected.

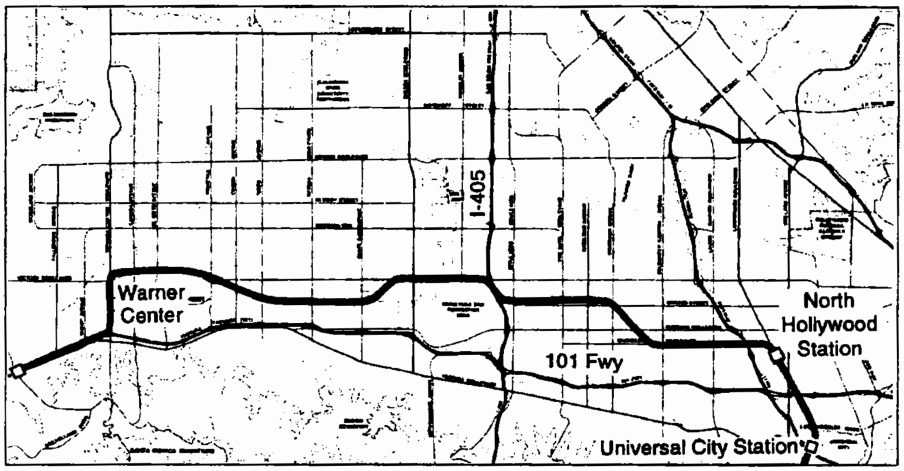
6-1 POTENTIALLY SIGNIFICANT IMPACTS

6-1.1 Transportation

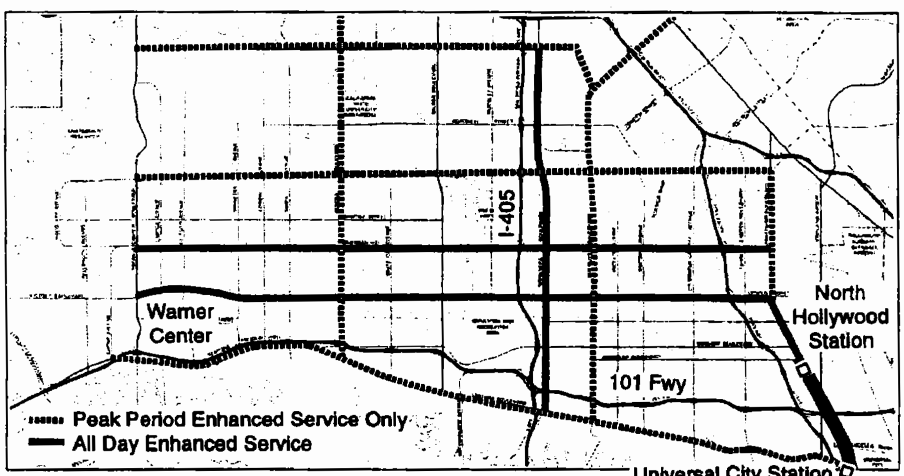
This section describes the transportation impacts of Cross Valley strategies that are described in Table 6-1 and shown on Figure 6-1. Capital costs for the alternatives are shown in Table 6-2. Impacts are measured in a general manner using systemwide performance indicators and travel corridor analysis with the screenlines, as described in Section 3-1.1. The main Cross Valley strategies include the Valleywide TSM, Alternative 12 (Dual Mode Red Line to Valley Circle), and Alternative 6 (Light Rail to Valley Circle). Also, for purposes of comparison, East Valley Alternatives 1 and 2, are evaluated with an enhanced bus system (TSM) in the West Valley.



Red Line Extension from North Hollywood to I-405 (Alternative 1,2) & TSM



Dual Mode Red Line Extension or Light Rail Transit from North Hollywood via SP Right-of-Way to West Valley (Alternative 6,12)



Enhanced Bus (Alternative 9)

Note: Alternative 10 - No Project would essentially maintain existing levels of transit service in the East - West Corridor.

SOURCE: MIS ALTERNATIVES SCREENING REPORT, MAY 1996.

Table 6-1: Cross Valley Alternative Strategies

Alternative Number	Alternative Variation	Description
10		No Project
9		Enhanced Bus (TSM)
1		Red Line Extension to I-405
	1a)	Deep Bore Subway, Hollywood Freeway to Hazeltine Avenue
	1b)	Cut & Cover Subway, Hollywood Freeway to Hazeltine Avenue
	1c)	Open-Air Subway, Hollywood Freeway to Hazeltine Avenue
	1d)	Aerial, Hollywood Freeway to I-405
2		Red Line Extension to I-405 via Oxnard Street
	Red Line Extension to I-405 via Oxnard Street + West Valley Option	+ Enhanced Bus in West Valley
		+ Dual Mode Red line Extension in West Valley
6		Light Rail Transit to Valley Circle
	6a)	LRT At-Grade
	6b)	LRT At-Grade, same as 6a + Cut-and-Cover Subway on Chandler Boulevard
12		Red Line Extension to Warner Center/Valley Circle with Dual Mode Vehicle
	12a)	Predominantly At-Grade, North Hollywood to Valley Circle
	12b)	Same as 12a + Cut-and-Cover Subway on Chandler Boulevard

Source: MFA, 1997.

Table 6-2: Cost Estimates for Cross Valley Alternatives

Cross Valley Alternatives		Capital Cost (in millions of dollars)			
East Valley	**West Valley**	**Base (incl. ROW)**	**Systemwide (Rail Fleet)**	**Bus**	**Total**
1a) SP Deep Bore	Enhanced Bus	0	0	$31	$31
1b) SP Cut & Cover	Enhanced Bus	$919	$241	$32	$1,192
1c) SP Open Cut	Enhanced Bus	$773	$241	$32	$1,046
1d) SP Aerial	Enhanced Bus	$663	$241	$32	$936
2) Oxnard Deep Bore	Enhanced Bus	$890	$241	$32	$1,163
6a) SP LRT		$1,133	$372	($9)	$1,496
6b) SP LRT		$1,333	$372	($9)	$11,696
11a) Dual Mode	Enhanced Bus	$634	$284	$32	$950
11b) Dual Mode	Enhanced Bus	$739	$284	$32	$1,055
12) Dual Mode		$1,476	$522	($12)	$1,987

Source: MFA, 1997.

Impacts of Cross Valley strategies are measured by comparing each strategy's performance with that of the No Project Alternative. Travel projections are based on the modeling methodology described in Appendix K.

a. Impacts on Countywide Performance Indicators

As seen on Table 6-3, the implementation of cross Valley strategies will result in an increase of countywide transit trips. This increase ranges from a high of 22,300 for Alternative 12 to 13,600 for Valleywide TSM. Enhancement of Alternatives 1 and 2 with TSM in the West Valley will have a more dramatic increase in countywide transit trips, in the range of 30,000 to 33,000. These increases are on the order of 1.3 to 2.2 percent for TSM and Valleywide rail strategies, and increase to around 3 percent for the TSM-enhanced Alternatives 1 and 2.

Countywide transit boardings follow a similar trend. The Valleywide TSM and the two Valley Circle rail extensions result in countywide increases in transit boardings in the range of 1.7 to 2.0 percent (29,000 to 35,000 boardings). However, the TSM-enhanced Alternatives 1 and 2 result in countywide increases of transit boardings between 3.5 to 4.0 percent (63,000 to 69,000 boardings).

The above increases in transit ridership result in systemwide decreases in vehicle trips and traffic. These are also indicated in Table 6-3. The Valleywide TSM strategy results in the lowest reduction at 11,500 Valleywide trips, or less than 0.1 percent. All other strategies result in approximately a 0.1 percent reduction in countywide daily vehicle trips. The Dual Mode Red Line extension to Valley Circle is estimated to reduce vehicle trips by 19,000 trips, but the light rail only by approximately 15,400 trips. When Alternatives 1 and 2 are enhanced with TSM in the West Valley, they produce the highest amounts of vehicle trip reduction, in the range of 25,800 to 27,800.

Total countywide vehicle mile of travel (VMT) decrease between a low of 0.1 percent for the TSM strategy to 3 to 4 percent for LRT and Dual Mode Red Line extensions, respectively. Countywide average vehicle travel speeds will also be positively affected as a result of the cross Valley transit options. The increases range from a low of 0.1 percent for TSM to 4.8 to 4.9 percent for rail extensions. Average speeds will increase by about 1 mile per hour (MPH) from 24.9 mph for the No Project to about 26.1 mph for the various strategies.

b. Impacts on Valley-wide Performance Indicators

As expected the impacts of the Cross Valley strategies are more pronounced when considering the travel statistics locally within the Valley. Alternatives 12 and 6 would reduce the total VMT in the Valley by 4 and 3 percent; respectively, which is also very similar to the impacts of the TSM-enhanced Alternatives 1 and 2. The Valleywide TSM strategy has only a 0.4 percent impact in reducing total VMT in the Valley. Vehicle hours of travel (VHT) also follow a consistent trend. The Valley Circle extension of the Red Line has the highest positive impact, with a 10.6 percent reduction, and Valleywide TSM has the lowest, at only 1.5 percent reduction.

Table 6-3: San Fernando Valley East-West MIS
Comparison of Travel Statistics for Cross-Valley Alternatives

	Alternative 10	Alternative 9	Alternative 12	Alternative 6	Alternative 1+TSM	Alternative 2+TSM
	No Project	TSM/(Enhanced Bus)	Dual Mode Red Line to Valley Circle	LRT to Valley Circle	Red Line SP to I-405 +TSM W. Valley	Red Line Oxnard to I-405 +TSM W. Valley
Countywide Statistics						
Daily Person Trips	38,234,000	38,234,000	38,234,000	38,234,000	38,234,000	38,234,000
Daily Segment Boardings	N.A.	N.A.	70,140	50,280	52,850	59,110
Daily Transit Trips	1,028,630	1,042,210	1,050,950	1,046,430	1,058,820	1,061,190
Change from No Project		13,580	22,320	17,800	30,190	32,560
% Change		1.32%	2.17%	1.73%	2.93%	3.17%
Daily Transit Boardings	1,749,850	1,779,000	1,784,450	1,779,000	1,812,300	1,819,250
		29,150	34,600	29,150	62,450	69,400
		1.67%	1.98%	1.67%	3.57%	3.97%
Daily Bus Boardings	1,207,700	1,231,880	1,205,720	1,200,310	1,242,620	1,246,390
		24,180	-1,980	-7,390	34,920	38,690
		2.00%	-0.16%	-0.61%	2.89%	3.20%
Daily Transit Mode Split	2.69%	2.73%	2.75%	2.74%	2.77%	2.78%
Daily Vehicle Trips	27,643,900	27,632,410	27,624,860	27,628,470	27,618,100	27,616,070
		-11,490	-19,040	-15,430	-25,800	-27,830
		-0.04%	-0.07%	-0.06%	-0.09%	-0.10%
Daily Auto VMT (assign.)	228,567,960	228,408,110	219,730,400	221,480,640	227,561,870	221,330,000
		-0.07%	-3.87%	-3.10%	-0.44%	-3.17%
Daily Auto VHT (assign.)	9,190,630	9,176,420	8,430,600	8,500,130	8,431,910	8,484,440
		-0.15%	-8.27%	-7.51%	-8.26%	-7.68%
Vehicle Hours of Delay	4,648,000	5,309,530	4,529,840	4,569,500	4,533,480	4,544,960
		14.23%	-2.54%	-1.69%	-2.46%	-2.22%
Avg. Veh. Speed (assign.)	24.9	24.9	26.1	26.1	27.0	26.1
		0.08%	4.80%	4.77%	8.52%	4.89%
Valley RSA's 12 and 13						
Daily Auto VMT (assign.)	26,592,190	26,494,010	25,524,540	25,803,710	25,523,070	25,738,190
		-0.37%	-4.01%	-2.97%	-4.02%	-3.21%
Daily Auto VHT (assign.)	958,630	943,990	857,470	868,660	857,380	861,580
		-1.53%	-10.55%	-9.39%	-10.56%	-10.12%
Vehicle Hours of Delay	464,800	530,740	430,080	434,070	430,490	427,220
		14.19%	-7.47%	-6.61%	-7.38%	-8.09%
Avg. Veh. Speed (assign.)	27.7	28.1	29.8	29.7	29.8	29.9
		1.18%	7.31%	7.09%	7.31%	7.69%

Source: Meyer, Mohaddes Associates, Inc., 1997.

Vehicle hours of delay show a reduction as high as 6.1 percent with Alternative 12. The average highway (freeways and arterials) speeds for all Cross Valley strategies increase from the No Project average speed of 27.7 mph to a range of 28.1 (1.2 percent improvement) for Valleywide TSM to 29.8 mph (7.3 percent improvement) for Alternative 12 and a high of 29.9 mph for TSM-enhanced Alternative 2 (a 7.7 percent improvement).

c. Impacts on Corridor Traffic Reduction

As discussed in Section 3-3.1, to more directly quantify the amount and patterns of traffic impacts on the Valley's various travel corridors a screenline analysis was conducted using a system of ten screenlines established across these corridors. Table 6-4 summarizes the screenline analyses for the Cross Valley strategies, comparing the screenline summaries for each strategy with that of the No Project Alternative. All Cross Valley strategies would reduce traffic volumes compared to the No Project alternative. The results are consistent with the findings for the county and Valleywide performance indicators, with one significant difference - the trip reduction impacts of the Valleywide TSM strategy would be less than that of the rail strategies. However, they are not as significantly less as with systemwide performance indicators (VMT, VHT and delay), which were often improved by a factor of 3 to 4. The rail strategies (12 and 6) or the enhanced rail strategies (1+TSM and 2+TSM) result in reduction of traffic in the range of 8.5 to 8.8 percent, whereas the Valleywide TSM strategy has a 7.7 percent overall traffic reduction effect.

The Valleywide rail extension strategies reduce east-west traffic volumes by 9.8 percent across all screenlines, while TSM reduces east-west traffic by 6.1 percent. The highest amount of reduction of east-west traffic occurs near Coldwater Canyon Avenue, where as much as 18,000 peak period trips (10.1 percent) are reduced from arterials and freeways. The Valleywide TSM strategy reduces east-west traffic at this location by 16,000 peak period trips, or 9.0 percent. The highest reduction (10.8 percent) of east-west trips would occur at Winnetka Avenue in the West Valley.

The north-south traffic reduction of Cross Valley strategies ranges from a low of 6.1 percent for the Valleywide TSM to 6.9-7.2 percent for rail extension and TSM-enhanced rail strategies. The highest amount and proportion of reduction of north-south traffic occurs near Burbank Boulevard, nearest to the project corridor, where as much as 18,400 peak period trips (7.8 percent) are reduced from arterials and freeways. The Valleywide TSM strategy reduces east-west traffic at this location by 15,700 peak period trips, or 6.7 percent. The Mulholland Drive screenline indicates the effectiveness and potential of the Cross Valley strategies for reducing trips between the Valley and the Los Angeles Basin. This impact ranges from a low of 14,300 peak period trips (5.7 percent) for the Valleywide TSM to a high of 17,300 trips (6.9 percent reduction) for the West Valley TSM-enhanced Oxnard alignment of the Red Line.

Table 6-4: San Fernando Valley East-West MIS
Comparison of Screenline Volumes for Cross-Valley Alternatives

	Alternative 10	Alternative 9	Alternative 12	Alternative 6	Alternative 1+TSM	Alternative 2+TSM
	No Project	TSM/(Enhanced Bus)	Dual Mode Red Line to Valley Circle	LRT to Valley Circle	Red Line SP to I-405 +TSM W. Valley	Red Line Oxnard to I-405 +TSM W. Valley
(1) e/o Topanga Canyon	135,740	123,080	121,580	121,690	122,230	122,250
Change from No Project		-12,660	-14,160	-14,050	-13,510	-13,490
% Change		-9.33%	-10.43%	-10.35%	-9.95%	-9.94%
(2) w/o of Winnetka	130,190	117,970	116,160	116,090	116,890	116,890
Change from No Project		-12,220	-14,030	-14,100	-13,300	-13,300
% Change		-9.39%	-10.78%	-10.83%	-10.22%	-10.22%
(3) w/o of Reseda	156,240	143,050	141,040	141,070	141,890	141,800
Change from No Project		-13,190	-15,200	-15,170	-14,350	-14,440
% Change		-8.44%	-9.73%	-9.71%	-9.18%	-9.24%
(4) w/o of Balboa	175,840	161,640	159,280	159,220	160,150	159,900
Change from No Project		-14,200	-16,560	-16,620	-15,690	-15,940
% Change		-8.08%	-9.42%	-9.45%	-8.92%	-9.07%
(5) e/o of Woodley	176,300	162,610	160,310	160,680	161,180	160,650
Change from No Project		-13,690	-15,990	-15,620	-15,120	-15,650
% Change		-7.77%	-9.07%	-8.86%	-8.58%	-8.88%
(6) e/o of Sepulveda	164,630	150,360	148,970	148,740	148,770	148,910
Change from No Project		-14,270	-15,660	-15,890	-15,860	-15,720
% Change		-8.67%	-9.51%	-9.65%	-9.63%	-9.55%
(7) e/o Coldwater Canyon	176,480	160,510	158,730	158,620	158,290	158,470
Change from No Project		-15,970	-17,750	-17,860	-18,190	-18,010
% Change		-9.05%	-10.06%	-10.12%	-10.31%	-10.21%

Table 6-4: San Fernando Valley East-West MIS
Comparison of Screenline Volumes for Cross-Valley Alternatives

	Alternative 10	Alternative 9	Alternative 12	Alternative 6	Alternative 1+TSM	Alternative 2+TSM
	No Project	TSM/(Enhanced Bus)	Dual Mode Red Line to Valley Circle	LRT to Valley Circle	Red Line SP to I-405 +TSM W. Valley	Red Line Oxnard to I-405 +TSM W. Valley
(8) n/o Sherman Way	194,540	182,700	182,080	181,480	180,900	180,830
Change from No Project		-11,840	-12,460	-13,060	-13,640	-13,710
% Change		-6.09%	-6.40%	-6.71%	-7.01%	-7.05%
(9) n/o Burbank	235,270	219,610	217,010	216,920	216,840	216,990
Change from No Project		-15,660	-18,260	-18,350	-18,430	-18,280
% Change		-6.66%	-7.76%	-7.80%	-7.83%	-7.77%
(10) s/o Mulholland	250,640	236,370	233,510	235,150	235,560	233,380
Change from No Project		-14,270	-17,130	-15,490	-15,080	-17,260
% Change		-5.69%	-6.83%	-6.18%	-6.02%	-6.89%
N/S SL's (E/W Traffic)	1,115,430	1,019,220	1,006,050	1,006,110	1,009,400	1,008,870
Change from No Project		-96,210	-109,380	-109,320	-106,030	-106,560
% Change		-8.63%	-9.81%	-9.80%	-9.51%	-9.55%
E/W SL's (N/S Traffic)	680,450	638,680	632,600	633,550	633,300	631,200
Change from No Project		-41,770	-47,850	-46,900	-47,150	-49,250
% Change		-6.14%	-7.03%	-6.89%	-6.93%	-7.24%
Grand Total	1,795,870	1,657,900	1,638,650	1,639,660	1,642,700	1,640,070
All Screenlines		-137,970	-157,220	-156,210	-153,170	-155,800
		-7.68%	-8.75%	-8.70%	-8.53%	-8.68%

Source: Meyer, Mohaddes Associates, Inc., 1997.

6-1.2 Land Use and Development

a. TSM/Enhanced Bus

This alternative would add buses to the roadway network throughout the San Fernando Valley. Bus stops and facilities identified int he *San Fernando Bus Restructuring Study* and described in Section 2-2.2 would be utilized. No parcels would be acquired. Existing land uses patterns would not be altered as a result of this alternative. No significant impacts are foreseen with this alternative.

b. Rail Alternatives

The predominant land use pattern in the West Valley is low-density single-family neighborhoods. Some small-scale commercial activity is clustered around the intersections of major streets. Larger commercial centers are a commercial strip along Victory Boulevard in Reseda and Topanga Plaza in Warner Center. Warner Center is a densely-developed area that consists of office buildings, commercial areas, and condominiums. The main open space use in proximity to the alignment is the Sepulveda Basin. Educational uses include Birmingham High School and Pierce College. Sensitive uses consist of the Sepulveda Basin, single-family neighborhoods, Pierce College and Birmingham High School.

The at-grade portion of the alignment would be located in the existing right-of-way and few, if any, properties would need to be acquired. There is the potential for impacts to occur in the area around aerial flyovers at major intersections related to increased noise, shade and shadow, and increased ambient light levels. South of Oxnard Street, along Owensmouth Avenue or Topanga Canyon Boulevard, right-of-way acquisition may be required to fit the aerial guideway into an area adjacent to the roadway. Impacts could result from the need to acquire property to widen either Topanga Canyon Boulevard or Owensmouth Avenue, thereby reducing the setback in front of certain buildings. This may create non-conforming uses or result in the loss of visual open space and landscaped areas. West of Topanga Canyon Boulevard, the alignment would pass behind several blocks of multi-family housing units. Proximity impacts could result from the close distance between the aerial guideway nearby apartment buildings.

Extension of the rail westward is consistent with the Los Angeles General Plan Framework as it provides transit options to a major regional center, as well as the Canoga Park-Winnetka-Woodland Hills Plan, and the Warner Center Specific Plan.

Station areas planned for the western portion of this alternative would generally be consistent with adjacent land uses, particularly the smaller scale at-grade stations. Station areas in the West Valley could be constructed on properties that are currently vacant or under-utilized. No residential properties or other sensitive uses would need to be acquired to facilitate station construction. Typically stations are located away from single-family areas, thus reducing the potential for impacts to occur. Stations at White Oak, Winnetka, and Tampa are surrounded by single-family housing and therefore have the greatest potential for causing adjacency impacts related to increased noise, traffic, and activity. If parking lots are to be provided, additional land may need to be acquired and the potential for proximity impacts to adjacent uses would increase. Impacts may also result from the level of activity potentially generated at the Valley Circle park-and-ride facility. If an aerial station design is utilized in some locations, the potential for station-related impacts would also increase. The Winnetka station serves Pierce College which is a transit-supporting land use and the higher-density commercial, office, and residential development of Warner Center are also transit-supporting.

The expected impacts of the rail alternatives could be potentially significant in some locations.

6-1.3 Acquisitions, Displacements, and Relocation

a. TSM Alternative

No acquisitions of private property are anticipated for this alternative.

b. Rail Alternatives

Because the West Valley alternatives have not been defined at the same level of detail as the East Valley alternatives, only an approximate estimate of acquisitions in the West Valley was made, assuming the number of acquisitions in the West Valley would be proportionate to the number of acquisitions in the East Valley. The number of acquisitions in the East Valley is 18 businesses, 149 employees, and 9 residents, and the length of the East Valley alignment is 6.6 miles. Thus, there are 2.73 businesses, 22.58 employees, and 1.36 residents displaced per mile of trackage.

Since the West Valley alignment is approximately 11 miles in length, it can be estimated to displace approximately 30 businesses, 250 employees, and 15 residents along the length of the alignment. It should be emphasized that these estimates are highly approximate and could vary substantially. An additional storage facility and maintenance yard, which would be necessary if the technology implemented is LRT, would be expected to be located on MTA property along Canoga Avenue and Sherman Way and would therefore not require additional acquisitions. Acquisitions would be considered significant prior to mitigation, which would consist of relocation assistance in accordance with state and federal regulations.

6-1.4 Visual and Aesthetic Conditions

a. TSM Enhance Bus Alternative

This alternative would add buses to the roadway network throughout the San Fernando Valley. Bus stops and facilities identified int he *San Fernando Bus Restructuring Study* and described in Section 2-2.2 would be utilized. No parcels would be acquired. Existing land uses patterns would not be altered as a result of this alternative. No significant impacts are foreseen with this alternative.

b. Rail Alternatives

The existing condition of the right-of-way in the West Valley is exposed soil with sparse vegetation. No formal landscape treatment is provided. West of the Sepulveda Station, the alignment would travel in an at-grade configuration to Canoga Avenue. Single-family residential dwellings are located adjacent to much of the alignment and impacts related to views of the rail vehicles from these houses could occur. The alignment also would pass along the northern edge of the Sepulveda Basin, which could result in visual impacts to this open space area as the rail system would add features of an urban infrastructure system to an area perceived as an undeveloped open space. The character of the Reseda commercial district would be compatible with the appearance of the rail system. The greatest potential for significant impacts to occur is in proximity to the grade-separated aerial flyovers that would be provided at major cross streets. Such crossings are probable at Balboa Avenue, Reseda Boulevard, Victory Boulevard/Topham Street, Winnetka Avenue, De Soto Avenue, and Canoga Avenue. These structures have the potential to block key views of the Santa Monica and Santa Susana Mountains, cast shadows on adjacent land uses, and to add visual features that are out of scale or incompatible with the existing visual character of adjacent residential and open space areas.

To the west and south of Canoga Avenue, the alignment would transition to an aerial configuration. The transition section could block views across the right-of-way and result in the addition of visual features that are incompatible with the visual environment of surrounding areas. The aerial guideway would be compatible with the more urbanized character of Warner Center. If additional right-of-way is required to provide space for the guideway along either Owensmouth Avenue or Topanga Canyon Boulevard, landscaped setback areas may be reduced, resulting in the loss of mature trees. The guideway may pass in close proximity to adjacent office or residential uses, potentially causing impacts related to the loss of views. Impacts related to loss of privacy, increased shade, and loss of views may be experienced as the aerial guideway passes behind multi-family dwellings along the north edge of U.S. 101 just east of Valley Circle Boulevard. Key views of the Santa Susana and Santa Monica Mountains may be blocked or altered by the aerial guideway as it crosses Topanga Canyon and Fallbrook Boulevards.

Station areas to be developed in conjunction with this alternative, if an at-grade design is used, would be compatible in scale with the low-density development that is located along much of the alignment. As these stations would be built within the existing right-of-way, it is not expected that mature trees or landscaping would be affected. Impacts could occur if large parking areas are developed that require the conversion of open space or landscaped areas to paved parking lots. Impacts could also occur if parking areas are not appropriately screened from the view of adjacent residential uses. If aerial stations are developed in conjunction with this alternative potential impacts could include increased shade and shadow, loss of privacy to adjacent residential uses, the addition of visual elements that are out of scale and character with the existing visual environment, or alterations of key views.

6-1.5 Noise and Vibration

a. Noise and Vibration Impacts of Enhanced Bus/TSM

Although the Enhanced Bus Alternative could result in substantial increases in bus traffic on some of the major surface routes in the West Valley, the change in total traffic volume would result in only a small change in total noise exposure. As a result, no noise or vibration impacts are projected for the Enhanced Bus Alternative.

b. Noise Impacts of West Valley Rail Alternatives

This alternative would comprise either light rail or dual mode vehicles with a number of at-grade street crossings. As discussed in Chapter 4, the noise emission characteristics of dual mode and light rail vehicles have been assumed to be equivalent. This is a reasonable assumption since the major noise generating mechanism for both technologies is steel wheels rolling on steel rails and the train lengths and number of trains per day would be similar for both technologies.

A preliminary noise and vibration assessment has been performed for an at-grade extension into the West Valley following the former Burbank Branch SP ROW. Alternative 1, the SP Branch Alternative, from the 1989 studies of east/west rail alternatives for the San Fernando Valley, was used as the basis for the preliminary assessment. This alternative starts in Canoga Park at Victory Boulevard and Canoga Avenue. It follows Victory Boulevard east, transitions to Topham Street just east of Winnetka Avenue, is between Oxnard and Topham from Tampa Avenue until east of White Oak Avenue where the alignment swings north to parallel Victory Boulevard until it meets the East Valley extension at the San Diego Freeway. The West Valley rail alternative would include at-grade, shallow trench with berms, and aerial structure track sections.

Much of the SP ROW in the West Valley passes through or near residential areas. As part of the effort to minimize noise impacts, the plan is that at-grade track in residential areas would be shallow trench with berms whenever possible. The primary areas where this type of construction would not be feasible are at-grade street crossings, aerial bridges, and transition sections from aerial structure to at-grade track. The initial plans include at-grade crossings at Mason Avenue, Corbin Avenue, Tampa Avenue, Wilbur Avenue, Lindley Avenue, White Oak Avenue, and Woodley Avenue. All except the Woodley Avenue grade crossing are in residential areas. The conclusion of the noise impact assessment is that, except in the immediate vicinity of grade crossings, all noise impacts can be mitigated through standard noise mitigation measures.

(1) Noise Impacts at Grade Crossings

The preliminary assessment is that the audible warning signals would cause noise impacts at all of the grade crossings except Woodley Avenue. The impact would be substantial and quite difficult to mitigate if it is required by safety standards that, in addition to the automated bells and crossing gates, train horns be sounded prior to all grade crossings. Approaches to mitigating noise impacts at grade crossings are:

1. Eliminate the need for the audible warnings. The most drastic approach is to close the street. This is unlikely to be practical for the affected grade crossings.

2. Eliminate the need for sounding the train horns or reduce the duration of the horn blasts. It is relatively standard practice to require that freight and transit train horns be sounded for 10 to 20 seconds prior to the train entering a grade crossing, even a crossing protected by gates and flashing lights. Recent research by the Federal Railway Administration indicates that for freight train grade crossings, sounding the horns reduces the incidence of grade crossing accidents. Since most accidents at gated grade crossings involve motorists driving around gates, approaches to reducing the noise impact of the horns usually focus on using roadway medians or four quadrant gates that make it very difficult for motorists to go around gates. Another approach that was considered for the Long Beach-Los Angeles Blue Line is to use horns mounted at the grade crossing in place of the train horns. This approach focuses the warning noise at the grade crossing and can substantially reduce the area affected by the horn noise.

3. Minimize the loudness and duration of the warning bells. At many grade crossings the warning bells ring continuously from a time before the gates are lowered until the train has passed and the gates are fully retracted. By stopping the bells after the gates are down and then starting them up again to warn that the gates are going to be lifted, the duration can be cut from 30 to 40 seconds to below 10 seconds. Also, different loudness bells are available. The noise impacts can be minimized by using lower volume bells in relatively quiet residential areas.

4. Sound insulate the residences most affected by the noise. Improving the sound insulation of residences usually requires new or improved windows, weather stripping or new doors, and new or improved air conditioning systems. Improved air conditioning is required since opening windows for ventilation will completely defeat all other sound insulation improvements. Although sound insulation is usually considered a last resort for mitigating rail transit noise impacts, it can be the most cost effective approach for mitigating noise impacts at specific residences.

(2) Noise Impacts from Train Operations

Some noise impacts would also be caused by normal train operations on at-grade and aerial track, although the degree of noise impact would be considerably lower than at-grade crossings and more standard measures could be applied to mitigate the impacts. These impacts are summarized below:

Shallow Trench/Berm Track: The shallow trench and berm configuration would be very effective at controlling noise impact. Noise impact is unlikely except where residences would be less than 50 feet from the tracks, in which case, the impact could be eliminated by a higher berm or a wall along the top of the berm.

At-Grade Track: Noise impacts along at-grade track sections would primarily occur where the tracks would transition from the shallow trench/berm configuration to at-grade several hundred feet before and after grade crossings. The impacts could be minimized by extending the berms, or a combination of berms and walls, to as close to the intersection as possible. The height of the berm/walls and how close the ends can be to intersections will be limited by the need for train operators to see the grade crossing area and for motorists and pedestrians to be able to see the approaching trains.

Retained Fill Track: There are several areas where the transition from shallow trench to aerial structure would occur near a residential area and noise impacts would be likely. It should be possible to mitigate the impacts with sound walls that extend to approximately 8 feet above the top or rail.

Aerial Structure: Aerial structure would be used to cross a number of major surface streets including De Soto Avenue, Winnetka Avenue, Victory Boulevard/Topham Street, Reseda Boulevard, and Balboa Avenue. The initial screening identified potential noise impacts near several of the aerial track segments even though the noise levels in these areas tend to be higher because of the proximity to heavily traveled surface streets. It appears possible to mitigate all of the noise impact near aerial segments of the West Valley extension through use of sound walls along the outside edge of the structure that extend to 4 feet above the top of rail.

c. Vibration Impacts of West Valley Rail Alternatives

The projection procedures for ground-borne vibration and ground-borne noise discussed in Section 4-9 indicate that vibration impacts along standard track sections are unlikely except where there are residences less than 60 feet from at grade track. Because vibration levels near special trackwork can be as much as 10 decibels higher than normal, this distance increases to approximately 120 feet where there would be special trackwork for crossovers, pocket tracks, or turnouts. Based on these preliminary screening distances, it appears that vibration impacts are unlikely except in localized areas. It should be possible to mitigate the impacts through relocating special trackwork so that it is at least 200 feet from sensitive receptors and using ballast mats when there are residential buildings less than 60 feet from the tracks. As discussed in Section 4-9, ballast mats should provide at least a 5 dB attenuation of ground-borne vibration and ground-borne noise levels.

6-1.6 Potential Effects Concerning the Sepulveda Basin

a. Biological Effects

In the Sepulveda Basin, wildlife areas have been established that provide habitat for a variety of species. Habitats include agricultural fields and riparian areas located along basin drainages and wildlife areas. Species occurring within the Sepulveda Basin include desert cottontail, raccoon, stripped skunk, and gopher snakes. In addition, more than 200 species of birds including waterfowl, songbirds, and raptors have been observed within the basin.

Species observed in the vicinity of the SP ROW (now officially MTA ROW) within the Sepulveda Basin during a survey completed on the proposed project include scrub jay, mourning dove, fox squirrel, and western fence lizard. In addition, the southwestern pond turtle could occur within riparian areas in the vicinity of the West Valley portion of the corridor.

Within the Sepulveda Basin, the Los Angeles River supports a disturbed wetland community. Plant species include cattails, mulefat, tree tobacco, and arundo weed. Downstream of the SP ROW, the river supports willows, sycamores, eucalyptus, palms, and ash.

In the remainder of the West Valley, only urban landscaping and non-sensitive animal species are found.

(1) Impacts of the TSM Alternative

No impacts are expected under this alternative.

(2) Impacts of the Rail Alternatives

Construction at the existing crossing of the Los Angeles River would require disturbance of wetland resources. The disturbed wetland community found in the project area is isolated and does not have a high biological value; however, as wetland habitat it may be considered sensitive by the state and federal permitting agencies.

Potential impacts during operation of a West Valley alternative could include an increase in noise levels during operation, lighting effects, and increased surface runoff. Potential impacts would be limited to the vicinity of the Sepulveda Basin.

Construction within the Los Angeles River would require the appropriate Section 404 permit from the U.S. Army Corps of Engineers and a Stream Bed Alteration permit from the California Department of Fish and Game. The actual level of mitigation, if required, would be determined by the state and federal resource agencies during consultations required for permitting. Potential mitigation would include on site restoration.

b. Section 4(f) Issues

(1) Impacts of the TSM Alternative

No impacts are anticipated under this alternative.

(2) Impacts of the Rail Alternatives

All rail alternatives proposed for the West Valley would utilize the SP ROW through the Sepulveda Basin. West of Balboa Boulevard, the SP ROW travels at the edge of the basin just south of the Victory Boulevard Off-Street Bicycle Path. At about Louise Avenue the alignment begins to veer south into the Sepulveda Basin and away from the Victory Boulevard bicycle path.

The alignment crosses the Los Angeles River and leaves the basin at White Oak Avenue. Through the Sepulveda Basin in the West Valley, the SP ROW passes the Tillman Water Treatment Plant, a U.S. Army Installation, Lake Balboa Park, a Naval and Marine Corps Reserve Center, a National Guard facility, the Los Angeles River, the Franklin Field Baseball Complex, and the SCCA Velodrome.

Potential impacts in the Sepulveda Basin are as follows.

- Temporary use under Section 4(f) could result from construction of the two potential stations at Balboa Boulevard and White Oak Avenue. Temporary construction easements on Sepulveda Basin property could be required.

- Constructive use under Section 4(f) is not likely to result from noise impacts caused by project operation. The uses surrounding the alignment through the basin are not noise sensitive and many of them generate high levels of noise themselves.

- Constructive use under Section 4(f) could occur if the reintroduction of rail hinders access within the basin. Mechanisms would have to be devised to ensure that operation of the project does not interfere with passage between recreational areas within the Sepulveda Basin.

Traditional use under Section 4(f) could occur if acquisition of parkland in the Sepulveda Basin is required. The railroad right-of-way west of the Balboa Station and behind the Moss Office Complex is only 30 feet wide. An additional 10 to 20 feet of width would be required in this area and acquisition of Sepulveda Basin parkland may be required to meet this need. If parkland is needed, the MTA would trade some of the land it owns within the Sepulveda Basin for the land it would require adjacent to the right-of-way. In addition, to the west of the Moss Office Complex, the right-of-way has a sharp S-curve that would have to be straightened. This activity could also involve acquisition of parkland and consequently use under Section 4(f).

Consultation with the National Park Service revealed that assistance under Section 6(f) of the Land and Water Conservation Fund Act was provided to acquire land in the Sepulveda Basin; however, the land within the SP ROW was not part of this land. Conflicts under Section 6(f) are possible if parkland acquisitions are required. Refer to Section 4-15 for an overview of requirements under Section 6(f).

6-2 OTHER POTENTIAL IMPACTS

6-2.1 Demographics and Neighborhoods

a. Neighborhoods

Residential neighborhoods adjoin the SP ROW for much of the length through the West Valley study area. West of the San Diego Freeway (I-405), both single-family and multi-family residences line Victory Boulevard on the north until the ROW veers south (just east of Louise Avenue). There are, however, pockets of nonresidential use west of I-405. The residential neighborhoods are separated from the ROW by Victory Boulevard, a bicycle path, and scattered mature trees.

Another residential neighborhood occurs as the ROW begins to parallel Topham Street, east of White Oak Avenue. Single family residences (SFR) line both sides of the ROW. The backyards of SFRs directly abut the ROW to the north, while Topham Street separates SFRs from the ROW to the south. This pattern continues until Winnetka Avenue; however, around Reseda Boulevard nonresidential uses are prominent. East of Wilbur Avenue, the ROW is very wide, and fairly dense vegetation and fencing separate residential backyards from the ROW. West of Wilbur Avenue, the ROW narrows somewhat, and backyards are closer to the existing railroad tracks.

West of Winnetka Avenue, residential neighborhoods abut the ROW to the north. West of De Soto Avenue residential neighborhoods give way to a predominantly commercial land use pattern. Multi-family residential (MFR) uses appear again on Topanga Canyon Boulevard south of Topanga Canyon Place. These residences are all secured condominium complexes highly insulated from Topanga Canyon Boulevard.

Residential uses lining the proposed corridor begin again on the north side of Valle Street west of Shoup Avenue and continue until about Fallbrook Avenue. These residences, both SFR and MFR, are sandwiched between Ventura Boulevard and the landscaped Ventura Freeway right-of-way.

b. Demographics

Tables 6-5 through 6-7 portray population, housing, and employment; transit dependency; and environmental justice variables, respectively, within the West Valley study area[1] and within the East-West Transportation Corridor[2] as a whole. Table 6-8 shows the percentage change in population, housing, and employment between 1990 and 2015, the project's horizon year.

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[1]The West Valley study area encompasses the length of the alignment beginning west of the Sepulveda Basin to Valley Circle Boulevard and the width of two census tracts on either side of the alignment.

[2]The East-West Transportation Corridor encompasses the entire length of the alignment from Lankershim Boulevard to Valley Circle Boulevard and the width of two census tracts on either side of the alignment.

Table 6-5: Population, Housing, and Employment Characteristics, 1990

Locale	Population	Housing Units	Housing Vacancy Rate	Percent SFRs	Percent Who Own Home	Employment[1]
Los Angeles County	8,863,164	3,163,343	5.49%	50.2%	50.4%	4,203,792
West Valley Study Area	190,535	78,341	5.97%	46.8%	52.0%	106,339
East-West Transportation Corridor	345,867	145,679	6.30%	39.8%	43.7%	190,054

Note: [1] Employment data are from SCAG and represent employees working within the census tracts of the locale and not employees living within the census tract who are employed.

Source: MFA, 1997; U.S. Census Data, 1990, SCAG, 1994.

Table 6-6: Transit Dependency Characteristics, 1990

Locale	Percent of the Population Under Age 16 & Over Age 64	Percent of Households without Private Transportation	Percent of Households Below the Poverty Level
Los Angeles County	33.2%	11.1%	11.2%
West Valley Study Area	30.1%	7.1%	7.6%
East-West Transportation Corridor	30.1%	7.9%	8.7%

Source: MFA, 1997; U.S. Census Data, 1990, SCAG, 1994.

Table 6-7: Environmental Justice Variables, 1990

Locale	Median Household Income	Percent Foreign Born	Percent Racial/Ethnic Groups				
			White	Hispanic	Black	Asian	Other
Los Angeles County	$34,965	32.7%	41.0%	37.3%	10.7%	10.4%	0.6%
West Valley Study Area	$40,098	46.1%	65.9%	23.6%	2.7%	7.4%	0.5%
East-West Transportation Corridor	$34,746	48.9%	61.5%	28.0%	3.6%	6.4%	0.5%

Source: MFA, 1997; U.S. Census Data, 1990, SCAG, 1994.

Table 6-8: Percentage Change in Population, Housing, and Employment Characteristics, 1990 to 2015[1]

Locale	% Change in Population	% Change in Occupied Housing Units	% Change in Employment
West Valley Study Area	44.3%	38.4%	35.0%
East-West Transportation Corridor	28.2%	24.0%	23.5%

Note: [1] 1990 and 2015 data obtained from SCAG population, housing, and employment projections (generated May 1994).

Source: MFA, 1997; SCAG, 1994.

c. *Environmental Consequences*

(1) Enhanced Bus (TSM) Alternative

This alternative would provide enhanced bus service throughout the San Fernando Valley. Additional buses would be confined to well-traveled city streets, and no effects on residential neighborhoods are predicted.

(2) Rail Alternatives

Neighborhood impacts would not likely be significant over the stretch from Woodley Avenue to Warner Center because the alignment would be predominantly at-grade and would remain within the SP ROW. Neighborhood character would not be affected because both alternatives would utilize the former SP rail corridor and would not affect the physical arrangement of the adjoining neighborhoods. Along this stretch, neighborhood security would also not likely be affected. Furthermore, where the ROW passes residential neighborhoods, it also parallels major streets, and thus adjoining neighborhoods are already highly visible. Both alternatives would be at-grade and would not offer any new views into the adjoining neighborhoods. Because both alternatives would utilize the former SP rail corridor, neighborhood access would not be affected; however, any existing informal recreational or pedestrian usage of the ROW could be eliminated.

West of De Soto Avenue the alignment would assume an aerial profile and would require some right-of-way acquisitions. Along this segment, residential uses are not as prominent as elsewhere along the corridor. Residential uses abut the alignment along Topanga Canyon Boulevard and along the Ventura Freeway west of Shoup Avenue. Due to the insulated nature of the residential complexes along Topanga Canyon Boulevard, neighborhood impacts along this street would not likely occur despite the fact that the alignment would be aerial. The residences that lie between the proposed alignment and Ventura Boulevard would be separated from the alignment by Valle Street. Neighborhood impacts along this segment are possible primarily because Valle Street is a residential, low-volume street buffered from the Ventura Freeway by extensive landscaping and from Ventura Boulevard traffic by high-rise residential and commercial buildings. The alignment would expose this residential neighborhood to people who live outside of it and could be potentially perceived to compromise the neighborhood's sense of security. Neighborhood character would not likely be affected by the introduction of a rail alignment because the scale of the neighborhood is already varied: Valle Street contains residential buildings of different sizes, a steep slope up to the freeway, and large street and freeway trees. Neighborhood access would also not be affected by the two rail alternatives.

6-2.2 Community Facilities and Services

a. *Impacts of the TSM Alternative*

No adverse effects are anticipated for police and fire protection, schools or libraries, religious institutions, health care facilities, or parks and recreational facilities.

b. *Impacts of the Rail Alternatives*

(1) Police and Fire Protection Services

No police or fire stations are adjacent to the proposed Cross Valley alternatives west of I-405, and therefore no station would be adversely affected by the project.

A traffic study to determine the proposed alignment's impact upon congestion will be conducted at a later stage of the project design. It is likely that the West Valley portion would have an effect on traffic similar to that of the East Valley portion.

(2) Schools and Libraries

The proposed alternatives would not result in increased student enrollment in the vicinity of the project, since they would not increase the residential population. Thus, school student capacities would be unaffected by the project. However, other impacts may occur due to the project's proximity to individual schools along the proposed routes. Potential noise impacts could occur at schools located adjacent to at-grade or aerial segments. Student safety could be a concern at schools located adjacent to at-grade segments but would not be a concern adjacent to aerial segments due to the grade separation.

The schools adjacent to the proposed West Valley alignment are Birmingham High School and Pierce College. The project is not likely to have noise or vibration impacts on this facility because the school buildings are far from the northern edge of the school property where the alignment is located. Access to and from the campus would likely improve due to implementation of the proposed rail alternatives.

There are no libraries located adjacent to the proposed alignment, and so libraries would not be affected by the project.

(3) Religious Institutions

The proposed West Valley alignment is located adjacent to one church, Saint John's Lutheran Church, located at 6220 Corbin Avenue, Tarzana. The impacts to this church would depend upon the final profile selected; potential noise and/or access impacts could occur.

(4) Health Care Facilities

The proposed alignment would not be adjacent to a hospital or health care facility and therefore the rail alternatives are not expected to result in an adverse impact.

(5) Parks and Recreational Facilities

The proposed West Valley alignment is adjacent to one park, Warner Park, which is located on the southeast corner of Topanga Canyon Boulevard and Califa Street, in Warner Center. The impacts to this park would depend upon the final profile selected. Little League ball fields at Winnetka station may need to be relocated and rebuilt. In addition, potential impacts could include noise, access impairment, and safety.

6-2.3 Fiscal and Economic Conditions

a. Employment and Economic Activity

The local community directly affected by the project would be the San Fernando Valley in the city of Los Angeles. In addition to serving the East Valley activity centers mentioned in Section 4-2 for the East Valley Corridor, the West Valley Corridor would serve Pierce College and the West Valley Adult Occupational Center.

The West Valley Corridor would also serve Warner Center, which is bounded by Vanowen Avenue, the Ventura Freeway, De Soto Avenue, and Topanga Canyon Boulevard. Warner Center is the designated urban retail/office center in the Canoga Park-Winnetka-Woodland Hills area and one of four urban centers in the San Fernando Valley. Warner Center has become a major corporate base in southern California serving as the company headquarters for major companies. Warner Center is represented by businesses in a wide array of industries and includes Topanga Plaza and the Promenade Mall. Woodland Hills has become one of the leading financial communities and Canoga Park has become one of the top retail trade communities in the San Fernando Valley due to Warner Center.[3] In 1993 the Los Angeles City Council approved the Warner Center Specific Plan which establishes provisions for new commercial and office development in Warner Center.

[3] *Warner Center Specific Plan Draft Environmental Impact Report*, prepared for the Los Angeles City Planning Department, August 1991.

As Cross Valley strategies, the West Valley Corridor would serve a larger area of the Valley than the East Valley Corridor and would link both the East and West Valleys with the greater Los Angeles area and the region via connections to the North Hollywood station and Union Station.

See Table 6-9 for existing and anticipated future employment in the West Valley corridor.

Table 6-9: Employment in the SCAG Region, 1990-2015

Jurisdiction	1990	2015	1990-2015 Change	
			Absolute	%
SCAG Region	6,838,904	9,804,890	2,965,986	43%
County of Los Angeles	4,612,821	5,911,920	1,299,099	28%
City of Los Angeles	1,902,065	2,165,778	263,713	14%
West Valley Corridor Census Tracts	106,339	143,558	37,219	35%

Note: Estimates do not include the desert areas of Riverside, San Bernardino, and Imperial counties. Estimates are from SCAG computer model assumptions of May 1994. In June 1996, SCAG revised these estimates downward to account for the slow economic recovery. However, the May 1994 estimates are used instead to be consistent with the traffic analysis which used the May 1994 estimates.

Source: SCAG, May 1994.

b. Impacts of the TSM Alternative on Fiscal & Economic Conditions

No impacts are expected under this alternative.

c. Impacts of the Rail Alternatives on Fiscal & Economic Conditions

(1) Employment Loss

As stated above, property acquisitions have not yet been determined for the West Valley Corridor. However, it is anticipated that few properties would be acquired because the alignment would follow the former SP rail corridor in an at-grade configuration from the Hollywood Freeway to Canoga Avenue and would not affect the physical arrangement of properties adjacent to the rail corridor. Thus, it is not likely that the alternatives would displace a substantial number of businesses and jobs in the West Valley.

Although displacement would be potentially significant to individual businesses, it would not have a significant impact on the overall local and regional business climate because the numbers of businesses to be displaced would be relatively small in comparison to the total jobs in the local area and regionwide. Thus, any job losses would have no significant impact on the local or regional economy. Like the East Valley Corridor rail alternatives, the West Valley Corridor rail alternatives would likely have beneficial economic effects because they would increase access to businesses in the Valley.

(2) Employment Generated by Operation Expenditures

It is estimated that the rail alternatives would generate approximately 210 direct, on-site jobs; 30 direct, off-site jobs; and 330 indirect jobs for a total of 570 annual FTE jobs.

Like the East Valley corridor alternatives, it is anticipated that these jobs would benefit the local and regional economy. Thus, the annual operation and maintenance expenditures of the rail alternatives would have a beneficial impact on the regional and local job supply.

(3) Property Tax Revenue Losses

It is not anticipated that a large number of properties would be acquired for the rail alternatives. The alternatives would likely have no significant impact on local property tax revenues.

(4) Joint Development

The potential for joint development in the West Valley Corridor could be explored by the MTA and local jurisdictions. Specific joint development actions are undefined at this time for the West Valley Corridor. It is expected that joint development, if it occurs, would result in beneficial economic effects that would include revenues from sales taxes and business license fees.

6-2.4 Air Quality

Traffic data for regional statistical areas (RSA) 12 and 13 were used to evaluate the emissions of vehicular pollutants within the San Fernando Valley subregion. Traffic data for the Cross Valley alternatives were compared to the No Project alternative. Similar to the East Valley alternatives, the Cross Valley alternatives would result in improvements to subregional vehicle miles traveled (VMT), travel speeds within the subregion and vehicle hours traveled (VHT). VMT would be reduced by a greater proportion than would be experienced under the East Valley options. Improvements of travel speed and travel time under this alternative would be approximately three to seven times greater than under the East Valley options, for both categories. A reduction in automobile VMT in addition to an increase in travel speeds resulting from operation of the TSM and rail alternatives would result in a lower subregional air-related pollutant burden.

Table 6-10 illustrates the differences in regional emissions between the No Project and Cross Valley alternatives for the year 2015. Compared to the No Project alternative, the Cross Valley alternatives would result in a reduction of pollutants emitted within the subregion. As shown in this table, the reductions in emissions from the Cross Valley alternatives would range from 165 to 20,698 pounds per day. When viewed from the perspective of the SCAQMD daily emissions incremental change thresholds, the reductions achieved by the Cross Valley alternatives would be considered beneficial and regionally significant.

Table 6-10: Daily Emissions of Cross Valley Alternatives (Pounds/Day)

Pollutant	No Project	Reduction in Emissions Compared to No Project (Pounds/Day)				
		Enhanced Bus	Red Line SP + West Valley TSM	Red Line Oxnard + West Valley TSM	Light Rail	Dual Mode
Reactive Organic Gas	18,743	69	1,878	1,736	1,732	1,878
Carbon Monoxide	220,821	815	22,370	20,698	20,645	22,370
Nitrogen Oxide	176,305	651	9,899	8,497	8,475	9,899
Sulfur Oxide	4,686	17	188	150	150	188
Particulate Matter	4,100	15	165	132	132	165
VMT	26,592,190	26,494,011	25,523,066	25,738,187	25,803,710	25,523,066

Note: /a/ Total reduction of pollutant emissions (pounds per day)
Numbers in parentheses = Daily VMT
Emissions factors calculated using the EMFAC7F model run for the year 2015.

Source: Terry A. Hayes Associates, 1997.

6-2.5 Geotechnical Considerations

a. TSM Alternative

There would be no impacts expected under this alternative.

b. Rail Alternatives

The Cross Valley rail alternatives would be a combination of at-grade and aerial segments.

There is a potential for liquefaction, seismic settlement, and compressible soils to have a significant impact in the vicinity of aerial guideway structures and the at-grade portions of the proposed alternatives. Mitigation would be achieved in the design phase of the project, and potential impacts can be reduced to a level of nonsignificance with proper engineering design and conformance with current building codes.

Limited impacts with regard to hazardous waste from operational activities along the proposed Cross Valley alternatives are anticipated. Proper engineering design and construction would mitigate the potential for public exposure to contaminated soil and/or groundwater and would prevent the accumulation of gases along the deep bore and cut/cover segments of the proposed alignments or at cut/cover stations to a level of nonsignificance. Therefore, the potential for public exposure to contaminated soil and/or groundwater, or the potential for public exposure to the accumulation of gases along the proposed alignment for the Cross Valley alternative is not anticipated to be significant.

6-2.6 Water Resources

Surface water resources located in the vicinity of the West Valley alternatives include the Los Angeles River, Bull Creek, Browns Canyon Wash, and Aliso Wash.

The West Valley alternatives are located within the lowland basin of the San Fernando Valley which is part of the Upper Los Angeles River Area (ULARA). The ULARA encompasses all of the watershed of the Los Angeles River and its tributaries above the Arroyo Seco. There are four groundwater basins located in the ULARA: San Fernando, Sylmar, Verdugo, and Eagle Rock basins. The San Fernando Basin is the largest of the four. The West Valley alternatives are located entirely within the San Fernando Basin. Beneficial uses of groundwater in the San Fernando Basin include municipal water supply and agriculture.

Groundwater depths are generally shallow along the West Valley alternatives (as shallow as approximately 5 feet below ground surface), although there are portions with groundwater greater than 100 feet below ground surface in the vicinity of the Sepulveda Basin. Groundwater flow in the western San Fernando Valley is generally eastward. Local flow patterns are influenced by groundwater extraction for water supply.

The USACOE *Los Angeles County Drainage Area Review* study did not identified areas of potential flooding in the vicinity of the West Valley alternatives. It should be noted that the Sepulveda Basin is an area of potential flooding and is designed to control floodwaters.

a. Impacts of the TSM Alternative on Water Resources

No impacts are expected under this alternative.

b. Impacts of the Rail Alternatives on Water Resources

(1) Surface Water Resources

The introduction of new impervious surfaces resulting from facility (parking lots, access roads) paving and construction would increase runoff and associated contaminants, potentially resulting in degradation of downstream water quality. However, water quality impacts associated with operation of a West Valley alternative would be minor given that the watershed within the San Fernando Valley is primarily urban, and the amount of impervious materials and additional runoff would be small in comparison to existing totals. The parking lots proposed at the station sites would likely be constructed on developed or paved surfaces, already having a high runoff coefficient.

(2) Groundwater

Since groundwater depths in the vicinity of the West Valley alignments are relatively shallow, they could affect construction of a West Valley alternative. Once constructed, the West Valley alternative would be separated from the water table and would have no significant effects on groundwater resources or beneficial uses of groundwater in the San Fernando Basin.

It is recommended that additional piezometers be installed and monitored prior to during final design of the chosen West Valley alternative to better establish groundwater conditions along the chosen alignment. See Section 5-12 for a discussion of dewatering measures that may be used should shallow groundwater be encountered.

(3) Floodplains

The potential for flooding would be a potential concern along the portions of the SP ROW that cross the floodplains identified above. However, given that only small areas of potential shallow flooding would be crossed, floodplain impacts are not anticipated to significantly affect the operation of a West Valley alternative. Upon the selection of an alternative, more detailed coordination with the USACOE and the Los Angeles County Department of Public Works will be completed to establish flood design parameters for final design of a West Valley alternative.

6-2.7 Safety and Security

a. TSM Alternative

Safety and security measures are already in place to serve current bus transit operations and related pedestrian activities near existing bus stops in the San Fernando Valley. Existing safety and security measures include transit police surveillance, non-uniformed police inspectors on transit buses and at major transfer nodes, and an emergency radio system to ensure quick response to emergencies.

b. Rail Alternatives

The proposed alternatives for rail transit service in the West San Fernando Valley would carry with them the potential for safety and/or security incidents along the alignment and near and within the rail stations. Such incidents would potentially occur within rail stations, at station entrances, and at park-and-ride lots and amenities located at street level. Of particular concern would be the safety and security of passengers on board the trains.

Private auto travel is inherently a more accident-prone mode of travel than public transit. By reducing the level of auto traffic in the corridor, the rail transit alternatives would be expected to have an overall beneficial effect on accident rates and resulting injuries. The one area in which the potential for accidents may increase would be at at-grade rail crossings of streets with the light rail alternatives, which would increase the number of vehicular traffic-train conflicts. There are state and federal standards for grade crossing warning devices. Local agencies are not permitted to deviate from their minimums, unless a specific order is issued by the governing agency. Any new grade crossings would be signalized. With appropriate measures, this potential accident risk can be reduced to below the level of significance.

Delays to cross traffic at grade crossings could potentially adversely affect emergency services delivery. The impact is not expected to be significant, however. Unlike freight trains, which can block a crossing for an extended period of time, the projected interruption of arterial cross traffic due to passing light rail trains is similar to that caused by a traffic signal. Transit rail trains are not nearly as long as freight trains, so that alternate crossings will be available at relatively short distance, even where an emergency vehicle encounters an light rail train. Finally, there are emergency services on both sides of the light rail alignments.

6-2.8 Cultural Resources and Section 106 Compliance

If the Cross Valley project becomes a federal undertaking, it will become subject to compliance with the National Historic Preservation Act (*16 U.S.C. 470*) and, if discretionary approval is required from a state or local agency, CEQA (*PRC §21084.1)*. Consequently, when environmental analysis of the Cross Valley alternatives is undertaken, historic properties will be identified with a similar level of effort as that described in Sections 4-14 and 5-15.

a. *Previously Identified Historic Properties*

Known historic properties near the proposed Cross Valley routes include:

Sepulveda Dam, Burbank Boulevard and I-405, Van Nuys
This Streamline Moderne style Earth Fill Dam was designed and constructed by the Army Corps of Engineers in 1941. Based on Caltrans correspondence (8/2/1984), it appears eligible for the National Register of Historic Places (National Register) and therefore also the California Register of Historical Resources (California Register).

Old Trapper's Lodge/Boot Hill, 6201 Winnetka Boulevard, Woodland Hills
This collection of folk art and statuary was constructed by John Ehn from 1951 to 1981 and moved to this location in the late 1980s. It is California Historical Landmark #939 and is on the California Register of Historical Resources.

Television and Motion Picture Fund Retirement Home, 23388 Mulholland Highway, Woodland Hills
Architect William Pereira designed this Contemporary style retirement complex, which was constructed beginning in 1942. Pending further research, it appears eligible for the National and California Register.

Sagebrush Cantina, 23527 Calabasas Road, Calabasas
Built in 1900, its relatively early age and representation of the old Calabasas commercial district warrants its consideration for the National and California Registers.

Leonis Adobe and Plummer House, 23537 Calabasas Road, Calabasas
Constructed in 1844, the Miguel Leonis Adobe was listed in the National Register on May 29, 1975 and is City of Los Angeles Historic-Cultural Monument #1. The Eugene Plummer House (1878) was the oldest house in Hollywood until it was moved to this location; it is California Historical Landmark #160.

Given the historical age of resources in some areas, and the route's use as an early road and stagecoach route, there is also a likelihood of encountering unknown archaeological resources.

b. Impacts

The *Criteria of Effect* (*36 CFR §800.9*) described in detail in Section 4-14.2, would be applied to each historic property located within the Area of Potential Effects, including but not limited to those listed above. If an adverse effect is anticipated on any historic property, then appropriate mitigation measures would be developed in consultation with the State Historic Preservation Officer and Advisory Council of Historic Preservation.

