DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

DRAFT
ENVIRONMENTAL IMPACT STATEMENT
AND
ENVIRONMENTAL IMPACT REPORT

LOS ANGELES RAIL RAPID TRANSIT PROJECT
LOS ANGELES, CALIFORNIA

MAY 26 1983

Date

for Robert W. Stout
Charles H. Graves
Urban Mass Transportation Administration

John A. Dyer

MAY 27 1983

Date

John A. Dyer
Southern California Rapid Transit District

U.S. DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

DRAFT ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT

Pursuant to Section 102(2)(c), of the National Environmental Policy Act of 1969; California Environmental Quality Act, State Public Resources Code, Division 13, Section 21000 et. seq.; Sections 3(d) and 14 of the Urban Mass Transportation Act of 1964, as amended; Section 106 of the National Historic Preservation Act of 1966; and Section 4(f) of the Department of Transportation Act of 1966.

RESPONSIBLE AGENCIES

Lead Agency: Urban Mass Transportation Administration
Cooperating Agency: Southern California Rapid Transit District

TITLE OF PROPOSED ACTION

Los Angeles Rail Rapid Transit Project ("Metro Rail Project")

ABSTRACT

The proposed rail rapid transit project is an 18.6 mile subway including 16 to 18 stations. Known locally as the Metro Rail Project, it would run from Union Station through downtown, west along the Wilshire Corridor, and then north through the Fairfax community and West Hollywood. The line would proceed eastward to serve Hollywood and continue through the Cahuenga Pass to the San Fernando Valley, where station locations are proposed at Universal City and North Hollywood. A No Project Alternative, an 8.8 mile "Minimum Operable Segment," and the proposed subway with a 2.6 mile aerial segment in the San Fernando Valley have also been defined and evaluated. The project traverses the Los Angeles Regional Core, the densest area of the Southern California metropolitan region. The project would provide much needed transit capacity and substantially reduce travel times through and within the Regional Core. The primary impact areas identified in this Draft EIS/EIR include transportation, land use, socio-economic, and historic resource preservation. Other impact areas include air quality, noise and vibration, energy, and construction activity impacts.

SEND COMMENTS ON THE DRAFT EIS/EIR TO:

Charles H. Graves, Director
Office of Planning Assistance
Urban Mass Transportation Administration
Washington, D.C. 20590

FOR FURTHER INFORMATION ON THE DRAFT EIS/EIR CONTACT:

Nadeem Tahir, Planning Manager
Metro Rail Project
Southern California Rapid Transit District
425 South Main Street
Los Angeles, California 90013
Telephone: (213) 972-6439

Comments must be received by: **July 25, 1983**

Public hearings will be held on the Draft EIS/EIR on **July 18–21, 1983** . Times and places of these public hearings will be announced in local newspapers in the Los Angeles area.

SUMMARY

PROJECT PURPOSE

The proposed project, known locally as the Metro Rail Project, is an 18.6 mile rail rapid transit line designed and located to serve the core of the Southern California region. The urbanized area of this region is the second most densely populated in the country, behind only the urbanized area of New York. By the year 2000, the most intensely developed section, known as the Regional Core, will house approximately one million persons, an increase of nearly 25 percent from 1980. The implications of this level of development for travel are significant. Already congested roadways will have to accommodate a projected travel demand increase in the Regional Core of 25 percent by the year 2000, while bus service, already strained to capacity along certain corridors, is not expected to improve significantly. Thus, a continued reliance on current modes of transportation would diminish the mobility of Regional Core residents and employees.

To foster the goals of improving mobility and achieving efficient land use and urban form in the Regional Core, the Southern California Rapid Transit District (SCRTD) is designing a rail rapid transit system. The system extends from the high-rises of the Los Angeles Central Business District (CBD) west along the intensely-developed Wilshire Corridor, and through Hollywood and the Cahuenga Pass to the San Fernando Valley. The rail project would help achieve regional and local goals relating to air quality, energy conservation, transportation, and land use.

This document is the Second Tier Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the SCRTD Metro Rail Project. It is called a Second Tier document because it follows extensive environmental analysis already performed by SCRTD. The earlier work, known as the Alternatives Analysis/Final EIS, identified a Preferred Alternative from among 11 alternatives that included various combinations of bus and rail projects and a "do nothing" alternative. The Alternatives Analysis/Final EIS, completed in April 1980, provided the justification and foundation for more detailed engineering and design of the preferred rail rapid transit alternative.

DESCRIPTION OF ALTERNATIVES

Several alternatives have been formulated to offer some improvement to travel conditions in the Regional Core. These alternatives include a Locally Preferred Alternative, a Locally Preferred Alternative with an Aerial Option, and a Minimum Operable Segment. The latter two alternatives have been developed with cost reductions as a major consideration. To describe the situation in the year 2000 if no major transit improvements are made, a No Project Alternative has also been examined. The following discussion identifies the alternatives' routes, alignments, station locations, and operating characteristics.

LOCALLY PREFERRED ALTERNATIVE

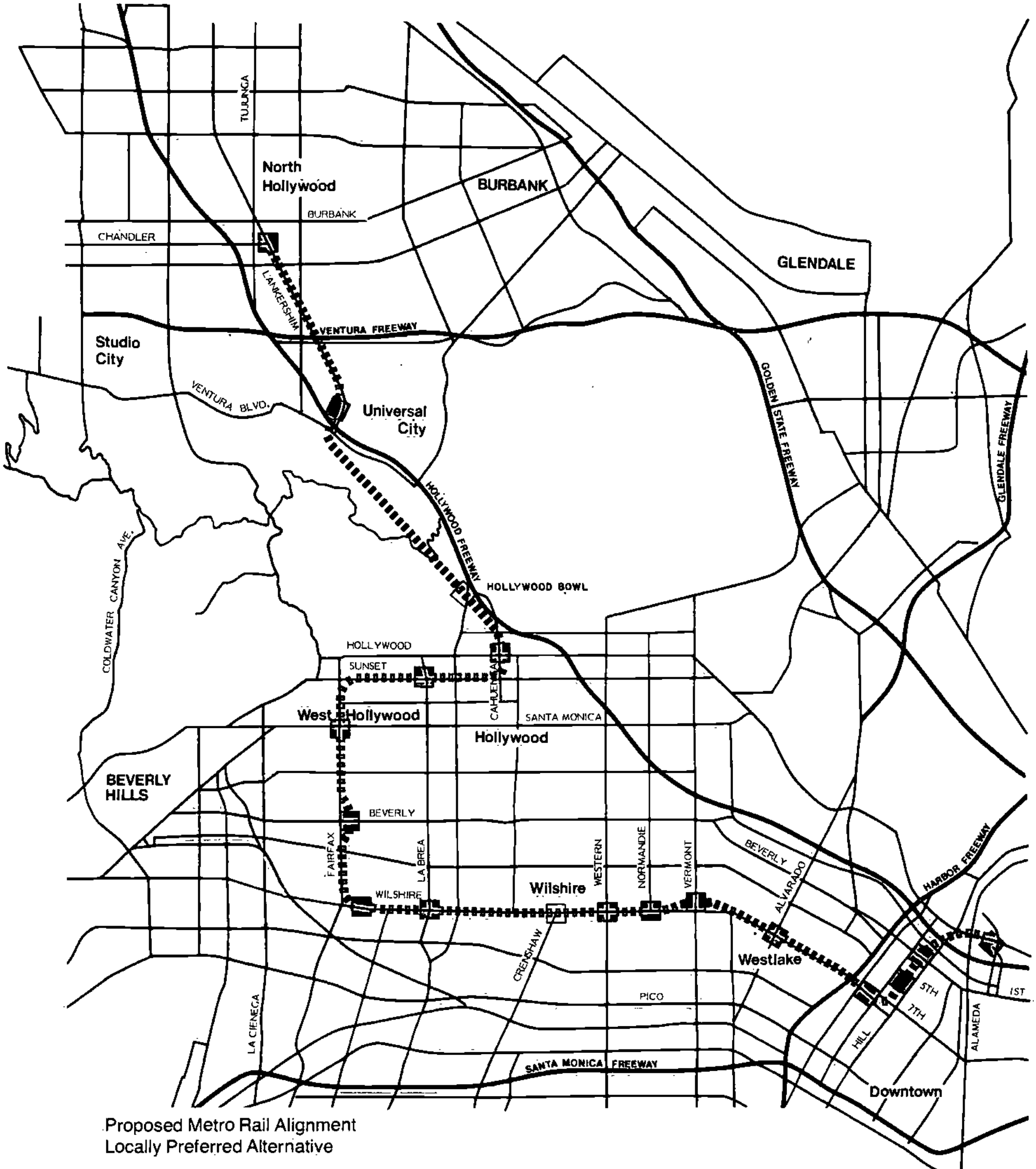
This alternative represents a refinement of the Locally Preferred Alternative adopted during the Alternatives Analysis. It evolved as a result of further engineering and environmental analysis and extensive community meetings. The proposed route, all in subway and including 16 stations plus two optional stations, is shown in Figure S-1. It begins at Union Station, where it turns southwest and runs through the CBD with stations at First and at Fifth Streets along Hill Street. The route turns west under Seventh Street, with a station at Flower Street. The route then passes the Harbor Freeway, and parallels Wilshire Boulevard to a station at Alvarado Avenue between Wilshire Boulevard and Seventh Street. Proceeding along Wilshire Boulevard, the route serves the Mid-Wilshire and Miracle Mile districts with stations at Vermont (half a block north of the intersection with Wilshire), Normandie, Western, La Brea, and Fairfax Avenues. An optional station is under consideration at Crenshaw Avenue along Wilshire Boulevard.

Turning north under Fairfax Avenue, the route serves the Fairfax and West Hollywood communities with stations at Beverly and Santa Monica Boulevards. The alignment turns east under Sunset Boulevard for approximately two miles, north again at Cahuenga Boulevard, and then northwesterly underneath the Hollywood Freeway. Hollywood is served by a station at Sunset Boulevard and La Brea Avenue and one at Cahuenga and Hollywood Boulevards; an optional station is being considered at the Hollywood Bowl at Odin and Highland Avenues. The tunnels of the subway system pass deep under the Santa Monica Mountains just west of the Cahuenga Pass, jog northeast to a station across Lankershim Boulevard from Universal Studios, and continue under Lankershim Boulevard to a North Hollywood terminal station.

The line is serviced by the main storage yard and maintenance facility at ground level along the west bank of the Los Angeles River just south of Union Station. The north end of the line will be extended 500 feet in subway for operating storage so that the system can start in the morning from both ends. Primary access to the rail line will be by a bus network that will be revised to offer more convenient bus-rail connections. Peak service requirements would be 1,845 buses. Bus terminals will be provided at eight stations, and on-street bus turnouts at 10 stations. Provisions for auto access include park and ride facilities at seven stations, and passenger drop-off (kiss and ride) areas at seven stations. The park and ride facilities are planned to be surface lots initially, with parking structures constructed at these same locations when alternative funding sources are identified.

LOCALLY PREFERRED ALTERNATIVE WITH AERIAL OPTION

Although subways minimize environmental impacts and avoid business and pedestrian disruption in dense urban areas, the costs of subways are high. Outside the densest areas, above ground or surface construction would result in cost savings. The Aerial Option, developed with cost savings as a key consideration, includes the line segments that have the lowest capital and operating costs and generate the highest patronage. This alternative follows the same route as the Locally Preferred Alternative and has the same station stops from Union Station through Hollywood. In North Hollywood, however, the alignment would be above ground. The trains, operating on an elevated structure, would emerge from the north slope of the Santa



Proposed Metro Rail Alignment
Locally Preferred Alternative

Proposed Metro Rail Station

Optional Metro Rail Station

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

0 1 2 3 miles

Figure S-1
Proposed Metro Rail Project and Station Locations

SEDWAY/COOKE
Urban and Environmental Planners and Designers

Monica Mountains and proceed to an aerial station at Universal City. Leaving Universal City, the trains would travel on the elevated structure to the terminal station at Lankershim and Chandler Boulevards. The complementary bus network and parking facilities are the same as for the Locally Preferred Alternative.

MINIMUM OPERABLE SEGMENT

Where federally assisted rail lines are planned, federal policy requires that the system be built in stages. This incremental approach to constructing urban rail transit is aimed at ensuring that high priority corridors receive attention and that appropriate balance is maintained between the transportation requirements of the entire region and those of local communities within the region, and between long range and short range needs for transportation improvements. Accordingly, a Minimum Operable Segment has been defined. This alternative is identical to the Locally Preferred Alternative from the main yard in the CBD to the Fairfax/Beverly Station. Over the 8.8-mile route, the system would stop at 11 stations, plus an optional one at Wilshire/Crenshaw. It would have a supporting bus network of 1,866 peak hour buses. Five stations would have bus terminals and eight would have on-street bus turnouts. Park and ride facilities would be provided at three stations, and a passenger drop-off area at four.

NO PROJECT ALTERNATIVE

Without a rail rapid transit system, travel in the Regional Core would continue to be served by the existing street network and bus system. Peak hour traffic demand volumes on freeways in the vicinity of the Regional Core will substantially exceed capacity over nearly all segments. The arterial street system, which currently handles the majority of travel in the Regional Core, is expected to carry an even greater share of the traffic in the year 2000. The bus system will be expanded by about five percent, and will include the present-day bus service plus the remaining projects contained in the Sector Improvement Plan. This plan is SCRTD's adopted program for bus service improvements and contains projects such as:

- Creating a simpler grid system from the bus lines that evolved from the first streetcar systems established in Los Angeles.
- For that grid system, establishing continuous bus line on major streets such as Sunset Boulevard, Santa Monica Boulevard, and Third Street.
- Adding bus service on north-south "crosstown" streets, previously unserved.
- Revising the system of bus line numbers.

KEY SYSTEM CHARACTERISTICS

RAIL PROJECT ALTERNATIVES

The proposed rail line will use proven two-track, steel wheel, and steel rail components. The vehicles, approximately 75 feet long and 10 feet wide, are designed to comfortably accommodate 170 passengers, but they can hold 231 passengers during heavy peak periods. Six vehicles will be linked to form a train. Each train would have an approximate passenger capacity between 1,000 and 1,400.

Average daily rail transit ridership in the year 2000 is forecast to be 376,000 boardings with the Locally Preferred Alternative (aerial or subway) and 295,000 with the Minimum Operable Segment. A ride from North Hollywood to Union Station on the full-length rail project will take slightly more than 30 minutes, including station stops. Additional data on the rail alternatives are shown in Table S-1.

All but a few portions of the subway will be tunneled, involving little or no surface disruption. Station structures (and, in some locations, adjacent crossovers, pocket tracks, vent shafts, or ancillary structures) will need to be constructed by cut and cover methods involving excavation. A temporary decking will be erected in place of the street's pavement, and excavation will be phased so that streets will generally remain open to traffic throughout construction. Excavation and station construction will then continue underneath this decking while limited street service is resumed above. Regular service can be provided on cross streets, while streets under which the subway runs will have limited service. The excavation will then be backfilled and the street surface replaced after the station structure has been completed.

For all Project alternatives storage, maintenance, and repair will be performed at a main yard and shop on a site east of the CBD, between the Santa Fe Railway and Santa Fe Avenue. Rail tracks will be provided at the other end of the system for operating storage only.

Estimated cost of construction for the Locally Preferred Alternative would be $2.35 billion (in constant 1983 dollars). The costs for the Locally Preferred Alternative with the Aerial Option would be $2.29 billion and for the Minimum Operable Segment, $1.55 billion. Of these totals, up to 75 percent may be federally funded. The balance would be locally funded, primarily using state Proposition 5, SB 620, and county Proposition A funds.

NO PROJECT ALTERNATIVE

Congestion in the Regional Core will increase substantially as total vehicle miles traveled in the Regional Core are projected to grow from 14.2 to 17.8 million daily by the year 2000, an increase of 25 percent over existing conditions. Twice as many of the Regional Core's intersections will have deteriorated to unsatisfactory levels of service compared to 1980. The current peak hour service requirement of 1,860 buses would be expanded by about 103 buses only, due to financial limitations. Estimated capital costs for the slight expansion in the bus fleet total $323.9 million. As a result, capacity on the bus system would increase marginally to 1.4 million daily boardings (less than five percent) by the year 2000. These additional buses would not likely improve the level of transportation service in the Regional Core since they will also have to travel on the extremely congested street system.

TABLE 5-1

COMPARISON OF PROJECT ALTERNATIVES

System Characteristics	No Project Alternative	Locally Preferred Alternative	Locally Preferred Alternative with Aerial Option	Minimum Operable Segment
RAIL				
System Length	N.A.	18.6 miles	18.6 miles	8.8 miles
Alignment	N.A.	all underground	86% underground 14% aerial	all underground
Number of Stations	N.A.	16, plus 2 optional	16, plus 2 optional	11, plus 1 optional
Daily Boardings[1]	N.A.	376,000	376,000	295,000
Daily Passenger Miles	N.A.	1,419,000	1,419,000	814,000
Round Trip Train Time (in minutes)	N.A.	70	70	43
Total Capital Costs (in 1983 dollars)	N.A.	$2,352,000,000	$2,288,000,000	$1,549,000,000
Total Capital Costs Escalated at 7% to 1987 midpoint of construction[2]	N.A.	$3,108,000,000	$3,054,000,000	$1,966,000,000
Annual Operating and Maintenance Costs (in 1983 dollars)	N.A.	$45,500,000	$45,500,000	$30,600,000
BUS				
Buses Required for Peak Hour Service	1,963	1,845	1,845	1,866
Daily Boardings	1,434,000	1,970,000	1,970,000	1,935,000
Daily Passenger Miles	5,451,000	6,876,000	6,876,000	7,161,000
Total Capital Costs[3] (in 1983 dollars)	$323,900,000	$304,400,000	$304,400,400	$308,000,000
Annual Operating and Maintenance Costs (in 1983 dollars)	$403,400,000	$388,300,000	$388,300,000	$386,600,000
TOTAL				
Daily Transit Boardings	1,434,000	2,346,000	2,346,000	2,230,000
Daily Passenger Miles	5,451,000	8,294,000	8,294,000	7,975,000

Source: SCRTD Planning and Metro Rail Departments.

N/A - Not applicable.

[1]Patronage estimates for bus and rail are contained in Milestone 9 Report: Supporting Services Plan (SCRTD, 1983). See Chapter 2, section 3.9.3, for a discussion of the cost effectiveness of the alternatives and the sensitivity to patronage estimates.

[2]See Chapter 2, Section 2.2.6, for the impact of a delay in construction schedule on the total capital costs.

[3]These costs only reflect the initial investment for one fleet of buses (for service plus 10 percent spares) with a projected economic life of about 12 years. Two replacement fleets would be required over the Metro Rail Project life. The bus fleet costs are shown for information and analysis only.

EVALUATION OF ALTERNATIVES

Total transit ridership (rail and bus) under the rail alternatives would greatly increase relative to the No Project Alternative (64 percent under the Locally Preferred Alternative and Aerial Option; 56 percent under the Minimum Operable Segment). Under the Locally Preferred Alternative and Aerial Option, 376,000 passengers would board Metro Rail daily (116.7 million annually). Under the Minimum Operable Segment, 295,000 million daily boardings (91.5 million annually) are projected. As a result, under the Locally Preferred Alternative and the Aerial Option, 1.73 million auto vehicle miles traveled per day would be diverted to transit. Some of this diversion would be to the improved bus network which results from the reallocation of buses made possible by the rail project. Under the Minimum Operable Segment, 1.69 million auto vehicle miles traveled per day would be diverted. These changes in travel patterns and mode choice have relatively direct, long term impacts upon land use efficiency transportation system viability, and the economic and fiscal attributes of the Regional Core. To a lesser extent, energy efficiency and air pollution abatement would also be affected by changes in travel patterns and mode choice. For the Project alternatives, these impacts are all, on balance, positive in comparison with the No Project Alternative.

Among Project alternatives, the Aerial Option represents a $64.4 million savings in capital costs relative to the Locally Preferred Alternative, but it results in considerably greater residential displacement, noise impacts, and visual disruption of the communities in the San Fernando Valley. The Minimum Operable Segment costs only two-thirds as much to construct as the Locally Preferred Alternative, but it does not provide the stimulus for economic revitalization in Hollywood and North Hollywood, nor the much needed additional transportation capacity through the Cahuenga Pass. The Project alternatives also have short term construction impacts, some of which are significant or potentially significant. Some, such as construction employment and its related effects, are substantial positive impacts. Others, such as station area excavation, are adverse, and depending upon the success and speed of decking techniques used, could be significant. The No Project Alternative would cause none of these effects. These effects are summarized below.

LOCALLY PREFERRED ALTERNATIVE

Long term beneficial effects compared to the No Project Alternative are summarized below.

- The rail system will attract 376,000 daily boardings. Along with the supporting bus network, this would result in a substantial increase in transit travel and a rise in transit's share of total trips from 2.5 percent to 3.27 percent.
- The land use and environmental policies of local and regional plans would be supported.
- A reduction of 1,730,000 automobile vehicle miles traveled (VMT) per day is projected.

- An estimated 3,036 billion BTUs per year in transportation energy demand can be saved. This demand includes both construction and operation energy over the life of this project. However, when compared to total energy use in the region, this saving is relatively minor.

- Traffic conditions are projected to improve at over half of the Regional Core's key street intersections.

- An additional 26.7 million square feet of commercial development could be accommodated in the Regional Core.

- An additional $8.1 million in property tax revenues and $.5 million in sales tax revenues will accrue to local taxing jurisdictions in the year 2000 as a result of new development in conjunction with this alternative. These figures do not take into account the loss of property tax revenues from parcels acquired by SCRTD for the project. However, estimates of this loss are negligible (less than 5 percent) relative to increases in property tax revenues from the new development. With development incentives to encourage joint development on SCRTD property around stations, property tax revenues could increase to $14.1 million and sales tax revenues to $1.2 million.

- Employment in Metro Rail station areas could increase 27 percent by the year 2000.

- The project could support the housing supply increase in the Regional Core called for by SCAG, the county, and the city in their land use plans.

- A reduction of almost 22.5 tons a day in the Los Angeles region of vehicular emissions of carbon monoxide and lesser reductions in reactive hydrocarbons, oxides of nitrogen, sulfur dioxide, and suspended particulates would be realized. While this is a positive benefit of the project, these reductions only represent minor improvements in overall regional air quality.

- Mobility in the Regional Core community, availability of commercial services, and accessibility to both commercial and public facilities would be improved.

- Total transit operating costs per passenger would decrease from 91 cents to 60 cents and revenues per passenger would decrease from 60 cents to 46 cents, resulting in a reduced net operating subsidy of 14 cents per passenger.

Long term potential adverse effects are summarized below.

- An estimated 224 residential units, 222 businesses, and nine nonprofit organizations would be displaced as a result of Metro Rail construction.

- Additional traffic is projected on local collector streets near Metro Rail stations. Metro Rail patrons looking for parking may intrude into adjacent residential areas or use parking normally available to customers or employees immediately adjacent to stations.

- Intensification of land uses around particular station locations could adversely affect established residential and commercial patterns.

- Land speculation would occur in some CBD station areas, as well as the Wilshire/Fairfax area, where there is limited supply of land relative to demand.

- Reinvestment in commercial and residential improvements will escalate rents around station sites at a more rapid rate than would otherwise occur. This, in turn, could result in some lower income renters and some marginal business operations having to relocate further away from the station site.

- Up to eight sites might experience ground-borne noise impacts unless special mitigation measures can be implemented.

- At the local level, carbon monoxide concentrations are expected to increase, particularly at station locations where parking structures are proposed.

- One property on the National Register of Historic Places (Union Station) and three properties eligible for inclusion (Title Guarantee Building, Pershing Square Building, and Hancock Park/La Brea Tar Pits) will be adversely affected.

- Known archaeological resources at Union Station may be encountered during construction of the crossover tracks north of the Metro Rail station.

- Initial studies by SCRTD indicate the Wilshire/Fairfax Station is sited in an area of extremely high paleontological sensitivity, the La Brea Tar Pits. Alternative station locations and other mitigation measures are being studied.

- The rail project would require the use of parklands, as defined by Section 4(f) of the Department of Transportation Act of 1966, at the Court of Flags, Pershing Square, Hancock Park, and Hollywood Bowl. Also, construction of station facilities at Universal City, while not using Campo de Cahuenga parklands, may adversely affect the site.

Short term construction impacts are summarized below.

- Between 3,000 and 5,000 jobs would be generated per year during the construction period.

- Approximately 6,000 feet of commercial frontage, will be disrupted by cut and cover construction activity. Substantial disruption, prior to the installation of the street decking and during its removal, will occur over a period of months. Commercial establishments fronting on streets under which the subway runs will also experience disruptions to parking and deliveries during construction.

- Dust, noise, and vibration impacts will occur adjacent to cut and cover construction sites, such as stations, and ancillary facilities. These impacts will also occur along routes used for muck removal. Temporary increases in air pollution from construction equipment are also expected.

- Station environs may be affected by parking related to construction activity where off-street equipment yards are not established.

- Construction will generate about 6.55 million cubic yards of excavated tunnel and station materials, a portion of which will need to be retrieved for backfilling after the completion of line and station construction.

- Increased traffic congestion in the vicinity of station construction sites is expected.

LOCALLY PREFERRED ALTERNATIVE WITH AERIAL OPTION

Long term beneficial effects compared to the No Project Alternative are approximately the same as those of the Locally Preferred Alternative. The differences include 62 million Btus in additional annual energy savings, $64.4 million savings in capital costs, and six fewer businesses and two fewer nonprofit organizations displaced.

Long term potential adverse effects are similar to those of the Locally Preferred Alternative. Additional impacts of the Aerial Option are summarized below.

- An additional 16 dwelling units would be displaced.

- Noise levels would exceed adopted criteria at an additional 30 single family homes and 10 apartment buildings.

- The elevated structure would adversely affect the visual setting around Universal City and North Hollywood and could change the area's character.

Short term construction impacts are similar to those of the Locally Preferred Alternative; differences are identified below.

- Construction of the entire aerial segment, more than 2-1/2 miles long, would disrupt commercial properties along Lankershim Boulevard.

- Construction will generate approximately 20 percent less excavated tunnel and station materials.

- Traffic will be disrupted along the entire aerial corridor rather than at just the station locations.

MINIMUM OPERABLE SEGMENT

Long term beneficial effects compared to the No Project Alternative are summarized below.

- The rail system will carry 295,000 daily boardings. This ridership, along with that of the supporting bus system would increase total transit travel 36 percent, resulting in an increase in transit's share of total trips from 2.5 percent to 3.25 percent.

- A reduction of 1,690,000 automobile vehicle miles traveled per day would be realized.

- An estimated annual savings of 3,555 billion BTUs per year in regional transportation energy demand can be achieved. This includes the construction and operating energy required by the project. While representing a larger savings than realized by the Locally Preferred Alternative, it still is only a nominal reduction in regional transportation energy use.

- An additional 19.0 million square feet of commercial development could be accommodated in the Regional Core by the year 2000.

- Development in conjunction with this alternative could result in increases of $6.6 million in property tax revenues and $.4 million in sales tax revenues for local taxing jurisdictions. These figures do not account for the loss of tax revenues that results when SCRTD acquires land for the project. However, the estimated losses are negligible compared to the increased revenues from the new development. With development incentives to encourage joint development on SCRTD property around stations, property tax revenues could increase to $12.6 million and sales tax revenues to $.8 million in the year 2000.

- Employment in Metro Rail station areas could increase 22 percent.

- The planned increase in housing supply in the Regional Core that is desired by SCAG, the county, and the city would be better accommodated.

- A reduction of 22 tons a day in the Los Angeles region of vehicular emissions of carbon monoxide and lesser reductions in reactive hydrocarbons, oxides of nitrogen, and suspended particulates would be realized. On a regional basis, these reductions only offer modest benefits in air quality.

- Mobility in the CBD and along the Wilshire Corridor will be improved, as would accessibility to commercial and public facilities in these areas.

- Total transit operating costs per passenger would decrease to 60 cents, and revenues per passenger would decrease to 43 cents, resulting in a reduced net operating subsidy of 17 cents per passenger.

Long term potential adverse effects are summarized below.

- An estimated 51 dwelling units, 136 commercial establishments, and five nonprofit organizations would be displaced.

- Some land speculation will occur in the CBD and in the Wilshire/Fairfax area.

- Two theaters would occasionally experience ground-borne noise levels above the noise criteria for such uses, unless special mitigation measures can be implemented.

- Carbon monoxide levels are projected to increase at sites where traffic congestion is expected to worsen, particularly around stations with proposed parking structures.

- The same historic properties adversely affected by the Locally Preferred Alternative would be affected by the Minimum Operable Segment. Similarly, there exists a high potential for encountering archaeological resources at Union Station and paleontological resources at Wilshire/Fairfax. Use of the same parklands as identified for the Locally Preferred Alternative would occur, except at Hollywood Bowl and Campo de Cahuenga, which would not be affected.

Short term impacts are summarized below.

- Approximately 5,000 feet of commercial frontage will be disrupted by cut and cover construction.
- Dust, noise, and vibration impacts are similar to the Locally Preferred Alternative along this alternative's alignment.
- Traffic will be congested, and pedestrians and motorists will be inconvenienced around station construction sites.
- Disposal of materials excavated during tunnel and station construction will cause adverse noise and traffic impacts.

NO PROJECT ALTERNATIVE

Long term beneficial effects are summarized below.

- No direct displacement of businesses or dwellings in station areas would occur.
- Historic or potentially historic properties would not be adversely affected.
- Stable residential areas would not be threatened by the growth accommodated by Metro Rail.

Long term adverse effects are summarized below.

- The Regional Core would experience increased auto use, decreased arterial street efficiency, and increased travel times.
- Transit service would be severely compromised as buses are limited to street speeds.
- Transit's share of total trips would decrease from its 1980 share of 3.03 percent to 2.50 percent by the year 2000.
- Operating energy per person mile traveled and per vehicle mile traveled in the Regional Core would increase, with likely increases also in energy consumption per capita and per dollar of gross regional product.
- Operating costs per transit passenger mile traveled in the Regional Core would be approximately 50 percent higher by the year 2000 as compared with the Locally Preferred Alternative.
- A development potential of about 26.7 million square feet of commercial space that could be accommodated in the Regional Core with a rail rapid transit system would be lost to other areas.
- Commercial housing investment commensurate with the needs of the Regional Core's current population and its over-aged stock of available housing would not likely occur.

- Opportunities to increase Regional Core employment would be foregone as new investment locates in areas with greater accessibility.
- An additional 22 tons of carbon monoxide, 1.8 tons of reactive hydrocarbons, 2.9 tons of oxides of nitrogen, .5 tons of sulfur dioxide, and .7 tons of suspended particulates would be generated daily in the Los Angeles region over what would occur with the Locally Preferred Alternative in the year 2000.
- Adopted land use policies and plans for the city and for the region would not be supported.

The No Project Alternative would not result in any short term adverse or beneficial impacts.

AREAS OF CONTROVERSY

- The appropriateness of a Metro Rail station at Crenshaw Avenue continues to be debated by the community. Because the City of Los Angeles has yet to make recommendations on the Wilshire/Crenshaw Station, it has been treated as an optional station only. After the City acts, the SCRTD Board of Directors will decide whether to include the station. An optional station at the Hollywood Bowl has not appeared to be justified, given its low utilization and high projected cost, but it has attracted community support nonetheless. This station has been recently adopted by the SCRTD Board of Directors.
- The Aerial Option is controversial among many San Fernando Valley residents, because of the visual intrusion and greater noise impacts. It, however, would provide a level of service equal to the Locally Preferred Alternative, while saving approximately $64.4 million from the Locally Preferred Alternative's $2.35 billion capital costs.
- The Minimum Operable Segment would be controversial to both Hollywood and North Hollywood communities; both groups would see adoption of the Minimum Operable Segment as detrimental to their efforts at revitalization. The Fairfax community is concerned about the Minimum Operable Segment insofar as a Beverly/Fairfax terminal station might attract additional vehicles through the residential streets north of the station, instead of just from the west along Beverly. On the other hand, this alternative improves travel along the congested Wilshire Corridor and accommodates a large portion of the development projected in conjunction with the Locally Preferred Alternative, at a substantially lower capital cost.
- Traffic and parking impacts around stations, especially those next to residential areas, are likely to be a major concern. Disruption of small businesses and shops facing onto cut and cover construction sites is also certain to be a major concern.

ISSUES TO BE RESOLVED

- The Locally Preferred Alternative is estimated to require $2.35 billion in capital costs, escalated to $3.1 billion at the midpoint of construction (at seven percent inflation). SCRTD alone cannot finance such a substantial capital expenditure and will, therefore, require both federal and local funding support. Funding at the federal level is uncertain, depending on budget appropriations, project priorities, and the share local sources are willing to carry. Accordingly, the level of funding is a crucial issue to be resolved at all levels of government.

- Related to the funding issue is the type of transit system SCRTD can build. If the rail project is implemented, which of the alternatives will be selected? Although the alternative preferred by SCRTD and the public calls for an 18.6 mile subway system, the level of federal support may necessitate a less expensive alternative: the Aerial Option or the Minimum Operable Segment.

- The Wilshire/Fairfax Station is currently located in a valuable paleontological resource area. Test drilling will be done to determine the presence of paleontological resources at the proposed station location and west to the intersection of Wilshire and Fairfax. If the drilling indicates that an area west is less sensitive than the present location, the station could be moved.

COMMENTING ON THE DRAFT EIS/EIR

A 45-day period has been set for receipt of comments on the Draft EIS/EIR. Comments should be sent to:

Charles H. Graves, Director
Office of Planning Assistance
Urban Mass Transportation Administration
Washington, D.C. 20590

Comments must be received by: **July 25, 1983**

Public hearings will be held on the Draft EIS/EIR on **July 18-21,1983**. Times and places of these public hearings will be announced in local newspapers in the Los Angeles area.

TABLE OF CONTENTS

Page

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

LIST OF FIGURES

Figures		Page

LIST OF TABLES

Tables		Page

CHAPTER 1

PURPOSE OF AND NEED FOR PROJECT

CHAPTER 1

PURPOSE OF AND NEED FOR PROJECT

1. PROJECT LOCATION AND REGIONAL SETTING

The Southern California region, generally defined by the six counties in the Southern California Association of Governments (SCAG)--Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial--covers over 38,500 square miles. Most of the region's population lives in less than one-tenth of the land area, in the Los Angeles Basin between the San Gabriel Mountains and the Pacific Ocean (Figure 1-1). The basin is divided in an east-west direction by the Santa Monica Mountains, which separate the San Fernando Valley from the rest of Los Angeles. Only a few mountain

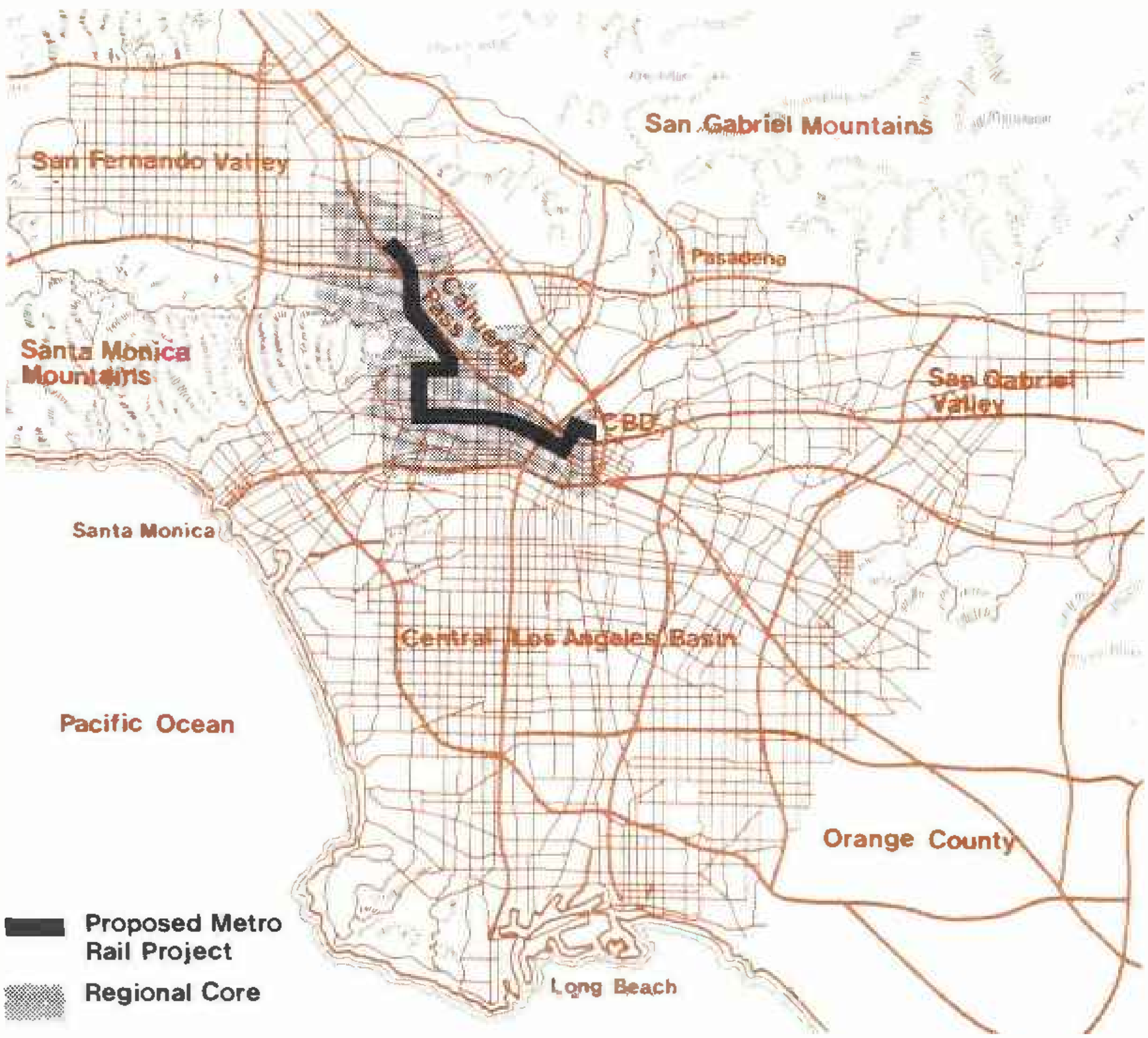


Figure 1-1 Regional Setting

passes, like the Cahuenga Pass, connect the two parts of the city. The remaining nine-tenths of the region is dominated by mountains (the Transverse and Peninsular Ranges) and deserts (Mojave and Colorado).

The Southern California region has grown from a community of 3.3 million people in 1940 to one of the largest metropolises in the world. In January 1980 the six-county SCAG region had an estimated population of 11,535,800--nearly one out of every two Californians--and employment of 5,605,900. SCAG projects that the region will grow to about 14.75 million by the year 2000, a 28 percent increase. The greatest increase will occur in Los Angeles County. Within the county, the greatest growth is projected for areas where population density is already high, particularly the Regional Core.

2. REGIONAL CORE

The Regional Core is the financial, retail, cultural, and entertainment center of Southern California. Two out of every ten Los Angelenos live and four out of every ten work in the 75-square-mile Regional Core.*

2.1 POPULATION AND EMPLOYMENT

Population in the Regional Core was 832,960 in 1980, a 17 percent increase over 1970. Hollywood, Westlake, and portions of the Central Business District (CBD) were the fastest growing communities, accounting for over three-fourths of the population growth. Much of this increase is directly attributable to the tremendous number of immigrants from Latin America and the Pacific Rim countries of Southeast Asia. The continued arrival of immigrants and economic growth of the region will cause the Regional Core population to reach 1.02 million within 20 years. The increase in population will tax an already overburdened infrastructure, including the transportation system.

Employment in the Regional Core was 811,600 in 1980. Nearly 80 percent of the Regional Core's jobs are in the major employment centers of the CBD, Wilshire, and Hollywood. Employment will climb to nearly one million by the year 2000. In the future, jobs will continue to be concentrated in the CBD, Wilshire, and Hollywood. This concentration of jobs in a relatively small geographic area results in high traffic volumes, congestion, and low travel speeds on the major freeways and arterials in the Regional Core.

---

* The Regional Core defined in this Draft EIS/EIR is slightly larger than the 55-square mile Regional Core of the SCRTD 1980 Alternative Analysis/Environmental Impact Statement/Environment Impact Report. The boundaries have been expanded in this analysis to better account for potential impacts from construction and operation of the Metro Rail Project.

2.2 LAND USE

The Regional Core contains a high density business sector stretching from the CBD westward to include Mid-Wilshire and Miracle Mile. Another commercial concentration is found in Hollywood north of Sunset Boulevard. The high-rise skyline that has developed in the CBD indicates its role as the heart of Southern California. High density development is also characteristic of portions of Wilshire, Hollywood, and Westlake. Outside of these areas, the land uses in the Regional Core are devoted predominantly to low and moderate density residential and commercial establishments.

SCAG projections show that density will continue to increase everywhere in the Regional Core (Table 1-1). Significant increases in the "clustering" of people are projected for the CBD; Westlake, Wilshire, and Hollywood will experience substantial growth of population; and population changes will be minor in Universal City and North Hollywood. Employment density will increase most significantly in the CBD, Wilshire, and Universal City/North Hollywood. The greatest population density changes projected are a 72 percent increase in the CBD and a 37 percent increase in Westlake. In absolute terms, the highest population density in the year 2000 will be in Westlake, with 35,870 persons per square mile. The greatest employment density will be in the CBD, with over 55,000 jobs per square mile.

TABLE 1-1
PROJECTED CHANGE IN REGIONAL CORE DENSITY

	POPULATION (persons per sq. mile)			EMPLOYMENT (jobs per sq. mile)[1]		
Planning Area	1980[2]	2000[3]	Percent Increase	1980	2000	Percent Increase
CBD	6,367	10,936	72%	42,855	55,192	29%
Westlake	26,190	35,870	37%	23,654	25,892	9%
Wilshire	15,372	19,129	24%	11,322	13,776	22%
Hollywood	10,208	12,178	19%	6,426	6,836	6%
Universal City/ North Hollywood	6,923	7,186	4%	3,010	3,960	32%
Regional Core	**10,888**	**13,355**	**23%**	**10,609**	**12,869**	**21%**

Sources: [1]SCAG, Draft SCAG-82 Growth Forecast Policy, 1982. SCAG-82B was used with minor adjustment by Sedway/Cooke.

[2]U.S. Bureau of the Census.

[3]SCAG, Draft SCAG-82 Growth Forecast Policy, 1982. SCAG-82B (representing high growth projections) was used, except in Universal City and North Hollywood, where population projections are derived by doubling the projected change between SCAG's low growth forecast (SCAG-82A) and 1980.

2.3 TRAFFIC

The freeways that skirt the Regional Core are loaded to capacity and are severely congested during peak commuter periods. In spite of present congested conditions, by year 2000 the demand for daily travel on freeways in the Regional Core is expected to increase nearly 1.5 million vehicle miles, a 24.2 percent increase over 1980 estimates. Existing and projected peak traffic volumes at selected points along the freeways within the Regional Core are compared against the capacity of the freeway in Table 1-2. Without major transit improvement, traffic congestion will worsen on all freeways in the area. Two proposed freeways which would have provided direct regional access to the Regional Core were canceled because of public oppositon and potential disruption to the community.

TABLE 1-2

COMPARISON OF ESTIMATED PEAK HOUR TRAFFIC VOLUMES AND FREEWAY CAPACITY IN THE REGIONAL CORE

Freeway	Estimated Peak Hour Capacity[1]	1980 Peak Hour Volume (am/pm)	2000 Peak Hour Volume[2]
Harbor/Pasadena Freeway			
north of First Street	9,000	9,200 (am)	9,200
north of Wilshire Boulevard	9,000	8,900 (pm)	10,100
south of Santa Monica Freeway	7,200	7,800 (pm)	11,500
Hollywood Freeway			
north of Burbank Boulevard	7,200	7,100 (pm)	8,400
north of Barham Boulevard	9,000	8,800 (am)	11,700
north of Franklin Avenue	9,000	8,600 (am)	12,100
west of Western Avenue	9,000	6,400 (am/pm)	9,700
west of Harbor Freeway	9,000	7,800 (am/pm)	13,500
Santa Monica Freeway			
west of La Cienega Avenue	7,200	7,500 (am)	15,100
west of Western Avenue	9,000	7,300 (am)	14,200
west of Harbor Freeway	7,200	7,000 (am)	13,700

Source: Los Angeles City Department of Transportation, 1980 and Year 2000 Base Condition, Traffic Volume Flow Maps; Caltrans

[1]Assumes 1,800 vehicles per hour, corresponding to Level of Service E, multiplied by the number of lanes in the direction of the peak hour flow.

[2]Peak hour volume is derived by multiplying average daily traffic volumes by a peak hour factor and by a factor for the direction of the peak hour flow.

Of particular note is the effect the Santa Monica Mountains have on travel between the San Fernando Valley and the CBD, Hollywood, and Wilshire areas. Traffic movement across the mountains is funneled through a few passes. The Hollywood Freeway, which carries over 78 percent of the traffic through the Cahuenga Pass, already operates at capacity during peak hours. In 1980, the average daily traffic through this pass was approximately 271,000 trips. By the year 2000, demand will increase over 25 percent to 342,000 trips. That demand cannot be accommodated.

Given the absence of convenient freeways and capacity constraints on existing ones, the majority of the traffic moving between major destinations within the Regional Core travels on arterial streets. The projected growth in residential and job development will further burden a circulation system ill-equipped to handle even current demand. By the year 2000, there will be an increased demand on the Regional Core's arterial system of nearly two million more vehicle miles daily, a demand that will result in severe delays. Table I-3 shows the projected growth in travel in the Regional Core.

TABLE I-3

TOTAL DAILY VEHICLE MILES TRAVELED IN THE REGIONAL CORE, BY ROADWAY TYPE
(in thousands)

Roadway	1980	2000	Percent Increase
Freeway	6,092	7,566	24.2
Arterial	7,384	9,369	26.9
Local	709	891	25.7
Total	14,185	17,826	25.7

Source: Los Angeles City Department of Transportation, Working Paper—2000 With Project Traffic Volumes, April 1983.

A measure of how well the arterial system is functioning is the level of congestion at key intersections during peak hours. In 1980, 46 of the Regional Core's key intersections were considered very near or over capacity (Level of Service E or F). When an intersection is at or over capacity, traffic is backed up, motorists may have to wait through several changes of the signal light before crossing, and movement slows down to far below the permissible speed limit. By the year 2000, assuming no major transportation improvements and only currently planned intersection and roadway improvements, it is projected that the number of severely congested key intersections will be more than three times greater than in 1980.

With the projected travel demand resulting from the increased densities in the year 2000, the present Regional Core's freeway and arterial street system simply will not function efficiently.

2.4 TRANSIT

SCRTD provides an extensive and well-utilized bus system within the Southern California region. During an average weekday in 1980, SCRTD operated 1,860 peak hour buses which traveled 334,000 miles and carried 1,386,349 passengers. More than 120 separate bus routes offer service to, from, and within the Regional Core. The most heavily patronized corridor is along Wilshire Boulevard. Within a one-half mile band along either side of Wilshire Boulevard (six streets including Wilshire), local bus lines carry about 177,000 daily boardings.

Patronage is expected to continue to increase because of the reduced bus fares made possible through the passage of a 1/2 cent sales tax for transit funding. Though ridership is increasing, limits to effective bus service are being approached:

- Bus operating speeds are hampered by street congestion. Local buses in the CBD about 6-8 miles per hour and only slightly higher speeds are attained on Wilshire and on Hollywood streets.

- Buses operating on several heavily used lines are already over capacity. Adding more buses will not fully alleviate the problem. For example, Wilshire Boulevard carries more than 40 buses past a given point in the peak hour. Buses are often bumper-to-bumper. Even with additional buses, riders would still be traveling on congested streets, so service would not improve. Moreover, additional buses require the hiring and training of new operators and, significantly, labor accounts for 80 percent of transit operating costs. As a result, the cost of adding buses would be high, but the improvements in terms of carrying greater numbers of people at faster speeds would be minimal.

- More than 20 million square feet of office, retail, commercial, and other space is being constructed currently or is in final planning stages in the CBD. If transit is to maintain its modal share for peak trips, some 500 to 700 additional peak hour buses will need to be added to the current total. Due to current and projected congestion levels, the street system cannot accommodate the additional buses needed to meet future travel demand. A high volume rail rapid transit system is a logical solution to relieve overloaded streets and freeways and to add needed capacity to the transit system.

3. NEED FOR PROJECT

A rail transit project is needed for several crucial reasons: to improve accessibility and mobility in the Regional Core, to further the attainment of land use and development goals, and to carry out the public mandate for rail transit. Each of these reasons is discussed below.

3.1 IMPROVE ACCESSIBILITY AND MOBILITY

The Regional Core is the most densely populated portion of the Los Angeles Urbanized Area. In some areas of the Regional Core, population densities exceed 26,000 people per square mile. Employment in the CBD is nearly 43,000 jobs per square mile. Projections indicate the Regional Core will continue to grow substantially between now and the year 2000. Yet this level of development cannot be accommodated without severely overtaxing an already constrained transportation system, as described earlier in this chapter. The inability of the road network and the bus system to adequately serve the Regional Core will also act as a major deterrent to the development of the area. To accommodate and foster the growth projected and desired for the Regional Core, an efficient, fast means of traveling must be available.

Based upon the analysis performed in the Alternatives Analysis/Environmental Impact Statement/Environmental Impact Report (1980), known as the First Tier EIS/EIR, an 18.6 mile rail rapid transit line serving the Regional Core emerged as the best way of relieving some of the burden on the region's transportation system. That determination was based, in part, on the project's ability to satisfy the following goals for mobility and cost effectiveness, defined by SCRTD and the public:

- Provide a necessary improvement in the level of mobility in the Los Angeles CBD-Wilshire-Hollywood-North Hollywood Regional Core area.

- Integrate the corridor transit system with the other three elements of RTDP (Regional Transit Development Plan) to provide convenient regional access for all corridor residents.

- Maintain and improve transportation system safety and dependability for both users and nonusers.

- Maximize system capital and operational cost effectiveness in the Regional Core in terms of passengers and passenger miles, over a foreseeable range of passenger volumes.

The rail transit system with supporting bus services was ranked superior to ten other alternatives. Its advantages included the highest transit ridership, highest operating efficiency, greatest reduction in vehicular traffic and auto dependency, greatest travel time savings, most economic benefits, greatest accessibility, maximum air quality improvements, and largest energy savings.

3.2 SUPPORT LAND USE AND DEVELOPMENT GOALS

An effective transportation system is necessary to support regional and local goals relating to land use and urban form. Such goals include:

- Complement regional and local land development goals including the Centers Concept, which calls for concentrating development in high activity areas while preserving the surrounding lower density residential and recreational areas.

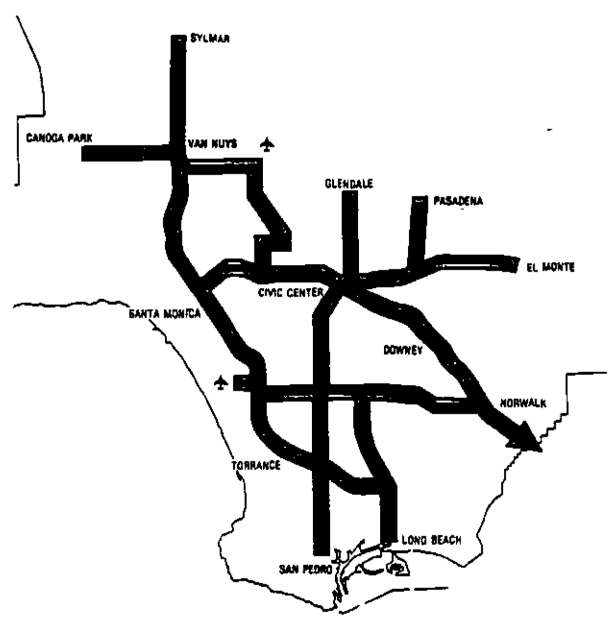
- Support city and county plans for land development along Wilshire Boulevard and for the revitalization of Downtown Hollywood and North Hollywood.

A rail rapid transit system appears best able to realize many adopted local and regional land use and environmental policies. Locally, the Concept of the Los Angeles General Plan calls for the creation of high density, multiuse centers. Earlier discussion demonstrated that the inability of the roadways and buses to provide sufficient capacity could frustrate the desired concentration of development. A high volume transit system would increase capacity and have the catalytic effect of fostering the Centers Concept. Similarly, the regional growth policy, adopted by SCAG, encourages development within a core area (of which the Regional Core is the most highly urbanized section) and the provision of transportation systems to support and connect a series of growth centers within the region. The proposed rail rapid transit system has been recognized by SCAG as an important ingredient in achieving its development and urban form objectives and has, accordingly, been made an integral part of the Regional Transportation Plan.

3.3 CARRY OUT PUBLIC MANDATE

Work on the Metro Rail Project began in earnest after Los Angeles County voters passed State Proposition 5 in 1975. Proposition 5 provided local gasoline tax funds for a rail rapid transit "starter line" for Los Angeles. Los Angeles County voters passed (by a 54.2 percent majority) an even more significant referendum, Proposition A, in November 1980. Proposition A added a half-percent to the county sales tax to provide the local financing for a complete regional rail rapid transit system.

This demonstration of growing voter commitment to rail rapid transit and its funding has come at a time when taxpayers have otherwise been extremely reluctant to sanction continued public spending. The Metro Rail Project is at the heart of the system that appeared on the Proposition A ballot and was subsequently determined by the Los Angeles County Transportation Commission to be the region's first priority rail rapid transit project. The Metro Rail Project would be an initial step toward responding to the mandate of the voters.



Source: Ballot Proposition A. November 4, 1980

Figure 1-2 Regional Rail Rapid Transit System

CHAPTER 2

ALTERNATIVES

CHAPTER 2
ALTERNATIVES

This chapter discusses the planning history and means of selecting the alternatives being evaluated in this EIS/EIR, identifies other alternatives which were considered but are no longer appropriate, and compares the advantages and disadvantages of the alternatives. The comparison serves only to highlight differences among the alternatives. A detailed assessment of each alternative is presented in Chapters 3 and 4.

1. PLANNING HISTORY

1.1 REGIONAL TRANSIT DEVELOPMENT PROGRAM

In 1975, in response to its legislative mandate to construct and operate a rapid transit system in its service area, the Southern California Rapid Transit District (SCRTD) Board of Directors established a Rapid Transit Advisory Committee to evaluate a series of regional transit corridors. The Rapid Transit Starter Line Corridor, from Long Beach in the south through the San Fernando Valley to Canoga Park in the north, was selected for further study. All-bus, bus/rail, and heavy rail alternatives were evaluated in a four-volume study that addressed cost effectiveness and environmental impacts as well as technical feasibility. After the study was published in 1976, local and state officials adopted a Regional Transit Development Program with four elements:

- I. Transportation Systems Management: low cost improvements to the existing regional bus system
- II. Freeway Transit: new guideways and high occupancy vehicle lanes
- III. Downtown People Mover: a means of providing circulation in the Central Business District of Los Angeles
- IV. Regional Core Rapid Transit System: an initial segment of rail rapid transit in the Los Angeles Regional Core

A fifth element was added in 1981:

- V. Commuter Rail: new or improved commuter rail service in three corridors.

The first three elements were approved for preliminary engineering by the U.S. Secretary of Transportation, while only more basic "initial" engineering and environmental documentation for the Regional Core Rapid Transit System were approved. Transportation Systems Management has become an ongoing SCRTD program.

Freeway Transit now includes the existing El Monte bus/high occupancy vehicle facility on the San Bernardino Freeway and plans for similar facilities on the Santa Ana and Harbor Freeways and the planned Century Freeway. The Downtown People Mover, after completion of the EIR/EIS and preliminary engineering, is no longer being considered for federal funding.

1.2 REGIONAL CORE RAPID TRANSIT SYSTEM

As part of Element IV, two projects are in various stages of implementation. The Los Angeles County Transportation Commission is conducting environmental analysis and initial engineering for a light rail line to serve the corridor from Long Beach to downtown Los Angeles. SCRTD has been evaluating a high capacity rail system to serve the Regional Core from the Central Business District (CBD) north to North Hollywood. Beginning in 1977, SCRTD began an exhaustive study of a number of different routes and modes to provide high capacity service within the Regional Core. Eleven alternatives with different combinations of bus and rail projects were identified and analyzed.

The study concluded that the all-bus alternatives provided some improvement but would not satisfy the projected travel needs, improve congestion, or be capable of handling increases in travel during energy shortages. An aerial busway was considered but presented the most severe environmental and operational problems. The rail/bus alternatives, while the most capital intensive, offered the greatest reduction in net operating subsidies and the largest increase in ridership and were, therefore, the most cost effective. The rail/bus alternatives also yielded the highest ridership and the greatest reduction in auto trips and vehicle miles traveled. As a result, these alternatives most improved traffic congestion, air quality, and energy use.

In September 1979, the SCRTD Board of Directors approved an all-subway rail rapid transit system to serve the Regional Core. This system was called the Locally Preferred Alternative, and its selection was documented in an Alternative Analysis/ Environmental Impact Statement/Environmental Impact Report. This document, completed and approved by the federal Urban Mass Transportation Administration (UMTA) and SCRTD in April 1980, fulfilled federal and state requirements for initial environmental documentation and assessment of alternative alignments and modes of transportation. The recommended route connected the CBD, the Wilshire Corridor, the Fairfax community, Hollywood, Studio City, and North Hollywood.

1.2.1 PRELIMINARY ENGINEERING

In 1981 SCRTD began the Preliminary Engineering phase. During this phase, which continues until mid-1983, the conceptual system adopted earlier by the Board is being refined and subjected to further environmental analysis. A final system plan is being devised as the basis for detailed design and construction. This 2-1/2 year effort is organized around 12 project milestones representing different aspects of design, engineering, and environmental analysis (Table 2-1). A Community Participation Program enables SCRTD to obtain public review and comments at each milestone (see Chapter 5).

Milestones 3 and 4. Because of their importance to the Preliminary Engineering phase, system alignment and station locations were considered early in the Milestone

TABLE 2-1

SCRTD PRELIMINARY ENGINEERING MILESTONES

Milestone 1	Preliminary System and Operating Plan (description of system)
Milestone 2	System Design Criteria (guidelines for system design and operating equipment)
Milestone 3	Route Alignment
Milestone 4	Station Locations
Milestone 5	Right-of-Way Acquisition and Relocation Policies and Procedures (guidelines for acquiring necessary real estate for transit construction)
Milestone 6	Development and Land Use Policies (strategies for joint development and value capture around stations)
Milestone 7	Safety, Fire/Life Safety, Security and Systems Assurance Policies (criteria to assure safe, secure, and reliable transit service)
Milestone 8	System and Subsystems (criteria for hours of operation, fare collection methods, and operating equipment)
Milestone 9	Supporting Services Plan (strategies for assuring adequate bus, auto, and pedestrian access)
Milestone 10	Fixed Facilities Plan (station designs and location of parking structures and other facilities)
Milestone 11	Cost Estimate
Milestone 12	Final System Definition

Process as Milestones 3 and 4, respectively. There were two screenings of alternative routes and station locations. During the first screening, two alternatives to the Broadway Street route through the CBD were considered (Figure 2-1). The proposed shift to either Hill or Flower Streets was primarily a response to the postponement of the Downtown People Mover and the resultant need to better serve the entire CBD. Three alternative routes were considered in Hollywood (Figure 2-2). One alternative shifted the Locally Preferred Alternative east-west route from Fountain Avenue onto Sunset Boulevard to better serve the commercial core of Hollywood and went north through the Cahuenga Pass. A second alternative maintained the east-west route along Fountain Avenue but turned northward along La Brea Avenue. As part of this alternative, an auxiliary transit system was proposed to provide east-west service to the commercial core of Hollywood. In the third alternative the route ran north along Fairfax Avenue to North Hollywood, with east-west service through Hollywood supplied by an auxiliary transit system, operating either at street level or in an aerial structure. This proposal offered faster service between the San Fernando Valley and major destinations along the Wilshire Corridor and in the CBD, and a more extensive distribution service in Hollywood. In North Hollywood, aerial versions of the subway alignment were also evaluated.

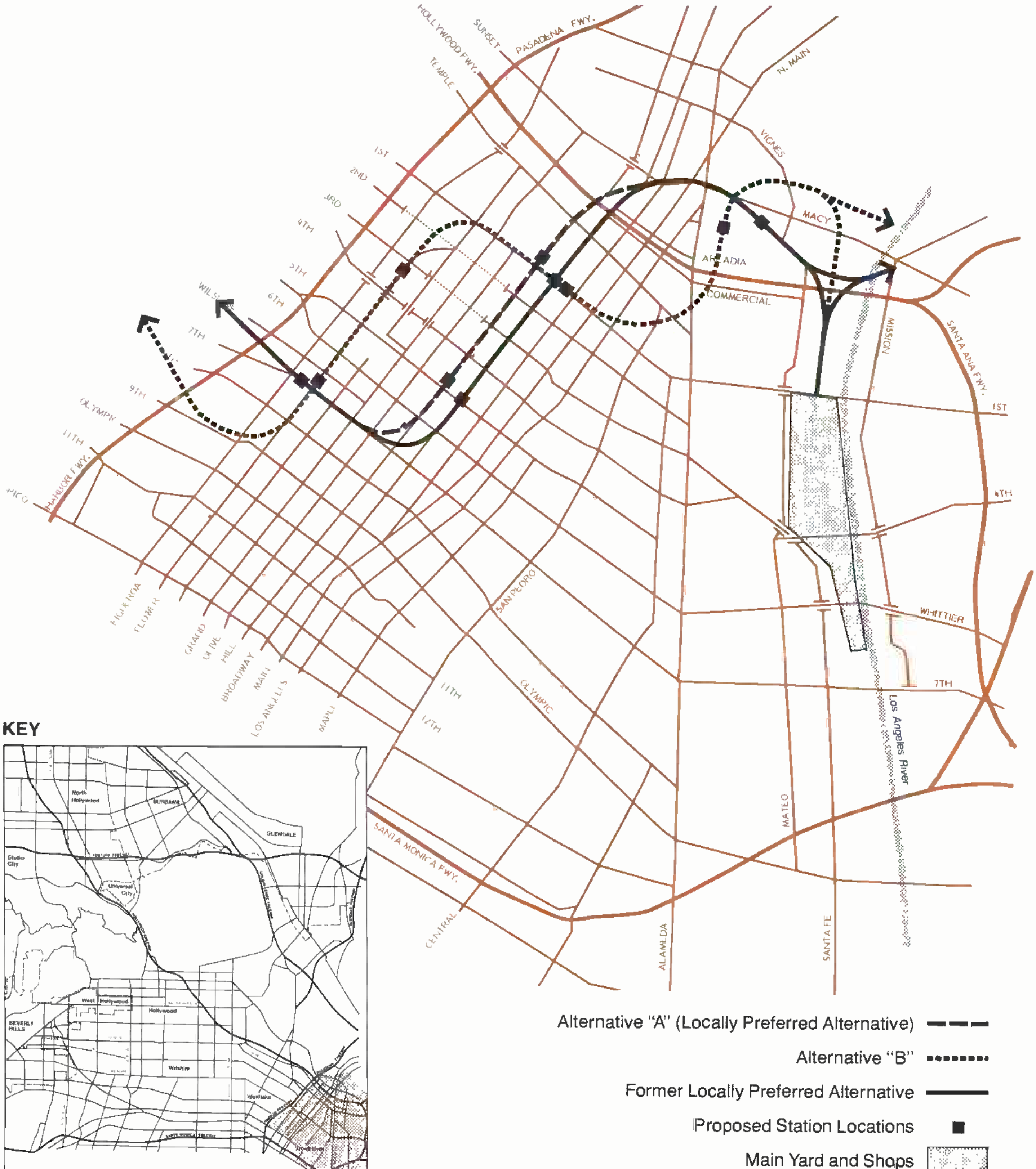
As part of Milestone 4, optional stations were considered at Wilshire/Witmer, Wilshire/Crenshaw, and La Brea/Sunset. Additionally, several stations were evaluated for their feasibility in "off-street" locations. These stations, located outside the street right-of-way, offered better opportunities for SCRTD and private interests to participate jointly in development projects, and less disruptive and expensive station construction.

After substantial public input, the SCRTD Board of Directors adopted on August 26, 1982 the following community recommendations:

- The Hill Street alignment through the downtown area.
- Off-street station locations for the Union Station, Wilshire/Alvarado, Wilshire/Vermont, Fairfax/Beverly, Hollywood/Cahuenga, and Universal City Stations.
- No further consideration of the optional stations at Hollywood Bowl, Wilshire/Witmer, and Wilshire/Crenshaw. Since that time the Board has reopened consideration of the Hollywood Bowl and Wilshire/Crenshaw Stations.
- Further consideration of the La Brea/Sunset Station, along with alternative Hollywood and North Hollywood alignments.

Special Alternatives Analysis. The additional analysis in the Hollywood and North Hollywood areas was prompted by unresolved issues at the SCRTD Board meeting in August 1982. These issues were the focus of a special study, called the Special Alternatives Analysis. The analysis and subsequent interaction among SCRTD staff, its consultants, and the public provided the second screening of alignments and station locations.

Five alignment alternatives were presented to the Hollywood community as part of the Special Alternatives Analysis (Figure 2-2). A Hollywood community committee evaluated each alternative, using measures representing the community's goals and objectives, with each measure weighted to reflect its importance. The Cahuenga Bend all-subway alignment, emerged as the clear preference, scoring highest in virtually every category.



Source: SCRTD Milestone 3 Report

Southern California Rapid Transit District

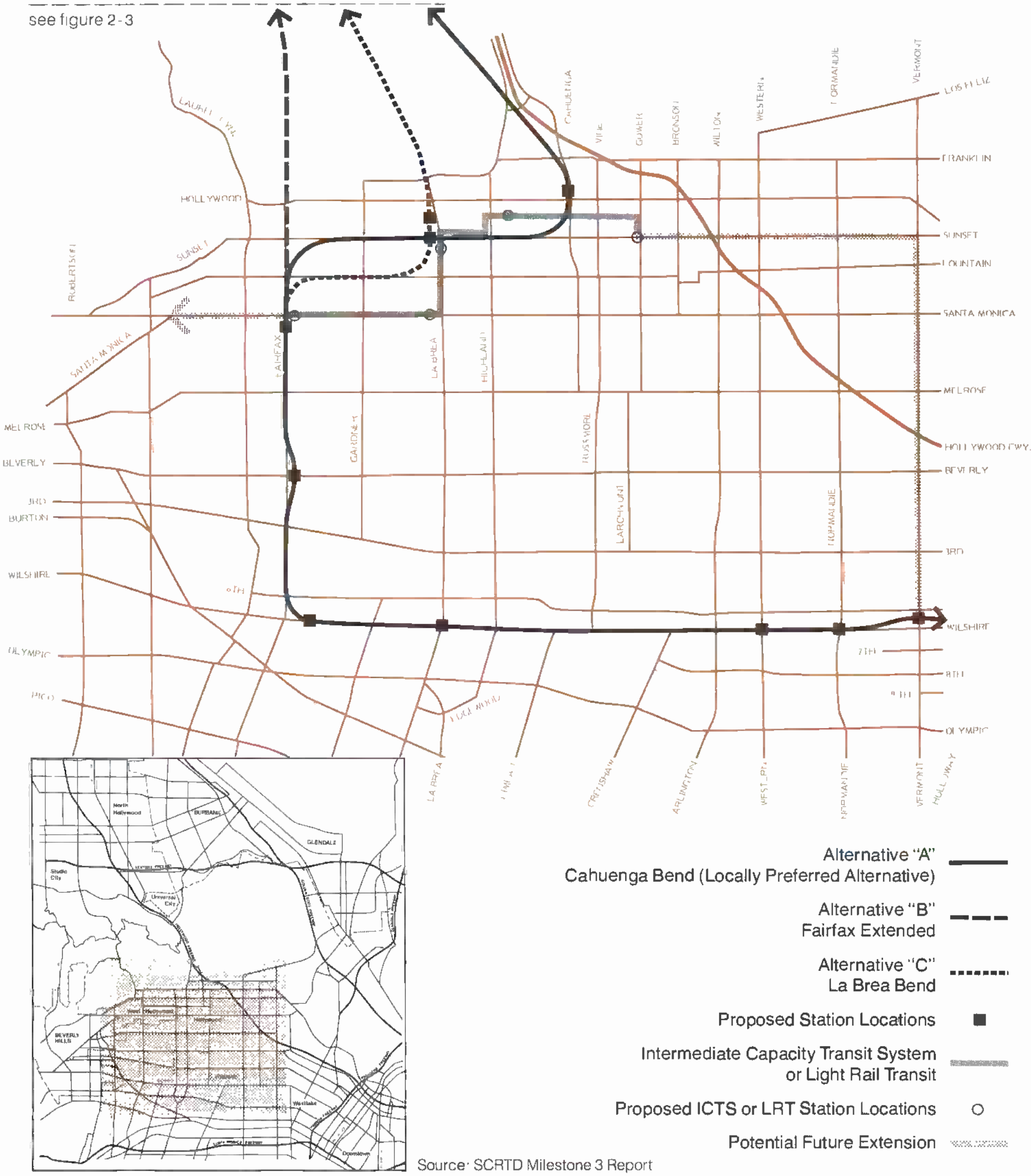
Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 500 1000 feet

Figure 2-1
Central Business District Alternative Alignments

SEDWAY/COOKE
Urban and Environmental Planners and Designers



Source: SCRTD Milestone 3 Report

Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 2000 4000 feet

Figure 2-2 Hollywood Alternative Alignments

SEDWAY/COOKE

Urban and Environmental Planners and Designers

In North Hollywood, after a review of preliminary alignments, SCRTD and the community organized the alternatives into four southern and six northern segments (Figure 2-3). Each of the northern and southern segments was evaluated using measures directly related to the goals and objectives formulated by the North Hollywood community. The primary concerns were the impacts of an aerial configuration, the choice of a station location at Universal City or Studio City, and the route and station location in North Hollywood.

Aerial alignments were generally $20-30 million per mile less expensive to build than subways, although the annual operating and maintenance costs were comparable. In spite of the significantly lower capital costs, aerial alignments required greater land acquisition, caused more conflicts with existing land uses, exceeded noise criteria at more locations, and, during construction, caused more temporary disruption to businesses and traffic. For these and other reasons, the North Hollywood community was very much opposed to an aerial configuration.

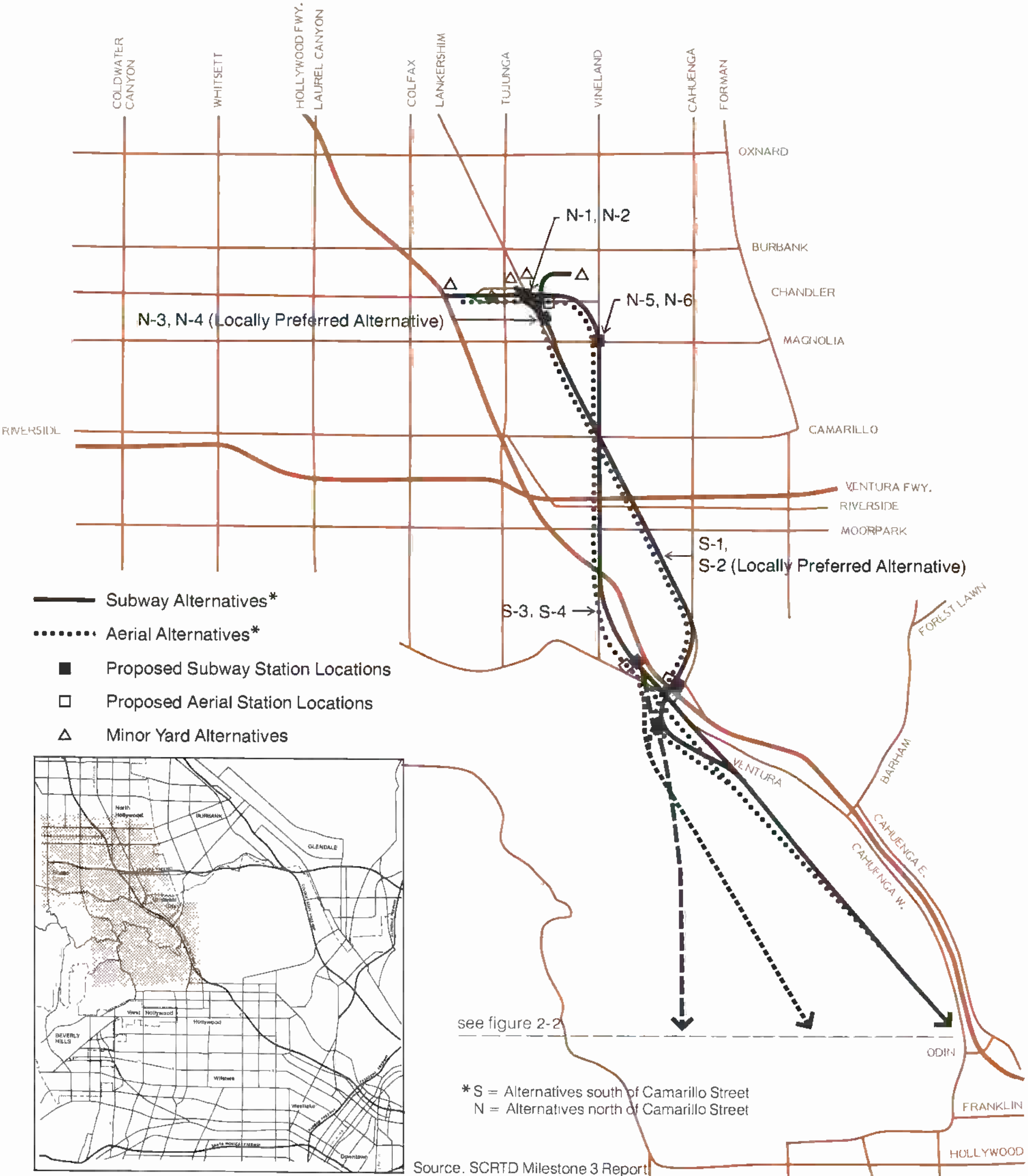
The analysis of a station location at Universal City versus Studio City highlighted the particular advantages of the Universal City Station. This station was found to be much more compatible with existing and planned land uses, less disruptive during construction, better located to stimulate commercial development, and slightly less costly to build. In addition, the Universal City Station was expected to attract more riders. The specific measures for which a Studio City Station was rated more desirable were the avoidance of land acquisition and the higher projected population within 1/4 mile of the station.

The choice of a station location in North Hollywood influenced the choice of alignment. In effect, a north-south station orientation required a route along Lankershim Boulevard; an east-west orientation along Chandler Boulevard would require a route along Vineland Avenue and then a westward bend into Chandler Boulevard. A third alternative station location at Magnolia and Vineland Avenues also dictated an alignment along Vineland Avenue. The Lankershim alignment with a station location near Chandler received the highest rating on each of the goals established by the Citizen's Committee.

As a result of the evaluation, the Hollywood and North Hollywood communities recommended the elimination of many of the options suggested by staff and the public earlier in the Special Alternatives Analysis, including the proposal to construct an auxiliary line in Hollywood, further consideration of a Studio City Station, and proposals for an aerial configuration in North Hollywood. The community recommendations were submitted to and approved by the SCRTD Board of Directors in December 1982. Their recommendations are reflected in the Locally Preferred Alternative.

2. DESCRIPTION OF ALTERNATIVES

This section discusses the alternatives presently under consideration. In addition to the No Project Alternative, several alternatives have been formulated to offer improved travel conditions in the Regional Core. These alternatives include a new Locally Preferred Alternative, a Locally Preferred Alternative with an aerial option,



Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 2000 4000 feet

Figure 2-3
San Fernando Valley Alternative Alignments

SEDWAY/COOKE
Urban and Environmental Planners and Designers

and a Minimum Operable Segment. The following discussion describes the alternatives' routes, alignments, station design, station locations, maintenance facilities, subsystems, operating characteristics, and costs.

2.1 NO PROJECT ALTERNATIVE

In accordance with requirements for the preparation of EISs and EIRs, a No Project Alternative has been evaluated. Under this alternative, travel in the Regional Core would continue to be served by the existing road network and SCRTD bus system. The present transit system will be improved in accordance with SCRTD's 1980 Sector Improvement Plan (SIP), which calls for an expanded and revised network of local and express services. Many of the plan's recommendations have already been implemented. This alternative would require 1,963 buses operating in the peak periods and is essentially a "do nothing" alternative, formulated to examine conditions in the year 2000 without significant transit improvements. The No Project Alternative does not assume growth in transit service commensurate with population and employment increase in the region. With this alternative transit would serve an ever decreasing share of regional trips. While this alternative is included as a basis for comparison of conditions under a rail rapid transit project, it does not imply that significant capital improvements will not be considered if the proposed rail project is not constructed.

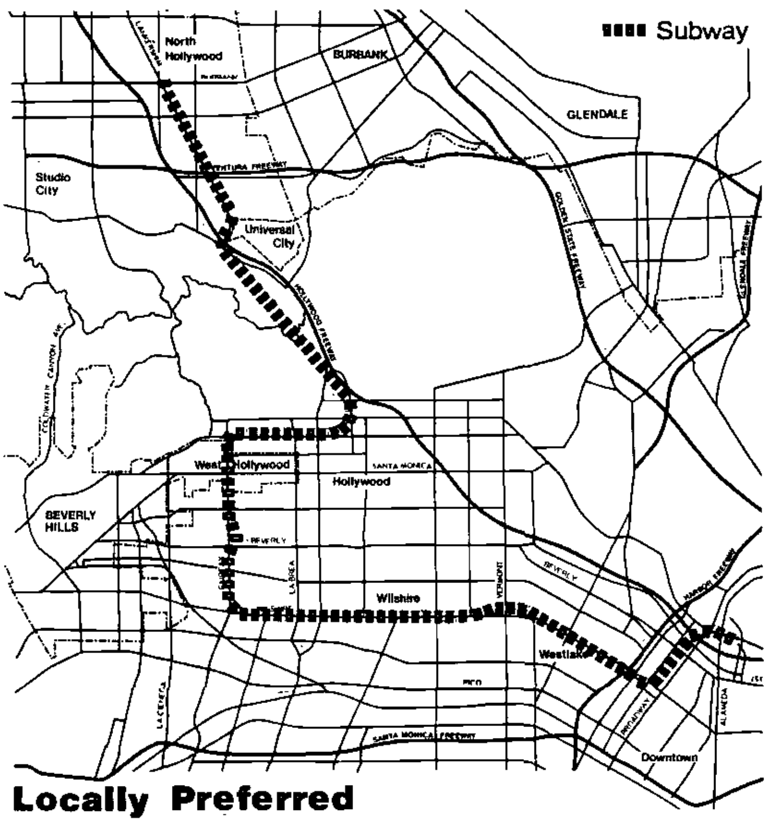
Systemwide transit ridership with this alternative totals 1.4 million boardings daily. The annual operating and maintenance cost for this all-bus system would be $403.4 million. The estimated capital cost of the No Project Alternative is $323.9 million and only includes additions to and periodic replacement of the existing bus fleet. Assuming a ten percent discount rate, the annualized cost would be $48.28 million per year. Thus, total annual costs (annualized capital costs plus annual operating and maintenance costs) for the No Project Alternative approximate $451.68 million in 1983 dollars.

2.2 LOCALLY PREFERRED ALTERNATIVE

2.2.1 ROUTE DESCRIPTION AND ALIGNMENT

The proposed route includes 16 stations plus two optional ones. The bus system, which would be slightly modified from the SIP being implemented under the No Project Alternative to offer more convenient bus-rail connections, would contain 1,845 buses and is described in SCRTD's Milestone 9 Report: Supporting Services Plan. The rail rapid transit route begins at Union Station, where it turns southwest and runs through the CBD along Hill Street. Turning on Seventh Street, the route heads towards the west side of downtown, past the Harbor Freeway, and continues along Wilshire Boulevard past MacArthur Park in the Westlake area. Proceeding along Wilshire Boulevard, the route serves the Mid-Wilshire and Miracle Mile business centers. At Fairfax, the Locally Preferred Alternative turns north to serve the Fairfax and West Hollywood communities and then turns eastward along Sunset Boulevard. The line continues for approximately two miles through Hollywood before it veers northwest at Cahuenga Boulevard. The route proceeds under the Santa Monica Mountains through the Cahuenga Pass and enters the San Fernando Valley near Universal City. It continues in a northwest direction along Lankershim Boulevard to its final stop at the North Hollywood Commercial Core.

The Locally Preferred Alternative is proposed as a subway system, with virtually all line segments tunneled by proven tunnel boring machines, and stations excavated from street level by cut and cover construction techniques. Both tunneling and cut and cover construction methods are briefly described in the Construction section of Chapter 3. Preliminary drawings have been prepared to show the alignment and the location where different construction techniques will be used, where special tracks will be installed, where stations will be built, and where the tunnel configuration will change (Figures 2-4.1 through 2-4.21).



Locally Preferred

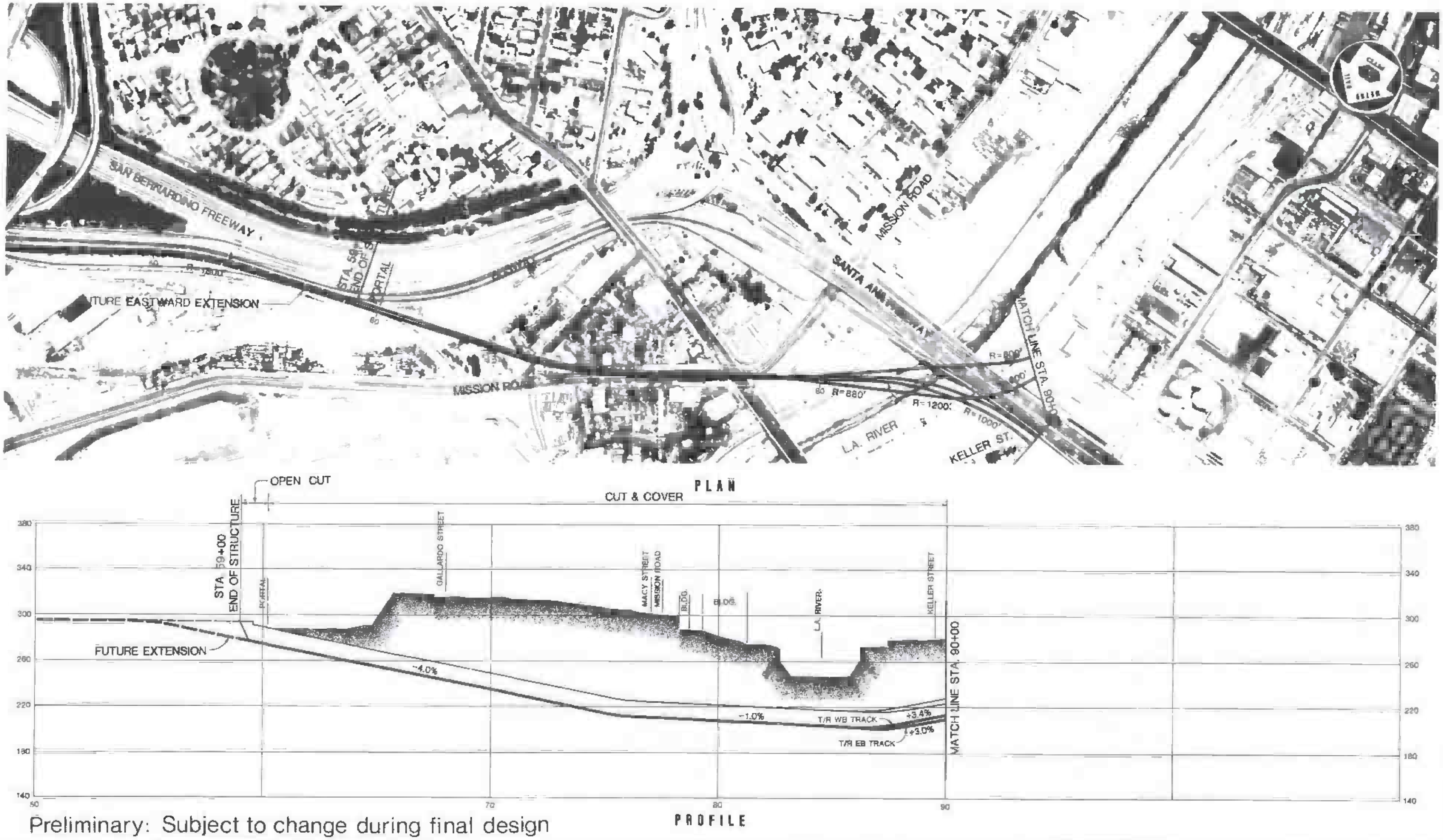
2.2.2. STATION DESIGN FEATURES

The following discussion describes some of the components and features of station design. A detailed presentation can be found in SCRTD's Milestone 10 Report: Fixed Facilities.

Platform. Metro Rail station loading platforms would be approximately 450 feet long to accommodate trains consisting of six 75-foot-long cars. The platform size is based on the ultimate system design capacity (generally thought of as being reached about 20 years after system opening) and provides for the safe and efficient circulation of passengers. As a cost reduction measure, center support columns are proposed in the platform area. Platforms may be "center" type, with a single platform flanked by the two tracks, or "side" type, with the tracks between two platforms. The center platform design is planned for most of the stations because it makes it easier for patrons to decide which train to take while they are on the platform, and because station costs are typically lower.