(1) TSM/Enhanced Bus

This alternative would add buses to the existing roadway network and would not require any property acquisition or require development of new bus or transit related facilities. Consequently, this alternative does not have the potential to affect cultural resources.

(2) Rail Alternatives

The portions of these alternatives that would be constructed at-grade within the SP ROW are unlikely to affect cultural resources. The *Criteria of Effect* would be applied to aerial portions of these alternatives in cases where visual or noise effects may be introduced near a historic property. Unknown archaeological resources may be affected where these alternatives require new ground disturbance or sub-surface construction. Any adverse effects on historic properties would be taken into account in accordance with Section 106 of the Historic Preservation Act (*16 U.S.C. 470[w]*) and its guidelines.

CHAPTER 7

EVALUATION

CHAPTER 7: EVALUATION

7-1 EVALUATION FRAMEWORK

The evaluation of alternatives for the San Fernando Valley East-West Transportation Corridor is based on a combination of local goals and objectives, and those used by the Federal Transit Administration (FTA). The first section of this chapter reviews the goals and objectives, and defines evaluation measures based on those objectives. The remainder of the chapter evaluates how well each objective satisfies the goals. The chapter is organized in subjects which correspond to the six major goals established for the SFV Corridor.

At the end of each section, the evaluation is summarized by means of performance ratings assigned to the alternatives. The calculated values (for the quantifiable measures) or the assessed values (for the unquantifiable measures)are ranked in one of four categories, from A (best) to D (worst). When dealing with quantifiable measures, the values for each alternative are placed in ranges corresponding to the four ratings. This means that small differences between alternatives do not show up in the ratings. This is reasonable, since the margins of error in many of the calculations may be larger than the differences in the values calculated for the alternatives.

This evaluation procedure follows what is referred to as the Multiple Measure Method, which is consistent with FTA's current guidelines for evaluating major projects. No attempt will be made to provide an overall ranking or single index combining all measures. The community and its decision-makers can apply their own values in weighing the importance of the various measures and selecting a locally-preferred investment strategy.

7-1.1 Corridor Goals & Objectives

The goals and objectives for the San Fernando Valley East-West Transportation Corridor have been defined in earlier phases of the study. The following six goals, with supporting objectives, are taken from the May 1996 *Major Investment Study: Alternatives Screening Report:*

1.Improve east-west mobility in the San Fernando Valley, i.e., the primary goal of the proposed transit project is to improve mobility in the east-west corridor within the San Fernando Valley.

- Provide an alternative to the congested Ventura Freeway corridor.
- Provide convenient access to the regional transit system.
- Minimize total travel time.
- Provide bi-directional transit service.
- Provide opportunities to intercept through traffic passing through the Valley.

2. *Support land use and development goals*, i.e., provide a transit project that complements the City of Los Angeles plans for:
- High capacity transit linkages between centers (Universal City Entertainment/Tourism Center, Van Nuys Government Center, Warner Business Center).
- Transit supportive land use policy.
- General Plan Framework Plan goals for increased transit mode split and concentration of growth in Targeted Growth Areas.
- Warner Center Specific Plan transit access enhancements.
- Joint development opportunities.
- Accessibility to governmental facilities in the Van Nuys Government Center.

3. *Achieve local consensus, i.e., the project will be identified in a manner that is responsive to community and policy makers.*
- Incorporate the citizen and policy maker input from previous studies in the San Fernando Valley.
- Provide opportunities for community input to the MIS process.
- Build community and political support through effective communication and integration with local and regional plans.

4. *Provide a transportation project which is compatible with and enhances the physical environment where possible.*
- Identify an alternative that minimizes adverse effects on the environment.
- Avoid impacts on park lands.
- Minimize noise impacts.
- Minimize impacts on cultural resources.
- Minimize air pollution.

5. *Provide a transportation project that minimizes impacts on the community.*
- Minimize business and residential dislocations, community disruption and property damage.
- Avoid creating physical barriers, destroying neighborhood cohesiveness or in other ways lessening the quality of the human environment.
- Minimize traffic and parking impacts.
- Minimize impacts during construction.

6. *Provide a transportation project that is cost effective and within the ability of MTA to fund, including capital and operating costs.*
- Identify cost saving measures through value engineering to reduce project costs.
- Maximize the benefits associated with use of right of way already purchased by the MTA.
- Ensure fiscal consistency with the MTA Long Range Plan.

7-1.2 FTA Evaluation Measures

The measures used for evaluating alternatives in the San Fernando Valley MIS are also based on Federal Transit Administration (FTA) guidelines for assessing major investments.[1]

Enactment of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and Executive Order 12893 (1994) have altered the criteria which the federal government uses to make discretionary grants for major transit capital investment projects. The original requirement that a project be "cost-effective" has been expanded; projects now must be justified, based on a comprehensive review of mobility improvements, environmental benefits, cost-effectiveness, operating efficiencies and other considerations.

FTA plans to base its findings of project justification on a range of different measures which account both for the assessment objectives mandated by ISTEA and the primary impacts of project alternatives. FTA will use the evaluation information to make funding decisions among candidate projects by weighing how well each project does on the overall array of criteria, essentially grouping projects with similar merit.

FTA does not suggest that the local project evaluation (to determine the locally-preferred alternative) must be based entirely on the recommended performance measures, or that the federal government must limit its consideration of candidate projects to those same performance measures. Therefore the evaluation will include measures based on the locally-defined goals and objectives discussed above, as well as FTA's recommended measures.

Evaluation Measures

Within five evaluation categories specified by the FTA, nine separate evaluation measures from FTA's guidelines will be used to evaluate the San Fernando Valley East-West alternatives. The five categories coincide closely with five of the six major local goals (the sixth local goal being local consensus).

1) Cost-Effectiveness

- Total incremental costs per incremental transit passenger-trip (new rider). (Section 7-7.3)

2) Mobility Improvements

- Value of annual travel time savings. This includes the travel time savings (or increases) for people using competitive modes, as well as travel time savings (or increases) to transit riders. (Section 7-2.3)

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[1] *Revised Measures for Assessing Major Investments: A Discussion Draft,* U.S. Department of Transportation, Federal Transit Administration, September 1994.

- Incremental number of zero-car households located within ½ mile of boarding points. (Section 7-2.4)

3) Operating Efficiencies

- Change in operating cost per revenue vehicle-hour (or mile). (Section 7-7.1)
- Change in passengers per revenue vehicle-hour (or mile). (Section 7-7.1)
- Change in passenger miles per revenue vehicle-hour (or mile). (Section 7-7.1)

This report uses the values per vehicle-mile, expressed for the region.

4) Environmental Benefits

- Change in criteria pollutant emissions and greenhouse gas emissions. (Section 4-7)
- Change in fuel consumption. (Section 4-8)

This report focuses on change in pollutant emissions and change in energy consumption.

5) Transit-Supportive Existing Land Use Policies and Future Patterns

- Degree to which local land use policies and the development market foster transit-supportive land use. (Section 4-1)

This criterion is addressed with a qualitative assessment of the degree to which local land use policies support the proposed transit investment as well as local commitment to the policies.

7-1.3 Alternatives Evaluated

The nine alternatives that are being evaluated in this chapter are summarized in Table 7-1 below. For detailed descriptions of the alternatives, please refer to Chapter 2.

Throughout this chapter, reference to "rail alternatives" is defined as those alternatives involving new rail construction, i.e., all except the No Project and TSM Alternatives.

Red Line Alternatives 1a, 1b, 1c, and 1d differ only in type of construction (vertical profile). For most measures used in this chapter, variations in vertical profile do not affect calculations since ridership and operational factors are the same. In these cases, results are reported as a group under Alternative 1.

Table 7-1: Summary of Alternatives Evaluated			
Alternative		West Valley	East Valley
NP	No Project	Status Quo Bus	Status Quo Bus
TSM	TSM	Enhanced Bus	Enhanced Bus
1a	Red Line Extension - SP	Enhanced Bus	Deep bore tunnel, SP ROW
1b	Red Line Extension - SP	Enhanced Bus	Cut & cover subway, SP ROW
1c	Red Line Extension - SP	Enhanced Bus	Open air subway, SP ROW
1d	Red Line Extension - SP	Enhanced Bus	Aerial structure, SP ROW
2	Red Line Extension - Oxnard St.	Enhanced Bus	Oxnard St. - deep bore tunnel
6a*	Light Rail - SP	Light Rail at-grade	Light Rail at-grade via SP ROW
11a*	Red Line / Dual Mode	Enhanced Bus	Red Line at-grade via SP ROW
* Representative of Alternatives 6 and 11. See text below.			

Source: Source: Manuel Padron & Associates, 1997.

While Alternatives 6 and 11 both have two versions (Alternative 6a and 6b, and Alternative 11a and 11b), the evaluation in this chapter focuses on Alternatives 6a and 11a as the representative version for each. This approach is used to help simplify the range of data being presented. The "b" version of both of these alternatives is virtually identical to the "a" version, except the two mile segment along Chandler Boulevard is in cut-and-cover subway instead of at-grade. Therefore, it can be expected that Alternatives 6b and 11b would be somewhat more costly and therefore slightly less cost-effective than their 6a and 11a counterparts.

Measures that deal with physical impacts, and composite factors such as cost-effectiveness, which consider capital costs in combination with ridership, are reported for all nine alternatives.

7-2 MOBILITY

The first goal established for the corridor is to "improve east-west mobility in the San Fernando Valley." The specific supporting objectives for this goal are:

- Provide convenient access to the regional transit system.
- Minimize total travel time.
- Provide bi-directional transit service.
- Provide opportunities to intercept through traffic passing through the Valley.

FTA evaluation measures related to mobility include value of annual travel time savings, and incremental number of zero-car households located within a half mile of boarding points.

Based on the above, the following measures will be applied to each of the alternatives:

- Ridership (indicates degree of success in providing alternative to Ventura Freeway corridor and in providing opportunities to intercept through traffic passing through the Valley)
- Travel time savings (measurement of minimized total travel time; FTA evaluation measure)
- Transit travel times (measures effect of providing convenient access to regional transit system and provision of bi-directional transit service)
- Traffic impacts (relates to minimizing total travel time)
- Effect on zero-car households (FTA evaluation measure)

7-2.1 Ridership

New ridership is a good measure for evaluating how well the alternatives achieve objectives such as providing an alternative to the Ventura Freeway and intercepting through traffic in the Valley, since it estimates how many people will switch to the transit mode. Ridership has been estimated for each alternative through the MTA's travel simulation model. The projected ridership for the alternatives is discussed in detail in Section 3.1. The results are summarized here and shown in Table 7-2 below. The linked trips[2] for each of the rail alternatives are compared to those for the TSM Alternative to determine the number of "new" transit trips, i.e., those attracted to transit from the automobile.

Table 7-2: 2015 Transit Ridership (Linked Trips)

Alternative >	No-Project	TSM	1	2	6	11
Daily linked transit trips	1,028,629	1,042,210	1,058,819	1,061,190	1,046,430	1,058,819
New daily linked trips	base	13,581	30,190	32,561	17,801	30,190
New trips compared to TSM	NA	base	16,609	18,980	4,220	16,609

Note: The increment compared to the TSM Alternative is used in calculating FTA's cost-effectiveness index.

Source: Manuel Padron & Associates, 1997.

[2] A linked trip is a complete trip from origin to destination, regardless of the number of boardings or transfers.

The TSM Alternative would divert about 13,500 daily trips from auto to transit. The Red Line to I-405 via SP (Alternatives 1 and 11) would attract about 30,200 new daily riders, while Alternative 2 (Red Line via Oxnard) performs slightly better, with nearly 32,500 new riders compared to No Project. Alternative 6 would divert about 17,800 auto trips.

In the calculation of cost-effectiveness (see Section 7-7.3), the "new rider" figure defined by FTA for the rail alternatives is calculated in comparison to the TSM Alternative. The Red Line to I-405 via SP (Alternatives 1 and 11) would attract about 16,600 more new daily riders than the TSM, while Alternative 2 (Red Line via Oxnard) performs slightly better, with nearly 19,000 new riders. Alternative 6 (LRT) does not perform as well, with 4,200 new riders.

7-2.2 Sample Travel Times

The rail alternatives provide east-west rail service in part or all of the corridor. The alternatives differ in the mode, alignment, and length of rail service. Figure 7-1 displays travel times for each alternative for some typical trips along the corridor. Table 7-3 gives additional information about the path used for each trip. The sample trips are:

1. From Warner Center to North Hollywood.
2. From Warner Center to downtown Los Angeles.
3. From Van Nuys to Hollywood.
4. From Downtown Los Angeles to Van Nuys.

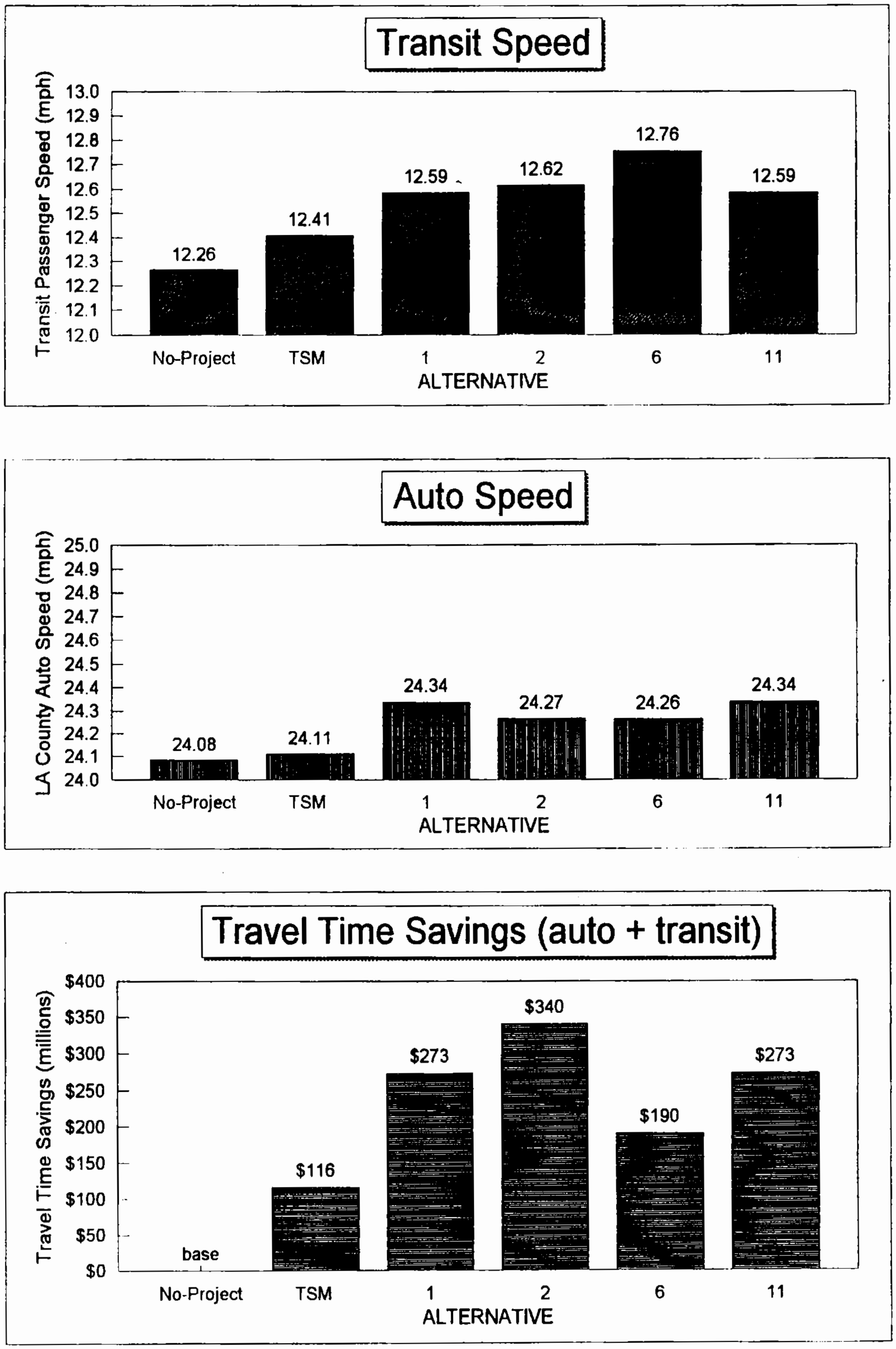
The rail alternatives provide significantly faster times than these for the No Project and TSM Alternatives for most of the sample trips.

For the trips from Warner Center, the fastest times are provided by the Light Rail Alternative (#6), which directly serves both the East and West Valley. Alternatives 1, 2, and 11 are slower since they require a transfer between bus and rail at the Sepulveda station.

For the trips to and from Van Nuys, the times via all of the rail alternatives are in the same range, with Alternative 6 (light rail) being a few minutes slower due to the extra transfer between the Red Line and the LRT at North Hollywood.

7-2.3 Travel Time Savings

The San Fernando Valley East-West Corridor alternatives will affect travel times for both the transit and highway systems. Since the rail alternatives offer faster travel times by transit in the corridor, some auto trips are diverted from highway to transit. This in turn decreases highway volumes and increases highway speeds, thus reducing travel times for many highway users as well. This section analyzes the net changes in travel times in 2015, and assigns a monetary value to those savings. The key results are provided in Table 7-4 and illustrated on Figure 7-1.



SOURCE: Manuel Padron & Associates, 1997.

Table 7-3: Sample Travel Times								
Origin >	**Warner Center**		**Warner Center**		**Van Nuys**		**Downtown L.A.**	
Destination >	**North Hollywood**		**Downtown L.A.**		**Hollywood**		**Van Nuys**	
Alternative	**Time**	**Via**	**Time**	**Via**	**Time**	**Via**	**Time**	**Via**
No Project	50	Bus #364*	59	#527* to UC > Red	28	#364 to NH > Red	52	Red Line to NH > #364
TSM	50	Bus #364*	59	#527* to UC > Red	28	#364 to NH > Red	49	Red Line to NH > #364
1 Red - SP	35	#527* to Sep. > Red	61	#527* to Sep. > Red	16	Red Line	34	Red Line
2 Red - OX	34	#527* to Sep. > Red	60	#527* to Sep. > Red	15	Red Line	33	Red Line
6 LRT	25	LRT	53	LRT to NH > Red	18	LRT to NH > Red	36	Red Line to NH > LRT
1 Dual Mode 1	35	#527* to Sep. > Red	61	#527* to Sep. > Red	16	Dual Mode	34	Dual Mode

Notes:
> indicates transfer required
* indicates proposed route as part of SFV Restructuring and/or feeder service to Red Line; times estimated from similar service.
Travel times (in minutes) include transfer times, but not first wait or walk times.
Transfer times based on half of anticipated peak headways for year 2010 patronage.
Bus travel times based on speeds from existing timetables.
No Project and TSM alternatives include Red Line operating to North Hollywood.
Source: Manuel Padron & Associates, 1997.

The top portion of Figure 7-1 shows the effect on transit trip speeds. Since transit service is improved in the rail alternatives, average speeds increase, and the trip time for most trips is reduced. For example, Alternative 6 (LRT) has an average transit passenger speed of 12.8 mph, vs. 12.3 for the No Project. However, the calculation of overall time savings must include the persons who shift from auto to transit. The top portion of Table 7-3 shows the transit component of the calculation. It shows that the average trip length on transit for the rail alternatives is higher, for example 9.47 miles for Alternative 6, vs. 9.1 miles for the No Project. This results partly from attracting more long trips from auto, and partly from added circuity for some trips in accessing the rail system. This increase in trip length, combined with the larger number of persons using transit, offsets the faster speed. The result is that the aggregate travel time of all persons using transit increases (shown as negative "savings"). The TSM Alternative increases the overall time spent in transit by almost four million hours annually, while the rail alternatives increase the time by as much as seven million hours. As described below, this shift is more than offset by savings in travel time by auto.

Table 7-4: Year 2015 Travel Time Savings

Alternative >		No-Project	TSM *	1	2	6	11
East Valley >			Enh. Bus	Red -SP	Red-Oxnard	LRT via SP	Dual Mode
West Valley >			Enh. Bus	Enh. Bus	Enh. Bus	LRT	Enh. Bus
Model Run >		1	8	12B	12	9	12B
	units						
ALL TRANSIT RIDERS							
Daily linked transit trips		1,028,629	1,042,210	1,058,819	1,061,190	1,046,430	1,058,819
Average transit trip speed	MPH	12.3	12.4	12.6	12.6	12.8	12.6
Average transit trip length	miles	9.10	9.24	9.36	9.37	9.47	9.36
Average transit trip time	min.	44.5	44.7	44.6	44.6	44.5	44.6
Daily Pass. Hours in Transit	hours	763,665	776,236	787,253	788,428	776,566	787,253
Daily Transit travel time savings	hours	base	(12,571)	(23,588)	(24,763)	(12,901)	(23,588)
Annual Transit travel time savings	hours	base	(3,897,010)	(7,312,280)	(7,676,530)	(3,999,310)	(7,312,280)
ALL AUTO USERS							
Total veh-miles of travel (VMT)		192,691,302	192,126,201	192,917,149	192,003,900	192,635,400	192,917,149
Average veh. speed	MPH	24.08	24.11	24.34	24.27	24.26	24.34
Total pass-hours of travel (PHT)	hours	11,348,571	11,304,010	11,249,679	11,229,960	11,283,157	11,249,679
Daily time saved, persons in autos	hours	base	44,561	98,892	118,611	65,414	98,892
Annual time saved, persons in autos	hours	base	13,813,910	30,656,520	36,769,410	20,278,340	30,656,520
VALUE OF TIME SAVINGS							
Total time savings (auto + transit)	hours	base	9,916,900	23,344,240	29,092,880	16,279,030	23,344,240
Value of time savings	mill.$	base	$116.0	$273.1	$340.4	$190.5	$273.1

NOTES:

Travel time savings are computed using No-Project as a base.
Ridership and operating statistics for Alternative 1 apply to 1a, 1b, 1c, & 1d.

Source: Manuel Padron & Associates

The middle section of Figure 7-1 shows the effect on highway travel times.[3] The average speeds decrease slightly for the rail alternatives. The reason for the relatively small effect is that the speeds are reported for regional travel, and the number of trips diverted is relatively small compared to the total regional trip-making by auto. Nevertheless, the aggregate travel time savings for auto users are significant, as shown in the second section of the table. For example, Alternative 2 would reduce highway person-hours by about 120,000 daily, or nearly 37 million hours annually. This is due to both the faster speeds and the fact that fewer people would be driving.

The third section of Table 7-1 combines the transit and highway time savings, and shows the estimated dollar value of the time savings. As noted above, the time savings for highway travel are larger than the slight increases in the aggregate time spent riding transit. The net savings therefore range from about 10 million hours for the TSM, to 16 million hours for Alternative 6, and 29 million hours for Alternative 2. FTA specifies an average value of time for studies such as this, based on the average wage rate in metropolitan areas ($11.70 per hour). Therefore the value of the annual net time savings for transit and auto combined ranges from almost $200 million for Alternative 6 to more than $300 million for Alternative 2, as shown in the bottom section of Figure 7-1. These large savings demonstrate the cumulative effects of the alternatives in relieving congestion, even though the savings for any individual trip are relatively small.

Table 7-5 shows a slightly different calculation of travel time savings, which will be used later in the calculation of FTA's cost-effectiveness index. Rather than comparing travel time savings for both auto and transit users against No Project as the base, this version focuses only on travel time savings for transit riders using rail alternatives, using the TSM Alternative as the base. (The TSM Alternative represents "existing riders" under FTA procedures.) Since the calculation is made for the same number of passengers for all alternatives, the faster speeds for the rail alternatives are reflected in reductions in aggregate transit travel time. The resulting values of the travel time savings for this group of transit riders range from $10.4 million to $17.7 million per year more than the TSM Alternative. These values are used in FTA's original version of the cost-effectiveness calculation; see Section 7-7.2.

7-2.4 Traffic Impacts

The localized traffic impacts of each alternative are discussed in Chapter 3. The TSM Alternative and all of the rail alternatives would reduce overall traffic levels in the San Fernando Valley. Table 7-6 lists the daily VMT for the SFV area (Regional Statistical Areas 12 and 13), along with the percentage reduction from the No Project.

[3] The data for vehicle-miles of travel (VMT) and passenger-hours of travel (PHT) are taken from the mode choice stage of the travel forecasting model. The VMT figures differ from those reported in Chapter 3, which are calculated after the highway assignment program. The models do not recalculate PHT after the assignment program. Therefore the travel time savings reported here may be underestimated.

Most key intersections would experience improvement in congestion levels. However, some would have increased congestion due to station-related traffic. Chapter 3 contains a detailed analysis of these impacts. The results are summarized in Table 7-6.

7-2.5 Effects on Zero-car Households

One of FTA's suggested evaluation criteria deals with the effectiveness of each alternative in improving mobility for transit-dependent households. FTA suggests a procedure which counts the households within ½ mile of the alignment of new transit service.

In the study area, there is existing bus service on most of the grid network of arterials and major collector streets. The basic pattern of bus service coverage does not vary among alternatives, although there are changes in frequency (TSM and Enhanced Bus service), and in orientation (some routes feed into rail stations). Therefore virtually all zero-car households have access to bus service in all alternatives.

In order to develop a meaningful measure of the effect of the different alternatives in addressing mobility of transit-dependent persons, this evaluation only considers proximity to rail stations. The specific calculation is based on the number of zero-car households in 1995 which are located within approximately ½ mile of a new rail station. The calculations are approximate, since available data are at the census tract level. Table 7-7 displays the results.

The No Project and TSM alternatives, which only include the North Hollywood Station in the study area, are the base for the comparison. (While the TSM Alternative does improve mobility for zero-car households by increasing service frequency, it does not expand physical access to these facilities, which is the focus of this measure.) Alternatives 1, 2, and 11 have four additional stations in the East Valley. The SP alignment (Alternatives 1 and 11) would serve approximately 2,700 zero-car households, while the Oxnard Street alignment (Alternative 2) would serve about 2,400. The difference is not considered significant.

Alternative 6 (Light Rail) also serves the West Valley, providing new access at 14 stations. Therefore it serves more zero-car households (about 4,800), even though the concentration of such households is lower in the West Valley than the East Valley.

7-2.6 Summary of Mobility Evaluation

Table 7-8 summarizes the evaluation of each alternative with respect to achieving the mobility objectives. Each of the quantitative measures discussed in the previous sections is rated on a scale from A to D.

For these objectives, Alternative 1 includes all four alignment variations, since there are no differences in travel times and ridership due to the differences in vertical alignment. Alternative 11 is identical to Alternative 1 in terms of the travel and mobility objectives. The differences between Alternatives 1 and 2 are very small, so the overall ratings are the same.

Table 7-5: FTA Travel Time Savings for "Existing" (TSM) Riders

	No-Project	TSM *	1	2	6	11
Daily TSM Pass. Hours	783,571	779,362	775,389	774,480	776,498	775,389
Daily Hours Saved	base for TSM	4,209	3,973	4,882	2,864	3,973
Annual Hours Saved	base for TSM	1,304,790	1,231,630	1,513,420	887,902	1,231,630

Note: *The TSM Alternative calculations are based on savings from No Project. TSM values are then used as the base for calculating travel time savings of the rail alternatives.

Source: Manuel Padron & Associates, 1997.

Table 7-6: Local Traffic Impacts

Alternative>	No-Project	TSM	1	2	6	11
Daily vehicle-miles in SFV	26,592,190	26,494,010	25,523,070	25,738,190	25,803,710	25,523,070
% change	base	-0.4%	-4.0%	-3.2%	-3.0%	-4.0%
Intersections with improved V/C	base	41	34	34	N/A	N/A
Intersections with significant worsening in V/C	base	0	5	7	N/A	N/A

Source: Manuel Padron & Associates, 1997.

Table 7-7: Rail Service to Zero-Car Households

Alternative		Number of New Stations	Zero-Car Households
NP	No Project	0	0
TSM	TSM	0	0
1	Red Line to I-405 - SP	4	2,700
2	Red Line to I-405 - Oxnard	4	2,400
6	LRT to Valley Circle	14	4,800
11	Dual Mode to I-405 (SP)	4	2,700

Note: Bus service coverage would be approximately the same for all

Source: Manuel Padron & Associates, 1997.

Table 7-8: Ratings of Alternatives - Mobility Goal						
Category	**No Project**	**TSM**	**ALT. 1**	**Alt. 2**	**Alt. 6**	**Alt. 11**
Ridership	D	C	A	A	B	A
Travel Time Savings	D	C	A	A	B	A
Transit Travel Times	D	D	C	C	B	C
Traffic Impacts	D	C	B	B	A	B
Zero-Car Households	D	C	B	B	A	B

Source: Manuel Padron & Associates, 1997.

Alternative 6 (light rail) rates slightly poorer in terms of new ridership, but better in service to zero-car households, than the other rail alternatives. In terms of travel time, Alternative 6 provides faster transit times for the typical trips examined, but does not do as well in diverting auto trips and therefore reducing highway congestion. It should be noted again that Alternative 6 differs from the other rail alternatives in two major respects: it provides rail service to the West Valley, but does not include the enhanced bus service in the West Valley.

7-3 LAND USE & DEVELOPMENT

The second project goal is to support land use and development goals, i.e., provide a transit project that complements the City of Los Angeles plans for:

- High capacity transit linkages between centers (North Hollywood, Van Nuys, Warner Center).
- Transit supportive land use policy.
- General Plan Framework Plan goals for increased transit mode split and concentration of growth in Targeted Growth Areas.
- Warner Center Specific Plan transit access enhancements.
- Joint development opportunities.
- Accessibility to governmental facilities in the Van Nuys Government Center.

The FTA evaluation criterion relating to land use and development focuses on the degree to which local land use policies and the development market foster transit-supportive land use, which coincides with one of the above criteria.

This section uses the land use and development analysis provided in Section 4-1, specifically the following categories:

- Consistency with planning and zoning (addresses transit linkages between centers; transit-supportive land use policy, also an FTA evaluation measure; General Plan Framework goals; and specific plans for Warner Center and Van Nuys-Sherman Oaks)

- Station area development potential (addresses joint development opportunities)

Please note that this goal focuses on the effective linkage of transit and land use. Land use issues relating to community impacts are discussed under Section 7-6.

7-3.1 Consistency with Planning & Zoning

As discussed in Section 4-1, all alternatives are largely consistent with various local planning documents. In fact, the rail alternatives all reinforce the General Plan's concept of connecting significant activity centers, which makes these alternatives perform better than the No Project or TSM alternatives. Transit station locations are all identified in community plans, with the exception of Alternative 2's Valley College station at Fulton/Oxnard and the Laurel Canyon station at Laurel/Oxnard. However, the Planning Department has indicated that the Laurel/Oxnard station would support planned development activities at Laurel Plaza and Valley Plaza Regional Shopping Centers. Because of their ability to reinforce designated transit locations in community plans, all rail alternatives are rated better than the No Project and TSM Alternatives (see ratings in Table 7-9).

Table 7-9: Ratings of Alternatives - Land Use & Development Goal

Category	No Project	TSM	Alt. 1	Alt. 2	Alt. 6	Alt. 11
Consistency with Planning & Zoning	C	C	B	B	B	B
Station Area Development Potential	C	C	B	B	B	B

Source: Manuel Padron & Associates, 1997.

7-3.2 Station Area Development Potential

Once again, the rail alternatives perform better than the No Project and TSM Alternatives since station area development potential is best realized with stations along a fixed rail corridor. All rail alternatives are able to provide good station area development potential at North Hollywood and Van Nuys. In addition, Alternative 2 provides opportunities at the Laurel/Oxnard station. The Valley College stations at either site (depending on alternative) and the Sepulveda station are a concern for all rail alternatives because of potential encroachment of incompatible uses into adjacent residential areas, though significant adverse impacts are not expected.

Given that the rail alternatives allow opportunities to guide transit-related development at appropriate locations, the rail alternatives are given higher ratings than the No Project and TSM alternatives (see ratings in Table 7-8).

7-3.3 Summary of Land Use & Development Evaluation

Because the emphasis of this goal is to foster a transit-supportive environment consistent with planning efforts, the rail alternatives are better at establishing such an environment. There is little variation between rail alternatives; most notably, Alternative 2 is the only case where a planning document does not designate the transit stations and would therefore require modification.

7-4 LOCAL CONSENSUS

The third project goal is to achieve local consensus, i.e., the project will be identified in a manner that is responsive to community and policy makers.

- Incorporate the citizen and policy maker input from previous studies in the San Fernando Valley.
- Provide opportunities for community input to the MIS process.
- Build community and political support through effective communication and integration with local and regional plans.

No FTA measures are related to this goal.

As described in detail in Chapter 8, the project corridor has been the subject of extensive public review and debate. All previous studies of this corridor have been done in a public format, eliciting considerable input.

The ongoing nature of the public review for the MIS process, by definition, does not allow any conclusive ratings to be made in this document. Based on years of community input from previous studies, the MTA Board has previously identified a subway project, as represented by Alternative 1, as the generally favored option prior to the MIS process. While state legislation SB211 defines a particular subway construction method represented by Alternative 1a, other below-ground profiles as developed for 1b and 1c would be consistent with the intent of SB211. On the other hand, an at-grade alternative such as Alternative 6a, or an aerial alternative, such as 1d, are known to raise substantial concerns for the communities along the corridor and are therefore rated lower.

Two alternatives are also rated lower not because of known community concerns, but because of a lack of community input. Alternative 11a (dual mode Red Line via SP ROW) and Alternative 2 (Oxnard Street alignment) have emerged within the MIS process and therefore limited public comment has been offered to date.

The TSM alternative has some significant support by those who believe that the San Fernando Valley is best served by improved bus service. However, this alternative also is considered insufficient by a significant segment of the public. Its rating reflects that there is some, but not widespread, positive sentiment.

It is important to note that the ratings shown in Table 7-10 below are based on the public's ability to comment so far. An important step is to consider the input that will be received with the circulation of this document. Once public comment is received, the MTA Board will be apprised of the updated public sentiment for each of the alternatives.

Table 7-10: Ratings of Alternatives - Local Consensus Goal

Category	No Project	TSM	Alt. 1a	Alt. 1b	Alt. 1c	Alt. 1d	Alt. 2	Alt. 6a	Alt. 11a
Local Consensus	C	B	A	A	B	C	C	C	C

Source: Manuel Padron & Associates, 1997.

7-5 ENVIRONMENTAL IMPACTS

The fourth project goal is to provide a transportation project which is compatible with and enhances the physical environment where possible.

- Identify an alternative that minimizes adverse effects on the environment.
- Minimize air pollution.
- Minimize noise impacts.
- Minimize impacts on cultural resources.
- Avoid impacts on park lands.

FTA-recommended measures under this category include change in criteria pollutant emissions and greenhouse gas emissions, and change in fuel consumption.

The following measures are used to assess alternatives' performance for this goal.

- Change in Pollutant Emissions (from Section 4-7; FTA evaluation measure)
- Change in Energy Consumption (from Section 4-8; FTA evaluation measure)
- Noise Impacts (from Section 4-9)
- Cultural Resources (from Sections 4-14 and 4-15)

7-5.1 Change in Emissions

This topic is analyzed in detail in Section 4-7. As a result of the reduction in VMT, all of the alternatives would have slightly beneficial effects on corridor emissions of criteria pollutants. The reductions in emissions would be generally proportional to the reductions in VMT in the Valley, as shown in Table 7-11, with all of the rail alternatives showing a larger improvement than the TSM Alternative.

7-5.2 Change in Energy Consumption

This topic is analyzed in detail in Section 4-8. The reductions in VMT would lead to decreased energy consumption by automobiles. However, for the rail alternatives this would be offset by increased energy consumption for the construction, propulsion, and maintenance of the new transit facilities. The result is a slight increase in overall energy consumption for the Red Line alternatives (+0.24 to 0.40%); a negligible increase for LRT (+0.04%); and a slight decrease (-0.07%) for the TSM Alternative (see Table 4-8.1).

7-5.3 Noise Impacts

Noise impacts are discussed in detail in Section 4-9. No Project and TSM alternatives have no expected noise impact. While rail alternatives have varying degrees of noise impacts, these impacts can be mitigated to acceptable levels. Ratings reflect that rail alternatives perform slightly worse than the No Project and TSM alternatives, because they would result in elevated noise levels in some locations that require mitigation.

7-5.4 Impacts on Cultural Resources/Section 4(f) Considerations

Impacts on cultural (archaeological and historic) and recreational/cultural resources are discussed in detail in Sections 4-14 and 4-15. None of the alternatives studied will negatively affect these resources.

7-5.5 Summary of Environmental Impacts Evaluation

Table 7-11 presents the ratings of alternatives in regard to the environmental impacts goal. Not surprisingly, the least amount of impact occurs under the TSM alternative. However, it also has the least ability to reduce emissions since fewer cars are taken off the road. Levels of impacts tend to be similar among the rail alternatives since mitigation measures are identified where any significant impacts are expected. Alternative 6 performs slightly better than the Red Line alternatives because it consumes somewhat less energy.

Table 7-11: Ratings of Alternatives - Environmental Impacts Goal

Category	No Project	TSM	Alt. 1	ALT. 2	ALT. 6	ALT. 11
Change in Emissions	base	C	B	B	B	B
Change in Energy Consumption	base	B	C	C	B	C
Noise Impacts	base	A	B	B	B	B
Impacts on Cultural Resources	base	A	A	A	A	A

Source: Manuel Padron & Associates, 1997.

7-6 COMMUNITY IMPACTS

The fifth goal is to provide a transportation project that minimizes impacts on the community.

- Minimize business and residential dislocations, community disruption and property damage.

- Avoid creating physical barriers, destroying neighborhood cohesiveness or in other ways lessening the quality of the human environment.
- Minimize traffic and parking impacts.
- Minimize impacts during construction.

No FTA measures relate to this category.

To address the elements embodied in this goal, the following analysis categories will be used for rating the alternatives. References to the full analysis are provided for each category.

- Localized Station Area Impacts (from Section 4-1.4)
- Acquisitions & Displacements (from Section 4-2)
- Neighborhood Impacts (from Section 4-3)
- Community Facilities/Services (from Section 4-4)
- Visual/Aesthetics (from Section 4-6)
- Traffic/Parking (from Chapter 3)
- Construction Impacts (from Chapter 5)

7-6.1 Localized Station Area Impacts

No impacts are anticipated under the TSM alternative. Impacts for the majority of rail alternatives are considered not significant. Significant impacts are anticipated for Alternatives 1c, 6a, and 11a and are able to be mitigated to acceptable impact levels.

7-6.2 Acquisitions & Displacements

No acquisitions or displacements are required for the TSM Alternative. All rail alternatives require acquisition of two residential parcels and displacement of 18 businesses.

7-6.3 Neighborhood Impacts

The TSM alternative as well as Alternatives 1a, 1b, 1c, 2, 6 and 11 would not affect neighborhood character. Aerial guideway on Alternative 1d would introduce project elements that may be out of balance with the scale of the neighborhood. All rail alternatives could potentially have impacts at stations and it is recommended that specific plans be developed to guide and ensure appropriate development.

7-6.4 Community Facilities/Services

Access to schools, libraries, religious institutions, health care facilities, parks and recreational facilities would all be improved over the No Project condition. Fire and police protection would not be significantly affected by any alternative.

7-6.5 Visual & Aesthetic Impacts

The TSM alternative, as well as Alternatives 1a, 1b and 2, would not result in significant changes to the visual and aesthetic environment. Alternative 1c introduces a segment of open trench; 1d involves aerial guideway; and 6a and 11a involve catenary wires and poles. Mitigations have been identified to reduce impacts to non-significance.

7-6.6 Traffic & Parking Impacts

Since the TSM alternative does not involve transit stations, no intersections would be affected. For the rail alternatives, significant impacts would occur at 5-11 study intersections; however, conditions improve for a far greater number of study intersections over the No Project condition. Roadway improvements have been identified to reduce impacts to non-significant levels. Parking impacts are expected at the Sepulveda Station for all the rail alternatives, and a mitigation program is recommended for implementation.

7-6.7 Construction Impacts

The TSM Alternative has no major construction impact, although there may be the need for local street improvements. Rail alternatives have impacts that can be mitigated to an insignificant level in the areas of transportation, effects on businesses, neighborhood access, noise and vibration, earth settlement, water resources, and utilities. Rail alternatives have potentially significant impacts on air quality during construction, although such impacts would only occur for short periods of time during peak days of construction activity.

7-6.8 Summary of Community Impacts Evaluation

Table 7-12 summarizes the ratings of alternatives for the community impacts categories. Once again, because the TSM alternative does not require construction of fixed facilities, minimal environmental impacts are expected and practically no community disruption occurs.

Among the rail alternatives, there are few points of distinction since most of the impacts identified can be mitigated to acceptable impact levels. Perhaps the greatest distinction between alternatives occurs in the visual/aesthetic category, where visual conditions vary widely: while Alternatives 1a, 1b, and 2 are underground, Alternative 1c involves an open trench, 1d involves aerial structure, and 6a and 11a involve surface rail with poles and catenary.

Table 7-12: Ratings of Alternatives - Community Impacts Goal									
Category	No Project	TSM	Alt. 1a	Alt. 1b	Alt. 1c	Alt. 1d	Alt. 2	Alt. 6a	Alt. 11a
Localized Station Area Impacts	base	A	B	B	B	B	B	B	B
Acquisitions/Displacements	*base*	*A*	*C*	*C*	*C*	*C*	*C*	*C*	*C*
Neighborhood Impacts	*base*	*A*	*B*	*B*	*B*	*C*	*B*	*B*	*B*
Community Facilities/Services	*base*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Visual/Aesthetic	*base*	*A*	*A*	*A*	*B*	*C*	*A*	*B*	*B*
Traffic & Parking	*base*	*A*	*B*	*B*	*B*	*B*	*B*	*B*	*B*
Construction Impacts	*base*	*A*	*C*	*C*	*C*	*C*	*C*	*C*	*C*

Source: Manuel Padron & Associates, 1997.

7-7 COST-EFFECTIVENESS

The sixth major goal for the corridor is to provide a transportation project that is cost effective *and* within the ability of MTA to fund, including capital and operating costs. The specific local objectives for this goal are:

- Identify cost saving measures through value engineering to reduce project costs.
- Maximize the benefits associated with use of right of way already purchased by the MTA.
- Ensure fiscal consistency with the MTA Long Range Plan.

The range of alternatives considered reflects the effort to reduce project costs. Examples are the consideration of less expensive construction methods for a Red Line Extension, such as Alternatives 1c and 1d, and the Dual Mode option. In addition, all of the rail alternatives make use of part of the SP right-of-way, which has already been purchased by the MTA. The financial feasibility of the project is evaluated in the following Section 7-8.

In addition to the objectives established by MTA, FTA has established procedures for evaluating the effectiveness of new projects. These include measures of operating efficiencies, and of the overall cost-effectiveness of the project. Each is discussed in the following sections.

7-7.1 Capital Costs

Capital costs are a major factor in the evaluation, directly and as a component of the cost-effectiveness calculation and determination of financial feasibility. Table 7-13 lists the capital cost data for each alternative.

Capital costs for project alternatives are divided into base capital costs and systemwide capital costs.

Table 7-13: Capital Costs Summary

Alternative >		No-Project	TSM *	1a	1b	1c	1d	2	6a	11a
East Valley >			Enh. Bus	SP deep bore	SP cut & cover	SP open cut	SP aerial	Red-Oxnard	LRT via SP	Dual Mode
West Valley >			Enh. Bus	Enh. Bus	Enh. Bus	Enh. Bus	Enh. Bus	Enh. Bus	LRT	Enh. Bus
	units									
RAIL CONSTRUCTION COSTS										
Base Capital Cost	mill.$	$0	$0	$901	$812	$755	$645	$873	$1,068	$616
ROW Cost	mill. $	$0	$0	$18	$18	$18	$18	$17	$65	$18
Total Rail Construction Costs	mill. $	$0	$0	$919	$830	$773	$663	$890	$1,133	$634
SYSTEMWIDE RAIL COSTS										
Red Line Vehicle Fleet	#	216	216	272	272	272	272	272	234	272
Addl. Red Line Vehicles	#	0	0	56	56	56	56	56	18	56
Addl. Red Line Vehicle Cost (1)	mill. $	$0	$0	$237	$237	$237	$237	$237	$76	$281
Addl. LRT Vehicles	#	0	0	0	0	0	0	0	48	0
Addl. LRT Vehicle Cost	mill. $	$0	$0	$0	$0	$0	$0	$0	$252	$0
Addl. Yard/Shop Cost	mill. $	$0	$0	$4	$4	$4	$4	$4	$44	$4
Total Rail Fleet-Related Costs	mill. $	$0	$0	$241	$241	$241	$241	$241	$372	$284
SYSTEMWIDE BUS COSTS										
MTA Bus Fleet	#	2,386	2,473	2,478	2,478	2,478	2,478	2,478	2,369	2,478
Muni Bus Fleet	#	1,086	1,086	1,085	1,085	1,085	1,085	1,085	1,079	1,085
Total Bus Fleet	#	3,472	3,559	3,563	3,563	3,563	3,563	3,563	3,448	3,563
Addl. Buses (vs. No-Project)	#	base	87	91	91	91	91	91	-24	91
Bus Vehicle Cost	mill. $	base	$31	$32	$32	$32	$32	$32	($9)	$32
Bus Maint. Fac. Cost	mill. $	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Bus Capital Cost	mill. $	$0	$31	$32	$32	$32	$32	$32	($9)	$32
TOTAL										
Total Capital and Systemwide Costs	mill. $	$0	$31	$1,193	$1,103	$1,047	$936	$1,163	$1,497	$951
Incremental Capital Cost (2)	mill. $	$0	$31	$1,162	$1,072	$1,016	$905	$1,132	$1,466	$920
Annualized Incremental Cap. Cost	mill. $	$0	$4	$87	$81	$77	$69	$85	$108	$70

(1) Dual mode cost includes retrofitting 108 Red Line cars for dual-mode operation.

(2) TSM incremental values are in comparison to No-Project; rail alternative values are compared to TSM

Source: Manuel Padron & Associates

- Rail construction costs include construction of line and stations, plus system elements such as traction power and train control, with all appropriate add-ons for design, construction management, and contingency. Base capital costs also include right-of-way that would have to be acquired for the project; this does not include the value of the SP right-of-way already purchased by MTA.

- Systemwide capital costs include rail and bus vehicle and facility costs. These costs can fluctuate over time, depending on operational decisions including headways, passenger load factors and levels of service. Table 7-13 shows the estimated fleet size for each alternative. As discussed previously, the system analyzed for ridership and operations includes proposed Red Line extensions to Whittier/Atlantic and Westwood.

The total rail construction costs for the Red Line extensions to I-405 via the SP range from $663 million (Alt. 1d) to $919 million (1a), depending on the vertical profile and type of construction. The Red Line extension to I-405 via Oxnard (Alt. 2) falls in the middle of the range for the SP alternatives at $890 million. Alternative 11a (dual mode to I-405), would cost slightly more than Alternative 1d, $634 million. However, this lower construction cost is more than offset by the additional cost of converting much of the Red Line fleet to dual mode operation. The LRT Alternative (6a), which extends to Valley Circle, is the most expensive at $1,133 million, but the cost per mile is lower than the other rail alternatives.

Table 7-13 separates systemwide capital costs by rail and bus. For rail vehicles, the fleet-related costs for the dual mode Alternative 11a include two special allowances. The *additional* 56 vehicles that would be for needed the extension would be procured with equipment for both third-rail and catenary operation. This is estimated to increase the unit cost from $4.15 million to$4.5 million. Since the dual mode vehicles will operate through from Sepulveda to downtown and possibly East LA, all of the cars operated on the Hollywood Branch of the Red Line need to be equipped for catenary operation. This amounts to about 60% of the estimated future fleet, and will require that some existing cars, or cars already under procurement, will have to be retrofitted.

Systemwide rail costs also include an allowance for storage and maintenance facilities. MTA's current priorities call for the San Fernando Valley line to be constructed prior to the Whittier/Atlantic and Westwood extensions. The existing Red Line yard and shop, along with tail tracks at the three terminal stations, could accommodate the expanded fleet size for the San Fernando Valley line without the other two extensions. However, additional yard and shop facilities would be required, somewhere on the Red Line system, with all three extensions in operation.

Systemwide bus costs focus on purchasing additional buses. The TSM alternative would have a bus capital cost of $31 million relative to No Project. While most of the rail alternatives would require slightly more buses than TSM, Alternative 6a actually requires fewer buses than No Project. In this case, a cost credit is reflected for this item. It is probable that bus fleet procurements would be undertaken independently from the construction timetable for any San Fernando Valley rail construction project.

No capital cost for additional bus maintenance facilities is assumed for any of the alternatives. There is adequate capacity at the two MTA bus divisions in the San Fernando Valley to accommodate the estimated increases in bus fleet size, although with some crowding in some cases.

Table 7-13 also expresses costs as incremental annualized costs for use in calculating the cost-effectiveness index. The incremental capital costs for the rail alternatives are calculated relative to the TSM Alternative. The annualized capital cost is calculated with a discount rate of 7%, established by FTA. Each major category of costs is annualized based on the expected life of those items:

Structures (line and stations)	50 years
Rail vehicles	25 years
Buses	12 years

The resulting annualized capital cost for the TSM Alternative (relative to No Project) is $4 million. The annualized costs for the Red Line extensions to I-405, including Dual mode, range from $69 to $87 million. The annualized capital cost for the cross-valley LRT alternative is $108 million.

7-7.2 Operating Costs and Efficiencies

The FTA guidelines give several examples of measures of operating efficiency. Some of the measures deal with how efficiently the transit system transports passengers, e.g. passengers per vehicle-mile, or passenger-miles per vehicle mile. Another group deals with the cost-efficiency of providing the service and carrying riders: operating cost per vehicle mile, per passenger, and per passenger-mile.

Table 7-14 lists the operating statistics that are used in this section of the evaluation. The resulting measures are shown in the table, and are also displayed graphically in Figure 7-2 and Figure 7-3.

- The top section of Table 7-14 lists the level of transit service, expressed in annual vehicle-miles, by mode for each alternative. These figures were derived from the MTA ridership model, with adjustments based on a comparison of model results and current actual levels of service.

- The middle section of the table lists the estimated operating cost for each mode for each alternative. The costs are estimated with a model which considers several measures of the level of service, including vehicle-miles, bus-hours and train-hours, and physical measures such as miles of track, number of stations, etc.

- The bottom section of the table lists the annual ridership for each alternative, converted from daily ridership reported in Sections 3-1 and 7-2.1, and shows the efficiency measures that are calculated from the above data for each alternative.

Table 7-14: Operating Costs and Efficiencies

Alternative >		No Project	TSM	1	2	6a	11a
East Valley >			Enh. Bus	Red -SP	Red-Oxnard	LRT via SP	Dual Mode
West Valley >			Enh. Bus	Enh. Bus	Enh. Bus	LRT	Enh. Bus
	units						
LEVEL OF SERVICE							
Annual vehicle-miles - Red Line	million	19.7	19.7	23.48	23.53	20.2	23.5
Annual vehicle-miles - LRT	million	6.5	6.5	6.5	6.5	10.7	6.5
Annual vehicle-miles - Green	million	3.3	3.3	3.3	3.3	3.3	3.3
Annual vehicle-miles - rail	million	29.5	29.5	33.3	33.3	34.2	33.3
Annual vehicle-miles - bus	million	113.6	116.2	116.2	115.9	111.5	116.2
Annual vehicle-miles - total	million	143.1	145.7	149.5	149.2	145.7	149.5
OPERATING COSTS							
Red Line O&M Cost	mill. $	$116	$116	$134	$134	$118	$134
LRT O&M Cost	mill. $	$66	$66	$65	$65	$97	$65
Green Line O&M Cost	mill. $	$31	$31	$30	$30	$30	$30
Total Rail O&M Cost	mill. $	$213	$213	$229	$229	$245	$229
MTA Bus O&M Cost	mill. $	$702	$723	$722	$721	$692	$722
Muni Bus O&M Cost	mill. $	$189	$186	$189	$189	$189	$189
Total Bus O&M Cost	mill. $	$891	$909	$911	$909	$880	$911
Annual System O&M Cost	mill. $	$1,104	$1,123	$1,140	$1,139	$1,126	$1,140
Incremental System O&M Cost for East-West Alternatives	mill. $	$0	*$18.3*	$17.7	$16.0	$3.3	$17.7
OPERATING EFFICIENCIES							
Annual linked transit passengers	million	318.9	323.1	328.2	329.0	324.4	328.2
Linked passengers per veh-mile		2.23	2.22	2.20	2.20	2.23	2.20
Annual transit passenger-miles	million	2,903	2,986	3,072	3,084	3,071	3,072
Passenger-miles per veh-mile		20.3	20.5	20.6	20.7	21.1	20.6
Rail Operating Cost per vehicle-mile		$7.24	$7.24	$6.90	$6.89	$7.18	$6.90
Bus Operating Cost per vehicle-mile		$7.84	$7.82	$7.84	$7.85	$7.90	$7.84
System Oper. Cost per passenger		$3.46	$3.47	$3.47	$3.46	$3.47	$3.47
System Oper. Cost per pass-mile		$0.380	$0.376	$0.371	$0.369	$0.367	$0.371

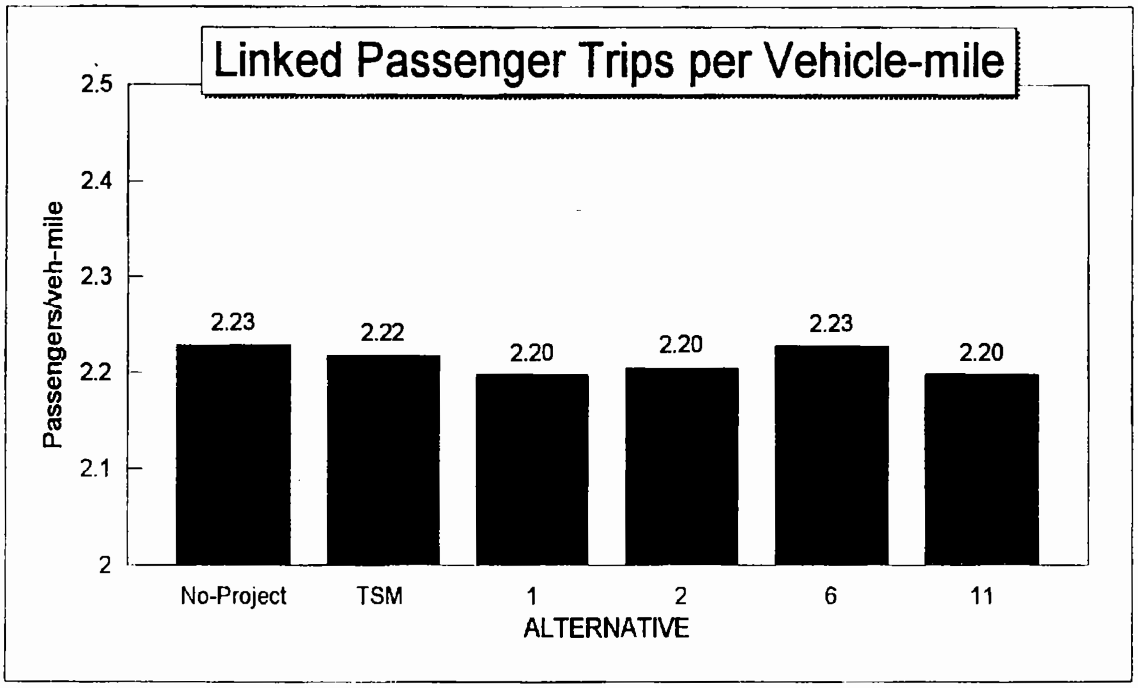
NOTES:

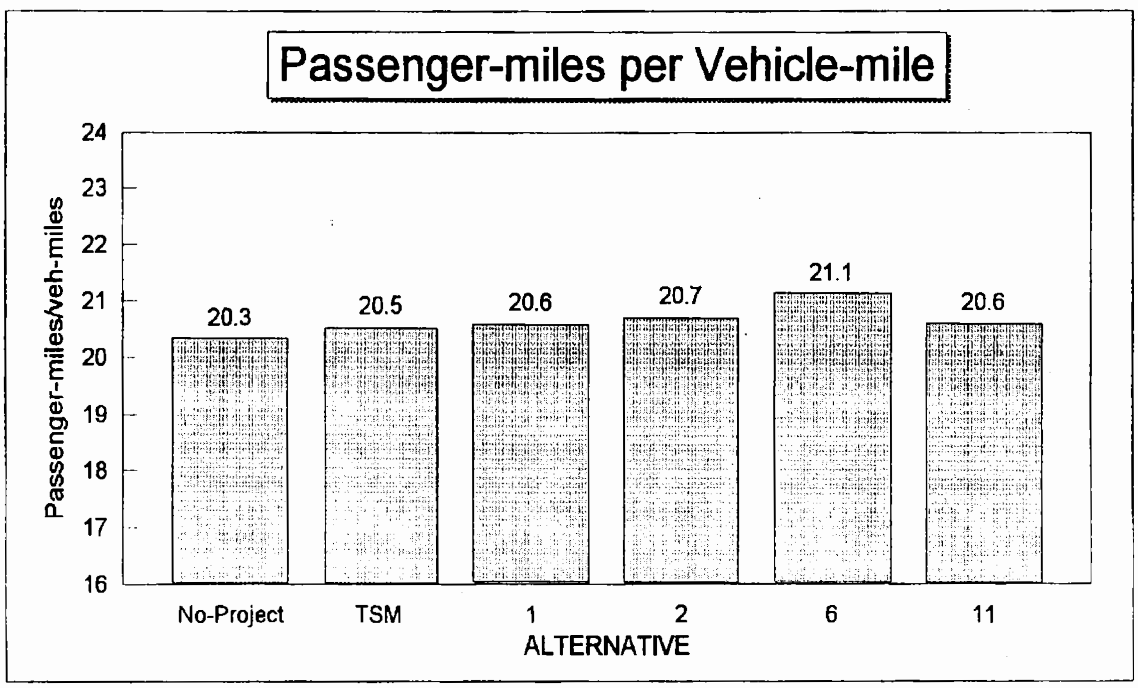
Ridership and operating statistics for Alternative 1 apply to 1a, 1b, 1c, & 1d.

LRT includes LB/LA and Pasadena, plus SFV in Alternative 6.

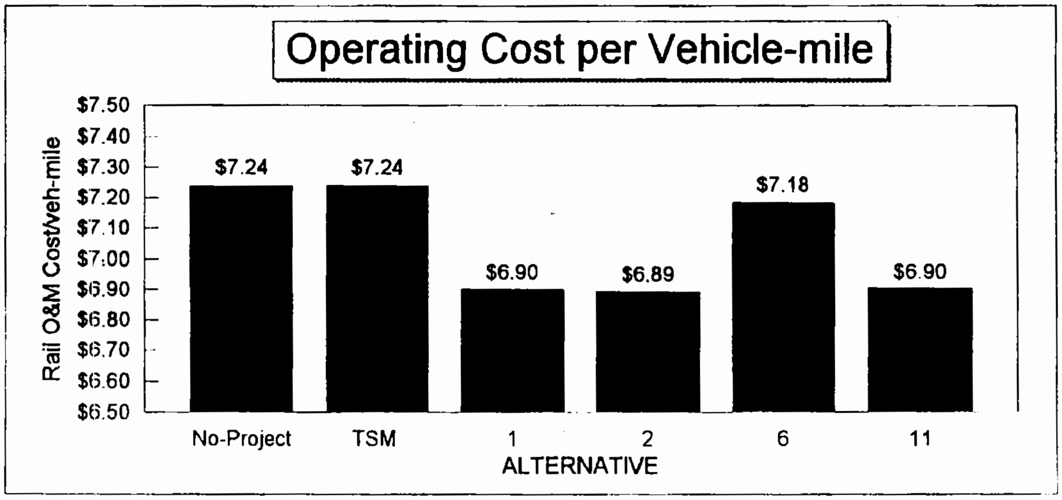
TSM incremental values are in comparison to No Project. Rail alternatives are compared to TSM.
Since two different bases are used, TSM values are not directly comparable to rail alternative values.