Entrance. Plaza entrances and entrances within existing or planned developments are favored. Where such off-street entrances are not possible, on-street entrances leading directly from the sidewalk to the fare collection area are proposed. Patronage levels are high enough to support entrances at each end of a station only in the CBD and at Wilshire/Fairfax. Particular site considerations also led to a "double-ended" station at North Hollywood.

Mezzanine/Concourse. This is the transition area between the entrance to the station and the train loading platform. Depending on the station site and whether it is an above ground or subway station, this area may be between the street surface and the platform(s), where it is called a mezzanine, or at street level, where it is called a concourse. The mezzanine/concourse provides space for various functions and typically includes the entire fare collection process, directional and information

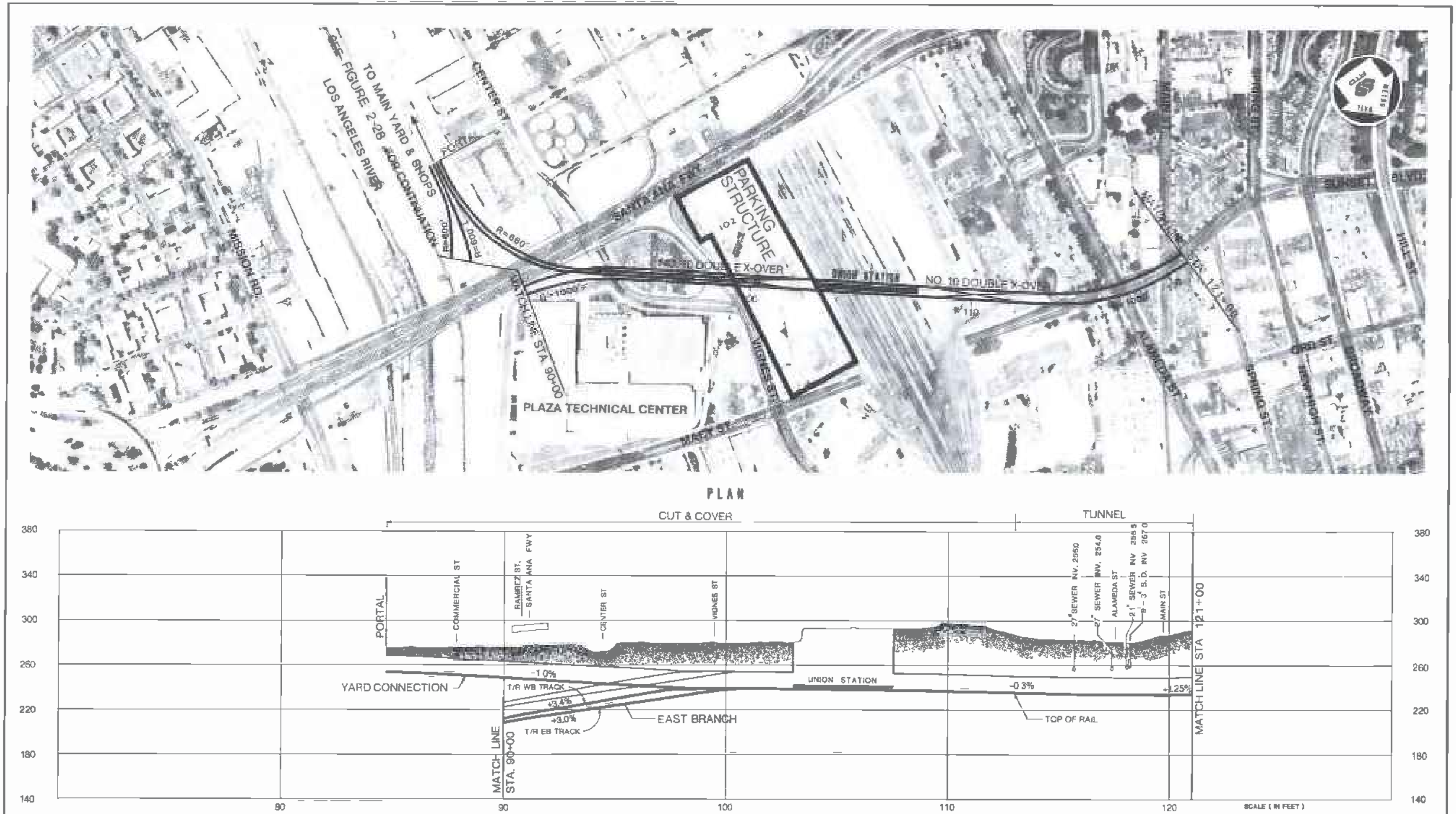


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·4.1 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

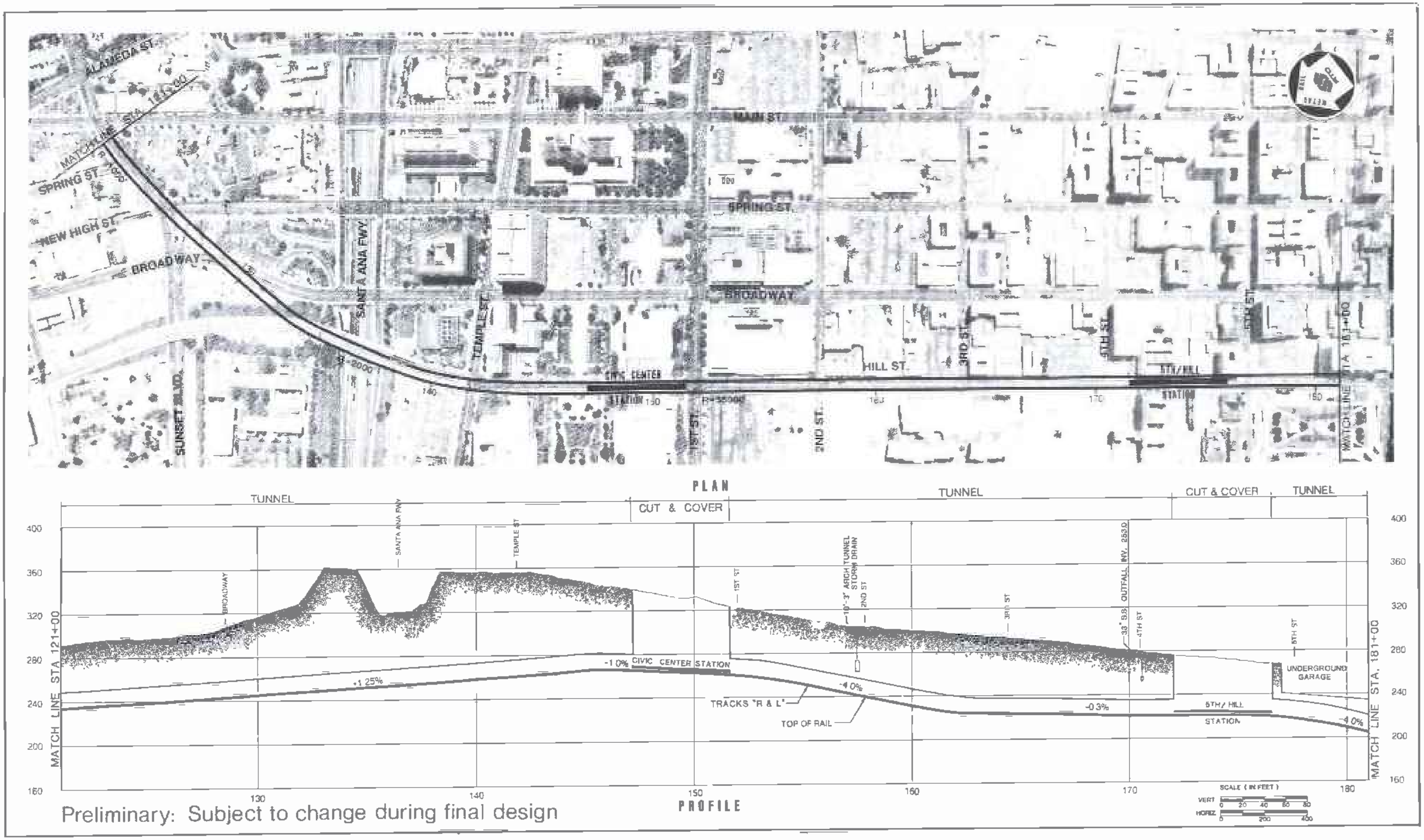


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·4.2 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

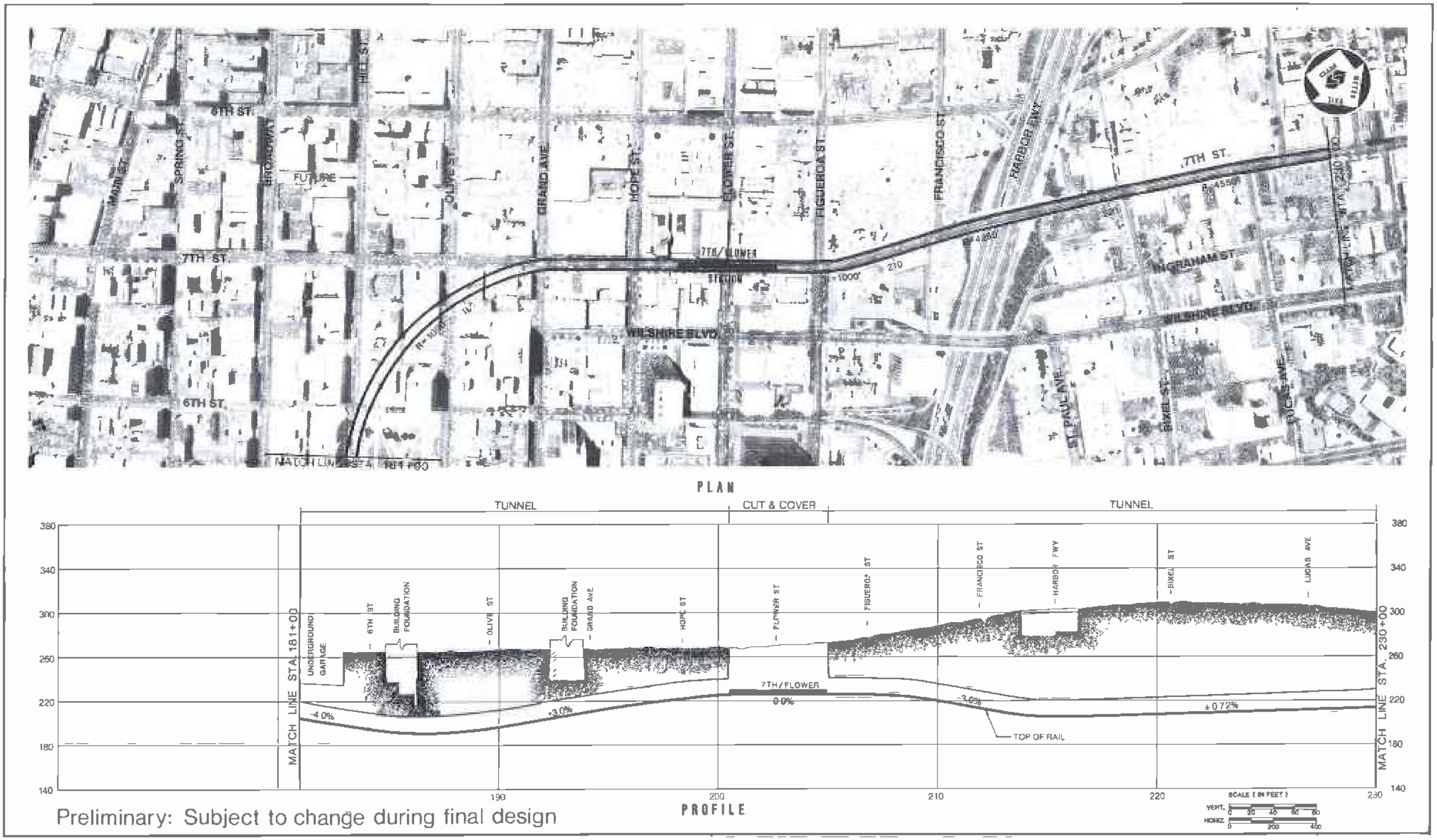


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.3 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD



Preliminary: Subject to change during final design

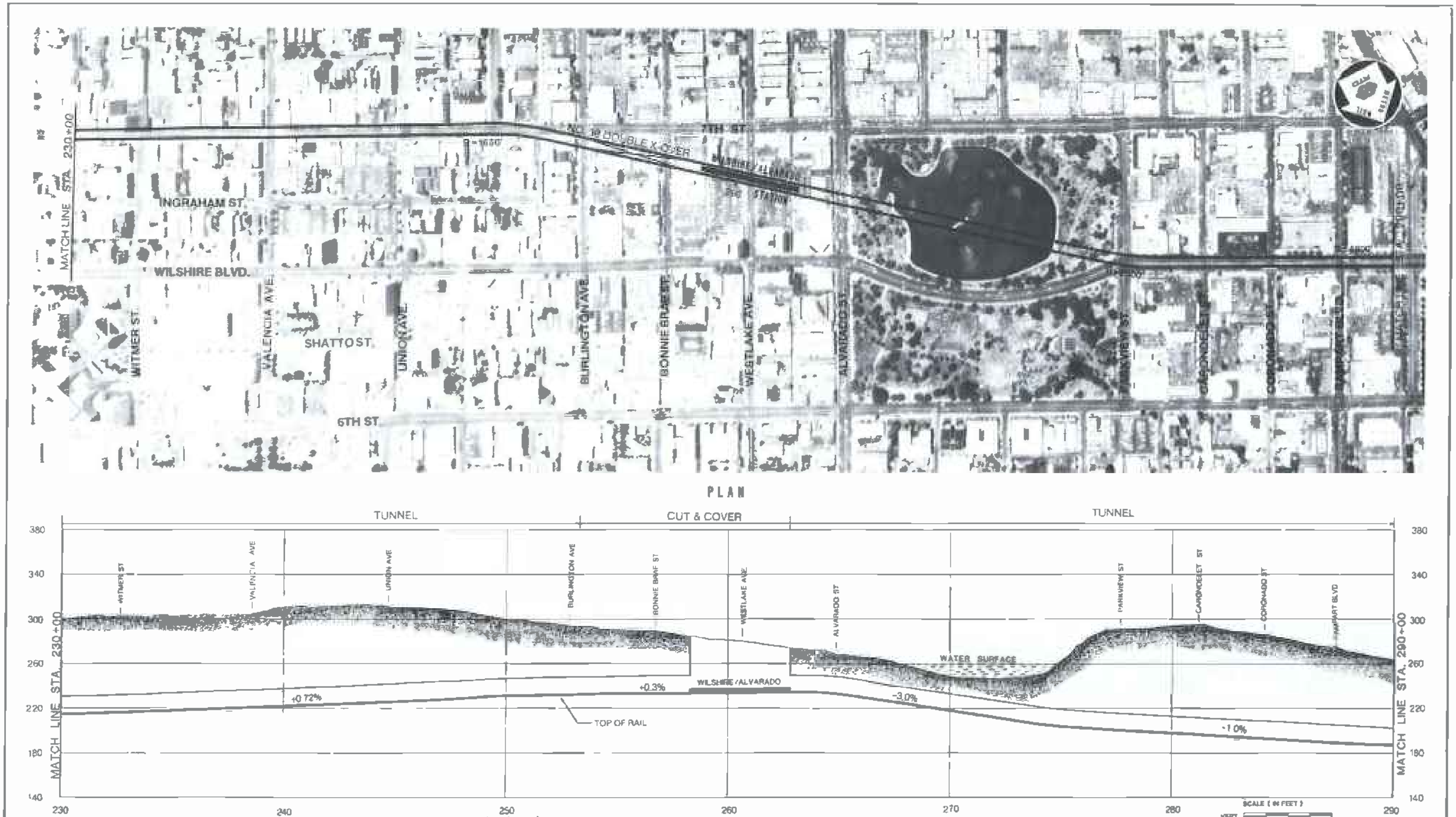
Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.4 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

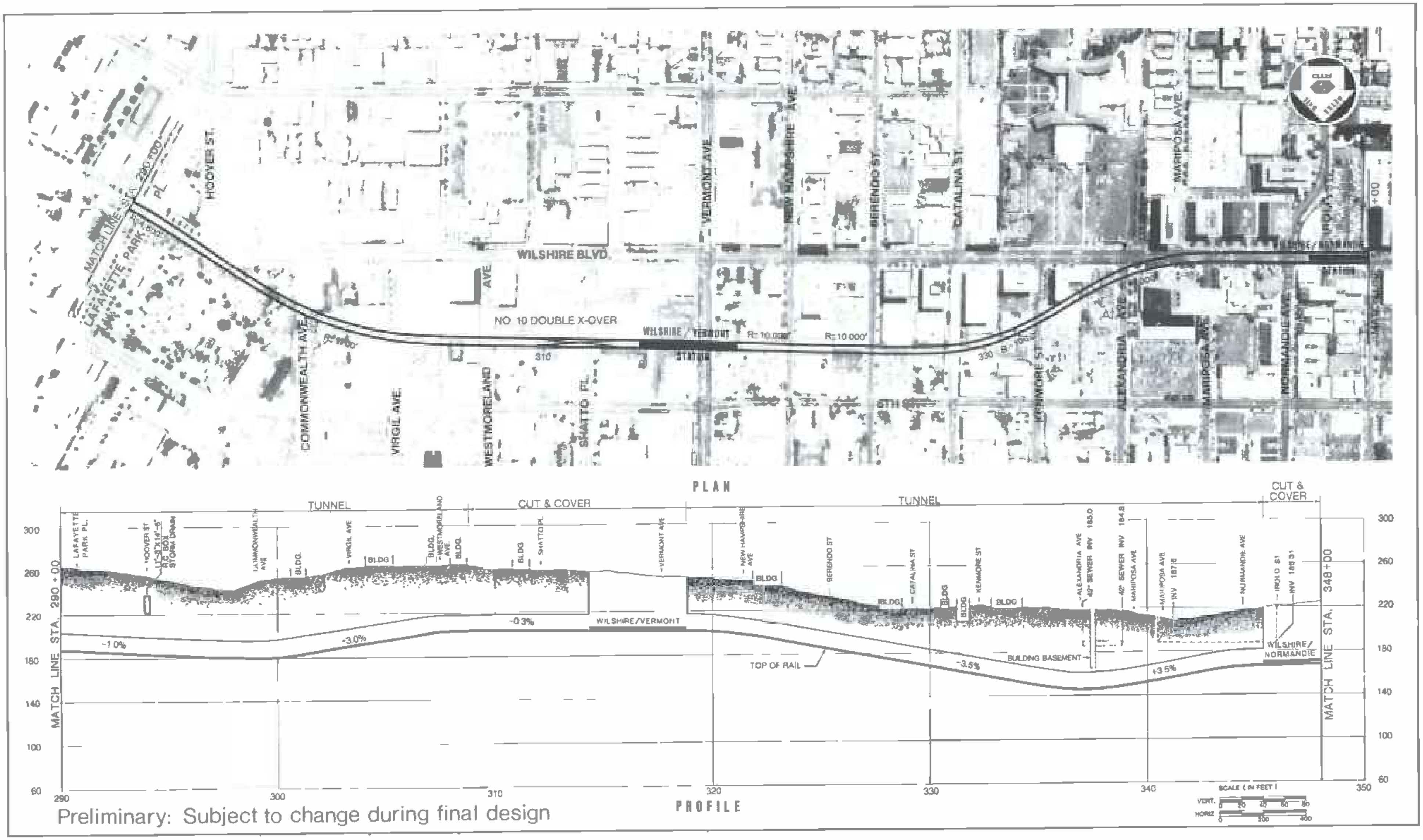


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.5 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

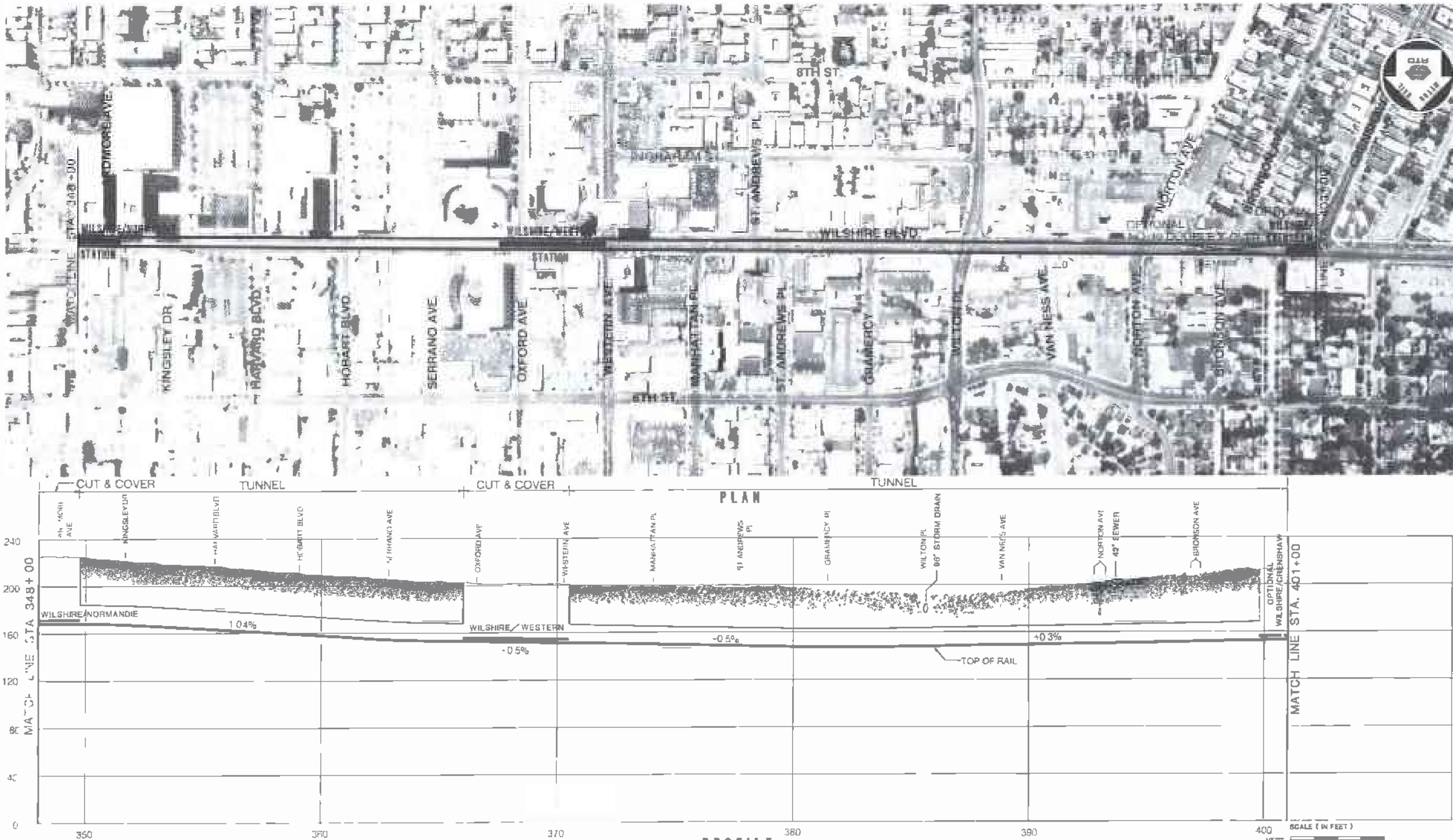


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.6 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD



Preliminary: Subject to change during final design

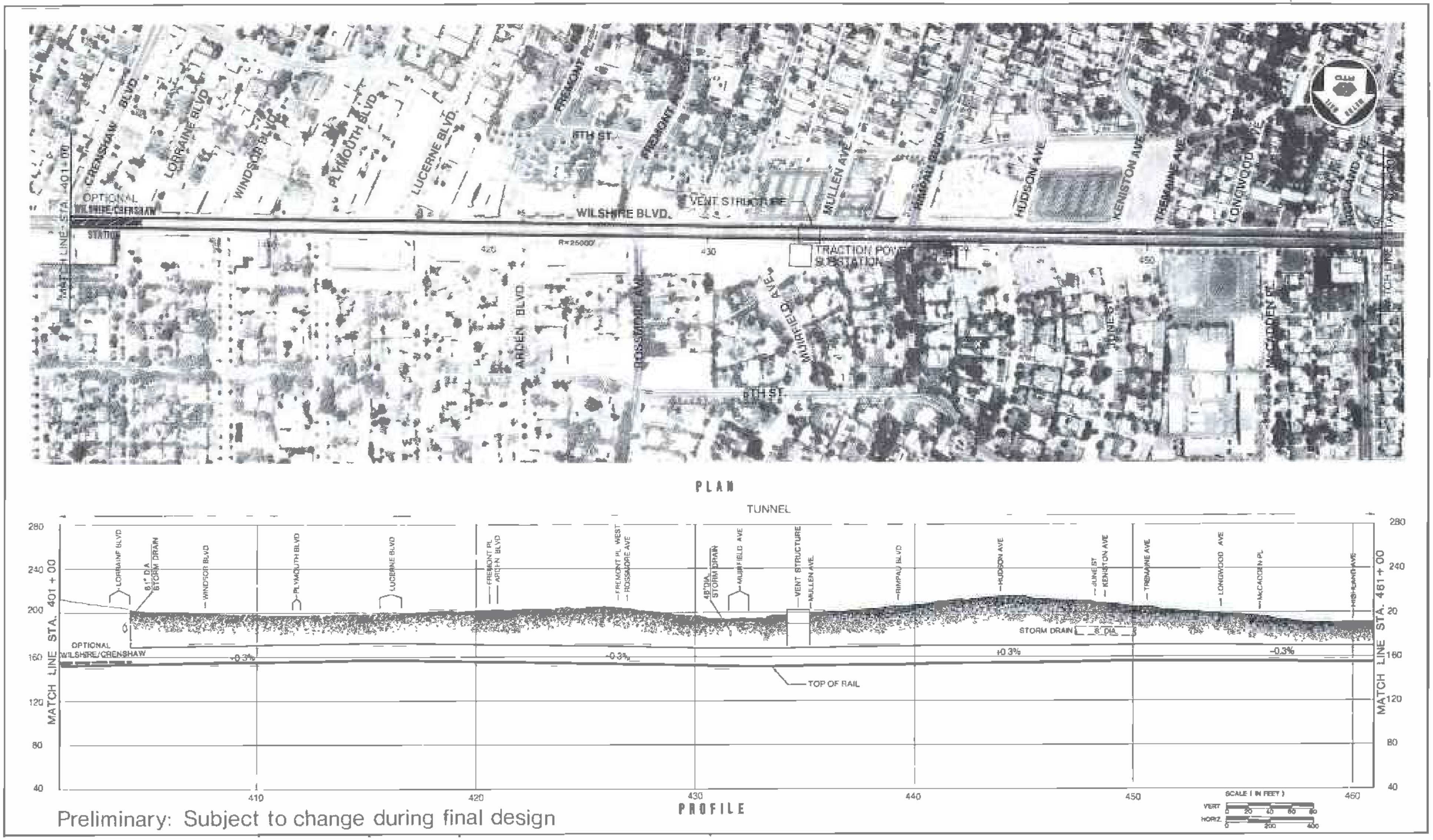
Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.7 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

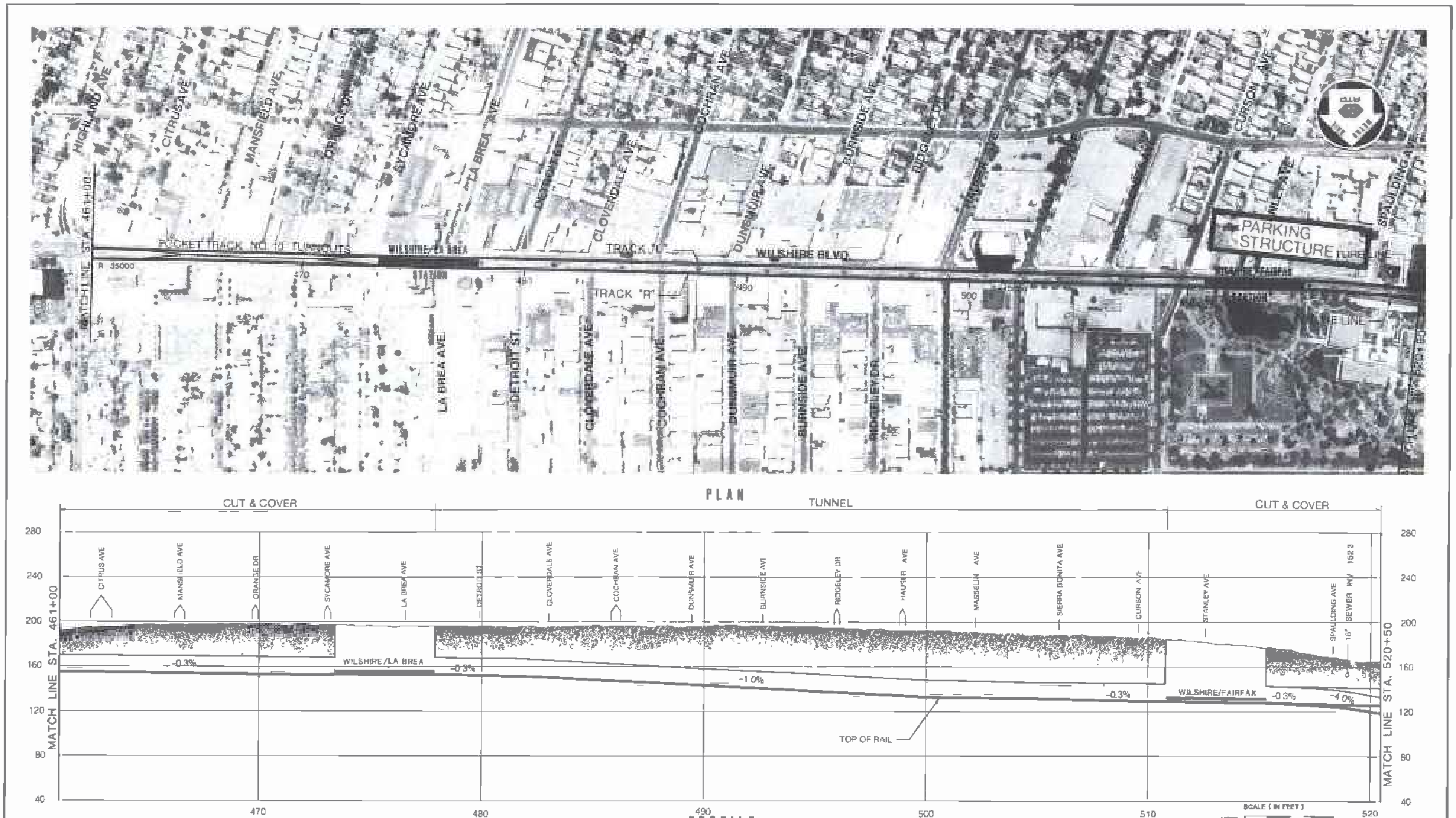


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·4·8 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

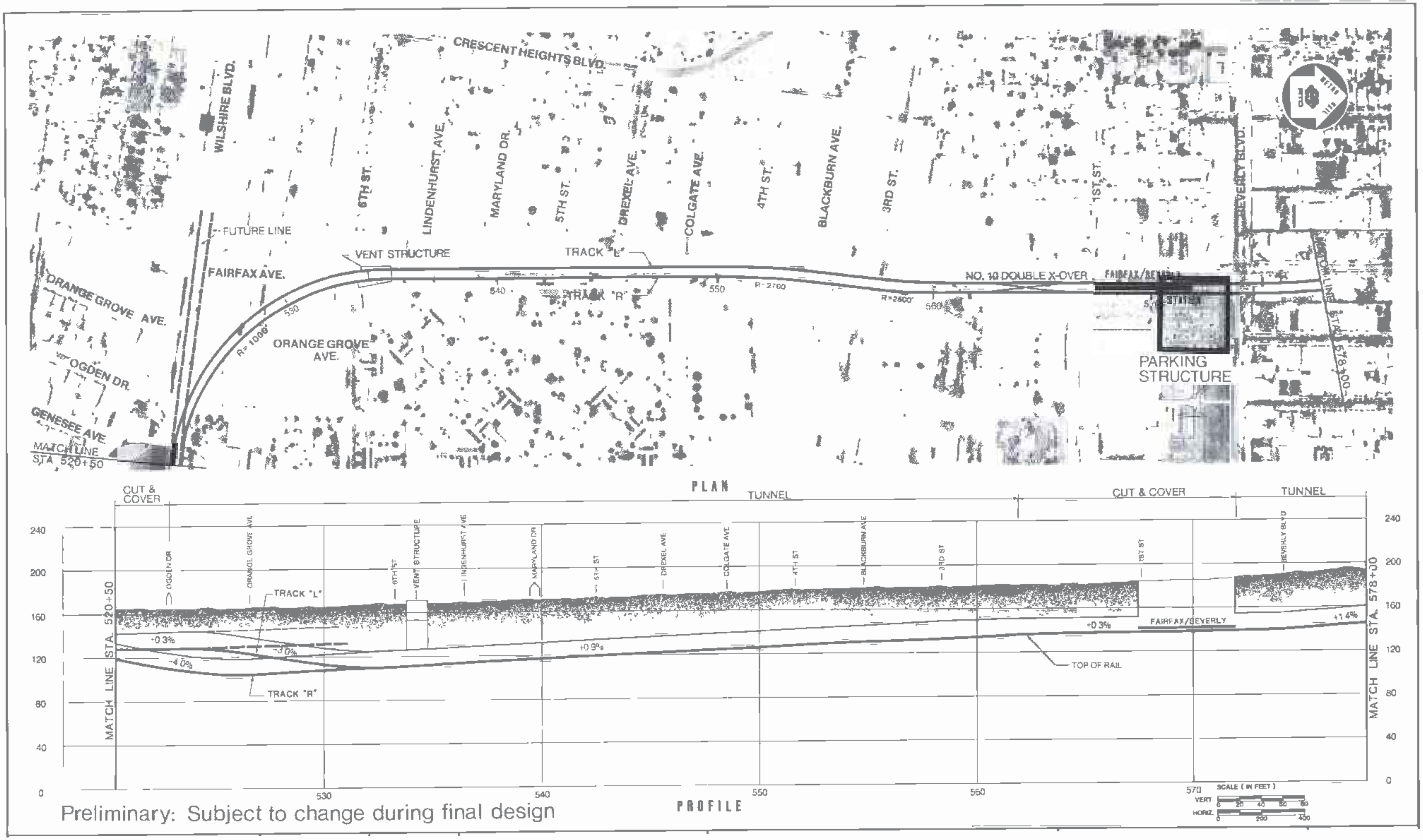


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.9 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD



Preliminary: Subject to change during final design

Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2·4·10 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

Preliminary: Subject to change during final design

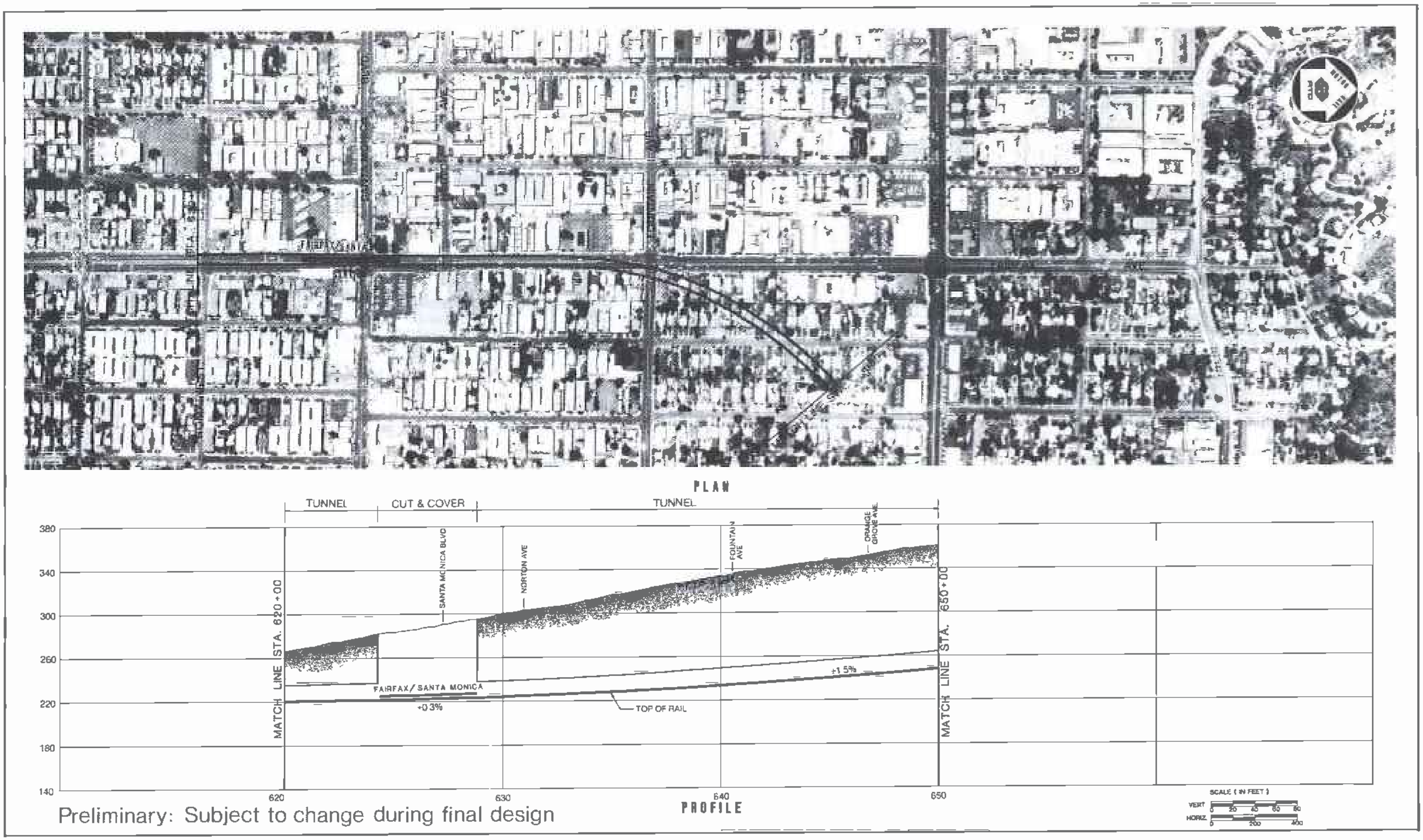
Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.11 Alignment for Locally Preferred Alternative

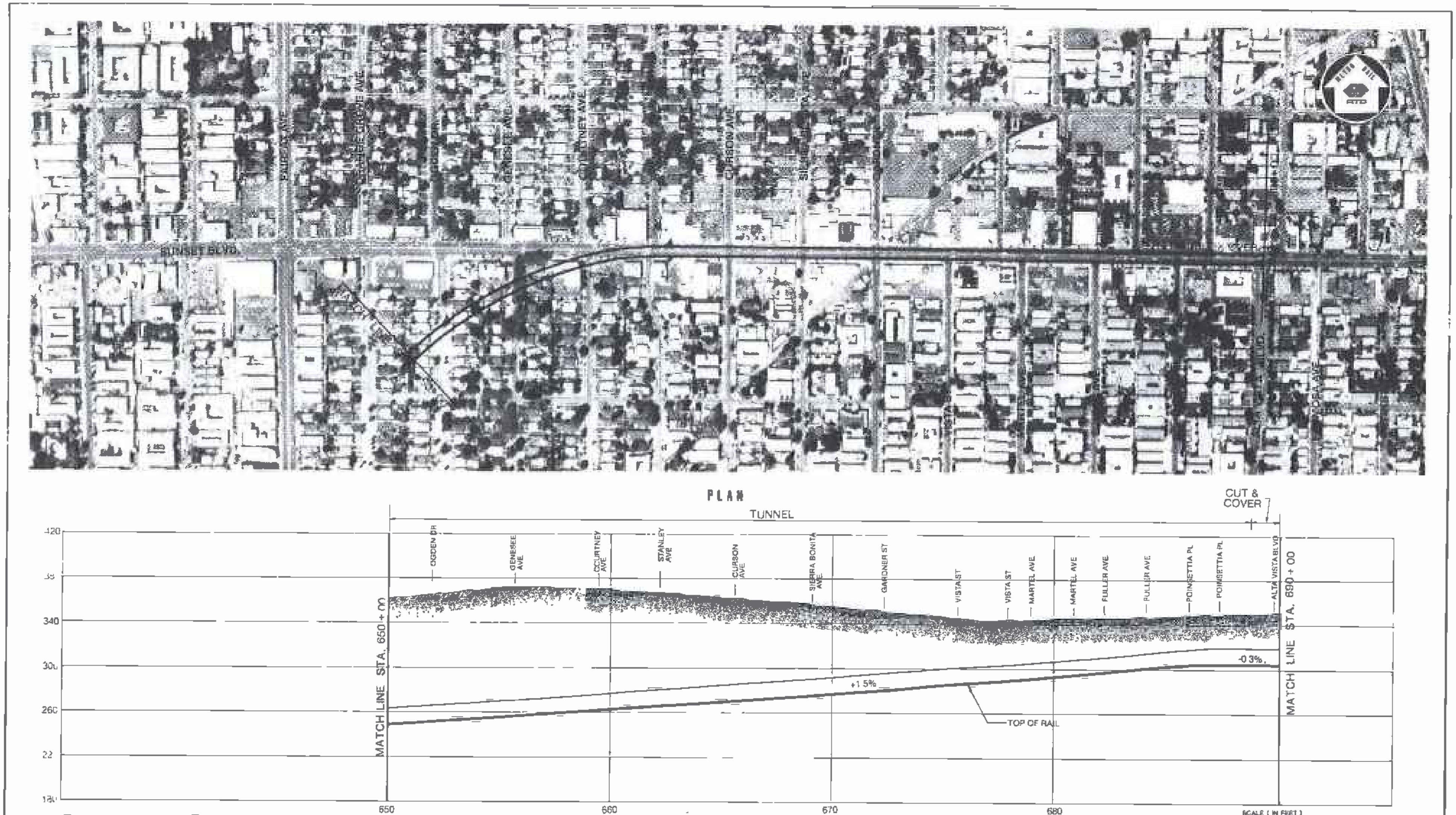
Source: DMJM/PBQD



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.12 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

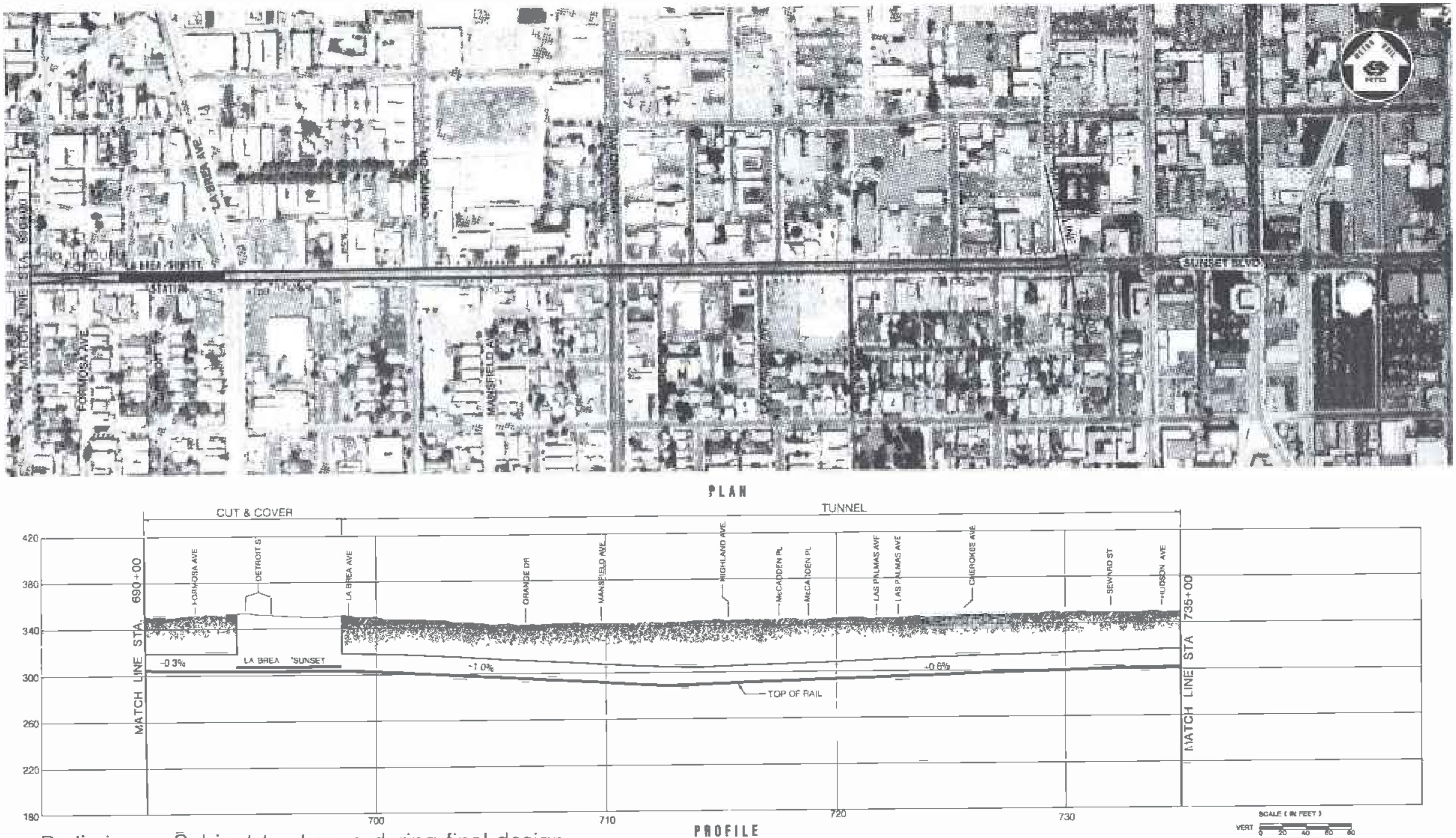


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.13 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD



Preliminary: Subject to change during final design

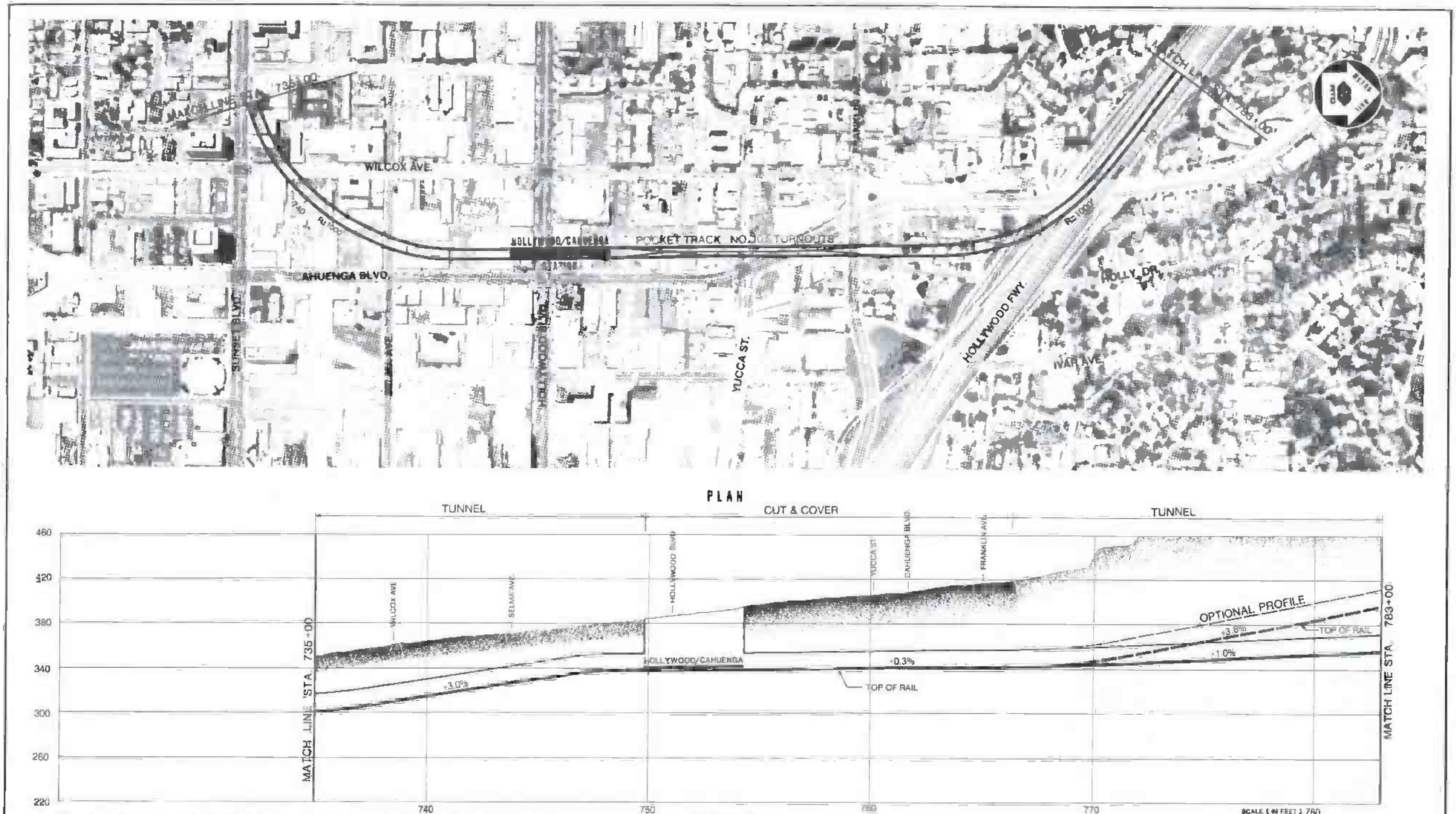
Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.14 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

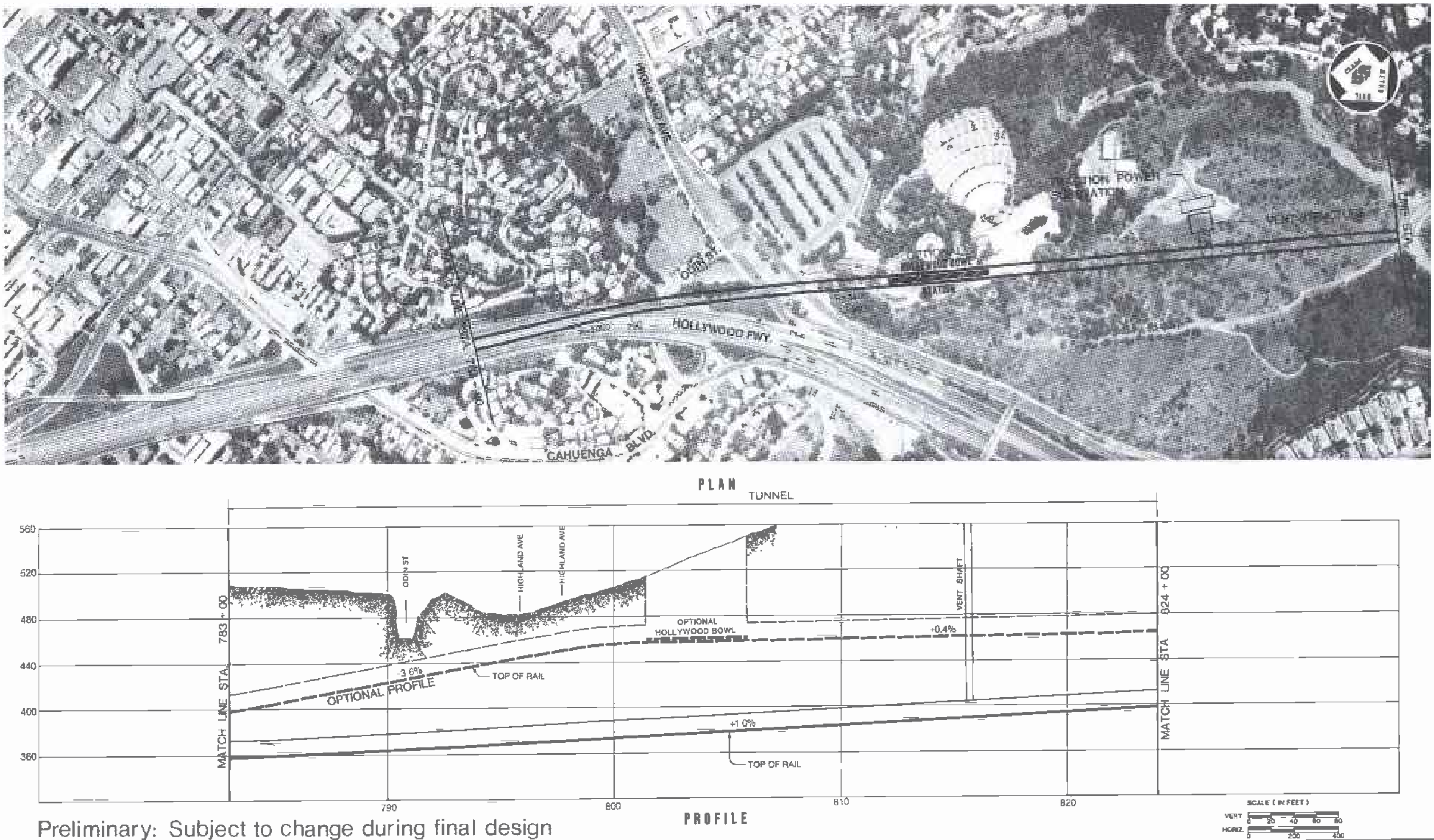


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.15 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

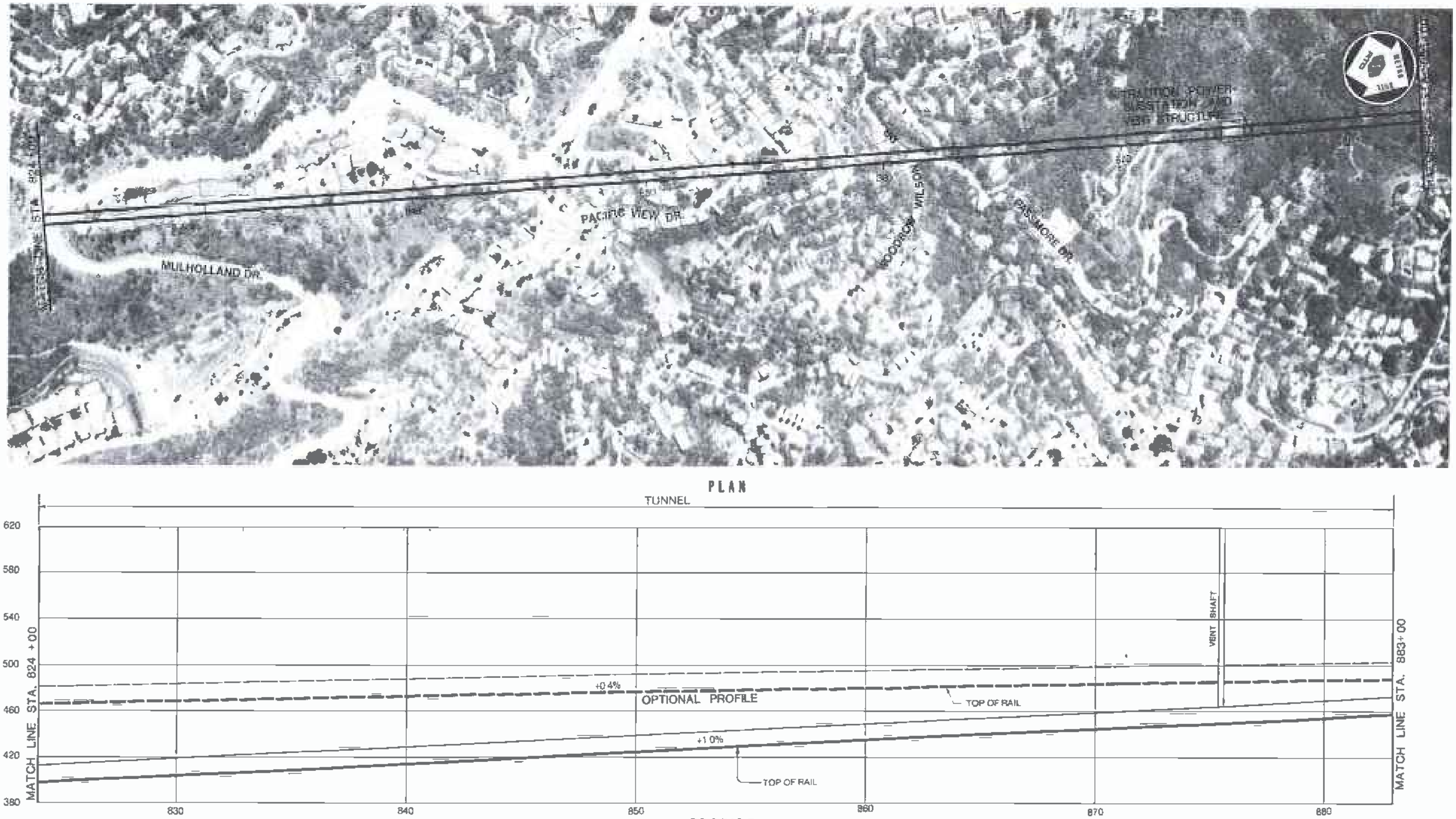


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.16 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

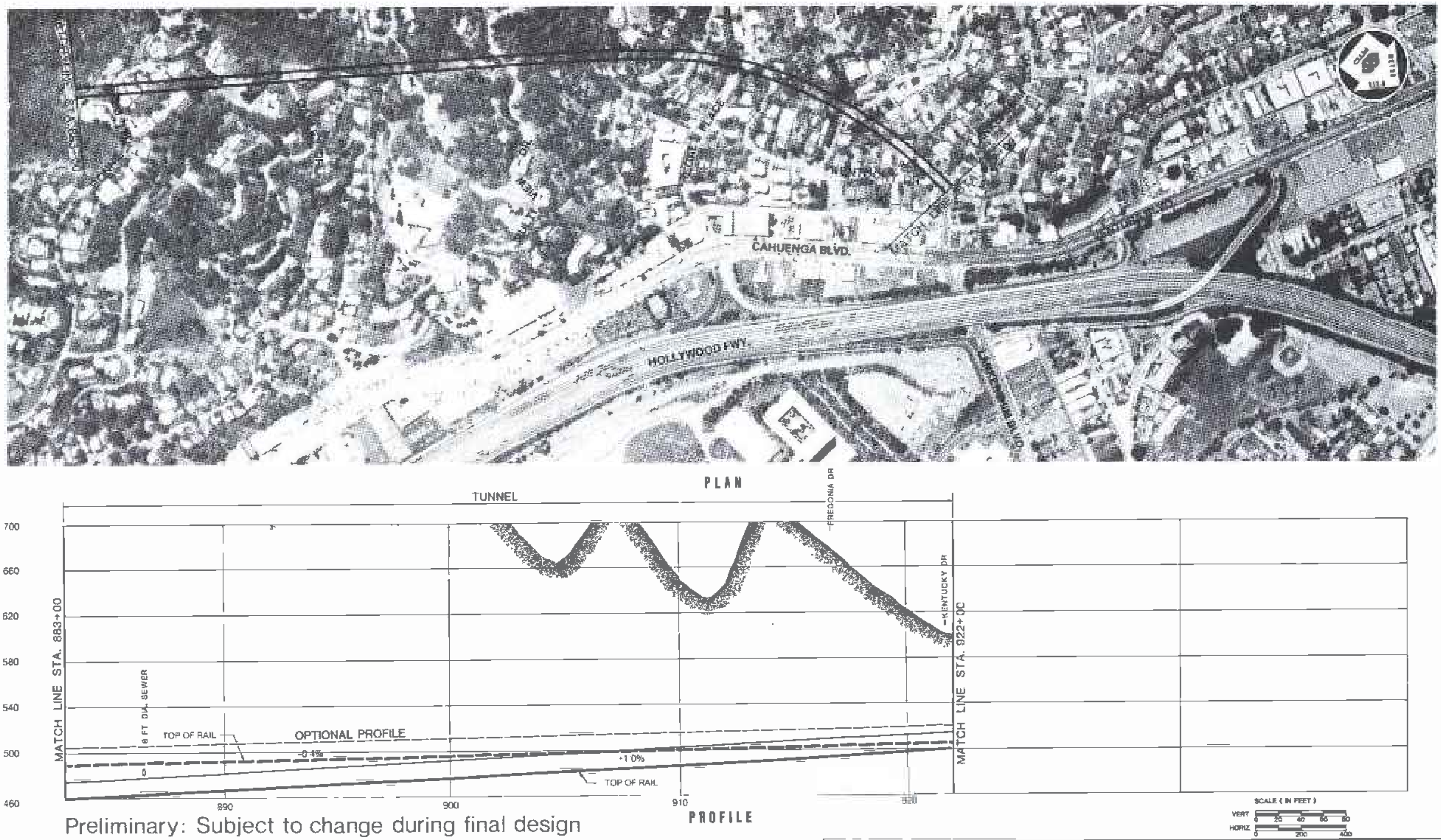


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.17 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

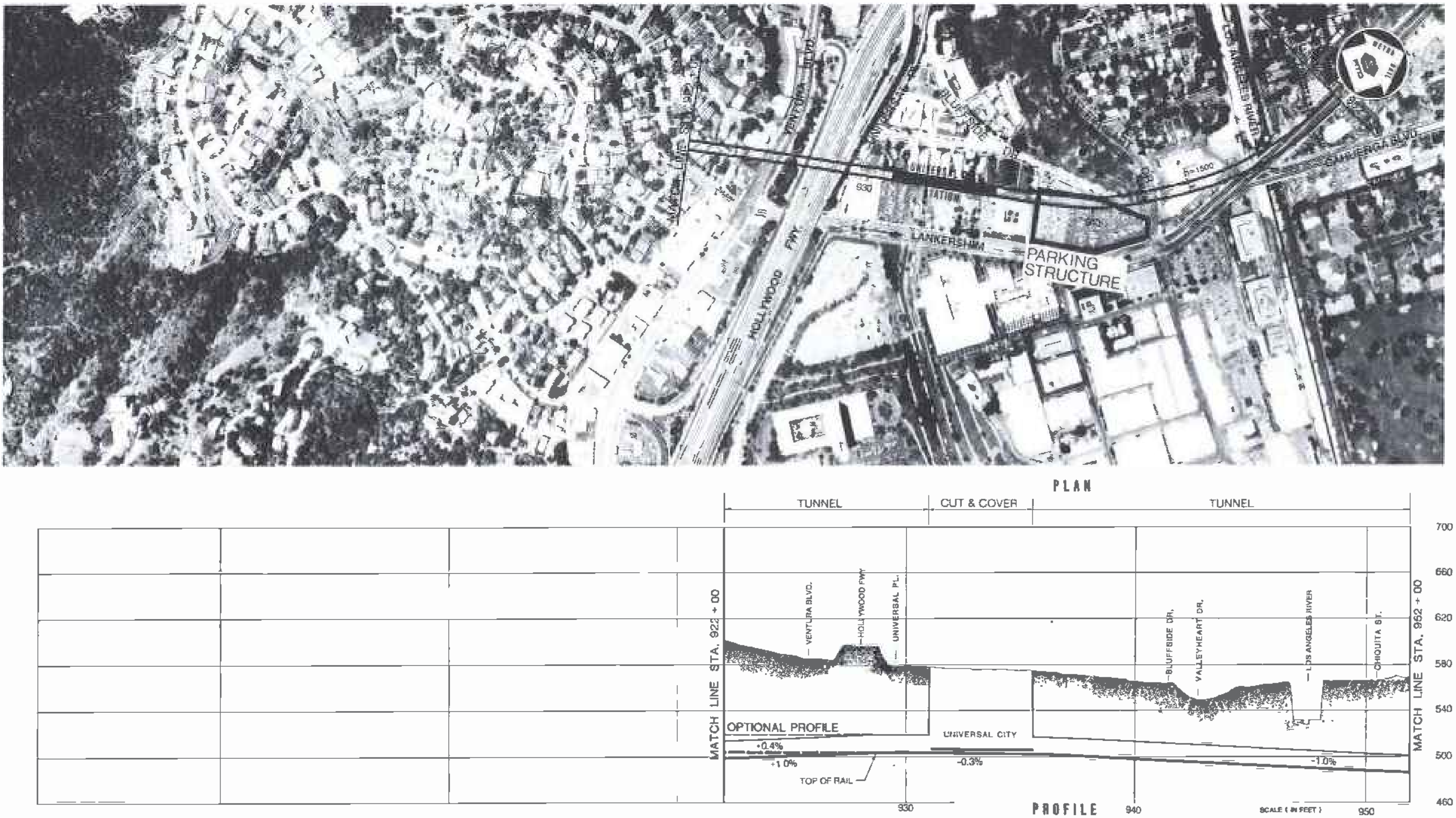


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.18 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

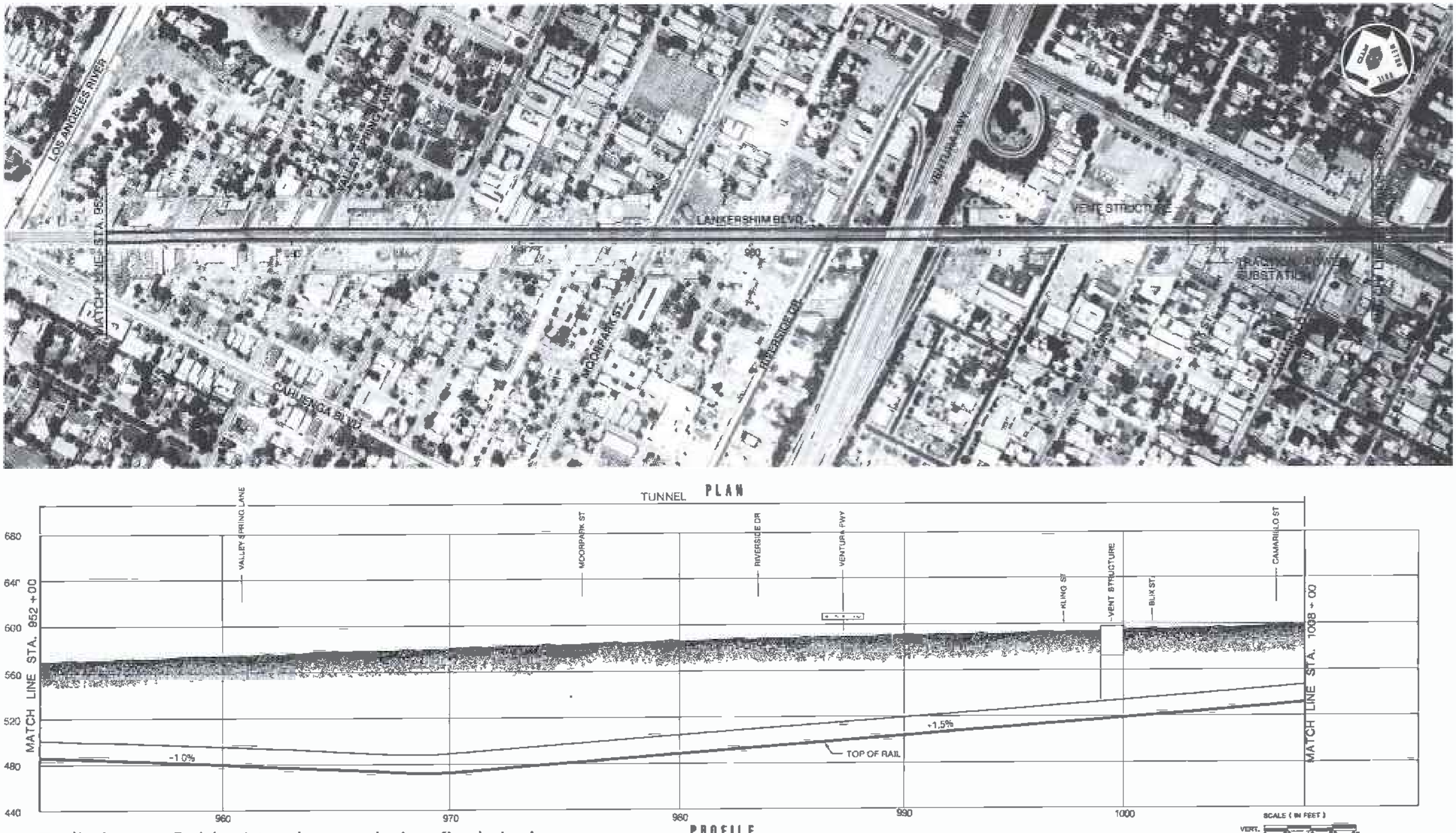


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.19 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD



Preliminary: Subject to change during final design

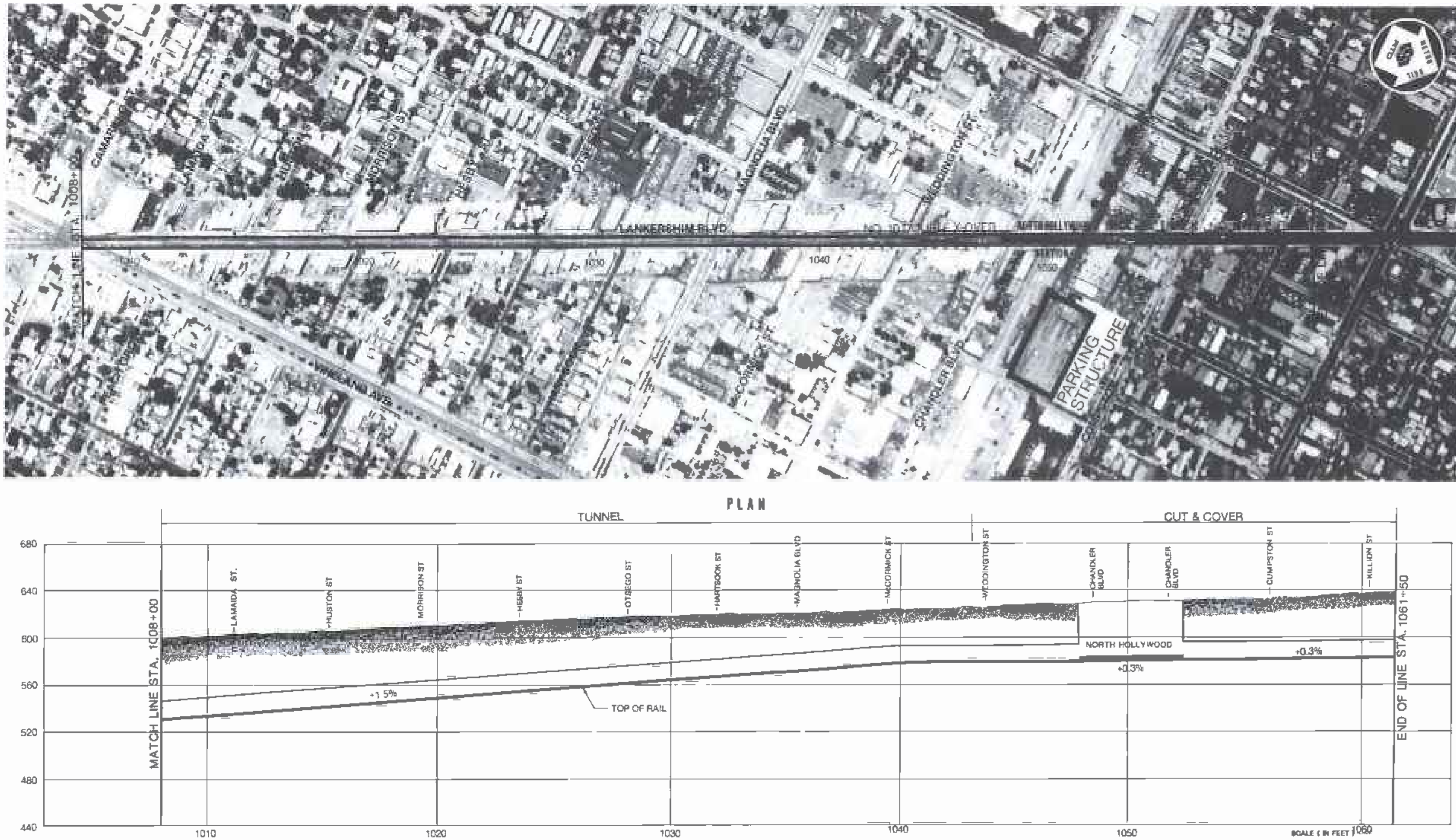
Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.20 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD



Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-4.21 Alignment for Locally Preferred Alternative

Source: DMJM/PBQD

signs, and amenities for patrons' needs and comfort. The space that patrons enter before ticketing is designated a "free" area, and the space after ticketing is designated a "paid" area. As a cost reduction measure, center support columns are proposed in the mezzanine area.

Architectural Design. Certain station elements will be standardized for economy and ease of use and to establish an identity for the system as a whole. Escalators, stairs, and elevators connect access points to fare collection areas and train platforms and all stations will have appropriate lighting and ventilation.

Fare Collection. This subsystem deals with the collection of fares from passengers as well as the provision of change and tickets. Locations and types of fare collection areas vary at individual stations. Individual station equipment will vary according to patronage projections for that station, and arrangements may vary as a function of site specific mezzanine and station entrance configurations. Both barrier and barrier-free ticketing systems are being considered for the rail transit project.

Parking. At rail transit stations, two types of parking can be provided:

- Drop-off and pick-up of patrons by auto (termed "kiss and ride") requires only a small amount of space for temporary parking.

- "Park and ride" locations provide long term parking where a significant number of patrons are expected to drive themselves to the station. This will consist of surface parking lots initially. Parking structures will be built later to provide planned parking capacity.

Kiss and ride spaces are proposed at seven stations: Wilshire/Alvarado, Wilshire/Vermont, Wilshire/Fairfax, Fairfax/Beverly, Hollywood/Cahuenga, Universal City, and North Hollywood. The projected demand for kiss and ride at other stations is generally smaller and will be accommodated on streets near the station entrances. Park and ride facilities are proposed at Union Station, Wilshire/Fairfax, Fairfax/Beverly, Universal City, and North Hollywood. In order to reduce the initial cost of the system, construction of parking structures at these locations is planned, but they will be deferred until alternative funding sources have been identified. The total number of park and ride spaces planned is 3,105 initially and 9,500 ultimately. Amounts at each station are shown in Table 2-2. The structures at Universal City and North Hollywood would about be five levels, while those at the other three stations would be four levels. (An alternative at Universal City would provide two structures of three levels each.)

Bus Access. An important criterion in the location of stations is their proximity to major bus routes that provide feeder service. Bus access is provided either as off-street terminals or on-street bus bays. Off-street terminals are planned for seven stations plus the optional Wilshire/Crenshaw Station. These will include separate areas for passenger boarding/alighting and bus layover and will be used in most cases by buses terminating at the stations. On-street bus bays, or turnouts, will be provided adjacent to ten stations and will generally be used by buses not terminating at the stations. Bus terminal sizes and turnout locations for each station are also shown in Table 2-2.

Bicycle Access. Bicycle racks or lockers for bicycles are provided at all but the three CBD and Wilshire/Normandie Stations.

Equipment Spaces. These facilities house the equipment required to operate and maintain the station. The facilities include electrical distribution rooms, fan rooms,

TABLE 2-2

SUMMARY OF STATION ACCESS FEATURES

Station	Right-of-Way Location	Bus Facilities (spaces)		Auto Facilities (spaces)	
		Terminal[1]	Turnout	Park & Ride[2]	Passenger Drop-off/Pick-up[3]
Union Station	off-street	27 + 20	--	300/2,500	--
Civic Center	Hill	--	Hill	--	--
Fifth/Hill	Hill	--	--	--	--
Seventh/Flower	Seventh	--	--	--	--
Wilshire/Alvarado	off-street	--	Alvarado	--	26
Wilshire/Vermont	off-street	3 + 3	Vermont, Sixth	--	20
Wilshire/Normandie	Wilshire	--	Normandie	--	--
Wilshire/Western	Wilshire	0 + 5	Western	--	--
Wilshire/Crenshaw	Wilshire	4 + 3	--	--	--
Wilshire/La Brea	Wilshire	--	La Brea	--	--
Wilshire/Fairfax	Wilshire	10 + 10	Wilshire	200/1,000	In Park & Ride lot
Fairfax/Beverly	off-street	--	Beverly	250/1,000	In Park & Ride lot
Fairfax/Santa Monica	Fairfax	--	Santa Monica	--	--
La Brea/Sunset	Sunset	--	--	--	--
Hollywood Cahuenga	off-street	3 + 6	--	--	99
Universal City	off-street	8 + 10	--	1,175/2,500	40
North Hollywood	Lankershim	6 + 6	Chandler	1,180/2,500	65

Source: SCRTD, Milestone 10 Report: Fixed Facilities, 1983.

Note: Bicycle racks or lockers will be provided at all but the three CBD stations and Wilshire/Normandie.

[1]Bus capacities shown are (de) boarding and layover locations, respectively.
[2]Park and ride capacities shown are surface-only and with-structures, respectively.
[3]Also referred to as kiss and ride.

and traction power substations that supply power to propel the passenger trains, as well as rooms for more general purpose functions such as trash collection, etc. Equipment spaces would generally be located at the track level beyond the platforms and at mezzanine levels beyond the public areas.

Station Locations. Station locations and design characteristics for the rail transit stations of the Locally Preferred Alternative with selected renderings are shown in Figures 2-5 through 2-27. Like the plans and profiles, these station plans are subject to change during Final Design.

Several optional station locations and designs are still being considered. Two versions of the Metro Rail station at Union Station are presented. One plan proposes the bus terminal be sited at Vignes Street; the other plan developed by Caltrans locates the terminal adjacent to the Passenger Terminal. The Wilshire/Crenshaw is identified as an optional station for all Project alternatives because the City of Los Angeles has not yet recommended mitigation options to eliminate potential conflicts between the station location and the city's adopted land use plans. A preliminary plan for a station at this location is presented in Figure 2-14. The Hollywood Bowl Station is considered because it offers direct service to an important cultural resource within the Regional Core. However, because its feasibility is still being examined and will not be resolved until the conclusion of Milestone 9, it too is treated as an optional station in this Draft EIS/EIR. A preliminary plan for the station is presented in Figure 2-24. Concern has been raised about the impacts of the Wilshire/Fairfax Station on paleontological resources at Rancho La Brea Tar Pits. Two alternative station locations that may mitigate such impacts are discussed in Chapter 4.

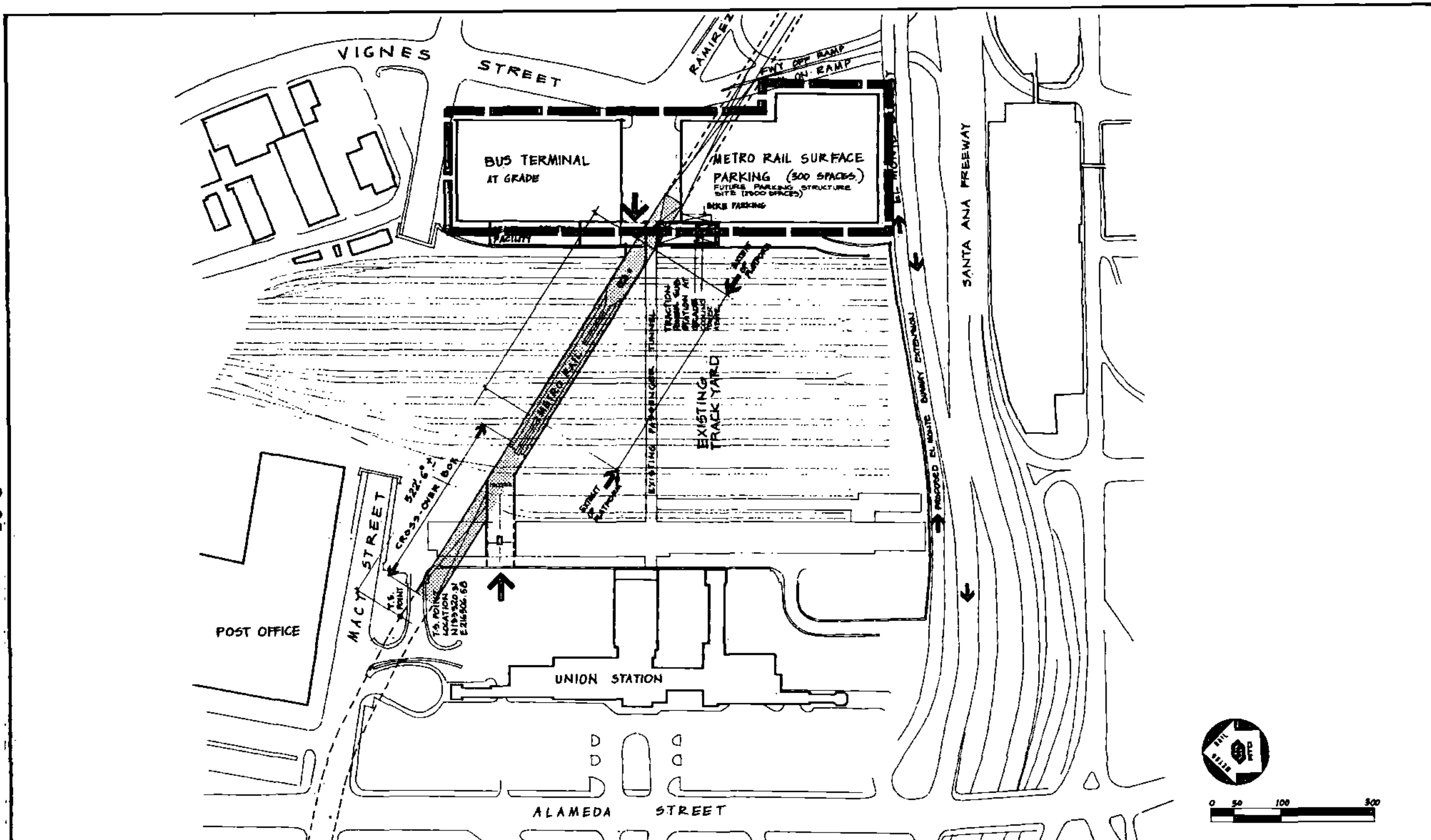
2.2.3 YARDS AND SHOPS

Common to all Project alternatives is a 45-acre major repair shop and storage yard, proposed for the downtown industrial area (Figure 2-28). The yards and shops provide space for the following functions: storage of trains when not in mainline service; dispatch, receipt, and change in trains for mainline service; interior and exterior cleaning of trains; preventive and corrective maintenance of cars; and testing of cars before revenue service and after major repairs. In addition to the main yard and shop, a minor maintenance or storage facility is proposed for each alternative. Under the Locally Preferred Alternative, operating storage will be provided by three stub-ended tail tracks, 500 feet long, north of the terminal station at Lankershim/Chandler.

2.2.4 SUBSYSTEMS

Subsystems, the operating equipment portions of the rail transit project, include passenger vehicles, train control, communications, traction power, and fare collection. The following discussion covers train control, communication, and traction power only, since the other subsystems have already been described elsewhere.