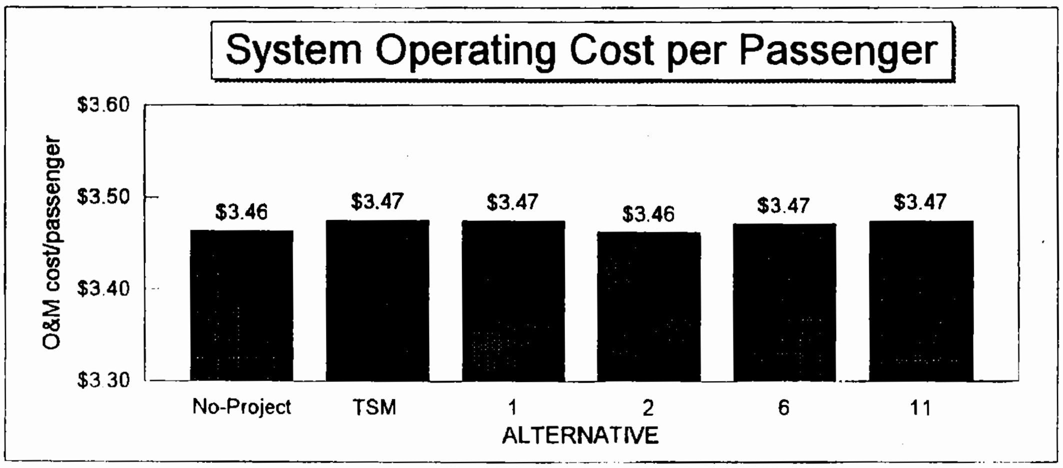
Source: Manuel Padron & Associates

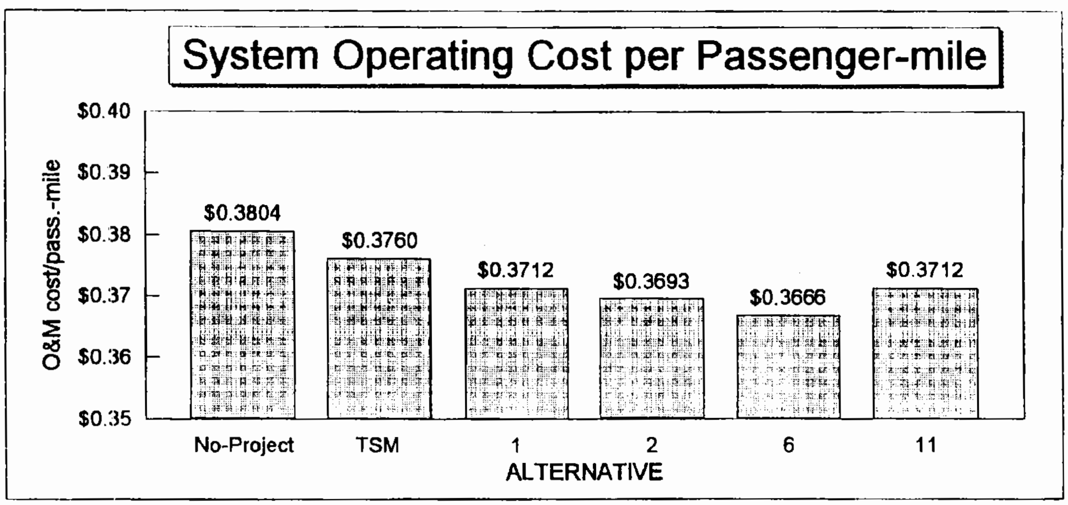




SOURCE: Manuel Padron & Associates, 1997.







SOURCE: Manuel Padron & Associates, 1997.

Figure 7-2 shows the efficiency measures related to ridership.

- Each of the Red Line alternatives, including dual mode, attracts slightly fewer passengers per vehicle-mile than the Alternative 6 (LRT), TSM or No Project alternatives. Alternative 6 (LRT) attracts slightly more passengers per vehicle-mile. This reflects the better utilization of vehicle capacity with light rail. The light rail trains would be scheduled for maximum utilization at their peak load point, approaching North Hollywood. The Red Line vehicle would be only partially full at that location, since they will continue to receive boarding passengers through the Hollywood/Vermont section of the line.

- The Red Line alternatives, including dual mode, compare slightly better in terms of passenger-miles of travel, while LRT is the most efficient. These patterns reflect the longer average trips attracted by the rail alternatives, particularly Alternative 6 which would provide rail service to the entire East-West corridor.

Figure 7-3 shows the measures related to operating costs:

- For the rail system, each of the rail alternatives shows an improvement in operating cost per vehicle-mile versus the TSM. Alternative 6 shows only a slight reduction compared to those for the heavy rail alternatives. This reflects the economies of scale of extending the Red Line versus using a different mode. Because of differences in vehicle size and capacity, this comparison is not as meaningful as those measures based on passengers, discussed below.

- When expressed in system cost per passenger, most of the rail alternatives have about the same cost as the TSM. The differences between alternatives are not large enough to be significant.

The system cost per passenger-mile shows a different pattern. The rail alternatives are more efficient than the TSM, with LRT (Alternative 6a) showing the largest cost reduction, because of its nature as a cross-Valley alternative.

7-7.3 Cost-Effectiveness

Since the early 1980's FTA has used a cost-effectiveness index to evaluate and compare new start transit projects. The cost-effectiveness index is an attempt to calculate the net cost, considering most major quantifiable costs and benefits, of attracting one new rider to transit. The original index is defined as follows:

$$\text{Cost-Effectiveness Index} = \frac{\Delta\text{Capital Cost} + \Delta\text{O\&M Cost} - \Delta\text{Value of Transit Travel Time Savings}}{\Delta\text{Linked Transit Riders}}$$

For the rail alternatives, each of the above four components is calculated as the *annualized increment* (Δ) compared to the TSM alternative. The TSM alternative is compared against the No Project condition.

The data used in the index is drawn from three different sections of this chapter:

- The system cost per passenger-mile shows a different pattern. Linked riders and travel time savings from section 7-2 (Table 7-2).

- The system cost per passenger-mile shows a different pattern. Annual operating costs from section 7-7.1 (Table 7-13).

- The system cost per passenger-mile shows a different pattern. Annualized capital costs from section 7-7.2 (Table 7-14).

Table 7-15 summarizes the data used in the calculation of the cost-effectiveness index. The top graph in Figure 7-4 shows the total annualized cost for each alternative, including the annualized capital cost plus the annual operating cost. The figures for the rail alternatives are grouped in a range from \$86 to \$112 million. Alternative 6 (cross-valley LRT) is the most costly, but the margin compared to the other alternatives (ending at I-405) is smaller than in the comparison of capital costs only.

The cost-effectiveness index is shown in the bottom graph of Figure 7-4. This uses the traditional method of calculation, defined above and still used in FTA's 3(j) report to Congress, which includes a credit for travel time savings for existing transit riders in the numerator.[4]

The following observations can be made from the cost-effectiveness analysis:

- The TSM Alternative has by far the lowest cost-effectiveness indices, indicating that it is the most effective alternative in attracting new trips to transit. This is largely due to the very low cost of this alternative in which buses run on existing city streets and no transit guideway costs are incurred. The cost-effectiveness of this alternative must be balanced with its limited ability to reduce travel times.

The TSM Alternative has by far the lowest cost-effectiveness indices, indicating that it is the most effective alternative in attracting new trips to transit. This is largely due to the very low cost of this alternative in which buses run on existing city streets and no transit guideway costs are incurred. The cost-effectiveness of this alternative must be balanced with its limited ability to reduce travel times.

- The indices for the five options for a Red Line extension to I-405 are clustered fairly closely. The most cost-effective ones are 1d (SP aerial) and 2 (Oxnard). Alternative 1d scores well because it has the lowest capital cost of the six options to I-405. Alternative 2 scores well because it attracts slightly more riders than the alternatives along the SP corridor, even though the capital costs are generally higher than the other alternatives.

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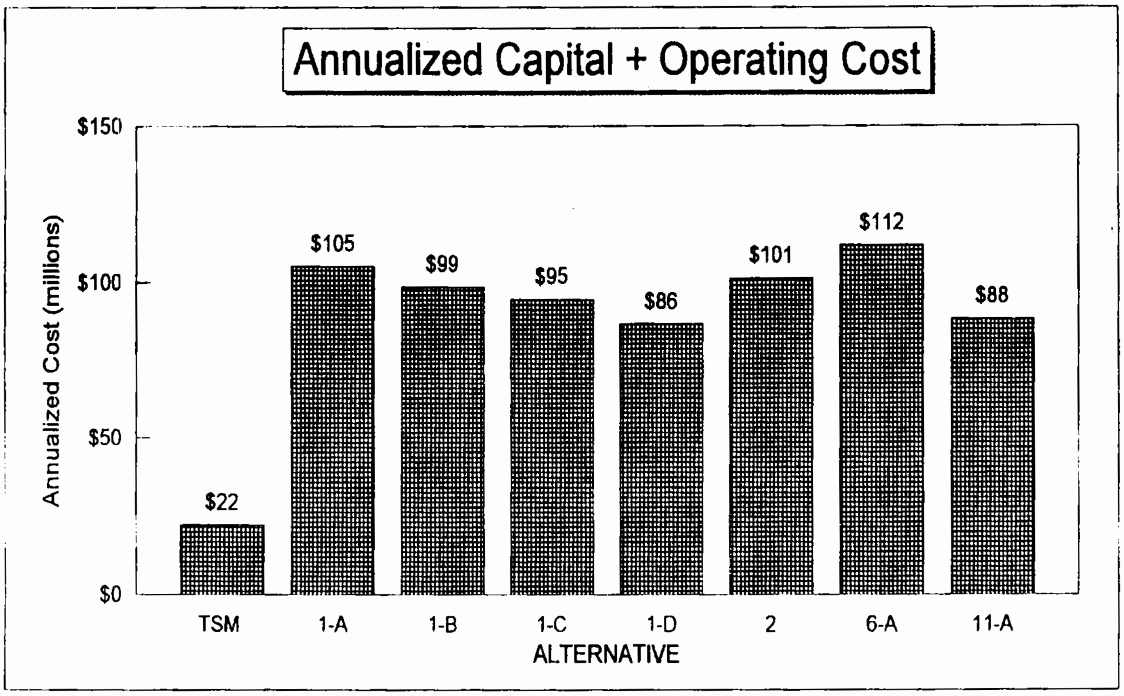
[4] The other method considers only annualized capital and operating costs in the numerator. The results of this computation are shown in the last row of Table 7-7.3. Both calculation methods result in the same relative standing of the alternatives.

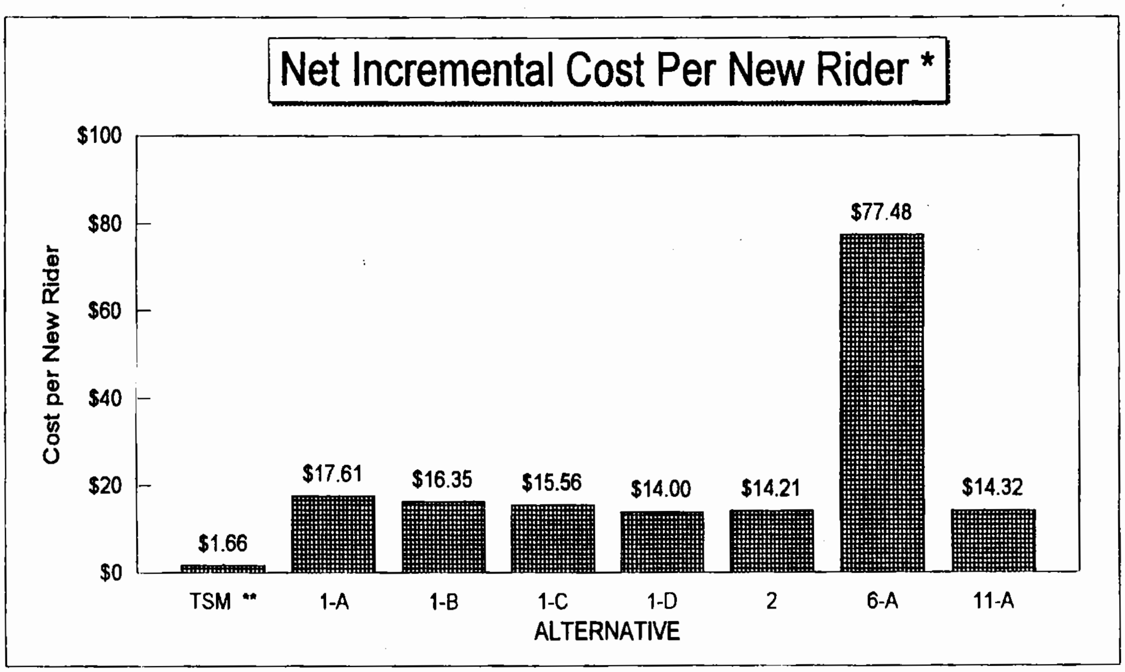
Table 7-15: Cost-Effectiveness

Alternative >	units	No-Project	TSM *	1a	1b	1c	1d	2	6a	11a
East Valley >			Enh. Bus	SP deep bore	SP cut & cover	SP open cut	SP aerial	Red-Oxnard	LRT via SP	Dual Mode
West Valley >			Enh. Bus	Enh. Bus	Enh. Bus	Enh. Bus	Enh. Bus	Enh. Bus	LRT	Enh. Bus
CAPITAL COSTS:										
Total Capital Cost	mill. $	$0	$31	$1,193	$1,103	$1,047	$936	$1,163	$1,497	$951
Addl. Capital Cost	mill. $	$0	$31	$1,162	$1,072	$1,016	$905	$1,132	$1,466	$920
Annualized Addl. Cap. Cost	mill. $	$0	$4	$87	$81	$77	$69	$85	$108	$70
OPERATING COSTS										
Total O&M Cost	mill. $	$1,104	$1,123	$1,140	$1,140	$1,140	$1,140	$1,139	$1,126	$1,140
Total Addl. Annual O&M Cost	mill. $	$0	$18.3	$17.7	$17.7	$17.7	$17.7	$16.0	$3.3	$17.7
TOTAL COSTS										
Annualized Capital + O&M Cost		$0.0	$22.2	$105.1	$98.6	$94.5	$86.5	$101.3	$111.7	$88.2
Annual Travel Time Savings	mill. $	$0.0	$15.3	$14.4	$14.4	$14.4	$14.4	$17.7	$10.4	$14.4
Net Incremental Annual Cost	mill. $	$0.0	$7.0	$90.7	$84.2	$80.1	$72.1	$83.6	$101.4	$73.7
RIDERSHIP										
Daily Transit System Linked Trips		1,028,629	1,042,210	1,058,819	1,058,819	1,058,819	1,058,819	1,061,190	1,046,430	1,058,819
Annual Transit System Linked Trips	mill.	318.9	323.1	328.2	328.2	328.2	328.2	329.0	324.4	328.2
Addl. Annual Linked Trips	mill.	NA	4.2	5.1	5.1	5.1	5.1	5.9	1.3	5.1
COST-EFFECTIVENESS										
Net Cap/O&M Cost Per New Rider		**NA**	**$5.28**	**$20.41**	**$19.15**	**$18.36**	**$16.80**	**$17.22**	**$85.42**	**$17.12**
Net Increm. Cost Per New Rider		**NA**	**$1.66**	**$17.61**	**$16.35**	**$15.56**	**$14.00**	**$14.21**	**$77.48**	**$14.32**

* TSM incremental values are in comparison to No-Project; rail alternative values are compared to TSM

Source: Manuel Padron & Associates





* Includes credit for value of travel time savings for "existing" (TSM) riders.

** TSM incremental values are in comparison to No-Build; Build values are compared to TSM

SOURCE: Manuel Padron & Associates, 1997.

- Alternative 6 (LRT) has the highest cost per new rider. This index is very sensitive to the number of *new* riders, and LRT is projected to attract the fewest new passengers to transit even though it extends across the entire Valley. As discussed earlier, this in part reflects differences in bus service among the alternatives. The Enhanced Bus service in the West Valley accounts for many of the new riders for the alternatives ending at I-405, and is not included in Alternative 6. The MTA ridership model is very sensitive to waiting times and transferring. Accordingly, LRT is adversely affected by the additional transfer for manypassengers at North Hollywood. However, the annualized cost of LRT, which serves theentire Valley, is only slightly higher than the annualized cost of the most expensive Red Line to I-405 option ($112 vs. 105 million). The annual operating cost is the lowest of any alternative except No Project.

- Alternative 11 (dual mode) has ridership and cost inputs very similar to Alternative 1d, except for higher vehicle costs. The resulting cost-effectiveness indices are slightly higher (more expensive) than Alternative 1d.

7-7.4 Summary of Cost-Effectiveness Evaluation

Table 7-16 summarizes the evaluation of the alternatives with respect to the achievement of the cost-effectiveness objectives. Each of the quantitative measures discussed in the previous sections is rated on a scale from A to D. For the operating efficiency factors, the values for the sub-alternatives to Alternative 1 are identical. Since Alternative 11 is similar to Alternative 1 in terms of operations, its values are the same also. The differences among the alignment variations show up in the factors that include capital costs.

Table 7-16: Ratings of Alternatives - Cost-Effectiveness Goal

Category	NO-PROJECT	TSM	1a	1b	1c	1d	2	6a	11a
Passenger-trips per vehicle mile	B	B	C	C	C	C	C	B	C
Passenger-miles/vehicle mile	C	B	B	B	B	B	B	A	B
Rail Oper. Cost per vehicle mile	C	C	A	A	A	A	A	B	A
System Oper. Cost/ pass-mile	D	C	B	B	B	B	A	A	B
Net Cost per New Rider	base	A	C	C	C	B	B	D	B

Source: Manuel Padron & Associates, 1997.

As discussed previously, Alternative 6 rates slightly better than the other rail alternatives in most of the operating efficiency measures. The exception is the rail cost per mile, where light rail performs slightly poorer. The system operating cost per passenger (middle of Figure 7-4) is not tabulated here, since all alternatives had virtually the same cost.

The two cost-effectiveness factors (annualized capital and operating cost, and net incremental cost per new rider) are summarized in a single line, since the two measures show the same relative standing among the alternatives. As discussed earlier, the TSM Alternative has the lowest cost-effectiveness indices for attracting new trips to transit.

7-8 FINANCIAL FEASIBILITY

This section presents the results of the financial analysis component of the San Fernando Valley East-West Corridor Study. The purpose of the financial analysis is to assist the MTA, general public, and local officials to: 1) evaluate the financial feasibility of the alternative transit plans for the corridor leading the selection of a locally preferred investment strategy; and 2) to prepare a financial plan for the San Fernando Valley East-West Project.

The major objectives of the financial analysis are:

Outline the assumptions used to determine financial capability; and

Determine the range of annual cash flow requirements for the region to construct and operate each of the proposed San Fernando Valley alternatives. Cash flow is the amount of funds required each year to operate the region's transit system and meet its capital funding requirement for asset replacement and new construction;

To meet its objectives, the financial analysis includes identification of operating and capital sources and uses of funds, estimation of annual cash flow requirements, and identification of potential new funding sources associated with implementing each of the alternatives.

7-8.1 Regional Operating Assumptions

Financial capability was examined for each San Fernando Valley alternative under the assumption that the priorities in the MTA's Long Range Transportation Plan are kept. The Long Range Transportation Plan (LRTP) is the MTA's long range strategic planning document, adopted in 1995. The schedule of rail projects included in the LRTP is shown in Table 7-17. The LRTP is currently being updated. As part of the update, the MTA Board of Directors has adopted an implementation schedule for rail extensions that were in the adopted LRTP. This schedule is currently being reviewed by FTA and proposes the delay of several projects by between two to six years. Pending consideration and adoption of a new Long Range Plan, it is fully expected that the San Fernando Valley East-West Corridor will remain as a funded component. Consistent with previous MTA Board policy, the financial analysis assumes that the San Fernando Valley rail project is implemented before further Red Line extensions to Wilshire & Federal and Whittier & Atlantic.

Table 7-17: MTA Projects in Adopted Long Range Plan		
Project	**Construction Start Year (Fiscal Year)**	**Operations Start Year (Fiscal Year)**
Red Line to Hollywood & Vine	under construction	1998-99
Red Line to North Hollywood	under construction	2000-01
Pasadena Line to Sierra Madre Villa	under construction	2001-02
Red Line to First & Lorena	1996-97	2002-03
Red Line to Pico & San Vicente	on hold	2002-03
San Fernando Valley East-West Extension	2003-04	2012-13
Red Line to Wilshire & Federal	2004-05	2013-14
Red Line to Whittier & Atlantic	2008-09	2013-14

Source: *MTA Long Range Transportation Plan,* March 1995.

7-8.2 Financial Capability with Existing Funding Sources

Transportation funding in Los Angeles County is a diverse and complex blend of federal, state, and local funding sources matched against a ambitious transportation program of highway, bus, and rail components. All funding estimates for the financial analysis are based on the assumptions made by MTA in its Long Range Plan.

7-8.3 Assumptions in the Long Range Transportation Plan

Numerous assumptions which reflect the best available estimate of future trends in funding and costs over the analysis period are included in the update of the Long Range Transportation Plan. Existing MTA policy, as well as federal and state policies and laws, guided the development of the assumptions. Listed below are the major assumptions[5] applied to the San Fernando Valley East-West financial analysis.

Inflation. A 3.28% average annual inflation rate, based on the September, 1996 UCLA sales tax forecast for Los Angeles County, was applied to projected revenues and operating costs. It was assumed that inflation would average 3.34% over the first decade and 3.10% during the second and third decades of the LRP. An annual average inflation rate of 2.41% was applied to estimated transit capital cost items. The rate is based on the relationship of the Construction Cost Index (CCI) to the Consumer Price Index (CPI), in which the CCI is calculated to be approximately 73% of the CPI.

[5]Source: *MTA Long Range Transportation Plan*, Summary Of Key Financial Assumptions, 1997 Draft.

Federal Urbanized Area Formula Program (formerly Section 9)[6]. The federal Urbanized Area Formula Program was assumed to be discontinued in FY2003 based on current reductions in federal operating funds, and based on preliminary federal budget estimates.

Fare Revenues. Fares were assumed to increase every two years by the rate of inflation, beginning in FY1998. For the San Fernando Valley alternatives, fare revenue is estimated for rail based on assumptions made in the LRP, and for bus by applying the current bus farebox recovery rate (34%) to future O&M costs. The LRP reflects fare reductions in accordance with recent litigation.

Sales Tax Funds. Propositions A and C are local sales tax measures which contribute over 47% of funding for the LRP. Local sales tax revenues of $43 billion over the next twenty years were estimated based on the UCLA Business Forecasting Project. Sales tax revenue is used, in part, to fund debt service on bonds for rail and highway construction projects.

Federal New Starts Funds. For the LRP, it assumed that each of three rail lines planned in the second and third decade of the plan will receive 50% funding from FTA New Starts funds. If the federal contribution is lower than 50%, project construction would be delayed for these projects.

Capital Costs. Capital costs for the San Fernando Valley East-West alternatives are based on estimates made specifically for this study. Capital costs were presented on Table 7-13. These costs, expressed in FY1997 dollars, were assumed to increase with inflation for the financial analysis.

Operating & Maintenance Costs. Operating and maintenance (O&M) costs are based on results from MTA's O&M Cost Model. O&M cost estimates for each of the San Fernando Valley alternatives were presented on Table 7-14. These costs, expressed in FY1997 dollars, were assumed to increase with inflation for the financial analysis.

Debt Financing. For the Long Range Plan it is assumed that senior lien bonds will be issued as needed to meet requirements for major capital projects, constrained by MTA debt service coverage ratio limitations. Debt service on bonds is assumed to be paid with Proposition A and Proposition C revenues. Debt financing is necessary for the completion of construction projects as scheduled in the LRP. No additional debt financing was assumed for the San Fernando Valley financial analysis.

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[6] The Federal Transit (FT) Act of 1992 (as amended) was codified in 1994 making citations to sections of the Act obsolete. For example, Section 9 is now section 5307 of Title 49, United States Code, Section 3 is now section 5309 of Title 49, United States Code. The new code sections can be found in the Federal Register dated November 24, 1995 (vol. 60, no. 226).

7-8.4 Financial Analysis

As stated earlier, the MTA is undergoing an update of its Long Range Transportation Plan. It is expected that the priorities in the adopted Plan will remain fundable though construction dates may slip from two to six years for the East-West corridor project and other rail extensions. The updated plan is expected to be reviewed and adopted by the Board later this year.

7-8.5 Potential New Funding Sources

This section describes some funding sources which may have the potential for addressing annual funding deficits for the San Fernando Valley East-West alternatives. MTA has identified five potential revenue sources that would generate approximately $220 million (FY1997 dollars) annually in Los Angeles County. These sources include:

- ¼-cent countywide general sales tax;
- 6-cent per gallon statewide fuel tax;
- Additional 4% statewide sales tax on fuel;
- ⅓-cent per mile vehicle use fee.

Implementation of any of these new funding sources would require legislation at the state and/or local level.

7-9 TRADE-OFFS/SUMMARY

Each of the San Fernando Valley alternatives has its own set of merits and disadvantages. The following discussion is organized according to two methods: (1) by goal, summarizing which alternatives best address each goal; and (2) by alternative, summarizing each alternative's relative strengths and weaknesses. As stated at the beginning of this chapter, no attempt is made to provide an overall ranking or single index combining all measures. The community and its decision-makers can apply their own values in weighing the importance of the various measures and selecting a locally-preferred investment strategy.

7-9.1 Summary by Corridor Goal

Mobility Goal. The strongest performers for the mobility goal are the alternatives related to the Red Line: Alternative 1a through 1d, Alternative 2 and Alternative 11. These alternatives offer the greatest potential for ridership and travel time savings. LRT Alternative 6 provides best access for zero-car households because, by penetrating the west valley, it is able to provide new access at several stations. The TSM Alternative is not able to offer the same degree of mobility benefits as the rail alternatives.

Land Use & Development Goal. All rail alternatives are considered superior to the TSM Alternative since the rail alternatives are able to better reinforce the transit-related centers identified in the General Plan and Community Plans.
Local Consensus Goal. While no conclusions can be made before public review for the MIS

process is completed, past local involvement has led to favoring a Red Line subway alternative; Alternatives 1a, 1b and 1c all fit this definition. Concerns have been raised in the past over aerial structure, which occurs in Alternative 1d; and at-grade rail operations which occurs in Alternative 6 and 11. Alternative 2 (Oxnard) and Alternative 11 (dual mode) have not had adequate community feedback since these options have been developed for the MIS evaluation.

Community Impacts Goal: In this category, the TSM Alternative is superior; since it does not require construction of fixed facilities, community impacts are minimal. Among rail alternatives, very little distinction occurs because any significant impacts that may have been identified for an alternative have been reduced to insignificant levels through mitigation. The main distinction is the visual/aesthetic impact which remains for an aerial structure (Alternative 1d) and the addition of poles and catenary wires for at-grade rail (Alternatives 6 and 11).

Cost-Effectiveness Goal. No one alternative performs uniformly as the strongest among the five measures evaluating cost-effectiveness.

- The lowest cost options are Alternatives 1d and 11; the additional vehicle cost for dual mode vehicles in Alternative 11 offsets the savings (compared to 1d) for more at-grade construction.

- For cost-effectiveness indices based on net cost per new rider, the TSM alternative performs the strongest. Alternative 6 (LRT) performs the worst.

- In terms of passenger-trips per vehicle mile, passenger-miles per vehicle mile, and system operating cost per passenger mile, Alternative 6 (LRT) performs the best.

- For rail operating cost per vehicle mile, the Red Line alternatives (Alternative 1a-1d, 2 and 11a) perform the best.

7-9.2 Summary by Alternative

TSM Alternative: This alternative is the most effective in terms of attracting new riders at a minimal cost of $1.66 per new rider (compared with costs ranging from $14 to $77 per new rider for rail alternatives). The increased bus service is estimated to attract 14,000 daily new riders to transit. The environmental impacts would be minimal. While it performs well in terms of cost-effectiveness, the TSM Alternative does not offer as significant of an impact on travel time savings, and because it does not provide new stations does not increase accessibility to zero-car households. The TSM Alternative is also less successful than the rail alternatives in reinforcing focal points for transit-related land uses.

Alternative 1 - Red Line Extension - SP : There are four different profile options under Alternative 1. All options perform well in terms of ridership and travel time savings. Rail operating cost per vehicle mile also performs well. The following distinctions between the Alternative 1 options are summarized below.

- Alternatives 1a, 1b, and to an extent 1c have a history of local support.

- Alternative 1d is the least expensive of all the rail alternatives. This alternative has the best net cost per new rider of the Red Line alternatives. However, it has the greatest potential of the Red Line alternatives for significant visual/aesthetic impacts since it involves aerial structure.

Alternative 2 - Red Line Extension - Oxnard: This alternative has the greatest travel time savings of all alternatives and is expected to attract the most ridership (19,000 more daily trips than the TSM Alternative). Its capital cost is one of the highest of the East Valley rail alternatives, but because of its strong ridership potential has one of the best incremental costs per new rider of the rail alternatives. Since it has been introduced only recently, it has not had the extent of community input as most of the other alternatives.

Alternative 6 - Light Rail - SP: This alternative is the only option evaluated which provides rail service to the West Valley. It has the largest rail service area, and performs well in most measures of system efficiency. The capital cost is the highest of the rail alternatives, while the operating cost is the lowest. The annualized capital and operating cost of $108 million is 25% more than for Alternative 1a, but it provides 14 new rail stations instead of only four for the Red Line extension alternatives. The forecast ridership is lower than the other rail options. This, combined with the higher cost of a cross-valley system, results in the worst cost-effectiveness value. However, this index may overstate the difference among the alternatives, since much of the new ridership for the rail options to I-405 comes from complementary bus improvements. The LRT option also has the unique advantage of a possible eastern extension, serving additional destinations in Burbank, and connecting with Metrolink and other possible new rail lines. This option historically has drawn considerable community concerns because it is predominantly at-grade.

Alternative 11 - Red Line - Dual Mode: This alternative uses a dual mode vehicle along an alignment similar to Alternative 1. Because it has the same operating characteristics as Alternative 1, this alternative also performs well in terms of ridership and travel time savings. It also has a relatively low net cost per new rider among the rail alternatives. The dual mode option requires a significant adjustment to operating procedures, since it introduces a second type of vehicle to the Red Line. Operations and maintenance will have to ensure that the correct type of vehicles are assigned to specific trains.

CHAPTER 8

COMMENTS AND COORDINATION

CHAPTER 8: COMMENTS AND COORDINATION

8-1 PUBLIC AND AGENCY OUTREACH

8-1.1 Objectives

The approach for developing a Public Involvement Program was focused on the following key objectives:

- Creating a legitimate, defensible, public involvement process that allows all those with a relevant stake in the Major Investment Study/Environmental Impact Statement/Supplemental Environmental Impact Report (MIS/EIS/SEIR) an opportunity to participate in its development.
- Identifying, cataloging, and responding to issues of concern to the public with regard to the MIS/EIS/SEIR to identify potential mitigations where appropriate.
- Managing the public involvement program in a manner that maximizes public support for the planning process.

8-1.2 Activities

a. Stakeholder Identification

Through the public involvement program, individuals, community organizations, businesses, homeowner groups, business groups, and officials that might be affected by or have an interest in the San Fernando Valley East - West Transportation Study were identified. All stakeholders were added to the project database, which to date contains over 1,200 names.

b. Stakeholder Outreach

Meetings have been conducted with various stakeholders throughout the San Fernando Valley to inform them of the study, elicit their feedback, and identify issues of concern. Following is summary list of all meetings held to date:

1. Valley Wide Transportation Council	September 12, 1995
2. Staff of Councilman Wachs	September 28, 1995
3. Staff of Councilman Feuer	October 3, 1995
4. Councilwoman Chick and Staff	October 5, 1995
5. VICA - Transportation Committee	October 10, 1995
6. Staff of Councilman Ferraro	October 10, 1995
7. Staff of Supervisor Yaroslavsky	October 12, 1995
8. Councilman Braude and Staff	October 16, 1995
9. Staff of Supervisor Antonovich	October 26, 1995
10. Public Scoping Workshop, Reseda	November 7, 1995
11. Resource & Regulatory Agency briefing	November 8, 1995
12. Interagency Management Committee briefing	November 8, 1995
13. Staff of Congressman Beilenson	November 13, 1995

14. Public Scoping Workshop, Sherman Oaks	November 14, 1995
15. Staff of Assemblywoman Kuehl	November 16, 1995
16. Staff of Assemblywoman Friedman	November 20, 1995
17. Valley Wide Transportation Council	November 27, 1995
18. Van Nuys Station Siting Workshop	December 7, 1995
19. Councilwoman Chick's CRA Advisory Committee	December 14, 1995
20. President and Staff of Valley College	December 21, 1995
21. Studio City Residents Association	January 9, 1996
22. Warner Center Associates	January 16, 1996
23. Rabbis Eidlitz & Stepen, Emek Hebrew Academy	January 17, 1996
24. Studio City Chamber of Commerce	January 18, 1996
25. Staff of Supervisor Antonovich	January 18, 1996
26. Staff of Councilman Feuer	January 19, 1996
27. VICA Executive Staff	January 22, 1996
28. Cameron Woods Homeowners Association - Board	January 22, 1996
29. Valley College Station Siting Workshop	January 23, 1996
30. Rabbi Sugarman, Shaarey Zedek	January 29, 1996
31. Staff of Supervisor Yaroslavsky	January 30, 1996
32. VICA Transportation Committee	February 4, 1996
33. Rabbi Rothblum, Adat Ari El	February 6, 1996
34. Reseda Chamber of Commerce	February 8, 1996
35. Mayor Riordan's San Fernando Valley Staff	February 14, 1996
36. Rabbi Kaufman, Temple Beth Hillel	February 20, 1996
37. Sepulveda Station Siting Workshop	February 27, 1996
38. Canoga Park Merchants	February 28, 1996
39. Staff of Mayor Riordan	February 29, 1996
40. Valley Wide Transportation Council	March 4, 1996
41. Pierce College Community Advisory Committee	March 5, 1996
42. San Fernando Valley Representatives	March 6, 1996
43. Rabbi Aben, Chabad of North Hollywood	March 11, 1996
44. Rabbi Block, Aish Ha Torah	March 11, 1996
45. North Hollywood Homeowners Association	March 11, 1996
46. Councilman Michael Feuer and Staff	March 15, 1996
47. Winnetka Chamber of Commerce	March 18, 1996
48. Staff of Mayor Riordan	March 19, 1996
49. Sherman Oaks Homeowners Association	March 20, 1996
50. Valley Wide Transportation Council	April 10, 1996
51. VICA Executive Staff	April 24, 1996
52. Staff of Supervisor Antonovich	April 25, 1996
53. Valley Jewish Federation/JCRC	May 1, 1996
54. Staff of Supervisor Yaroslavsky	May 3, 1996
55. Staff of Mayor Riordan	May 3, 1996
56. Councilwoman Laura Chick and staff	May 3, 1996
57. San Fernando Valley Economic Alliance	May 6, 1996
58. Staff of Councilman Michael Feuer	May 6, 1996
59. Staff of Supervisor Antonovich	May 7, 1996
60. Staff of Councilman Braude	May 8, 1996
61. VICA Transportation Committee	May 9, 1996
62. Rabbi Sugarman, Shaarey Zedek	May 13, 1996
63. Valley Wide Transportation Council	May 14, 1996
64. LADOT Transit Coordination Task Force	May 21, 1996
65. Staff of Assemblywoman Kuehl	June 11, 1996
66. Woodland Hills Homeowners Assn. Bd. of Directors	June 13, 1996
67. Woodland Hills Chmbr. of Commerce, Transp. Cttee.	June 26, 1996
68. Staff of Valley Cities Jewish Cmty. Center (JCC)	July 9, 1996
69. Valley Cities JCC Board of Directors	July 10, 1996
70. Management of Valley Plaza	July 18, 1996

71.	Tarzana Chamber of Commerce	July 18, 1996
72.	Woodland Hills Chamber of Commerce	August 20, 1996
73.	VICA Transportation Committee	August 21, 1996
74.	Ownership of Laurel Plaza	August 27, 1996
75.	Emmanuel Lutheran Church/Laurel Hall School	September 12, 1996
76.	Reseda Chamber of Commerce	September 17, 1996
77.	Staff of Councilman Feuer	September 18, 1996
78.	Winnetka Optimist Club	October 3, 1996
79.	VICA - Transportation Committee	October 9, 1996
80.	Ownership of Laurel Plaza	October 22, 1996
81.	Laurel Canyon/Oxnard Street Station Siting Workshop	October 23, 1996
82.	Staff of Supervisor Yaroslavsky, Councilman Feuer and Mayor Riordan	November 1, 1996
83.	Developer of Laurel Plaza	November 6, 1996
84.	VICA - Transportation Committee	January 21, 1997
85.	Assemblyman Robert Hertzberg and Staff	January 24, 1997
86.	Rabbis Eidlitz and Stephen, Emek Hebrew Academy	February 19, 1997
87.	Rabbi Aben, Chabad of North Hollywood	February 19, 1997
88.	Councilman Mike Feuer and Staff	February 19, 1997
89.	Lori Dinkin and Marc Woersching, Valley Village Homeowners Association	February 21, 1997
90.	Barbara Firestone, the H.E.L.P. Group	February 21, 1997
91.	Irene Fraenkel, Valley Village Senior Apartments	February 21, 1997
92.	Rabbi Rothblum, Adat Ari El	February 24, 1997
93.	Rabbi Sugarman, Shaarey Zedek Congregation	February 24, 1997
94.	Jack Mayer, San Fernando Valley Jewish Federation Barbara Creme, Jewish Community Relations Committee	February 25, 1997
95.	Congressman Howard Berman	March 3, 1997
96.	VICA Transportation Committee	March 13, 1997

c. Hotline

A telephone hotline has been used to provide the public with immediate access to accurate, up-to-date information. The hotline briefly describes the planning process and the opportunities for public involvement. Callers have the option of either leaving their name and address so they can receive additional information by mail or leaving a detailed message so that a staff member can follow-up on their inquiries.

d. Station Siting Workshops

Small workshops have been conducted with various stakeholder groups that might potentially be located adjacent to proposed transit station locations along the corridor study area. At these workshops, community members commented on possible station designs and planning issues related to the stations.

Following is a list of the workshops held at potential station sites:

Van Nuys Station	December 7, 1995
Valley College Station(s)	January 23, 1996
Sepulveda Station	February 27, 1996
Laurel Canyon/Oxnard Station	October 23, 1996

e. Update Mailing

At the initiation of the study, a letter to homeowner and business groups throughout the San Fernando Valley was mailed to over 2,000 addresses. The letter updated stakeholders about important milestones and the status of the study process. The letter contained information on important decisions made by the MTA Board regarding the study, the names and telephone numbers of whom to contact, and information on how to access the hotline number. The mailing encouraged everyone's participation and feedback.

8-2 NOTICE OF INTENT/NOTICE OF PREPARATION

The federal Notice of Intent (NOI) was on issued October 15, 1995, and was published in the Federal Register on October 24, 1995 (Vol. 60 No. 205). The NOI announced the Federal Transit Administration's intent to prepare an Environmental Impact Statement in accordance with federal environmental law. It included information on the project background, the alternatives, the MIS process, Federal Transportation Administration (FTA) procedures, scoping meetings to be held, and contacts and sources of further information. The comment period closed on November 20, 1995.

The State of California Notice of Preparation (NOP) announcing the MTA's intent to prepare an SEIR was mailed on October 24, 1995. Like the NOI, the NOP described the proposed project and requested input from agencies, organizations, and individuals. The alternatives and anticipated effects were briefly described. The comment period closed on November 20, 1995. The State Clearinghouse designated this as project No. 95101050. Responses to the NOI and NOP are discussed below.

8-2.1 Public Scoping Activities

The official public comment period began on October 24, 1995 and ended on November 24, 1995. The comments that follow below only address those issues raised during the scoping period and at the two public scoping workshops that were held.

a. Public Scoping Workshops

During the public comment/scoping period, two public scoping workshops were held to discuss the project with the public.

1. West Valley Scoping Workshop: Reseda Senior Service and Resource Center, 18255 Victory Boulevard — November 7, 1995
2. East Valley Scoping Workshop: Sherman Oaks Woman's Club, 4808 Kester Avenue — November 14, 1995

Multiple means were used to invite the public to the workshops. Approximately 1,700 invitations were mailed to key individuals and organizations that had been identified by the MTA through an earlier study and by Consensus Planning Group. Two display advertisements announcing the start of the study process and the workshops were placed in *The Los Angeles Times* and *La Opinion*, the predominant Spanish language newspaper in Los Angeles. A calendar of events issued to announce the workshops resulted in a calendar item in the *Daily News*. The MTA informed numerous local organizations and elected officials' offices of the workshops in meetings preceding the workshops. Immediately prior to the workshops, approximately 25 homeowner associations, chambers of commerce, and other community organizations were contacted by phone to encourage their members' participation.

A total of 106 people attended the 2 workshops: 41 in Reseda and 65 in Sherman Oaks. Attendees submitted a total of 35 written comments: 15 in Reseda and 20 in Sherman Oaks. Additionally, four comment sheets were submitted after the workshops. The following discussion summarizes the written comments received and observations frequently shared by project team members about attendees' questions and comments.

b. Summary of Comments

(1) Overall Theme

The hallmark of the workshops was the participants' apparent acceptance that a rail line would be built in the San Fernando Valley. In the past, public hearings often included many speakers who spoke against building public transit using rail technology in the San Fernando Valley. In the workshops, there was virtually no outright opposition to the proposed rail transit line itself. Given the project's long and controversial history, this lack of opposition was particularly remarkable to some project team members. The absence of opposition could be interpreted in a number of ways. These included the possibility that participants accepted the rail line as inevitable, or believed it would never be built and therefore did not feel the need to voice strong opposition, or were potentially supportive.

(2) Alignments

Workshop participants' greatest interest was the corridor's potential alignments. More questions and comments were received on the possible alignments than any other topic. From these comments, no clear support for Chandler vs. Oxnard or Topham/Victory vs. Sherman Way was demonstrated. Instead, participants generally seemed to oppose the alignment nearest their home and favor the one farther away.

East Valley - Chandler vs. Oxnard: Participants who favored the Chandler alignment characterized the alignment as "what people expect, don't mess around with it now." Some also commented that it would be less costly because the MTA already owns the Chandler right-of-way, which it does not on Oxnard.

Workshop attendees who favored the Oxnard alignment believed it would draw a larger ridership than the Chandler alignment. Proponents emphasized that the Oxnard line would serve the retail centers at Valley Plaza and Laurel Plaza and generally cater to the more commercial area along Oxnard, rather than the more residential area along Chandler.

West Valley - Topham/Victory vs. Sherman Way: Participants who preferred the Southern Pacific Burbank Branch right-of-way (SP ROW), also known as the Topham/Victory alignment, in the West Valley, believed the alignment would be more cost-effective and less difficult to build than the Sherman Way alignment because the MTA already owns the existing right-of-way. Favorable comments also maintained that the SP ROW choice would have minimal effect on bordering properties, ease traffic congestion on Victory Boulevard, and enhance future business opportunities around Warner Center.

Those who preferred the Sherman Way alignment asserted that ridership would be higher on that route and it would serve the business community better than the SP ROW alignment. Some participants were also drawn to the possibilities for economic revitalization along Sherman Way that the rail might bring, including an appreciation in commercial real estate values. Others commented that construction impacts would be more tolerable in the Sherman Way business community than in the Topham/Victory residential community.

A petition opposing the Sherman Way alignment was also received at the workshops. Signed by 105 people, it "implored" the MTA and other entities to choose the SP ROW route, and stated in part that "...to change the route now would be a tremendous waste of...tax payer's money and impose extreme and needless hardships on those living along the proposed alternate route including unacceptable noise, congestion and decline in property value." It should be noted that the Sherman Way alignment was formally dropped from further consideration by the MTA Board of Directors on May 22, 1996.

(3) Technology

Compared to the number and depth of comments on the alignment choices, there were few comments on technology options. The small number of comments that were received included arguments for maintaining the same technology across the entire Valley, on the assumption that a change in mode would reduce ridership. A few participants also believed that any at-grade option would worsen traffic congestion, thereby defeating the purpose of the corridor, and led a couple of people to recommend an aerial profile. A small number also commented that subway was too expensive. In general, the alignment alternatives and technology alternatives seemed to be too closely intertwined in attendees' views to allow them to be differentiated.

(4) Community and Neighborhood Impacts

Crime: Few people commented directly on crime as a potential impact, although one participant believed that a rail line would bring strangers to the neighborhood and asked if there was a correlation between increased crime and subways.

Environmental Issues: Very few concerns were expressed about general environmental impacts. A small number of participants commented that a subway would cause more harm to the environment than at-grade rail. A small number also asked about what protections Sepulveda Basin would have from a rail line.

Noise and Vibration: Participants commented on noise and vibration impacts more than any topic other than alignments. There appeared to be roughly equal concern for these impacts, both during construction and later during actual operation of the line. Attendees were particularly concerned about how dramatic an impact noise and vibration would have on residential areas.

Safety: A few participants expressed concern about the safety of at-grade alternatives, especially in residential areas and at intersections.

Traffic and Parking: Many attendees commented that the current traffic situation in the Valley would improve if a rail line were available. Some were generally concerned, however, about how traffic flow patterns might change due to the line, both during construction and once operations began. There were specific questions about whether traffic around stations would increase and whether parking would spill over into neighborhoods around stations.

(5) Suggestions and Requests

Some participants offered specific suggestions on enhancing the East-West rail line. A few people recommended that the MIS/EIS/SEIR include an analysis and discussion of incorporating the MTA "Greenways Plan" throughout the corridor. Some attendees suggested that the plans consider improvements such as a park, horse path, or bikeway. One participant suggested that the transit corridor should extend west into Ventura County to serve the Ahmanson Ranch development, and that Ventura County should be asked to help fund the extension.

One attendee requested that a variation of the Oxnard alignment be studied. The variation would be a "shift in the alignment a quarter mile north to Erwin Street for the first mile west of Lankershim Boulevard with a station at Laurel Canyon Boulevard and Erwin Street. West of Laurel Canyon Boulevard the alignment would return to Oxnard Street."

(6) General Comments

Some attendees expressed appreciation for the opportunity to obtain information and provide feedback on the project. A few people specifically commented that the workshop format was good because it enabled them to focus on the issues that most interested them.

A few participants were still in favor of the Ventura Freeway alignment because they felt it would serve the businesses and community along Ventura Boulevard.

There were several complaints regarding the MTA in general. Of these complaints, most were from attendees who were angry that the MTA was spending additional money to study the East-West line, after the many years of study that had already taken place.

8-2.2 Agency Coordination

a. Responses to NOP/NOI

A summary of the responses received appears as Appendix G. These ranged from "no comment" to suggestions for additional alternatives to be studied and methodologies for analysis.

b. Interagency Management Committee

The Interagency Management Committee was formed to provide a forum for obtaining comments, concerns, and direction from interested agencies. Its members are listed in Table 8-1. This committee met on November 8, 1995, discussed the project description, and offered comments on the alternatives to be included in the study.

c. Resource and Regulatory Agencies

The Resource and Regulatory Agency Group was established to provide a forum for obtaining comments, concerns, and direction from agencies having regulatory interest in the project. Its members are also listed in Table 8-1. This committee met on November 8, 1995, and discussed the project description, the alternatives under consideration, and the NOP.

Table 8-1: San Fernando Valley East-West Transportation Corridor Coordination List

Interagency Management Committee
Metropolitan Water District of Southern California
Los Angeles County Department of Health Services
Los Angeles County Department of Public Works
Los Angeles County Flood Control District
Los Angeles County Department of Regional Planning
City of Los Angeles, Bureau of Engineering
City of Los Angeles, Bureau of Sanitation
City of Los Angeles, Community Redevelopment Agency
City of Los Angeles, Department of Recreation and Parks
City of Los Angeles, Department of Transportation
City of Los Angeles, Department of Water and Power
City of Los Angeles, Fire Department
City of Los Angeles, Planning Department
City of Los Angeles, Police Department, Van Nuys Division
City of Los Angeles, Police Department, North Hollywood Division
City of Los Angeles, Police Department, West Valley Division
Los Angeles Unified School District
City of Burbank, Department of Transportation
City of Calabasas, Department of Transportation
City of Hidden Hills, Department of Transportation
City of Los Angeles, Office of the Chief Legislative Analyst
City of Los Angeles, Office of the Mayor
Resource & Regulatory Agency Group
Federal Transit Administration
Federal Highway Administration
U.S. Environmental Protection Agency
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
State of California, Department of Conservation
State of California, Regional Water Quality Control Board
State of California, Department of Fish and Game
Southern California Association of Governments
South Coast Air Quality Management District
Caltrans (California State Department of Transportation)

APPENDICES

Appendix A
List of Parties Receiving Copies of the Environmental Document

APPENDIX A: LIST OF PARTIES RECEIVING COPIES OF THE ENVIRONMENTAL DOCUMENTS

FEDERAL AGENCIES

Federal Transit Administration
Federal Highway Administration
U.S. Environmental Protection Agency
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
Department of the Interior, Office of Environmental Affairs
Federal Emergency Management Agency
Department of Health and Human Services
Department of Housing and Urban Development
Department of Energy
Federal Railroad Administration
US Department of Transportation, Environmental Division
Advisory Council on Historic Preservation

STATE AGENCIES

Department of Conservation
Department of Fish and Game
Regional Water Quality Control Board
California Department of Transportation
Los Angeles Unified School District
California Department of Housing and Community Development
State Clearinghouse, Office of Planning and Research
Office of Historic Preservation, California Parks and Recreation Department
California Air Resources Board
Division of Mining and Geology
California Department of Parks and Recreation
California Public Utilities Commission
California Department of Health Services
Native American Heritage Commission
State Lands Commission
California Energy Resources Commission
California Department of Education
California Department of General Services
California Department of Water Resources
California Joint Legislative Audit Committee
California Office of Public Assistance, State Clearinghouse

STATE AGENCIES, cont'd.

California Resources Agency
State Library, Government Publications Section
California Transportation Commission
Los Angeles Community College District

REGIONAL AGENCIES

Southern California Association of Governments
South Coast Air Quality Management District
Metropolitan Water District of Southern California
Southern California Gas Company

LOS ANGELES COUNTY

Department of Health Services
Department of Public Works
Los Angeles County Flood Control District
Department of Regional Planning
District Attorney
Chief Administrative Officer
Superintendent of Schools
County Clerk
Department of Community and Senior Citizens Services
Assessor
Sheriff
Library Department
Parks and Recreation Department
Public Social Services Department
Regional Planning Commission
Sanitation District

CITY OF LOS ANGELES

Bureau of Engineering
Bureau of Sanitation, Wastewater Treatment Management
Community Redevelopment Agency
Department of Recreation and Parks
Department of Transportation
Los Angeles Public Library
Department of Water and Power
Fire Department
Planning Department
Police Department

Social Services Department
Housing Authority
Environmental Affairs Commission
Department of Airports
Cultural Heritage Commission
Cultural Affairs Department
Community Development Department
Building and Safety Department
City Clerk
Office of the Chief Legislative Analyst

OTHER CITIES/AGENCIES

City of Burbank
City of Calabasas
City of Hidden Hills
Ventura County Transportation Commission

ELECTED OFFICIALS

Richard Riordan, Mayor of the City of Los Angeles
City of Los Angeles City Attorney

City of Los Angeles Council Members:

Council Member Joel Wachs, 2nd District
Council Member Laura Chick, 3rd District
Council Member John Ferraro, 4th District
Council Member Michael Feuer, 5th District
Council Member Richard Alarcon, 7th District
Council Member Marvin Braude, 11th District
Council Member Hal Bernson, 12th District

County of Los Angeles Board of Supervisors:

Supervisor Zev Yaroslavsky, 3rd District

California State Assembly Members:

Assembly Member Tom McClintock, 38th District
Assembly Member Tony Cardenas, 39th District
Assembly Member Robert M. Hertzberg, 40th District
Assembly Member Sheila Kuehl, 41st District
Assembly Member Wally Knox, 42nd District

California State Senate:

Senator Cathie Wright, 19th District
Senator Herschel Rosenthal, 20th District
Senator Adam Schiff, 21st District
Senator Tom Hayden, 23rd District

U.S. House of Representatives:

Congressman Brad Sherman, 24th District
Congressman Howard Berman, 26th District
Congressman Henry Waxman, 29th District

U.S. Senate

Senator Barbara Boxer
Senator Diane Feinstein

COMMUNITY GROUPS

National Audobon Society
Sierra Club

In addition, copies of the Executive Summary of the Draft MIS/EIS/SEIR are being sent to over 90 other community groups.

OTHERS

Universal Studios
YMCA
CBS Studios
Friends of Sepulveda Basin
Warner Center Association
Veterans Hospital

Appendix B
List of Preparers

APPENDIX B: LIST OF PREPARERS

LEAD AGENCY

MTA

- James de la Loza, Executive Officer, Regional Transportation Planning & Development
- Robert Cashin, Deputy Executive Officer
- Renee Berlin, Director, San Fernando Valley/North County Area Team
- David Mieger, AICP, MTA Project Manager

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- Greg Williams, Assistant Planner
- Richard Starzak, Architectural Historian
- Francesca Smith, Architectural Historian
- Linda Weston, Technical Editor

Gruen Associates: Land Use, Visual & Aesthetics

- John Stutsman, AICP, Consultant Team Project Director
- Walker Wells, Senior Planner/Urban Designer
- Angie Coyier, Urban Planner
- Tim McCormack, ASLA, Senior Landscape Architect
- Robert Glennie, CAD Drawings
- Eve Meng, Graphic Designer
- Moon Empig, Assistant Planner
- Michelle Ball, Technical Editor

Meyer Mohaddes Associates: Traffic, Transportation & Parking

- Michael Meyer, Principal-in-charge
- Viggen Davidian, Project Manager
- Ian Pari, Senior Project Engineer
- David Chow
- Theresa Dau
- Nicole Walker
- Jwalin Champaneria

Manuel Padron & Associates: Alternatives Evaluation and Financial Feasibility

- Manuel Padron, Principal-in-charge
- Bruce Emory, Senior Associate
- Susan Rosales, Senior Associate
- Dennis Markham, Associate

Terry A. Hayes Associates: Air Quality, Energy

- Terry A. Hayes, Principal
- Walt D. Lauderdale, Jr., Assistant Planner
- Minh Q. Thai, Assistant Planner

Harris Miller Miller & Hanson: Noise & Vibration

- Hugh Saurenman, Principal Consultant
- Yuki Kamura, Senior Consultant
- Kristy Grace, Consultant
- Lance Meister, Consultant

Law/Crandall: Geology

- Paul Elliot, Principal Engineering Geologist
- Susan Franzen, Senior Engineering Geologist

De Leuw, Cather and Company: Safety & Security, Construction Methods

- Arthur Lohrmann, Senior Project Engineer
- Dave Mansen, Transit Planning Manager

Appendix C
List of Persons and Agencies Consulted

APPENDIX C: LIST OF PERSONS AND AGENCIES CONSULTED

Aaron Allen, Project Manager, Regulatory Branch, U.S. Army Corps of Engineers

Calabasas Historical Society

Cameron Bauer, P.E, Senior Planner, Bay Area Rapid Transit District

Pat Bowie, President, Los Angeles City Historical Society

Ken Bernstein, Planning Deputy, Councilwoman Laura Chick's Office, Council District 3

California Preservation Foundation, Acting Executive Director

David G. Cameron, Chairperson, Los Angeles County Historical Landmarks and Records Commission

Campo de Cahuenga Memorial Association

Canoga Park Chamber of Commerce

Joan Chaplick, National Park Service

Benjamin Chan, City of Los Angeles Department of Transportation

Xueming Chen, LACMTA Countywide Planning

Stewart Chesler, LACMTA Countywide Planning

Shirley Chu-Nealy, City of Los Angeles Department of Water and Power, Underground Transmission Group

City of Los Angeles, Cultural Affairs Department

David Cole, South Coast Air Quality Management District, Planning and Policy

Elizabeth Culhane, City of Los Angeles Department of Transportation

Linda Dishman, Executive Director, Los Angeles Conservancy

Tom Henry, Planning Deputy, Councilman Joel Wach's Office, Council District 2

Historical Society of Southern California

Henry Hogo, South Coast Air Quality Management District, Planning and Policy

Lyman Jaung, Principal Accountant, Los Angeles County Hall of Administration

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Keith Killough, Deputy Executive Officer, LACMTA Regional Transportation Planning & Development

Leslie Lambert, Planner, City of Los Angeles Community Redevelopment Agency

Deng Bang Lee, LACMTA Countywide Planning

Illeana Liel, Senior Planner, City of Los Angeles Community Redevelopment Agency

Henry Liu, LACMTA Construction Cost Estimating

Jeff Long, California Air Resources Board, Motor Vehicle Analysis Section

Michael McCone, Executive Director, California Historical Society

Debbie Nelson, Research Analyst, California State Board of Equalization

Ron Mabin, Planner, City of Los Angeles, Department of City Planning

Deborah Murphy, Associate AIA, City of Los Angeles Department of City Planning

Rudy Ortega, Native American—Gabrieliño/Fernandeño

Silva Pasqua, Accountant III, Los Angeles County Hall of Administration

Simon Pastucha, Planning Deputy, Councilman Mike Feuer's Office, Council District 5

Vahan Pezeshkian, City of Los Angeles Department of Transportation

Reseda Chamber of Commerce

Vera Rocha, Native American—Gabrieliño

San Fernando Valley Historic Site Commission

Carol Silver, LACMTA Operations Planning

Society of Architectural Historians/Southern California Chapter, Historic Preservation Officer

Scott Stonestreet, Hydraulic Engineer, Hydrology and Hydraulics Branch, U.S. Army Corps of Engineers

Doug Thompson, California Air Resources Board

Van Nuys Chamber of Commerce

Haripal Vir, City of Los Angeles Department of Transportation

Carol Washburn, Woodland Hills Chamber of Commerce

Appendix D
Bibliography

APPENDIX D: BIBLIOGRAPHY

Abler, R., J.S. Adams, and P. Gould. *Spatial Organization: The Geographer's View of the World.* Prentice-Hall. Englewood-Cliffs. 1971.

American Public Transit Association. *Employment Impacts of Transit Capital Investment and Operating Expenditures.* Washington, D.C. April 1, 1983.

Anderson, John G., and Luco, J. Enrique. *Consequences of Slip Rate Constraints on Earthquake Occurrence Relations.* Bulletin of the Seismological Society of America, Vol. 73, No. 2, p. 471-496. 1983.

Arnold, J. *Craft Specialization in the Prehistoric Channel Islands, California.* University of California Publications in Anthropology 18. Berkeley. 1987.

Bancroft, H.H. *History of California, Vol. 1, 1542-1800.* Wallace Hebberd. Santa Barbara. 1963.

Barrows, A.G. *A Review of the Geology and Earthquake History of the Newport-Inglewood Structural Zone, Southern California.* California Division of Mines and Geology Special Report 114. 1974.

Barrows, D.P. *Ethno-Botany of the Cahuilla Indians.* University of Chicago. Chicago. 1900.

Bay Area Rapid Transit District. *Visual Resources Technical Report, Bay Area Rapid Transit District Dublin/Pleasanton Extension Project.* September 1989.