Train Control. Metro Rail trains would be controlled automatically and manually. A central control facility would be located in a separate operations control center in the downtown area near Union Station. The facility would house the necessary displays, control consoles, communication apparatus, and operating personnel responsible for the overall safety and security of passengers, and for the daily operation of



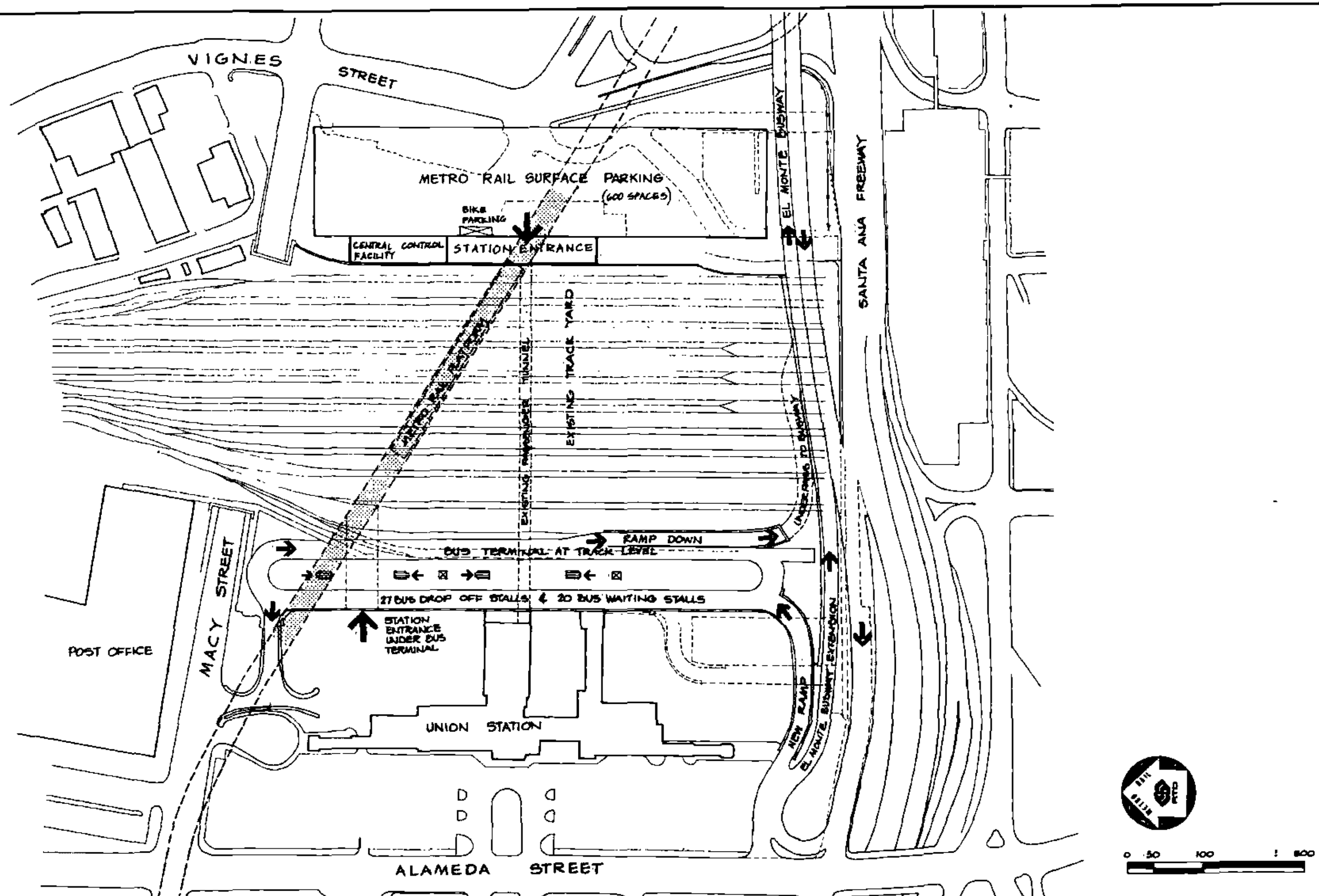
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·5

Union Station · Station Location for Locally Preferred Alternative

Harry Weese & Associates



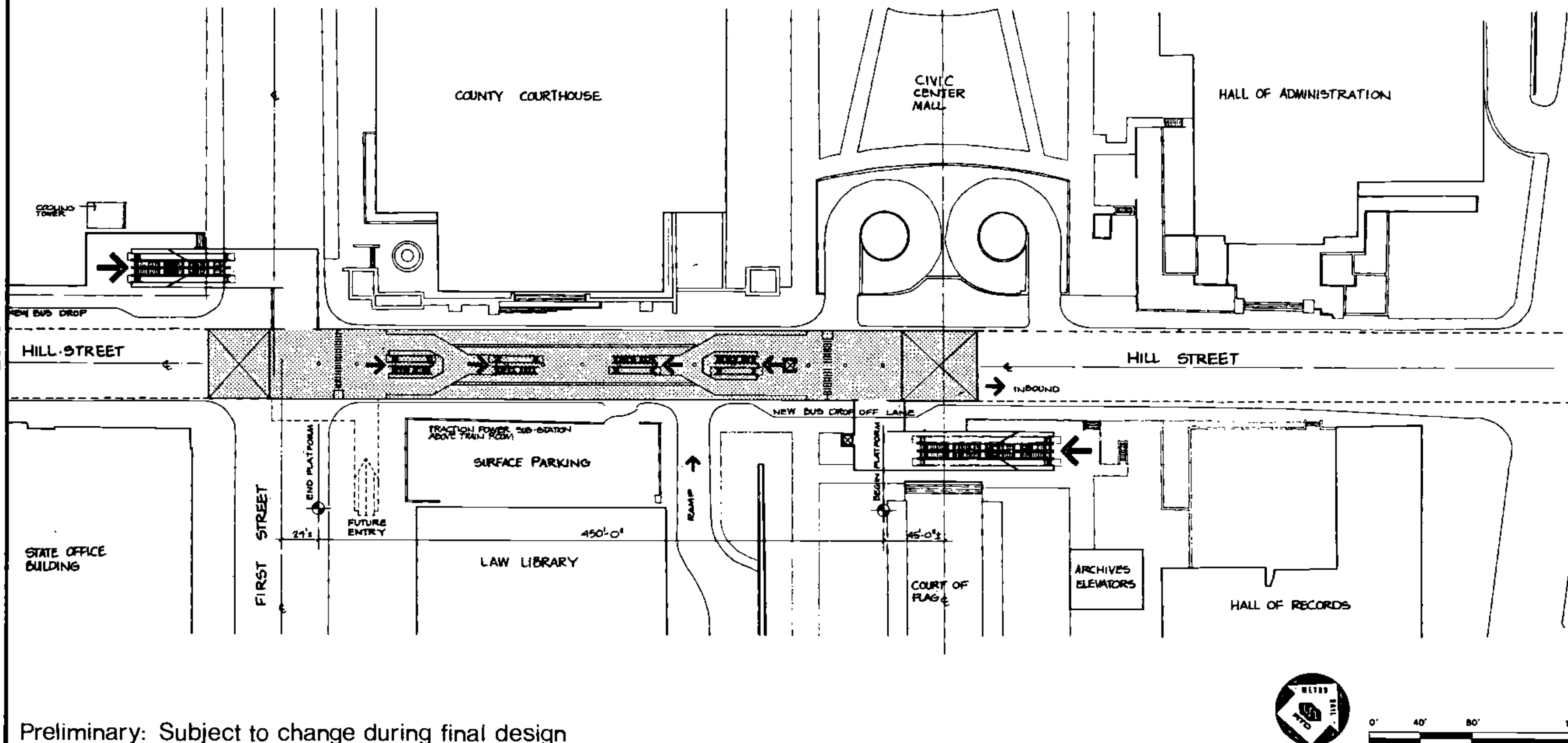
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-5.1

Union Station-Station Location (Optional)

Harry Weese & Associates



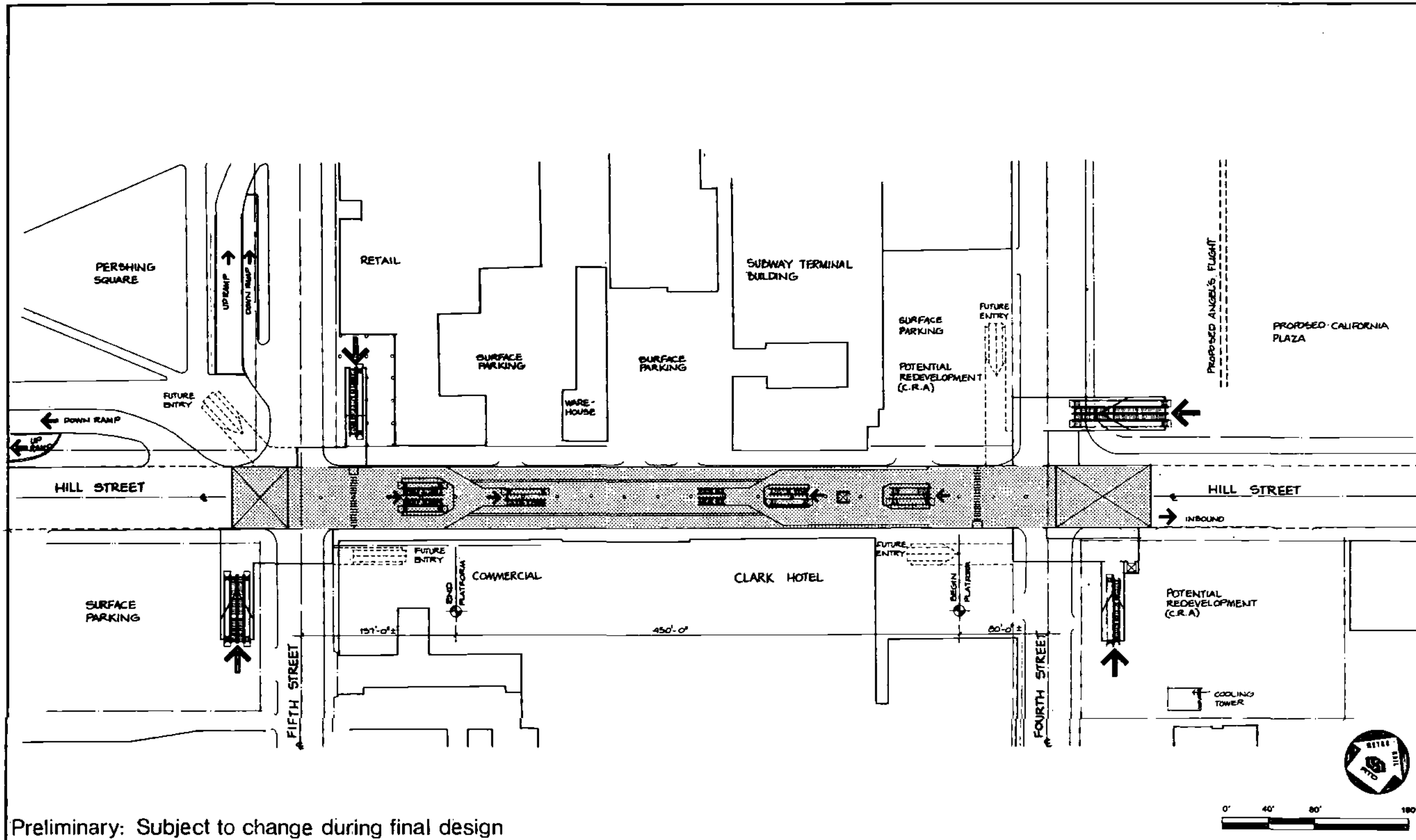
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-6

Civic Center Station Location for Locally Preferred Alternative

Harry Weese & Associates



Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-7

Fifth/Hill Station Location for Locally Preferred Alternative

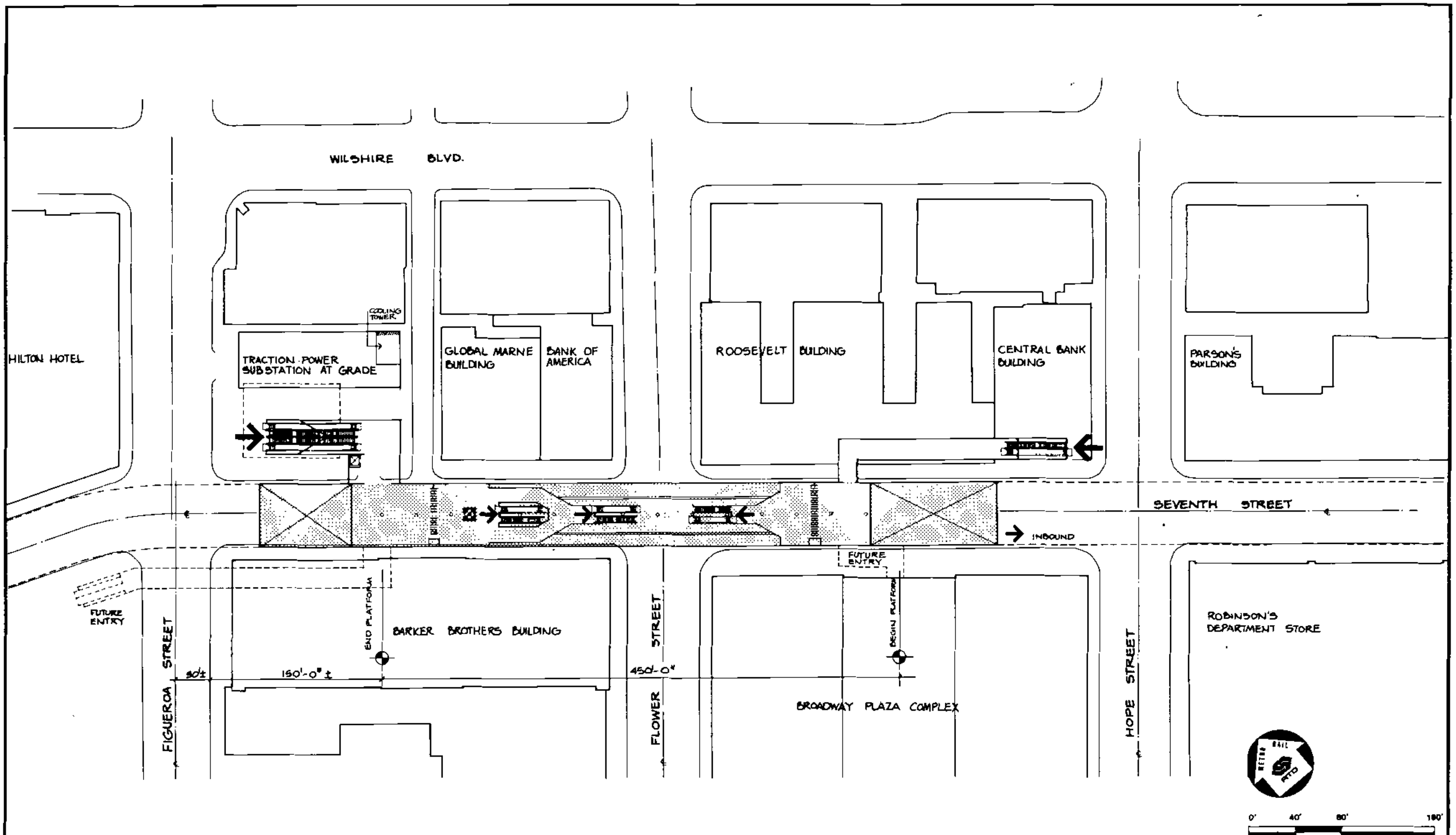
Harry Weese & Associates

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-8

Fifth / Hill Station
Cutaway Looking West

Harry Weese & Associates



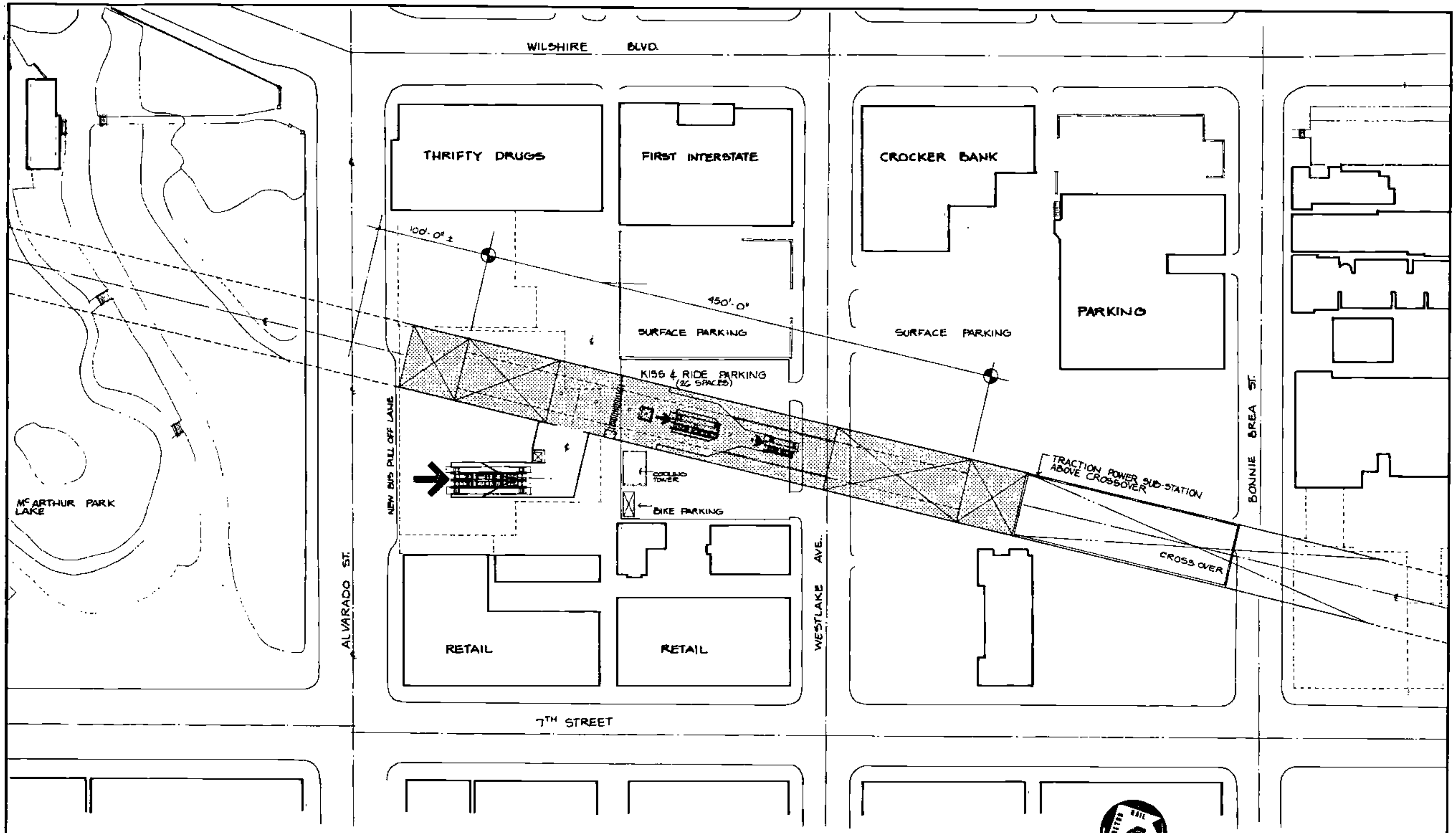
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-9

Seventh/Flower Station Location for Locally Preferred Alternative

Harry Weese & Associates



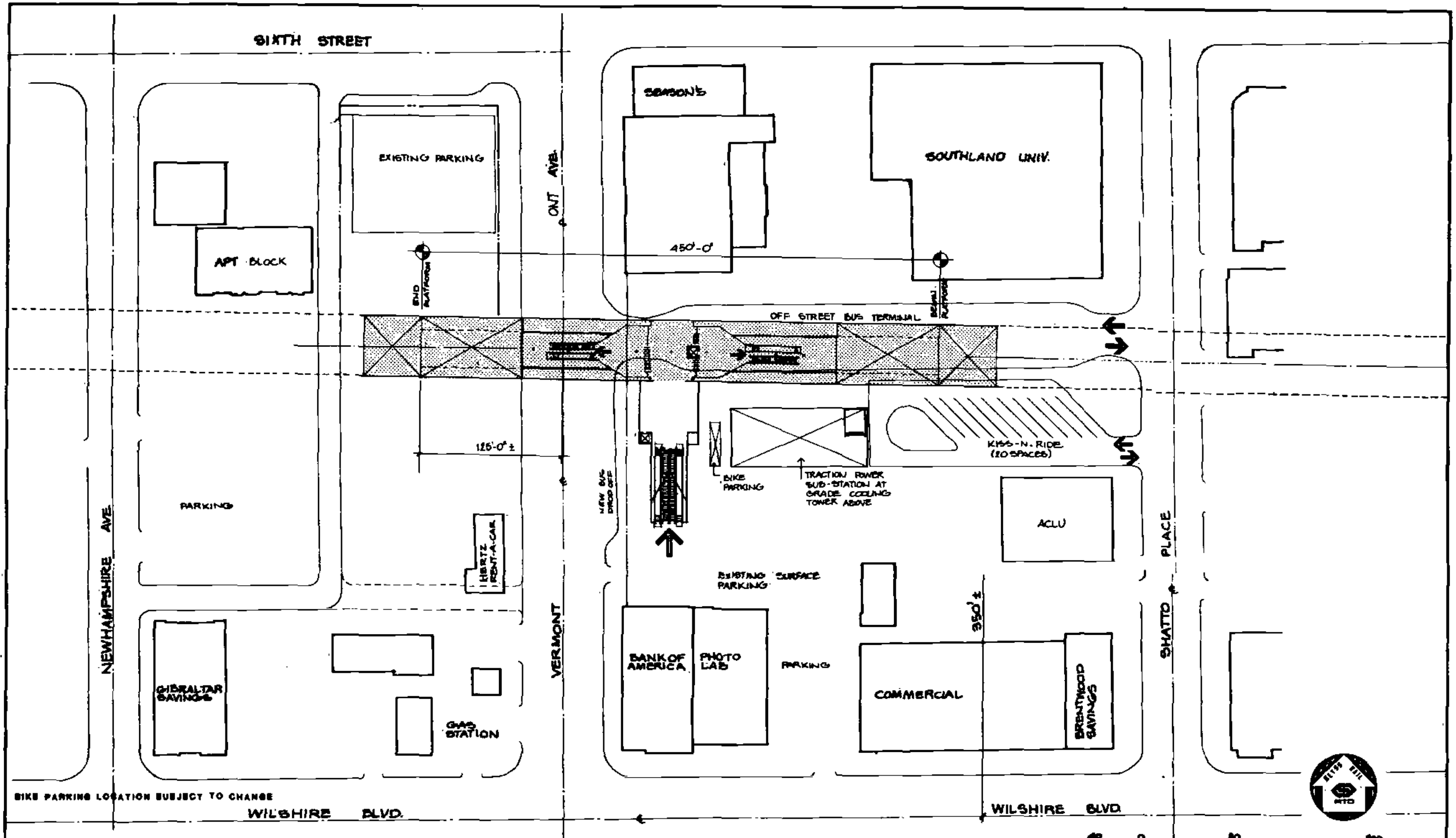
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-10

Wilshire/Alvarado Station Location for Locally Preferred Alternative

Harry Weese & Associates



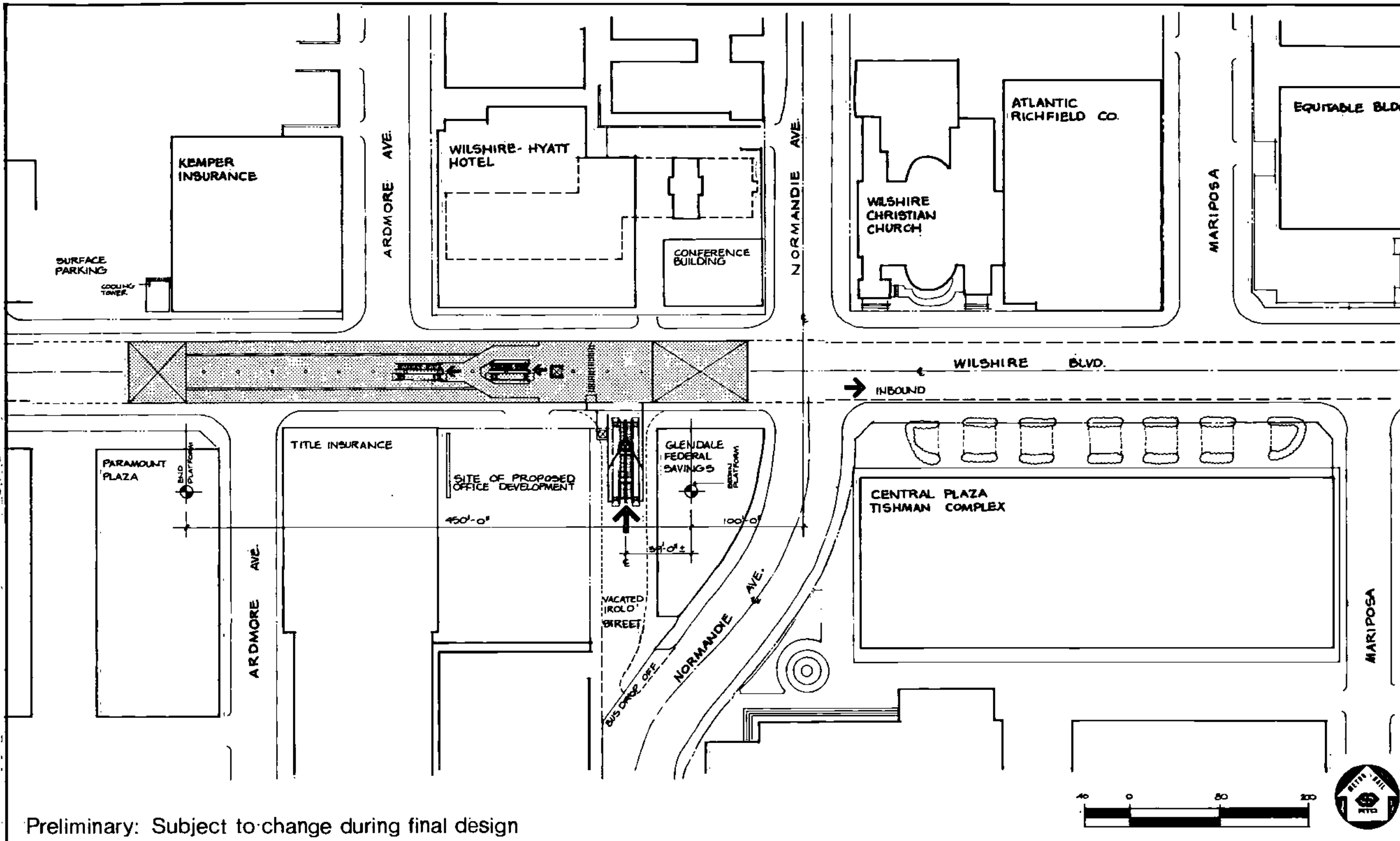
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-11

Wilshire/Vermont Station Location for Locally Preferred Alternative

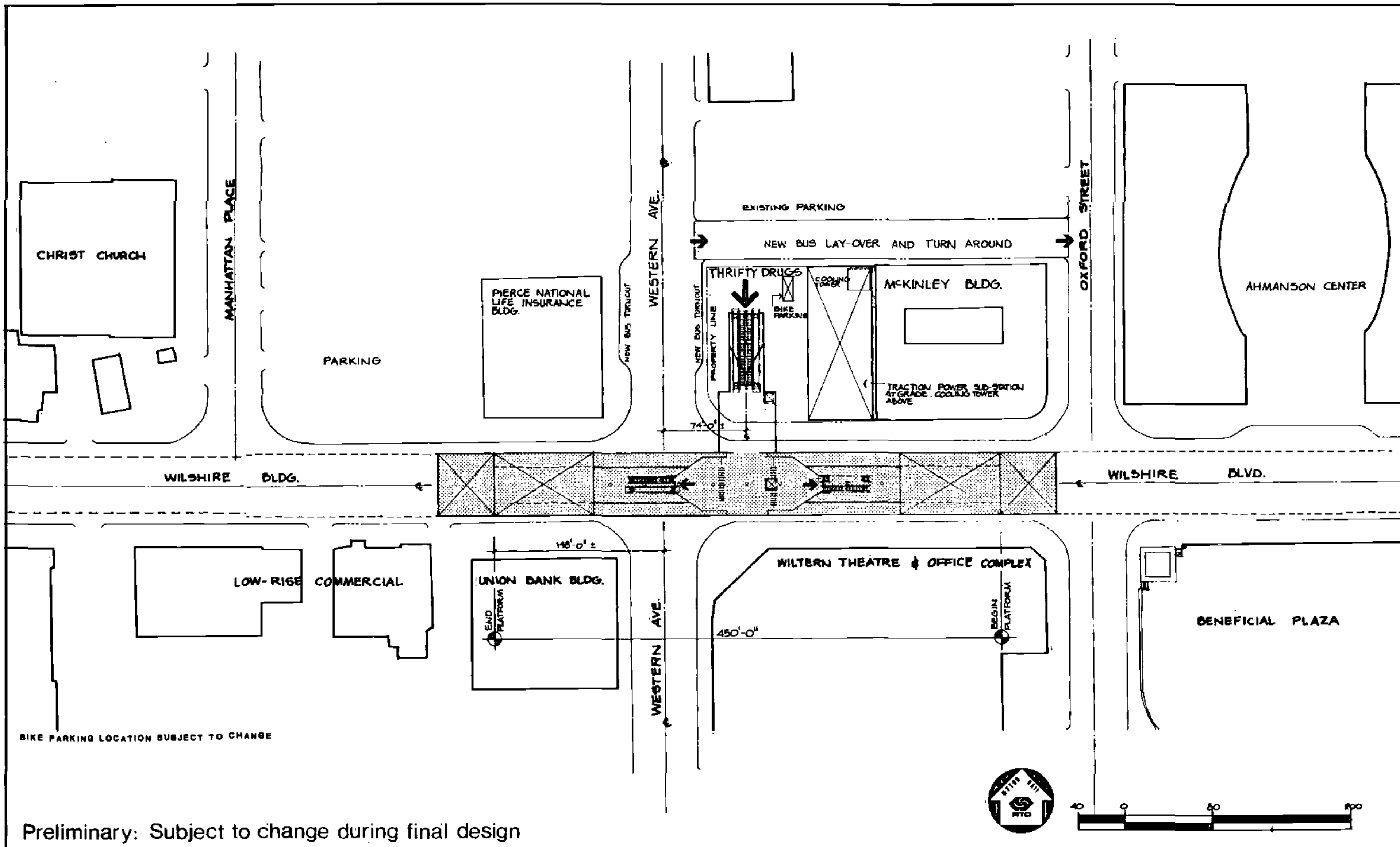
Harry Weese & Associates



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-12 **Wilshire/Normandie Station Location for Locally Preferred Alternative**

Harry Weese & Associates

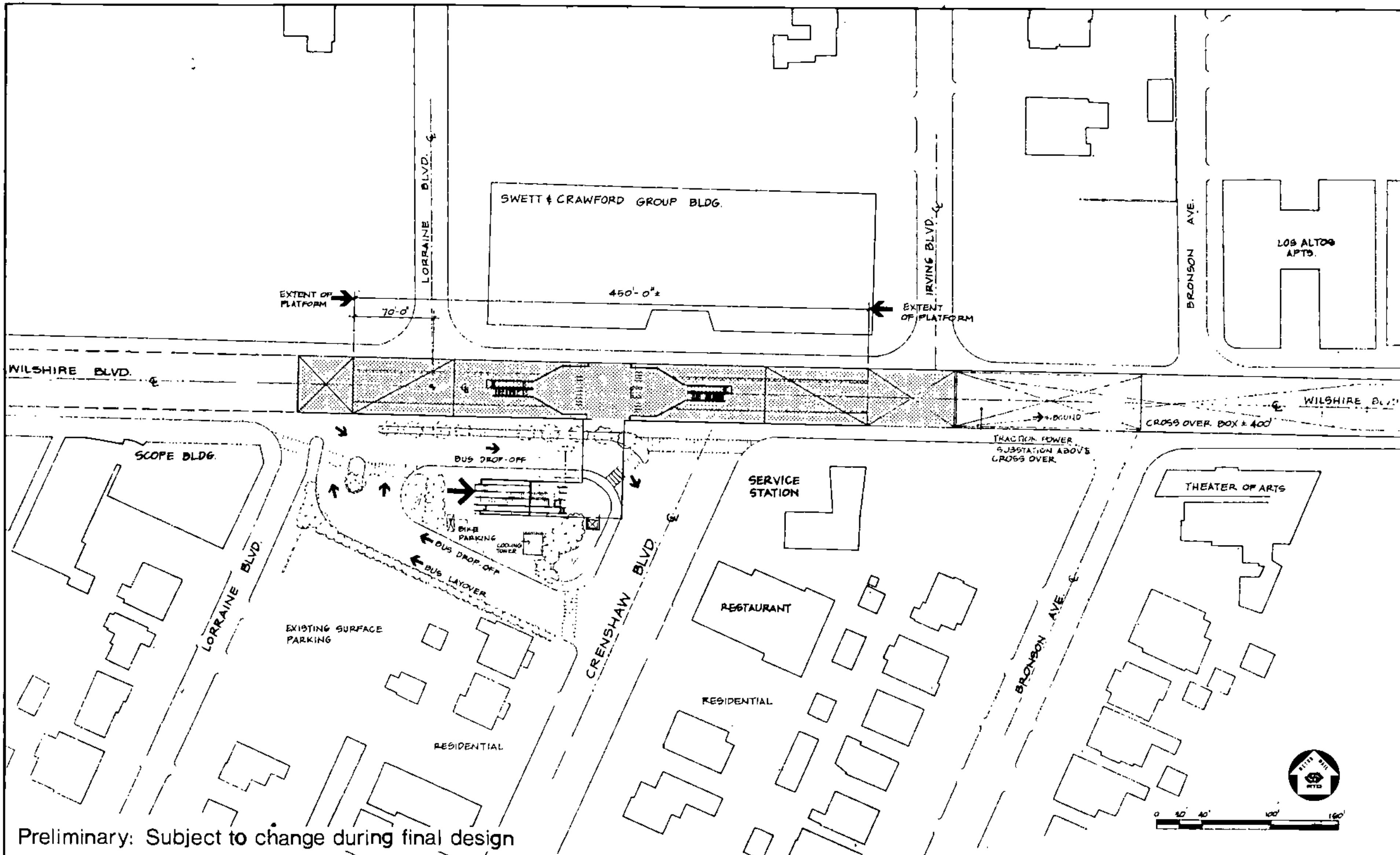


Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-13

Wilshire/Western Station Location for Locally Preferred Alternative

Harry Weese & Associates



Southern California Rapid Transit District

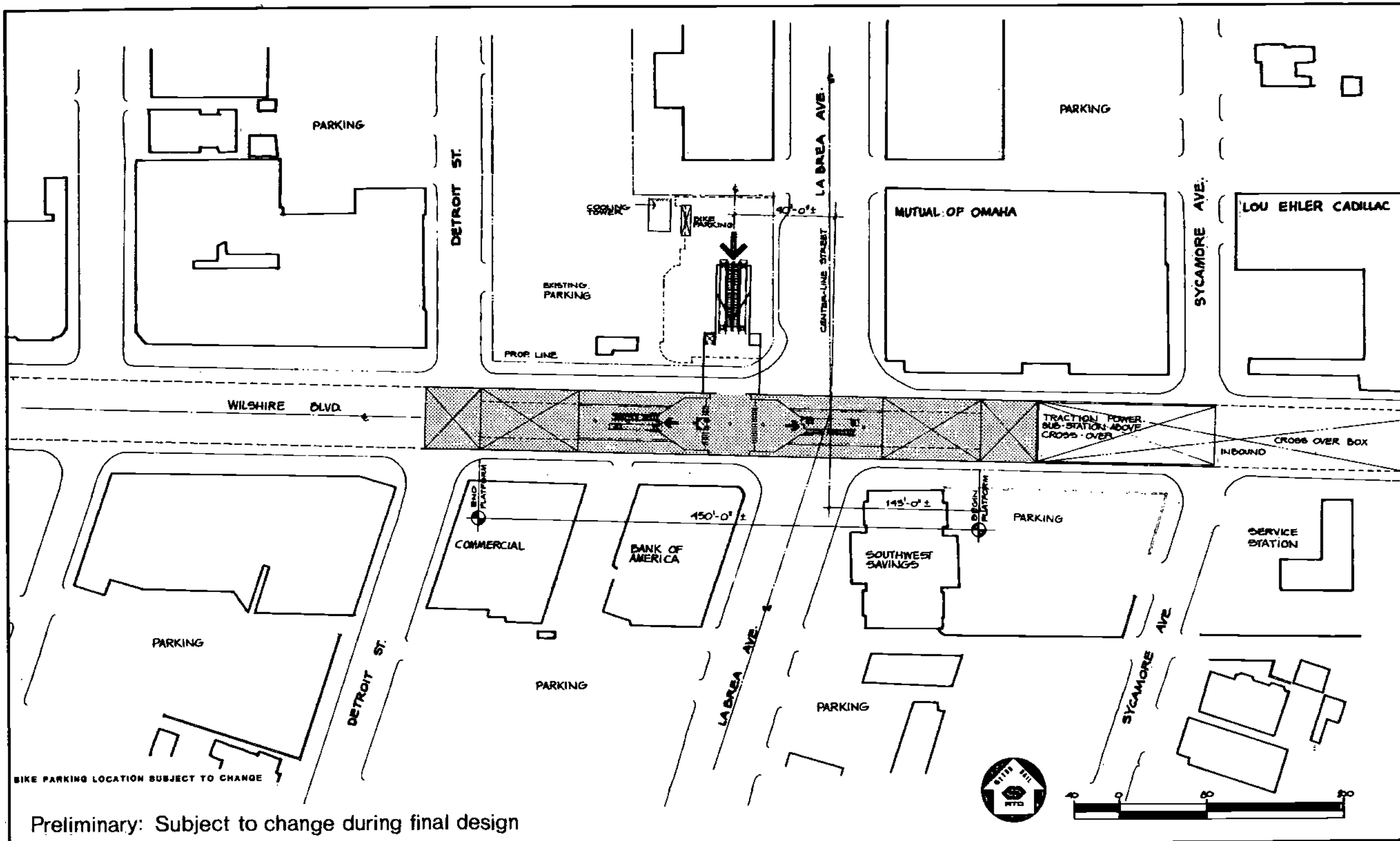
Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-14

Wilshire/Crenshaw Station Location (Optional)

Harry Weese & Associates



Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-15

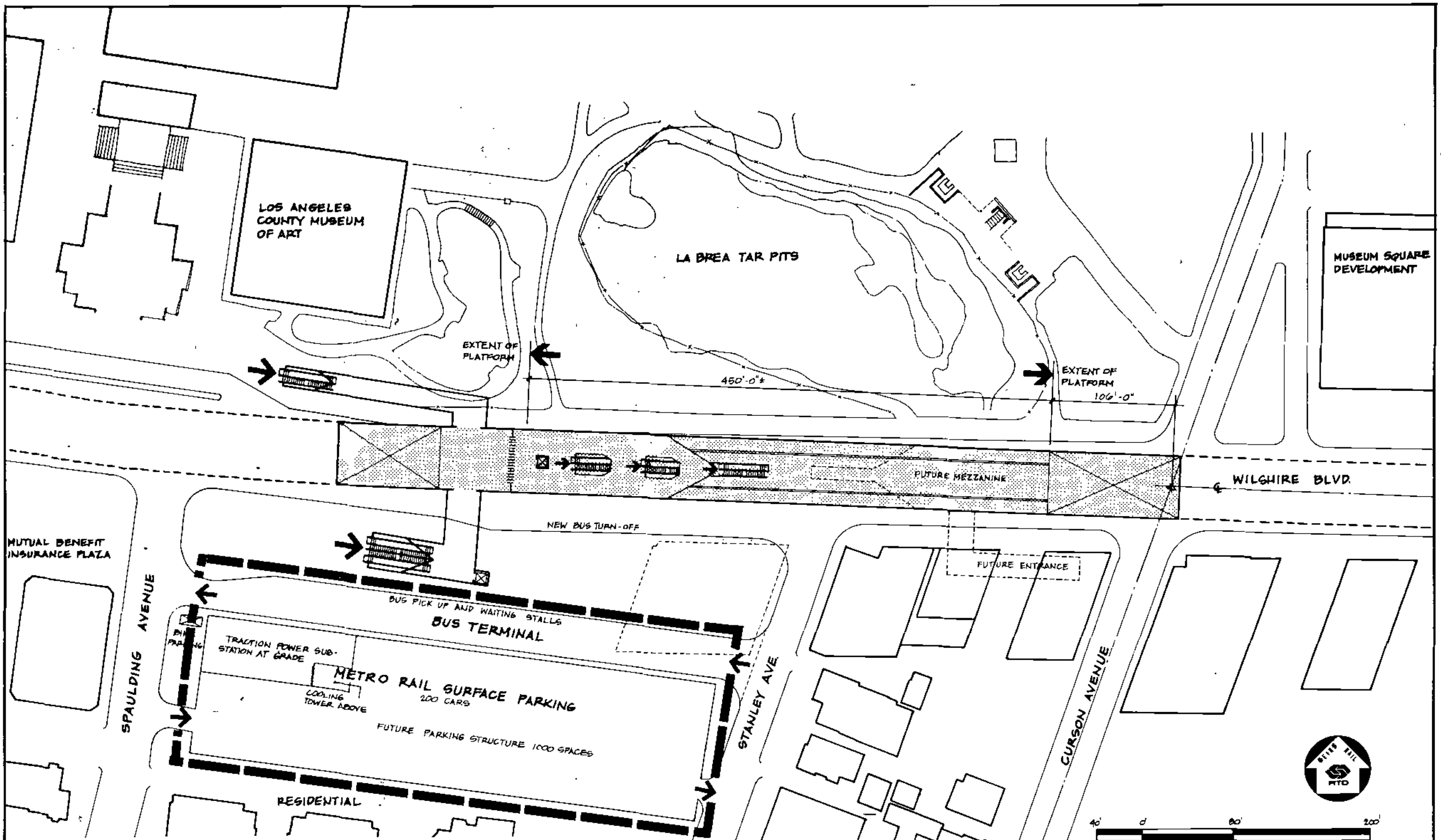
Wilshire/La Brea Station Location for Locally Preferred Alternative