Bean, L.J. *Mukat's People: The Cahuilla Indians of Southern California.* University of California. Berkeley. 1972.

Bean, L.J. and K.S. Saubel. *Temalpakh: Cahuilla Indian Knowledge And Usage Of Plants.* Malki Museum. Morongo. 1972.

Bean, L.J. and C.R. Smith. (R.F. Heizer, ed.) Gabrieliño. In *Handbook of the Indians of North America,* Volume 8: California. Smithsonian Institution. Washington D.C. 1978.

Benedict, R. *A Brief Sketch of Serrano Culture.* American Anthropologist, Volume 24. 1924.

Bishop, K. and Tandy, L. *Ground Failure During the 1994 Northridge Earthquake, Field Trip Guidebook.* Association of Engineering Geologists. 1995.

Bishop, R.J., 1950, *Geology of the Southern Flank of the Santa Susana Mountain.* University of California, Los Angeles, unpublished M.A. Thesis, p. 115. 1950.

Blake. *FRISKSP, A Computer Program for Probabilistic Estimation of Peak Acceleration and Uniform Hazard Spectra Using 3-D Faults as Earthquake Sources.* 1995.

Bolt, B.A. *Duration of Strong Ground Motion.* Proceedings, Fifth World Conference on Earthquake Engineering. 1973.

Bolton, H.E. *Fray Juan Crespi: Missionary Explorer on the Pacific Coast, 1769-1774.* AMS Press. New York. 1971.

Boneau Companys, F. (translated by. A. Brown). *Gaspar de Portola: Explorer and Founder of California Lerida.* Instituto de Estudios Ilerdenses. Spain. 1983.

Boore, D.M., Joyner, W.B., and Fumal, T.E. *Estimation of Response Spectra and Peak Accelerations from Western North American Earthquakes: An Interim Report, Part 2.* U.S. Geological Survey Open File Report 94-127. 1994.

Boore, D.M., Joyner, W.B., and Fumal, T.E. *Estimation of Response Spectra and Peak Accelerations from Western North American Earthquakes: An Interim Report.* U.S. Geological Survey Open File Report 93-509. 1993.

Brandes, R. *The Costanso Narrative of the Portola Expedition: First Chronicle of the Spanish Conquest of Alta California.* Hogarth Press. Newhall. 1970.

Brown, A.K. *The Aboriginal Population of the Santa Barbara Channel.* University of California Archaeological Survey Reports (69). 1967.

Cahuilla. R.F. Heizer, ed. In *Handbook of the Indians of North America*, Volume 8: California. Smithsonian Institution. Washington D.C. 1978.

California Department of Fish and Game. *California Natural Diversity Database.* 1996.

California Department of Transportation (Caltrans). Log of Test Borings for 170 Freeway-Chandler Boulevard Overhead, Bridge No. 53-1644. 1961.

California Department of Water Resources. *Watermaster Service in the Upper Los Angeles River Area, Los Angeles County.* Bulletin 181-74. 1975.

California Division of Mines and Geology. *Geologic Effects of the Northridge Earthquake of January 17, 1994 in the Southern Part of the Van Nuys Quadrangle, Los Angeles County, California*. Open File Report 95-02. 1995.

California Division of Mines and Geology. *Guidelines for Geologic/Seismic Considerations in Environmental Impact Reports*. Note 46. 1982.

California Division of Mines and Geology. *Special Studies Zones, San Fernando Ouadrangle, Official Map*. 1976.

California Division of Oil and Gas. *Regional Wildcat Map W1-2*. 1977.

California Institute of Technology. Magnetic Tape Catalog of Earthquakes for Southern California. 1932-1996.

California State Board of Equalization. *Taxable Sales in California (Sales and Use Tax) 1995 Fourth Quarter*.

Cameron, J.S. *Simi Grows Up: The Story of Simi, Ventura County, California*. Anderson, Ritchie and Simon. Los Angeles. 1963.

City of Los Angeles. *City of Los Angeles Business & Other Taxes*. City Clerk's Office of the City of Los Angeles. March 1996.

City of Los Angeles. *City of Los Angeles General Plan Framework*. Adopted December 1996.

City of Los Angeles. *City of Los Angeles Land Use/Transportation Policy*. Adopted November 1993.

City of Los Angeles Department of City Planning. *North Hollywood Plan*. Adopted January 1973.

City of Los Angeles Department of City Planning. *Van Nuys/North Sherman Oaks Plan*. Adopted October 1977.

City of Los Angeles Department of City Planning. *Valley Administrative Center Development Plan*. Adopted July 1958.

City of Los Angeles Department of General Services. *San Fernando Valley Civic Center Revitalization Concept Plan*. June 1996.

City of Los Angeles Department of Recreation and Parks. *Parks-Valley Region*. September 1995.

Converse Ward Davis Dixon. *Geotechnical Report, Metro Rail Project Design Unit A430.* Prepared for Metro Rail Transit Consultants. 1984.

Converse Consultants, Earth Science Associates, Geo-Resource Consultants. *Geotechnical Investigation Report*, Volume I and Volume II, Appendices 1 and 2. Prepared for Southern California Rapid Transit Metro Rail Project. 1981.

County of Los Angeles. *Bike Map.* No Date.

County of Los Angeles. Revised Apportionment Factor File for Fiscal Year 1995-96. Prepared for the Los Angeles County Auditor Controllers Office. December 8, 1995.

County of Los Angeles. *Seismic Safety Element.* 1975, draft revision 1990.

County of Los Angeles. Tax Revenue Distribution File for Fiscal Year 1995-96. Prepared for the Los Angeles County Auditor Controllers Office. January 8, 1996.

County of Los Angeles. *Taxpayers Guide for County of Los Angeles 1995-1996.* Compiled under supervision of Alan T. Sasaki, Auditor Controller.

Crandall, LeRoy and Associates. *Report of Geologic Studies Related to Raymond Fault identification, San Marino High School, San Marino, California.* Prepared for San Marino Unified School District, Job No. E-77186. 1978

Crook, R., Jr., and Proctor, R.J. *The Santa Monica and Hollywood Faults and the Southern Boundary of the Transverse Ranges Province.* Engineering Geology Practice in Southern California. 1992.

Crook, R., Proctor, R.J., and Lindvall, E.I. *Seismicity of the Santa Monica and Hollywood Faults Determined by Trenching.* Technical Report to the U.S. Geological Survey, Contract No. 14-08-001-20253, p. 26. 1983.

Crook, R., Jr., Allen, C.R., Kamb, R., Bayne, C.M., and Proctor, R.J. *Quaternary Geology and Seismic Hazard of the Sierra Madre and Associated Faults of the Western San Gabriel Mountains.* U.S. Geological Survey Professional Paper 1339, Ch. 2, pp. 27-63. 1987.

Crowe, E. *Men of El Tejon: Empire in the Tehachapis.* Ward Ritchie Press. Los Angeles. 1957.

Dibblee, T.W. *Geologic Map of the San Fernando-Van Nuys (North 1/2) Quadrangles, Los Angeles County, California.* 1991.

Dolan, J.F., et al... *Prospects for Larger or More Frequent Earthquakes in the Los Angeles Metropolitan Region, California.* Science, Volume 267, pp. 199-205. 1995.

Dolan, J.F. and Sieh, K. *Paleoseismology and Geomorphology of the Northern Los Angeles Basin: Evidence for Holocene Activity on the Santa Monica Fault and identification of New Strike-Slip Faults through Downtown Los Angeles.* EOS, Transactions of the American Geophysical Union, Vol. 73, p. 589. 1992.

Dumke, G.S. *The Boom of the 'Eighties in Southern California.* Huntington Library. San Marino. 1944.

Earth Technology Corporation. *Geotechnical Investigation for Limited Preliminary Engineering Program, San Fernando Valley East-West Segment, Metro Red Line Project*, Volume I. Prepared for Engineering Management Consultants. 1993.

Eberhart, H. *The Cogged Stones of Southern California.* American Antiquity, (26), 361-370. 1961.

Englehart, Z. *San Fernando Rey: The Mission of the Valley.* Franciscan Herald Press. Chicago. 1927.

Englehart, Z. *The Missions and Missionaries of California*, Volume II: Upper California, (2nd edition, revised). Franciscan Herald Press. Chicago. 1930.

Erlandson, J. *Of Millingstones and Molluscs: The Cultural Ecology of Early Holocene Hunter-Gatherers on the California Coast.* Unpublished Ph.D. dissertation, UCSB. 1988.

Erlandson, J. and R. Colton, eds. *Hunter-Gatherers of Early Holocene Coastal California.* Perspectives in California Archaeology, (1). UCLA. 1991.

Federal Emergency Management Agency. Flood Insurance Rate Map, City of Los Angeles, California, Los Angeles County. Panels 36-38, 41. 1980.

Federal Transit Administration, U.S. Department of Transportation. *Revised Measures for Assessing Major Investments, A Discussion Draft.* September 1994.

Federal Transit Administration, U.S. Department of Transportation. *Transit Noise and Vibration Impact Assessment.* April 1995.

Geiger, M. *Franciscan Missionaries in Hispanic California, 1769-1848: A Biographical Dictionary.* Huntington Library. San Marino. 1969.

Greensfelder, R. W. *Maximum Credible Rock Acceleration from Earthquakes in California.* California Division of Mines and Geology Map Sheet 23. 1974.

Greenwood, R. B. *Regional Geologic Overview of the Los Angeles Basin.* California Division of Mines and Geology Special Publication 116. 1995.

Handbook of the Indians of California. Bureau of American Ethnology, Bulletin 78. Washington, D.C. 1925.

Hart, E. W. *Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zone Maps.* California Division of Mines and Geology Special Publication 42. 1973, revised 1994.

Hauksson, E. *Earthquakes, Faulting, and Stress in the Los Angeles Basin.* Journal of Geophysical Research, Volume 95, No. B10, pp. 15,365-15,394. 1990.

Hauksson, E. *Seismotectonics of the Newport-Inglewood Fault zone in the Los Angeles Basin, Southern California.* Bulletin of the Seismological Society of America, Vol. 77, pp. 539-561. 1987.

Heizer, R.F. ed. Serrano. In *Handbook of the Indians of North America.* Volume 8: California. Smithsonian Institution. Washington D.C. 1978.

Hill, R.L., Sprotte, E.C., Chapman, R.H., Chase, G.W., Bennett J.H., Real, C.R., Borchardt, G., and Weber, Jr. *Earthquake Hazards Associated with Faults in the Greater Los Angeles Metropolitan Area, Los Angeles County, California, Including Faults in the Santa Monica-Raymond, Verdugo-Eagle Rock and Benedict Canyon Fault Zones.* California Division of Mines and Geology, Open File Report 79-16LA. 1979.

Holgun, Fahan and Associates. *Phase I Environmental Assessment of the Burbank Branch of the Southern Pacific Transportation Company Railroad, San Fernando Valley, California.* Prepared for Metro Rail Transit Consultants. 1990.

Holgun, Fahan and Associates. *Phase II Environmental Assessment of the Burbank Branch of the Southern Pacific Transportation Company Railroad, San Fernando Valley, California.* Prepared for Metro Rail Transit Consultants. 1990.

Hooper, L. *The Cahuilla Indians.* University of California Publications in American Archaeology and Ethnology, (6), 315-380. 1920.

Houston, J.R., and Garcia, A.W. *Type 16 Flood Insurance Study: Tsunami Predictions for Pacific Coastal Communities.* U.S. Army Engineer Waterways Experiment Station, Hydraulic Laboratory. 1974.

Idriss, I.M. And Sun,, J.I. *SHAKE91, A Computer Program for Conducting Equivalent Linear Seismic Response Analyses of Horizontally Layered Soil Deposits*. 1992.

Ingram, W.K. *Aliso Canyon Oil Field: summary of Operations, California Oil Fields*. California Division of Oil and Gas, V. 45, No. 1, pp. 65-73. 1959.

Jackson, D.D., et al. *Seismic Hazards in Southern California- Probable Earthquakes, 1994 to 2024*. Seismological Society of America Bulletin Volume 85, Number 2. 1995.

Jennings, C.W. *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions*. California Division of Mines and Geology Map No. 6. 1994.

Jennings, R.A. *Geology of the Southeastern Part of the Oat Mountain Quadrangle and Adjacent Parts of the San Fernando Quadrangle Los Angeles County, California*. University of California, Los Angeles, unpublished M.A. Thesis, p. 105. 1957.

Johnson, K.L. *Site LAN-2: A Late Manifestation of the Topanga Complex in Southern California Prehistory*. Anthropological Records (23). 1966.

Johnston, B.E. *California's Gabrieliño Indians*. Southwest Museum. Los Angeles. 1962.

Jorgensen, L.C., ed. *The San Fernando Valley: Past and Present*. Pacific Rim Research. Los Angeles. 1982.

Kowta, M. *The Sayles Complex: A Late Milling Stone Assemblage from the Cajon Pass and the Ecological Implications of Its Scraper Planes.* University of California Publications in Anthropology, (6). Berkeley. 1969.

Kroeber, A.L. *Ethnography of the Cahuilla Indians*. University of California Publications in American Archaeology and Ethnology, (2), 29-68. 1908.

Lamar, D.L. *Geology of the Elysian Park-Repetto Hills Area, Los Angeles County, California*. California Division of Mines and Geology Special Report 101, p. 45+. 1970.

Landberg, L. *The Chumash Indians of Southern California*. Southwest Museum Papers, (19). Los Angeles. 1965.

Leighton and Associates. *Technical Appendix to the Safety Element of the Los Angeles County General Plan*. Draft Report with Sedway Cooke Associates. 1990.

Leonard, N.N. *Natural and Social Environments of the Santa Monica Mountains (6000 B.C. to 1800 A.D.)*. [UCLA] Archaeological Survey Annual Report 13, 93-136. 1977.

Los Angeles County Metropolitan Transportation Authority. *Fundable Plan of the 30-Year Integrated Transportation Plan.* 1995.

Los Angeles County Metropolitan Transportation Authority. *Los Angeles East Side Corridor Final Environmental Impact Report*, Volume 1. June 1994.

Los Angeles County Metropolitan Transportation Authority. *San Fernando Valley East-West Rail Transit Project - Engineering and Design Technical Report.* October 1989.

Los Angeles County Metropolitan Transportation Authority. *San Fernando Valley East-West Rail Transit Project - SP Burbank Branch Alignment - Extended Metro Rail Solution - Pre-Preliminary Engineering Study.* August 1994.

Los Angeles Design Action Team. *Vision Van Nuys.* October 1988.

Mark, R.K. *Application of Linear-Statistical Models of Earthquake Magnitude Versus Fault Length in Estimating Maximum Expectable Earthquakes.* Geology, Vol. 5., pp. 464-466. 1977.

McIntyre, M.J. (B. Love and W. DeWitt, ed.) *Cultural Resources of the Upper Santa Clara River Valley, Los Angeles and Ventura Counties, California.* Archaeology and Ethnohistory of Antelope Valley and Vicinity. Antelope Valley Archaeological Society Occasional Paper No. 2., 1-20. 1990.

Meighan, C.W. *The Little Harbor Site, Catalina Island: An Example of Ecological Interpretation in Archaeology.* American Antiquity 24. 383-405. 1959.

Metropolitan Transit Development Board. *Visual Quality and Aesthetics Technical Report: Mission Valley East Transportation Improvement Project.* July 1996.

Meyer Mohaddes Associates. *SFV E-W Transportation Corridor MIS Model Technical Background Report.* July 1996.

Mualchin, L. and Jones. *Peak Acceleration From Maximum Credible Earthquakes in California (Rock and Stiff-Soil Sites).* California Division of Mines and Geology Open-File Report 92-1. 1992.

Nadeau, R. *The City-Makers: The Story of Southern California's First Boom.* Trans-Anglo Books. Corona del Mar. 1965

National Cooperative Highway Research Program. *Circular 212 - Interim Materials on Highway Capacity Manual.* 1982

Nelson, Howard J. *The Los Angeles Metropolis*. Kendall/Hunt Publishing Company. Dubuque. 1983.

Office of Statewide Health Planning and Development (OSHPD). *Reconciliation Between OSHPD Review and Seismic Hazards Mapping Approaches to Probabilistic Seismic Hazards Assessments, Division of Mines and Geology*. Status Report dated January 18, 1995.

Poland, J.R., Garrett A.A., and Sinnott, Allen. *Geology, Hydrology, and Chemical Character of Groundwaters, in the Torrance-Santa Monica Area, California*. U.S. Geological Survey Water Supply Paper 1461. 1959.

Reid, H. (R.F. Heizer ed.) *The Indians of Los Angeles County: Hugo Reid's Letters of 1852*. Southwest Museum Papers No. 21. 1968.

Robinson, W.W. (revised D.B. Nunis, Jr.). *Los Angeles From the Days of the Pueblo*. California Historical Society. Los Angeles. 1981.

Robinson, W.W. *The Story of the San Fernando Valley*. Title Insurance and Trust Company. Los Angeles. 1961.

Robinson, W.W. *The Spanish and Mexican Ranchos of the San Fernando Valley*. Southwest Museum. Los Angeles. 1966.

Rogers, D.B. *Prehistoric Man of the Santa Barbara Coast*. Santa Barbara Museum of Natural History. Santa Barbara, California. 1929.

Salls, R. *The Scraper Plane: A Functional Interpretation*. Journal of Field Archaeology (1) 99-106. 1985.

Saul, Richard B. *Geology of the Southeast slope of the Santa Susana Mountains and Geologic Effects of the San Fernando Earthquake*. California Division of Mines and Geology, Bulletin 196. 1975.

Sick K.E. *Lateral Offsets and Revised Dates of Large Pre-historic Earthquakes at Pallett Creek, California*. Journal of Geophysical Research, Vol. 9, pp. 7461-7670. 1984.

Shaw, J.H. *Active Blind-Thrust Faulting and Strike-Slip Folding in California*. Ph.D. Thesis, Princeton University, Princeton, New Jersey, pp. 216. 1993.

Slemmons, D.B. *Evaluation of Geomorphic Features of Active Faults for Engineering Design and Siting Studies*. AEG Short Course. 1979.

Slosson, J.E., and Barnhart, J.T. *Late Pleistocene Deformation in the Limekiln Canyon Area, Santa Susana Mountains.* Southern California Academy of Sciences Bulletin, v. 66, No. 2., pp. 129-134. 1967.

Southern California Association of Governments. *Employment Trends Monthly.* July 1996.

Southern California Association of Governments. *Employment Trends Monthly.* June 1996.

Southern California Association of Governments. Growth Projections for Southern California Cities 1990-2020 File.

Southern California Association of Governments. *Regional Mobility Plan.* 1996.

Southern California Association of Governments. *Regional Review & Outlook.* 1996.

Strong, W.D. *Aboriginal Society in Southern California.* University of California Publications in American Archaeology and Ethnology 26. Berkeley. 1929.

Tan, S.S. *Geologic Effects of the Northridge Earthquake of January 17, 1994, in the Southern Part of the Van Nuys Quadrangle, Los Angeles County, California.* California Division of Mines and Geology Open File Report OFR-95-02. 1995.

The Earth Technology Corporation. *Geotechnical Investigation for Limited Preliminary Engineering Program San Fernando Valley East-West Segment, Metro Red Line Project.* Prepared for Engineering Management Consultant. December 1993.

Thompson and West. *History of Los Angeles County, California, With Illustrations Descriptive of its Scenery, Residences, Fine-Blocks and Manufactories.* Oakland. 1880.

Transportation Research Board, National Research Council. *Report 7: Reducing the Impact of Overhead Contact Systems.* 1995.

Treganza, A.E. and A. Bierman. *The Topanga Culture: Final Report on Excavations, 1948.* Anthropological Records, 20 (2). Berkeley. 1958.

Treganza, A.E. and C.G. Malamud. *The Topanga Culture: First Season's Excavation of the Tank Site, 1947.* Anthropological Records, 12 (4). Berkeley. 1950.

TRW REDI Property Map Disc, California. 1995.

University of California Los Angeles. *Metro Van Nuys.* June 1993.

Upper Los Angeles River Area Watermaster. *Watermaster Service in the Upper Los Angeles River Area Los Angeles County.* May 1987.

U.S. Army Corps of Engineers. *Los Angeles County Drainage Area Review, Draft Feasibility Report.* September 1991.

U.S. Census Bureau, 1990 Data, U.S. Census of Population and Housing.

U.S. Geological Survey. *Burbank 7.5-Minute Quadrangle Map.* 1966, photorevised 1972.

U.S. Geological Survey. *Van Nuys 7.5-Minute Quadrangle Map.* 1966, photorevised 1972.

Valley Industry & Commerce Association. *About The Valley.* 1995.

W & S Consultants. *Phase II Test Excavations and Determinations of Significance at CA-LAN-2133, -2233, -2234, -2235, -2236, -2240, -2241 and -2242, Los Angeles County, California.* Unpublished manuscript on file. UCLA AIC. 1994.

Wallace, R.E. *Notes of Stream Channel Offset by San Andreas Fault, Southern Coast Ranges, California.* In Dickinson U. R., and Grantz, A., eds., *Proceedings of Conference of Geologic Problems on San Andreas Fault System.* Stanford University Publications, Geological Sciences, Vol. IX, p. 6-21. 1968.

Wallace, W.J. *A Suggested Chronology for Southern California Coastal Archaeology.* Southwestern Journal of Anthropology, 11, (3), 214-230. 1955.

Weber, F.H., Bennett, J.H., Capman, R.H., Chase, G.W., and Saul., R.B. *Earthquake Hazards Associated with the Verdugo-Eagle Rock and Benedict Canyon Fault Zones, Los Angeles County, California.* California Division of Mines and Geology Open File Report 80-10LA. 1980.

Wells, D.L., and Coppersmith, Kevin J. *New Empirical Relationships among Magnitude, Rupture Length, Rupture Width, Rupture Area, and Surface Displacement.* Bulletin of the Seismological Society of America, Volume 84, No. 49, pp. 974-1002. 1994.

Wesnousky, S.G. *Earthquakes, Quaternary Faults and Seismic Hazard in California.* Journal of Geophysical Research, Vol. 91, No. B12, pp. 12,587-12963. 1986.

Whitley, D.S. (C.W. Clewlow, Jr., D.S. Whitley and E.L. McCann, ed.) *Subsurface Features, Toolkits and A Sweathouse Pit From the Ring Brothers Site Complex, Archaeological Investigations at the Ring Brothers Site Complex, Thousand Oaks, California.* UCLA Institute of Archaeology, Monograph 13, 101-110. 1979.

Whitley, D.S. *Shamanism and Rock Art in Far Western North America.* Cambridge Archaeological Journal, (1), 89-113. 1992.

Whitley, D.S. *By The Hunter, For The Gatherer: Art, Social Relations And Subsistence Change In The Prehistoric Great Basin.* World Archaeology, (25), 356-373. 1994.

Whitley, D.S. and M.P. Beaudry (W. Fowler, ed.) *Chiefs on the Coast: Developing Chiefdoms in the Tiquisate Region in Ethnographic Perspective.* The Development of Complex Civilizations in Southeastern Mesoamerica. CRC. 101-120. Orlando. 1991.

Whitley, D.S. and C.W. Clewlow, Jr. (C.W. Clewlow, Jr., and D.S. Whitley, ed.) *The Organizational Structure of the Lulapin and Humaliwo, The Archaeology of Oak Park, Ventura County, California.* UCLA Institute of Archaeology, Monograph 11, 149-174. 1979.

Whitley, D.S. and R.I. Dorn. *New Perspectives On The Clovis Vs. Pre-Clovis Controversy.* American Antiquity, 58, (4), 603-627. 1993.

Whitley, D.S., J. Simon and G. Gumerman. *Out West at 3500 B.P.* Unpublished manuscript.

Wissler, S.G. *Stratigraphic Formations of the Producing Zone of the Los Angeles Basin Oil Fields.* California Division of Mines and Geology, Bulletin 118, pt. 2, p. 210-234. 1943.

Woehlke, W.V. *Los Angeles: Pacific Rim Research.* Originally published in Sunset Magazine 32. February 1914.

Woehlke, W.V. (Jorgensen, L.C., ed.). *The Rejuvenation of the San Fernando Valley.* In *The San Fernando Valley: Past and Present.* 120-125. 1982.

Ziony, J.I., and Yerkes, R.F. *Evaluating Earthquake and Surface Faulting Potential.* In Ziony, J.I., ed., *Evaluating Earthquake Hazards in the Los Angeles Region-An Earth Science Perspective,* U.S. Geological Survey Professional Paper 13609, pp. 43-91. 1985.

Appendix E
Glossary

APPENDIX E: GLOSSARY

Above-Grade	Above existing ground level
ACHP	Advisory Council on Historic Preservation
Aerial structures	Structures built above ground like bridges that are constructed contiguously for short or long lengths like a viaduct. The structures carry rail transit vehicles.
AIC	Architectural Information Center
Anticline	A fold that is convex upward. In simple anticlines, the beds are oppositely inclined.
APTA	American Public Transit Association
AQMP	Air Quality Management Plan
At-Grade	A guideway or road with vertical alignment at elevations generally the same as the surrounding areas (i.e., not elevated or depressed).
AWP	Annual Work Plan
BMPs	Best Management Practices; applicable to management of water quality.
BTU	British Thermal Unit
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
Cast-in-place	When molds and forms are built at the final place in the project site where the cast material will rest. Molds and forms are removed after the casting is complete.
CCAA	California Clean Air Act
CDMG	California Division of Mines and Geology

CDOG	California Division of Oil and Gas
CEQA	California Environmental Quality Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESA	California Endangered Species Act
cfs	cubic feet per second
CO	Carbon Monoxide
Cost-effectiveness	An index defined by FTA for purposes of evaluating major transit investments. It relates the capital and operating costs of a project to its ridership and travel time savings; see section 7-7 for a more complete discussion.
CPUC	California Public Utilities Commission
Crossing bracing (struts)	Usually steel beams placed horizontally across the excavation between soldier piles to counter the earth pressure on the temporary excavation support wall. They may be used instead of or in conjunction with tie backs.
Cut and cover	When a box structure is placed in a temporary trench and earth is backfilled to cover the box.
DAT	Digital Audio Tape
dB	Decibel
dBA	An A-weighted measure of sound level, based on the American National Standard Institute specifications for sound level meter performance. The A-scale approximates the sensitivity of the human ear to various sound frequencies and is the scale used for most environmental noise studies.
Decibel (dB)	A unit of measurement of the intensity of sound or the air pressure differentials created by sound. Zero db was established as the weakest sound that can be detected by a young and alert person without hearing impairment. It is equivalent to an air pressure differential of 0.0002 microbars.
Deep Bore Tunneling	A mechanized way of mining a tunnel underground.

Dewatering	Removal of water from a construction excavation or tunnels by pumping or displacement.
Dip	The angle at which a stratum or any planar feature is inclined away from the horizontal. The dip direction is at a right angle to the strike.
DWP	City of Los Angeles Department of Water and Power
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPB	Earth pressure balance TBM machine is a tunneling machine that applies a pressure to the face of the tunnel excavation. Earth pressure balancing is one way of controlling unwanted loss of earth from around the mined tunnel. There are several methods and types of EPB TBM machines.
ERNS	Emergency Response Notification System
Falsework	Temporary support structures used to during the construction of aerial structures and bridges.
FEMA	Federl Emergency Management Agency
FTA	Federal Transit Administration
FTE	Full Time Equivalent as in full time equivalent employees.
FY	Fiscal Year
H beams	Rolled steel sections of different sizes who's cross section is in the shape of the letter H.
HDPE	High Density Polyethylene
High Angle Fault	A fault with a dip greater than 45 degrees.
HVAC	Heating, Ventilation, and Air Conditioning System
HWIS	Hazardous Waste Information System
ISTEA	Intermodal Surface Transportation Efficiency Act
kV	Kilo volt, a unit of measure of electric potential

LACBD	Los Angeles Central Business District
LACMTA	Los Angeles County Metropolitan Transportation Authority
LACDA	Los Angeles County Drainage Area Review
LADOT	City of Los Angeles Department of Transportation
Ldn	Sound level, day, night. This is a 24-hour Leq with the daytime level from 0700 to 2200 hours and the nighttime level from 2200 to 0700 hours. A 10-dB penalty is added to the nighttime period because this is normally the sleeping time.
Leq	The equivalent steady state sound level which in a stated period of time would contain the same acoustical energy as the time-varying sound level during the same period.
Lineament	A linear feature; any line on an aerial photograph, that is structurally controlled, including any alignment of separate photographic images, such as stream beds, trees, or topographic features.
Linked Trip	A complete trip from origin to destination, regardless of the number of transfers.
LPA	Locally Preferred Alternative
LRT	Light Rail Transit
LUST	Leaking Underground Storage Tank
MFR	Multi-family residence
MIS	Major Investment Study
MDE	Medium Design Earthquake
MOA	Memorandum of Agreement
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act

New rider	A passenger who would use the transit system with the proposed major investment, and who would not use the TSM Alternative.
NHPA	National Historic Preservation Act
NIST	U.S. National Institute of Standards and Technology
NOAA	U.S. National Oceanic and Atmospheric Administration
NOX	Nitrogen Dioxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List of USEPA.
Open cut (open air)	A large trench or ditch that, depending upon configuration, will be lined with reinforced concrete or other construction materials.
Pantograph	An adjustable metal frame on the roof of a rail vehicle that can be extended vertically to contact and collect electrical power from an overhead wire.
Pb	Lead
PM10	Particulate Matter (less than 10 microns in size)
ppm	parts per million
ppv	peak particle velocity
Pre-cast	When a cast or molded material is fabricated at a plant or manufacturing facility and is transported to the project site and set in place.
PWA	Public Works Administration
Ravelling	Rock or soil that drops out of the roof of walls of a tunnel or excavation with the passage of time.
RCRA-V	Resource Conservation and Recovery Act Violators
rms	root-mean-square
ROG	Reactive Organic Gas
ROW	Right of way

RTP	Regional Transportation Plan
RSA	Regional Statistical Area
SCAQMD	South Coast Air Quality Management District
Screenline	An imaginary line drawn across streets and freeways that is used to track and record traffic volumes at the points where the screenline intersects the facility.
SEL	Sound Equivalent Level
SETS	Site Enforcement Tracking System
SFR	Single-family residence
SFV	San Fernando Valley
SOCAB	South Coast Air Basin
Soldier piles	H beams driven into the earth or placed into holes augured into the earth. Soldier piles are uniformly spaced along the edge of a planned vertical excavation for the construction of trenches and tunnels. During excavation, lagging is placed between the soldier piles to form the temporary excavation support.
SOWAPM	Scope of Work for Archaeological and Paleontological Monitoring
SOX	Sulfur Dioxides
SP	Southern Pacific Railroad
Strike	The direction or bearing of a horizontal line in the plane of an inclined stratum, joint, fault, or other structural plane. The strike is perpendicular to the dip.
SVP	Society of Vertebrate Paleontology
SWIS	Solid Waste Information System
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board

Tie backs	Tie backs are long rods attached to the soldier piles and anchored into the earth behind the wall to counter the earth pressure on the temporary excavation support wall. They may be used instead of or in conjunction with cross bracing or struts.
TBM	A tunnel boring machine used for deep bore tunneling.
TSM Alternative	A transportation system management alternative that seeks to optimize use of the existing system, including improvements in bus service, without a major new capital investment.
ULARA	Upper Los Angeles River Area
USACOE	U.S. Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
UST	Permitted Underground Storage Tank
VOC	Volatile Organic Compounds
VHT	Vehicle Hours of Travel
WTCP	Worksite Traffic Control Plan

Appendix F
Notice of Intent / Notice of Preparation

APPENDIX F: NOTICE OF INTENT; NOTICE OF PREPARATION

Provided on the following pages are copies of the Notice of Intent published in the Federal Register on October 24, 1995 and the Notice of Preparation.

Federal Transit Administration

Environmental Impact Statement; Los Angeles County, CA

AGENCY: Federal Transit Administration (FTA), DOT.

ACTION: Notice of intent to prepare an environmental impact statement.

SUMMARY: The Federal Transit Administration and the Los Angeles County Metropolitan Transportation Authority intend to prepare an Environment Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) for transportation improvements in Los Angeles County, California. In addition, the FTA intends to prepare, in addition to the EIS, a Major Investment Study (MIS) for the project. Further, the MTA will be jointly issuing a Supplemental Environmental Impact Report (SEIR), pursuant to the California Environmental Quality Act (CEQA). The purposes of the project are to improve east-west travel options in the San Fernando Valley and to provide a connection to other portions of a regional rail network that is being developed by the MTA.

DATES: *Comment Due Date:* Written comments on the scope of alternatives and impacts to be considered should be sent to the address below by November 20, 1995. *Scoping Meetings:* Two scoping workshops will be held on November 7, 1995 at Reseda Senior Service and Resource Center from 6:30 p.m. until 9:00 p.m; and on November 14, 1995 at the Sherman Oaks Woman's Club from 6:30 p.m. until 9:00 p.m. See addresses below. The public is invited to arrive at any time. There will be no formal presentations; both workshops will be held in an open house format.

ADDRESSES: *Written comments* on the project scope should be sent to David Mieger, Project Manager, Los Angeles County Metropolitan Transportation Authority, 818 West 7th Street, Los Angeles, California, 90017. *The scoping workshops* will be held at the following locations: Reseda Senior Service and Resource Center, 18255 Victory Boulevard, Reseda, California, and Sherman Oaks Woman's Club, 4808 Kester Avenue, Sherman Oaks, California.

FOR FURTHER INFORMATION CONTACT: Hymie Luden, City & Regional Planner, Federal Transit Administration, Telephone (415) 744–3115.

SUPPLEMENTARY INFORMATION: The FTA, in cooperation with the MTA, will prepare an Environmental Impact Statement (EIS) for a proposed public transit project in the San Fernando Valley, Los Angeles County, California, to be implemented in an east-west corridor extending from an under-construction Metro Rail station located in North Hollywood westward to Valley Circle Boulevard, a distance of approximately 17 miles. The purposes of the project are to improve east-west travel options in the San Fernando Valley and to provide a connection to other portions of a regional rail network that is being developed by the MTA.

FTA and MTA invite interested individuals, organizations and federal, state and local agencies to participate in defining the alternatives and environmental factors to be evaluated in the MIS/DEIS/DSEIR. Scoping comments regarding these matters may be made at the workshops on the dates and at the locations indicated above, and they may also be made in writing if mailed to the address indicated above. During scoping, comments should focus on identifying specific social, economic or environmental concerns to be evaluated and suggesting alternatives which should be considered during the MIS process. Scoping is not the appropriate time to indicate a preference for a particular alternative. Comments of this nature should be communicated after the MIS/DEIS/DSEIR has been completed.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State and local agencies, and to other parties who are known to have an interest in the project. Comments or questions concerning this proposed action should be addressed to the FTA.

Background

Rail transit planning has been underway regarding the San Fernando Valley since 1980, with the passage locally of a ½ cent sales tax measure to fund rail improvements in Los Angeles County. In 1988, studies were conducted to identify alternatives, and in 1990 and 1992, the MTA completed an EIR and SEIR for the study corridor. These studies and environmental documents led to the identification of a preferred rail alignment along the existing Southern Pacific Burbank Branch, following Chandler Boulevard, Oxnard Street, Victory Boulevard, and Topham Street, which the MTA subsequently purchased in 1990. In 1994, this corridor was endorsed by the MTA's Board of Directors.

Local concerns which had surfaced regarding noise, aesthetics and other issues led to the passage by the California legislature of Senate Bill 211, which restricts the development of a rail transit facility along Chandler Boulevard to a below-grade subway from the Hollywood (SR 170) Freeway to Hazeltine Avenue, a distance of approximately 3.5 miles. In an effort to develop a project for implementation, the currently adopted alignment is being reevaluated, along with other alignment options, in the context of a Federally-required Major Investment Study, which is being administered by the FTA.

Description of the Study Area

The study corridor extends from the North Hollywood Red Line station (currently under construction), located at Lankershim Boulevard and Chandler Boulevard, west across the entire San Fernando Valley to the vicinity of Valley Circle Boulevard. The length of the corridor is approximately 17 miles. The corridor is being considered in two phases. Phase I (currently included in the MTA's 20-Year Implementation Plan) extends from North Hollywood to the vicinity of the I–405 Freeway (approximately 6 miles in length). Phase II extends from I–405 to the west (approximately 11 miles in length). In addition to the Southern Pacific Burbank Branch, other alignment variations are being considered along segments of Oxnard Street and Sherman Way. Also, a potential connection to the Chatsworth Metrolink station is under consideration, thus extending the corridor to the north at that location.

Alternatives

A range of alternatives is being considered as part of the MIS/EIS/SEIR. These include the following:

• No Build

This alternative would include the transit system primarily as it exists today, augmented by those additional projects for which a funding commitment has been made. The Red Line would terminate at the North Hollywood station, and the level of bus service shown in the MTA Long range Plan would be provided, in accordance with the findings of the San Fernando Valley Bus Restructuring Study. Highway and HOV projects would be provided on a number of freeways.

• Transportation Systems Management/Best Bus

This alternative would not require major investment for capital cost items, but would rather focus its efforts on maximizing the efficiency of existing facilities and expanding and improving the existing bus system. Enhanced bus service would be provided, on-street bus lanes would be included, and park-ride lots would be proposed. Buses would be given priority through traffic signal preemption techniques. Intersection improvements would be proposed to reduce congestion at selected locations. Arterial improvements would be identified to improve east-west movements in the study corridor.

• Rail Transit Alternatives

A range of rail transit alternatives will be developed to serve the study corridor that will include technology options such as the Red Line heavy rail, the Blue/Green Line light rail, or, as potentially feasible in selected applications, Diesel Multiple Units (DMUs). Alignments will include the SP Burbank Branch, Oxnard Street, Sherman Way and Topanga Canyon Boulevard. Profile options will range from below-grade subway to at-grade alignments to above-grade stations (bearing in mind the restrictions imposed by SB211), in areas permitted by law.

Probable Effects

The FTA and MTA will evaluate all significant environmental, social and economic impacts of the alternatives analyzed in the MIS/DEIS/DSEIR. Potential impact categories which will be evaluated include: Land Use and Development; Economic and Fiscal Impacts; Displacement and Relocation; Traffic Circulation and Parking; Community and Neighborhood Impacts; Visual and Aesthetic Impacts; Air Quality; Noise and Vibration; Geotechnical Considerations; Water Resources; Natural Resources; Energy; Safety and Security; Cultural Resources; Community Facilities and Parklands; Construction Impacts. The impacts will be evaluated both for the construction period and the long-term period of operation, and financial information in support of the MIS will be provided. Measures to mitigate significant adverse impacts will also be addressed.

MIS Process

The MIS process was formally initiated by the SCAG MIS Committee at its June, 1995 meeting. At that meeting, the Committee concurred in the definition of the proposed study corridor. Within the corridor, a range of alternatives is being studied in the MIS, which is being conducted in parallel with the EIS. The alternatives (as described above) include: No Project, Transportation Systems Management (TSM), Enhanced Bus, and a series of rail transit alternatives, including options regarding technology, alignment, profile, and station locations. When completed, the FTA intends to issue its EIS jointly with the MTA's SEIR, which will update the environmental documentation required under CEQA.

FTA Procedures

The EIS process will be performed in accordance with Federal Transit Laws and FTA's regulations and guidelines for preparing an Environmental Impact Statement. The impacts of the project will be assessed, and, if necessary, the scope of the project will be revised or refined to minimize and mitigate any adverse impacts. After its publication, the draft EIS will be available for public and private agency review and comment. One public hearing will be held. On the basis of the draft EIS and comments received, the project will be revised or further refined as necessary and the final EIS completed.

Date Issued: October 19, 1995.

Leslie Rogers,

Deputy Regional Administrator.

[FR Doc. 95-26350 Filed 10-23-95; 8:45 am]

BILLING CODE 4910-57-M

National Highway Traffic Safety Administration

[Docket No. 95-80; Notice 1]

Long Range Strategic Planning

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation.

ACTION: Notice and request for comment.

SUMMARY: NHTSA has prepared a Draft Strategic Execution Plan (SEP) that translates the mission, vision, values, and goals of the Agency's Strategic Plan into programs and activities. The Draft SEP covers a five year period. It spells out the priorities, measures of success and milestones that will guide the Agency toward attaining its vision of leading the nation to create the highest level of road safety in the world.

This notice invites comments, suggestions and recommendations from all individuals and organizations that have an interest in highway safety, motor vehicle safety, the Agency's non-safety programs and other NHTSA activities. These comments should address the Draft SEP and provide substantive input on any elements of the draft for which the commenter has relevant information, data or expertise. The comments will be considered along with the Agency's Fiscal Year 1996 budget appropriation, in development of the final SEP.

DATES: Comments are due no later than December 28, 1995.

ADDRESSES: Comments should refer to the docket number of this notice and should be submitted to: Docket Section, NHTSA, Room 5109, Nassif Building, 400 Seventh Street SW., Washington, DC 20590. (Docket hours are 9:30 a.m. to 4 p.m.)

FOR FURTHER INFORMATION CONTACT: Eleanor A. Hunter, Strategic Planning Division, NPP-11, National Highway Traffic Safety Administration, 400 Seventh Street SW., Washington DC 20590, telephone 202/366-2573, facsimile 202/366-2559. Copies of NHTSA's Strategic Plan and the Draft SEP are available on the Internet (NHTSA Home Page) or by written request (facsimile or letter) from Ms. Hunter.

SUPPLEMENTARY INFORMATION: NHTSA released its first Strategic Plan in December 1994. It provides a blueprint to take the Agency into the Twenty-first Century. The plan presents NHTSA's contribution to the Department of Transportation Strategic Plan by laying out a comprehensive, long-range approach to injury control. It provides fresh direction to the science, management, and public service of our task.

NHTSA's Strategic Plan is a mix of traditional and new goals. NHTSA is committed to reducing the incidence and consequence of crashes, conducting research and data collection to support safety improvements, and assisting state and community safety programs. The goals articulated in the Agency's Strategic Plan include making motor vehicle safety a priority on the nation's health care agenda; serving customers and partners better; managing and using the best information resources and technology available; and maintaining a work force that is professional, innovative, and diverse. NHTSA's Strategic Plan reiterates the Agency's commitment to greater effectiveness and efficiency.

In its Strategic Plan, NHTSA commits itself to working with other organizations and with citizens in an open cooperative atmosphere. The values articulated in the plan are characterized by integrity, professionalism, service, and respect for the people involved in NHTSA's mission.

The mission reads as follows:

The mission of the National Highway Traffic Safety Administration is to save lives, prevent injuries, and reduce traffic-related health care and other economic costs. The Agency develops, promotes, and implements effective educational, engineering, and enforcement programs toward ending preventable tragedies and reducing the

Los Angeles County
Metropolitan
Transportation
Authority

818 West Seventh Street
Suite 300
Los Angeles, CA 90017

213.972.6000

Mailing Address:
P.O. Box 194
Los Angeles, CA 90053

NOTICE OF PREPARATION

FOR

SAN FERNANDO VALLEY EAST-WEST TRANSIT CORRIDOR MIS/EIS/SEIR

TO: All Interested Agencies, Organizations and Individuals

FROM: Los Angeles County Metropolitan Transportation Authority

1.0 INTRODUCTION

The Los Angeles County Metropolitan Transportation Authority (MTA) will be the lead agency under the California Environmental Quality Act (CEQA) for the preparation of a Supplemental Environmental Impact Report (SEIR) for the San Fernando Valley East-West Transit Corridor project. This SEIR is being prepared to supplement an existing EIR that was certified in 1990 and a subsequent EIR that was completed, but not certified, in 1992. The proposed SEIR would use the range of alternatives and routes considered in these previous CEQA documents as the basis for additional analysis.

In addition to the environmental document being prepared under CEQA, an Environmental Impact Statement (EIS), pursuant to the National Environmental Policy Act (NEPA), is also being prepared under the sponsorship of the Federal Transit Administration (FTA) as the federal lead agency. The SEIR and the EIS will be prepared jointly. Also, the analysis of alternatives that is being conducted prior to issuance of the EIS/SEIR is being performed in accordance with recently adopted guidance from the United States Department of Transportation (USDOT) referred to as the Major Investment Study (MIS) requirements. Consequently, when completed, the combined documentation will then be known as an MIS/EIS/SEIR.

The purpose of this Notice of Preparation (NOP) is to request input from agencies, organizations and individuals on the scope of the environmental analysis and the alternatives to be included in the environmental document. From public agencies, the MTA is requesting comments on the scope and content of the environmental information which is germane to each agency's statutory responsibilities in connection with the proposed project. Responsible Agencies as defined by CEQA Guidelines (Section 15381) will need to use the MIS/EIS/SEIR prepared for this project when considering permits or other approvals for the project. The MTA is also requesting the views of organizations and interested individuals on the scope and content of the environmental document.

A description of the project alternatives, a location map, and a discussion of the probable environmental effects for the proposed project are provided below.

Additional information regarding the proposed project and an opportunity for community members, interest groups and government agencies to comment on the scope of the environmental document will be provided at two public workshops. One workshop will be held on November 7, 1995 at Reseda Senior Service and Resource Center, 18255 Victory Boulevard, Reseda, California, from 6:30 p.m. until 9:00 p.m. A second workshop will be held on November 14, 1995 at Sherman Oaks Woman's Club, 4808 Kester Avenue, Sherman Oaks, California, from 6:30 p.m. until 9:00 p.m. There will be no formal presentations; both workshops will be held in an open house format.

Comments can also be submitted by mail to:

David Mieger, Project Manager
San Fernando Valley East-West Transit Corridor Study
Los Angeles County Metropolitan Transportation Authority
P.O. Box 194, Los Angeles, CA 90053

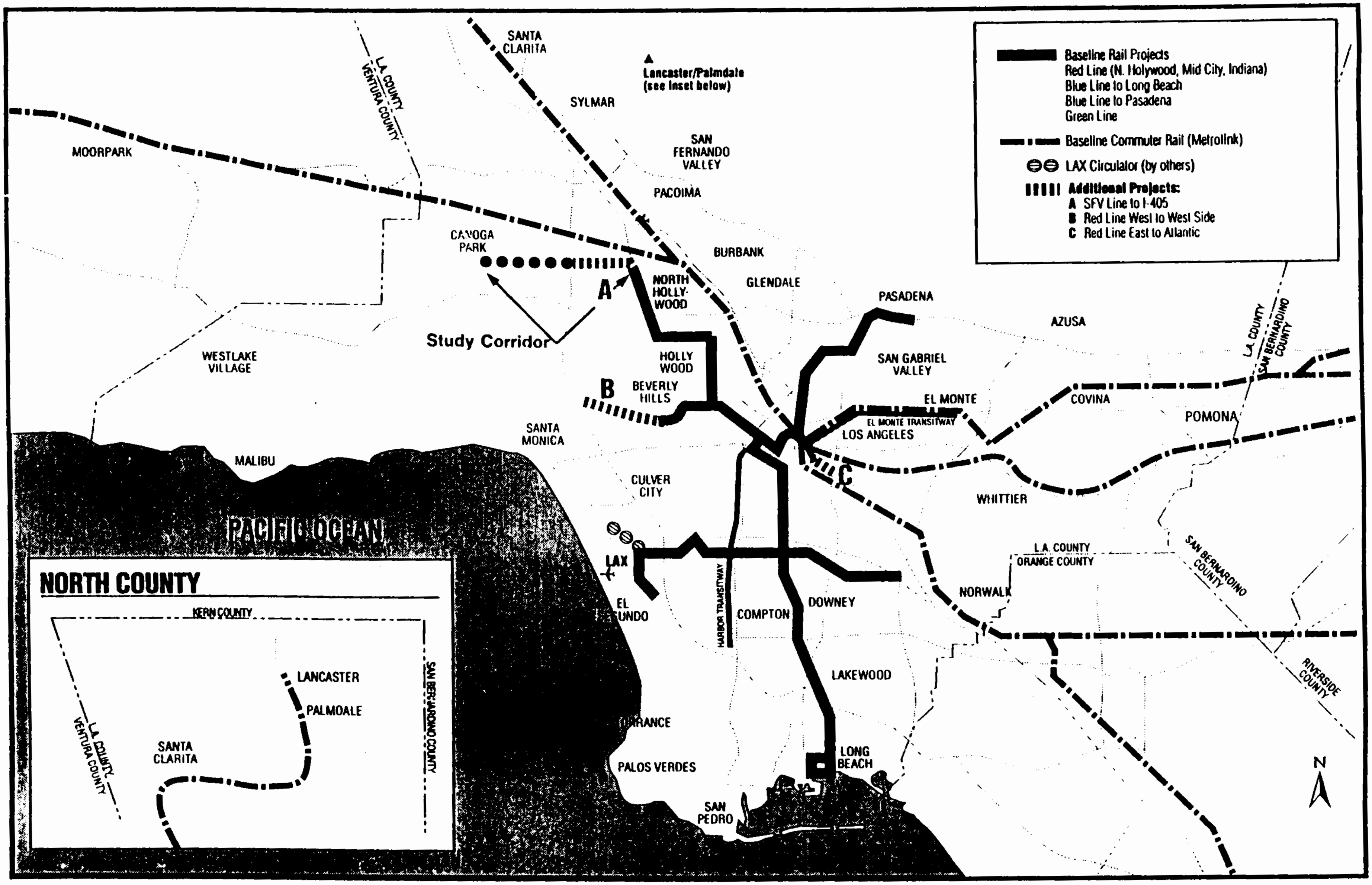
Comments are due by November 20, 1995 in order to receive consideration. Please include the name and telephone of a contact person in your agency or organization for purposes of continuing coordination. David Mieger can be reached at (213) 244-6320.

2.0 BACKGROUND

Efforts to provide rail transit service in the San Fernando Valley began with passage of Proposition A in 1980, which enabled the collection of a one-half cent sales tax to fund rail transit throughout Los Angeles County. The planning of a San Fernando Valley line began in earnest in 1986 with an initial consideration of alternatives and subsequent feasibility studies and proceeded with refinement of alternatives and environmental assessment in the San Fernando Valley East-West Rail Transit Project EIR and SEIR, in 1990 and 1992, respectively. The alternatives included in the work to this point ranged from at-grade light rail transit to heavy rail subway. Routes that were considered in the planning that led to these documents included Ventura Boulevard, San Fernando Road, the Southern Pacific (SP) Coast Mainline (now being used for Metrolink service), the SP Burbank Branch (former Pacific Electric and Southern Pacific Railroad right-of-way following Chandler, Oxnard, Victory and Topham streets), Victory Boulevard, the Ventura Freeway, and the Los Angeles River. Subsequent to these documents, additional study was undertaken to reexamine the feasibility of using the Ventura freeway as a rail corridor.

In 1990, the MTA purchased the SP Burbank Branch for use as a right-of-way for rail transit service. In August 1994, Pre-Preliminary Engineering Studies for the SP Burbank Branch alignment were completed and in October 1994, this corridor was endorsed by the MTA Board, and the Ventura Freeway alternative was thus eliminated from further consideration.

In response to concerns regarding noise, aesthetics and other issues, legislative action (SB 211) in 1991 was taken to restrict the development of a rail transit facility along Chandler Boulevard to a below-grade subway, from the Hollywood Freeway (SR 170) to Hazeltine Avenue, a distance of approximately 3.5 miles. SB 211 requires construction of a deep-bore subway for one mile on each side of the Tujunga Wash and it also limits the introduction of stations to one location, at Los Angeles Valley College, with an entrance to be located on the campus.



SOURCE: LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, ADOPTED LONG RANGE PLAN, APRIL 1995

The purposes of the MIS/EIS/SEIR are three-fold: (1) to complete the Major Investment Study requirements of USDOT; (2) to complete a federal environmental document, thus allowing federal funding to be used for the project; and (3) to complete an additional Supplemental EIR pursuant to CEQA, such that the eventually-selected proposed project would also be cleared under California law.

3.0 PROJECT DESCRIPTION

The corridor (see Figure 2) that has been defined for the study extends from the North Hollywood Red Line station (currently under construction), located at Lankershim Boulevard and Chandler Boulevard, west across the entire San Fernando Valley to the vicinity of Valley Circle Boulevard. The length of the corridor is approximately 17 miles. The corridor is being considered in two phases. Phase I (currently included in the MTA's 20-Year Implementation Plan) extends from North Hollywood to the vicinity of the I-405 Freeway (approximately 6 miles in length). Phase II extends from I-405 to the west (approximately 11 miles in length).

In addition to the SP Burbank Branch, other alignment variations are being considered along segments of Oxnard Street and Sherman Way. Also, a potential connection to the Chatsworth Metrolink station is under consideration, thus extending the corridor to the north at that location.

A range of alternatives is being considered as part of the MIS/EIS/SEIR. This includes the following:

- **No Build**

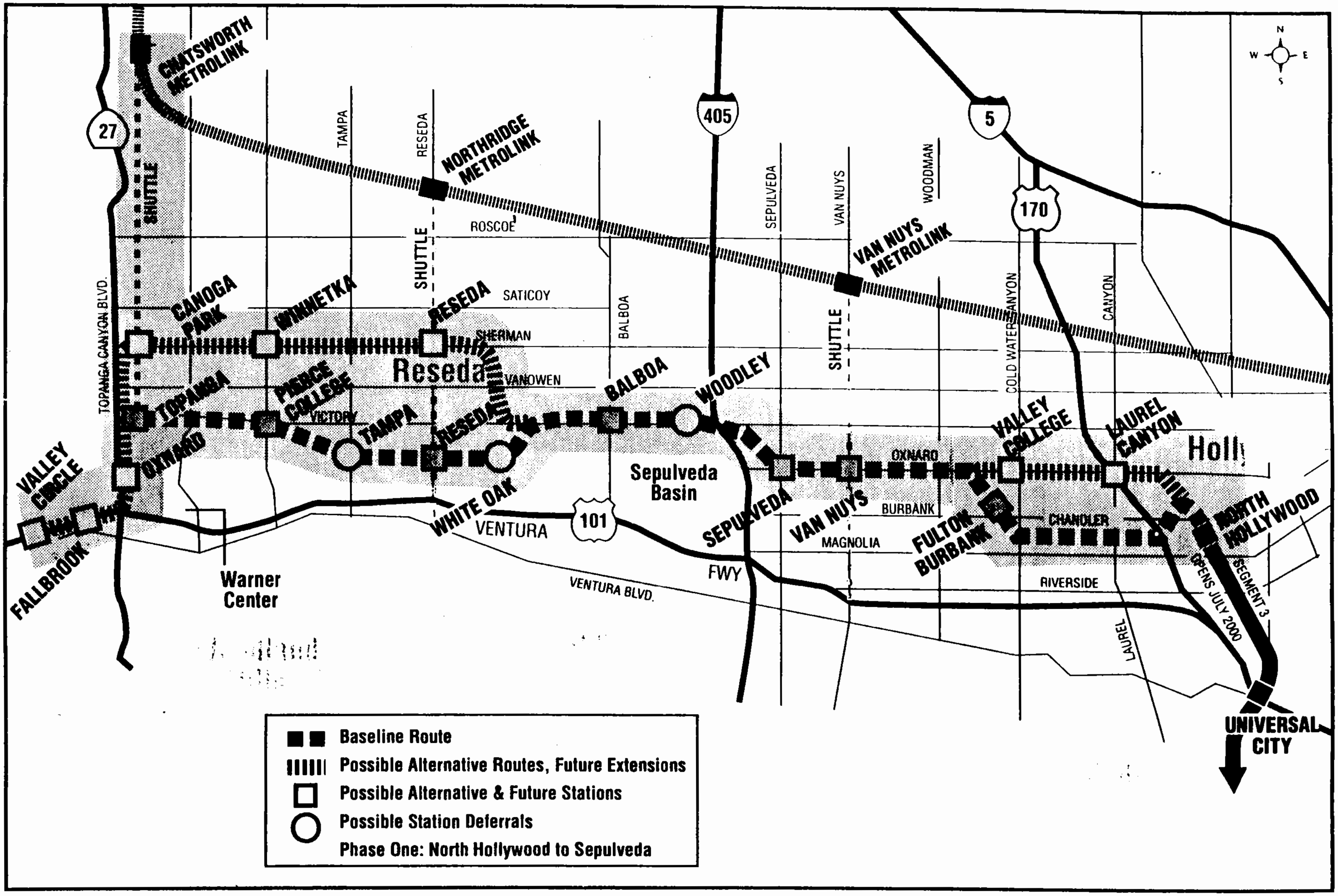
  This alternative would include the transit system primarily as it exists today, augmented by those additional projects for which a funding commitment has been made. The Red Line would terminate at the North Hollywood station, and the level of bus service shown in the MTA Long range Plan would be provided, in accordance with the findings of the San Fernando Valley Bus Restructuring Study. Highway and HOV project would be provided on a number of freeways.

- **Transportation Systems Management / Best Bus**

  This alternative would not require major investment for capital cost items, but would rather focus its efforts on maximizing the efficiency of existing facilities and expanding and improving the existing bus system. Enhanced bus service would be provided, on-street bus lanes would be included, and park-ride lots would be proposed. Buses would be given priority through traffic signal preemption techniques. Intersection improvements would be proposed to reduce congestion at selected locations. Arterial improvements would be identified to improve east-west movements in the study corridor.

- **Rail Transit Alternatives**

  A range of rail transit alternatives will be developed to serve the study corridor that will include technology options such as the Red Line heavy rail, the Blue/Green Line light rail, or, as potentially feasible in selected applications, Alternative Rail Technology Vehicles (ARTVs). Alignments will include the SP Burbank Branch, Oxnard Street, Sherman Way



SOURCE: LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY, ADOPTED LONG RANGE PLAN, APRIL 1995

METRO

San Fernando Valley
East-West Transit Corridor
MIS • EIS • SEIR

FIGURE 2
Study Corridor

and Topanga Canyon Boulevard. Profile options will range from below-grade subway to at-grade alignments to above-grade sections, in areas permitted by law.

Stations are currently under consideration at a number of locations, including Laurel Canyon, Valley College, Fulton/Burbank, Van Nuys, Sepulveda, Woodley, Balboa, White Oak, Reseda, Tampa, Winnetka, Pierce College, Canoga Park, Topanga Canyon/Victory, Topanga Canyon/Oxnard, Fallbrook, and Valley Circle. A Chatsworth Extension would be possible with stations at Sherman Way, Roscoe and Devonshire/Lassen.

Construction techniques may include at-grade or above-grade conventional construction, or below-grade construction either by means of conventional tunneling techniques or cut-and-cover techniques. The selection of construction methods will depend upon factors such as cost, geotechnical considerations, legislative prohibitions and the degree of acceptability of potential impacts which may be associated with a given construction method.

A series of rail technologies, alignments and profiles will be evaluated and combined to create distinct alternatives, which will then be evaluated against a range of criteria. The results of this evaluation will be used to reduce the number of alternatives to be carried forward into the environmental document. It is envisioned that several rail transit alternatives will be carried through the environmental process.

4.0 POTENTIAL ENVIRONMENTAL EFFECTS

The following provides an overview of the environmental effects that may be associated with the proposed project alternatives, based on a preliminary understanding of attributes and operating characteristics. Where adverse effects are noted below, mitigation measures will be developed, as appropriate and practicable, to reduce such adverse effects. Detailed assessments regarding project impacts, beneficial effects and mitigation measures will be provided in the MIS/EIS/SEIR document.

Land Use and Development

The proposed project will be evaluated for consistency with local land use planning policies, as documented in the City of Los Angeles Community Plans for the areas through which it would pass, and also in the context of the recently issued General Plan Framework. Adverse impacts are not expected.

The proposed project will be evaluated for its compatibility with surrounding land uses. Effects to be evaluated would be primarily associated with station areas and would include either direct effects resulting from the proximity of a station or indirect effects associated with proximity to potential transit destinations. Both positive and adverse effects are possible.

The proposed project may provide opportunities for intensifying development and specific joint development opportunities at some locations. These opportunities would be developed in the context of underlying land use plans and policies and therefore the effects would be beneficial.

Economic and Fiscal Impacts

The proposed project has the potential to result in both positive and adverse impacts related to economic and fiscal conditions. The project may cause parcels of private property to be removed from the property tax rolls, reducing the associated revenues accordingly. It may also cause economic hardship to some businesses during the construction period. Beneficial effects may also be realized, including construction-related employment, construction spending in the region and multiplier effects associated with such spending. The project may also have beneficial economic effects resulting from joint development projects that occur at selected locations, and it may have a positive long-term influence on property values in some areas in proximity to the project.

Displacement and Relocation

Although a major portion of the proposed project is likely to be within property already owned by the MTA, the proposed project could require the acquisition of some additional parcels of private property for purposes of right-of-way, station construction and the siting of ancillary facilities. To the extent that additional land acquisition is required, it would result in the displacement of property owners, residents, renters, businesses and employees. These effects would all be considered adverse.

Traffic Circulation and Parking

The proposed project would have the beneficial effect of increasing transit ridership and creating a connection with other components of the MTA system, with an attendant reduction in automobile usage. It would also result in changes in local traffic patterns and volumes around stations, which may or may not result in adverse consequences. To the extent that spillover parking occurs in station areas, that could constitute an adverse effect associated with the project. The project alternatives may vary substantially in terms of their effects on traffic circulation and parking.

Community and Neighborhood Impacts

The proposed project may enhance existing neighborhoods or it may result in negative effects, depending upon the specific relationship of the project with its surroundings. It is possible that a neighborhood may experience a physical intrusion or separation as a result of the project. It may alter the character of an existing neighborhood by introducing an incompatible element or as a result of effects occurring around stations. If property acquisition becomes substantial, the project may change the character of a neighborhood as a result of reducing the housing stock. It is not anticipated that these adverse effects would occur other than in isolated instances, however, and it is also possible that the beneficial effects of the project may overwhelm the adverse effects in the areas in which they occur.

Visual and Aesthetic Impacts

Portions of the proposed project would be below grade, in which case no visual effects would occur. However, there will also be portions of the project that would be either at grade or elevated. Where this occurs, the potential for adverse visual and aesthetic effects exists. The environmental document will examine the relationship of the proposed project (including both the guideway and station areas) with its surroundings and will evaluate whether this relationship could be viewed adversely by area residents and visitors. The visual quality of project surroundings and the presence of unique features and landmarks will play a role in this determination.

Air Quality

The proposed project will contribute to improved air quality by adding transit riders to the system and consequently reducing automobile usage. Criteria pollutants will be reduced on a daily basis as a result of the project. The project will also create the potential for air quality impacts, however, since it will provide opportunities for carbon monoxide "hot spots" at station area parking facilities. To the extent that local traffic conditions are changed as a result of the project, both beneficial and adverse effects are possible.

Noise and Vibration

The proposed project could result in noise impacts in areas adjacent to project operations. The extent of potential for such impacts will be dependent upon whether the project is at or above grade, how far it is separated from nearby sensitive land uses and building occupants, and the noise transmission characteristics of the technology in question. It is not anticipated that vibration would be at issue once the project becomes operational, although it is possible that adverse effects could occur under certain conditions.

Geotechnical Considerations

Included among the potential effects to be considered under this heading are geotechnical issues, subsurface conditions, seismic effects, and hazardous materials impacts. A geotechnical analysis has been conducted to determine the soil conditions that exist in the project study area and along potential alignments. Surface or above grade construction, while needing to be cognizant of these conditions, are amenable to treatment via design, and therefore adverse effects are not expected. Subway construction, particularly using tunneling techniques, carries with it the potential for adverse effects, with surface settlement being the impact of most concern. This potential must be considered carefully both in terms deciding upon a project profile and also in terms of specifying appropriate construction techniques and safeguards. If below-grade sections can be constructed using open cut techniques, the potential for adverse effects can be substantially reduced.

Hazardous materials may be encountered along a given project segment, with the possibility of adverse effects being dependent upon the types and amounts of materials encountered. Standards of handling are available to adequately collect, treat and dispose of such material, and therefore the potential for serious adverse effects is quite low.

Water Resources

Potential water resources issues relevant to the proposed project would include surface runoff and effects on flood control, water quality effects on surface waters, interception of groundwater, and effects on drinking water quality. In the study area, the important resources include the

Sepulveda Basin (an important flood control facility for the region), the Los Angeles River, the Tujunga Wash, and miscellaneous other channels. Impact analysis will focus on construction impacts on water resources, potentially including dewatering, sedimentation from staging areas, and the crossings of the Los Angeles River, the Tujunga Wash and other channels. In addition, surface runoff from parking areas and other operational issues will need to be addressed. Some permit requirements may be entailed, and coordination with the U.S. Army Corps of Engineers will be necessary. It is anticipated that all adverse effects associated with construction can be resolved to the satisfaction of the appropriate authority. Significant encroachment into the Sepulveda Basin is not anticipated at this time, however proximity impacts may occur to adjacent uses in the Sepulveda Basin.

Natural Resources

There would be few biological resources likely to be found in the study area, and therefore the likelihood of producing an adverse impact is low. Landscaping and urban vegetation are not regarded as biological resources and therefore would be addressed only in the context of visual considerations. Resources present in the Sepulveda Basin, however, would be a clear exception to the above statements and would be treated with appropriate care. Coordination with the U.S. Army Corps of Engineers under the Section 404 process will be undertaken as required.

Energy

The proposed project should have a beneficial effect on energy consumption, to the extent that it encourages automobile users to become transit users. These effects would not be substantial, however. Minor amounts of energy would be consumed during the construction process and for vehicle propulsion and station operation, once the project becomes operational.

Safety and Security

System safety will be governed by the configuration of the proposed project (grade-separated or in mixed traffic) and by the degree of automation which is eventually selected. If there are any open air station or guideway sections, safety concerns related to these areas may arise. Existing rail transit criteria are in place with which to adequately handle most, if not all, problems that are likely to be encountered. Security issues involving system users are also addressed through existing criteria, and surveillance and station layout are typically the ways in which such issues are addressed.

Cultural Resources

Historic, archaeological and paleontological resources may exist within the study area and along one or more project alternative alignments. To the extent that excavation is required, it is possible that archaeological and/or paleontological resources could be encountered and potentially affected. Avoidance or mitigation of cultural resource impacts will be addressed in the environmental document.

Historic resources will be inventoried, pursuant to Section 106 of the Historic Preservation Act, and such resources will be classified as to their National Register eligibility. Effects findings will be made where one or more alternatives would produce adverse effects. In addition to adhering to the Section 106 requirements, Section 4(f) of the Department of Transportation Act will be addressed.

Community Facilities and Parklands

The proposed project will provide long-term enhanced accessibility, reduced traffic and noise, and other potential benefits to a number of community facilities in the vicinity of each station. However, along with beneficial effects, the same facilities may experience some adverse environmental impacts, primarily during construction, but also potentially in some cases during system operation. Community services and facilities which will need to be identified include police and fire protection, schools, libraries, medical facilities, churches, cemeteries, social services and parks. Issues will vary, but generally include: police and fire (response time, other safety issues), schools (noise, traffic, student safety), libraries and churches (noise), parklands (noise, visual encroachment, property acquisition). Construction disturbances will affect most facilities in the immediate vicinity of the project.

Construction Impacts

Construction impacts have been discussed for some topics above, but would generally apply to all resources and affected parties. Construction impacts can vary in intensity and duration, but it is reasonable to expect that the duration would be over multiple years and the intensity could range from very low to quite substantial. Each of the topics discussed above will also be examined for construction impacts, using a detailed construction scenario that outlines the sequential steps in the construction process. Some of the alternatives under consideration (TSM, Best Bus) would have little or no construction impacts of significant proportions, whereas other alternatives could have construction impacts that would be significant throughout the multi-year construction period.

Phased Extension Impacts

The MTA Long Range Plan identifies a funding commitment for the project as far as the San Diego Freeway (I-405). The EIS will focus on this 6-mile segment as the base project. Phased extensions beyond I-405 will be evaluated at a programmatic level in the document, including phased-terminal stations at I-405, Warner Center, Valley Circle and Chatsworth. Because the full project is between 14-18 miles in length, it is very probable that the project will be constructed in three or more segments. The impacts of interim terminal stations would potentially include increased demands for service because of their location at the end of the line.

Appendix G
Summary of the Scoping Process

APPENDIX G: SUMMARY OF THE SCOPING PROCESS

Table G-1 on the following pages provides a summary of the comments received during the scoping process for the environmental documents.

TABLE G-1: SUMMARY OF COMMENTS RECEIVED DURING THE SCOPING PERIOD

COMMENTING PARTY	COMMENT
U.S. Department of the Interior Fish and Wildlife Service Gail Kobetich, Field Supervisor	Requests that the EIS/EIR contain a complete discussion of purpose/need and a complete description of the project, including practicable alternatives to reduce impacts.
	Requests the EIS/EIR contain acreage and descriptions of sensitive habitats; qualitative and quantitative assessments of biological resources; an assessment of all impacts on wildlife and habitat; a list of federal and state candidate, proposed or listed species and a description of them; specific mitigation; and long-term mitigation protecting habitat.
	Requests that the EIS/EIR analyze project effects on hydrology of riparian/wetland areas and provide an analysis of conveying runoff/flood water without impact to vegetation.
	Requests that the EIS/EIS examine soil erosion and habitat siltation prevention measures.
	Requests that the EIS/EIS thoroughly analyze noise impacts on birds.
California Regional Water Quality Control Board Los Angeles Region Wendy Phillips, Chief, Planning Unit	Requests identification and evaluation of impacts to beneficial uses and water quality.
	Provides a list of permits likely to be required.
State of California Public Utilities Commission Safety and Enforcement Division Steven Handelman Transportation Engineer	Believes consideration should be given to impacts affecting railroad operations, grade crossings and grade separations.
	Concerned with any changes in circulation patterns, land use that may affect railroad operations and safety
State of California California Transportation Commission Robert Wolf, Chairman	Wants to ensure MTA knows the CTC will require a full funding package for construction; demonstration of funding to operate; and a commitment to equipment rehabilitation and replacement.

TABLE G-1: SUMMARY OF COMMENTS RECEIVED DURING THE SCOPING PERIOD	
COMMENTING PARTY	**COMMENT**
Los Angeles Unified School District Facilities Services Division Elizabeth Harris California Environmental Quality Act Officer	In addition to identified issues, air quality impacts to schools should be analyzed.
	List schools located within .25 miles of each route and each station; and identify exact distance between schools and route/station for those schools directly adjacent to facility.
	Safety of students is a prime concern. A list of generic traffic and safety mitigation measures are provided.
	Guidelines for traffic, safety, noise/vibration, and air quality analysis are provided.
	Requests that noise measurements be taken at schools near proposed facilities; requests that measurements be coordinated with School District.
	Requests disclosure of locations of tunneling operations.
Los Angeles Unified School District Student Auxiliary Services Branch Carole Takaki & Tim Bower School Traffic and Safety Education	Concerned about locating stations near schools due to traffic and parking issues.
	Requests that LAUSD be allowed to provide specific mitigation requests at a later date. Provides a list of mitigation measures believed to be applicable to the project and requests that they be considered. These measures deal with school bus routes, pedestrian safety, construction, traffic, and security.
Los Angeles Unified School District Environmental Health & Safety Branch Sharon Thomas	Noise and vibration levels must be analyzed at affected schools. The District's guidelines for noise analysis are provided.
	An appropriate microscale analysis must be conducted to determine CO effects at affected schools; PM10 analysis must also be performed. The District's guidelines for air quality analysis are provided.
Southern California Association of Governments Eric Roth Manager, Intergovernmental Review	Requests the opportunity to review the DEIR or any changes in project scope. A project description is published on 11/15/95 in the Intergovernmental Review Report.
Metropolitan Water District of Southern California Laura Simonek Senior Environmental Specialist	MWD has a facility in the area of the project and requests that its guidelines be consulted before its right-of-way is used by the project. Guidelines are provided.

TABLE G-1: SUMMARY OF COMMENTS RECEIVED DURING THE SCOPING PERIOD

COMMENTING PARTY	COMMENT
County of Los Angeles Public Library Fred Hungerford Head, Staff Services	Has determined there would be no impact on services provided by the Library.
County of Los Angeles, Board of Supervisors Michael Antonovich Supervisor, Fifth District Director, Metropolitan Transportation Authority	The alternatives under review in the MIS neglect the least costly at-grade freeway alternative. This alternative must be fully evaluated.
	Requests a fair cost comparison between all feasible transit alternatives, including a subway and an at-grade freeway system. Commentator will pursue this comparison.
	The MTA Board and community must discuss openly the drastic realignment of the transit line outside of the Burbank/Chandler right-of-way. This realignment has caused confusion and ire in the community.
	The failure to properly inform the community of the realignment must be addressed.
City of Los Angeles Department of Transportation Allyn Rifkin, Principal Transportation Engineer	Requests a 7 day extension for comments.
City of Los Angeles Department of Public Works, Bureau of Engineering Wayne Savaria Division Engineer	The project may require excavation and shoring permits from this bureau. Document must identify impacts to underground city utilities and other underground structures.
City of Los Angeles Department of Fire Dal Howard Assistant Fire Marshal	During construction, delays in Fire Department response are possible and should be addressed.
	Hazardous materials may be encountered along the route and this should be addressed.
	Fire Department shall be notified in advance of any project that would affect access to streets, fire hydrants or structures.
	The number of intersections that will operate below LOS E after project completion shall be minimized or eliminated.
	Leaking USTs or hazardous materials are encountered, the Fire Department must be notified.
	The project shall comply with all applicable codes and ordinances.

TABLE G-1: SUMMARY OF COMMENTS RECEIVED DURING THE SCOPING PERIOD	
COMMENTING PARTY	**COMMENT**
City of Los Angeles Department of Fire (cont'd.)	Definitive plans and specifications shall be submitted to the Fire Department and required permits shall be obtained prior to project commencement.
	The Fire Department shall be consulted regarding traffic signal preemption.
	The Fire Department is particularly concerned with internal sprinkler systems, fire exists, smoke and air handling systems and rescue corridors.
	Several standards and codes regarding fire and safety are listed which should be used.
	Fire-flow requirements are provided.
	A list of fire stations along the route is provided.
	Access for Fire Department apparatus and personnel to/into all structures shall be required.
	The project may cause a need for increased Fire Department staffing and facilities, or relocation of existing facilities.
City of Los Angeles Department of Transportation Allyn Rifkin, Principal Transportation Engineer *(Unsigned, draft letter received 2/12/96)*	The department requests changes to the project description including the addition of a new alternative; recommends specific details the traffic study should include and requests a scoping meeting with the DOT; requests a discussion on the sewer and storm drain relocation plans; suggests strategies to prevent conflicts between utilities and project structures; and requests certain construction related issues be discussed in the study, such as detour plans, haul routes, and maintaining business and residential access.

Appendix H
Agency Correspondence

APPENDIX H: AGENCY CORRESPONDENCE

Provided on the following pages are copies of correspondence with federal agencies.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

November 6, 1995

Mr. David Mieger
Los Angeles County
Metropolitan Transportation Authority
818 West Seventh Street, Suite 300
Los Angeles, CA 90017

Re: Notice of Intent to Prepare a Environmental Impact Statement, Major Investment Study, and Supplemental Environmental Impact Statement for the San Fernando Valley East-West Transit Corridor, Los Angeles County, California (1-6-96-HC-016)

Dear Mr Mieger:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Notice of Preparation (NOP) dated October 19, 1995, regarding the referenced project. As currently proposed, the purpose of the project is to improve east-west travel options in the San Fernando Valley and to provide a connection to other portions of the regional rail network. The project site is located from North Hollywood, westward to the vicinity of Valley Circle Boulevard in the San Fernando Valley, Los Angeles County.

The primary concern and mandate of the Service is the protection of public fish and wildlife resources and their habitats. Our mandates further require that we provide comments on any public notices issued for a Federal permit or license affecting the nation's waters (e.g., Clean Water Act, Section 404 and River and Harbor Act of 1899, Section 10).

The Service is also responsible for administering the Endangered Species Act of 1973 as amended (Act). Section 7 of the Act requires Federal agencies to consult with the Service should it be determined that their discretionary acts may affect a listed threatened or endangered species. Section 9 of the Act prohibits the "take" (e.g., harm, harassment, pursue, injure, kill) of Federally listed wildlife species. "Harm" (i.e., "take") is further defined to include habitat modification or degradation where it kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering. "Take" can only be permitted pursuant to the pertinent language and provisions in Section 7 (Federal consultations) and Section 10(a) or conditioned through a special rule under section 4(d) of the Act.

The Service is particularly concerned with project induced impacts to vernal pools, coastal sage scrub, riparian wetland and native grassland habitat, and the rare and sensitive plant and animal species which occur in these habitat types. The discharge of fill material into a vernal pool wetland will require a Federal permit pursuant to Section 404 of the Clean Water Act. Due to the scarcity and biological value of the vernal pool resource the Service has requested that the Corp of Engineers exert its discretionary authority and require an individual permit, regardless of the size of the vernal pool or the presence of sensitive species.

The Service offers the following specific information and recommendations to assist you in planning for the preservation of sensitive wildlife species and habitat within the project area and as a means to assist you in complying with pertinent Federal statutes. In order to facilitate the evaluation of the proposed project from the standpoint of fish and wildlife protection, we request that the Environmental Impact Statement/Report contain the following specific information:

1) A complete discussion of the purpose and need for the project or each of the project alternatives.

2) A complete description of the proposed project, including all practicable alternatives that have been considered to reduce project impacts to wetland areas, other sensitive habitat types, and fish and wildlife resources.

3) Specific acreage and descriptions of the types of wetland, coastal sage scrub, and other sensitive habitats that will or may be affected by the proposed project or project alternatives. Maps and tables should be used to summarize such information.

4) Descriptions of the biological resources associated with each habitat type. These descriptions should include both qualitative and quantitative assessments of the resources present on the proposed project site and alternative sites.

5) An assessment of direct, indirect, and cumulative project impacts to fish and wildlife and associated habitats. All facets of the project should be included in this assessment.

6) A list of Federal candidate, proposed or listed species, state-listed species, and locally sensitive species that are on or near the project site. A detailed discussion of these species, including information pertaining to their local status and distribution, should be included in this report. The anticipated or real impacts of the project on these species should be addressed fully. The Service is particularly interested in any and all pertinent information and data pertaining to potential or real impacts to: a) currently listed species; b) raptors; c) sensitive plant species; d) all species proposed for listing; and e) Federal candidates for listing. If proposed candidate species are subsequently listed as threatened or endangered, the publishing of the final rule designating official listing could occur during the course of the planning or implementation phases of the various proposed project activities.

7) Specific mitigation plans to fully offset project-related impacts, including proposals for mitigating the cumulative impacts of direct and indirect habitat loss, degradation, or modification. Adverse project-related impacts should be mitigated through the preservation, re-creation, or revegetation of impacted habitat types.

8) An analysis of the effects of the project on the hydrology of any and all riparian or wetland communities within the sphere of influence of the project. Of particular importance is an analysis of the adequacy of proposed means to convey major flood or runoff flows without impacting vegetation off-site or in the restoration area.

9) Identification of methods to be employed to prevent soil erosion and siltation of habitats off-site.

10) Measures to be taken to perpetually protect the habitat value of proposed mitigation. Issues that should be addressed include restrictions on vehicle and people access, proposed land dedications, monitoring and management programs, control of illegal dumping, restrictions on lighting near mitigation areas, etc.

11) A thorough analysis of expected noise impacts on avian species and measures to be taken to mitigate any adverse impacts resulting from increased noise levels.

The Service thanks you for the opportunity to comment on the referenced NOP and looks forward to working with the Metropolitan Transportation Authority. If you should have any questions pertaining to these comments, please contact Shawnetta Grandberry of my staff at (619)-431-9440.

Sincerely,

Gail C. Kobetich

Gail C. Kobetich
Field Supervisor

#1-6-95-HC-234
cc: CDFG, San Diego, CA (Attn: Bill Tippets)

Appendix I
MTA Long Range Plan

APPENDIX I: MTA LONG RANGE PLAN - PLANNED TRANSPORTATION IMPROVEMENTS

Transit-Capital Improvements

Red Line Segments 1-3:
- North Hollywood
- Western extension to Pico/San Vicente
- Eastern extension to First/Lorena

Pasadena Blue Line: Union Station to Sierra Madre Villa
Red Line Western Extension to I-405
Red Line Eastern Extension to Whittier/Atlantic
Red Line Segments 2 and 3 Station Enhancements
L.A. Car
Miscellaneous Rail Rehabilitation 1
Bus Replacement/Maintenance/Expansion
Union Station Transit Center
Diesel Multiple Unit (DMU) Rail-Bus Technology/
Alternative Rail Technology (ART) Project

Transit-Operations Improvements

Operation of Rail System described above
Operation of Bus System described above

Highway-Capital Improvements

I-5 HOV:
- I-10 to Route 14
- I-605 to Orange County Line

I-10 HOV:
- Baldwin Ave. to I-605
- I-110 to I-405

Route 14 HOV: I-5 to Avenue P-8
Route 30 HOV: I-210 to Foothill
Route 57 HOV: Orange County Line to Route 60
Route 60 HOV: I-605 to San Bernardino County Line
Route 118 HOV: Ventura County Line to I-5
Route 134 HOV: Route 101/170 to I-210
Route 170 HOV: Route 101 to I-5
I-405 HOV:
- Orange County Line to I-110
- I-105 to I-5

I-605 HOV: Orange County Line to I-10
I-5/Route 14 Interchange
Route 57/Route 60 Interchange
I-10/I-605 Interchange
Route 60/I-605 Interchange
I-5/I-405 Interchange
Route 118/I-405 Interchange
Route 91/I-605 Interchange
I-105/I-405 Interchange
Route 170/134 Interchange
I-5/Route 118 Interchange
Route 30 Gap Closure: Route 66 to San Bernardino County Line
Route 126: Arterial Widening
Route 138 Gap Closure/Widening: Avenue T to 90th Street
Route 710 Gap Closure to Pasadena

Multimodal-Capital Improvements

Alameda Corridor
Park and Ride Transit Centers
Regional Bikeways

Appendix J
Screening Process

APPENDIX J: SCREENING PROCESS AND PRELIMINARY ALTERNATIVES CONSIDERED

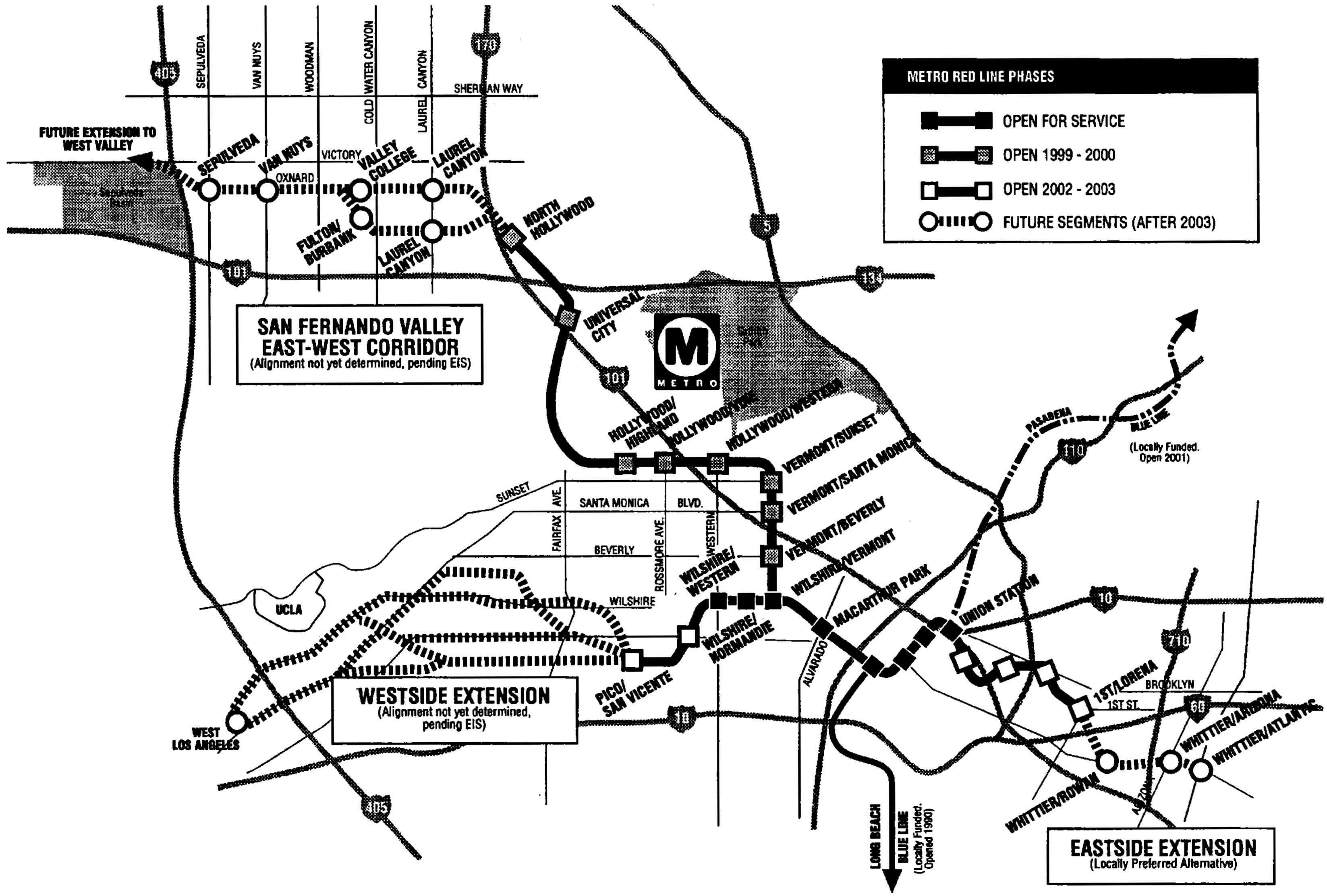
J-1 PLANNING AND PROJECT DEVELOPMENT PROCESS

In November 1980, Los Angeles County voters approved Proposition A, authorizing the LACTC (now the MTA) to assess a county-wide half-cent sales tax to improve and expand the county's existing public transit system, and to construct and operate a rail rapid transit network. In June 1990, voters approved Proposition C, which added another half-cent to the local sales tax to fund further expansion of transit systems and allow expedited construction of area transportation projects. The passage of these two propositions led the LACTC to formulate the *30-Year Integrated Transportation Plan*, adopted in April 1992, which called for construction of over 400 miles of rail transit in Los Angeles County and beyond, at a cost of approximately $187 billion. The map accompanying Proposition A on the ballot included a rail transit line running east-west through the San Fernando Valley (see Figure J-1). The 30-Year Plan included this same corridor as a candidate for rail service.

However, in March 1995 the MTA adopted a scaled-down version known as the Long Range Plan, with a 20-year time frame extending to the year 2015. The Long Range Plan was drafted in response to Intermodal Surface Transportation Efficiency Act (ISTEA) requirements for fiscally-constrained transportation planning and addressed an anticipated decline in sales tax revenues due to the severity of the recession affecting the Los Angeles region. The Long Range Plan limited investment in the county's transit network to $72 billion, eliminating several previously proposed rail lines and designating five proposed rail projects as candidate corridors "should funding become available." Nonetheless, the east-west corridor through the San Fernando Valley from North Hollywood to I-405 remained a funded corridor, and in August 1994 the MTA's Board of Directors adopted the corridor as the "next build" line for the county's rail transit system (see Figure J-2).

A series of studies has been conducted over the past 12 years to identify promising transit alternatives and rail technologies for the San Fernando Valley East-West Transportation Corridor. The most significant among them are:

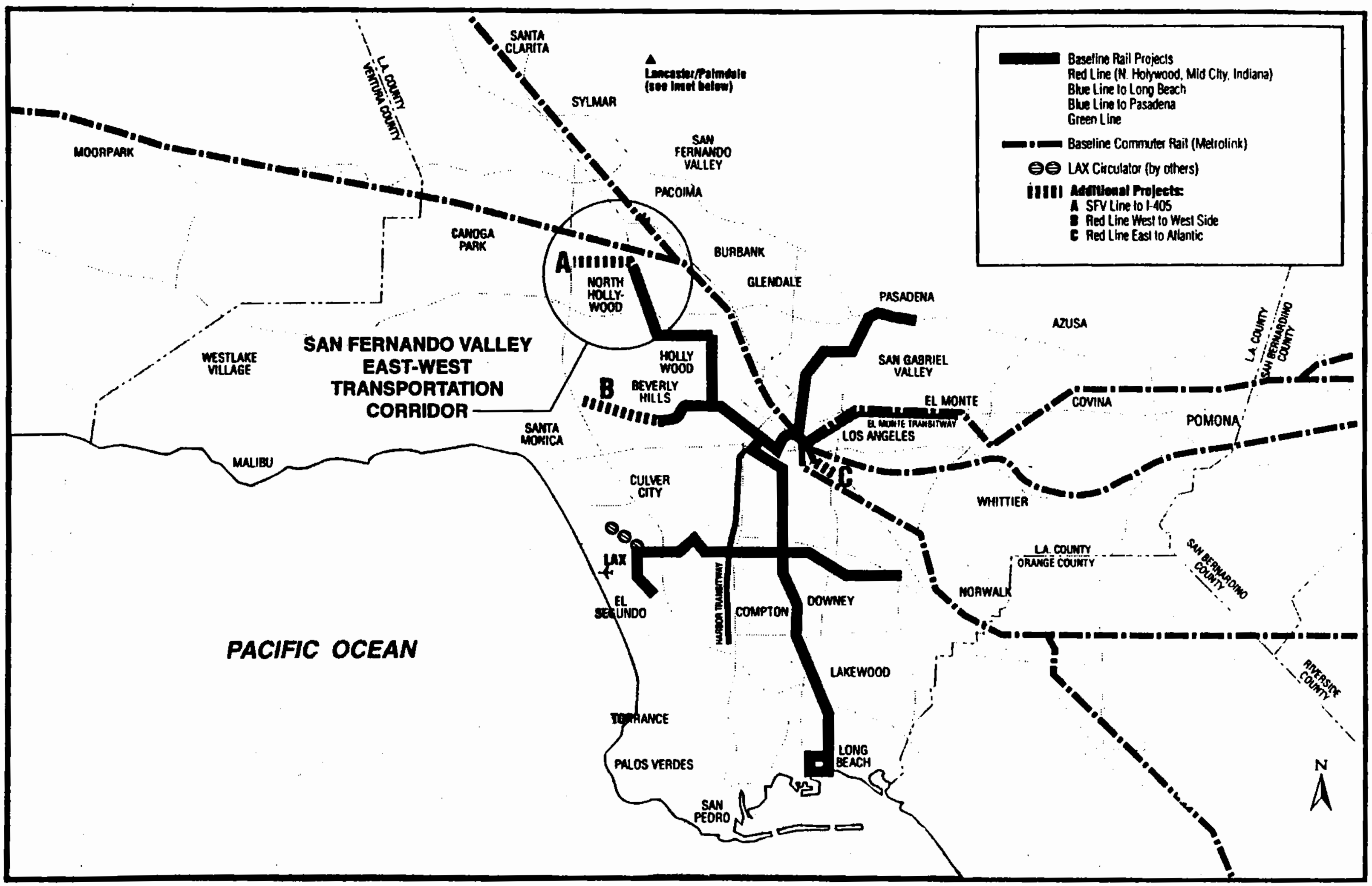
- *Initial Alternatives Evaluation Report*, 1987
- *San Fernando Valley East-West Rail Transit Project Environmental Impact Report (EIR)*, 1990
- *San Fernando Valley East-West Rail Transit Project Subsequent Environmental Impact Report: Ventura Freeway Advanced Aerial Technology Alternative (SEIR)*, 1992
- *Ventura Freeway Rail Transit Draft Project Study Report (PSR)*, 1994
- *SP Burbank Branch Pre-Preliminary Engineering Study*, 1994



SOURCE: ADOPTED FROM MTA LONG RANGE PLAN, MARCH 1995.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE J-1
Potential Future Extensions



SOURCE: MTA, 1995.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE J-2
MTA Long Range Plan

Alignment alternatives proposed for the project included the SP Coast Mainline right-of-way (ROW), the SP Burbank Branch ROW, Sherman Way, Victory Boulevard, Ventura Boulevard, the Ventura Freeway, and the Los Angeles River. The location of these alternative alignments within the Valley is shown in Figure J-3. The evaluation and sequential narrowing down of candidate alternatives is summarized in Figure J-4 and discussed below.

J-1.1 Preliminary Route Assessment

In 1983, LACTC initiated preliminary assessment of various above-ground rail transit alternatives for an east-west corridor through the San Fernando Valley. Listing from north to south, the alignments initially considered were:

- SP Coast Mainline
- Sherman Way
- Los Angeles River
- SP Burbank Branch
- Ventura Freeway
- Ventura Boulevard

The results of this initial analysis process led LACTC in 1984 to remove the Sherman Way and Ventura Boulevard alternatives from further consideration, for reasons discussed below. The remaining alternatives were carried forward for further evaluation, and are discussed in detail later in this chapter.

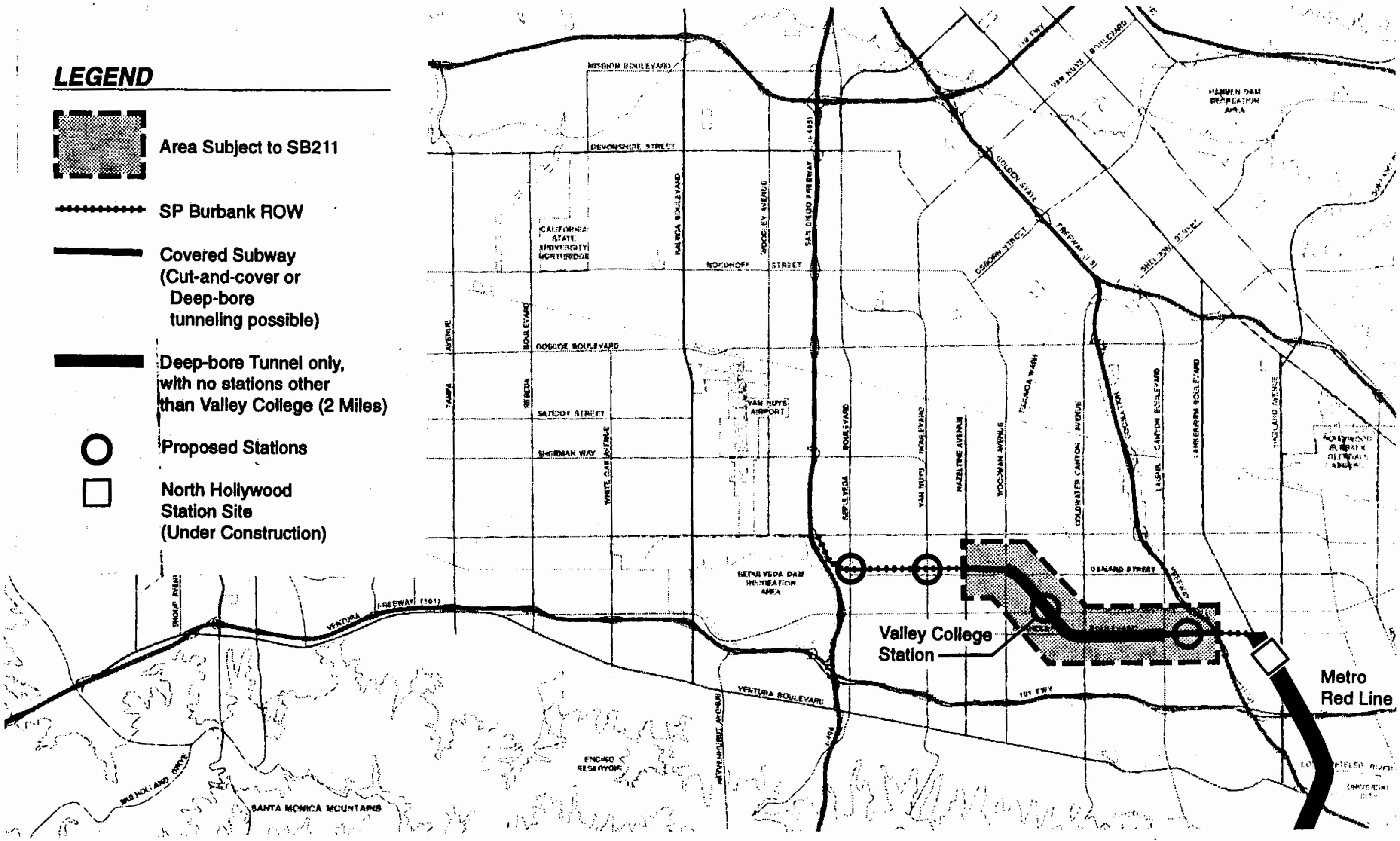
a. Sherman Way

Sherman Way is an east-west arterial that was considered as a candidate for a light rail transit facility, operating either at grade or on an aerial guideway in the median of the street. Between Balboa Boulevard and I-405, the guideway would have to cross under the Van Nuys Airport main runway. A Sherman Way alignment would serve the commercial districts of Canoga Park, Reseda, and Van Nuys, and pass through residential areas along the rest of its length. The route is approximately 15 miles in length, and would connect Canoga Park with the North Hollywood Metro Rail Red Line station. It would not directly serve Warner Center.

Due to the need to acquire substantial numbers of commercial properties in the Reseda commercial district and the expected difficulties of construction in the Van Nuys airport tunnel, LACTC dropped this alternative from consideration in 1984. In 1995, Sherman Way was revived as a candidate for a proposed subway in the West Valley, but the high costs associated with an entirely subsurface alignment led to its dismissal.

b. Ventura Boulevard

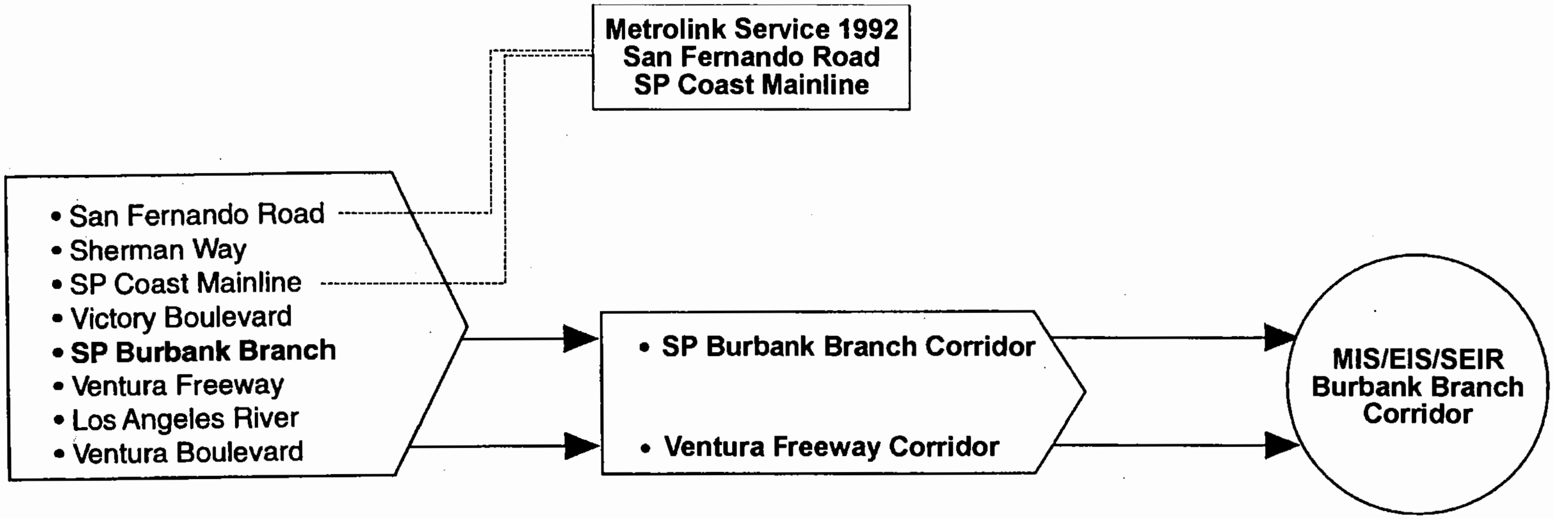
Ventura Boulevard is a long, densely developed commercial corridor that traverses the southern edge of the San Fernando Valley extending from the Warner Center area on the western edge of



SOURCE: GRUEN ASSOCIATES, 1996.

San Fernando Valley
East-West Transportation Corridor
MIS/EIS/SEIR

FIGURE J-3
SB211



1983/1984
Initial LACTC Evaluation

1985/1986
Route Refinement Study

1987-1992
In-Depth Route Refinement/EIR/SEIR

1990
Adoption & Certification of SP Burbank Branch EIR (CEQA)

1992
Draft SEIR proposed to include Ventura Freeway Rail Alternative

1993/1994
Ventura Freeway Draft Project Study Report (PSR)

SP Burbank Branch Geotechnical/Engineering Study

October 1994
MTA Board Adoption of SP Burbank Branch Corridor

1995-1997
MIS/EIS/SEIR

SOURCE: GRUEN ASSOCIATES, 1996.

FIGURE J-4
Successive Evaluation and Re-Evaluation of Candidate Alternatives

the Valley to Universal City, and would be expected to generate substantial ridership. Ventura Boulevard was originally studied as a candidate for an east-west light rail transit line and in 1991, it was considered as an alignment for a deep-bore subway.

The principal drawbacks to the Ventura Boulevard alignment would be the required acquisition of commercial properties and its location at the extreme southern edge of the Valley. These concerns prompted LACTC to drop this alternative from future consideration in 1984. In 1991, Ventura Boulevard was revived as a candidate for a proposed subway through the Valley, but the high costs associated with an entirely subsurface alignment led to its dismissal.

Based on the preliminary assessment of candidate routes, in October 1983 LACTC selected a light rail line generally following the SP Burbank Branch alignment as a representative route for system planning purposes.

J-1.2 Initial Evaluation of Alternatives

The preliminary assessment was followed by a route refinement study conducted in 1985-86, focusing on options within the SP Burbank Branch ROW. However, in response to local opposition to the SP Burbank Branch alignment, LACTC broadened the range of alternatives under consideration to include four other routes, namely the SP Coast Mainline, Victory Boulevard, the Los Angeles River, and the Ventura Freeway.

In February 1987, LACTC authorized the preparation of an EIR for the proposed rail transit line connecting the West Valley to the Metro Rail station in either North Hollywood or Universal City. The *Initial Alternatives Evaluation Report,* a precursor to the EIR, was issued in September 1987, and detailed conceptual plans were prepared for the following five alternatives:

- SP Coast Mainline
- Victory Boulevard
- Los Angeles River
- SP Burbank Branch
- Ventura Freeway

Each of these routes (see Figure J-4) was analyzed with respect to engineering issues, environmental impacts, and land uses. For all five alternatives, the rail technology evaluated was light rail, operating along a combination of at-grade and grade-separated alignments. Following completion of the *Initial Alternatives Evaluation Report*, LACTC eliminated the SP Coast Mainline, Victory Boulevard, and Los Angeles River alignments from further consideration. The report's findings regarding these alternatives are summarized below.

a. SP Coast Mainline

The SP Coast Mainline alignment would have used existing Southern Pacific ROW (with new connections in North Hollywood) to provide rail transit service between North Hollywood and Chatsworth, with 13 to 14 stations at major north-south arterial streets, including Reseda, Sepulveda, and Van Nuys Boulevards. The route passed largely through industrial areas, which constituted 67 to 81 percent of the adjacent land uses. The system would have been light rail, adjacent to the existing Southern Pacific freight tracks. While the existing ROW was grade-separated at most street crossings, 10 were at-grade. Of these, at least five were projected to require construction of grade separations to eliminate conflicts between trains and north-south automobile traffic.

The need to construct several grade-separated street crossings was perceived as a significant engineering problem, as was the need to build a new bridge structure to carry the rail line over the Hollywood Freeway. Furthermore, the route failed to serve major activity centers, and would have limited ridership. Finally, the alignment was already in use for freight trains and Amtrak passenger rail, which posed a conflict. Following the 1987 *Initial Alternatives Evaluation Report*, the LACTC decided to remove the SP Coast Mainline from further consideration. However, the route was ultimately adopted for Metrolink commuter rail service using existing railroad ROW between downtown Los Angeles and Moorpark, in eastern Ventura County. Service along the route began in 1992.

b. Victory Boulevard

The Victory Boulevard alignment began at Warner Center, and continued east in the SP Burbank Branch ROW to Woodley Avenue. East of Woodley Avenue, the alignment left the SP Burbank Branch ROW and proceeded down Victory Boulevard for a total of 4 miles, to connect the North Hollywood Metro Rail station. A total of 15 stations were proposed, with elevated stations in the center of Victory Boulevard at the intersections with Sepulveda and Van Nuys Boulevards (serving the Van Nuys Governmental Center) and at Woodman and Coldwater Canyon Avenues. The technology evaluated was light rail, operating on an elevated guideway in the middle of Victory Boulevard, approximately 20 feet above street level. To provide room for the support structures, at least one lane of the boulevard would be permanently closed to traffic. Aerial crossings of the San Diego and Hollywood Freeways would also have been required.

Adverse impacts on adjacent homes were identified as a substantial disadvantage, and in addition, placement of the guideway in the middle of the street meant the removal of a lane of traffic from Victory Boulevard. Because of these drawbacks, LACTC dropped Victory Boulevard from further consideration.

c. Los Angeles River

The Los Angeles River flows from west to east through the southern half of the San Fernando Valley, except for the portion within the Sepulveda Basin. The river channel and Sepulveda Basin are maintained as flood control facilities by the L.A. County Flood Control District and the U.S. Army Corps of Engineers, respectively. This route would follow the flood control channel for its 15-mile length, extending from near Warner Center to North Hollywood, where the alignment would run parallel to the Hollywood Freeway. Light rail, on a 25-foot or higher aerial guideway parallel to the river channel and 13 stations were proposed. Operating speeds would have been reduced to as low as 25 miles per hour along the eastern portion of the alignment (compared to an average speed of 55 miles per hour for other alignments), due to tight curves along the river channel.

The Los Angeles River alignment would have required substantial cooperation with the flood control agencies to ensure that construction and operation of the rail transit line did not interfere with flood control requirements. The all-aerial guideway would have led to significant impacts (noise, vibration, visual intrusion, and loss of privacy) on the residences that comprised the majority land use along the route. Accordingly, LACTC dropped the Los Angeles River alignment from future consideration in 1987.

Of the five alignments documented in the *Initial Alternatives Evaluation Report*, LACTC retained the Ventura Freeway and SP Burbank Branch for future consideration. The findings of the 1987 report are summarized here, briefly.

d. Ventura Freeway

The 1987 *Initial Alternatives Evaluation Report* studied the Ventura Freeway as an alignment for a light rail transit corridor, running from Warner Center to Universal City on an aerial guideway. The vast majority of the route, 13 miles, would be adjacent to the freeway. The alignment would be placed south of the freeway in the western valley, between Canoga Avenue and Reseda Boulevard, to serve the commercial uses adjacent to nearby Ventura Boulevard. East of Reseda Boulevard, the alignment was shifted north of the freeway, to serve Riverside Drive, Burbank Boulevard, and the majority of riders who would be coming from residential districts to the north.

LACTC retained the Ventura Freeway alternative as a candidate for the East-West Corridor. The alignment, with modifications, was evaluated in the 1990 East-West Rail Transit Project EIR.

e. SP Burbank Branch

The SP Burbank Branch alignment is located within a 14-mile long ROW that would link Warner Center, the Van Nuys Governmental Center, and North Hollywood, and also serve Pierce College and Los Angeles Valley College. The *Initial Alternatives Evaluation Report* studied light rail transit operating at-grade, except at major street intersections where grade-separation would be required to accommodate heavy traffic volumes. In addition, a depressed alignment was proposed in residential areas. Landscaped berms would have been used to shield homes adjacent to the alignment from view from passing light rail vehicles.

The SP Burbank Branch ROW was retained as a candidate alignment for the East-West Corridor project. A variety of rail technologies and grade configurations within this ROW were analyzed for environmental impacts in the 1990 EIR.

J-1.3 Public Reaction

During preparation of the *Initial Alternatives Evaluation Report*, a series of six public workshops were conducted in the San Fernando Valley to obtain public input on the project. More than 725

Valley residents attended these workshops, and over 2,000 people submitted comments on the rail proposal.

In general, opposition was voiced by residents along all five route alternatives. The community raised concerns about noise and vibration, property values, safety, traffic conflicts, and neighborhood disruption. In particular, there was concern that light rail transit in the SP Burbank Branch alignment, as proposed, would disrupt an Orthodox Jewish community located along Chandler Boulevard in the North Hollywood area.

In November 1987 LACTC voted to defer environmental impact studies of the project and requested assistance from elected officials serving the San Fernando Valley to decide whether to continue with a rail project in the Valley and, if so, where the project should be located. The Los Angeles City Council appointed the San Fernando Valley Citizens Advisory Panel on Transportation Solutions. The panel (composed of 32 citizen members) held 19 public meetings. In August 1988 the panel issued its report, entitled *Transportation Solutions*, which recommended that LACTC pursue further studies of the SP Burbank Branch and the Ventura Freeway alignments. The report further proposed that the SP ROW parallel to San Fernando Road in the easternmost part of the Valley be considered for rail service. In response, LACTC commissioned an EIR on the SP Burbank Branch and Ventura Freeway alignments for the proposed rail transit project.

J-1.4 Preparation of the 1990 EIR

The remaining candidates, the SP Burbank Branch and the Ventura Freeway, were carried forward for full-scale environmental analysis under the California Environmental Quality Act (CEQA). The *San Fernando Valley East-West Rail Transit Project Final EIR*, certified in 1990, studied a variety of alignments and technologies for these two routes. In addition, a "phased length" option was considered for each alternative, under which the rail line would initially be built only to Sepulveda Boulevard, roughly halfway between Universal City and Warner Center.

As part of the public participation process, two open houses and two public hearings were held. In addition to the public hearing testimony, a total of 247 comments were received from public agencies, elected officials, community organizations, schools, private residents, and businesses. Various concerns were raised in the following order of frequency: noise and air quality impacts; traffic impacts; costs; patronage; perceived depreciation of property values; safety issues; parking adequacy and spillover; growth inducement; construction impacts; earthquakes; and adequately informing the community on the process. Many of the comments did not raise specific questions or issues about the DEIR, but merely expressed a preference for or against the project.

The following alternatives were evaluated in the 1990 EIR:

a. SP Burbank Branch Alternatives

Burbank LRT Vineland: A predominantly at-grade light rail transit (LRT) facility between Warner Center and Universal City that followed Vineland Avenue between North Hollywood and

Universal City. This alternative utilized earth berms and shallow excavated trenches in residential areas to mitigate noise and visual impacts. Transit riders would have needed to transfer at Universal City from LRT to Red Line subway trains.

Burbank LRT Lankershim: A predominantly at-grade LRT facility between Warner Center and North Hollywood, following the adopted Metro Rail subway route along Lankershim Boulevard between North Hollywood and Universal City. This alternative was identical to the "Burbank LRT Vineland" alternative, except for the Metro Rail subway segment between North Hollywood and Universal City. Transit riders would have needed to transfer at North Hollywood.

Burbank LRT Deep Trench Vineland: An LRT facility between Warner Center and Universal City that was in a deep trench or subway 25 to 30 feet below grade in residential areas. This alternative connected to the Metro Rail Red Line at Universal City via Vineland Avenue. Transit riders would have needed to transfer at Universal City.

Burbank LRT Deep Trench Lankershim: An LRT facility between Warner Center and North Hollywood that was in a deep trench or subway 25 to 30 feet below grade in residential areas. This alternative was identical to the "LRT Deep Trench Vineland" alternative, except between North Hollywood and Universal City where the adopted Metro Rail subway line under Lankershim Boulevard was used. Transit riders would have needed to transfer at North Hollywood.

Burbank Metro Rail Red Line Extension: An extension of Metro Rail from Universal City to Warner Center, in deep-bore subway 40 to 50 feet below grade in residential areas. Transit riders would not be required to transfer between the main Metro Rail Red Line and the San Fernando Valley extension and could ride continuously on one train to Downtown Los Angeles.

Burbank ART: An automated rail transit (ART) facility from North Hollywood to Warner Center, in deep-bore subway 40 to 50 feet below grade in residential areas. Single car, fully automated trains would run at 2-minute headway during peak periods, but passengers would have had to transfer to Red Line trains at the North Hollywood station.

b. Ventura Freeway Alternatives

Ventura South Side Metro Rail Red Line Extension: An extension of Metro Rail, predominantly on aerial guideway, from Universal City to Warner Center along the south side of the Ventura Freeway. Transit riders would not have had to transfer between the Red Line and the San Fernando Valley extension and could ride continuously on one train to downtown Los Angeles.

Ventura South Side ART: An automated rail transit facility between Warner Center and Universal City, routed along the south side of the Ventura Freeway on aerial guideway. Single car, fully automated trains would run at 2-minute headways during peak periods, but passengers would have had to transfer at the Universal City station.

Ventura North Side Metro Rail Red Line Extension: An extension of Metro Rail that was partially on aerial guideway and partially in deep-bore subway between Warner Center and Universal City. This alignment followed the north side of the Ventura Freeway in a subway configuration between Reseda and Laurel Canyon Boulevards. Transit riders would not have had to transfer and could ride continuously on one train to Downtown Los Angeles.

Ventura North Side ART: An automated rail transit facility between Warner Center and Universal City that was partially on aerial guideway and partially in deep-bore subway. Single car, fully automated trains would run at 2-minute headways during peak periods, but passengers would have had to transfer at the Universal City station.

The Final EIR, completed in 1990, identified "Alternative 3a," the Burbank Metro Rail Red Line Extension with deep-bore subway in residential areas comprising 9 miles of the total 14 miles of the route, as the environmentally superior alternative. This determination was based on the following factors:

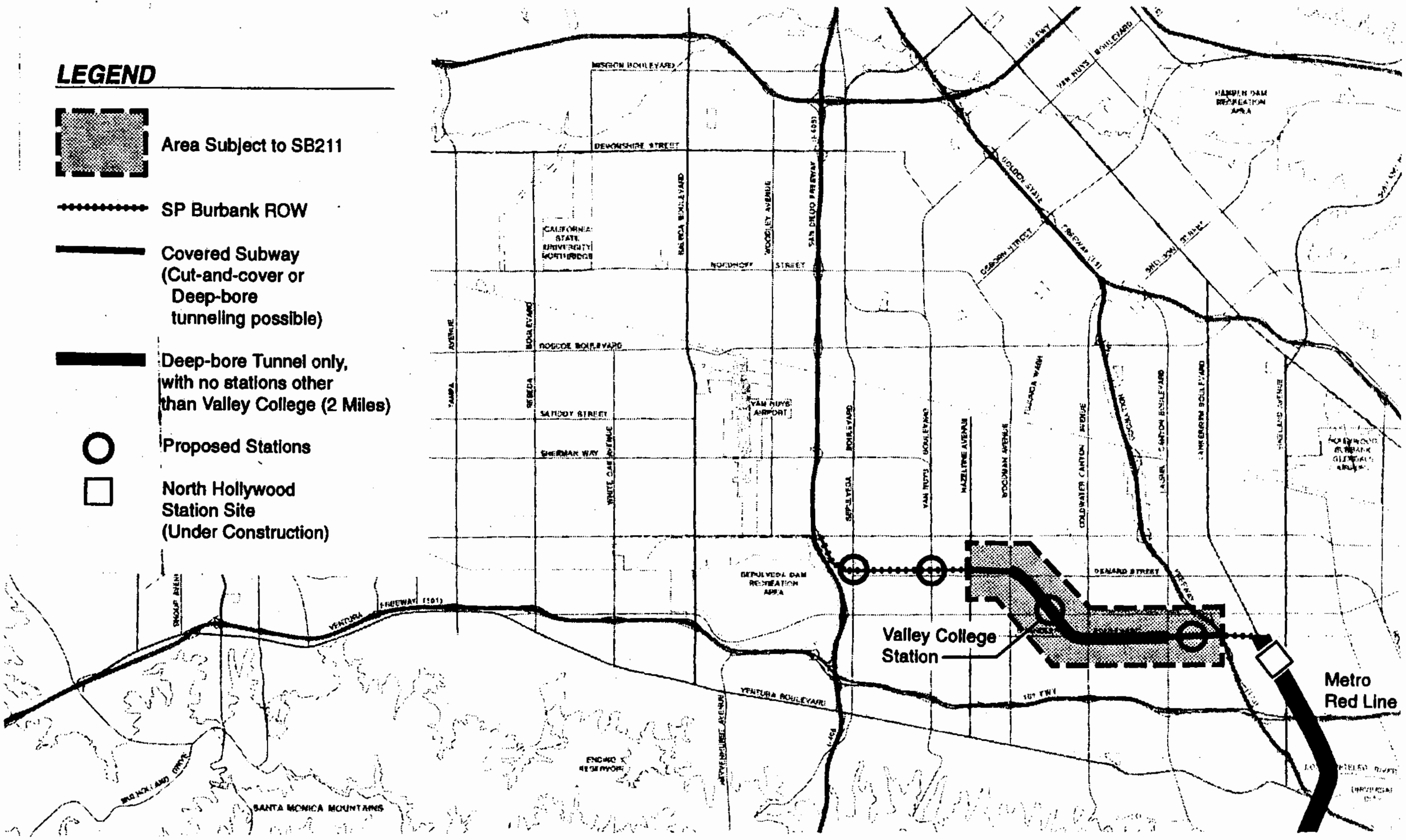
1) The alternative was in subway through residential areas, thus eliminating adverse noise and visual impacts;
2) The alternative, being located in the existing SP Burbank Branch ROW, required no displacement of existing residences;
3) The alternative had a higher projected ridership than other alternatives, which would translate into reduced traffic congestion and improved air quality due to the reduction in automobile trips.

However, the alternative was among the most costly alignments studied, due to the expense of deep-bore subway construction.

J-1.5 Subsequent Environmental Analysis

On February 28, 1990, LACTC certified the Final EIR for the San Fernando Valley East-West Rail Transit Project, covering all of the alternatives previously discussed. The LACTC directed that findings be prepared for the deep-bore Metro Rail Red Line Extension known as Alternative 3a. On March 28, 1990, LACTC adopted Findings and Statement of Overriding Considerations and approved a Mitigation Monitoring Program for the Red Line extension, thus completing CEQA environmental clearance for the project.

In June 1991 the Governor signed Senate Bill 211, an act of the California Legislature which endorsed an underground configuration for a rail transit project along Chandler Boulevard between the North Hollywood Metro Rail subway station and Hazeltine Avenue, some 3.5 miles to the west. Figure J-5 highlights the area of the study corridor discussed in SB 211.
While LACTC adopted the SP Burbank Branch deep-bore subway alternative, it also requested a study of two additional alternative alignments. The Ventura Boulevard alignment, previously discarded, was revived for study as a candidate for a Metro Rail subway extension. An alignment in the Ventura Freeway median (rather than the edge of freeway) was also considered for the use of advanced aerial technology, including monorail, mag-lev trains, and driverless ART.



SOURCE: GRUEN ASSOCIATES, 1996.

San Fernando Valley
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MIS/EIS/SEIR

FIGURE J-5
SB211

In 1991, a report entitled *Supplemental Evaluation of Ventura Boulevard and Ventura Freeway Alternatives* was released. Based on cost estimates from that study, LACTC deleted the Ventura Boulevard alternative from further consideration due to the expense of constructing an all-subway alignment. The Ventura Freeway median alignment was retained, however, for consideration in a Subsequent EIR to supplement the existing 1990 EIR.