Harry Weese & Associates

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-16

Wilshire/La Brea Station
Cutaway Looking North
Harry Weese & Associates



Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-17

Wilshire/Fairfax Station Location for Locally Preferred Alternative

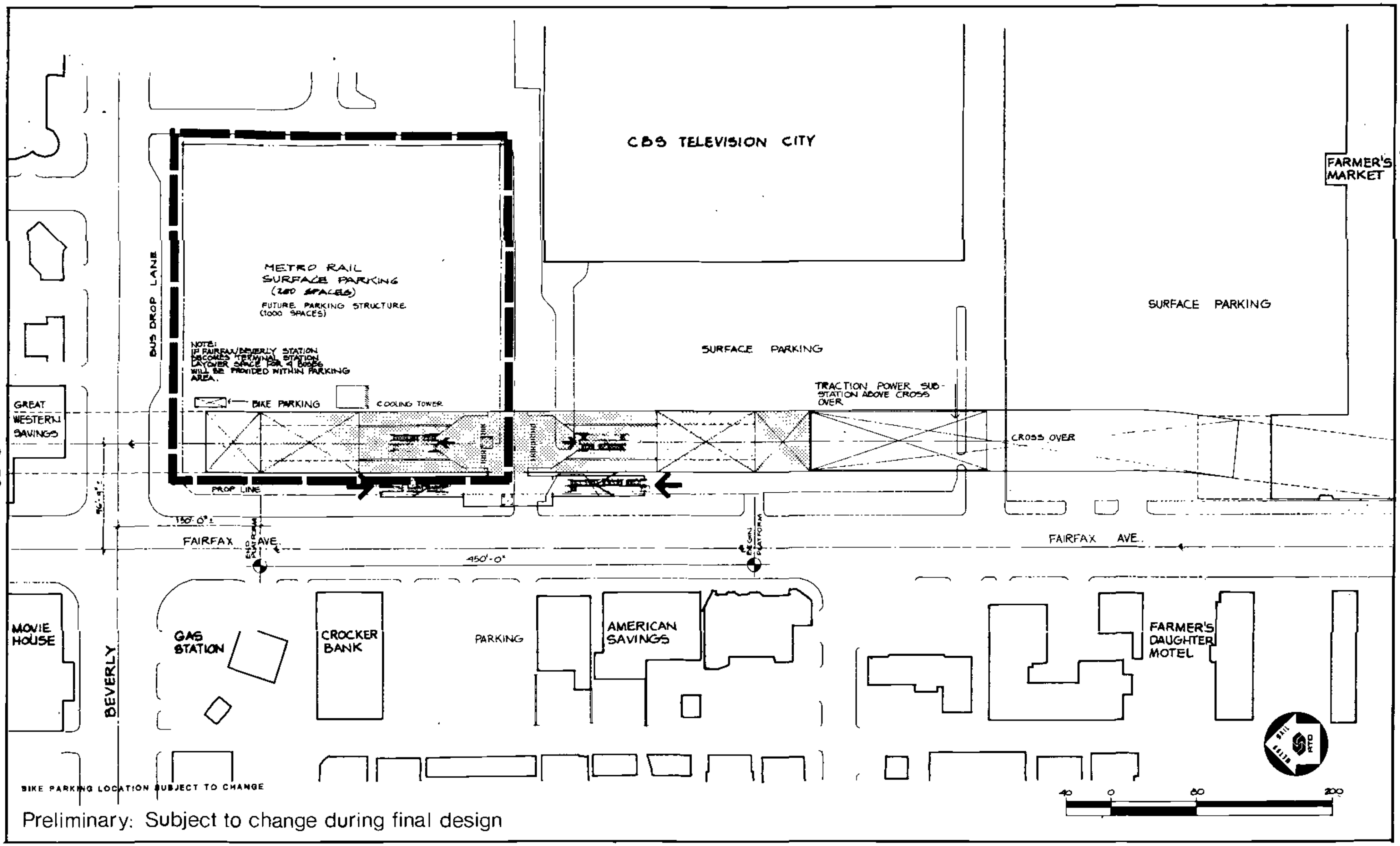
Harry Weese & Associates

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·18

Wilshire/Fairfax Station
View Looking Southeast

Harry Weese & Associates



Southern California Rapid Transit District

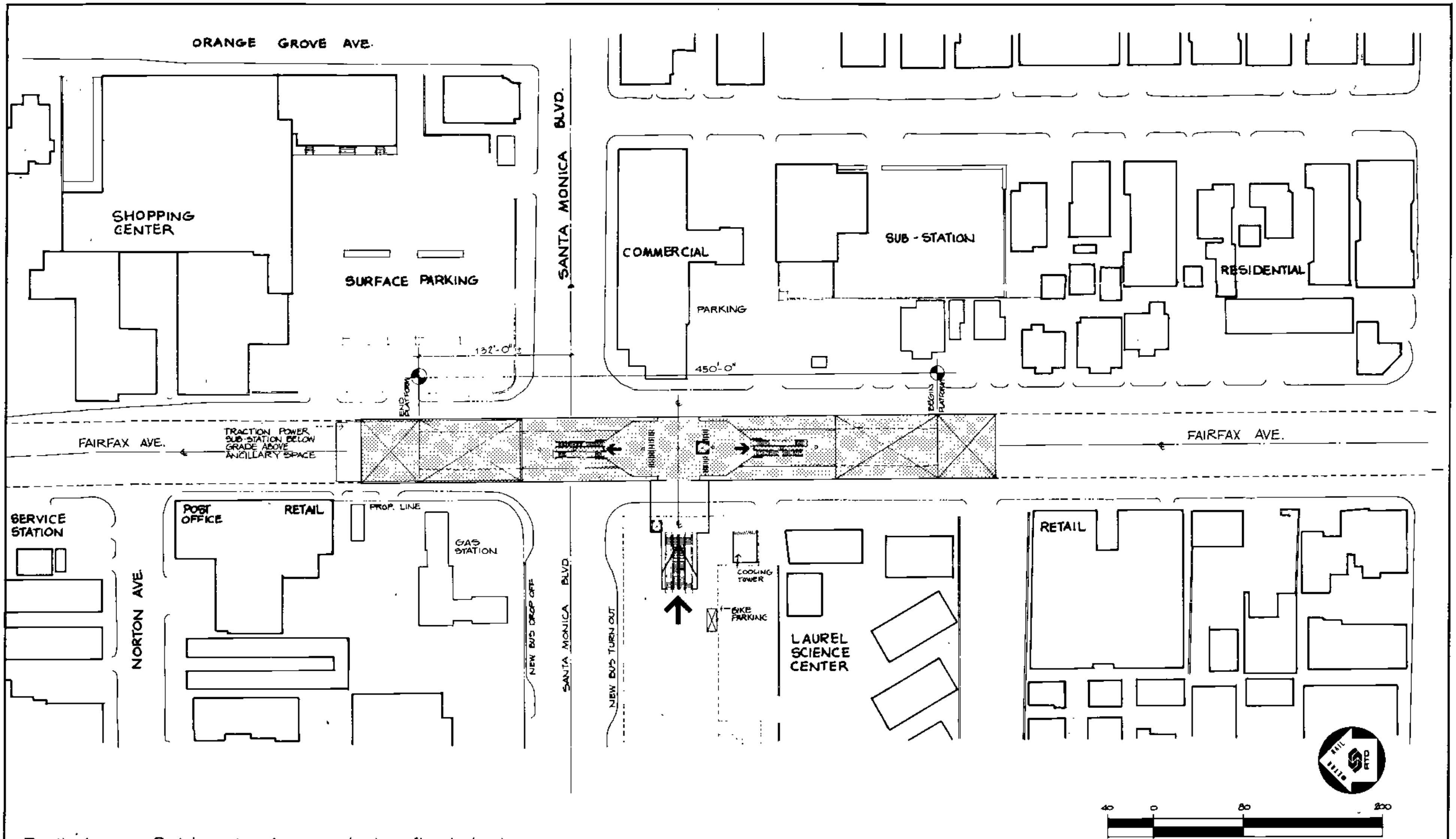
Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-19

Fairfax/Beverly Station Location for Locally Preferred Alternative

Harry Weese & Associates



Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

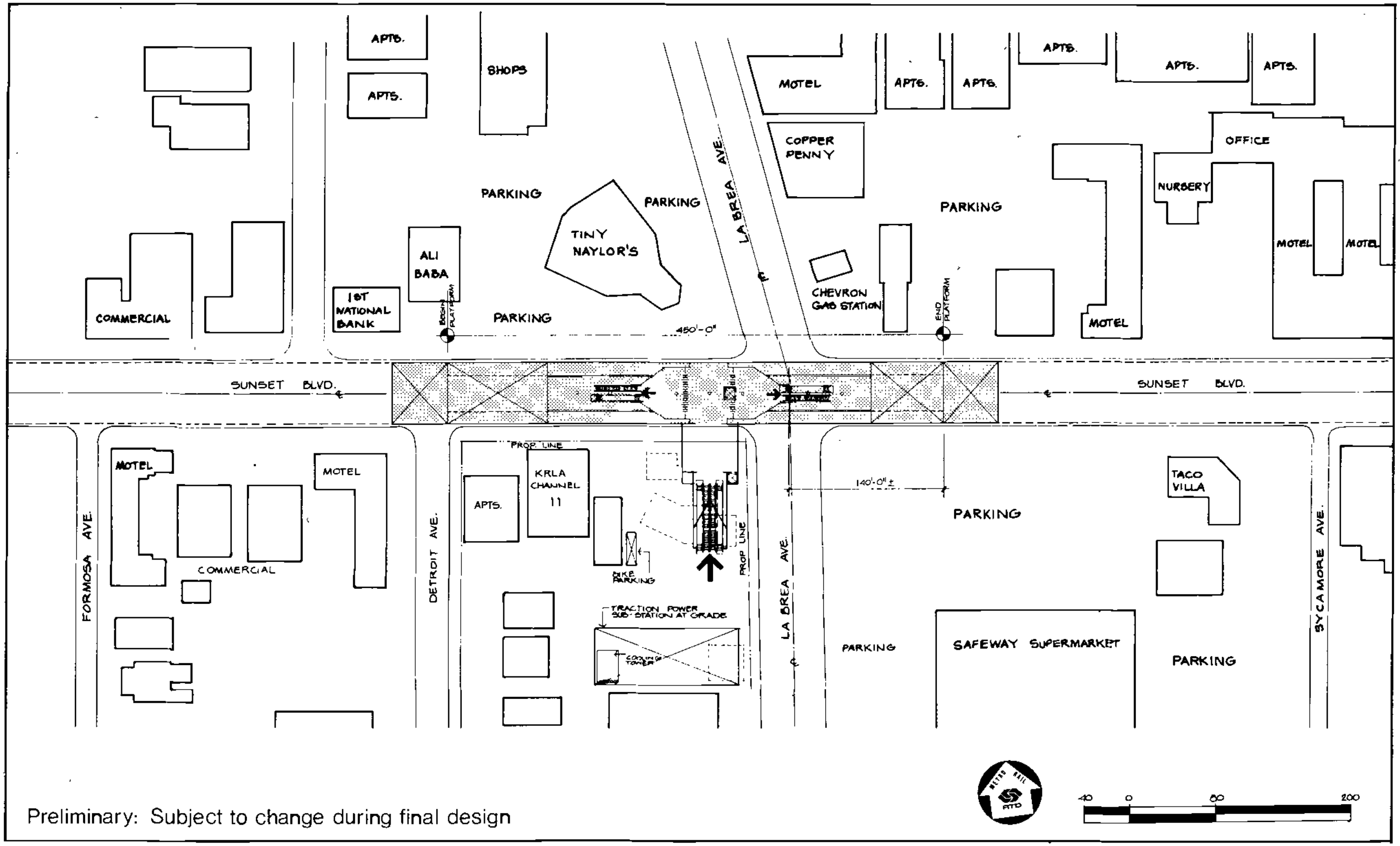
Figure 2·20 **Fairfax/Santa Monica Station Location for Locally Preferred Alternative**

Harry Weese & Associates

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-21

Illustrative Example of Station Interior
Clearspan End Mezzanine
Harry Weese & Associates



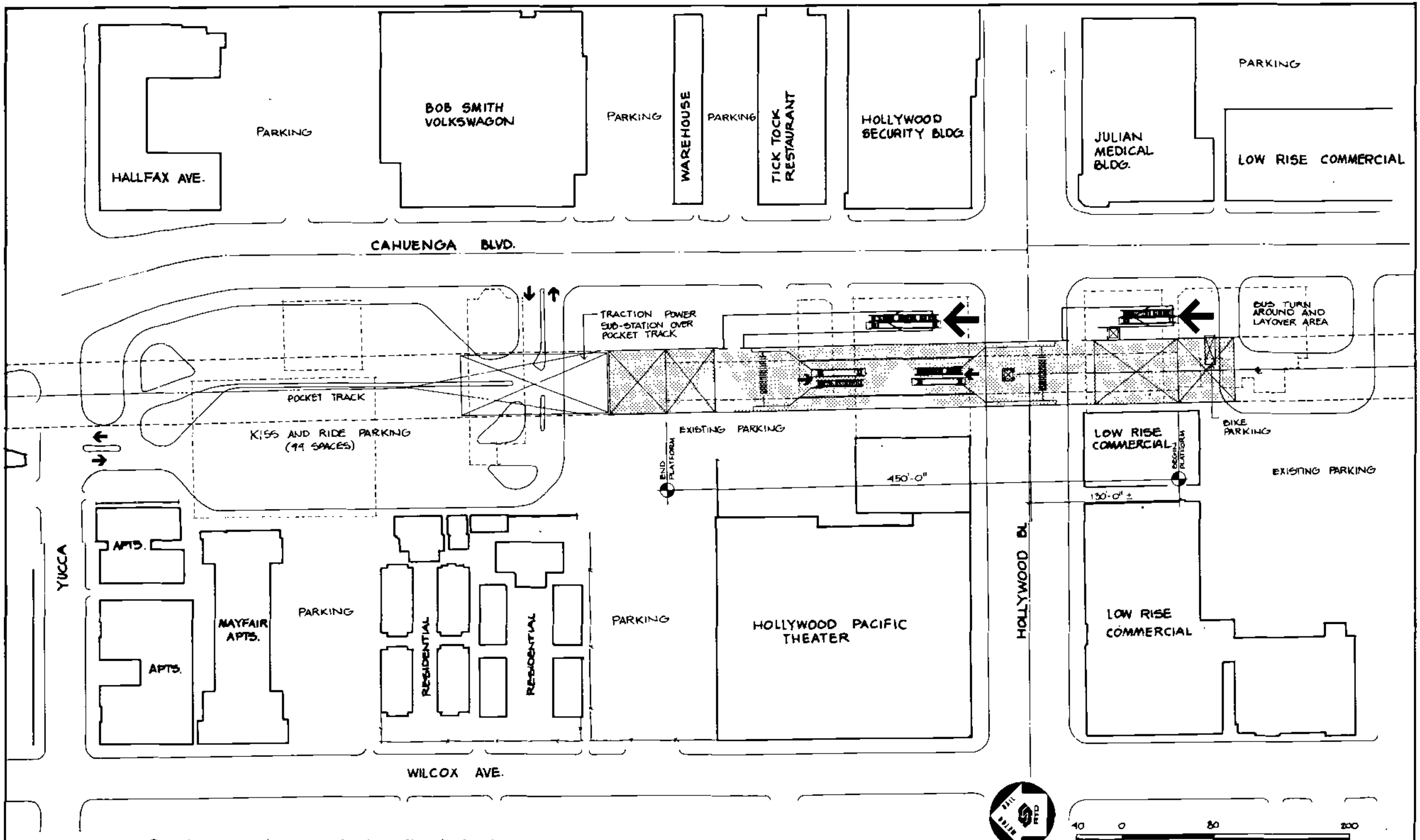
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·22

La Brea/Sunset Station Location for Locally Preferred Alternative

Harry Weese & Associates

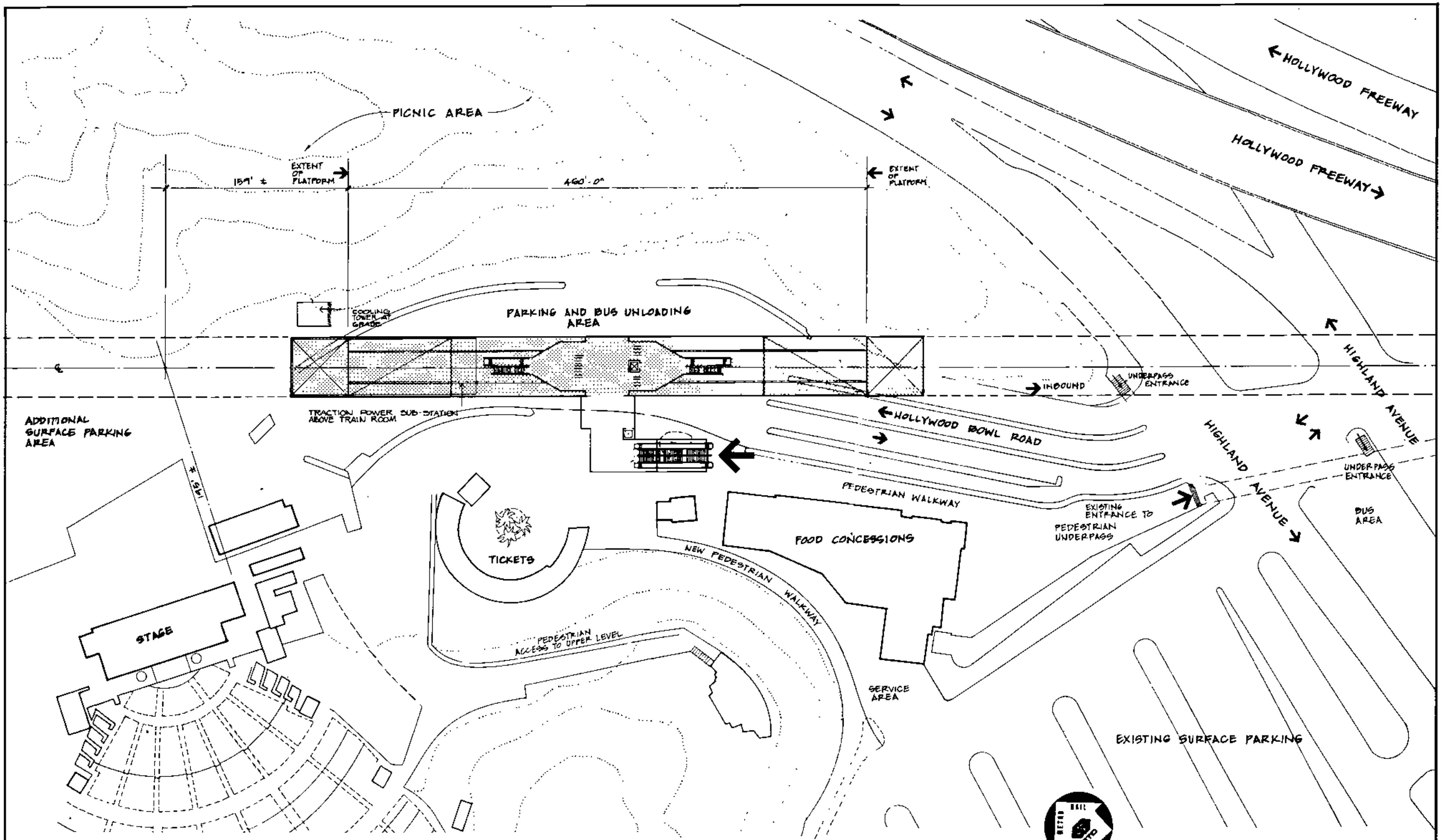


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·23 **Hollywood/Cahuenga Station Location for Locally Preferred Alternative**

Harry Weese & Associates



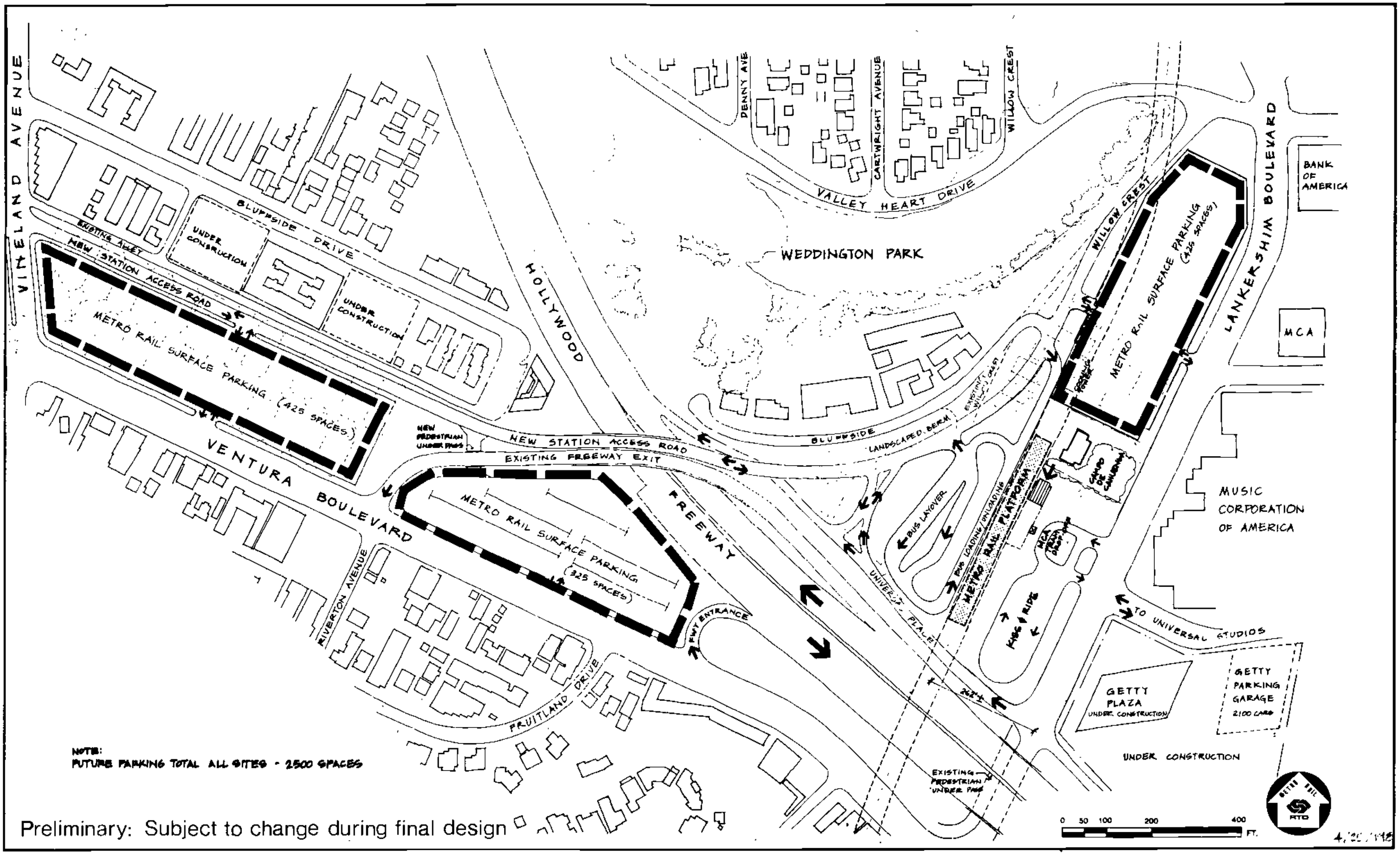
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·24

Hollywood Bowl Station Location (Optional)

Harry Weese & Associates



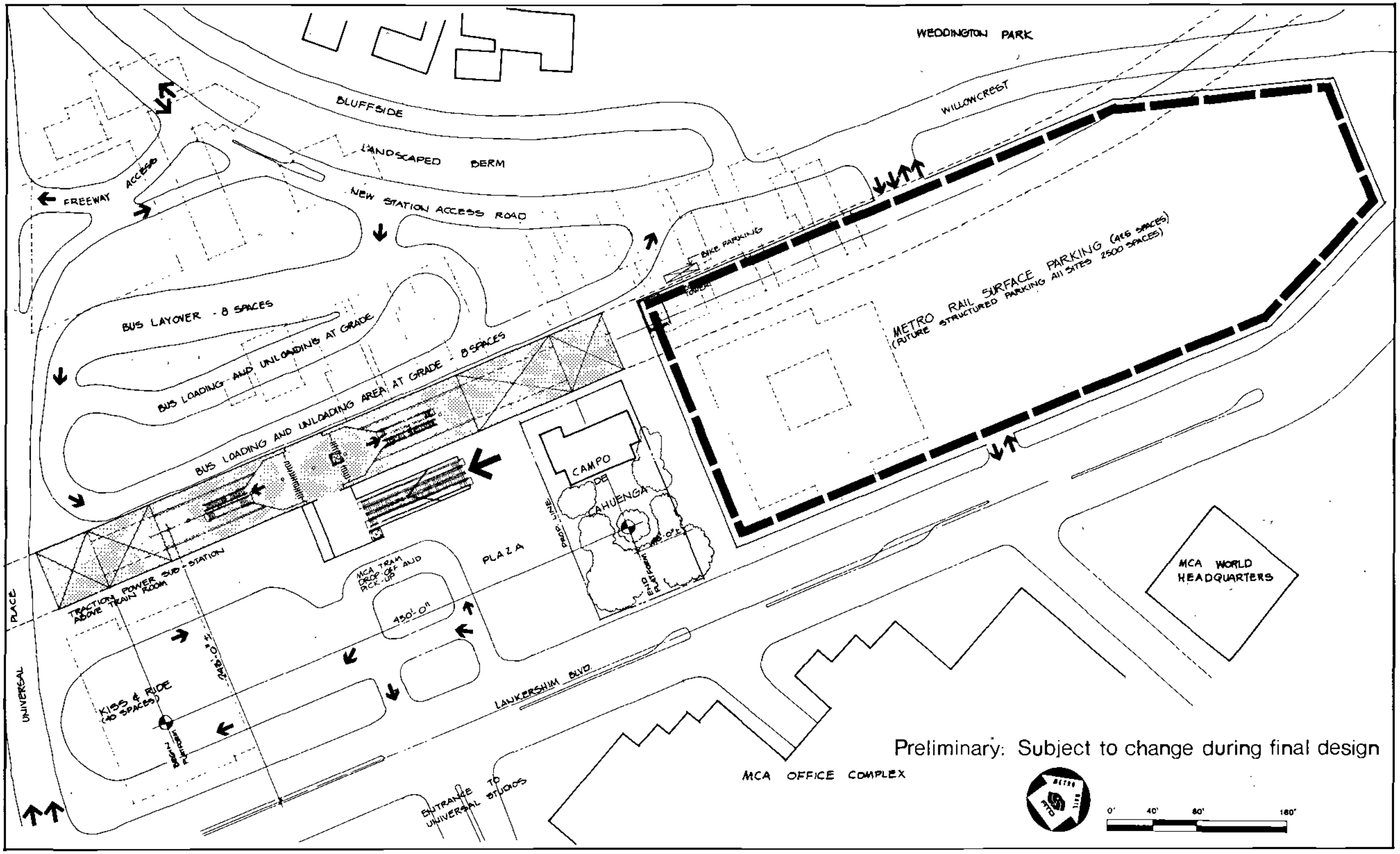
Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·25

Universal City Station Area

Harry Weese & Associates

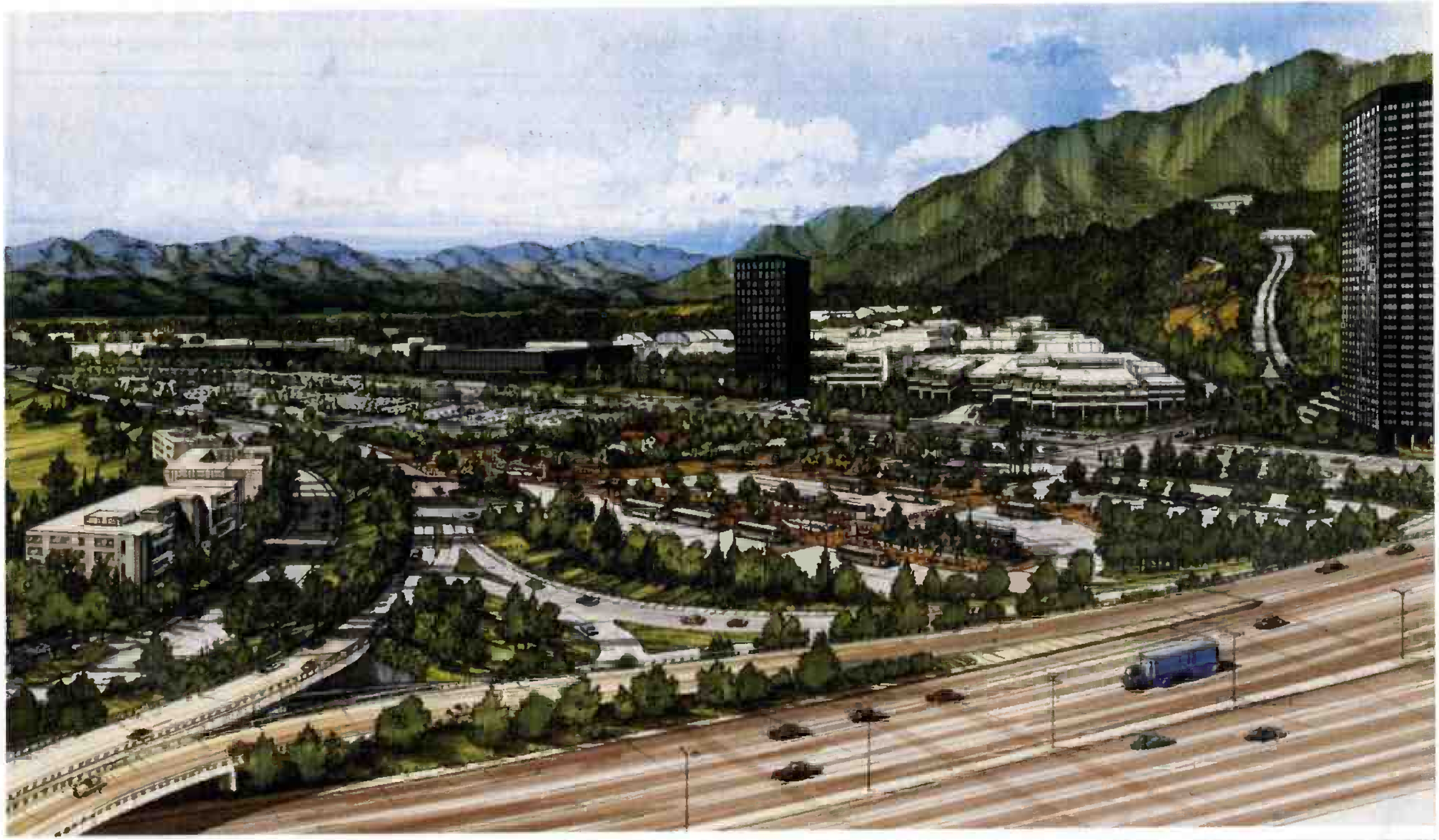


Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-25.1

Universal City Station Location for Locally Preferred Alternative

Harry Weese & Associates

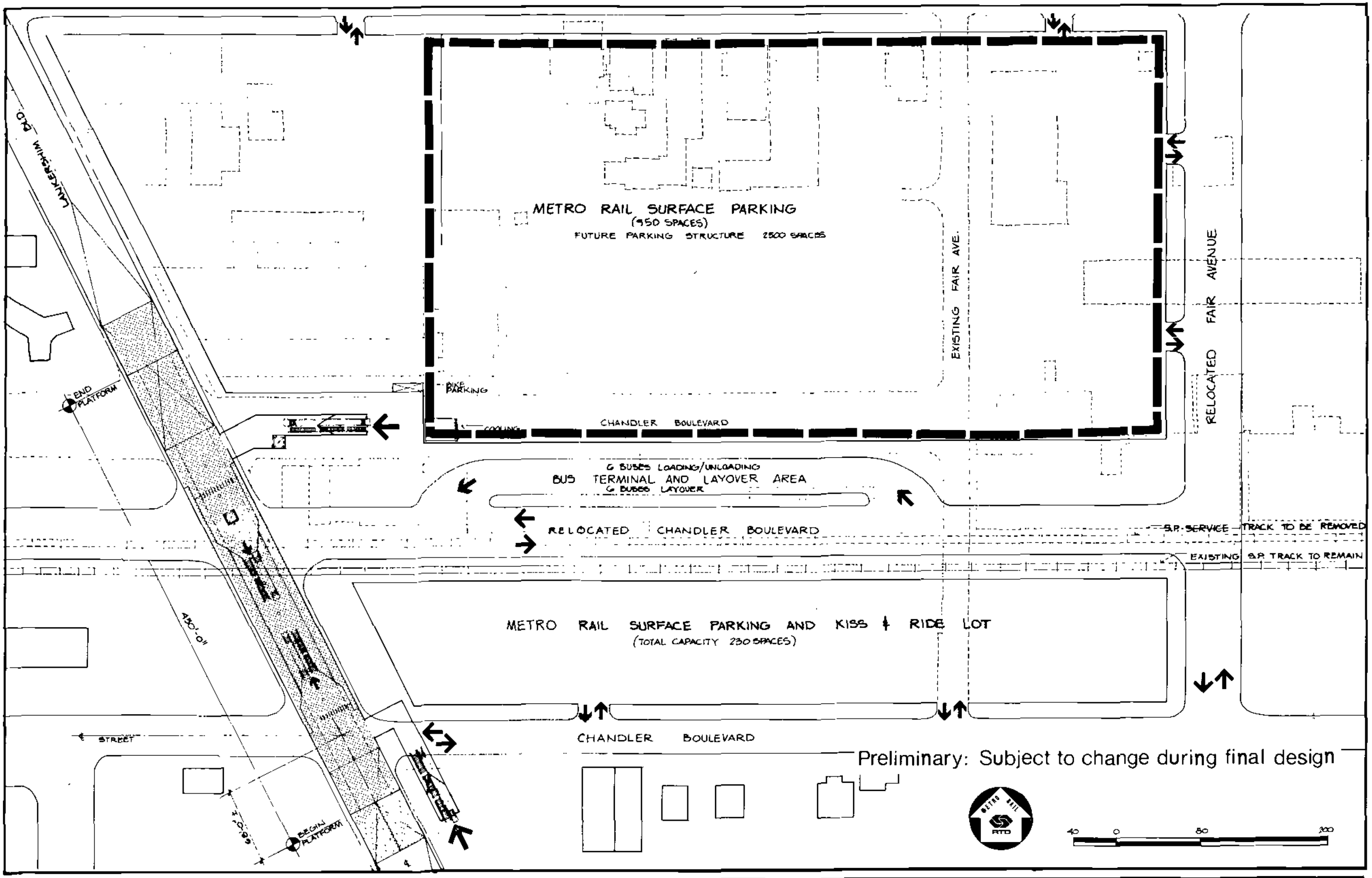


Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-26

Universal City Station
Hollywood Freeway, Lankershim Blvd & Proposed New Access Road

Harry Weese & Associates



Southern California Rapid Transit District

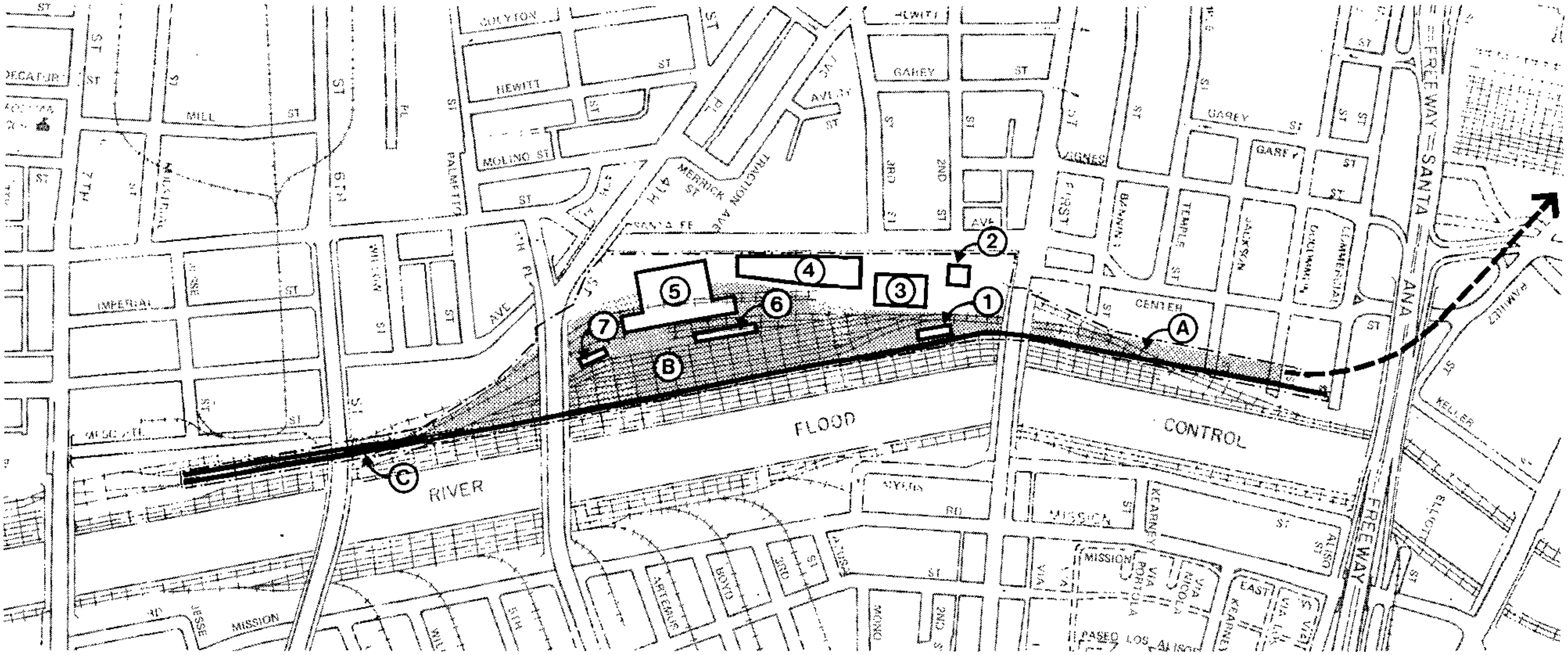
Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-27

North Hollywood Station Location for Locally Preferred Alternative

Harry Weese & Associates



▭	Proposed Locations for Buildings and Parking
①	Test Building
②	Transportation Building
③	Maintenance of Way Shop
④	Parking.
⑤	Main Shop Building
⑥	Car Washing Facility
⑦	Car Cleaner's Building
░	Proposed Locations for Tracks
Ⓐ	Transfer Zone
Ⓑ	Storage Yard
Ⓒ	Tail Track and Test Track

Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·28

Source: DMJM/PBQD

Main Yard and Shops

trains, stations, and all supporting wayside apparatus. Central Control would serve as the focal point from which all Metro Rail operations would be supervised. Automated train controls would be installed to ensure train protection.

Communications. The communications subsystems would convey information among management, operations, maintenance, and security personnel, and to transit patrons. The communications subsystems include the following services:

- Radio service between various areas for operations and maintenance, security purposes, and emergency needs
- Telephone services, including direct line emergency, administrative, maintenance, and public telephone service
- Public address and intercommunication systems services within the passenger stations
- Closed circuit television surveillance at passenger stations
- Transmission via wire and cable to carry communications between the stations and Central Control

Traction Power. The traction power subsystem provides power to the passenger vehicles. Substations along the route would convert the higher commercial AC voltage to the lower DC voltage (600-750 volts) used by the trains. From the substations, the energy would be transferred to the third rail that supplies power to the train. Components of the traction power subsystem include transformers, rectifiers, switches, and circuit breakers.

2.2.5 OPERATING CHARACTERISTICS

The rail transit system will use proven two-track, steel wheel, steel rail components. The system's operating characteristics are based on an analysis of hours of operation, train size, vehicle loading, the duration of each station stop (dwell time), and average operating speed. Further information is contained in the Milestone I Report: Preliminary System Definition and Operating Plan.

Patronage. Under the Locally Preferred Alternative, it is estimated that more than 376,000 passengers will board the rail system daily in the year 2000. Total transit boardings are nearly 2,347,000, of which about 1,970,000 would be on the bus network. Daily rail transit boardings by mode of access for the Locally Preferred Alternative are shown in Table 2-3. The greatest number of rail boardings arrive by feeder buses. This mode of access accounts for 64 percent of the total rail boardings. Figure 2-29 shows total daily boardings at stations as well as patronage along the various segments of the Locally Preferred Alternative. The highest total is between the Seventh/Flower Station and the Wilshire/Alvarado Station where more than 88,900 patrons are accommodated daily in each direction.

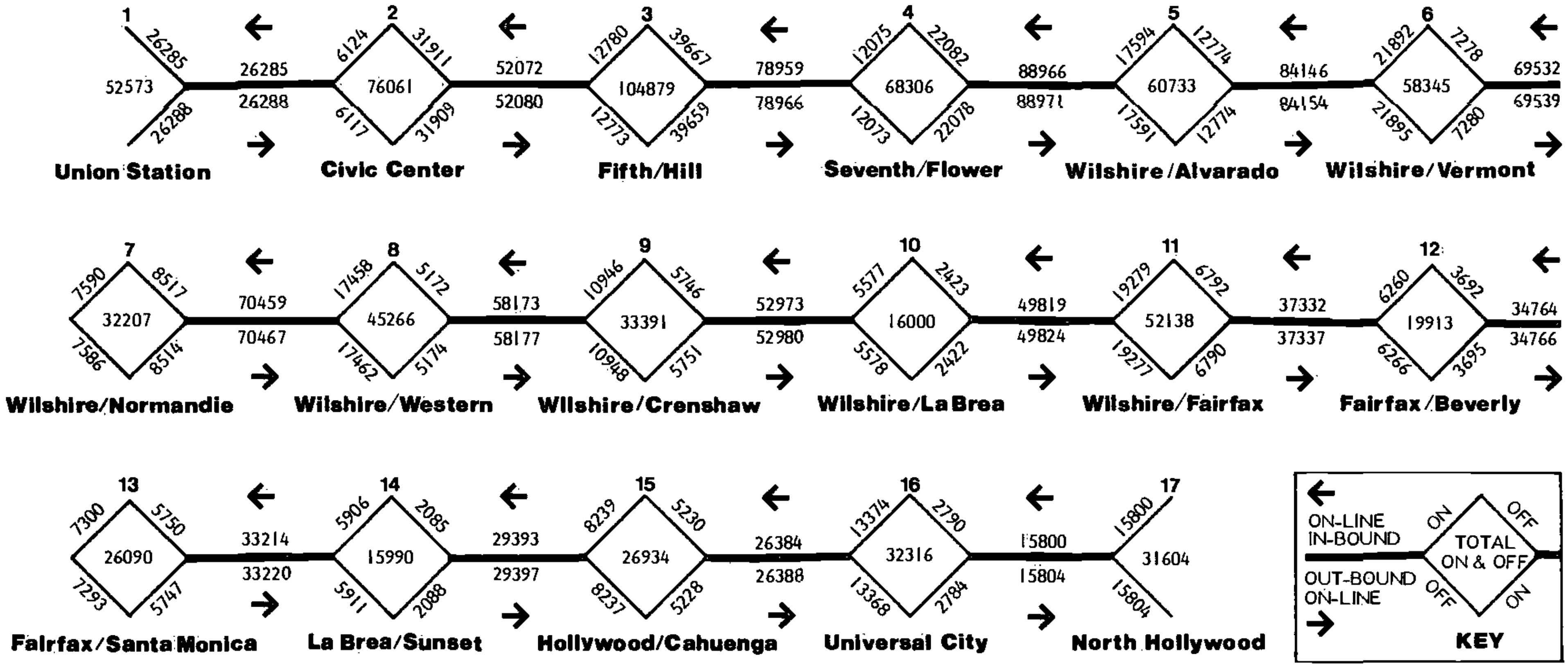
Hours of Operation. Hours of operation for other rail rapid transit systems vary from 14 hours to 24 hours per day. The operating characteristics described here assume a 20-hour day for purposes of estimating fleet size, operating costs, and other system information. The 20-hour day allows a regular period for maintaining the tracks and other parts of the system. Table 2-4 shows the proposed hours of operation during the week and the frequency of service.

TABLE 2-3

DAILY RAIL TRANSIT BOARDINGS BY MODE OF ACCESS
LOCALLY PREFERRED ALTERNATIVE

Station	Walk	Park & Ride	Kiss & Ride	Bus	Total
Union Station	2,378	4,746	2,161	17,003	26,288
Civic Center	15,299	--	--	22,734	38,033
Fifth/Hill	10,582	--	--	41,857	52,439
Seventh/Flower	24,047	--	--	10,106	34,153
Wilshire/Alvarado	16,522	--	4,038	9,808	30,368
Wilshire/Vermont	10,267	--	3,129	15,776	29,172
Wilshire/Normandie	1,348	--	2,065	12,691	16,104
Wilshire/Western	1,706	--	1,689	19,237	22,632
Wilshire/Crenshaw	4,258	--	1,950	10,489	16,697
Wilshire/La Brea	1,320	--	909	5,770	7,999
Wilshire/Fairfax	1,380	2,065	1,459	21,165	26,069
Fairfax/Beverly	1,727	1,397	437	6,394	9,955
Fairfax/Santa Monica	714	--	291	12,042	13,047
La Brea/Sunset	333	--	423	7,238	7,994
Hollywood/Cahuenga	642	--	2,446	10,379	13,467
Hollywood Bowl	--	--	--	--	--
Universal City	3,919	3,568	1,329	7,342	16,158
North Hollywood	1,934	2,979	496	10,391	15,800
Total	98,376	14,755	22,822	240,422	376,375

Source: Schimpeler-Corradino Associates.



Source: Schimpeler—Corradino Associates

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·29 Locally Preferred Alternative Boarding, Alighting and Link Volumes by Direction Year 2000 Average Daily Volumes

TABLE 2-4

SERVICE FREQUENCY

	Period	Maximum Schedule Headway (Minutes)	Cars
Weekdays			
Early Morning	5:30 a.m. - 6:00 a.m.	15	6
	6:00 a.m. - 6:30 a.m.	3.5	6
Peak Periods	6:30 a.m. - 9:00 a.m.	3 - 6	6
	3:30 p.m. - 6:30 p.m.	3 - 6	6
Midday	9:00 a.m. - 3:30 p.m.	7.5	6
Evening	6:30 p.m. - 7:30 p.m.	7.5	6
Night	7:30 p.m. - 1:30 a.m.	15	4
Saturdays			
Morning	5:30 a.m. - 7:30 a.m.	15	4
Day	7:30 a.m. - 7:30 p.m.	10	6
Night	7:30 p.m. - 1:30 a.m.	15	4
Sundays and Holidays			
All Day	5:30 a.m. - 1:30 a.m.	15	4

Source: SCRTD, Milestone I Report: *Preliminary System Definition and Operating Plan*, August 1982.

Estimated Travel Time. For the Locally Preferred Alternative a one-way trip from North Hollywood to Union Station would take about 30 minutes. A round trip requiring two turn-arounds could be made in less than 70 minutes. Addition of either of the optional stations would add about one minute in each direction.

Train Size and Fleet. The proposed maximum train size is six cars, with each car approximately 75 feet long by 10 feet wide. This train size will provide the required peak capacity to carry projected passenger demand with about 3.5 minutes between trains. A six-car train requires a 450-foot station platform to provide for the convenient loading and unloading of passengers.

A fleet of 140 cars will be required initially, although the ultimate operating capacity of six car trains operating at two minute headways would require a fleet of 214 cars. The fleet size includes vehicles needed for revenue service plus those vehicles required for standby, maintenance, etc.

Vehicle Loading. The peak passenger load planned per car over the heaviest link during the peak hour is 170 passengers. This loading standard is based on a capacity of 76 seated passengers plus a 3.3 square foot area for each standing passenger, permitting reasonable standing comfort and movement within the car. For off-peak service, loads will not exceed 91 passengers per car. With the high rate of passenger turnover expected at stations near the heaviest link, few passengers would have to stand for more than one station stop during off peak hours.

System Capacity. The ultimate capacity shown in Table 2-5 is the maximum number of passengers that could be carried given various schedule headways and passenger loads per car.

TABLE 2-5

MAXIMUM PASSENGERS PER HOUR

Maximum Passengers Per Car	6-Car Trains 2 Minute Headways	6-Car Trains 2.5 Minute Headways
170	30,600	24,480
200	36,000	28,800
231	41,580	33,264

Source: SCRTD, Milestone I Report: Preliminary System Definition and Operating Plan, August 1982.

A system using six-car trains would have an hourly maximum capacity of 30,600 passengers with two-minute headways. Higher passenger loadings per car (up to a packed condition with 231 patrons) provide flexibility for unplanned circumstances. These capabilities are adequate to meet expected growth during the first 15 to 20 years of rapid transit system operation.

2.2.6 COSTS

Capital and operating costs are presented in this section. The most general cost estimate is the concept level, which uses basic unit costs for typical sections. This was the level of detail presented in the First Tier EIS/EIR. Those estimates are refined during Preliminary Engineering. These estimates are presented here for the Locally Preferred Alternative and include a 15 percent design contingency for facilities, a 10 percent contingency for systems, and an allowance for uncertainties during subsequent engineering design work. The need for this factor diminishes as design progresses to the final stages. Cost estimates for the bus support system are also included.

Capital costs are presented in 1983 and in escalated dollars (considering inflation). Annual operating and maintenance costs are also in 1983 dollars. Because cost estimates are sensitive to the choice of discount rates, three different rates have been used. At this time the 10 percent discount rate appears to be most appropriate. However, discount rates of four percent and seven percent have been included to assess the system's costs and cost effectiveness under other assumptions regarding future economic conditions.

Capital Cost Items. Capital costs are investments for the design and construction of permanent facilities and procurement of equipment required for the operation and maintenance of the rail rapid transit system. Each major cost item is presented in Table 2-6 and is described below. The estimated total cost for the rail portion of the Locally Preferred Alternative is $2.35 billion; in escalated dollars it is anticipated to be $3.108 billion. Total capital costs for the increased bus fleet are $304.4 million*. The addition of a Wilshire/Crenshaw or Hollywood Bowl Station increases the system's capital costs by about $40 to $50 million for each station. More information on cost estimates is contained in the SCRTD Milestone 11 Report: Cost Estimate.

Guideways and Stations. Includes the basic heavy construction for the transit line and station facilities, and all structures necessary to support the transit vehicle, such as line structures, station shells, yards, and shop buildings.

Utilities. Accounts for utilities within construction sites that must be temporarily or permanently relocated, or supported in place and maintained. The estimate includes work on storm and sanitary sewers; water, gas, and steam lines; electric duct lines for power, telephone, telegraph, traffic lights, police, and fire; manholes; catch basins and storm drains; and overhead power and utility lines.

Parking. Covers various SCRTD-provided parking facilities, including bus terminals, park and ride lots, and kiss and ride areas.

Central Control Facility and Main Yard. Includes the facilities necessary for the storage and dispatch of rail vehicles and the control tower, from which all movement within the yard would be directed.

North Hollywood Tail Track. Includes the cost of storage tracks at the northern end of the rail rapid transit system.

Trackwork. Includes procurement and installation of the running rails and turnouts, crossovers, track fasteners, ties, and ballast. These are the facilities required for the vehicles to respond to the command-and-control system and to follow the guideway.

Train Control. Includes the cost of systems for train protection, train operation, and train supervision. Specific facilities include track circuits, switch and lock movements, and signals; yard control power; control consoles and supervisory computers; and automatic train operation and protection.

Communications. Covers the communication system between central control, auxiliary and supervisory personnel, rapid transit vehicles, and stations. Also included are the public address systems and a closed circuit television for security.

Traction Power. Covers the cost of furnishing and installing equipment to provide power for vehicle propulsion and system operation, including all equipment for power transmission, conversion, and distribution.

---

* This is the estimated capital cost for one bus fleet including 10 percent spares. Over the time period used for the financial analysis two replacement fleets would be required.

TABLE 2-6

CAPITAL COSTS OF LOCALLY PREFERRED ALTERNATIVE
(in 1983 dollars)

Item	Cost
Guideways	$523,000,000
Stations	634,000,000
Utilities	25,000,000
Parking	9,000,000
Central Control Facility	1,500,000
Main Yard	40,000,000
Trackwork	79,100,000
Train Control	56,800,000
Communications	20,800,000
Traction Power	38,100,000
Fare Collection	17,400,000
Vehicle-Passenger	130,000,000
Vehicle-Auxiliary	1,300,000
Capital Cost Subtotal	$1,576,000,000
Design Contingency 15% - Facilities 10% - Systems	223,200,000
Right-of-Way	174,000,000
Design and Construction Management 13% - Facilities 10% - System	225,200,000
Agency Cost	78,800,000
Insurance	75,000,000
TOTAL COST* (in constant 1983 dollars)	$2,352,200,000
ESCALATED COST (at 7% to July 1987 midpoint of construction)	$3,108,300,000

Source: SCRTD, Milestone 11 Report: Cost Estimate, 1983.

*Inclusion of the Wilshire/Crenshaw or Hollywood Bowl Stations would add $40-50 million per station to the capital cost. An additional $304.40 million would be needed for the complementary bus system, but these costs would not be part of this project.

Fare Collection. Includes facilities like ticket vending machines, bill changers, entry and exit consoles, and handicapped/emergency gates.

Passenger Vehicles. Includes vehicles for rail passengers.

Auxiliary Vehicles. Includes vehicles for servicing the system like locomotives, self-propelled cranes, and flat cars.

Other Construction Related Cost Items. These items include the aspects of construction not related to facilities and structures.

Right-of-Way. Reflects the cost of obtaining easements, the permanent taking of real property required for the construction and operation of the system, and the cost of relocating the displaced residents and businesses.

Engineering Design and Construction Management. Includes indirect costs for project design and for procurement and construction management during construction of the system, and is estimated as a percentage of the total facilities cost.

Agency Cost. Accounts for indirect costs incurred by SCRTD for administration of the project. Included are costs for construction inspection; staff support on design matters, cost estimating, and cost control; special consultants; operational planning; and pre-operating and start up costs.

Insurance Costs. Includes insurance for facilities and contractors during construction.

Effect of Project Delay on Construction Capital Costs. The present cost estimates are based on a six-year construction schedule beginning in 1984. These costs would escalate were the project to be delayed. To illustrate the impact of a delay on the project, cost estimates for a one-year and a two-year delay at a seven percent inflation rate have been prepared. With a one-year delay, capital costs of the Locally Preferred Alternative would increase by over $200 million to over $3.33 billion. With a two-year delay, costs would increase by about $450 million to $3.58 billion. Increases of this magnitude would affect SCRTD's projected cash flow and financing plans. Thus, the importance of achieving the projected schedule is apparent.

Annual Operating and Maintenance (O & M) Cost Items. Operating and maintenance costs are annual recurring costs necessary for safe and dependable rail rapid transit service. Over the life of the system, they represent a major portion of the total investment for the project. Projections for year 2000 annual O & M costs, including labor costs, are based on the experience of comparable rail rapid transit systems, including BART (San Francisco), MARTA (Atlanta), NYCTA (New York), and CTA (Chicago). Unit costs were developed for each of the following major categories: maintenance of ways and structures, maintenance of vehicles, electrical power, and transportation.

General Administration. Includes the added SCRTD administration expense required as a result of rail operation. It includes the labor cost associated with the incremental labor required for general management, planning and marketing, operations training and safety, customer relations, administrative management, and finance function.

Maintenance of Ways and Structures. Includes the expenses of maintaining fixed facilities such as subways, aerial structures, tracks, stations, electrical and control equipment, power systems, fare collection equipment, escalators, landscaping, fencing, and parking lots.

Maintenance of Vehicles. Covers the cost of maintaining, inspecting, repairing, and cleaning vehicles.

Electrical Power. Includes the cost of providing traction power for propulsion of the vehicles; auxiliary power for lighting stations, yards, and shops; and operation of system machinery and equipment.

Operations. Provides for all management, train operations, control center, stations and security functions including all labor, materials and other miscellaneous expenditures necessary to operate the transit system.

Subsystem Operations and Maintenance. Includes management, personnel, materials, parts, and equipment to maintain the various subsystems and also includes all electrical power to run the transit vehicles. Subsystems covered by this element are traction power, train control, fare collection and communications.

Liability. Includes expense to estimate the costs of personal injury, property damage, other liability expenses and/or insurance coverage.

Unit Costs. The unit costs for estimating the rail rapid transit system's annual O & M costs were developed from cost accounts and operating statistics provided by each transit system in its Section 15 reports to UMTA and were then applied to the operating statistics projected for the system in year 2000. The Locally Preferred Alternative has annual rail O & M costs of $45.5 million. The O & M costs for the background bus system is $388.3 million. The total transit O & M costs for the Locally Preferred Alternative are $433.8 million (Table 2-7).

TABLE 2-7

ANNUAL OPERATING AND MAINTENANCE COSTS
LOCALLY PREFERRED ALTERNATIVE
(in millions of 1983 dollars)

Item	Cost
General Administration	$ 3.6
Maintenance of Ways and Structures	4.7
Maintenance of Vehicles	8.3
Electrical Power	9.3
Operations	9.2
Subsystems	8.6
Liability	1.8
Total Rail Costs	$ 45.5
Total Bus Costs	$388.3

Source: Booz, Allen & Hamilton; SCRTD.

Annualized Costs. In addition to annual O & M costs, the "annualized" capital cost of the project can be determined. This figure represents the cost of each capital item during a "typical" year over its economic life. The annualized cost is derived based on assumptions about the economic life of the capital item, the salvage value, if any, and the discount rate. Combined with the annual O & M, the annualized capital costs give an idea of how much the system costs each year.

Table 2-8 shows the annualized capital, O & M, and total annual costs for the Locally Preferred Alternative. Assuming a seven percent discount rate instead of ten percent results in a 27 percent decrease in the annualized capital costs for the rail component. At ten percent, the rail rapid transit system's annualized capital costs total about $241.9 million per year. For the Locally Preferred Alternative, total annual rail costs amount to $287.4 million and total annual transit costs amount to $721.07 million (at ten percent).

Financing. SCRTD is currently securing funds for the construction and operation of the Metro Rail Project. Because the exact source and amounts are uncertain, this discussion focuses on the prime sources of funding potentially available for the rail project. All of the following sources are assumed to be available, but future changes in federal and state policy could affect their availability to SCRTD. Prime sources of funding are divided into federal and nonfederal categories. An illustrative cash flow is presented in Table 2-9. It shows funding annual requirements over a six-year construction period and the amounts required of federal and local sources, assuming a 75%/25% split. As cost estimates and funding availability become more definite, a more specific cash flow can be prepared.

Federal Share. UMTA is the federal agency that provides transit funding. Federal funds could finance up to a maximum of 75 percent of the capital costs of the project subject to UMTA's funding constraints. The prime UMTA funding programs include Section 3 (discretionary capital assistance) and Section 9 (formula capital assistance).

Local Share. Nonfederal sources of financing include state and local assistance programs and SCRTD revenue programs. Nonfederal sources of funding are expected to provide a minimum of 25 percent of the capital costs of the Metro Rail Project. The California Transportation Commission (CTC) through the Los Angeles County Transportation Commission, allocates a major source of nonfederal transit funding. Primary local funding programs include the following:

- Article 19 Mass Transit Guideways Program (Proposition 5) - State program which allows motor vehicle revenues to be used for rail transit projects.
- Transportation Planning and Development Funds (TPD) - Fund allocates "spillover" revenues from the state sales tax on gasoline through AB2551 (formerly SB620). Recent legislation, SB 1331, calls for the combining of Article 19 and TPD Funds into one mass transit guideway fund.
- Proposition A - Measure which allows a 1/2 cent sales tax increase in Los Angeles County to help finance lower bus fares, local transit improvements, and construction of a rail rapid transit system.

TABLE 2-8

TOTAL ANNUAL COST -- LOCALLY PREFERRED ALTERNATIVE
(millions of 1983 dollars)

	RAIL			TOTAL (Rail & Bus)		
Discount Rate	Annualized Capital Cost[1]	Annual O & M Cost	Total Annual Cost	Annualized Capital Cost	Annual O & M Cost	Total Annual Cost
4%	$115.5	$45.5	$161.0	$149.83	$433.8	$583.63
7%	176.9	45.5	222.4	216.41	433.8	650.21
10%	241.9	45.5	287.4	287.27	433.8	721.07

Source: Lynn Sedway & Associates for annualized costs.

Note: Costs exclude the optional stations. If both the Wilshire/Crenshaw and Hollywood Bowl Stations were constructed, the annualized capital cost and annual operating and maintenance costs would be only slightly higher.

[1]Annualized costs are derived using the following formula:

$$\text{Annualized Cost} = \frac{i}{1 - (1 + i)^{-n}} \times cc$$

Where: i = discount rate
n = economic life of capital item
cc = initial cost of purchasing the capital item (less present value of salvage)

Key assumptions are:

- Discount rates are 4, 7, and 10 percent.
- The economic life for capital items is 32 years.
- Salvage values at the end of 32 years:

Rights-of-Way	100%
Tunnel	50%
Stations in Subway	50%
Parking Facilities	50%
Yards	50%
Control Center	25%
Other	0%

(From UMTA and SCRTD, Final Alternatives Analysis/Environmental Impact Statement/Report on Transit System Improvements in the Los Angeles Regional Core, Appendix IIE, "Benefit-Cost Analysis," April 1979.)

****

TABLE 2-9

REQUIREMENTS AND SOURCES OF FUNDS BY ANNUAL OBLIGATIONS
($ in Millions)

	FY84	FY85	FY86	FY87	FY88	FY89	FY90	Total
Total Requirements	$273	611	901	768	501	31	23	$3,108
Sources								
UMTA	$205	458	676	576	376	23	18	$2,332
Local	$68	153	225	192	125	8	6	$ 777

Source: SCRTD.

[1]For illustrative purposes, assumes maximum federal contribution of 75 percent and 25 percent local share.

- Joint Development/Value Capture Funds - Techniques to generate revenues for capital and construction costs. Joint development may result in cost efficiencies in the construction of the rail system, a limited recovery of capital costs, and increased farebox revenues. Value capture may create revenues by tapping the increased real estate value generated around station areas by the Metro Rail Project.

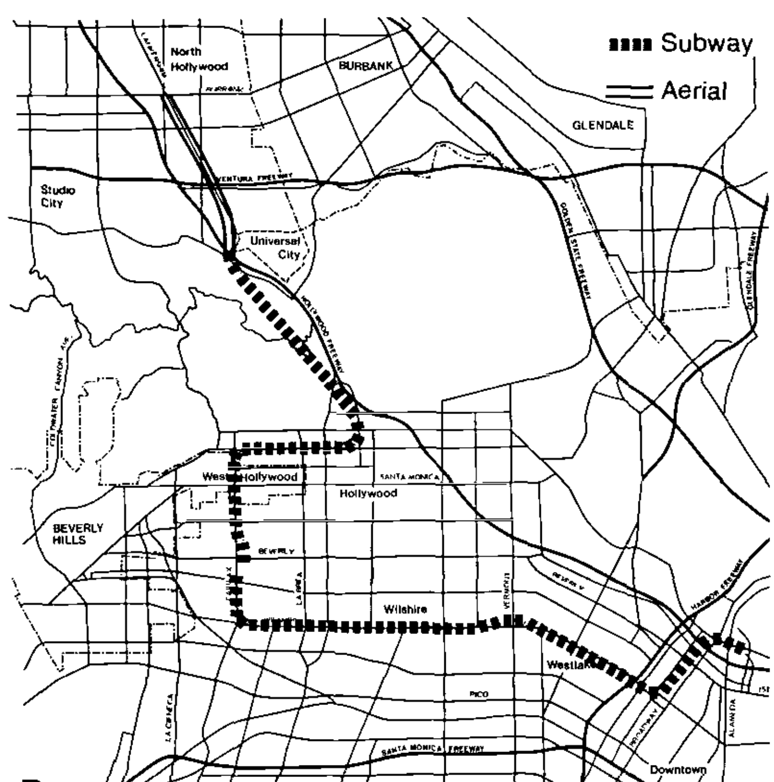
- Other - Other nonfederal sources of financing to be considered by SCRTD include Equipment Trust Certificates, Grant Anticipation Notes, Certificates of Participation, and Revenue Bonds.

2.2.7 REVENUES

The Locally Preferred Alternative is expected to generate $1.07 million in total transit revenues per day, of which $808,000 would be from bus operations.

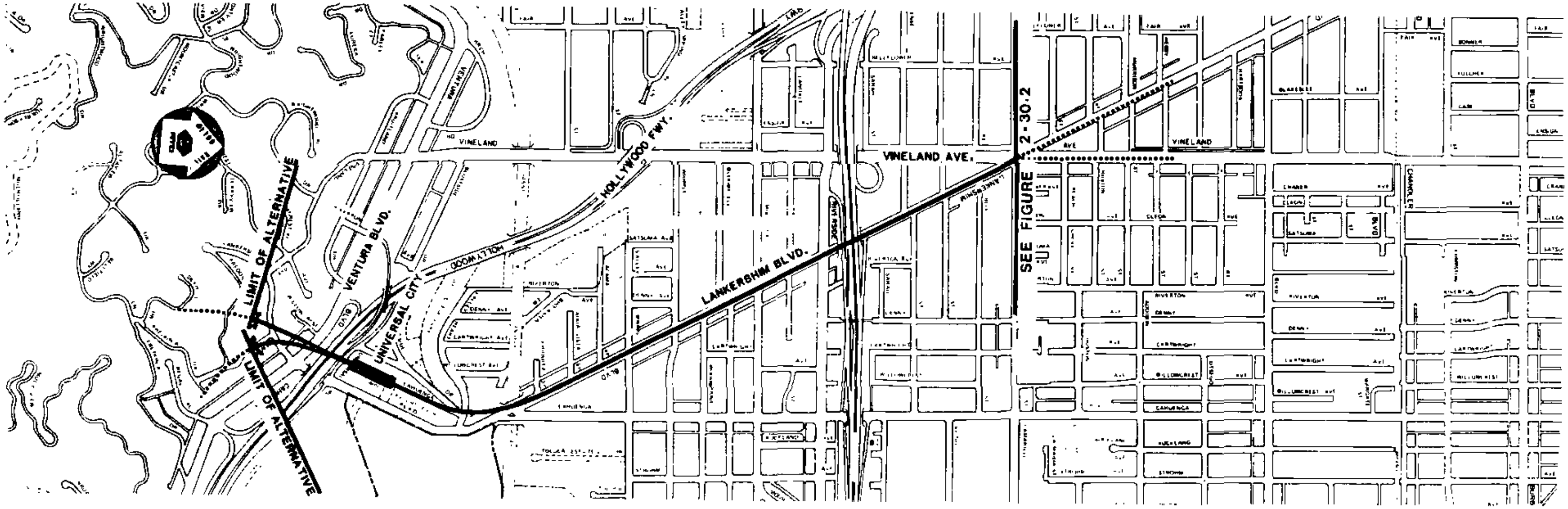
2.3 LOCALLY PREFERRED ALTERNATIVE WITH AERIAL OPTION (AERIAL OPTION)

2.3.1 ROUTE DESCRIPTION AND ALIGNMENT

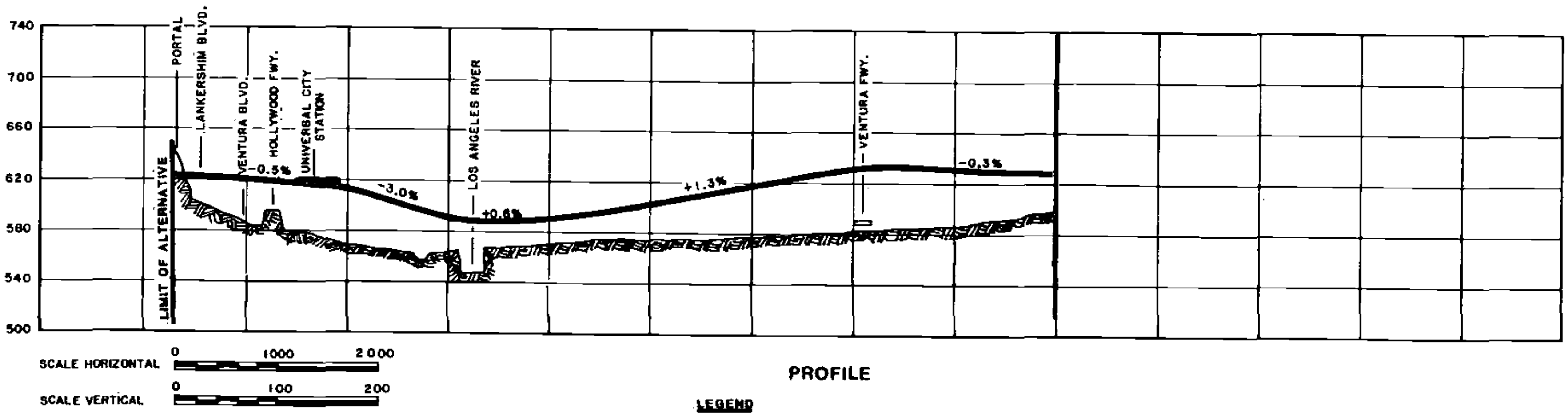


Locally Preferred with Aerial Option

This systemwide alternative is a variation of the Locally Preferred Alternative. Although subways minimize environmental impacts and are justified in dense urban areas, the costs of tunneling are high. Outside the densest areas, above ground or surface construction may result in considerable savings. The Aerial Option was developed with costs savings as a key consideration. Based on preliminary estimates of costs and ridership, it was formulated by combining the alternative alignments that had the lowest capital and operating costs and generated the highest potronage. This alternative includes the Locally Preferred Alternative alignment from Union Station through Hollywood. In North Hollywood, however, the alignment would be above ground (Figures 2-30.1 and 2-30.2). The trains, operating on an elevated guideway, would emerge from the north slope of the Santa Monica Mountains and proceed



PLAN



PROFILE

LEGEND

STATION

METRO RAIL TRANSIT LINE (AERIAL)

Preliminary: Subject to change during final design

Southern California Rapid Transit District

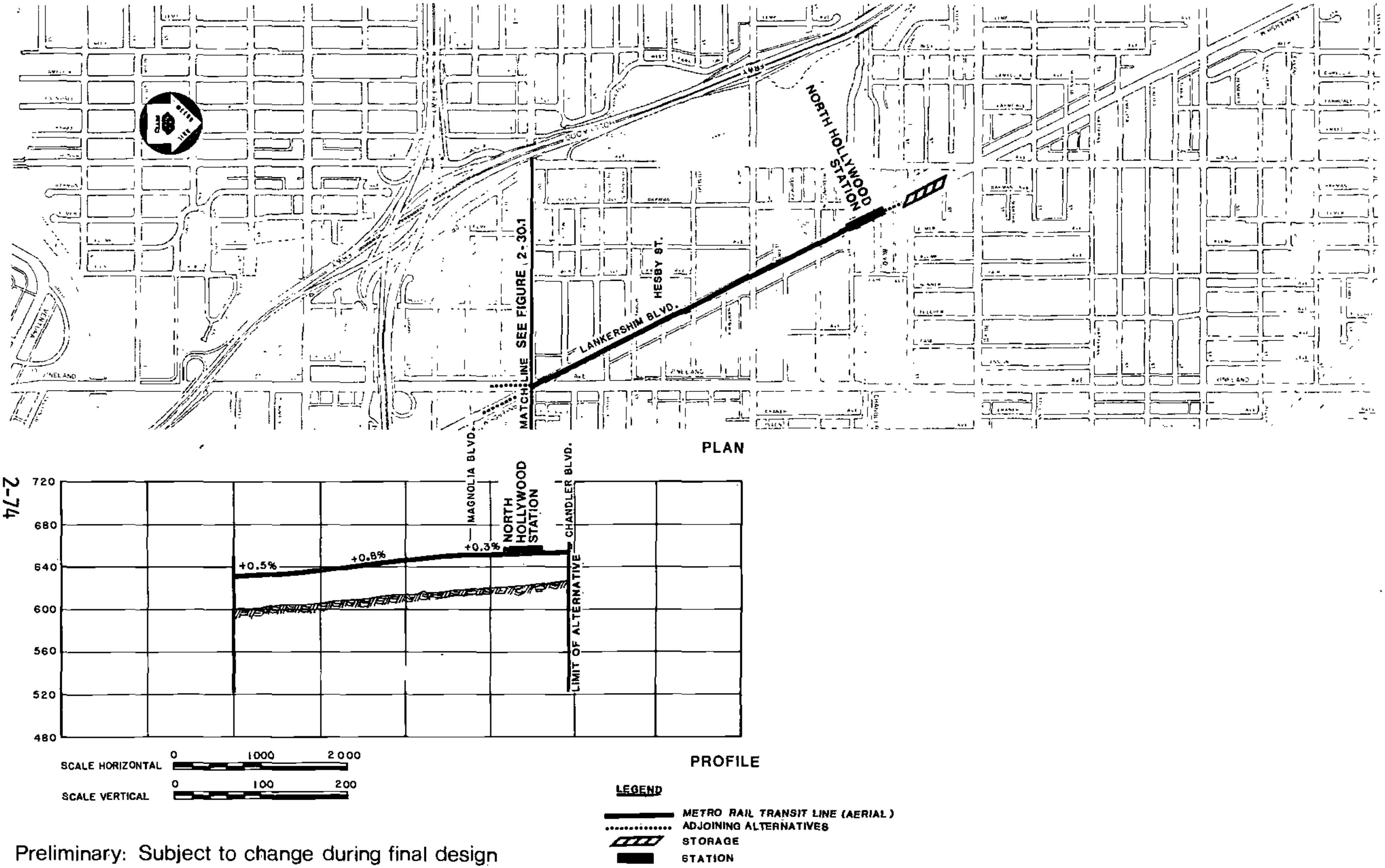
Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 2-30.1

Source: DMJM/PBQD

Aerial Corridor
South of Camarillo Street



Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-30.2

Source: DMJM/PBQD

Aerial Corridor North of Camarillo Street

to an aerial station at Universal City. Leaving Universal City, the trains would proceed northwest to a terminal station in North Hollywood at Lankershim and Chandler Boulevards.

2.3.2 STATIONS

The stations for the Aerial Option are the same as for the Locally Preferred Alternative, except at Universal City and North Hollywood. At these locations, this alternative proposes elevated stations approximately 20-30 feet above the ground (Figures 2-31 and 2-32).

2.3.3 YARDS AND SHOPS

This alternative makes use of the same 45-acre major repair and storage yard described under the Locally Preferred Alternative. In addition, aerial tail tracks would be provided along Lankershim Boulevard immediately north of the station.

2.3.4 SUBSYTEMS

The subsystems are the same as for the Locally Preferred Alternative.

2.3.5 OPERATING CHARACTERISTICS

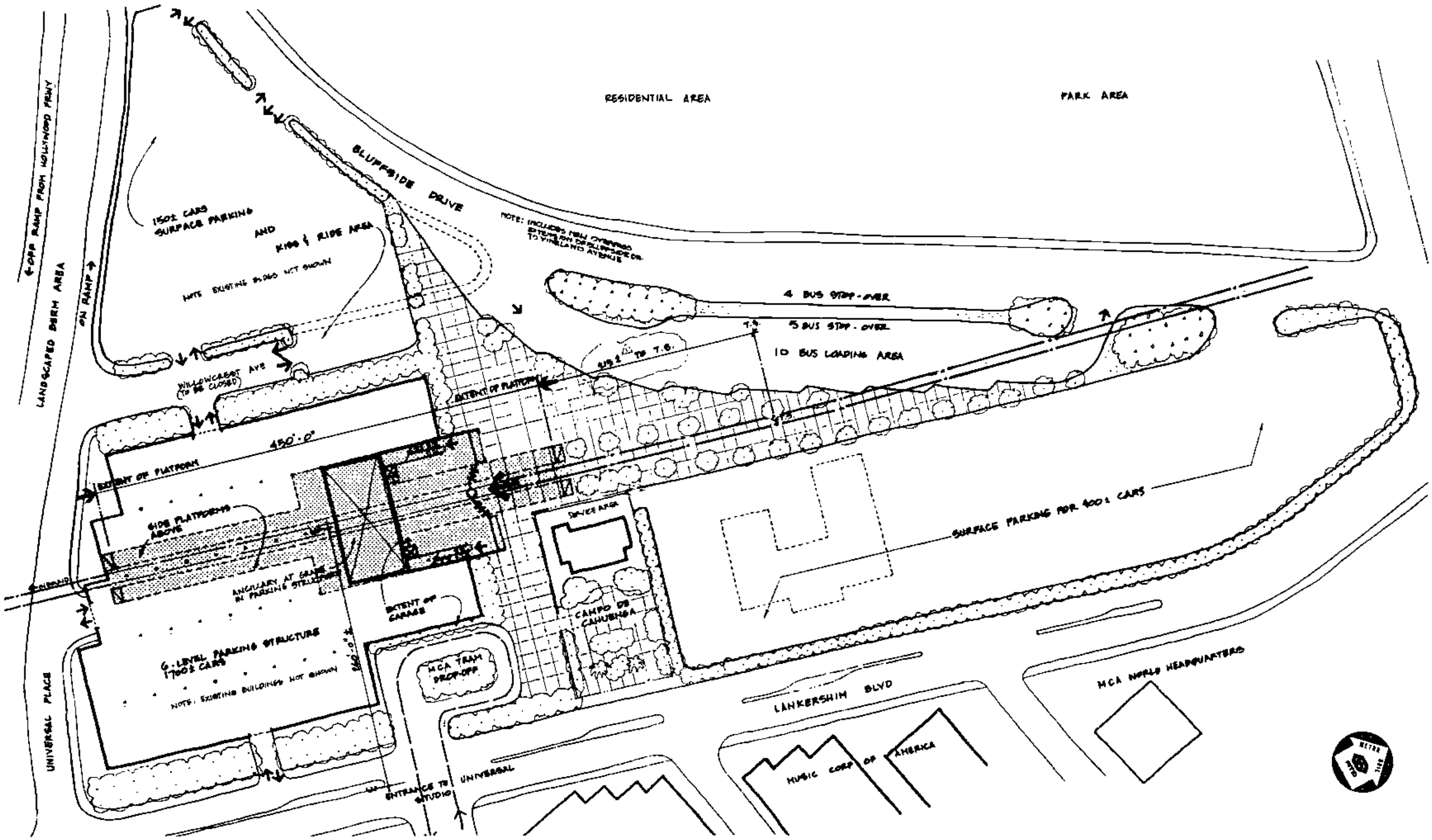
The Aerial Option would have the same rail patronage as the Locally Preferred Alternative, more than 376,000 per day. Total ridership on the bus and rail systems would be about 2,347,000 per day. Hours of operation, boardings, and mode of arrival by station would be the same as for the Locally Preferred Alternative.

A one-way trip from North Hollywood to Union Station would take approximately 30 minutes, the same as for the Locally Preferred Alternative. Train size, fleet, vehicle loading, and system capacity also would be the same as for the Locally Preferred Alternative.

2.3.6 COSTS

Capital Costs. The Aerial Option with elevated guideway and stations at Universal City and North Hollywood would reduce the capital costs of the Locally Preferred Alternative by about $64.4 million to $2,287.8 million in 1983 dollars (Table 2-10). The escalated cost would be $3,023.0 million.

Total Annual Costs. The Aerial Option has the same annual rail O & M cost as the Locally Preferred Alternative, $45.50 million per year. Using the ten percent discount rate, the annualized cost for the rail component of the Aerial Option totals $235.30 million per year, slightly less than for the Locally Preferred Alternative. This gives a total annual rail cost of $280.80 (see Table 2-11). Total annual costs for rail and bus include $280.67 million in annualized costs plus $433.80 million in annual O & M costs.

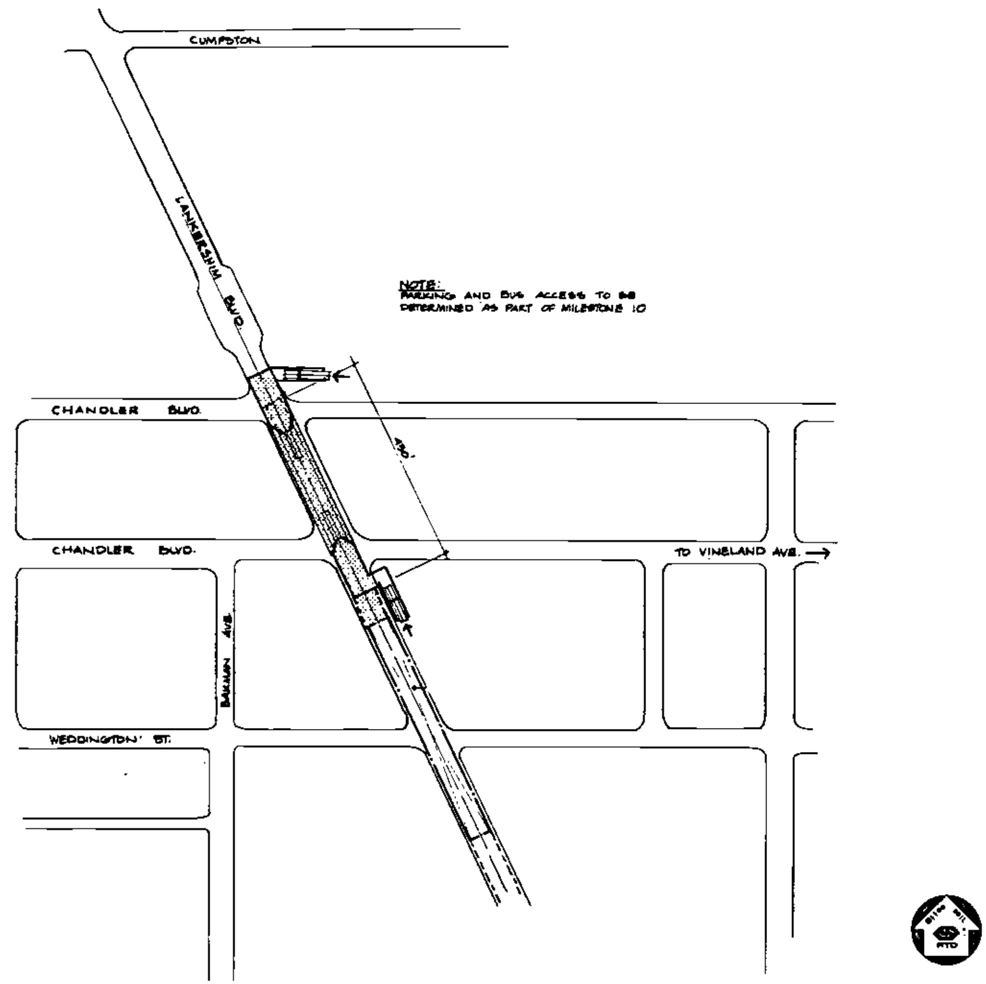


Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-31 **Aerial Station Alternative · Universal City**

Source: Harry Weese & Associates



Preliminary: Subject to change during final design

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2-32 Aerial Station Alternative - North Hollywood

Source: Harry Weese & Associates

TABLE 2-10

CAPITAL COSTS OF THE AERIAL OPTION
(in 1983 dollars)

Item	Cost
Guideways	$496,301,500
Stations	616,930,500
Utilities	25,000,000
Parking	9,000,000
Central Control Facility	1,500,000
Main Yard	40,000,000
Trackwork	79,167,000
Train Control	56,615,000
Communications	20,739,000
Traction Power	38,062,000
Fare Collection	17,400,000
Vehicles-Passenger	130,000,000
Vehicles-Auxiliary	1,300,000
Capital Cost Subtotal	$1,532,015,000
Design Contingency 15% - Facilities 10% - Systems	$214,517,000
Right-of-Way	174,000,000
Design and Construction Management 13% - Facilities 10% - System	213,400,000
Agency Cost	78,800,000
Insurance	75,000,000
TOTAL COST* (in constant 1983 dollars)	$2,287,772,000
ESCALATED CAPITAL COST (at 7% to July 1987 midpoint of construction)	$3,023,000,000

Source: DMJM/PBQD.

*Inclusion of the Wilshire/Crenshaw or Hollywood Bowl Stations would increase total capital costs by $40-50 million per station. An additional $304.40 million would be needed for the complementary bus system, but these costs would not be part of this project.

TABLE 2-11

TOTAL ANNUAL COST — AERIAL OPTION
(in millions of 1983 dollars)

	RAIL			TOTAL (RAIL & BUS)		
Discount Rate	Annualized Capital Cost[1]	Annual O & M Cost	Total Annual Cost	Annualized Capital Cost	Annual O & M Cost	Total Annual Cost
4%	$112.44	$45.5	$157.94	$146.77	$433.8	$580.57
7%	172.04	45.5	217.54	211.55	433.8	645.35
10%	235.30	45.5	280.80	280.67	433.8	714.47

Source: Lynn Sedway & Associates for annualized costs.

Note: Same notes as Table 2-8.

2.3.7 REVENUES

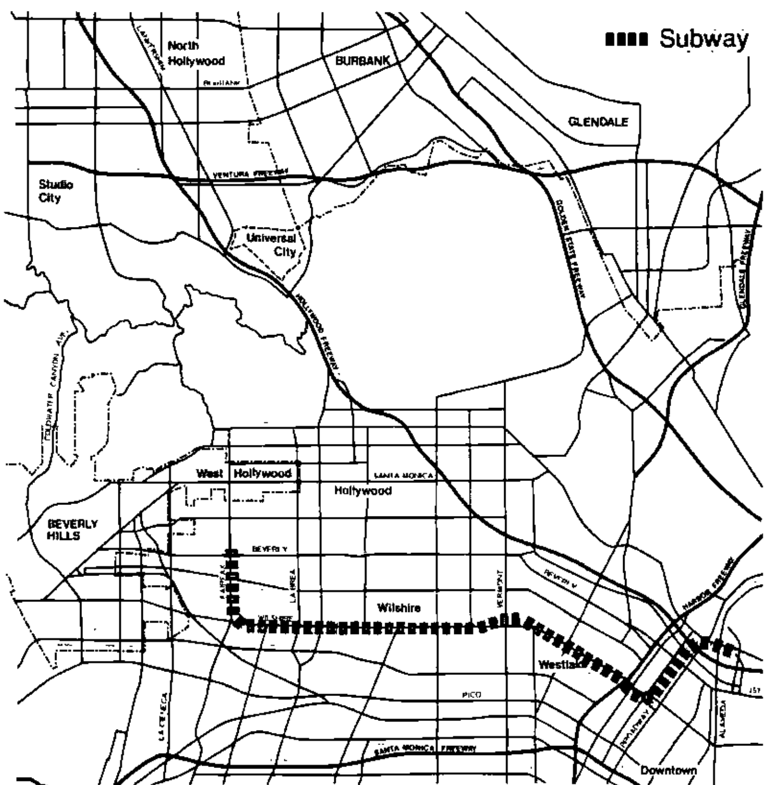
The Aerial Option would generate the same daily revenues as the Locally Preferred Alternative: $1.07 million from both bus and rail operations.

2.4 MINIMUM OPERABLE SEGMENT

2.4.1 ROUTE DESCRIPTION AND ALIGNMENT

The Minimum Operable Segment is identical to the Locally Preferred Alternative from the main yard in the CBD to the Fairfax/ Beverly Station. Over the 8.8 mile route, the system would stop at eleven stations, plus an optional one at Wilshire/ Crenshaw. It too would have a supporting bus network, based on modifications to the SIP.