The purpose of the subsequent EIR, completed in 1992, was to provide LACTC with a basis for determining whether advanced aerial technology located in the Ventura Freeway median would provide a more cost-effective alternative to the already-adopted Metro Rail subway extension along the SP Burbank Branch ROW.

Two open houses and two public hearings were held in October and November 1991, during the course of a 90-day comment period. In addition to the public hearing testimony, a total of 587 comments were received from public agencies, elected officials, community organizations, private citizens, and businesses.

The comments expressed the following concerns: noise and air quality impacts; proximity impacts such as visual and privacy intrusion; perceived depreciation of property values; safety issues; parking adequacy and spillover; construction impacts; security; and traffic congestion. Approximately half of the comments received during the public comment period were in support of the project.

In December 1992, LACTC conditionally adopted the Ventura Freeway alignment as the preferred route for the San Fernando East-West Transportation Corridor, pending the completion of engineering studies that would provide greater detail on project costs and feasibility. In January 1993, LACTC ordered that pre-preliminary engineering studies be done for both the Ventura Freeway and SP Burbank Branch alternative alignments. These studies were completed in mid-1994.

In the interim, the public involvement process continued. Forty-five outreach meetings were held regarding the benefits and impacts of both alignments under consideration, and more than 500 people participated. The most frequently raised issues and concerns (in no particular order of frequency) included noise and vibration impacts, perceived depreciation of property values, safety and security, traffic congestion, loss of parking in neighborhoods, construction impacts, and proximity impacts such as visual intrusion and perceived loss of privacy for both alignments.

J-1.6 Pre-Preliminary Engineering and Selection of the SP Burbank Branch Alignment

Following the Northridge earthquake in January 1994, revised construction standards adopted by the MTA meant that wider support columns would be needed, which in turn meant the freeway median might need to be widened beyond its current 6-foot width. The California Department of Transportation (Caltrans) determined that closure of freeway lanes to facilitate construction of an aerial guideway was not acceptable. Caltrans assessed construction issues regarding the

Ventura Freeway alignment in a *Project Study Report* (PSR) written in 1994. In August of that year, Caltrans rejected a "constrained freeway" alternative that would have narrowed the freeway lanes to accommodate construction and required only 7 feet of road widening in each direction. Citing public safety concerns, and only incremental cost increases above the constrained freeway approach, Caltrans determined that the "full standard" alternative was preferable. Under this design, the Ventura Freeway alignment would require widening the existing freeway median to 28 feet to accommodate the 6-foot wide support columns for the aerial guideway. Overall, the freeway would have to be widened by 34 feet (17 feet on each side) to provide five 12-foot wide traffic lanes in each direction of travel, a design which would meet Federal Highway Administration standards and provide a safer traffic facility. Caltrans estimated the costs of this widening at approximately $240 million.

In a parallel effort, the MTA prepared cost estimates for the SP Burbank Branch alignment in the *Pre-Preliminary Engineering Study*, completed in September 1994, that revealed that the cost savings of an aerial configuration on the Ventura Freeway versus a subway in the SP Burbank Branch ROW were less than expected, due primarily to the construction of the subway with cut-and-cover methods and proposed use of open-air station construction in the SP Burbank Branch.

After examining the results of these studies and hearing testimony from all interested parties, in October 1994 the MTA's Board of Directors reaffirmed LACTC's earlier endorsement of the SP Burbank Corridor over the Ventura Freeway Corridor.

In 1995, the MTA Board of Directors directed the preparation of a Major Investment Study (MIS) for alternative alignments within the SP Burbank Branch Corridor. This is required by the U.S. Department of Transportation for all federally-funded transportation projects, and its goal is to facilitate local decision-making by ensuring that a broad range of project alternatives is considered. The MIS contains information on costs, benefits, and transportation impacts of each alternative, and assesses each alternative's cost-effectiveness, efficiency, and mobility improvements. The MIS has been conducted as part of the EIS required by NEPA and the Supplemental EIR required under CEQA.

J-2 PRELIMINARY ALTERNATIVES CONSIDERED

As noted in Section 2-1 of the MIS/EIS/EIR, the alternatives that are examined in this environmental document have been derived as the result of a screening process that initially considered a broader range of options. The following sections of this chapter describe the set of preliminary alternatives that were considered for Phase I (East Valley) and Phase II (West Valley) of the San Fernando Valley East-West Transportation Corridor project. This comprehensive set of alternatives was developed in response to federal MIS guidelines that mandate analysis of project alternatives.[1]

[1] Where Federally funded major transportation improvements are being contemplated, the MIS should identify all reasonable strategies for addressing the transportation demands and other problems at a corridor or subarea level of the metropolitan area. (Memorandum from FTA Associate Administrator for Grants Management to FTA

The preliminary alternatives represent the full range of possible rail transit alternatives within the corridor. A busway option, providing express bus transit through the corridor, has also been studied. In addition, "No Project" and Transportation Systems Management (TSM) alternatives required by federal and state legislation were included for evaluation in the MIS and the EIS/SEIR.

This section describes the guideway profiles, technologies, and alignment options that were considered for use in the East-West Corridor. Section J-2.4 describes each of the preliminary alternatives that were generated for analysis in the MIS.

J-2.1 Profile Options

Several different profiles are possible for a transit system operating in the East-West Corridor (see Figure J-6).

At-grade: An at-grade system would operate at ground level. Pedestrian and vehicular cross-traffic would conflict with movement of rail vehicles, meaning crossing barriers and/or signal pre-emption devices would be necessary at major intersections.

Aerial: An aerial system would operate on an overhead guideway supported by a series of columns. Trains using an aerial guideway would be completely separated from all cross-traffic, which would pass underneath the guideway.

Deep-bore subway: A system operating in a deep-bore subway would be located completely underground. The tunnel would be excavated from below the earth's surface, using boring equipment. This method of construction is most commonly used for subway tunnels located beneath existing streets or intensely-developed areas in order to minimize surface and near-surface (utilities) disruption.

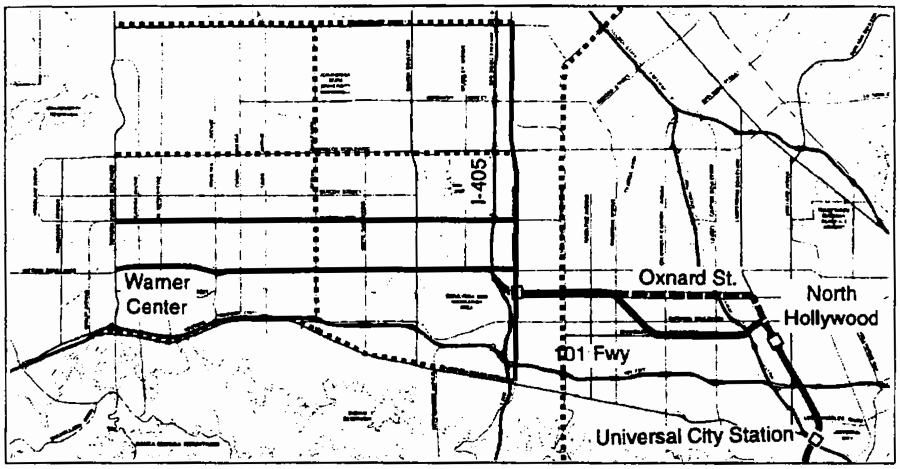
Cut-and-cover subway: A rail transit system operating in a cut-and-cover subway would travel in an underground tunnel. However, the tunnel would be excavated from the surface, rather than bored underground, and would be located at a shallower depth than a deep-bore subway tunnel.

Open-air subway: An open-air subway configuration consists of a channel located below-grade level. The rail guideway would be located in the channel, which would remain uncovered to reduce construction costs and to minimize access and ventilation expenses.

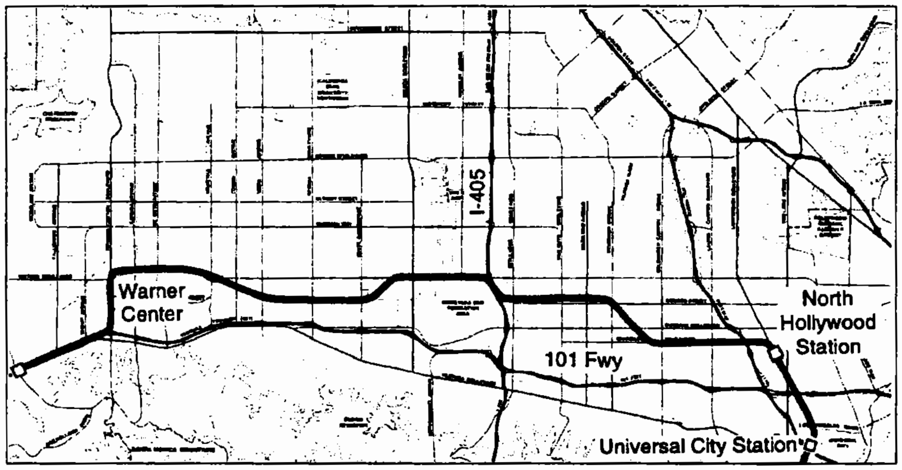
J-2.2 Technology Options

Four different rail transit technologies and one bus technology were considered for use in the East-West Corridor. They are as follows:

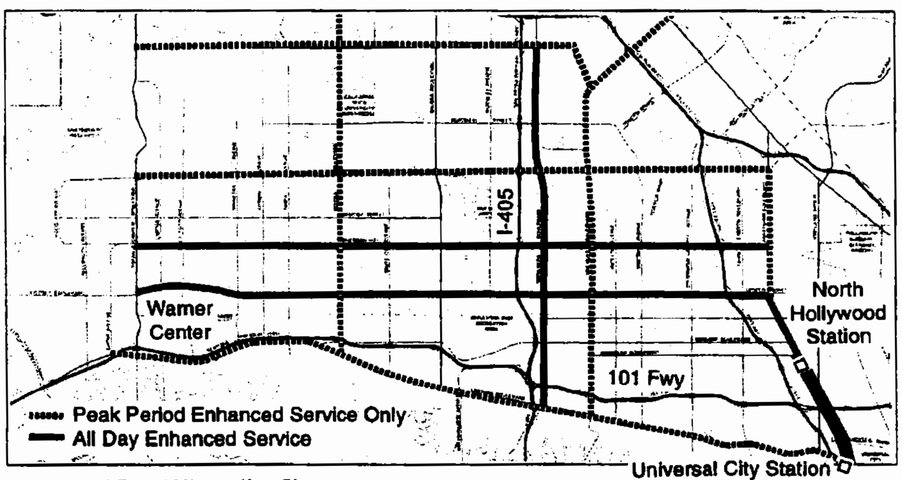
Regional Administrators, dated August 19, 1994.)



Red Line Extension from North Hollywood to I-405 (Alternative 1,2) & TSM



Dual Mode Red Line Extension or Light Rail Transit from North Hollywood via SP Right-of-Way to West Valley (Alternative 6,12)



Enhanced Bus (Alternative 9)

Note: **Alternative 10 - No Project would essentially maintain existing levels of transit service in the East - West Corridor.**

SOURCE: MIS ALTERNATIVES SCREENING REPORT, MAY 1996.

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FIGURE J-6
Cross Valley Strategies

Heavy Rail: A heavy rail project in the San Fernando Valley would be an extension of the Metro Red Line using conventional Red Line Vehicles. A heavy rail guideway must be fenced off along its length or otherwise grade-separated to prevent individuals from coming into contact with the high-voltage "third rail" used to power the trains. A Red Line extension would have the greatest passenger capacity among the technologies available, but it would also be the most expensive. An extension of the Red Line would allow direct service between the Valley and downtown Los Angeles, without a need for passenger transfers.

Dual Mode: Recently it has been learned that it is possible to modify the roof area of the standard Red Line vehicle to allow for installation of a pantograph, which is used by light rail vehicles to collect electrical power from overhead wires (called a catenary). This optional installation would make it possible to runs Red Line vehicles both in grade-separated and non-grade-separated conditions. This vehicle type is being considered because it offers some routing and long-term extension possibilities that otherwise would not be available.

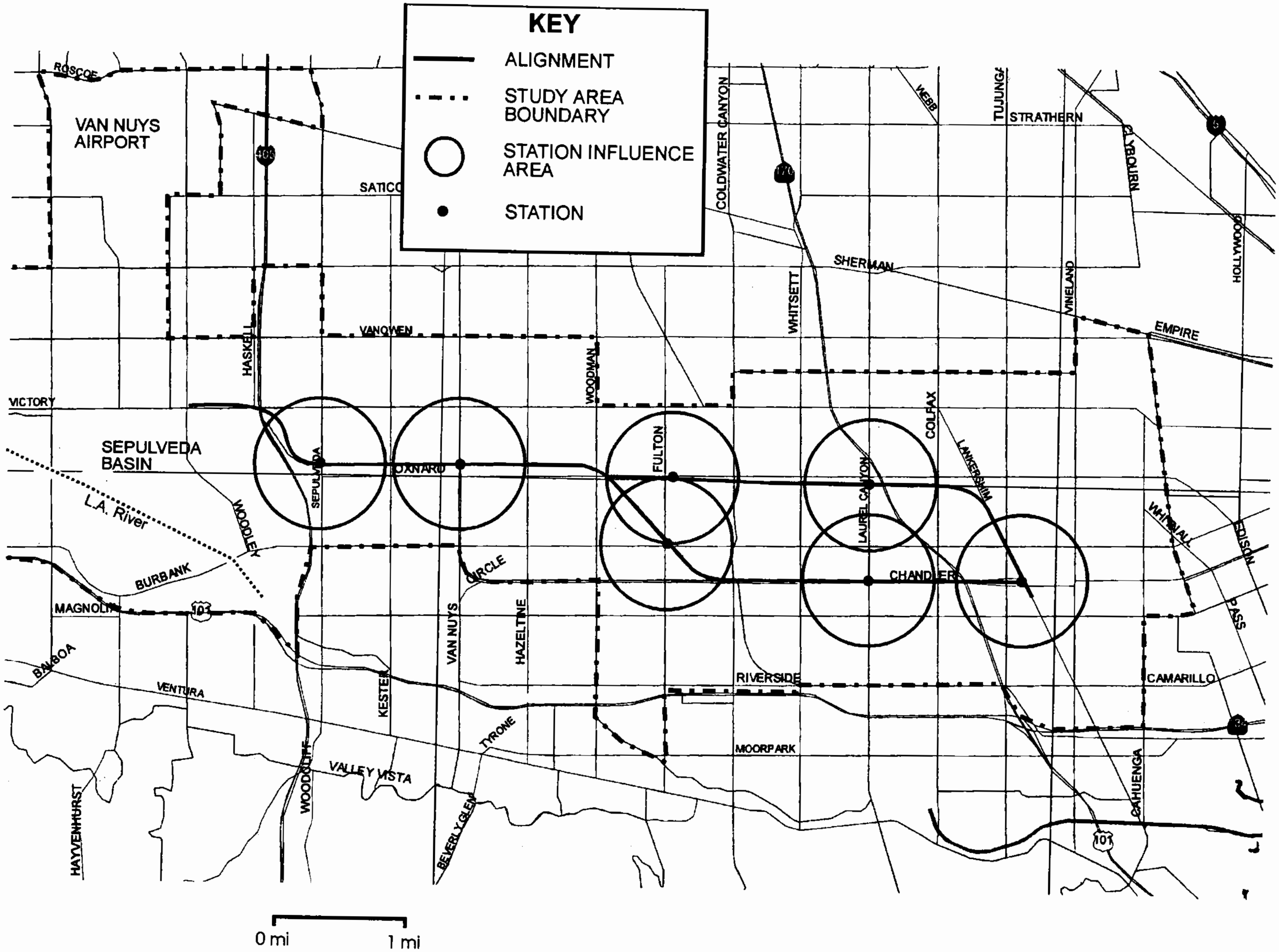
Light Rail: A light rail transit system could be implemented in the Valley and operate on an at-grade, aerial, or underground guideway. Because the catenary wires that provide power to the light rail vehicles are located overhead, it is not necessary to provide grade-separated pedestrian and street crossings, except as may be required for reasons such as heavy traffic volumes. Light rail has slower maximum speeds and lower passenger capacity than heavy rail.

Alternate Rail Technology (ART): ART vehicles have operating speeds similar to light rail, but they are powered by internal combustion engines rather than electricity. Because of air quality concerns, an ART system in the San Fernando Valley might employ vehicles that run on compressed natural gas or other low-polluting fuels, although only diesel fuel vehicles are currently available. ART vehicles can run as single units, or they can be linked into trains of two to three units to increase passenger capacity. An ART system would require passengers to transfer to the Red Line at North Hollywood to reach downtown Los Angeles, resulting in increased travel times compared to a heavy rail extension.

Standard Bus: Transit service can also be provided using standard buses that would run along either a dedicated busway or on city streets. Because of air quality concerns, "clean air buses" powered by natural gas might be employed. An express bus system would likely be less expensive than any of the rail technologies under consideration, but would have lower passenger carrying capacity than a rail system.

J-2.3. Candidate Alignments

The area of the San Fernando Valley included in the study corridor is shown in Figure J-7. The portion of the East Valley which encompasses the initial project phase is highlighted. This East Valley area has been identified in the MTA Long Range Plan for development in the next 20 years. Within the entire study corridor, a baseline route and two variations have been identified for transit between the North Hollywood Metro Rail station and the Warner Center area.



SOURCE: MYRA FRANK & ASSOCIATES, INC., 1996.

San Fernando Valley
East-West Transportation Corridor
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FIGURE J-7
San Fernando Valley Corridor Study Area

Southern Pacific Burbank Branch ROW: This alignment follows the Southern Pacific Burbank Branch ROW (SP ROW) from the North Hollywood Metro Rail station to Warner Center, then continues west along Victory Boulevard, Topanga Canyon Boulevard, and the Ventura Freeway to a proposed terminus at Valley Circle Boulevard. The SP portion of the required ROW is now owned by the MTA and serves as the baseline route for the project.

Oxnard Street variation (East Valley): This alignment begins at the North Hollywood Metro Rail station. Instead of following the SP ROW along Chandler Boulevard, this variation of the baseline route extends north along Lankershim Boulevard and then turns west onto Oxnard Street. At Woodman Avenue, the alignment returns to the SP ROW and continues in the ROW to Sepulveda Boulevard.

Sherman Way variation (West Valley): This alignment diverges from the SP ROW near the intersection of Victory and Balboa Boulevards and heads northwest to follow the alignment of Sherman Way between Reseda Boulevard and Canoga Avenue. The alignment then extends south on Canoga Avenue to the Warner Center area, where it returns to the baseline route along Victory Boulevard, Topanga Canyon Boulevard, and the Ventura Freeway.

J-2.4 Description of Preliminary Alternatives

The following set of alternatives were included in the MIS, using different combinations of the technologies, profiles, and alignments discussed above. It was from these that the alternatives selected for environmental analysis were selected. Additional information can be found in the *MIS Alternatives Screening Report*, May 1996.

a. *Red Line Extension to I-405 via SP ROW (Alternative 1)*

This alternative is described in Chapter 2.

b. *Red Line Extension to I-405 via Oxnard Street (Alternative 2)*

This alternative is described in Chapter 2.

c. *Light Rail Transit to I-405 via SP ROW (Alternative 3)*

Light rail transit alternatives would provide a lower-cost rail transit solution for the San Fernando Valley. Light rail transit vehicles cannot carry as many passengers as a heavy rail system, but they have enough capacity to meet the projected travel demand in the East-West Corridor. Moreover, they have lower operating costs than the Red Line heavy rail system. The capital costs of a light rail system could be lower than a Red Line extension, because light rail vehicles can operate at grade level.

If an LRT system is implemented, passengers from the Valley would have to transfer to the Red Line at North Hollywood to reach central Los Angeles, resulting in slightly increased travel times and somewhat reduced system ridership.

This alternative has two variations. Variation 3a proposes a predominately at-grade light rail system in the East Valley, with landscaped berms paralleling the trackway through residential areas to reduce visual impacts on adjacent homes. Variation 3b would locate the portion of the LRT system between the Hollywood Freeway and Fulton Avenue in a cut-and-cover subway, to reduce noise and visual impacts on neighboring residences and make pedestrian and vehicle crossings safer. In both cases, the LRT system would operate on the SP Burbank ROW and would include grade separations at selected major streets.

d. Red Line Extensions to Valley Circle Boulevard via SP ROW (Alternative 4)

This alternative would extend the Red Line heavy rail system from North Hollywood west across the entire San Fernando Valley to Valley Circle Boulevard. The extension would be located along the SP ROW. Between White Oak Avenue and De Soto Avenue, any of the following variations could be employed: deep-bore subway (Variation 4a), cut-and-cover subway (Variation 4b), open-air subway (Variation 4c), or aerial guideway (Variation 4d). Common to each of these variations are the segments along the edge of the Sepulveda Basin from I-405 to White Oak Avenue and in Warner Center from De Soto Avenue to Valley Circle Boulevard, which would have an aerial profile.

Due to the length of a cross-Valley rail project (roughly 17 miles) and the need for grade-separations at all cross-streets, these alternatives would be by far the most expensive transit solutions under study.

e. Red Line Extension to Valley Circle via Sherman Way (Alternative 5)

This alternative would extend the Red Line to I-405 via Oxnard Street as described in Alternative 2, then continue west along Sherman Way in the West Valley. To avoid disruption of traffic and disturbing the landscaped median along Sherman Way, this alternative would be constructed using deep-bore tunneling underneath the street.

f. Light Rail Transit to Valley Circle Boulevard via SP ROW (Alternative 6)

This alternative is described in Chapter 2.

g. Alternate Rail Technology to Chatsworth via SP ROW (Alternative 7)

Alternate Rail Technology (ART) is a term used to describe a passenger rail vehicle that has operating speeds and passenger capacity similar to light rail, but is powered by an on-board internal combustion engine rather than electricity. The absence of an overhead catenary wire system and traction power substations yields substantial capital cost savings over light rail systems. Alternative 7 has been conceived as a Valley-wide alternative that would provide service from North Hollywood to Warner Center, with an extension to the Chatsworth Metrolink station. The ART system would operate on the SP ROW.

h. Busway to Warner Center via SP ROW (Alternative 8)

This alternative envisions using the MTA-owned SP ROW to provide an exclusive roadway for buses operating between North Hollywood and Warner Center. Buses using the busway would make limited stops, and would have priority over cross-traffic at selected intersections. Alternative 8 is proposed as a Valley-wide transit solution that would provide service between North Hollywood and Warner Center.

i. Enhanced Bus/Transportation Systems Management (Alternative 9)

This alternative is described in Chapter 2.

j. No Project (Alternative 10)

This alternative is described in Chapter 2.

J-2.5. Evaluation of Preliminary Alternatives

The set of preliminary MIS alternatives was evaluated using quantitative measures of capital cost, operating cost, expected ridership, and cost-effectiveness. In addition, qualitative evaluations of community concerns and potential environmental impacts were undertaken. The application of these criteria and the evaluation results are discussed below.

a. Costs

(1) Capital Costs

Capital costs are the costs associated with the construction of a transit system, including purchase of ROW, construction of guideway structures and stations, provision of parking facilities, purchase of vehicles, and construction of vehicle maintenance facilities. Capital costs have been divided into project construction costs (the costs of building a transit system in the Valley) and system costs (costs incurred by linking the Valley corridor to the expanded MTA rail system envisioned in the year 2015 by the Long Range Plan).

Due to variations in the profile of the guideway and the type of rail technology employed, the project alternatives encompass a wide range of capital costs. Project construction costs are least expensive for those alternatives which minimize the use of below-grade profiles and grade-separations at cross streets. The most expensive alternatives are those which propose Red Line extensions, using third rail technology that requires grade separation along the entire length of the system. In contrast, alternatives employing ART or bus vehicles have the lowest construction costs, as they were defined to operate entirely at-grade.

System costs have increased from estimates prepared in prior years for all of the project alternatives. This reflects the fact any project implemented in the Valley will incur systemwide costs including bus and rail vehicles needed to link the project with the larger MTA system, including full rail extensions for East Los Angeles and the Westside as adopted in the Long Range Plan. Maintenance and storage facilities will also be required for these vehicles.

Table J-1 illustrates the range of costs associated with both Red Line rail extensions and LRT systems.

For Cross-Valley transit service, the most expensive alternatives are those which make extensive use of below-grade subway profiles. The costliest alternatives would be Alternatives 4a ($2,766 million) and Alternative 5 ($2,861 million), which extend Red Line service to Valley Circle predominately in deep-bore subway along the SP ROW and Sherman Way, respectively. In contrast, other options are cheaper because they employ lower-cost construction methods (e.g., cut-and-cover or open-air). The least expensive Red Line extension across the Valley would use an aerial guideway (Alternative 4d), and cost only $1,930 million. Lower capital costs are associated with the LRT alternatives (6a and 6b), which achieve cost reductions through the use of at-grade segments and range from $1,418 to $1,618 million. ART operating entirely at-grade (Alternative 7) would cost only $873 million.

If a project to I-405 were pursued, the LRT alternatives (3a and 3b) would be the cheapest options, costing from $627 million for an at-grade system to $809 million if cut-and-cover segments were included. LRT has lower project construction costs ($371-$554 million) than any of the below-grade Red Line extensions to I-405. However, if built only to I-405, LRT loses some of its construction costs advantages compared to a Red Line extension because it incurs substantial systems costs ($255 million) associated with vehicle procurement and maintenance facilities. A below-grade Red Line extension would have similar systems costs ($250 million), but cost more to construct, ranging from a total of $673 million for Alternative 1c (open-air subway) to $826 million for Alternative 1a (deep-bore subway). An aerial Red Line extension to I-405 would be the least expensive Red Line extension alternative, costing only $763 million total.

The Busway and Enhanced Bus alternatives are both cheaper than any rail transit project, costing $289 million and $87 million, respectively.

(2) Operating and Maintenance Costs

Operating and maintenance (O&M) costs are the expenses associated with sustaining the day-to-day service provided by a transit system. They include labor costs, fuel for vehicles, vehicle maintenance, and station upkeep.

Table J-1: Capital Costs of Preliminary Alternatives (in 1996 $ millions)

	Alternative	Construction Costs	System Costs	Total Capital Cost
1a.	Red Line to I-405 in deep-bore subway via SP ROW	$826.4	$249.6	Total: $1076.0
1b.	Red Line to I-405 in cut-and-cover subway via SP ROW	$734.4	$249.6	Total: $984.0
1c.	Red Line to I-405 in open-air subway via SP ROW	$673.1	$249.6	Total: $922.7
1d.	Red Line to I-405 on aerial guideway via SP ROW	$513.4	$249.6	Total: $763.0
2.	Red Line to I-405 in deep-bore subway via Oxnard Street	$808.6	$249.6	$1058.2
3a.	LRT to I-405 at-grade via SP ROW	$371.3	$255.2	$626.5
3b.	LRT to I-405 at-grade/cut-and-cover via SP ROW	$553.6	$255.2	$808.8
4a.	Red Line to Valley Circle in deep-bore subway via SP ROW	$2329.3	$436.6	$2765.9
4b.	Red Line to Valley Circle in cut-and-cover subway via SP ROW	$2039.9	$436.6	$2476.5
4c.	Red Line to Valley Circle in open-air subway via SP ROW	$1893.3	$436.6	$2329.9
4d.	Red Line to Valley Circle on aerial guideway via SP ROW	$1493.0	$436.6	$1929.6
5.	Red Line to Valley Circle in deep-bore subway via Sherman Way	$2424.8	$436.6	$2861.4
6a.	LRT to Valley Circle at-grade via SP ROW	$1063.8	$353.7	$1417.5
6b.	LRT to Valley Circle at-grade/cut-and-cover via SP ROW	$1264.7	$353.7	$1618.4
7.	ART to Chatsworth via SP ROW	$598.5	$274.1	$872.6
8.	Busway to Warner Center via SP ROW	$129.2	$159.5	$288.7
9.	Enhanced Bus	$0	$87.1	$87.1
10.	No Project (Existing + Committed System)	$0	$0	$0

O&M costs are related to the length of the project constructed and the type of technology used to provide transit service. For any given project length (i.e. to I-405 or to Valley Circle), O&M costs are highest for Red Line extensions and somewhat lower for an LRT system. For example, a Red Line extension to Valley Circle along the SP ROW (regardless of profile) would cost approximately $48 million annually to operate. In contrast, an LRT system on the same alignment would have O&M costs of only $30 million, and an ART system would cost $32 million. Among the alternatives that reach only to I-405, Red Line extensions would cost roughly $30 million to operate, while LRT would cost only $21 million.

The lowest annual O&M costs would be obtained for a bus-based system, under either the Busway or Enhanced Bus alternatives. The rail transit alternatives have higher O&M costs than the bus alternatives, but these expenses are partially offset by the reductions in bus operating costs that occur as bus service is supplemented or replaced by rail service.

O&M costs for each of the preliminary alternatives are presented in Table J-2, and are separated into bus and rail components. The values shown represent the change in O&M costs associated with implementation of a Valley corridor project as compared to the No Project scenario, which itself represents the MTA transit system proposed for the year 2015 by the Long Range Plan, excluding a Valley rail line.

b. Ridership

For all project alternatives, ridership is a function of travel time and cost. All else being equal, the faster technologies attract more riders. Longer segments have higher ridership because they serve a larger area and incorporate more stations. Alignment choice SP ROW versus Oxnard Street or Sherman Way) also affects ridership, as the Oxnard Street variation and the Sherman Way variation serve more intensely-developed commercial areas. The choice of subway versus aerial profiles does not affect ridership, nor does subway construction method (deep-bore, cut-and-cover, or open-air). At-grade profiles, however, may reduce ridership if transit vehicles do not have signal priority at at-grade street crossings, creating longer travel times.

The projected ridership for each alternative is shown in Table J-3. The "boardings" column represents the number of passengers expected to use the system *within* the Valley, that is, board and disembark at stations constructed as part of the Valley corridor project. "Linked transit trips" shows how many transit trips would be made on the entire MTA transit system (bus and rail) and excludes transfers between modes to avoid "double counting" riders. "New transit riders" compares the number of linked trips for each alternative to the Enhanced Bus (TSM) alternative, which serves as the baseline for ridership studies as required by the FTA.

Table J-2: Operating and Maintenance Costs of Preliminary Alternatives (1996 $ millions)

Alternative		Annual O&M Costs		
		Bus	**Rail**	**Total**
1.*	Red Line to I-405 via SP ROW	$4.8	$25.6	$30.4
2.	Red Line to I-405 via Oxnard Street	$3.5	$26.4	$29.9
3.*	LRT to I-405 via SP ROW	$2.8	$18.4	$21.2
4.*	Red Line to Valley Circle via SP ROW	($3.1)	$50.9	$47.8
5.	Red Line to Valley Circle via Sherman Way	($5.4)	$51.7	$46.3
6.*	LRT to Valley Circle via SP ROW	($8.0)	$37.8	$29.8
7.	ART to Chatsworth via SP ROW	($7.6)	$40.1	$32.5
8.	Busway to Warner Center via SP ROW	$17.0	($.5)	$16.5
9.	Enhanced Bus (TSM)	$16.6	($.3)	$16.3
10.	No Project	$0	$0	$0
Note: *Costs are identical for all variations.				

The TSM/Enhanced Bus alternative would yield 1,042,200 daily transit trips, or 13,600 more trips than would be expected if no project were implemented in the East-West Corridor. Compared to the TSM, the best-performing alternative is Alternative 5, which would extend the Red Line to Valley Circle Boulevard. This alternative attracts an additional 10,200 riders. Alternative 5 serves the entire Valley from North Hollywood to Warner Center, employs the high-speed/high-capacity technology of the Red Line heavy rail system, and allows passengers to travel directly to central Los Angeles without transfers. Alternative 4 has these same advantages, but attracts slightly fewer new riders (8,900) because it serves a less intensely developed area along the SP ROW. Alternative 6 (LRT) would attract 4,200 new riders. The other cross-Valley alternatives, ART and the busway, are less effective in attracting ridership. These two alternatives have slower average speeds than the other alternatives since their at-grade operation without signal priority leads to numerous stops at several traffic intersections, increasing travel time.

Table J-3: Ridership of Preliminary Alternatives					
	Alternative	Daily Rail Boardings[1] (Valley segment only)	Daily Linked Transit Trips (county-wide)	New Daily Transit Riders (change from No Project)	Incremental New Daily Transit Riders above TSM
1.	Red Line to I-405 via SP ROW	24,900	1,047,100	18,500	4,900
2.	Red Line to I-405 via Oxnard Street	28,500	1,049,500	20,900	7,300
3.	LRT to I-405 via SP ROW	17,800	1,042,200	13,600	0 (nominal)
4.	Red Line to Valley Circle via SP ROW[2]	44,400	1,051,100	22,500	8,900
5.	Red Line to Valley Circle via Sherman Way[2]	44,200	1,052,400	23,800	10,200
6.	LRT to Valley Circle via SP ROW[2]	32,400	1,046,400	17,800	4,200
7.	ART to Chatsworth via SP ROW[2]	30,200	1,043,000	14,400	800
8.	Busway to Warner Center via SP ROW[2]	n/a	1,045,100	16,500	2,900
9.	Enhanced Bus (TSM)	n/a	1,042,200	13,600	0 (base case)
10.	No Project	n/a	1,028,600	n/a	n/a

Note: [1]Excludes forced transfers to Red Line at North Hollywood for LRT and ART alternatives.
[2]Cross-Valley Alternatives

Among the alternatives that only reach I-405, the Red Line extensions perform the best, as they allow through travel from the Valley to central Los Angeles. Alternative 2, a Red Line extension along Oxnard Street, garners the highest number of new riders (7,300), followed by all other Red Line extensions (Alternatives 1a-1d), which operate along the SP ROW and attract fewer new riders (4,900). Both LRT alternatives (3a and 3b) suffer due to the transfer requirement at North Hollywood, and attract minimal additional riders compared to the TSM/Enhanced Bus alternative. Passengers who wish to travel beyond the Valley must switch to the Red Line system, which increases travel time and consequently discourages use of an East Valley LRT system.

c. Cost-Effectiveness

Cost-effectiveness is a measure used to evaluate how the costs of a transit project (for both construction and operation) compare to the expected benefits (increased transit ridership and reduced travel times). Cost-effectiveness is calculated as an index which represents the added cost associated with serving each new transit rider. The smaller the index, the more cost-effective the project alternative. Consistent with FTA requirements, cost-effectiveness for each alternative is measured against the TSM/Enhanced Bus alternative, which was developed as the lowest-cost transit improvement for the East-West Corridor. Cost-effectiveness for the TSM/Enhanced Bus option was measured using the No Project scenario as a baseline.

Figure J-8 groups the preliminary alternatives into categories of "greater cost-effectiveness" (less than $25 per new rider) and "lesser cost-effectiveness" (more than $25 per new rider). Within each category, the alternatives are listed in decreasing order of cost-effectiveness.
The most cost-effective alternatives are those which yield a high number of new riders at a low incremental cost. The TSM/Enhanced Bus alternative is very cost-effective, as it attracts approximately 13,000 riders (compared to No Project) while avoiding the large capital costs for guideways and stations that are associated with all of the rail alternatives. The Red Line extension to I-405 on aerial guideway is also quite cost-effective, costing less than $10 per new rider. In contrast, the Red Line extensions to I-405 with subway profiles attract the same number of new riders but are less cost-effective because they entail higher construction costs.

The only cross-Valley rail alternatives that fall within the "greater cost-effectiveness" category are the LRT systems (Alternatives 6a and 6b). Though they attract fewer riders than a Red Line extension across the Valley, they are less expensive to construct, and fall within the $20-$25 per new rider range.

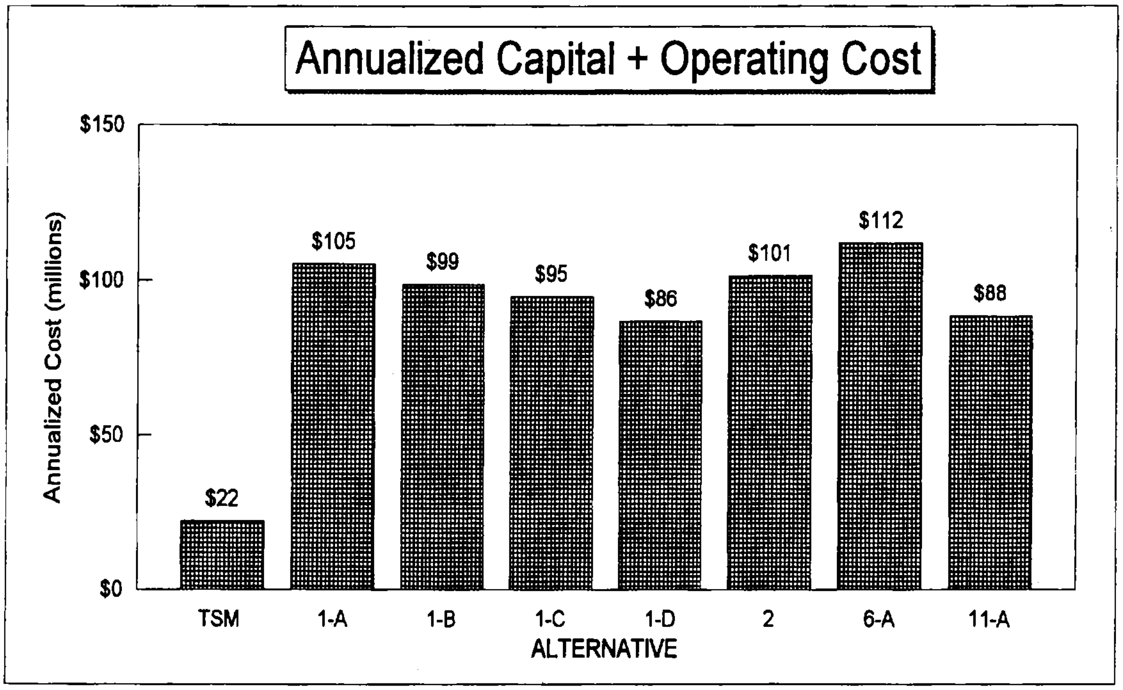
Red Line extensions to Valley Circle that employ any form of subway (deep-bore, cut-and-cover, or open-air) are less cost-effective than most other alternatives, costing approximately $40-$60 per new rider. The ART alternative and the LRT systems to I-405 perform least well in the cost-effectiveness analysis. These alternatives combine substantial capital costs with limited new ridership, resulting in cost per rider indices of more than $60.

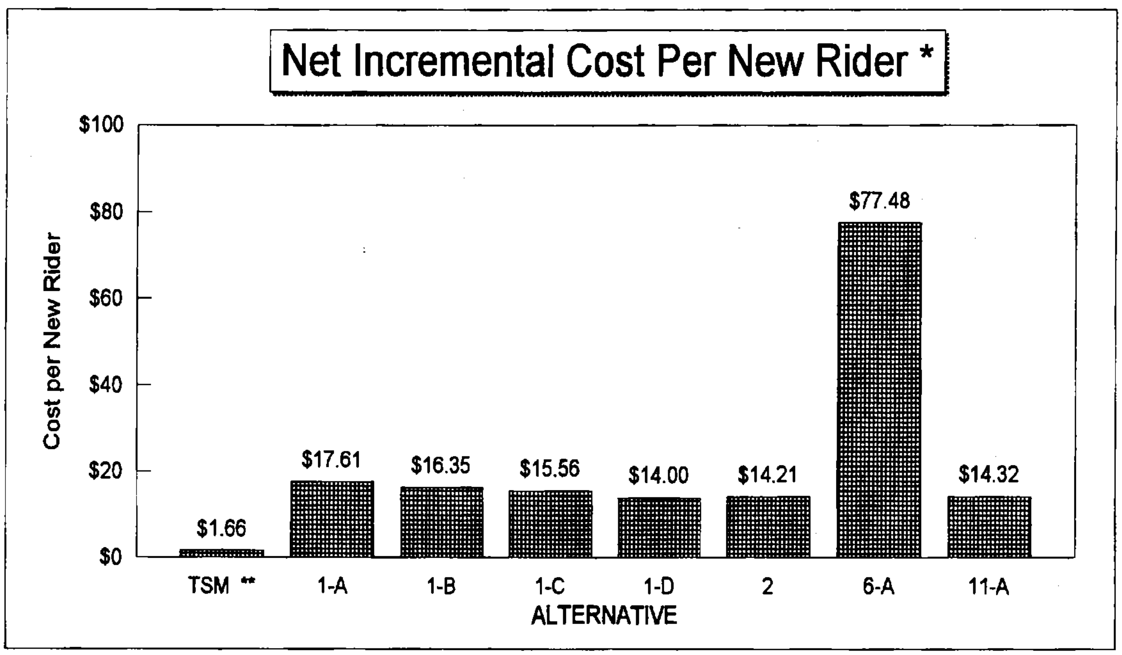
Based on the performance of the Enhanced Bus-Valleywide (Alternative 9), additional investigation of the Red Line extension options to I-405 was undertaken, wherein a West Valley "enhanced bus" service option was defined to more effectively feed riders to and from a Red Line terminus at Sepulveda Boulevard. The results of this analysis showed greatly increased cost-effectiveness for Red Line extensions to I-405.

It should be noted that to achieve this higher cost-effectiveness, the enhanced bus service would add capital and annual O&M costs of $76 million and $11 million, respectively, beyond the applicable bus service assumed for the base "No Project" analyses (essentially the MTA-planned San Fernando Valley Bus Restructuring Plan).

d. Conclusions

Based on all the factors considered, the following alternatives were selected for detailed evaluation in the environmental document: 1a through 1d, 2, 6a and 6b. These are described in detail in Chapter 2.





* Includes credit for value of travel time savings for "existing" (TSM) riders.
** TSM incremental values are in comparison to No-Build; Build values are compared to TSM

SOURCE: Manuel Padron & Associates, 1997.

Table 2-9: Preliminary Cost-Effectiveness of Alternatives

Alternative		Cost-Effectiveness Index*
Greater Cost-Effectiveness (less than $25 per added transit rider)		
9.	Enhanced Bus (TSM)	Under $10
1d.	Red Line to I-405 via SP ROW (aerial)	Under $10
6a.	LRT to Valley Circle via SP ROW (at-grade)	$10-$15
1c.	Red Line to I-405 via SP ROW (open-air)	$15-$20
1b.	Red Line to I-405 via SP ROW (cut-and-cover)	$15-$20
2.	Red Line to I-405 via Oxnard Street	$15-$20
1a.	Red Line to I-405 via SP ROW (deep-bore)	$20-$25
6b.	LRT to Valley Circle via SP ROW (cut-and-cover)	$20-$25
Lesser Cost-Effectiveness (greater than $25 per added transit rider)		
8.	Busway to Warner Center via SP ROW	$25-$40
4d.	Red Line to Valley Circle via SP ROW (aerial)	$25-$40
4c.	Red Line to Valley Circle via SP ROW (open-air)	$40-$60
4b.	Red Line to Valley Circle via SP ROW (cut-and-cover)	$40-$60
5.	Red Line to Valley Circle via Sherman Way	$40-$60
4a.	Red Line to Valley Circle in via SP ROW (deep-bore)	$40-$60
7.	ART to Chatsworth via SP ROW	$60 +
3a.	LRT to I-405 via SP ROW (at-grade)	$60 +
3b.	LRT to I-405 via SP ROW (cut-and-cover)	$60 +

Appendix K
MIS Model Technical Background Report

APPENDIX K: MIS MODELING TECHNICAL BACKGROUND REPORT

Provided on the following pages is the *SFV E-W Transportation Corridor MIS Modeling Technical Background Report*, March 19, 1997, prepared by Meyer, Mohaddes Associates.

SFV E-W Transportation Corridor MIS Modeling Technical Background Report

Prepared for

Los Angeles County Metropolitan Transportation Authority (LACMTA)

Prepared by

Meyer, Mohaddes Associates
900 Wilshire Boulevard, Suite 1200
Los Angeles, CA 90017

March 19, 1997

J95-017

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INTRODUCTION

The San Fernando Valley East-West Transportation Corridor Major Investment Study (MIS) Project utilized the Los Angeles County Metropolitan Transportation Authority (LACMTA or MTA) Long Range Transportation Plan (LRTP) Model for travel demand forecasting as part of this study.

The MTA was created by the California State Legislature to administer and plan transportation services for Los Angeles County. A key instrument in MTA's ability to fulfill its purpose is the computerized travel simulation model. The model is an integrated highway and transit model with zonal level inputs which include demographics of the region.

The purpose of a simulation model is to forecast future travel demand, patterns and conditions given the anticipated growth that will occur by an assumed horizon year in the future. The forecast provides the most reasonable picture of the conditions that may exist in the future and a means of testing different transportation system scenarios and mitigation measures.

In the past, MTA has used numerous simulation models for its multi-modal planning purposes. The LRTP Model is the latest and most sophisticated of these travel forecast models. This model is the second generation of a model based on the Southern California Association of Governments (SCAG) five county travel demand model. The development of the model included Federal Transit Administration (FTA) peer review and approval. The use of the MTA LRTP model for the MIS Project included review of the zonal system, network modifications for scenarios, and a number of customized refinements.

The remainder of this report describes each modeled scenario alternative, discusses the model review process and areas of model refinement, and provides final results and projections. A discussion of the history of the MTA model, the FTA review process, and general modeling assumptions are included in Appendix A to this report.

MODEL RUN SCENARIOS

This section describes the set of alternative scenarios run using the MTA LRTP model. A total of 13 scenarios were generated, including the No Project scenario required by California law and the TSM scenario required by the FTA. Applicable references to the corresponding MIS alternative are indicated as appropriate. Graphic depictions of the MIS alternatives are included in Appendix B.

<u>Scenario 1 - No Build (MIS Alternative 10)</u>
The "No Project" Scenario reflects conditions anticipated in the year 2015 without any major transit improvement investments within the Valley's East-West Corridor. This would mean no use of the MTA-owned Burbank-Chandler right of way for a transit project. All other funded transportation improvements in the MTA Long Range Plan, or major projects which will be implemented by others, such as the City of Los Angeles, are assumed to be in place.

<u>Scenario 2 - Red Line SP to I-405 (MIS Alternatives la, lb, 1c, 1d)</u>
This scenario proposes an extension of the Red Line from North Hollywood to Sepulveda Boulevard near I-405, following the Southern Pacific Burbank right-of-way. Portions of the alignment may contain deep-

bore subway, cut-and-cover subway, open-air subway, and aerial guideway, though the alignment profile has no bearing on the model network. Stations are proposed to be located at North Hollywood, Laurel Canyon Boulevard, Fulton Avenue/Burbank Boulevard, Van Nuys Boulevard, and Sepulveda Boulevard.

Scenario 3 - Red Line Oxnard to I-405 (MIS Alternative 2)
This scenario would extend the Red Line heavy rail system from the North Hollywood station north to Oxnard Street in a deep-bore subway tunnel under Lankershim Boulevard. The guideway would curve onto Oxnard Street and continue in a deep-bore tunnel under Oxnard Street to Woodman Avenue, where it would re-enter the SP Burbank Branch right-of-way. After passing under Hazeltine Avenue, the guideway would transition onto an aerial structure and continue to Sepulveda Boulevard. Stations would be located at Laurel Canyon Boulevard, Valley College, Van Nuys Boulevard, and Sepulveda Boulevard.

Scenario 4 - Red Line SP to I-405, busway SP I-405 to WC (Not in MIS)
This scenario is similar to Scenario 2, with the addition of a busway that would extend from the Sepulveda Boulevard station to Warner Center. The at-grade busway would consist of a two-lane paved roadway in the SP right of way, which would be restricted to MTA and other authorized public transit carriers only. The facility would be fenced along its entire length and include at-grade crossings with crossing gates at all north-south streets. Bus stops would be located at each Major Highway crossing, at approximately one mile intervals. It is anticipated that the buses would not receive priority treatment at north-south Major Highways, but that they would receive priority signal treatment at minor crossings. Between crossings, the buses would be able to travel at top speeds of 55 miles per hour. Along the busway, stations would be located at Woodley Avenue, Balboa Boulevard, White Oak Avenue, Reseda Boulevard, Tampa Avenue, Winnetka Avenue, De Soto Avenue, and Topanga Canyon Boulevard.

Scenario 5 - Red Line SP to WC/VC (MIS Alternatives 4a, 4b, 4c, 4d)
Scenario 5 is a continuation of Scenario 2. It would extend the Red Line heavy rail system west from Sepulveda Boulevard, through Warner Center, to a terminus at the Valley Circle Boulevard interchange on the Ventura Freeway. Additional stations would be located at Woodley Avenue, Balboa Boulevard, White Oak Avenue, Reseda Boulevard, Tampa Avenue, Winnetka Avenue, Topanga Canyon Boulevard, Oxnard Street, Fallbrook Avenue, and Valley Circle Boulevard.

Scenario 6 - Red Line SP to WC/VC - Sherman Way (MIS Alternative 5)
Scenario 6 is a continuation of Scenario 3. It would extend the Red Line heavy rail system west from Sepulveda Boulevard to a terminus at the Valley Circle Boulevard interchange on the Ventura Freeway. This scenario would follow the alignment of Sherman Way, rather than the SP right-of-way, through most of the West Valley. Additional stations would be located at Woodley Avenue, Balboa Boulevard, Reseda Boulevard, Tampa Avenue, Winnetka Avenue, De Soto Avenue, Topanga Canyon Boulevard, Oxnard Street, Fallbrook Avenue, and Valley Circle Boulevard.

Scenario 7 - Busway SP to WC (MIS Alternative 8)
This scenario would create an exclusive facility for high-quality bus service within the SP Burbank right-of-way. The busway would extend from the North Hollywood Metro Rail station to Warner Station. The at-grade busway would consist of a two-lane paved roadway in the SP right of way, which would be restricted to MTA and other authorized public transit carriers only. The facility would be fenced along its entire length and include at-grade crossings with crossing gates at all north-south streets. Bus stops would be located at each Major Highway crossing, at approximately one mile intervals, with park and ride lots provided at the Sepulveda and Balboa Boulevard stops. It is anticipated that the buses would

not receive priority treatment at north-south Major Highways, but that they would receive priority signal treatment at minor crossings. Between crossings, the buses would be able to travel at top speeds of 55 miles per hour. Stations would be located at North Hollywood, Laurel Canyon Boulevard, Coldwater Canyon Boulevard, Woodman Avenue, Van Nuys Boulevard, Sepulveda Boulevard, Woodley Avenue, Balboa Boulevard, White Oak Avenue, Reseda Boulevard, Tampa Avenue, Winnetka Avenue, De Soto Avenue, and Topanga Canyon Boulevard.

Scenario 8 - TSM/"Best Bus" (MIS Alternative 9)
The TSM Scenario reflects year 2015 conditions under a maximum reasonably enhanced bus system which would serve the San Fernando Valley in general and the East-West Transportation Corridor in particular, in lieu of an East-West Valley rail transit project. This enhanced bus service scenario will be designed to increase and improve bus operations to its point of maximum efficiency, i.e., after which bus service will degrade due to congestion, slower speeds, etc.

Under the TSM Scenario, the regional rail system will be identical to that assumed for the "No Project" Scenario, i.e., the Red Line will only be extended only as far as the North Hollywood Station in the San Fernando Valley. Highway and HOV projects will also be identical to the "No Project" Scenario, with the exception of arterial traffic flow improvements on TSM corridors, as discussed below.

The background bus network will remain the same as the "No Project" Network. However, TSM improvements will be implemented on select corridors and bus service levels will be improved on all routes on these corridors. Bus services operating on designated TSM improved corridors will provide 10 minute peak period and 20 minute base service (except on Devonshire Street). All other services will provide a minimum service level of 20 minutes during the peak periods and 30 minutes during the base on the trunk portion of the route.

TSM improvements will include various projects to enhance the performance of bus transit on major arterials, where bus service frequencies will be increased. These measures include traffic signal progression and adjustments for transit priority, implementation of "queue-jumpers" at intersections to provide automobile queue bypass, and signal priority lanes for buses at major intersections, and possible on-street dedicated bus lanes through some of the more congested arterial segments. It is, however, not expected that these exclusive bus lanes will be implemented through taking of regular traffic lanes or by other measures, which would result in capacity reductions to regular vehicular traffic.

Scenario 9 - LRT SP to WC/VC (MIS Alternatives 6a, 6b)
Scenario 9 proposes the creation of a light rail transit (LRT) system, in lieu of a Red Line extension, operating from North Hollywood, through Warner Center, to a terminus at the Valley Circle Boulevard interchange on the Ventura Freeway. The system would be constructed within the SP right-of-way. Passengers traveling from the Valley to central Los Angeles would be required to transfer to the Red Line at the North Hollywood station. Stations are proposed to be located at North Hollywood, Laurel Canyon Boulevard, Fulton Avenue/Burbank Boulevard, Van Nuys Boulevard, Sepulveda Boulevard, Woodley Avenue, Balboa Boulevard, White Oak Avenue, Reseda Boulevard, Tampa Avenue, Winnetka Avenue, Canoga Avenue, Oxnard Street, Fallbrook Avenue, and Valley Circle Boulevard.

Scenario 10 - ART SP to Chatsworth (MIS Alternative 7)
Under this scenario, an Alternate Rail Technology (ART) system would extend west from the North Hollywood Metro Rail station to the Warner Center area in the SP Burbank right-of-way. An extension would provide a connection to the Chatsworth Metrolink station, following the SP Burbank right-of-way along Canoga Avenue.

ART vehicles have operating speeds similar to light rail, but they are powered by internal combustion engines rather than electricity. Because of air quality concerns, an ART system in the San Fernando Valley might employ vehicles that run on compressed natural gas or other low-polluting fuels. An ART system would require passengers to transfer to the Red Line at North Hollywood to reach downtown Los Angeles. The system would operate at-grade. Stations are proposed to be located at North Hollywood, Laurel Canyon Boulevard, Valley College, Van Nuys Boulevard, Sepulveda Boulevard, Balboa Boulevard, Reseda Boulevard, Pierce College, Canoga Avenue, Roscoe Boulevard, and the Chatsworth Metrolink station.

Scenario 12 - Red Line I-405/Oxnard + TSM West Valley (Variation on MIS Alternative 2)
This scenario is similar to Scenario 3, with the addition of the bus-related TSM improvements discussed in Scenario 8 in the West Valley only. As stated earlier, TSM improvements will include traffic signal progression and adjustments for transit priority, implementation of "queue-jumpers" at intersections to provide automobile queue bypass, and signal priority lanes for buses at major intersections, and possible on-street dedicated bus lanes through some of the more congested arterial segments. It is, however, not expected that these exclusive bus lanes will be implemented through taking of regular traffic lanes or by other measures, which would result in capacity reductions to regular vehicular traffic. Stations would be located at Laurel Canyon Boulevard, Valley College, Van Nuys Boulevard, and Sepulveda Boulevard.

Scenario 13 - LRT SP to I-405 (MIS Alternatives 3a, 3b)
This scenario is identical to the segment of Scenario 9, east of I-405. The LRT system would be constructed within the SP right-of-way. Passengers traveling from the Valley to central Los Angeles would be required to transfer to the Red Line at the North Hollywood station. Stations are proposed to be located at North Hollywood, Laurel Canyon Boulevard, Fulton Avenue/Burbank Boulevard, Van Nuys Boulevard, and Sepulveda Boulevard.

MODEL REVIEW AND REFINEMENT

The LRTP model input data and assumptions were reviewed to determine if any of the local detailed factors within the San Fernando Valley that drive the ridership estimates and traffic forecasts should be modified to better reflect conditions in the San Fernando Valley. Areas which were reviewed for accuracy and possible refinement included:

- Travel analysis zones (TAZ's) for possible disaggregation to produce more precise traffic projections,

- Unique, large activity centers and destination sites (special generators) to ensure reflection of actual trip-making characteristics,

- Highway network detail codings and zonal centroid connections to ascertain proper traffic loading and local detail for intersection level forecasts,

- Bus transit feeder codings to ensure proper connections for mode of access and station transit impacts, and

- Modal choice and traffic assignment methodology.

Specific areas of the model that were refined are each discussed in detail below.

SOCIO-ECONOMIC DATA

One key area of review was the socio-economic data (SED) assumed for future year conditions. With the assistance of staff in the City of Los Angeles Department of Transportation (LADOT) and Department of Planning, the SED in the LRTP model was compared against the SED in the City of Los Angeles Citywide Framework Model. The Framework Model was developed by the City of Los Angeles to aid in the recent development of a comprehensive general plan framework for the City. At the time of its development, the Framework Model contained the most detailed SED for the City of Los Angeles of all the regional models in the Los Angeles Metropolitan area. The SED data in the LRTP model was found to be generally consistent with the Framework model, with the data in most TAZ's differing by less than ten percent. The differences were determined to be project specific and inconsequential to transit patronage forecasting, therefore, no adjustments were made to the SED in the LRTP model based on this review.

SPECIAL GENERATORS

Several model zones in the San Fernando Valley were designated as "special generators". Special generators are unique land uses that have trip-making characteristics that differ from the standard formulas used for trip generation in the traffic model. Such land uses might include airports, stadiums, hospitals, military bases, schools, and large suburban office complexes. Special generators are relatively few in number in any urban area, but may represent a significant portion of trips, and therefore, justify special treatment. This is especially the case when a particular area of a large regional model is being analyzed in more detail.

A total of five special generators were identified in the San Fernando Valley that required special treatment in the LRTP model to properly replicate their trip-making characteristics and the impact on any future transit system in the Valley. The five special generators are:

- Universal City
- Warner Center
- Van Nuys Government Center
- Los Angeles Valley College
- Pierce College

In general, each of these land uses was not generating enough trips in the LRTP model as compared to actual documented conditions. The LRTP model, being of regional nature, generates trips based on the total number of dwelling units, retail employment and non-retail employment in each traffic analysis zone. Retail employment generates more trips per employee than non-retail employment. Since it was not desirable to alter the total employment in each zone for purposes of regional policy consistency, some non-retail employment was reallocated to retail employment within the zones that contained each special generator. This had the effect of increasing the total trips generated for each of the special generators and better replicating actual conditions. The sources used for each location are as follows:

- Universal City - Universal City Transportation Study
- Warner Center - Warner Center Specific Plan
- Van Nuys Government Center - Current Employee Survey
- Los Angeles Valley College - College Personnel Office
- Pierce College - College Personnel Office

HIGHWAY AND TRANSIT NETWORK

The highway and transit networks in the LRTP model were reviewed in coordination with staff in the MTA Modeling/Geographic Information Systems Department. Areas of review for the highway network included roadway attributes (i.e., speed, capacity, number of lanes) and zonal centroid connections. Based on this evaluation, no changes were made to the highway network. The transit network was similarly reviewed. Detailed changes to the rail and bus operating plans for each scenario are discussed below. An additional refinement to the transit network was the treatment of connections between the highway network and each assumed park-and-ride lot along the various project scenarios. The park-and-ride lots were connected to all zones within a five-mile radius around each lot, with the exception of the terminus stations. At these stations, the radius was increased to seven miles to reflect the longer distance a motorist would be willing to travel to transit when they are beyond the end point of the system. Stations where no park-and-ride facilities would be provided were assumed to have a three-mile radius. The terminus station for each scenario is listed below:

- Scen. 1 (No Build) - N/A
- Scen. 2 (Red Line SP to I-405) - Sepulveda Boulevard
- Scen. 3 (Red Line Oxnard to I-405) - Sepulveda Boulevard
- Scen. 4 (Red Line SP to I-405; busway SP I-405 to WC) - Sepulveda Boulevard
- Scen. 5 (Red Line SP to WC/VC) - Valley Circle Boulevard
- Scen. 6 (Red Line SP to WC/VC - Sherman Way) - Valley Circle Boulevard
- Scen. 7 (Busway SP to WC) - N/A
- Scen. 8 (TSM/"Best Bus") - N/A
- Scen. 9 (LRT SP to WC/VC) - Valley Circle Boulevard
- Scen. 10 (ART SP to Chatsworth) - Chatsworth Metrolink
- Scen. 12 (Red Line I-405/Oxnard + TSM West Valley) - Sepulveda Boulevard
- Scen. 13 (LRT SP to I-405) - Sepulveda Boulevard

RAIL OPERATING PLANS

For all scenarios, the following base rail network and operating frequencies were assumed for the peak and off-peak period:

Red Line North Hollywood - East Los Angeles = 4 minute peak, 8 minute off-peak
Red Line West Los Angeles - East Los Angeles = 4 minute peak, 8 minute off-peak
Blue Line Long Beach - Downtown Los Angeles = 6 minute peak, 10 minute off-peak
Blue Line Pasadena - Downtown Los Angeles = 5 minute peak, 10 minute off-peak
Green Line Norwalk - El Segundo = 6 minute peak, 10 minute off-peak

This base operating plan had no additions or amendments for the No Project Scenario #1 and the Enhanced Bus/Transportation Systems Management Scenario #8. The other scenarios assumed the following additions to the base rail operating plan:

Red Line Extensions to I-405 (Scenarios 2, 3, 4 and 12):
Red Line North Hollywood - East Los Angeles extended to I-405 = 4 minute peak, 8 minute off-peak

Red Line Extensions to Valley Circle Boulevard (Scenarios 5 and 6):
Red Line North Hollywood - East Los Angeles split into two separate operating lines:

1. East Los Angeles to I-405 = 8 minute peak, 0 minute off-peak
2. East Los Angeles to Valley Circle = 8 minute peak, 8 minute off-peak
   (This allows combined Valley service to be 4 minute peak, 8 minute off-peak service between North Hollywood and I-405, and 8 minute peak, 8 minute service between I-405 and Valley Circle.)

Light Rail Transit to Valley Circle Boulevard (Scenario 9):
LRT Line North Hollywood to Valley Circle = 5 minute peak, 10 minute off-peak

Light Rail Transit to I-405 (Scenario 13):
LRT Line North Hollywood to I-405 = 5 minute peak, 10 minute off-peak

Alternate Rail Technology (ART) to Chatsworth (Scenario 10):
ART Line North Hollywood to Chatsworth = 5 minute peak, 10 minute off-peak

Busway to Warner Center (Scenario 7):
Dedicated bus line along corridor = 5 minute peak, 10 minute off-peak

Station-to-station cumulative running times and average speeds were computed for each "build" scenario. These are included in Appendix C.

BUS OPERATING PLANS

For each of the scenarios, modifications were made to the bus network to represent how bus service may complement the scenario as appropriate.

The No Project Scenario #1 represents the bus network as it is today, with the following modifications:

- The San Fernando Valley Transit Restructuring Study is fully implemented, including transit centers in Sylmar, Burbank, Chatsworth, Warner Center, Universal City, and Northridge.

- The San Fernando Valley receives a share of the additional buses funded through the MTA Long Range Plan.
- Key MTA local and limited routes are revised to re-route buses to the Universal City and North Hollywood Red Line stations. Limited services along Roscoe Boulevard, Sherman Way and Victory Boulevard are added.

- Some express routes from the San Fernando Valley to Downtown Los Angeles are redeployed since the Red Line is able to serve the corridor.

- It is assumed that some service will be provided through the Mobility Allowance concept, and that projects funded through the Call for Projects that allow transit speed improvements along arterials will be implemented.

From this base bus network, the following paragraphs highlight significant changes to the bus plans for the other scenarios:

- For the Enhanced Bus Valley-wide/MM Scenario #8, service frequencies on more heavily used lines are improved. Bus services operating on designated TSM improved corridors will provide 10 minute peak period and 20 minute base service (except on Devonshire Street). All other services will provide a minimum service level of 20 minutes during the peak periods and 30 minutes during the base on the trunk portion of the route.

  Additional transit speed improvements along major arterials with bus service are also assumed. These measures include traffic signal progression and adjustments for transit priority, implementation of "queue-jumpers" at intersections to provide automobile queue bypass, and signal priority lanes for buses at major intersections, and possible on-street dedicated bus lanes through some of the more congested arterial segments. It is, however, not expected that these exclusive bus lanes will be implemented through taking of regular traffic lanes or by other measures, which would result in capacity reductions to regular vehicular traffic.

- For the Red Line scenarios to the I-405 or to Valley Circle, some bus lines are re-routed to the Sepulveda Red Line station (rather than the North Hollywood or Universal City station). Other bus lines are modified or service improved to provide better access to other stations along the route.

- For the LRT and ART scenarios, bus lines are modified or service improved to provide better access to stations along the route. The limited buses remain routed to the nearest Red Line station at North Hollywood or Universal City to minimize additional transit transfers.

- For the Busway scenario, new bus service from Warner Center to North Hollywood is introduced to take advantage of the busway facility. Other bus lines are modified or service improved to provide coordination with the busway and to generally promote bus use.

MODEL RESULTS

The MTA Modeling/GIS staff prepared travel simulations for each scenario using its LRTP model. From these model runs, an estimate of ridership potential was developed, as well as other transit and highway-related statistics, including total transit trips, transit mode split, total automobile trips, and automobile occupancy. Some of the key systemwide statistics are summarized in Table 1.

Total transit trips within Los Angeles County are projected to number over one million (between 1,030,000 and 1,060,000). Between 23,000 and 44,000 of those trips are forecast to occur on the proposed San Fernando Valley East-West transit system, with patronage varying based on the particular alignment and technology of each scenario. Total transit mode share is projected to be between 2.7 and 2.8 percent.

TABLE 1
Travel-Related Statistics

Scenario		Daily Rail Boardings [1] (Valley Segment Only)	Total LA Co. Transit Trips	Transit Mode Share	Total LA Co. Vehicle Trips	Run Time [2] (min)
1	No Build	N/A	1,028,600	2.69%	27,643,900	N/A
2	Red Line SP to I-405	24,900	1,046,900	2.74%	27,628,200	8.8
3	Red Line Oxnard to I-405	27,800	1,049,500	2.74%	27,625,900	8.8
4	Red Line SP to I-405; busway SP 1405 to WC	23,200	1,047,900	2.74%	27,627,200	8.8 Red Line + 19.1 Busway
5	Red Line SP to WC/VC	44,400	1,050,900	2.75%	27,624,900	28.3
6	Red Line SP to WC/VC - Sherman Way	44,200	1,052,400	2.75%	27,623,600	29.2
7	Busway SP to WC	N/A	1,032,500	2.70%	27,640,200	32.5
8	TSM/"Best Bus"	N/A	1,042,200	2.73%	27,632,400	N/A
9	LRT SP to WC/VC	34,700	1,046,400	2.74%	27,628,500	31.0
10	ART SP to Chatsworth	31,900	1,043,000	2.73%	27,631,400	33.2
12	Red Line I-405/Oxnard + TSM West Valley	28,100	1,061,200	2.78%	27,616,100	8.8 Red Line
13	LRT SP to I-405	31,600	1,042,200	2.73%	27,632,200	9.5

1) Excludes forced transfers to Red Line at North Hollywood for LRT and ART scenarios.
2) Run Time is from North Hollywood Station to terminus station. See "Highway and Transit Network" section of this report for list of terminus station for each scenario.

The two Red Line scenarios that would go all the way to Valley Circle Boulevard (Scenarios 5 and 6) are projected to have more ridership than the corresponding LRT or ART scenarios (9 and 10, respectively). Daily ridership along the Valley segment of a Red Line extension to Valley Circle Boulevard is projected to be slightly over 44,000 daily riders, compared to between 31,900 and 34,700 daily riders for the LRT and ART scenarios. In addition, total travel time from one end of the alignment to the other would be shorter for the Red Line scenarios (between 28 and 29 minutes, as compared to between 31 and 33 minutes for the LRT and ART scenarios). Overall transit trips in Los Angeles County and transit mode split would be higher under scenarios 5 and 6, than with either scenario 9 or 10.

Among the two Red Line scenarios that would go to I-405 (Scenarios 2 and 3), Scenario 3 is projected to have more ridership. The Red Line extension along the Oxnard alignment (Scenario 3) is projected to carry approximately 27,800 riders per day, and the Red Line extension along the Southern Pacific alignment (Scenario 2) is projected to carry approximately 24,900 riders per day.

Scenario 4, Red Line extension along Southern Pacific alignment to I-405 with a busway to Warner Center, is projected to carry fewer riders than either Scenarios 2 or 3. This is due to the fact that transit riders would likely stay on the bus between Warner Center and North Hollywood than transfer to rail at the Sepulveda Boulevard station. Transfers often cause significant delays for transit riders. Overall transit trips in the County would be expected to be between Scenarios 2 and 3.

Scenario 12, Red Line extension to I-405 along the Oxnard alignment with enhanced bus service in the West Valley, is projected to carry slightly more riders than Scenario 3, 28,100 daily riders for Scenario 12 as compared to 27,800 riders for Scenario 3. Scenario 12 would have the largest projected overall transit trips in Los Angeles County of all the scenarios.

Scenario 7, an at-grade busway from the North Hollywood Metro Rail station to Warner Station, would have the smallest impact on overall transit trips in the County of all the scenarios. Overall transit trips would increase by approximately 4,000 as compared to the No-Build scenario. The rail scenarios are projected to increase overall transit trips between 14,400 (Scenario 10) and 23,800 (Scenario 6).

Additional bus and rail statistics for each model scenario are included in Table 2. The scenarios are organized into four categories: Baseline Runs, Build Options to I-405, Build Options to Warner Center/Valley Circle, Hybrid Build Options (rail and bus). Included is the date in 1996 when each model run was performed.

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TABLE 2
San Fernando Valley E-W Rail Study - Selected Summary Data as of 3/28/96

Model Run	Date	Daily Transit Trips		Systemwide Rail Boardings		Segment Boardings	MTA Bus Boardings		Coded MTA Buses	
		Total	Total-TSM	Total	Total-TSM		Total	Total-TSM	Total	Total-TSM
Baseline Runs										
1. No Build	Jan 9	1,028,629	(13,581)	422,138	(4,694)	N/A	1,207,701	(24,180)	2,438	(95)
8. TSM/"Best Bus"	Mar 5	1,042,210	Base	426,832	Base	N/A	1,231,881	Base	2,533	Base
Build Options to I-405										
2. Red Line SP to I-405	Jan 16	1,046,916	4,706	450,941	24,109	24,882	1,214,572	(17,309)	2,440	(93)
3. Red Line Oxnard to I-405 (Laurel Canyon sta)	Jan 16	1,049,481	7,271	455,304	28,472	27,831	1,218,478	(13,403)	2,440	(93)
13. LRT SP to I-405	Mar 27	1,042,212	2	468,326	41,494	31 ,604	1,213,330	(18,551)	2,445	(88)
Build Options to Warner Center/Valley Circle										
5. Red Line SP to WC/VC	Mar 4	1,050,946	8,736	463,262	36,430	44,379	1,205,721	(26,160)	2,402	(131)
6. Red Line SP to WC/VC - Sherman Way	Mar 12	1,052,429	10,219	465,438	38,606	44,157	1,207,926	(23,955)	2,402	(131)
7. Busway SP to WC	Mar 21	1,032,492	(9,718)	417,728	(9,104)		1,223,212	(8,669)	2,470	(63)
8. LRT SP to WC/VC	Mar 11	1,046,430	4,220	490,822	63,990	34,666	1,200,307	(31,574)	2,410	(123)
9. ART SP to Chatsworth	Mar 15	1,043,037	827	484,083	57,251	31,866	1,200,672	(31,209)	2,410	(123)
Hybrid Build										
4. Red Line SP to I-405; busway SP I-405 to WC	Mar 14	1,047,914	5,704	447,546	20,714	23,211	1,220,379	(11,502)	2,448	(85)

12. Red Line I-405 /Oxnard + TSM West Valley	Feb 22	1,061,190	18,980	458,538	31,706	28,099	1,246,389	14,508	2,518	(15)

APPENDICES

APPENDIX A - HISTORY OF THE LRTP MODEL

APPENDIX B - MIS ALTERNATIVES

APPENDIX C - STATION-TO-STATION CUMULATIVE RUNNING TIMES AND AVERAGE SPEEDS

APPENDIX A
HISTORY OF THE LRTP MODEL

HISTORY OF THE MTA MODEL

The history of the MTA travel simulation model begins with the original Los Angeles Area Regional Transportation Study (LARTS) model developed in the late 1960's by Caltrans. This was one of the first travel forecasting models in the United States and at the time, the only model available in the region. The LARTS model was the tool that allowed Caltrans to identify future deficiencies in the highway system and to develop engineering system plans for the region.

The LARTS model was used as a base to develop the Southern California Regional Model by SCAG. This comprehensive multi-county model gave the state, regional planning agencies and local governments a tool to meet state and federal legislative requirements such as the development of the Regional Transportation Plan, The Regional Transportation Improvement Plan and California's Congestion Management Program.

Both the LARTS and Regional Model are based on the U.S. Department of Transportation Urban Transportation Planning System (UTPS). The SCAG Regional Model was the next iteration of the LARTS model. Much of the core network and approach to the modeling process were the same. Being the regional planning agency, SCAG has the ability and insight to further develop the travel simulation model, and especially to take the lead in development of socio-economic inputs and forecasts. The SCAG model has become the one centralized tool for regional planning and development of Countywide and local models.

In the early years, the MTA (Southern California Rapid Transit District or SCRTD at that time) was one of a number of public agencies that used the SCAG Regional Model. Although the model was relatively coarse for transit planning, it allowed MTA to examine the effectiveness of the transit plan and the effects of transit on the transportation system. It was clear then that more detailing and diversification would be necessary in order for the model to meet all of MTA's transit corridor planning needs.

In 1982 SCAG developed another version of the Regional Model, the Cambridge Systematic (CSI) Model. The SCAG CSI model was not used by SCAG, but was provided to SCRTD for rail patronage forecasting It became known as the SCRTD Model when the model was given to the agency to manage. The County of Orange used this model for its county-wide rail study. As part of the study, an update to the non-work mode split module was developed. After the Orange County rail study, the model was returned to SCRTD for use on the Red Line AA/EIS studies. It received FTA review and approval during the mid 1980s.

Meanwhile, the planning side of the MTA (then the Los Angeles County Transportation Commission or LACTC) was still relying heavily on the SCAG Regional Model for much of its forecasting and planning needs. But as the legislative mandates began to proliferate, the Regional Model became less available to MTA's specialized requirements for county-wide and project-specific use. This resulted in MTA developing it's own travel simulation model in 1992.

As a logical starting point, MTA used the updated SCRTD model for its model development. This model which was, as mentioned earlier, based on SCAG's Regional Model, contained additional updates and improvements over the Regional Model and received FTA review. The first generation of the MTA model was called the Metro Red Line Eastern Extension model (Red Line Model). The model gave MTA the ability to be self-reliant when future forecasts were needed. MTA was now also able to customize the tool for all its planning needs.

Being based on the SCAG Regional Model, the Red Line Model was the next generation SCAG Regional Model. The highway network, Socio-economic data and modeling processes have their origins in the Regional Model. The distinction is that the Red Line Model was designed and customized for transit analysis. Another distinction is that the Red Line Model also underwent a vigorous FTA peer review process, similar to the SCRTD Model. This review process is discussed in more detail in the following section.

In 1994, MTA began a revision of its former 30 Year Integrated Transportation Plan and with it, the development of the Long Range Transportation Plan (LRTP) Simulation Model. The LRTP Simulation Model is therefore the second generation of MTA's travel demand/simulation model. This is evident both in terms of sophistication of the process and refinements in the model's system. The model assumptions and methodology section discusses these points in more detail.

The LRTP model is a full multi-modal analysis package. Conformity to previous models is maintained by using much of the core assumptions, processes and input data from its predecessors. Special modifications such as k-factors to more accurately model trip length frequency distribution, highway skims to capture congestion and fare-based skims for transit modeling provide better forecasts. Like the Red Line Model, a voluntary peer review process was also conducted for the LRTP model. The review used the same team of peer reviewers and had similar positive results.

FTA REVIEW

The MTA Metro Red Line Eastern Extension and the subsequent LRTP model are FTA reviewed transit patronage/travel forecasting models. Numerous mode choice models have been developed by various agencies and consultants for the area but few have received FTA peer review and approval.

The FTA peer review process consists of a thorough examination of the model inputs, methodologies and assumptions by an outside panel of experts. These examinations look for flaws and biases which may generate unreasonable results. The review found that the assumptions and methodology used in the Red Line Model were reasonable and in line with standard practices in the industry.

Similarly, a less exhaustive peer review of the LRTP model was conducted. The formal FTA peer review was not necessary in this instance because the LRTP Model carried forward much of the same assumptions and methodology found in the Red Line Model. The review found no flaws or biases in the more enhanced second generation MTA model.

OVERALL MODELING ASSUMPTIONS

Each input to the MTA LRTP Model is a representation of the characteristics of the trip maker, the model area, the trip or the transportation system. This information is usually employed at the census tract level, but may include some distributions of characteristics within the census tract. Census tract and sub-census tract areas used to identify the social and economic data are called "traffic analysis zones" (zones).

All zonal level inputs for the 1990 model validation process used empirical data compiled from a variety of sources (see Assumption/Methodology Summary Table). Projections of the socio-economic variables for the planning horizon year of 2015 were obtained primarily from SCAG. The model uses econometrics and behavioral formulations to project travel response and transportation system impacts under a variety of transportation system environments and conditions.

There are several major assumptions upon which the forecasts are based that either reflect a continuation of existing trends or fall into the policy arena. If the future condition varies from theses assumptions (other than the parameters included as part of an scenario), the projected future year results will likely be different from those projected by the model. These key assumptions are:

- SCAG growth forecast (population, employment, household, demographics) occurs as projected in the various communities of the SCAG region.

- Per mile fuel operating cost does not change in constant dollars (i.e. changes in fuel prices and fuel economy offset one another) but rise with inflation.

- Adopted July 1994 transit fare structure is fully implemented and the regular inflationary adjustments are made

- Parking costs rise with inflation and the location and application of parking costs do not change significantly from today's conditions (i.e., where parking is free and where it is paid, employer subsidies, etc.)

- Need and distribution of travel does not dramatically change due to major changes in business hours other than peak spreading or a major displacement of work trips by telecommuting.

- The benefits of implementation of Intelligent Transportation System technologies are not reflected in the model due to uncertainty with regard to how they'll effect travel patterns, speeds and capacities.

Detailed descriptions of sources of data, assumptions and parameters are summarized in Table 1 "MTA Model Assumptions/Methodology". It is important to note that the Assumptions column lists the primary assumptions used for a particular element of the model while the Parameters column identifies the components in the element that affect model results. The purpose of the table is to provide a quick overview of the modules, components, and assumptions used in the MTA LRTP Model. The information was summarized from the *Multi-Modal Travel Demand Forecasting Model Methodology and Assumptions Report* and *LACMTA - Transportation for the 21st Century: A Plan for Los Angeles County - Technical Appendices* produced by MTA.

Table 1
MTA Model Assumptions/Methodology Summary

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Zone System	The zone system is used to describe the urban activity in an area of land. A system of 2,413 zones at sub-census tract, census tract and aggregates of census tract levels. The finest zone level, traffic analysis zones (TAZ's) cover L.A. County and are at census tract or census block level. The intermediate zone level, labeled community statistical areas (CSA's) are aggregation of census tracts that surround L.A. County. The areas include Ventura County, Orange County and parts of North LA County. The coarsest level of detail is the regional statistical area (RSA), which can be described as aggregations of CSA's. RSA's cover the outer extremities of the model. They cover parts of North L.A. County and all of Riverside and San Bernardino County.	SCAG 1980 Zone System modified in Los Angeles County to conform to 1990 census tracts.	Census tract level of detail for traffic analysis zones sufficient to provide information for analysis of study area.	Census tract level of detail at the finest zone level. Location and connection points for centroids.	More detail within L.A. County, subsets of SCAG zones.

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Socio-economic Data (SED)	The measures of urban activity used to generate number of trips in a zone. Population, Employment and Housing units are the three basic inputs The socio-economic data consists of information on Single Family Dwelling Units, Multi Family Dwelling Units, Group Quarter Population, Total Population, Workers, Retail Employment, Total Employment and Income.	Latest SED released by SCAG in April, 1994 for 2015 forecasts Note: 2020 SED is currently being developed but won't be adopted until Spring 1995.	Base Year SED compiled from 1990 census for SCAG region in 1,000's. 1990 Population Total: 13,959 SF Dwelling Units: 2,637 MF Dwelling Units: 2,059 Total Dwelling Units: 4,696 Retail Employment: 1,127 Total Employment: 6,838 Future Year forecasts produced by SCAG. 2010 Population Total: 20,252 SF Dwelling Units: 3,596 MF Dwelling Units: 3,097 Total Dwelling Units: 6,693 Retail Employment: 1,805 Total Employment: 9,832	Single Family Dwelling Units - detached single family homes including mobile homes. Multi Family Dwelling Units - condominiums, apartments and attached single family homes. Group Quarter Population - multiple housing on a one by one basis for trip purposes, added to multiple housing numbers Population - compiled from census data, includes group quarter population Workers - employed civilian work force by place of residence Total Employment -	Identical assumptions and information to SCAG

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Highway Network	Abstraction of the street system made up of links to represent roadways and nodes to represent intersections and other points of access. Five facility types are represented in the network: Freeway, Major Arterial, Primary, Secondary and HOV. Area type (e.g. urban vs. rural) is used as secondary means of classification for purposes of coding network parameters	The base year network was obtained from SCAG.	Speed and capacities of links established based on facility type and area type. 1990 Highway Network based on SCAG 2015 Highway Network with following LRTP projects: Route 5 HOV • Route 10 to Route 14 • Route 605 to Orange County Line Route 10 HOV • Baldwin Ave. to Rote 605 • Route 110 to Route 405 Route 14 HOV - Route 5 to P-8 Route 30 HOV - Route 210 to Foothill Route 57 HOV - Orange County line to Route 60 Route 60 HOV - Route 605 to San Bernardino County Line Route 118 HOV - Ventura County Line - Route 5 Route 134 HOV - Route 101/170 to Route 210 Route 170 HOV - Route 101 to Route 5	A node/B node - two nodes used to describe the link. Link Distance - coded distance of a link. Facility Type - operational classification of a link. Area Type - area location of a link (e.g. CBD, non-CBD, suburban, rural, mountain.). Regional Statistical Area - zone where link resides. User Code - not used. Number of Lanes - the number of lanes on a facility. Observed Speed -the typical speed on a street.	Highway network identical to SCAG outside of L.A. County. Highway network more detailed in L.A. County. MTA uses intersection centroid connectors to provide better accessibility to TAZ's

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Transit Network	Transit routes are codes with reference to the highway network (same nodes). Modes 1-5 represent access links to the transit network: Mode 1-sidewalk transfer, Mode 2-walk ingress, Mode 3-walk egress, Mode 4-auto access, Mode 5-walk access from auto to transit. With the exception of the walk mode, all access links are two-way links. Modes 6-9 currently unused. Modes 10-30 represent the companies that run transit. Currently 29 companies are represented in the transit network by consolidating some companies into one mode. The list of modes is a comprehensive listing of all major transit providers in the region (i.e. OCTA, RTA, Antelope Valley Transit Authority, etc.)	Developed by MTA Modeling/GIS independently from SCAG.	Sidewalk links surround transit stations to facilitate walk and transfer access. Walk access algorithm permits up to six bus connections from each zone and averages access distance across all connectors. Walk access to rail stations is supplemented by as many as 3 additional connections to stations within 1 mile of the zone. Speed of all walk links (Modes 1-3, 5) assumed to be 3 mph. Sidewalk links cover 0.5 mile radius of stations. Speed of auto access (Mode 4) obtained from congested highway network. Park-and-ride links have a 7* mile limit. Kiss-n-ride links have a limit of 4.5* miles, Mode 5, walking time is globally coded as one minute. *Note: The above assumption for PNR and KNR precludes the SFV line from being used by outlying areas such as Santa Clarita, Palmdale and most of Ventura County because of the dist. Auto access links use congested travel time along highway network instead	Link Speed/Time - travel time for transit on a link. Mode Definition - mode number which defines the company. Headways - time between buses, trains, etc. Routing Nodes - nodes used to identify and graphically depict a route, not an actual stop.. Stop Nodes - nodes where an actual stop occurs along a route.	The MTA transit network is completely redefined and improved from the SCAG Regional model. Transit network one generation newer than SCAG. The SCAG model incorporates the latest MTA transit network every time it is updated (e.g., the '96 RTP will incorporate the LRTP model updates.) Non-transit modes have been fully developed and detailed. Separate modes used to represent each transit operator results in more modes than SCAG which aggregates

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Trip Generation	The process by which SED are translated into number of trips ends. There are 5 trip purposes in the model: home-work, home-to-other, home-to-shopping, other-to-other and other-to-work. For each of the 5 purposes, trip production and attraction models are applied to estimate the trips produced by and attracted to each zone. The MTA trip generation process performs two iterations. The first model run uses SCAG's 1,555 zones. The second model run uses 2,413 zones without constant terms. The original zones are used as control totals to proportion the trip generation for disaggregated zones.	The trip generation model is the same as SCAG.	1990 Home-to-Work Trips L.A. County: 5,306,234 Orange: 1,849,407 Riverside: 515,486 San Bernardino: 631,984 Ventura: 453,021 1990 Total Trips L.A. County: 29,347,906 Orange: 9,339,380 Riverside: 3,058,239 San Bernardino : 3,923,703 Ventura: 2,814,156 1991 Origin/Destination Survey for time of day analysis. AM Peak Period (6-9 AM) PM Peak Period (3-7 PM) Off Peak Period (remaining 17 hours of the day) MTA mode choice based on three trip purposes: home-to-work, home-based-other, non-home-based. No special generators are used to model specific land uses which are not modeled reasonable in the standard trip generation process.	Socio-economic data Conversion Rates	Trip generation calibrated to SCAG numbers.

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Trip Distribution	Procedure in which zone to zone travel interchanges are developed based on magnitude of trip productions and attractions by each zone.	SCAG distribution model with a modification based on the 1990 Census Transportation Planning Package (CTPP) data. K-factors used to modify results to match CTPP results	1990 CTPP used to adjust distribution model. SCAG f-factors remained unchanged but k-factors were introduced. Observed trips from the CTPP were aggregated onto a 290 by 290 CSA matrix as control totals for calibrating k-factors.	F-factors - friction factors used to model zone to zone trip impedances to represent observed trip length frequencies. K-factors - zone to zone adjustment factors to account for social or economic behaviors. Total trip production Relative attraction	F-factors identical to SCAG K-factors introduced to modify work trip distribution to match CTPP results. Trip length frequency and distribution patterns match CTPP results. SCAG's trip length frequency lower than CTPP

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Path Building	Highway path building provides minimum time, distance and impedance for each zone pair. Highway path building provides the minimum time, distance and impedance for each zone pair for all different combinations of possible highway routes. This information (called " highway skims") are used for mode choice. Transit path building determines the minimum transit path based on the impedance values between zones. Impedance is a function of time and fare, expressed in terms of minutes.	Developed by MTA Modeling/GIS The transit path tracing program reads a transit network and set of control parameters and then generates a transit path file and transit fare matrix file. The transit path file is then read and a file to transit travel time matrices is generated. The travel times may be specified by individual mode or a combination	Assumptions such as fares, prohibition of transfers between modes and transfer/wait times by mode groupings are important inputs in the control parameters.	Wait Time Factors - time spent waiting for arrival of transit. Run Time Factors - weights of travel time on each mode. Intra-modal Transfer Penalties - walking time needed to transfer from one transit mode to another. Inter-modal Transfers - transfers that occur within the same mode (i.e. bus to bus transfers). Delete Access Modes - parameters used to control the appropriate access mode for each path. Fare Time Conversion - boarding fares and transfer	Highway path building is similar to the SCAG methodology Transit path building relies on parameters defined by MTA which are more detailed than SCAG assumptions (e.g., fares).

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Mode Choice	Mode choice determines the distribution of person trips among the various modes of transportation available in the model. There are three sets of mode choice modules applied by the MTA model, corresponding to a unique trip purpose: home-based-work, home-based-nonwork (home-based-other), and non-home-based. Each of the three mode choice models (HBW, HBO and NHB) were calibrated for peak period and off-peak period. This element enables the mode choice model to replicate and predict the mode shares determined from the observed data.	The home-based-work mode choice model originally developed by SCAG in 1982. Modified by MTA The home-based-other model consists of a model transferred from Dallas/Fort Worth (North Central Texas Council of Governments - NCTCOG). The non-home-based model was developed by MTA 1991 O/D	The home-based-work mode choice model is a multinomial logit model with five alternatives: drive alone, 2 person carpool, 3 person carpool, transit walk access, transit auto access. The coefficients for the parameters were calibrated to mode shares in peak period and off-peak period. A binary logit submode choice model further splits the total auto access into park-and-ride and kiss-and-ride submodes. The submode checks for a maximum KNR distance. If exceeds the maximum, then all auto access trips are PNR trips. If less, a binary logit model is applied to split auto access to PNR and KNR. The home-based-other mode choice model contains four alternatives: drive alone, carpool, transit walk and transit auto access. The model is a trinomial logit model with a further submode choice split of the PNR trips. PNR trips consists of park-and-ride-driver (PND) and park-and-ride-passenger (PNP). The model checks for a KNR maximum.	Home-Based-Work In Vehicle Time Out Vehicle Time Cost/Income CBD Bias Constant Workers/Household Autos/Licensed Driver Parking Time at PNR lot Home-Based-Other In Vehicle Time Hwy Terminal/Transit Walk Time Transit Wait Time Hwy Run Cost/Transit Fare Parking Cost Income Tertile Autos/Person Autos/Household Household Size CBD Bias Constant Rural Area Bias Constant Non-Home-Based	Mode Choice models refined by MTA to include variables which further describe mode choice options. Inclusion of variables discussed in the parameters column such as parking time at PNR. Mode Choice distributions calibrated to 1991 O/D survey.

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
O/D, Peaking Factors and Trip Assignment	A conversion process applied to mode choice production-attraction trip tables to generate origin-destination (O/D) trip tables for highway assignment	Developed by MTA Modeling/GIS .	Peaking factors used to convert P-A to O/D were developed based on the 1991 O/D Survey information. Daily HBW, HBO and NHB trip tables are split into peak and off-peak period trip tables before mode choice process. The mode choice models are applied to produce peak and off-peak trips separately for each trip purpose. Daily trips are then computed by adding the peak and off-peak trips.	Peaking Factors by Time Periods. O/D Conversion Factors from P-A and A-P.	Similar to SCAG

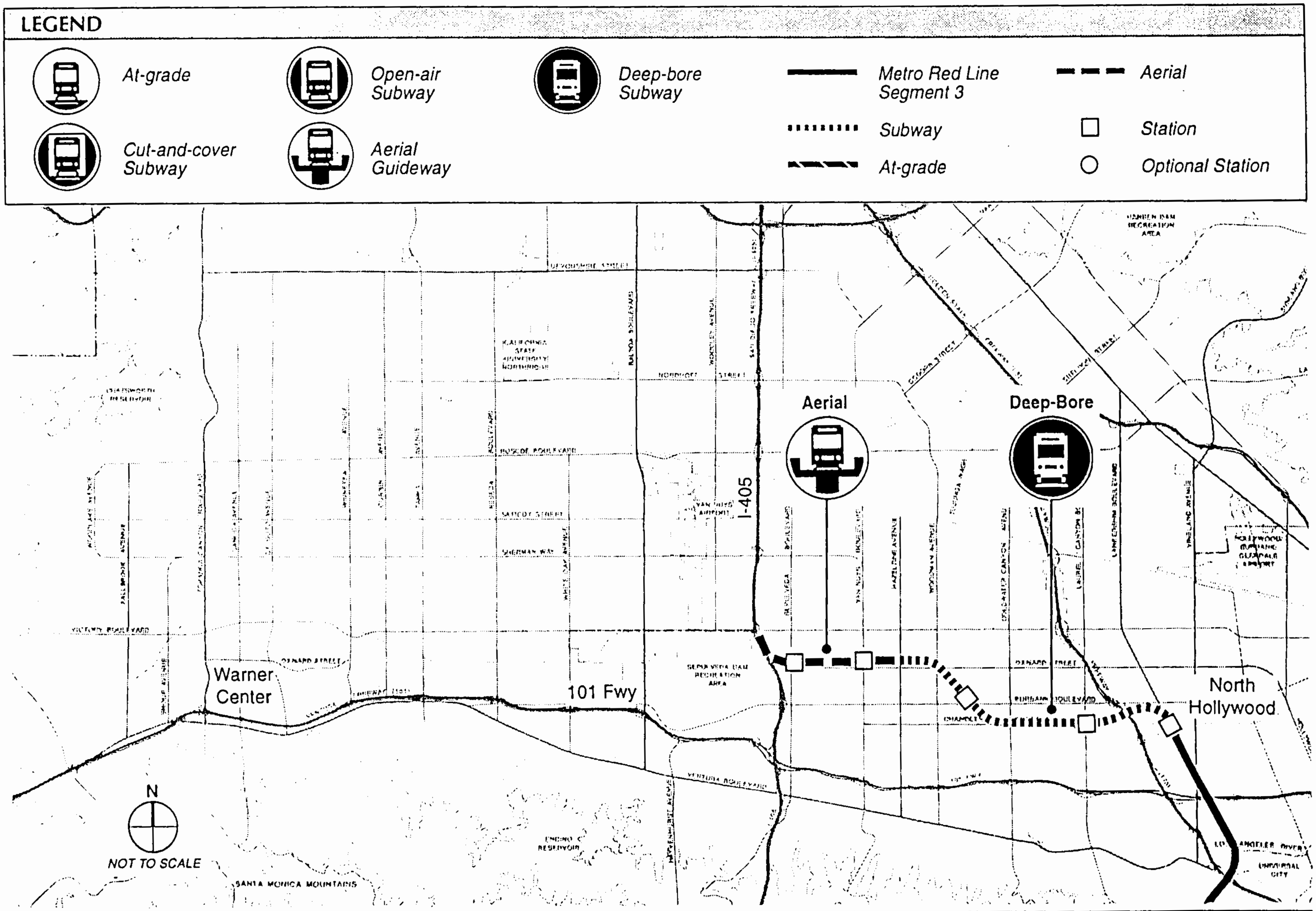
Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Highway Assignment	This is the process by which the vehicle trip tables are assigned to the highway networks for four periods: AM, midday, PM and night periods. Separate vehicle trip tables in O/D format are generated from the HBW, HBO and NHB trip tables.	Developed by MTA Modeling/GIS .	The assignment is an equilibrium capacity restrained assignment, set to run a maximum of 25 iterations. Due to the level of congestion, network equilibrium was never achieved. Vehicle trip assignment was validated by comparing model total daily volumes to Average Daily Traffic (ADT) ground counts across eleven screenlines. The five screenlines in L.A. County fall within 7% of the ground counts. The percent aggregate screenline crossings within L.A. County is only 1.65%. The region-wide total error of all 11 screenlines is only 2.35%.	Ground Counts at Screenline Locations	Calibration results within acceptable limits. Results in line with standard practice (i.e. comparable to SCAG results). Screenlines same as SCAG screenlines. SCAG data used for calibration. The model substantially over-predicts vehicle trips for screenlines in Ventura County and under-predicts in Orange County. The model predicts within $\pm$ 10% for screenlines in San Bernardino and Riverside Counties. The percent error of total screenline trips outside L.A. County is about 5%.

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Transit Assignment	The process of assigning transit trips on the transit network. The transit assignment process is a two-period dual-access path assignment. Separate person trip tables for daily peak and off-peak periods in P-A format generated from HBW, HBO and NHB mode choice models. These tables are combined into 4 tables for transit assignment: daily peak auto access, daily peak walk access, daily off-peak auto access, and daily off-peak walk access. Peak hour assignments are produced using peaking factors.	Developed by MTA Modeling/GIS .	Transit assignment is validated by comparing model estimated total daily boardings to actual boardings. The actual boardings are obtained from MTA's ride checks, summarized by the MTA Operations Department. The transit assignment validation focused on the MTA system only. This is done due to the fact that the number of boardings for non-MTA operators are not readily available and the large market share of MTA in the region-wide transit system. Comparisons of model boardings against actual boardings shows that MTA captures 1.22 million of 1.53 million region-wide daily boardings, i.e. 79.2%.	Socio-economic data Mode Choice Factors Peaking Factors	Process and results more detailed than SCAG, as MTA model is geared toward patronage analysis and peak hour loadings on transit lines. SCAG focus is on overall mode split.

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
Other Assumptions	Assumptions which may have impact on the results of the travel simulation model		Future Metrolink Service - assumed commuter train system in Los Angeles County by 2015, plan per SCRRA. % Trip Reduction due to telecommuting same as for 1990, 4.5%. Impact of ITS technology not included. Regulation XV not specifically included. Peak Period Spreading, MTA uses 3 hr. peak period and assumes travel demand is evenly spread over 3 hours (no peak within the peak).	Future Metrolink Service % Trip Reduction due to telecommuting - the amount of traffic reduced through use of telecommunications Impact of ITS technology - amount of enhanced capacity/reduced congestion by the use of advance intelligent transportation services. Regulation XV - employer trip reduction. Peak Period Spreading - the spreading of the peak period from 2 to 3-4+ hours	Assumptions similar to SCAG. SCAG generally assumes 4.5%+4% by 2000 and an additional +3.7% by 2010 SCAG assumes 2.5% incr. fwy. capacity by 2000 and 5% by 2010. SCAG assumes 80% effectiveness (modeled through parking pricing) SCAG assumes 3hr AM and 4 hr PM.

Element	Description	Source	Assumptions	Parameters	Comparison to SCAG Regional Model
			Congestion Pricing not modeled. Non-motorized Transportation not reflected.	Congestion Pricing - pricing through tolls, usage fees, gas taxes, etc. used to put a cost on travel during peak period. Non-motorized Transportation	SCAG assumes \$0.183 gas tax since 1990.

APPENDIX B
MIS ALTERNATIVES

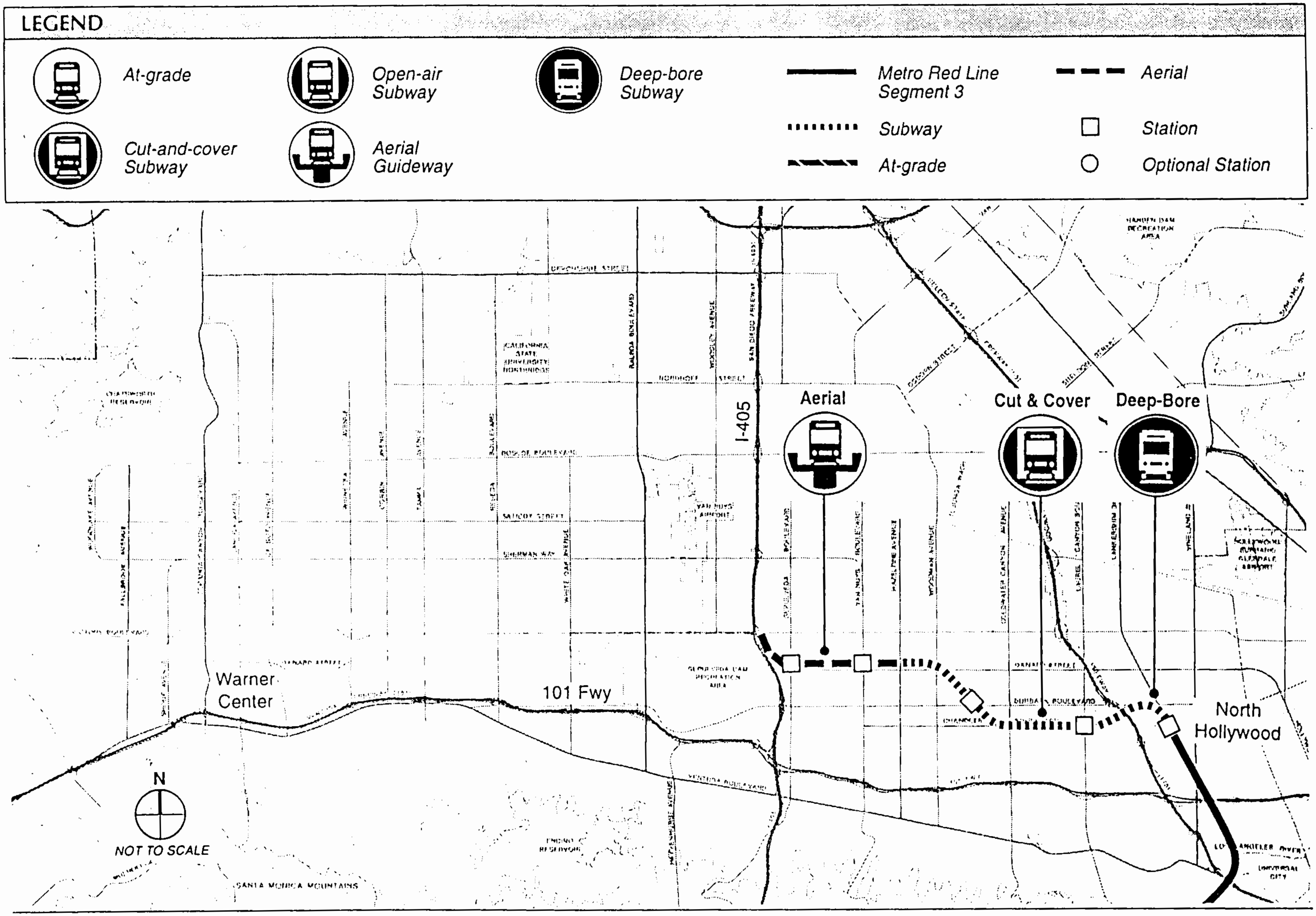


San Fernando Valley

East-West Transportation Corridor

MAJOR INVESTMENT STUDY

Alternative 1a
HRT Deep Bore via SP to I-405

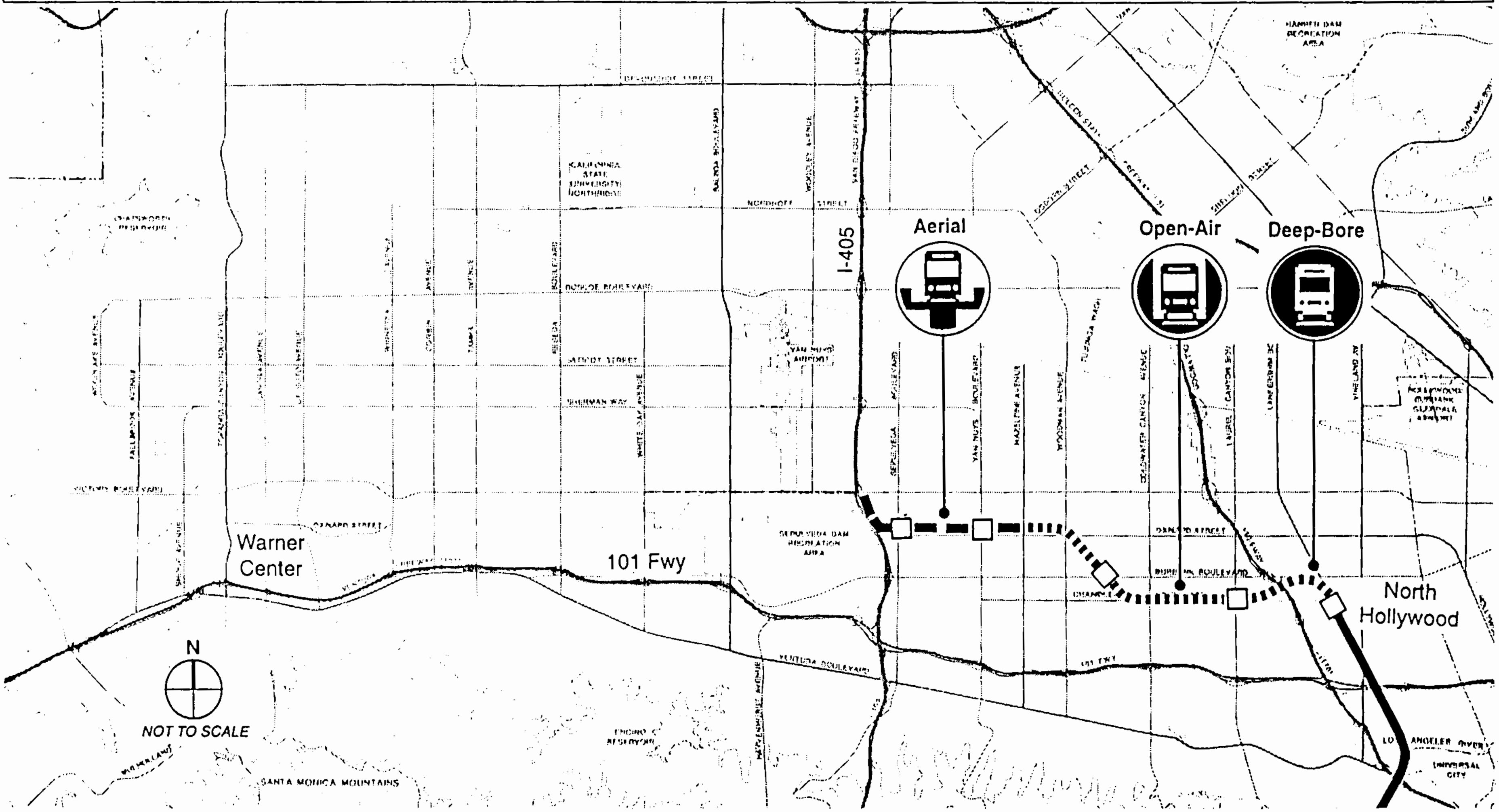


San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 1b
HRT Cut-and-cover via SP to I-405

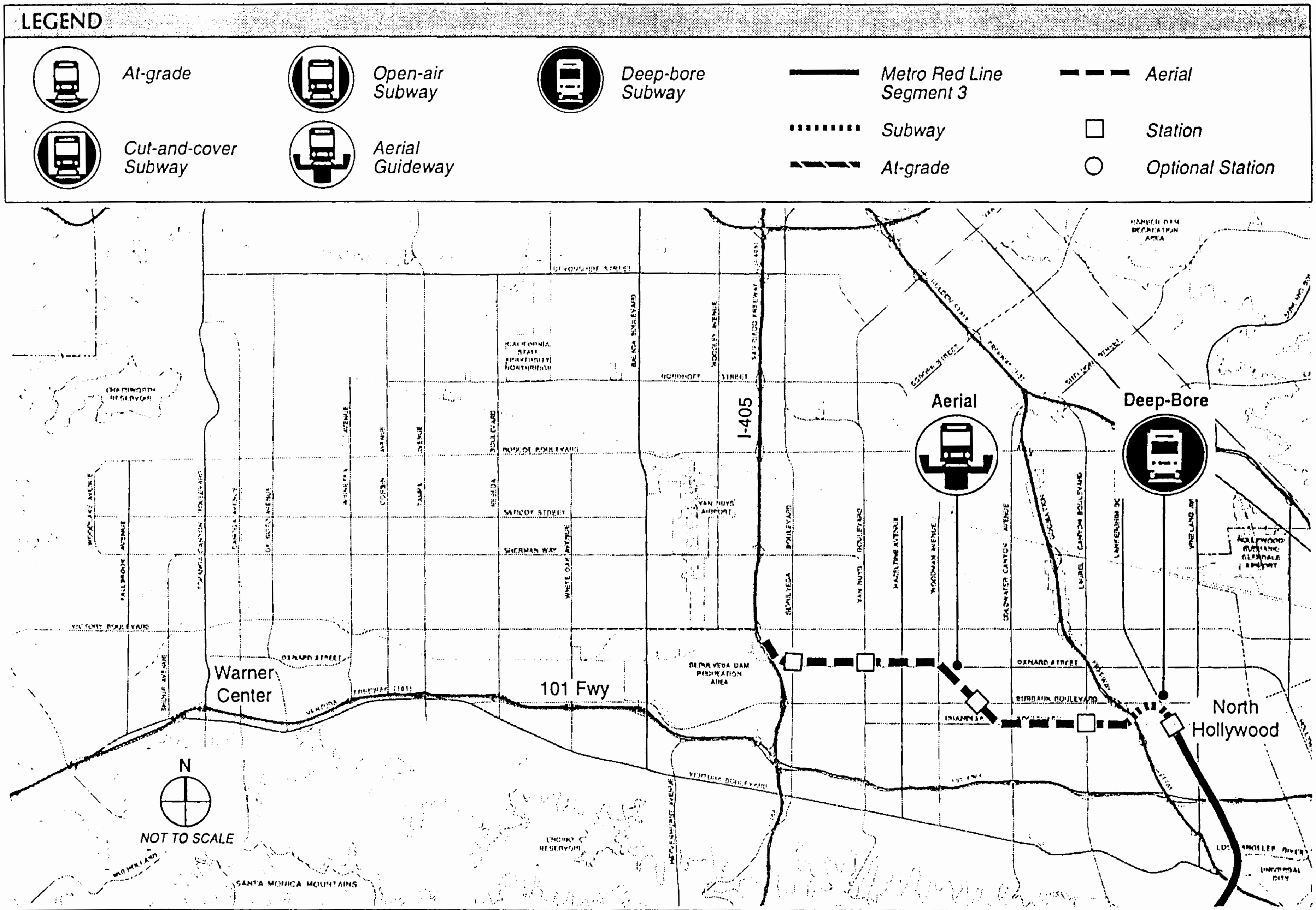
LEGEND

At-grade	Open-air Subway	Deep-bore Subway	Metro Red Line Segment 3
Cut-and-cover Subway	Aerial Guideway		Subway
			At-grade
			Aerial
			Station
			Optional Station



San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 1c:
HRT Open Air via SP to I-405



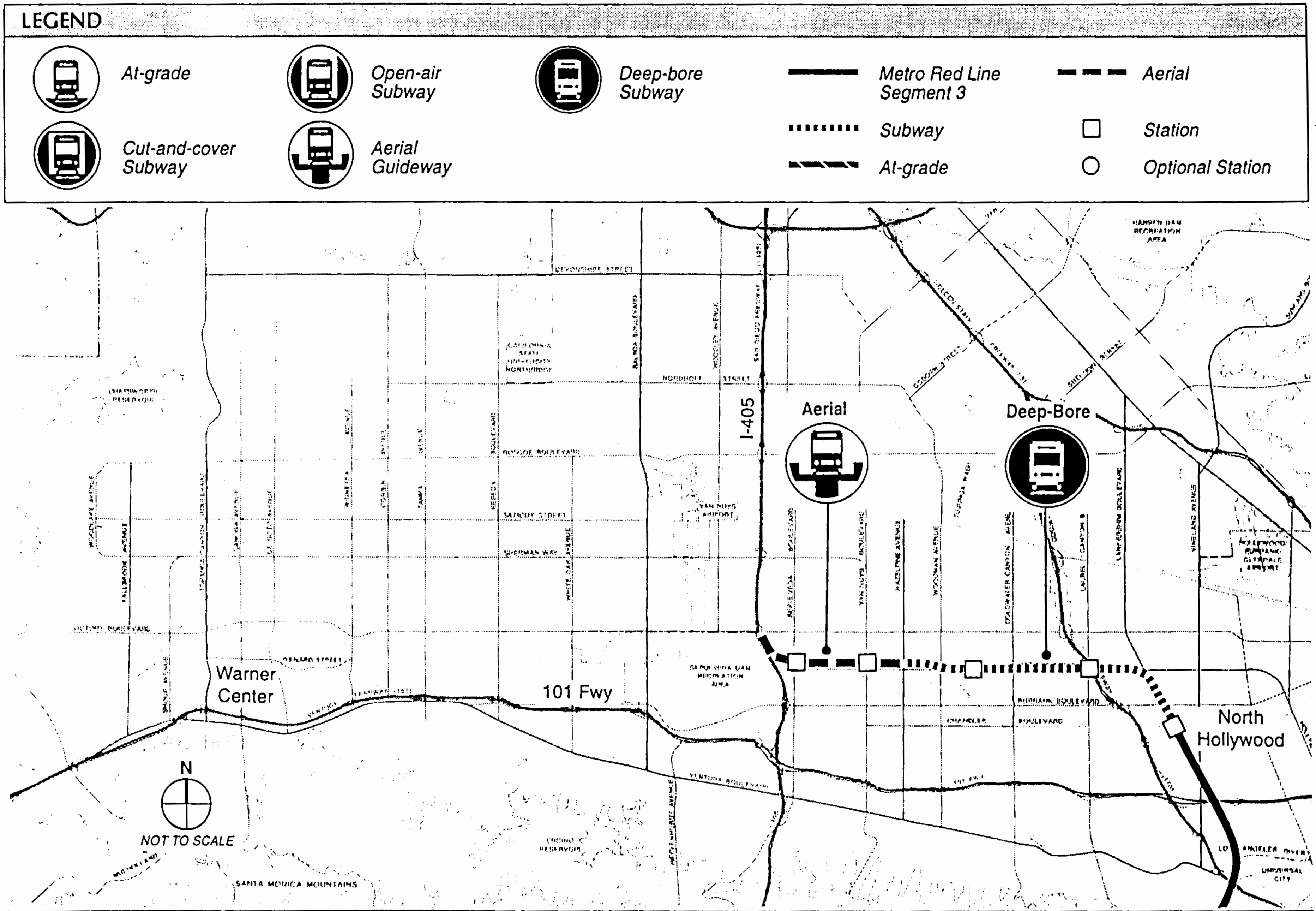
San Fernando Valley

East-West Transportation Corridor

MAJOR INVESTMENT STUDY

Alternative 1d

HRT Aerial via SP to I-405

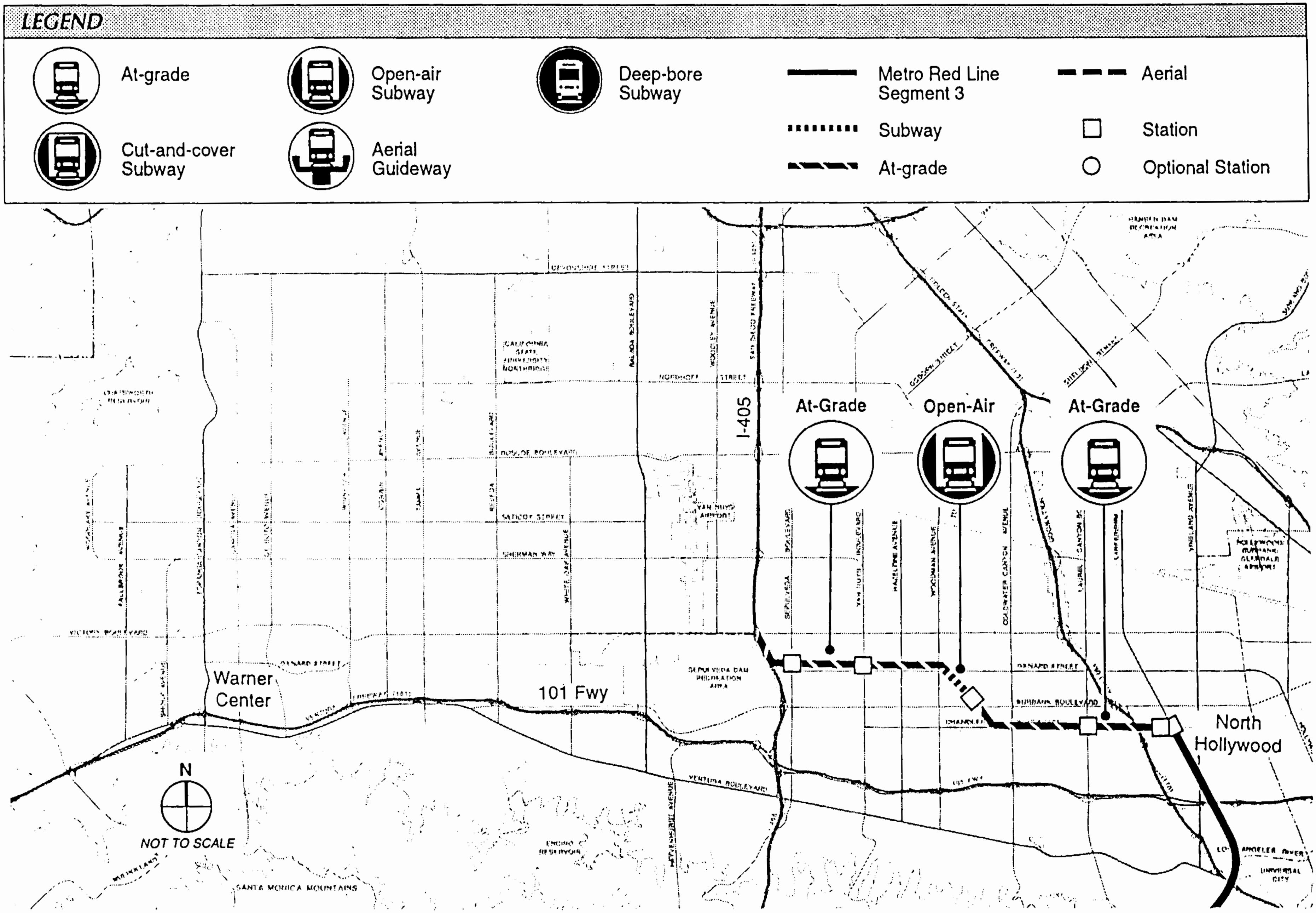


San Fernando Valley

East-West Transportation Corridor

MAJOR INVESTMENT STUDY

Alternative 2:
HRT Deep Bore via Oxnard to I-405

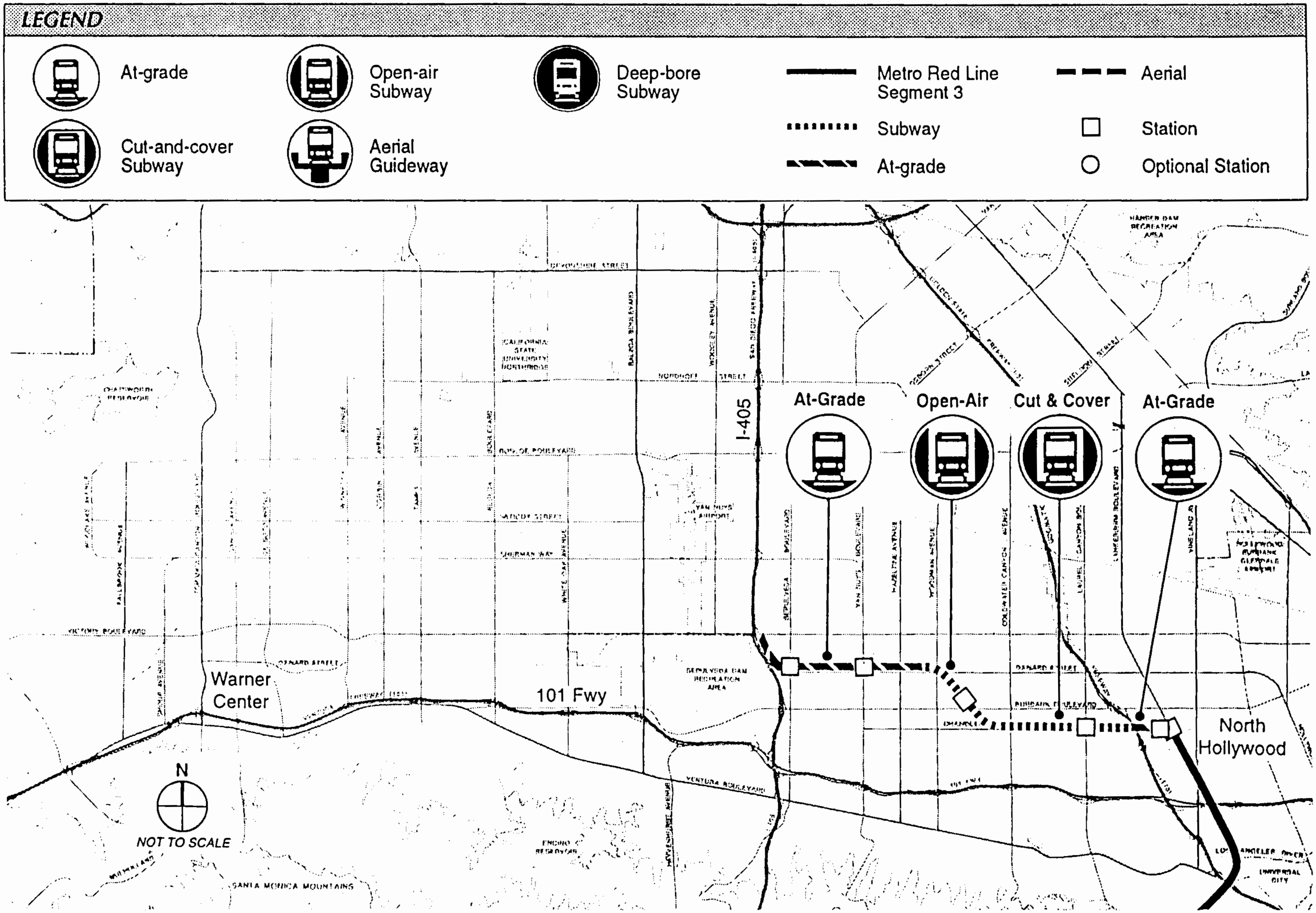


San Fernando Valley

East-West Transportation Corridor

MAJOR INVESTMENT STUDY

Alternative 3a:
LRT At-grade via SP to I-405

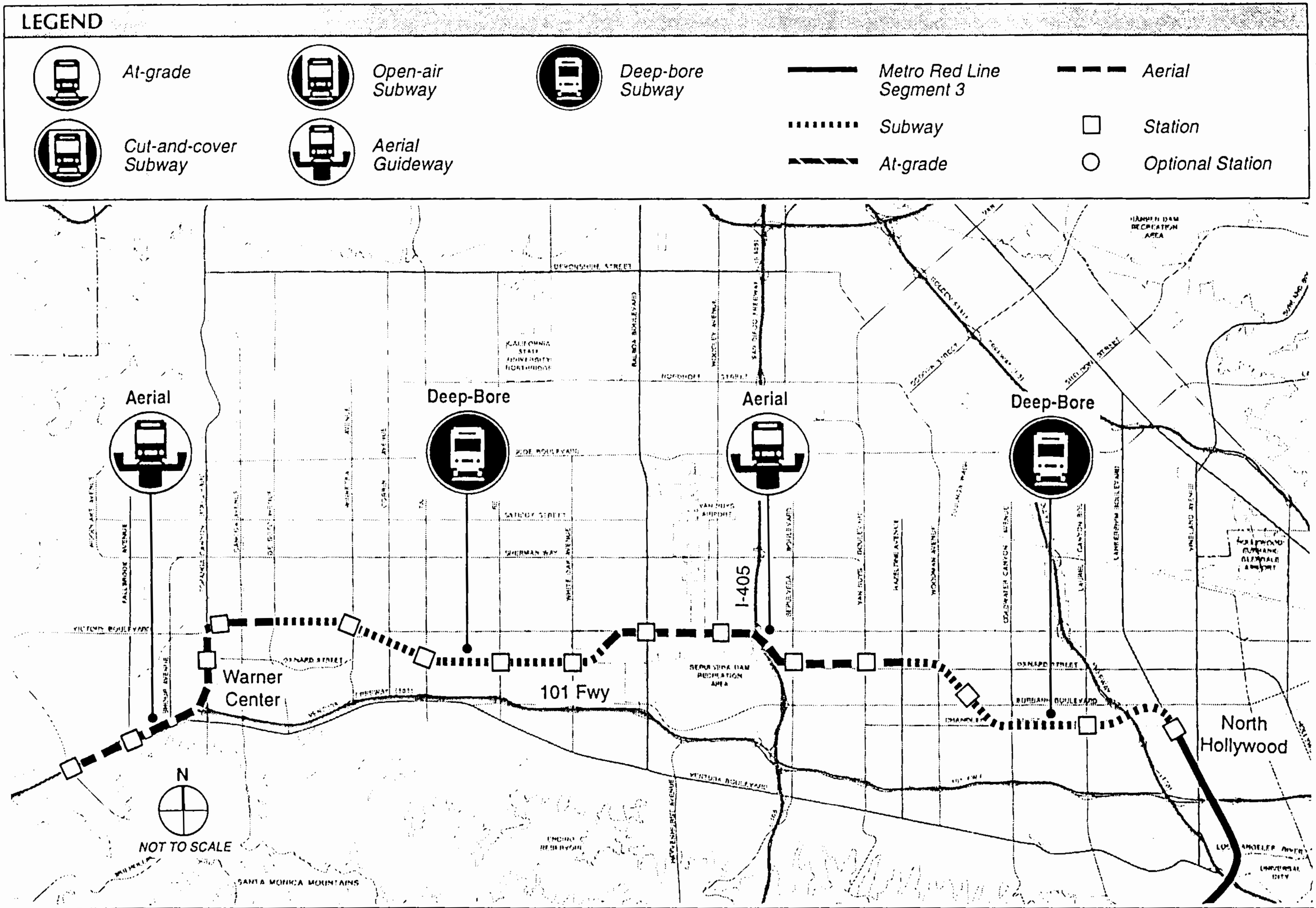


San Fernando Valley

East-West Transportation Corridor

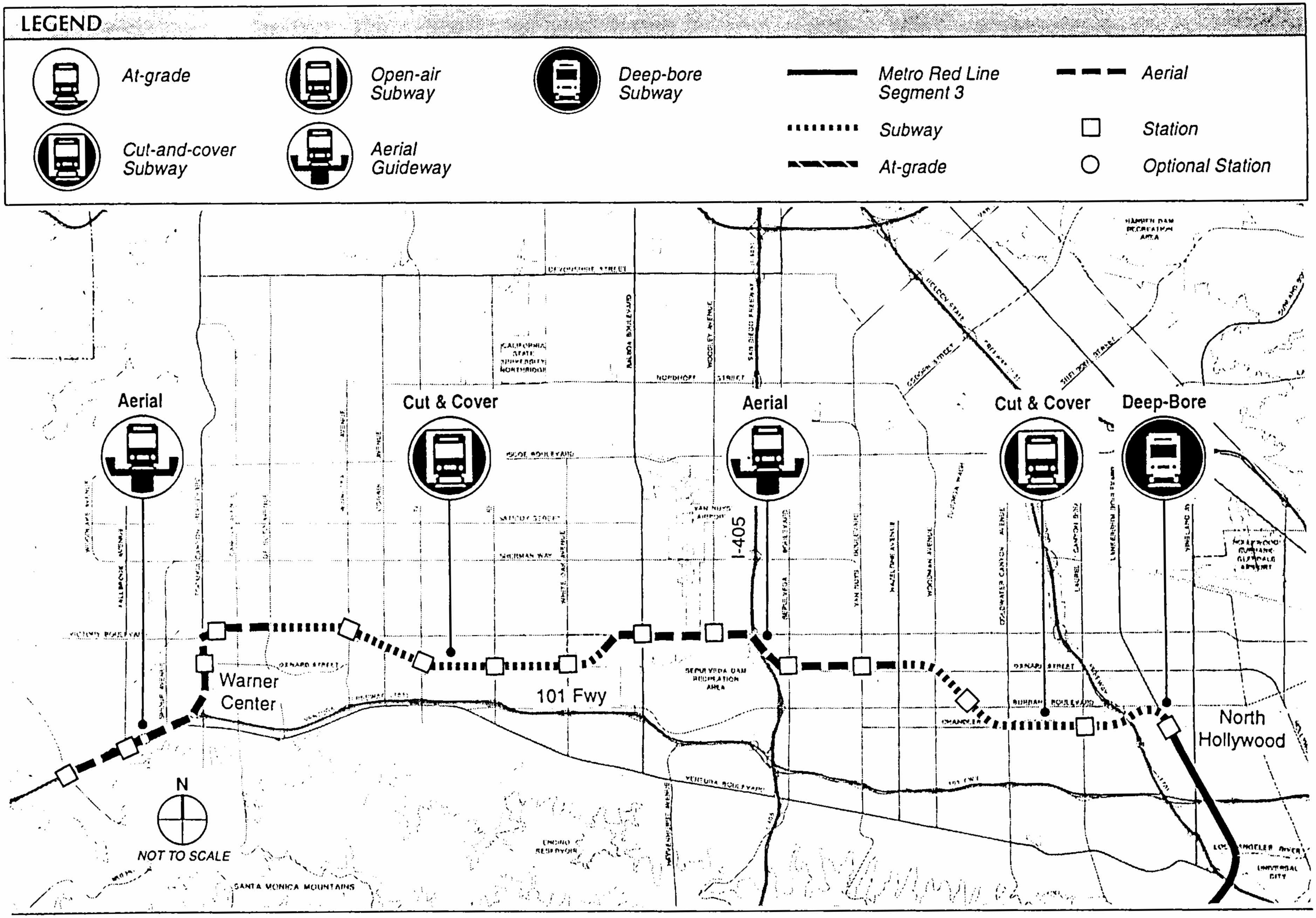
MAJOR INVESTMENT STUDY

Alternative 3b: LRT At-grade/
Cut-and-cover via SP to I-405



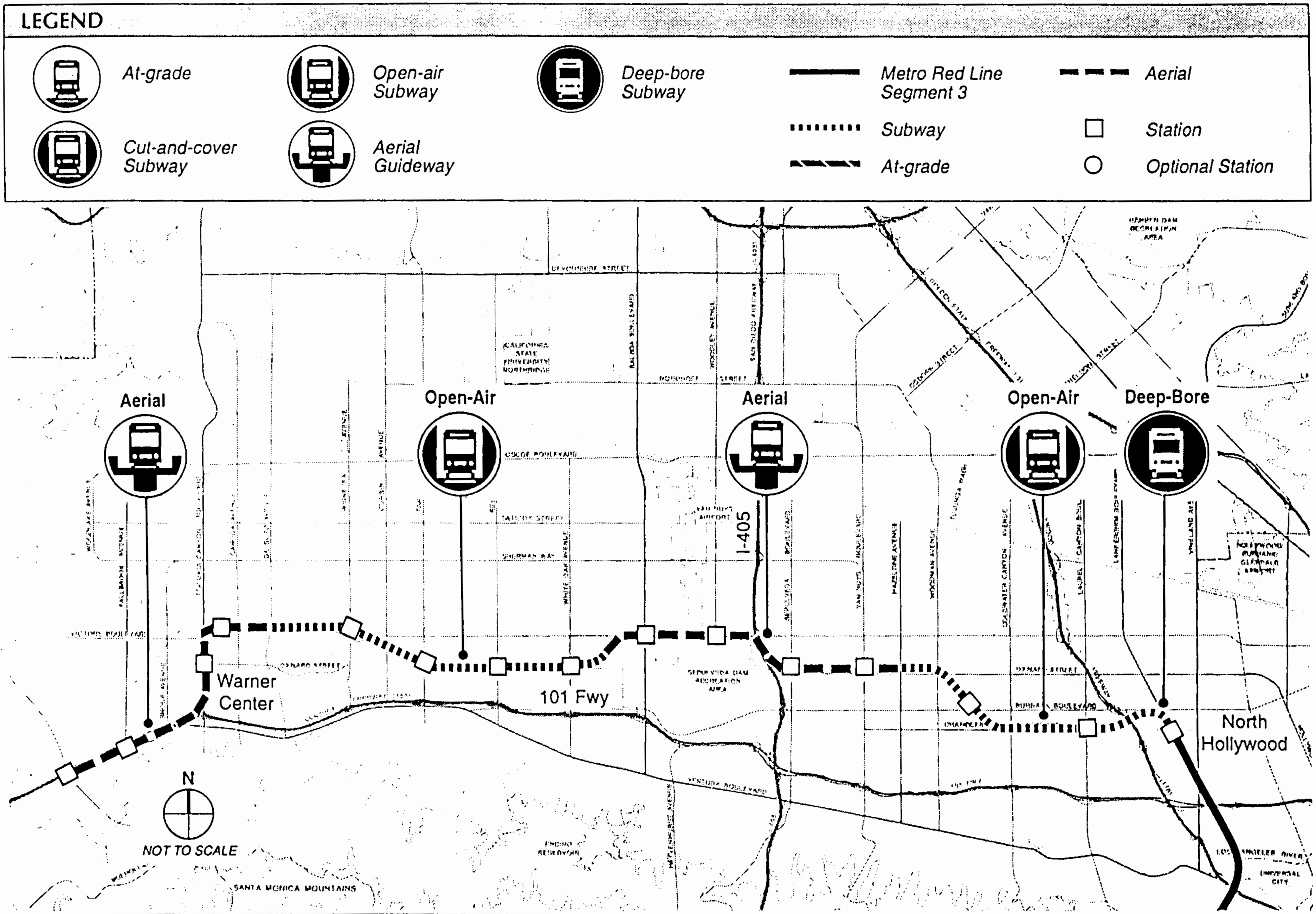
San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 4a: HRT Deep Bore
via SP to Valley Circle



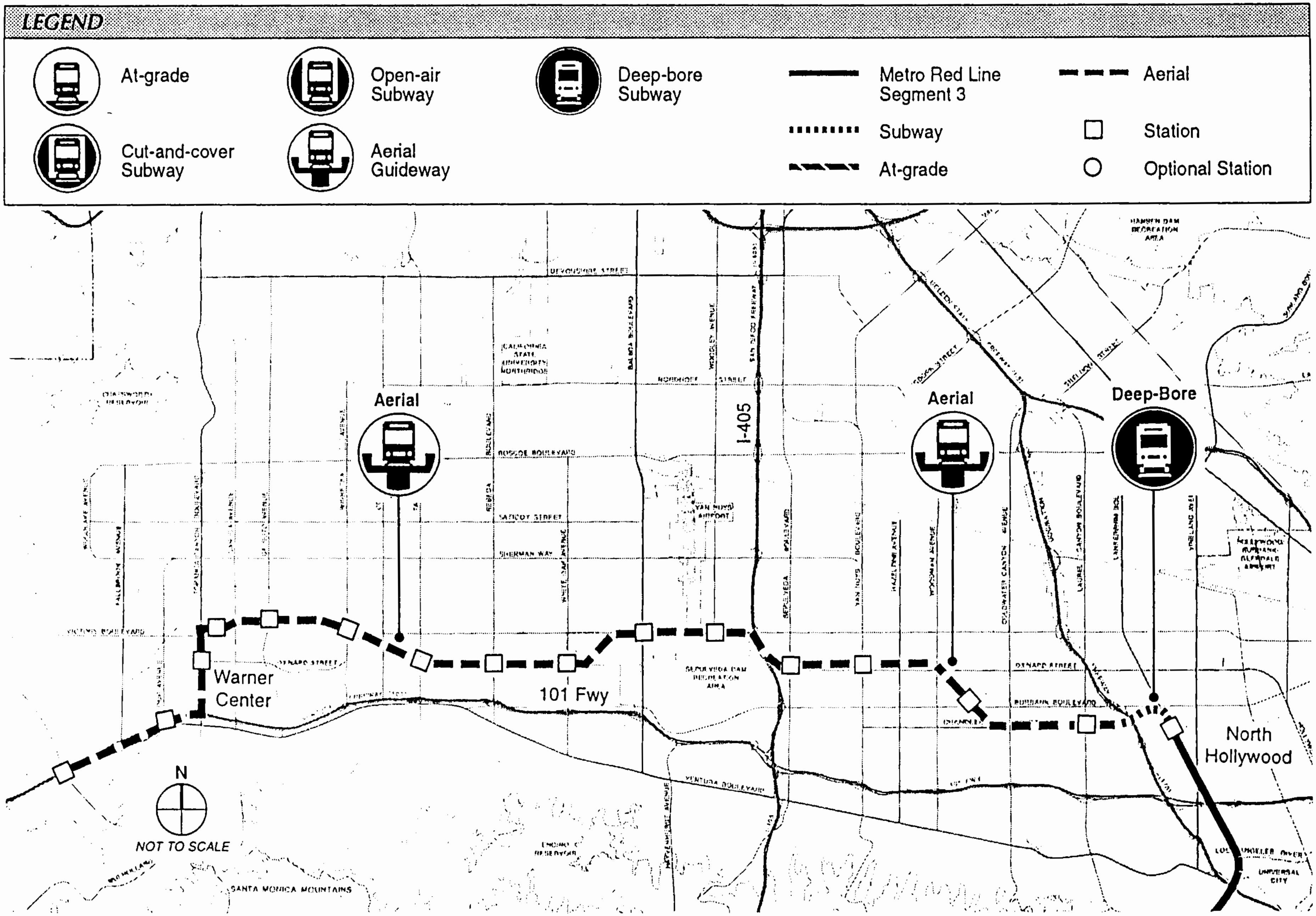
San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 4b: HRT Cut-and-cover
via SP to Valley Circle



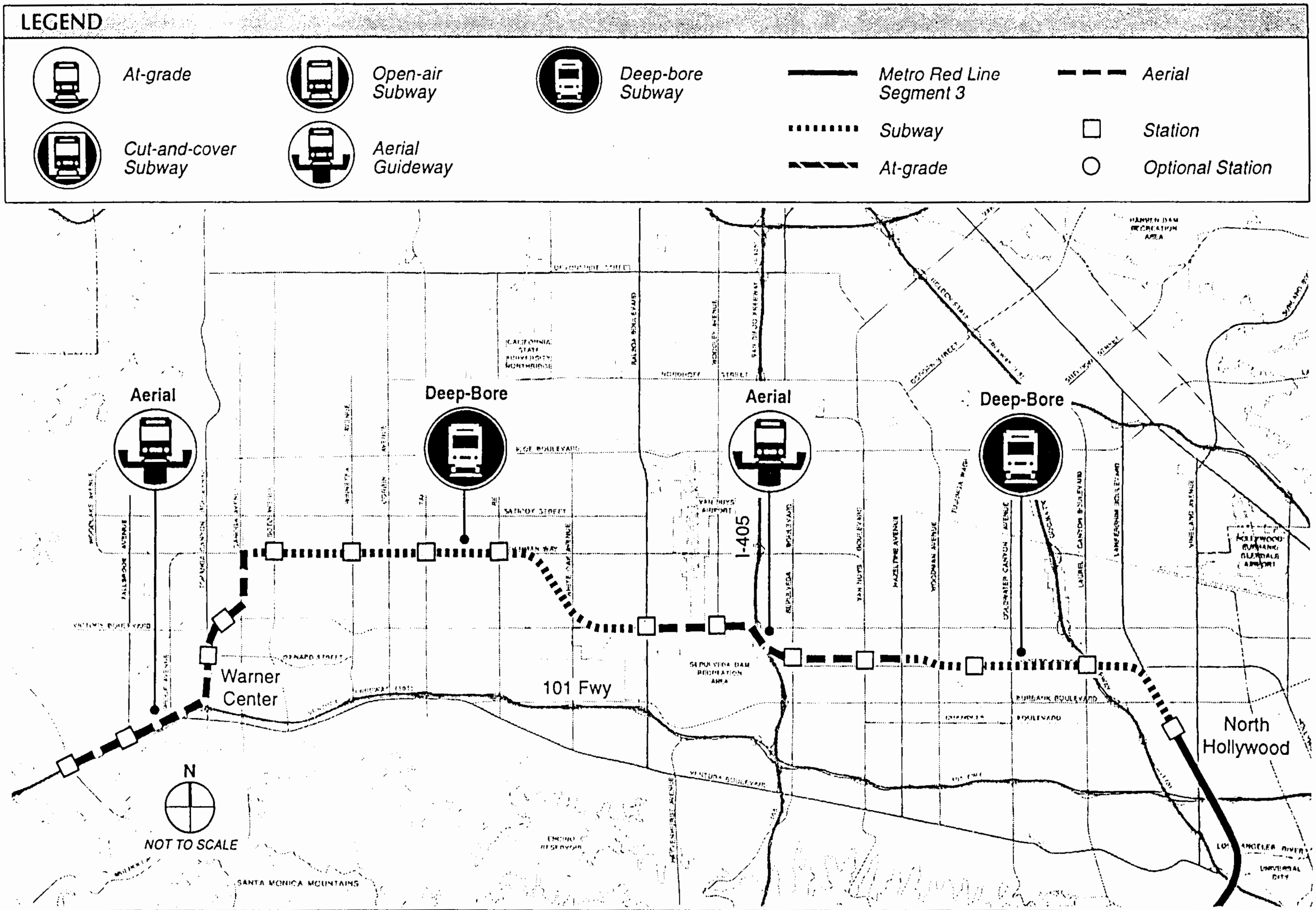
San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 4c: HRT Open-air
via SP to Valley Circle



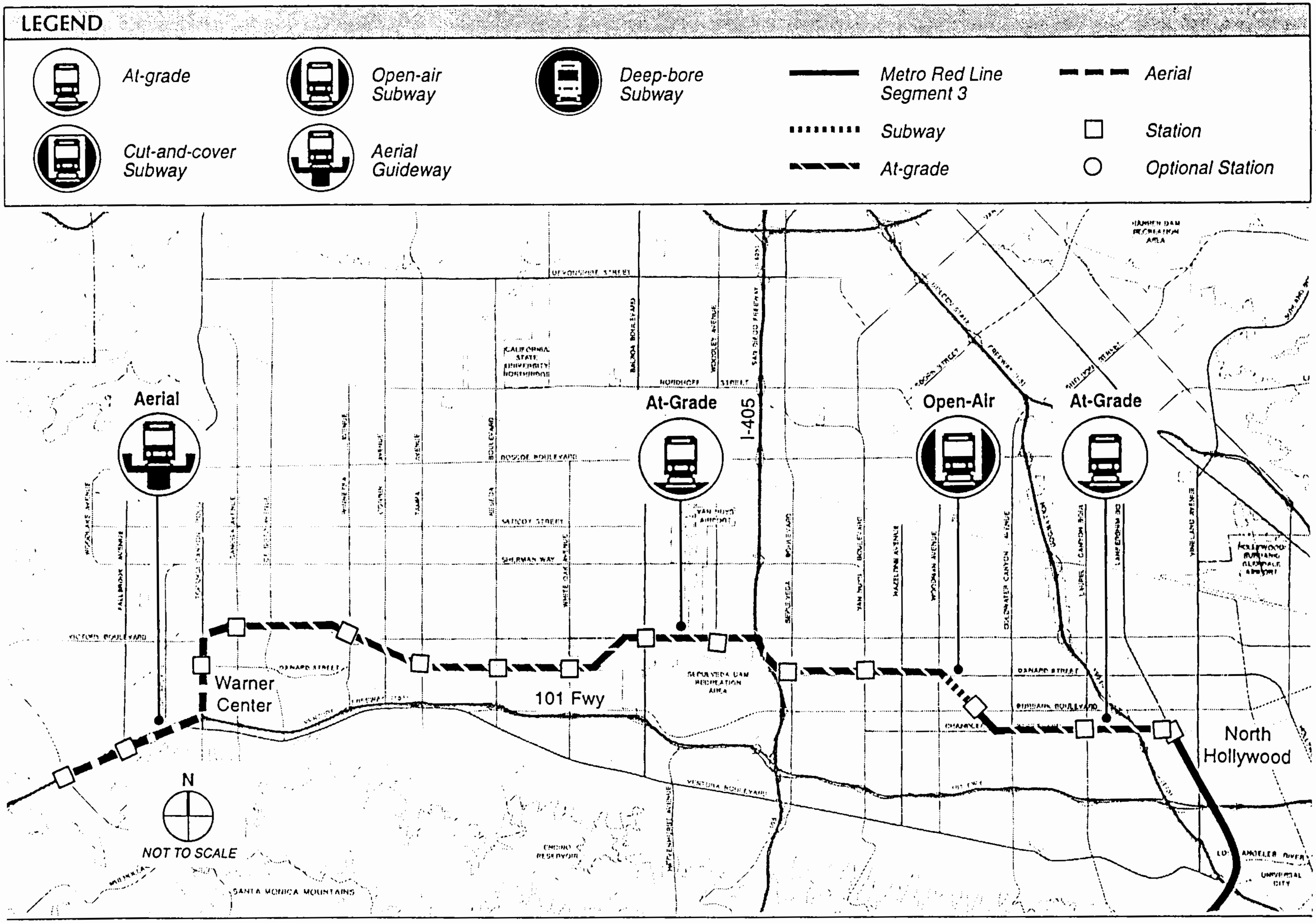
San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 4d: HRT Aerial via SP to Valley Circle



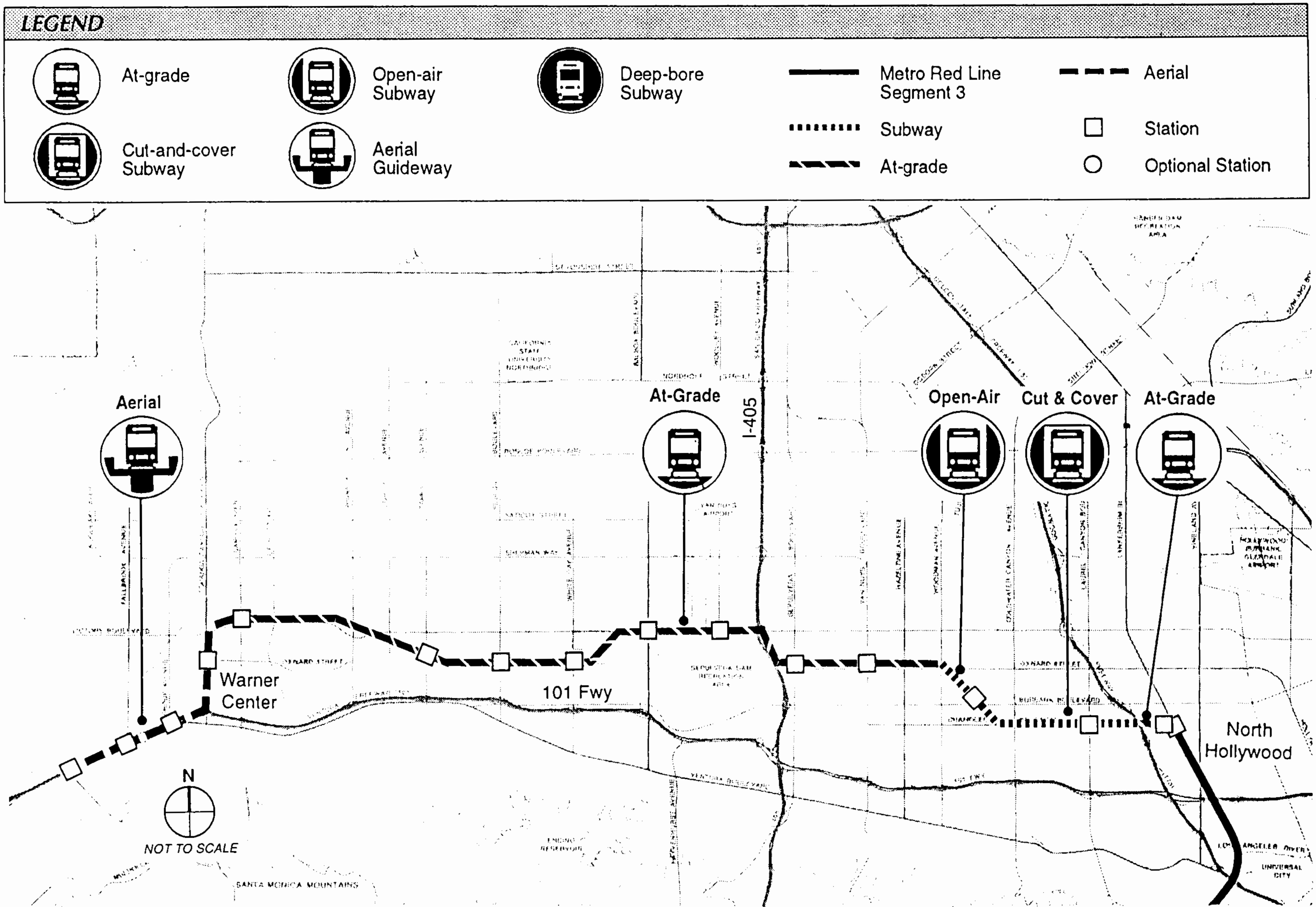
San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 5: HRT Deep Bore via Oxnard/SP/Sherman Way to Valley Circle



San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 6a: LRT At Grade
via SP to Valley Circle

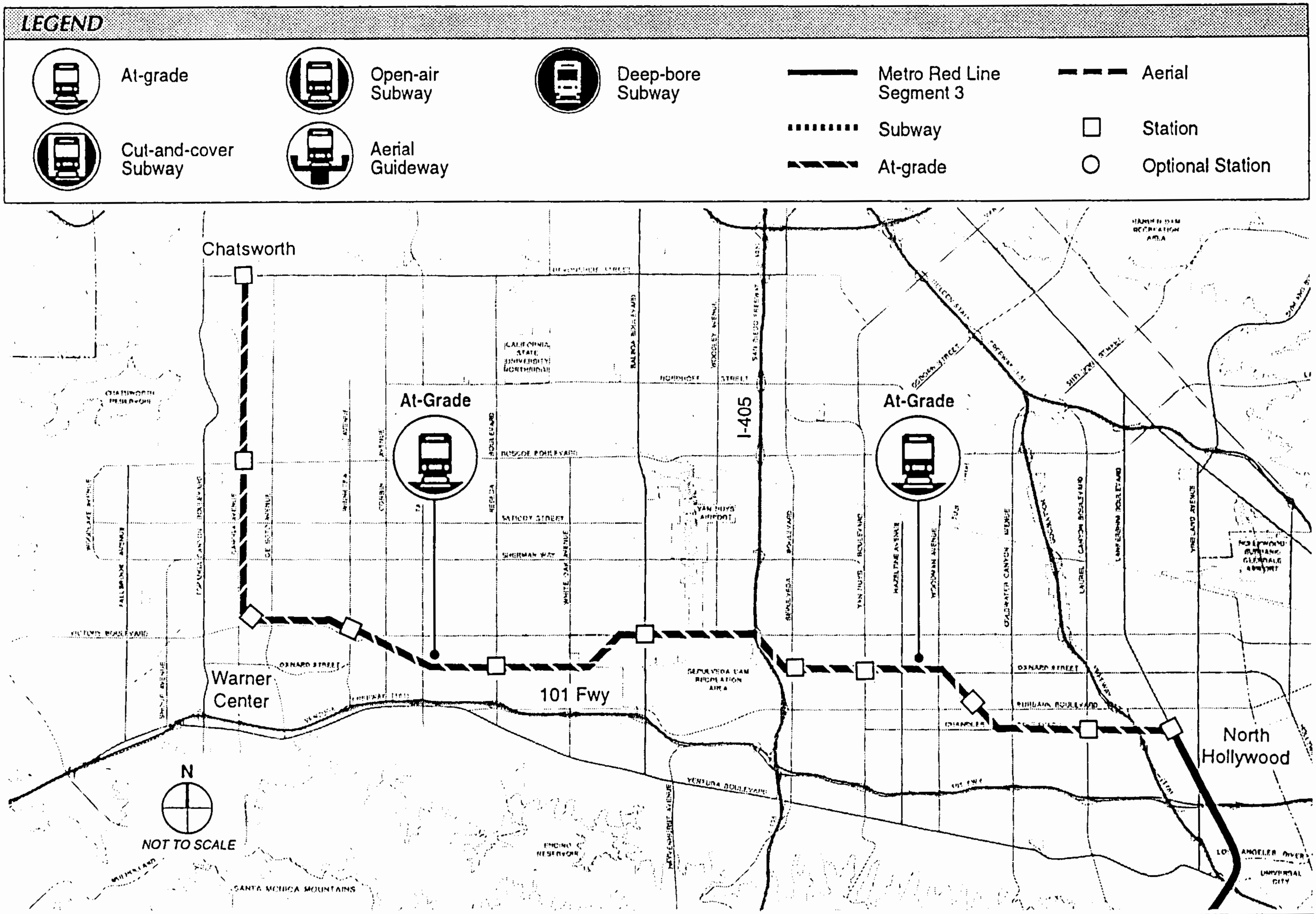


San Fernando Valley

East-West Transportation Corridor

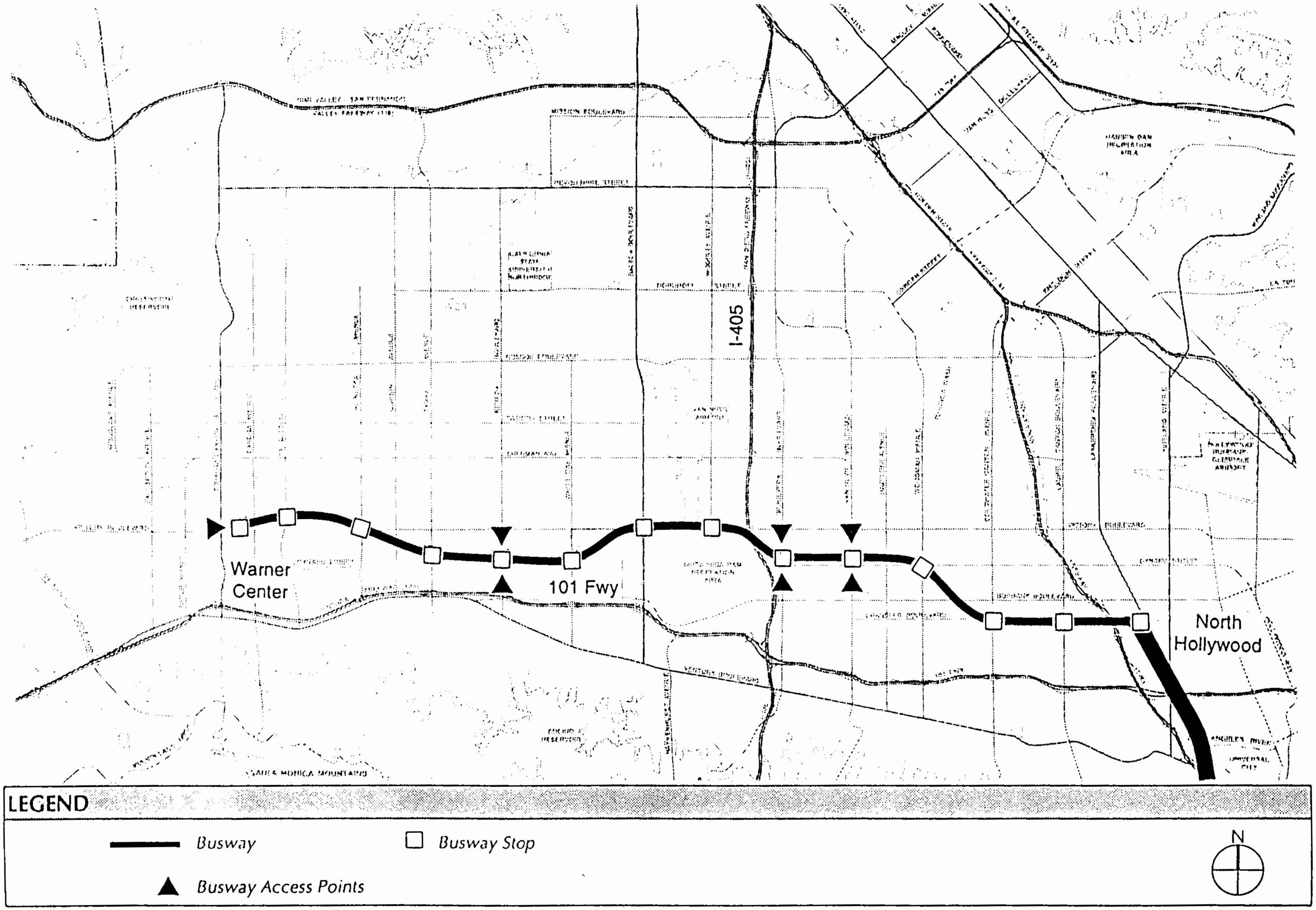
MAJOR INVESTMENT STUDY

Alternative 6b: LRT At-grade/ Cut-and-cover via SP to Valley Circle



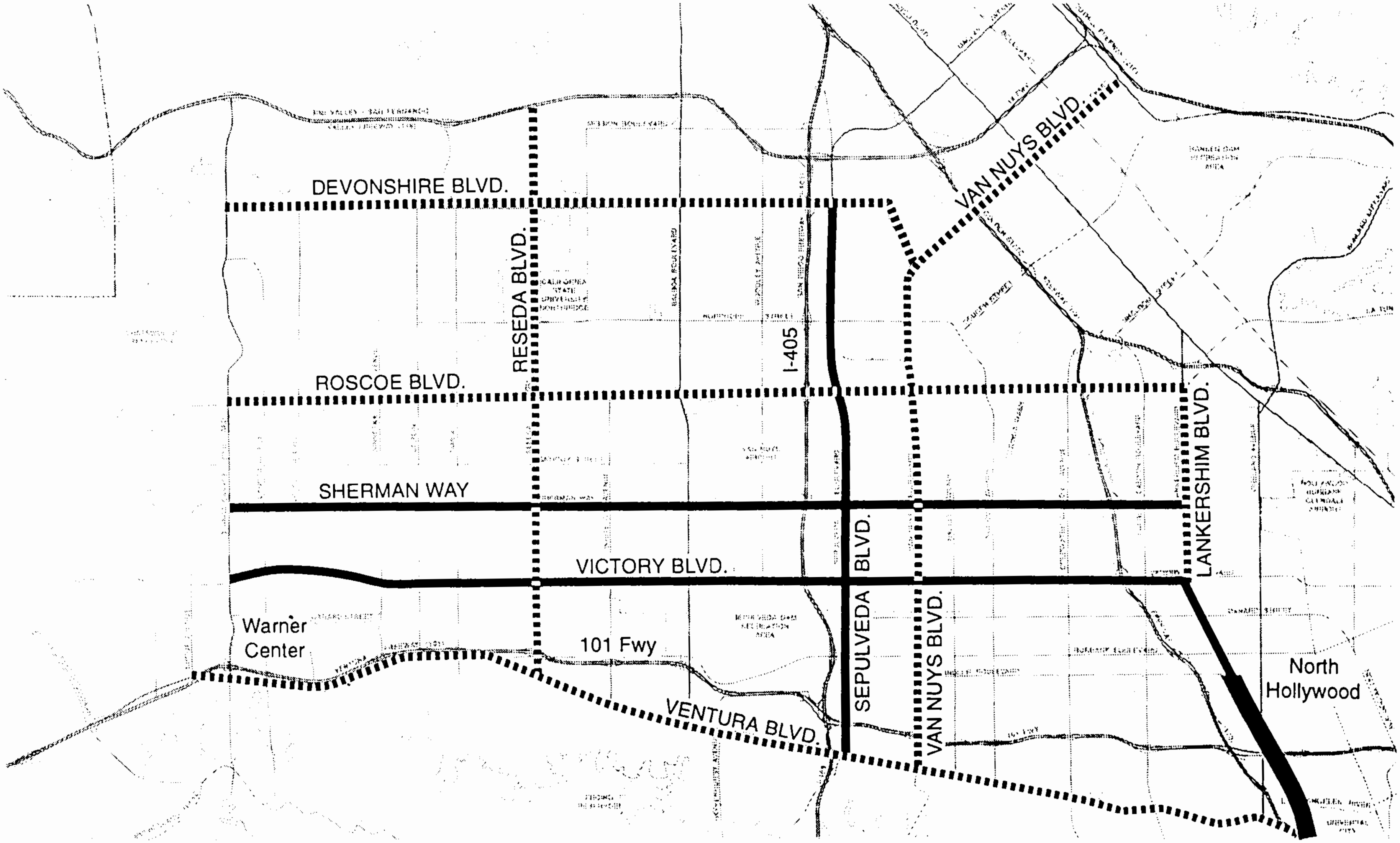
San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 7: ART Cross Valley



San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 8:
Busway



LEGEND	
TSM Improved Corridors	Peak Hours (10 min. peak headway)
	All Day (10 min. peak headway/20 min. base headway)

N

NOT TO SCALE

METRO

San Fernando Valley
East-West Transportation Corridor
MAJOR INVESTMENT STUDY

Alternative 9:
Enhanced Bus Valleywide

APPENDIX C
STATION-TO-STATION CUMULATIVE
CUMULATIVE RUNNING TIMES
AND AVERAGE SPEEDS

ESTIMATION OF RUNNING TIME *MODEL RUN #5*

SAN FERNANDO VALLEY OPTION:

RED LINE from NORTH HOLLYWOOD to VALLEY CIRCLE

VIA BURBANK/CHANDLER, SP ROW

STATION / LINE SECTION	MAX. SPEED	DISTANCE (MILES) segment	DISTANCE (MILES) station	CUMUL. DIST. (MILES)	RUNNING TIME (MIN.)	STA-STA TIME INCL DWELL	ELAPSED RUN TIME (MIN.)
NORTH HOLLYWOOD				0.0			0.0
	25	0.46			1.19		
curve 714+65 to 737+60							
	55	2.32			2.84	4.36	
FULTON/BURBANK			2.78	2.8			4.4
	55	0.89			1.20		
curve 545+00 to 561+00							
	70	0.80			0.98	2.51	
VAN NUYS			1.69	4.5			6.9
	70	1.12			1.57	1.90	
SEPULVEDA			1.12	5.6			8.8
	55	0.74			1.03		
curves 405+00 to 444+00							
	55	0.38			0.62	1.99	
WOODLEY			1.12	6.7			10.8
	55	0.73			1.03		
curve 337+00 to 345+00							
	55	0.19			0.42	1.78	
BALBOA			0.93	7.6			12.5
	55	0.98			1.29		
curves 280+00 to 317+00							
	55	0.19			0.42	2.05	
WHITE OAK			1.17	8.8			14.6
	70	1.06			1.52	1.85	
RESEDA			1.06	9.9			16.4
	70	1.08			1.54	1.87	
TAMPA			1.08	10.9			18.3
	55	1.02			1.55	1.88	
WINNETKA			1.02	12.0			20.2
	70	1.80			2.15	2.49	
WARNER CENTER (Owensmouth)			1.80	13.8			22.7
	55	0.76			1.26	1.59	
OXNARD ST.			0.76	14.5			24.3
	55	0.72			1.01		
curve 50+00 to 70+00							
	70	0.89			1.07	2.41	
FALLBROOK			1.61	16.1			26.7
	55	0.81			1.32	1.65	
VALLEY CIRCLE			0.81	17.0			28.3

Avg. Sta. Spacing: 1.3

Avg. speed 35.9 mph

NOTES:

1. Distances Woodman to Warner Ctr.. based on alignments drawn by Gannett Fleming 6/1/89.
   Distances west of Warner Center from 7/94 extension drawings.
   Horizontal curves shown where design speed is less than 60 mph.
2. Travel times estimated with run time model developed by MPA, based on 2/92 performance data.
3. Speed codes of 9, 25, 40, 45, 55 and 70 mph were assumed.

ESTIMATION OF RUNNING TIME
SAN FERNANDO VALLEY OPTION:
RED LINE from NORTH HOLLYWOOD to VALLEY CIRCLE
VIA BURBANK/CHANDLER, SP ROW ***WITH LAUREL CANYON STATION***

STATION / LINE SECTION	MAX. SPEED	DISTANCE (MILES) segment	DISTANCE (MILES) station	CUMUL. DIST. (MILES)	RUNNING TIME (MIN.)	STA-STA TIME INCL DWELL	ELAPSED RUN TIME (MIN.)
NORTH HOLLYWOOD				0.0			0.0
	25	0.46			1.19		
curve 714+65 to 737+60							
	55	0.80			1.18	*2.70*	
LAUREL CANYON			*1.26*	1.3			2.7
	55	1.52			2.09	*2.42*	
FULTON/BURBANK			*1.52*	2.8			5.1
	55	0.89			1.20		
curve 545+00 to 561+00							
	70	0.80			0.98	*2.51*	
VAN NUYS			*1.69*	4.5			7.6
	70	1.12			1.57	*1.90*	
SEPULVEDA			*1.12*	5.6			9.5
	55	0.74			1.03		
curves 405+00 to 444+00							
	55	0.38			0.62	*1.99*	
WOODLEY			*1.12*	6.7			11.5
	55	0.73			1.03		
curve 337+00 to 345+00							
	55	0.19			0.42	*1.78*	
BALBOA			*0.93*	7.6			13.3
	55	0.98			1.29		
curves 280+00 to 317+00							
	55	0.19			0.42	*2.05*	
WHITE OAK			*1.17*	8.8			15.4
	70	1.06			1.52	*1.85*	
RESEDA			*1.06*	9.9			17.2
	70	1.08			1.54	*1.87*	
TAMPA			*1.08*	10.9			19.1
	55	1.02			1.55	*1.88*	
WINNETKA			*1.02*	12.0			21.0
	70	1.80			2.15	*2.49*	
WARNER CENTER (Owensmouth)			*1.80*	13.8			23.4
	55	0.76			1.26	*1.59*	
OXNARD ST.			*0.76*	14.5			25.0
	55	0.72			1.01		
curve 50+00 to 70+00							
	70	0.89			1.07	*2.41*	
FALLBROOK			*1.61*	16.1			27.5
	55	0.81			1.32	*1.65*	
VALLEY CIRCLE			*0.81*	17.0			29.1

Avg. Sta. Spacing: *1.2*   *Avg. speed* *34.9 mph*

NOTES:

1. Distances Woodman to Warner Ctr.. based on alignments drawn by Gannett Fleming 6/1/89.
   Distances west of Warner Center from 7/94 extension drawings.
   Horizontal curves shown where design speed is less than 60 mph.
2. Travel times estimated with run time model developed by MPA, based on 2/92 performance data.
3. Speed codes of 9, 25, 40, 45, 55 and 70 mph were assumed.

Manuel Padron & Associates
C:\LA\SFV\#SP-LCVC.wk4

12-Apr-96

ESTIMATION OF RUNNING TIME
SAN FERNANDO VALLEY OPTION:
RED LINE from NORTH HOLLYWOOD to TOPANGA via OXNARD STREET

STATION / LINE SECTION	MAX. SPEED	DIST. (MILES) segment	DIST. (MILES) station	CUMUL. DIST. (MILES)	UNNIN TIME (MIN.)	*STA-STA TIME INCL DWELL*	ELAPSED RUN TIME (MIN.)	SPEED CODE1	SPEED CODE2
NORTH HOLLYWOOD				0.0			0.0		
	55	0.83			1.13			0.55	55.55
curve 714+65 to 737+60				0.8					
	55	0.76			1.04	*2.50*		55.55	55.00
LAUREL CANYON			*1.59*	1.6			2.5		
	70	1.42			1.83	*2.16*		0.70	70.00
VALLEY COLLEGE			*1.42*	3.0			4.7		
	70	1.55			1.94	*2.28*		0.70	70.00
VAN NUYS			*1.55*	4.6			6.9		
	70	1.12			1.57	*1.90*		0.70	70.00
SEPULVEDA			*1.12*	5.7			8.8		
	55	0.74			1.03			0.55	55.55
curves 405+00 to 444+00				6.4					
	55	0.38			0.62	*1.99*		55.55	55.00
WOODLEY			*1.12*	6.8			10.8		
	55	0.73			1.03			0.55	55.55
curve 337+00 to 345+00				7.5					
	55	0.19			0.42	*1.78*		55.55	55.00
BALBOA			*0.93*	7.7			12.6		
	55	0.98			1.29			0.55	55.55
curves 280+00 to 317+00				8.7					
	55	0.19			0.42	*2.05*		55.55	55.00
WHITE OAK			*1.17*	8.9			14.7		
	70	1.06			1.52	*1.85*		0.70	70.00
RESEDA			*1.06*	10.0			16.5		
	70	1.08			1.54	*1.87*		0.70	70.00
TAMPA			*1.08*	11.0			18.4		
	55	1.02			1.55	*1.88*		0.55	55.00
WINNETKA			*1.02*	12.1			20.3		
	70	1.80			2.15	*2.49*		0.70	70.00
WARNER CENTER (Owensmouth)			*1.80*	13.9			22.7		

Avg. speed: *36.6 mph*

NOTES:

1. Distances west of Woodman Ave. based on alignments drawn by Gannett Fleming 6/1/89.
   Horizontal curves shown where design speed is less than 60 mph (from 1987 drawings).
   REVISED ALIGNMENT N. HOLLYWOOD TO VALLEY COLLEGE PER 7/94 PB/DMJM PLANS.
2. Travel times estimated with run time model developed by MPA, based on performance data from Booz Allen, 2/92.
3. Speed codes of 9, 25, 40, 45, 55 and 70 mph were assumed.

ESTIMATION OF RUNNING TIME ***MODEL RUN #6***
SAN FERNANDO VALLEY OPTION:
RED LINE from NORTH HOLLYWOOD to VALLEY CIRCLE
VIA BURBANK/CHANDLER & SHERMAN WAY

STATION / LINE SECTION	MAX. SPEED	DISTANCE (MILES) segment	DISTANCE (MILES) station	CUMUL. DIST. (MILES)	RUNNING TIME (MIN.)	STA-STA TIME INCL. DWELL	ELAPSED RUN TIME (MIN.)
NORTH HOLLYWOOD				0.0			0.0
	25	0.46			1.19		
curve 714+65 to 737+60							
	55	2.32			2.84	*4.36*	
FULTON/BURBANK			*2.78*	2.8			4.4
	55	0.89			1.20		
curve 545+00 to 561+00							
	70	0.80			0.98	*2.51*	
VAN NUYS			*1.69*	4.5			6.9
	70	1.12			1.57	*1.90*	
SEPULVEDA			*1.12*	5.6			8.8
	55	0.74			1.03		
curves 405+00 to 444+00							
	55	0.38			0.62	*1.99*	
WOODLEY			*1.12*	6.7			10.8
	55	0.74			1.03		
curve 337+00 to 345+00							
	55	0.23			0.46	*1.82*	
BALBOA			*0.97*	7.7			12.6
	70	1.17			1.35		
gradual curves							
	70	1.14			1.24	*2.93*	
RESEDA/SHERMAN			*2.31*	10.0			15.5
	55	1.00			1.52	*1.86*	
TAMPA/SHERMAN			*1.00*	11.0			17.4
	55	1.00			1.52	*1.86*	
WINNETKA/SHERMAN			*1.00*	12.0			19.2
	55	1.00			1.52	*1.86*	
DESOTO/SHERMAN			*1.00*	13.0			21.1
	55	1.12			1.46		
curves to/from Canoga							
	40	0.32			0.63	*2.43*	
WARNER CENTER (Owensmouth)			*1.44*	14.4			23.5
	55	0.76			1.26	*1.59*	
OXNARD ST.			*0.76*	15.2			25.1
	55	0.72			1.01		
curve 50+00 to 70+00							
	70	0.89			1.07	*2.41*	
FALLBROOK			*1.61*	16.8			27.5
	55	0.81			1.32	*1.65*	
VALLEY CIRCLE			*0.81*	17.6			29.2

Avg. Sta. Spacing: 1.4 *Avg. speed 36.2 mph*

NOTES:
1. Distances Woodman to Warner Ctr.. based on alignments drawn by Gannett Fleming 6/1/89.
   Distances west of Warner Center from 7/94 extension drawings; Sherman Way from 1/96 marked-up maps.
   Horizontal curves shown where design speed is less than 60 mph.
2. Travel times estimated with run time model developed by MPA, based on 2/92 performance data.
3. Speed codes of 9, 25, 40, 45, 55 and 70 mph were assumed.

ESTIMATION OF RUNNING TIME — ***MODEL RUN #7***

SAN FERNANDO VALLEY OPTION:

BUSWAY from NORTH HOLLYWOOD to WARNER CENTER via SP ROW

STATION / LINE SECTION	MAX. SPEED	DISTANCE (MILES) segment	DISTANCE (MILES) station	CUMUL. DIST. (MILES)	RUNNING TIME (MIN.)	DELAY TIME (MIN.)	STA-STA TIME INCL DWELL	ELAPSED RUN TIME (MIN.)
NORTH HOLLYWOOD				0.0				0.0
	55	1.20			1.86	0.17	2.53	
LAUREL CANYON			1.20	1.2				2.5
	50	1.00			1.66	0.17	2.32	
COLDWATER CANYON			1.00	2.2				4.9
	45	0.55			1.11	0.17	1.78	
FULTON/BURBANK			0.55	2.8				6.6
	45	0.70			1.31	0.17	1.98	
WOODMAN			0.70	3.5				8.6
	55	1.03			1.68	0.17	2.34	
VAN NUYS			1.03	4.5				10.9
	55	1.12			1.77	0.17	2.44	
SEPULVEDA			1.12	5.6				13.4
	50	0.74			1.20			
curves 405+00 to 444+00				6.3				
	50	0.38			0.59	0.17	2.46	
WOODLEY			1.12	6.7				15.9
	50	0.73			1.20			
curve 337+00 to 345+00				7.4				
	50	0.19			0.37	0.17	2.24	
BALBOA			0.93	7.6				18.1
	55	0.98			1.47			
curves 280+00 to 317+00				8.6				
	55	0.19			0.36	0.17	2.50	
WHITE OAK			1.17	8.8				20.6
	55	1.06			1.71	0.17	2.38	
RESEDA			1.06	9.9				23.0
	55	1.08			1.73	0.17	2.40	
TAMPA			1.08	11.0				25.4
	50	1.02			1.68	0.17	2.35	
WINNETKA			1.02	12.0				27.7
	50	1.00			1.66	0.17	2.32	
DESOTO			1.00	13.0				30.0
	45	0.40			0.79			
transition to on-street operation				13.4				
	25	0.40			0.98	0.17	2.44	
WARNER CENTER (Owensmouth)			0.80	13.8				32.5

Avg. Sta. Spacin 1.0

Avg. speed: 25.5 *mph*

ASSUMPTIONS:

	seconds	minutes
Average station dwell time	30	0.50
Average intersection delay (no station)	*assume pre-emption*	
Added intersection delay at station	*10*	0.17

Revised
17-Jan-96

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ESTIMATION OF RUNNING TIME

MODEL RUN #9

SAN FERNANDO VALLEY OPTION:
LIGHT RAIL from NORTH HOLLYWOOD to VALLEY CIRCLE
VIA BURBANK/CHANDLER, SP ROW

STATION / LINE SECTION	MAX. SPEED	DISTANCE (MILES) segment	DISTANCE (MILES) station	CUMUL. DIST. (MILES)	RUNNING TIME (MIN.)	STA-STA TIME INCL DWELL	ELAPSED RUN TIME (MIN.)
NORTH HOLLYWOOD				0.0			0.0
	55	1.2			1.90	2.23	
LAUREL CANYON			1.2	1.2			2.2
	65	1.5			2.16	2.50	
FULTON/BURBANK			1.5	2.7			4.7
	55	0.89			1.33		
curve 545+00 to 561+00							
	65	0.80			1.04	2.70	
VAN NUYS			1.69	4.4			7.4
	55	1.12			1.78	2.12	
SEPULVEDA			1.12	5.5			9.5
	55	0.74			1.16		
curves 405+00 to 444+00							
	55	0.38			0.63	2.32	
WOODLEY			1.12	6.7			11.9
	55	0.73			1.15		
curve 337+00 to 345+00							
	55	0.19			0.41	1.90	
BALBOA			0.93	7.6			13.8
	55	0.98			1.43		
curves 280+00 to 317+00							
	55	0.19			0.41	2.18	
WHITE OAK			1.17	8.8			15.9
	55	1.06			1.72	2.05	
RESEDA			1.06	9.8			18.0
	55	1.08			1.74	2.07	
TAMPA			1.08	10.9			20.1
	55	1.02			1.67	2.01	
WINNETKA			1.02	11.9			22.1
	65	1.80			2.44	2.77	
WARNER CENTER (Owensmouth)			1.80	13.7			24.8
	45	0.76			1.42	1.75	
OXNARD ST.			0.76	14.5			26.6
	55	0.72			1.13		
curve 50+00 to 70+00							
	65	0.89			1.13	2.60	
FALLBROOK			1.61	16.1			29.2
	55	0.81			1.44	1.77	
VALLEY CIRCLE			0.81	16.9			31.0

Avg. Sta. Spacing: 1.2

Avg. speed 32.8 mph

NOTES:
1. Distances Woodman to Warner Ctr.. based on alignments drawn by Gannett Fleming 6/1/89. Distances west of Warner Center from 7/94 extension drawings.
2. Full pre-emption assumed for LRV's at all at-grade street crossings, except partial pre-emption at Woodley.
3. Travel times estimated with run time model developed by MPA, based on 1992 LB/LA data.
4. Top speed of 65 mph assumed with new LA Car.

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23-Jan-96

ESTIMATION OF RUNNING TIME ***MODEL RUN #10-B***

SAN FERNANDO VALLEY OPTION:

ART from NORTH HOLLYWOOD to CHATSWORTH

VIA BURBANK/CHANDLER, SP ROW

STATION / LINE SECTION	MAX. SPEED	DISTANCE (MILES) segment	DISTANCE (MILES) sta.-sta.	CUMUL. DIST. (MILES)	RUNNING TIME (MIN.)	*STA-STA TIME INCL DWELL & DELAY*	ELAPSED RUN TIME (MIN.)
NORTH HOLLYWOOD				0.0			0.0
	62	1.2			1.91	*2.44*	
LAUREL CANYON			*1.2*	1.2			2.4
Coldwater Canyon signal	62	1.5			2.81	*3.55*	
FULTON/BURBANK			*1.5*	2.7			6.0
	55	0.89			1.34		
curve 545+00 to 561+00							
	62	0.80			1.09	*2.97*	
VAN NUYS			*1.69*	4.4			9.0
	62	1.12			1.80	*2.34*	
SEPULVEDA			*1.12*	5.5			11.3
	55	0.74			1.17		
curves 405+00 to 444+00							
Woodley signal	62	1.12			2.02		
curve 337+00 to 345+00							
	45	0.19			0.47	*4.19*	
BALBOA			2.05	7.6			15.5
	55	0.98			1.44		
curves 280+00 to 317+00							
White Oak signal	62	1.25			2.15	*4.13*	
RESEDA			2.23	9.8			19.6
Tampa signal	62	2.10			3.41	*3.94*	
WINNETKA			2.10	11.9			23.5
DeSoto signal	62	*1.4*			2.69	*3.22*	
WARNER CENTER (Canoga/Victory))			*1.40*	13.3			26.8
^ curves close to station ^	62	*2.0*			3.90	*4.43*	
VanOwen & Sherman signals							
ROSCOE BLVD.			*2.00*	15.3			31.2
Nordhoff signal	62	*2.5*			3.81	*4.14*	
CHATSWORTH (MetroLink)			*2.50*	17.8			35.3

Avg. Sta. Spacing: *1.8*   *Avg. speed* *30.3 mph*

NOTES:

1. Distances Woodman to Warner Ctr.. based on alignments drawn by Gannett Fleming 6/1/89. Distances north of Warner Center scaled by MPA.
2. **Pre-emption assumed for ART vehicles at some at-grade street crossings:**
   NO pre-emption at crossings of major arterials:
   Coldwater Canyon, Woodley, White Oak, Tampa, DeSoto, VanOwen, Sherman, & Nordhoff.
   Full pre-emption at crossings of minor arterials between stations
   No pre-emption at signals located at stations. Avg. delay = 12 sec.
3. Run times estimated with model developed by MPA, based on Siemens data for Regio Sprinter DMU.
4. Top speed of 100 km/hr (62 mph).
5. Dwell time = 20 seconds.

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09-Feb-96