An earlier alternative of the Minimum Operable Segment ended at Wilshire/Fairfax. Initially this appeared to be acceptable because it served the areas likely to become most congested by the year 2000. However, upon closer examination, operational and service benefits suggested extending the system to Fairfax/ Beverly. The rationale for making this adjustment included the following considerations:



Minimum Operable Segment

- Major regional centers at CBS and Farmers Market would not be served as well by a terminal station at Wilshire/Fairfax.

- Because the Wilshire/Fairfax Station is several blocks east of Fairfax Avenue, convenient transfer between Fairfax buses and Metro Rail would require detouring the buses. With the station at Fairfax/Beverly, buses can stop at Metro Rail entrances or within convenient walking distance.

- To preserve the orientation toward Hollywood and North Hollywood and to retain the link between Downtown and the San Fernando Valley.

- This routing would help divide the load on the Wilshire/Fairfax Station so that rail patrons from the north and west could be intercepted at Fairfax/Beverly while patrons from the south and west would enter the rail system at Wilshire/Fairfax.

2.4.2 STATIONS

This alternative would have the same 11 stations as the Locally Preferred Alternative between the Union Station and the Fairfax/Beverly Station. An optional station could be located at Wilshire/Crenshaw. Station access facilities would be the same as for Locally Preferred Alternative. In this alternative the Fairfax/Beverly Station would serve as a terminal station. The station layout would be modified slightly to provide for bus layover space as noted in Figure 2-19.

2.4.3 YARDS AND SHOPS

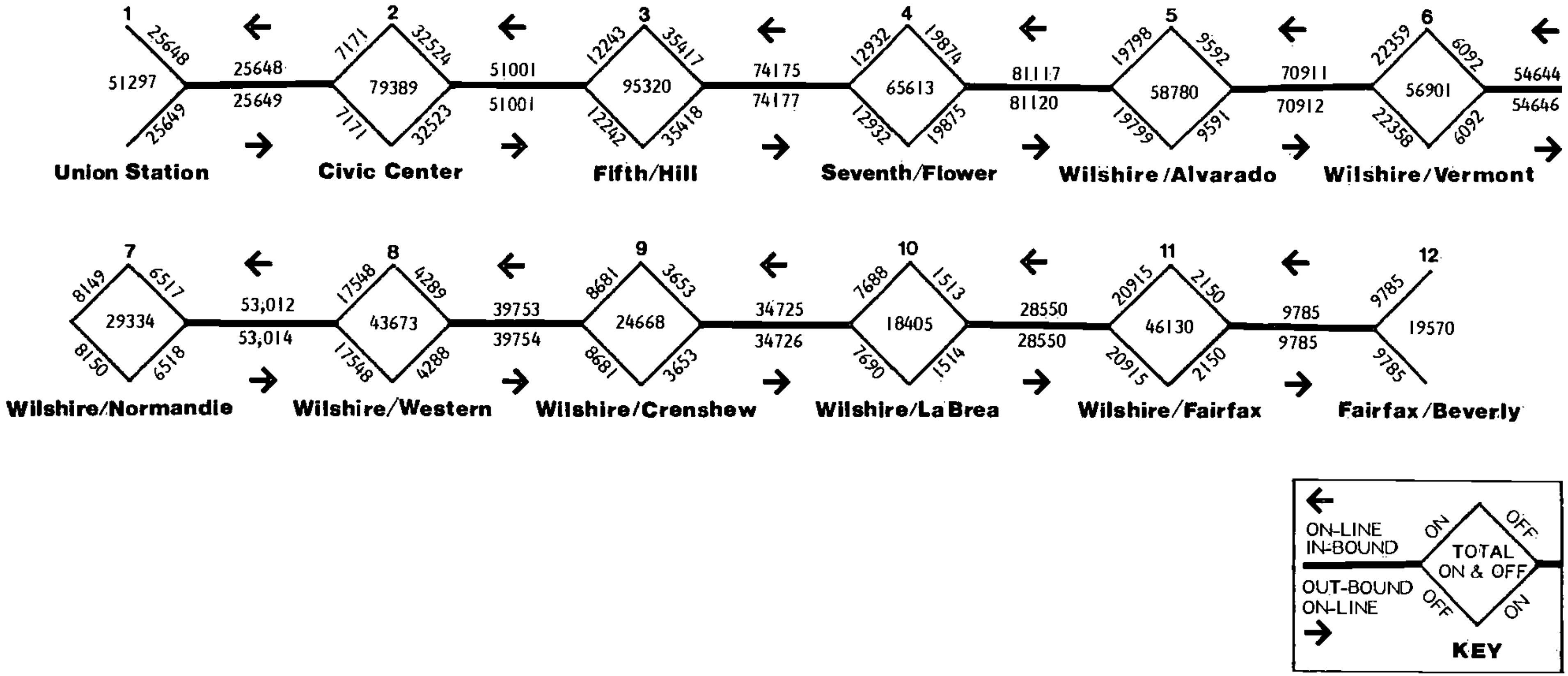
The 45-acre site in the CBD industrial area would be used for a main yard and shops, as in the Locally Preferred Alternative. Additionally, tail end pocket tracks for temporary storage of passenger vehicles would be provided just beyond the Fairfax/Beverly Station.

2.4.4 SUBSYSTEMS

Subsystems would be the same as for the Locally Preferred Alternative.

2.4.5 OPERATING CHARACTERISTICS

Daily rail transit boardings by mode of access for the Minimum Operable Segment are shown in Table 2-12. Total transit boardings for the Minimum Operable Segment are approximately 2,230,800 per day. This includes 295,300 daily boardings on the rail component and about 1,935,500 on the SCRTD bus system. The greatest number of rail boardings is by feeder bus. This mode of access accounts for 62 percent of the total boardings. Figure 2-33 shows total daily boardings at stations, as well as patronage along the various segments of the Minimum Operable Segment. The highest total is between the Seventh/Flower Station and the Wilshire/Alvarado Station where over 81,000 patrons are accommodated daily in each direction. Hours of operation and train size are assumed to be the same as the Locally Preferred Alternative. A fleet size of 74 cars is proposed.



Source: Schimpeler—Corradino Associates

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 2·33 Minimum Operable Segment
Boarding, Alighting and Link Volumes by Direction
Year 2000 Average Daily Volumes

TABLE 2-12

DAILY RAIL TRANSIT BOARDINGS BY MODE OF ACCESS
MINIMUM OPERABLE SEGMENT

Station	Walk	Park & Ride	Kiss & Ride	Bus	Total
Union Station	2,217	4,758	2,160	16,504	25,369
Civic Center	14,185	0	0	14,185	39,711
Fifth/Hill	8,705	0	0	8,705	47,828
Seventh/Flower	23,817	0	0	23,817	33,055
Wilshire/Alvarado	15,937	0	7,920	15,937	29,525
Wilshire/Vermont	9,891	0	3,079	9,891	28,527
Wilshire/Normandie	984	0	2,033	984	14,639
Wilshire/Western	1,280	0	1,717	1,280	21,854
Wilshire/Crenshaw	3,547	0	2,013	3,547	12,366
Wilshire/La Brea	1,079	0	909	1,079	9,208
Wilshire/Fairfax	713	2,045	1,334	713	23,165
Fairfax/Beverly	603	1,364	372	603	9,766
Total	82,958	8,167	21,537	182,624	295,283

Source: Schimpeler-Corradino Associates

2.4.6 COSTS

Capital Costs. The estimated total cost for the rail portion of the Minimum Operable Segment is $1.55 billion (1983 dollars). Escalated cost totals $1.97 billion. Table 2-13 itemizes the capital costs for this alternative. Total capital costs for the increased bus fleet are $308.0 million.

Total Annual Costs. Table 2-14 shows the alternative's annual O & M costs. Table 2-15 shows the annualized, O & M, and total annual costs for the Minimum Operable Segment. The Minimum Operable Segment has the lowest total annual costs among the alternatives because of its shorter length and reduced service. Using the ten percent discount rate, the annualized costs for the rail component of the Minimum Operable Segment totals about $159.14 million per year. The O & M costs are estimated to be $30.60 million making the total annual cost $189.74 million for the rail operations. For bus and rail operations, total annual costs amount to $622.25 million, including $205.05 million for annualized costs and $417.20 million for O & M (at ten percent).

2.4.7 REVENUES

The Minimum Operable Segment is expected to generate $168,300 per day from rail operations and $787,200 per day from bus operations, for a total daily revenue of $955,500.

TABLE 2-13

CAPITAL COSTS OF MINIMUM OPERABLE SEGMENT
(in 1983 dollars)

Item	Cost
Guideways	$271,900,000
Stations	474,200,000
Utilities	16,300,000
Parking	3,100,000
Central Control Facility	1,500,000
Main Yard	40,000,000
Trackwork	51,500,000
Train Control	36,000,000
Communications	15,800,000
Traction Power	21,700,000
Fare Collection	14,400,000
Vehicle-Passenger	74,000,000
Vehicle-Auxiliary	1,300,000
Capital Cost Subtotal	$1,021,700,000
Design Contingency 15% - Facilities 10% - Systems	145,100,000
Right-of-Way	154,100,000
Design and Construction Management 13% - Facilities 10% - System	127,900,000
Agency Cost	51,100,000
Insurance	49,000,000
TOTAL COST* (in constant 1983 dollars)	$1,548,900,000
ESCALATED CAPITAL COST (at 7% to July 1987 midpoint of construction)	$1,966,500,000

Source: SCRTD, Milestone 11 Report: Cost Estimate, 1983

*Inclusion of the Wilshire/Crenshaw Station would increase total capital costs by $40-50 million. An additional $308.0 million would be needed for the complementary bus system, but these costs would not be part of this project.

TABLE 2-14

ANNUAL OPERATING AND MAINTENANCE COSTS
MINIMUM OPERABLE SEGMENT
(in millions of 1983 dollars)

Item	Cost
General Administration	$ 2.62
Maintenance of Ways and Structures	3.58
Maintenance of Vehicles	4.96
Electrical Power	5.28
Operations	6.64
Subsystems	6.33
Liability	1.19
Total Rail Costs	$ 30.60
Total Bus Costs	$386.60

Source: Booz, Allen & Hamilton; SCRTD

* * * * * * * * * * * * *

TABLE 2-15

TOTAL ANNUAL COST — MINIMUM OPERABLE SEGMENT
(in millions of 1983 dollars)

	RAIL			TOTAL (RAIL & BUS)		
Discount Rate	Annualized Capital Cost	Annual O & M Cost	Total Annual Cost	Annualized Capital Cost	Annual O & M Cost	Total Annual Cost
4%	$75.61	$30.6	$106.21	$110.34	$417.2	$527.54
7%	116.19	30.6	146.79	156.17	417.2	573.37
10%	159.14	30.6	189.74	205.05	417.2	622.25

Source: Lynn Sedway & Associates for annualized costs.
Note: Same notes as Table 2-9.

3. COMPARISON OF ALTERNATIVES

Each of the alternatives has positive and negative attributes. The purpose of this section is to summarize and highlight the differences among the alternatives, the No Project Alternative, the Locally Preferred Alternative, the Aerial Option to the Locally Preferred Alternative, and the Minimum Operable Segment. The comparison covers the following categories, which correspond generally to the impact discussion in Chapters 3 and 4: transportation, land use and development, economic and fiscal concerns, displacement, social and community concerns, aesthetics, physical environment, and cultural resources. In addition, a cost effectiveness evaluation has been included.

3.1 TRANSPORTATION

3.1.1 TRANSIT

By the year 2000, over 2.6 million daily person trips will be generated within the Regional Core. Under the No Project Alternative, 15.5 percent of these trips would be made on the bus system and 84.5 percent by automobile. The transit demand would require a peak hour fleet of 1,963 buses. The Locally Preferred Alternative and Aerial Option would reduce this demand to 1,845 buses, and the Minimum Operable Segment would reduce fleet requirements to 1,866 buses. Bus demand in the Wilshire Corridor under all rail alternatives and along the Hollywood Freeway under the Locally Preferred Alternative and Aerial Option would be reduced substantially relative to the No Project Alternative. Under the Locally Preferred Alternative and Aerial Option, about 390,820 auto person-trips would be diverted to transit. Under the Minimum Operable Segment, 382,169 auto person-trips would be diverted to transit. As a result of this diversion, total transit ridership (rail and bus) would increase from 1.43 million daily boardings to 2.36 million under the Locally Preferred Alternative and Aerial Option and to 2.23 million under the Minimum Operable Segment.

3.1.2 TRAFFIC

Within the Regional Core, total vehicle miles of travel (VMT) under the No Project Alternative will grow from 14.2 million VMT in 1980 to 17.8 million VMT by the year 2000, a 25 percent increase. Peak hour traffic demand volumes on freeways will exceed capacity virtually everywhere within the Regional Core. On the Hollywood Freeway just east of the Harbor Freeway demand is projected to be nearly twice capacity. The arterial street system which currently handles the majority of the Regional Core travel is expected to carry an even larger share by the year 2000. As a result of this growth, three times as many of the Regional Core's key intersections will deteriorate to unsatisfactory levels of service. Under the No Project Alternative, these congested conditions mean motorists, transit users, and pedestrians will have diminished mobility and will therefore require more time to reach their destinations.

All of the rail alternatives would reduce automobile trips and VMT as compared to No Project conditions. Table 2-16 summarizes the effect the Metro Rail Project would have on various travel characteristics. The Aerial Option and the Locally Preferred Alternative would have the same impacts on travel, reducing vehicle miles traveled in the Regional Core by five percent and reducing average daily vehicular trips into and out of the Regional Core by about two percent.

3.1.3 PARKING

Demand for parking in the Regional Core is expected to increase faster than the supply of available spaces between now and the year 2000. Under the No Project Alternative the CBD will have a net parking deficiency of well over 23,000 spaces. With implementation of the rail transit project, many auto drivers will be diverted to transit, and parking pressures should ease at many locations in the Regional Core. The increased development that may be accommodated because of the presence of the rail line will, on the other hand, add to parking pressures in some areas. The net effect of these factors on parking supply and demand is that the CBD stations will continue to experience parking shortages under the rail alternatives, and that the Fairfax/Beverly, Universal City, and North Hollywood Stations will experience parking deficiencies that would not have occurred under the No Project Alternative.

TABLE 2-16

TRAVEL CHARACTERISTICS UNDER SYSTEMWIDE ALTERNATIVES

Travel Characteristics	No Project Alternative	Locally Preferred Alternative and Aerial Option	Minimum Operable Segment
Average Daily Traffic crossing			
Harbor Freeway between Sunset & Pico	657,000	619,000	644,300
Western between Franklin & Santa Monica Freeway	1,015,600	938,800	1,001,100
La Cienega between Sunset & Santa Monica Freeway	739,100	732,500	735,700
Hollywood Boulevard between Laurel Canyon & Wilton	486,400	469,100	486,400
Pico between La Cienega & Alameda	957,400	955,500	957,200
Vehicle Miles Traveled In Regional Core	17,826,000	16,961,000	16,981,000
Percent of Key Intersections (am peak) with			
- improved conditions	-	56%	NM
- no significant change	-	32%	NM
- worsened conditions	-	12%	NM
- good operating conditions	44%	47%	NM

Source: City of Los Angeles Department of Transportation; SCRTD

NM = Not measured

Park and ride facilities will be provided at some of the rail stations, initially as surface lots and ultimately as parking garages. The Locally Preferred Alternative and Aerial Option include 9,500 total spaces (3,105 initially) at five stations, while the Minimum Operable Segment includes facilities at three stations containing 4,500 spaces (750 initially). Demand for the park and ride facilities under each rail alternative will exceed the number of spaces supplied at each of these stations. Consequently, parking demand will spill over into surrounding areas, creating more traffic in these areas. While the traffic will not affect Union Station, which is surrounded by commercial and industrial activities, residential areas in the other station areas with proposed parking facilities are more sensitive to traffic and would be adversely affected.

3.2 LAND USE AND DEVELOPMENT

Rail rapid transit would intensify development and, if supported by appropriate land use decisions, accommodate development beyond projections for the No Project conditions. A comparison of total development levels within the Regional Core under the various systemwide alternatives is presented in Table 2-17. The effects of the Aerial Option would be virtually identical to those of the Locally Preferred Alternative. A direct consequence of this growth will be the increasing "densification" of the Regional Core and, particularly, the station areas.

TABLE 2-17

INCREASED DEVELOPMENT IN STATION AREAS
UNDER SYSTEMWIDE ALTERNATIVES, YEAR 2000

	No Project Alternative	Locally Preferred Alternative[1]	Minimum Operable Segment
Commercial Space (1,000 Gross Sq. Ft.)	91,315	105,015-116,835*	102,615-111,615*
Employment	368,000	419,300-466,900*	412,000-449,900*
Dwelling Units	44,280	58,750	55,350
Population	97,000	131,250	124,470
Persons per Square Mile[2]	13,355	16,504	15,548

Source: Sedway/Cooke

*Range reflects amount of development both without and with a concerted effort by SCRTD and others to promote joint development.

[1]Also reflects development under the Aerial Option.

[2]For Regional Core.

Within designated centers in the Regional Core, 88.0 million gross square feet of commercial floor area is expected to be constructed by the year 2000 under the No Project Alternative. Commercial development in conjunction with the Locally Preferred Alternative could increase by 13 to 23 percent over the No Project Alternative. The commercial floor area is expected to increase 10 to 19 percent in conjunction with the Minimum Operable Segment.

Focusing development into specific areas is entirely consistent and supportive of the City of Los Angeles' long range land use and development goals. These goals call for the development of major centers of residence and business. Nearly all stations under each rail alternative are in designated centers. These high density areas are envisioned to contain a rapid transit station, high-rise office structures, department stores, hotels, theaters, restaurants, and government offices. The Locally Preferred Alternative is the most effective in helping fulfill the city's Centers Concept. The Minimum Operable Segment is somewhat less effective and the No Project Alternative would not stimulate development in designated centers. The Minimum Operable Segment could have a slightly different impact on commercial development than the Locally Preferred Alternative. Under the Minimum Operable Segment, the Wilshire Corridor would have greater regional accessibility than Hollywood and North Hollywood. Accordingly, office and regional retail development that may have been attracted to these areas under the Locally Preferred Alternative might instead locate in the Wilshire Corridor.

An analysis of the land available for reinvestment around each station area suggests that the considerable growth accommodated by the rail transit alternatives would not adversely affect surrounding neighborhoods and community development objectives, if appropriate mitigation options are applied. The ability to accommodate the projected residential development within walking distance of 11 of the 18 proposed station locations and the projected commercial development within 16 of the 18 station locations is considered a highly beneficial impact. Even projected growth in the "non-center" station areas (Wilshire/Crenshaw, Fairfax/Beverly, Fairfax/Santa Monica, and Hollywood Bowl) is generally consistent with the intensity of development established by the applicable land use plans.

3.3 ECONOMIC AND FISCAL CONSIDERATIONS

The rail rapid transit project would have substantial and diverse economic and fiscal impacts. The regional economy, employment, development opportunities, and the fiscal obligations and revenues of governments in the Regional Core would all benefit. The impacts from the Locally Preferred Alternative and its Aerial Option would be essentially the same and would result in the greatest positive benefit.

The Locally Preferred Alternative would generate between 3,000 and 5,000 jobs annually during construction, and 800 and 850 permanent jobs. The Minimum Operable Segment would, given its shorter route, generate fewer employment opportunities. The Locally Preferred Alternative is expected to increase the gross regional product (total income within the Southern California Region) by between $91.0 million and $136.5 million, while the Minimum Operable Segment would add between $61.2 million and $91.8 million.

The additional development that the rail rapid transit project could help accommodate would also have considerable economic benefits. These benefits would affect not only the regional economy in general but SCRTD in particular, were SCRTD to pursue an aggressive program to capture a share of the revenue generated by development in station areas. These "value capture" mechanisms include leasing air rights above parcels acquired by SCRTD and formation of a special benefit assessment district. Under the Locally Preferred Alternative, SCRTD could realize about $10.6 million a year in lease revenues from development on SCRTD acquired sites. Special assessment districts could also be established in all station areas, as has been done in other U.S. transit systems, generating between $2.3 million and $5.7 million for SCRTD in 1984 and as much as $10.5 million in the year 2000. Under the Minimum Operable Segment, $9.3 million a year in lease revenues could be realized, as well as between about $2 million and $5 million in 1984 assessment district revenues and as much as $10 million in the year 2000.

While there initially could be some potentially adverse fiscal impacts from the rail rapid transit project, the overall fiscal effects would be positive. Some property acquisition by SCRTD would remove parcels from the property tax base. Business loss could decrease sales tax revenues, but these effects would be only temporary, given the increased development expected to occur in conjunction with the project. Under the Locally Preferred Alternative, this development could increase annual property tax revenues by between $8.1 million and $14.1 million over No Project figures in the year 2000 and could increase year 2000 sales tax revenues by between $.5 million and $1 million. The Minimum Operable Segment would add between $6.6 million and $11.6 million to property tax revenues and $.4 million and $.8 million to sales tax revenues over year 2000 No Project figures. These figures to not account for the relatively small losses associated with land acquisition by SCRTD. The higher estimates assume SCRTD actively pursues joint development programs on its sites.

3.4 LAND ACQUISITION AND DISPLACEMENT

Construction of the rail rapid transit project would require the acquisition of land and the removal or replacement of uses within its right-of-way. The displacement under each alternative is summarized in Table 2-18. The Locally Preferred Alternative and the Aerial Option would displace the greatest number of residences and businesses. While the Locally Preferred Alternative would displace six more businesses than the Aerial Option, it would displace 16 fewer residences. The Minimum Operable Segment requires the least land acquisition and incurs the least in relocation costs.

TABLE 2-18

DISPLACEMENT UNDER PROJECT ALTERNATIVES

Use	Locally Preferred Alternative	Aerial Option	Minimum Operable Segment
Residences			
Single Family	5	11	1
Multifamily	219	229	50
Businesses	222	216	136
Public Services/Nonprofit Organizations	9	7	5

Source: SCRTD

3.5 SOCIAL AND COMMUNITY CHANGES

Social and community impacts can be both positive and negative, since population groups with different social values may be affected differently. Most of the long term impacts on a community result from the growth expected to be accommodated by the rail alternatives. These physical land use and economic changes are considered in conjunction with surveyed community values to arrive at an evaluation of social change in the station environs. For the environs common to each Project alternative the impacts are expected to be similar. Relative to the No Project Alternative, the Project alternatives would result in the following impacts:

- A beneficial net increase in housing supply at all station environs except Hollywood Bowl and Universal City. However, this would result in some direct displacement and would also cause some indirect displacement if rents rise beyond the financial means of the tenants.

- A beneficial net increase in commercial services. The benefits include revitalizing economically stagnant or declining areas, creating opportunities for pedestrian oriented shopping areas, and increasing the availability and choice of services. The greater attractiveness and accessibility of commercial areas could, in a few instances, increase rents and consequently cause businesses to relocate. To some extent this would occur in all station areas except Union Station, Civic Center, and the optional stations.

- It is assumed induced growth will result in direct and indirect displacement of social services and public facilities at all station environs except at Union Station, Civic Center, Wilshire/Fairfax, Hollywood Bowl, and Universal City. Growth in conjunction with the rail transit project will require expanding existing social services. This will require additional revenues to maintain the same level of social services as now exists. Accordingly, Metro Rail could indirectly, adversely affect social services, if funding for these services were constrained.

- Improved mobility for the community and greater accessibility to major destinations because of faster travel service, somewhat reduced congestion, and the expanded and modified bus network designed to connect with the rail project. Patrons who are dependent on transit would benefit most.

- The character and cohesiveness of the Fairfax community could diminish, if the new commercial development is permitted to conflict with the area's many small businesses and parking deficiencies are not alleviated.

- The aerial structures of the Aerial Option would disrupt the neighborhood atmosphere, as defined by local residents, in the San Fernando Valley.

3.6 AESTHETICS

Visual impacts would be the same for the Project alternatives along the alignment from Union Station to Fairfax/Beverly, where the Minimum Operable Segment terminates. The Locally Preferred Alternative and the Aerial Option, would create the same visual impacts up to the north face of the Santa Monica Mountains, where the

Aerial Option would emerge as an elevated guideway. Virtually all adverse impacts for these segments of the route can be mitigated, so that the net effect of the Locally Preferred Alternative and the Minimum Operable Segment will be a beneficial one. The significant adverse impacts of the Aerial Option can only be partially mitigated. These impacts include the contrasting and inappropriate scale of the aerial guideway to the surrounding visual setting and the visual intrusion upon the occupants of commercial and residential structures fronting along the aerial alignment. Local and regional views from streets, homes, and businesses also would be obstructed by the elevated guideway and stations.

3.7 PHYSICAL ENVIRONMENT

3.7.1 NOISE AND VIBRATION

Various design features (such as use of resilient direct fixation fasteners) have been proposed to ensure that ground-borne noise and vibration from the rail rapid transit project would not be intrusive to occupants of nearby buildings. No vibration impacts are expected with any of the Project alternatives and only at a few locations would rail rapid transit operations generate noise levels exceeding adopted standards and criteria. Under the Locally Preferred Alternative, eight sites would experience noise levels in excess of standards unless special mitigation measures are implemented. Two sites, both theaters, would be affected under the Minimum Operable Segment. The Aerial Option, in addition to generating ground-borne, would emit airborne noise. Much of this noise would be reduced to acceptable levels through the use of sound barrier walls. Nevertheless, approximately 30 additional single family residences and 10 apartment buildings in the San Fernando Valley would experience excessive airborne noise that would not occur with the Locally Preferred Alternative.

3.7.2 AIR QUALITY

Impacts on air quality are defined at two geographic levels: subregional and local. The subregional analysis examines the effect of the rail rapid transit project on pollutant emissions for the area used to study traffic changes. Within this area, all alternatives would reduce emissions for all five pollutants studied (Table 2-19).

At the site specific, or micro, level air quality impacts are measured in terms of exposure to air pollutants at sensitive sites such as residences, parks, hospitals, and schools. The pollutant of primary concern is carbon monoxide whose effects are related to levels of traffic congestion. Such areas, known as "hot spots" include the Lankershim/Burbank intersection and four of the stations with parking. Background levels for carbon monoxide (eight-hour) in the year 2000 range from 9.7 parts per million at Union Station to 15.0 parts per million at Universal City. These levels exceed the state eight-hour standard. Changes to carbon monoxide levels by any of the Project alternatives beyond those under the No Project Alternative were found to be minimal. The traffic changes resulting from the project would not cause the eight-hour carbon monoxide standard to be exceeded.

TABLE 2-19

COMPARISON OF POLLUTANT EMISSIONS UNDER SYSTEMWIDE ALTERNATIVES
(tons/day)

Pollutant	No Project Alternative Regional Vehicular Emissions	Reductions in Emissions under Locally Preferred Alternative[1]	Minimum Operable Segment
Carbon Monoxide	461.3	22.5	22.0
Reactive Hydrocarbons	37.7	1.8	1.8
Oxides of Nitrogen	57.9	2.9	2.9
Sulfur Dioxide	8.9	0.5	0.5
Suspended Particulates	12.4	0.7	0.7

Source: WESTEC Services, Inc.; SCRTD

[1]Also reflects reductions under the Aerial Option

3.7.3 ENERGY

Transportation energy requirements under the No Project Alternative include the demand for construction, operation, and maintenance of automobiles and buses, and the demand for fuel. The resultant energy demand in the year 2000 is a function of auto and bus travel. An estimated 544,539 billion British thermal units (BTUs) would be required for transportation purposes in the Los Angeles region.

Under the Project alternatives, approximately three-fourths of the rail system energy demand is required for traction power and station operations; the balance is for construction of guideways, structures, and passenger vehicles and for maintenance. Total annual rail energy demand for the Locally Preferred Alternative is 1,433 billion BTUs; for the Aerial Option, 1,371 billion BTUs; and for the Minimum Operable Segment, 850 billion BTUs. The construction and operation of the Locally Preferred Alternative, the most energy demanding of the Project alternatives, would represent less than one-half of one percent of the City of Los Angeles' Department of Water and Power's projected year 2000 annual demand.

The energy demand imposed on the region by Metro Rail is projected to be offset by the reduction in auto and bus vehicle miles traveled. Most of the net energy savings generated by the rail transit system will come from reductions in propulsion energy consumption; that is, the gasoline and diesel fuel that would be consumed if Metro Rail were not built.

3.7.4 GEOLOGY AND HYDROLOGY

Features already incorporated into the design of the Project alternatives will eliminate nearly all potential geologic and hydrologic hazards. The only hazard with significant consequences for the rail transit system would be a fault rupture and subsequent ground shaking which could impact the alignment of all Project alternatives and damage support structures of the Aerial Option. However, the probability of such an event is extremely low--the maximum displacement estimated for the Malibu-Santa Monica Fault is expected to occur on an average of once every 20,000 to 30,000 years and for the Hollywood Fault, once every 60,000 to 70,000 years.

3.8 CULTURAL RESOURCES

3.8.1 SECTION 106 AND 4(f) HISTORIC PROPERTIES

The No Project Alternative would have no effect on the 63 properties found to be historically significant from surveys conducted along the Metro Rail Alignment. One historic and three potentially historic properties may be adversely affected by the Project alternatives.

- At Union Station, a National Register District, two design alternatives are being considered which could affect this district to differing degrees. Alternative A would cause the staged removal and replacement of Union Station rail track; removal of the north end of the Mail, Baggage, and Express Building; removal and later reconstruction of a ramp and an architecturally integrated wall on the north side of the station; the removal of the first floor of another section of the Mail, Baggage, and Express Building; and the removal of a canopied loading dock east of the track area. Alternative B would involve the same actions as Alternative A plus the removal of the Mail, Baggage, and Express Building at and above track level, removal of a covered parking area at track level, and the removal and redesign of the ramp at the south end of the station.

- At the Title Guarantee Building on West Fifth Street and possibly the Pershing Square Building on South Hill Street (if another station entrance is needed in the future) the ground floors of the building would need to be altered to include station entrances. Visual and audible elements out of character with the buildings would also be introduced.

- At Hancock Park/La Brea Tar Pits a portion of land would be required for a station entrance.

Were the Aerial Option to be adopted, an additional 26 potentially historic structures may be adversely affected along the North Hollywood alignment.

3.8.2 ARCHAEOLOGY

Along the Locally Preferred Alternative's alignment, three archaeologically significant sites have been identified and four other sites are considered potentially significant. All Project alternatives have the potential for disrupting resources in the Los Angeles Passenger Terminal District, at the Civic Center and Hill Street Station locations, and in the Hancock Park/La Brea Tar Pits area. In addition, the Locally

Preferred Alternative and the Aerial Option may uncover archaeological resources in the Campo de Cahuenga area of Universal City. No other adverse effects are expected but, to insure protection of these resources, an archaeologist will observe construction activities at the other identified and potentially significant sites.

3.8.3 PALEONTOLOGY

Potential impacts on paleontological resources are identical for all Project alternatives. The most significant impact would be in the Rancho La Brea Tar Pits resource area where there are known occurrences of fossils. Marine invertebrates and vertebrates may also be encountered in the CBD and along the Wilshire Corridor.

3.8.4 PARKS AND RECREATION LANDS

The No Project Alternative would not enhance accessibility to public parks and other recreational facilities in the Regional Core, in contrast to the Project alternatives. While the long term net effect to 4(f) lands will be beneficial, short term effects are expected. Under all Project alternatives, removal of sidewalks and landscaping would occur at the Court of Flags and at Pershing Square and minor land acquisition near the east wing of the Los Angeles County Museum of Art at Hancock Park would be necessary for construction of station entrances. In addition, the Locally Preferred Alternative and the Aerial Option would affect the Campo de Cahuenga park area through indirect construction impacts (such as noise and vibration). No actual use of parkland in the area will be required. The Hollywood Bowl, an optional station, would also be affected under these two alternatives. A station entrance and vent shafts at each end of the station would be built on Bowl property if this station were constructed.

3.9 COST EFFECTIVENESS ANALYSIS

Cost effectiveness, as used here, is a measure of the cost of the benefits derived from investment in rail transit. Benefits include the number of patrons served and the number of passenger miles traveled. This section considers the cost effectiveness of the rail alternatives under differing assumptions about the discount rate and the patronage estimates.

3.9.1 COST SUMMARY

Table 2-20 presents a summary cost comparison of the alternatives in 1983 dollars. Included are total capital cost, annualized capital cost at ten percent (currently assumed to be the most accurate rate), year 2000 operating cost, and total annual cost. The costs include bus and rail costs. Over the time period of the financial analysis, the initial bus fleet with its 12 year economic life would have to be replaced twice. This has been taken into account in the annualization of the capital costs.

The Locally Preferred Alternative is the most costly alternative with a total rail and bus capital cost of $2,656.6 million and a total annualized cost of $287.3 million. The Aerial Option would reduce rail and bus capital costs by $64.4 million and total annualized costs by $6.6 million. The Minimum Operable Segment would cost a total of $1,856.9 million in rail and bus capital expenditures and result in a total annualized cost of $205.1 million. Expected annual revenue for the Locally Preferred Alternative and the Aerial Option are the same, estimated at $332.2 million. The Minimum Operable Segment could generate as much as $35.43 million a year less in revenue.

TABLE 2-20

COST COMPARISON
(in millions of 1983 dollars)

	No Project	Locally Preferred Alternative	Aerial Option	Minimum Operable Segment
Capital Cost[1]				
Bus	$323.9	$304.4	$304.4	$308.0
Rail	N.A.	2,352.2	2,287.8	1,548.9
Total	$323.9	$2,656.6	$2,592.2	$1,856.9
Total Annualized Capital Cost[2] (@ 10%)	$48.3	$287.3	$280.7	$205.1
Annual Operating Cost[1]				
Bus	$403.4	$388.3	$388.3	$386.6
Rail	N.A.	45.5	45.5	30.6
Total	$403.4	$433.8	$433.8	$417.2
Total Annual Cost[2] (@ 10%)	$451.7	$721.1	$714.5	$622.3
Total Annual Revenue[3]	$179.8	$332.2	$332.2	$296.8

Source: [1]DMJM/Kaiser Engineers/Booz, Allen & Hamilton (capital and operating costs.

[2]Lynn Sedway & Associates (annualized costs).

[3]SCRTD; Schimpeler-Corradino Associates (patronage and revenues). Annual revenues are based on 310 operating days.

3.9.2 COST EFFECTIVENESS

This section presents calculations of cost effectiveness for total annual costs (annualized capital costs and annual O & M costs) on both an average cost and marginal cost basis. Average costs are total costs divided by either total passengers or total passenger miles. For systems of comparable length, the cost per passenger is a useful measure of comparison. However, for systems of different lengths it is more accurate to compare passenger miles because this measure accounts for both trip volumes and trip length. Marginal costs are the expenditures incurred for each addition to the rail project. In the following discussion, the cost effectiveness in terms of average and marginal cost is presented first for the entire transit system and then for the rail component alone.

Analysis of Average Costs. Table 2-21 presents total annual costs on both a per passenger and passenger mile basis. Considering total transit (rail and bus) ridership on a per passenger basis, the least costly alternative is the Minimum Operable Segment, at $0.90 (at ten percent), $0.09 less than the projected costs for the No Project Alternative. Even with the substantial capital cost associated with the full-length rail alternatives, the average cost per passenger is the same as or less than that projected for the No Project Alternative. On a per passenger mile basis, the average cost of the No Project Alternative is $0.27. Only the Minimum Operable Segment would reduce the total average costs of the transit system; both the Locally Preferred Alternative and the Aerial Option would cause average costs to rise slightly. It should be repeated that this analysis is based on a ten percent discount rate. At a lower discount rate, such as seven percent, all transit systems with a rail component would be less expensive than the No Project Alternative. Among the rail alternatives, the Minimum Operable Segment costs least per passenger; the Locally Preferred Alternative costs the most. This is to be expected for two reasons. First, the Minimum Operable Segment is shorter and has fewer stations; thereby costing about two-thirds of the Locally Preferred Alternative's capital and operating costs. Second, the Minimum Operable Segment, although much shorter, still carries 78 percent of the Locally Preferred Alternative's ridership. On a per passenger mile basis, which is a better measure of the use of the system because it takes into account the number of miles traveled, the Aerial Option has the lowest average cost. It should be realized that this alternative was developed with this objective in mind. Essentially, the Aerial Option carries the same ridership as the Locally Preferred Alternative, but it costs $64.4 million less to build. Compared to the No Project Alternative, each of the rail systems alone have higher average costs. However, as noted earlier, the combination of the rail alternatives with their complementary bus networks, would result in comparable or lower average costs.

Analysis of Marginal Costs. A marginal cost analysis can determine if further expenditures for a project are economically feasible. The analysis involves a comparison of the average cost of current operations against the incremental, or marginal, costs of expanding operations. If the marginal costs are less than current average costs, then expansion can occur without increasing the average cost. Conversely, if the marginal costs are greater than current average costs, then expansion will cause average costs to rise. In effect, further expansion is feasible if the marginal cost is less than the average cost of the No Project Alternative. It should be kept in mind that the cost effectiveness analysis offers only one perspective on the merits of a project. Other factors, such as improving mobility and supporting land use decisions, will be weighed by UMTA, SCRTD, and the public in determining the project's merits.

<u>Total Annual Costs.</u> Table 2-22 presents the additional costs of carrying an additional passenger or offering service for one more passenger mile. This table should be compared with total average costs per passenger and per passenger mile in Table 2-21. As seen in the tables, the marginal costs (Table 2-22) on a per passenger basis are less than the average costs (Table 2-21). This means that the additional investment in a rail system would have the effect of reducing the average costs of building and operating the overall SCRTD transit system. This, in turn, means that the operating subsidy would be reduced.

On a per passenger mile basis, however, only the Minimum Operable Segment meets the desired criterion of lowering the average costs for transit. In contrast, the

TABLE 2-21

TRANSIT EFFICIENCY AND PATRONAGE SENSITIVITY
TOTAL ANNUAL COST PER UNIT OF PRODUCTIVITY[1]
(in 1983 dollars)

	No Project Alternative	Locally Preferred Alternative		Aerial Option		Minimum Operable Segment	
Rail							
Per Passenger							
4%	N.A.	$1.38	($1.97)	$1.35	($1.93)	$1.16	($1.66)
7%	N.A.	1.91	(2.72)	1.86	(2.66)	1.60	(2.27)
10%	N.A.	2.46	(3.52)	2.41	(3.44)	2.07	(2.96)
Per Passenger Mile							
4%	N.A.	$0.37	($0.52)	$0.36	($0.51)	$0.42	($0.60)
7%	N.A.	0.51	(0.72)	0.49	(0.71)	0.58	(0.82)
10%	N.A.	0.65	(0.93)	0.64	(0.91)	0.75	(1.07)
Total (Rail & Bus)							
Per Passenger							
4%	$0.97	$0.80	($1.15)	$0.80	($1.14)	$0.76	($1.09)
7%	0.98	0.89	(1.28)	0.89	(1.27)	0.83	(1.18)
10%	0.99	0.99	(1.42)	0.98	(1.40)	0.90	(1.29)
Per Passenger Mile							
4%	$0.26	$0.23	($0.32)	$0.23	($0.32)	$0.21	($0.30)
7%	0.26	0.25	(0.36)	0.25	(0.36)	0.23	(0.33)
10%	0.27	0.28	(0.40)	0.28	(0.40)	0.25	(0.36)

Source: Lynn Sedway & Associates

[1] Figures in parentheses assume projected rail and bus patronage are reduced by 30 percent. For a discussion of the sensitivity of the costs to these different patronage levels, see section 3.9.3 of this chapter.

****

TABLE 2-22

MARGINAL COST SENSITIVITY ANALYSIS - TOTAL ANNUAL RAIL AND BUS COST[1]
(in 1983 dollars)

	Locally Preferred Alternative		Aerial Option		Minimum Operable Segment	
Marginal Total Annual Cost Per Marginal Passenger						
4%	$0.51	($2.22)	$0.50	($2.18)	$0.35	($2.22)
7%	0.72	(3.17)	0.71	(3.09)	0.52	(3.24)
10%	0.95	(4.17)	0.93	(4.06)	0.69	(4.31)
Marginal Total Annual Cost Per Marginal Passenger Mile						
4%	$0.16	($1.31)	$0.16	($1.28)	$0.11	($2.15)
7%	0.23	(1.86)	0.23	(1.82)	0.17	(3.14)
10%	0.30	(2.45)	0.30	(2.39)	0.22	(4.18)

Source: Lynn Sedway & Associates

[1]Figures in parentheses assume projected rail and bus patronage are reduced by 30 percent. For a discussion of the figures, see section 3.9.3 of this chapter.

Locally Preferred Alternative and Aerial Option have average costs of $0.28 per passenger mile, but the marginal costs are $0.30 per passenger mile. This suggests that a full-length system is less cost efficient than the Minimum Operable Segment. This situation is a good example of where other factors should at least be recognized. While the Minimum Operable Segment costs the least, it does not provide the desired improvement in transit travel times between the San Fernando Valley and destinations in Hollywood, the Wilshire Corridor, or the CBD, nor does it satisfy the land use and development objectives of Hollywood and North Hollywood. It should also be realized that all of the rail alternatives would be cost efficient under assumptions of a lower discount rate.

Operating Costs. The efficiency of operating costs is a useful index, because once the rail project is built, a primary concern becomes the annual operating costs and how they will be met. Table 2-23 presents measures of marginal operating costs on both a marginal passenger and marginal passenger mile basis with regard to the total system (rail and bus). To carry an additional passenger the Minimum Operable Segment would incur the least additional operating cost. This is because its operating costs are only slightly higher (about three percent) than projected for the No Project Alternative, yet this alternative increases boardings by more than 55 percent. The Minimum Operable Segment is much more efficient than the full-length systems on the per marginal passenger basis--again, primarily because the system is only 8.8 miles compared to the full-length 18.6 mile system and has 11 stations compared to 16 stations.

TABLE 2-23

MARGINAL OPERATING COST SENSITIVITY ANALYSIS[1]
(in 1983 dollars)

	Locally Preferred Alternative	Aerial Option	Minimum Operable Segment
Rail			
Marginal Operating Cost Per Marginal Passenger	$0.39 ($0.56)	$0.39 ($0.56)	$0.33 ($0.48)
Marginal Operating Cost Per Marginal Passenger Mile	$0.10 ($0.15)	$0.10 ($0.15)	$0.12 ($0.17)
Total (Rail & Bus)			
Marginal Operating Cost Per Marginal Passenger	$0.11 ($0.47)	$0.11 ($0.47)	$0.05 ($0.35)
Marginal Operating Cost Per Marginal Passenger Mile	$0.02 ($0.28)	$0.02 ($0.28)	$0.02 ($0.34)

Source: Lynn Sedway & Associates.

[1] Figures in parentheses assume projected rail patronage is reduced by 30 percent. For a discussion of these figures, see section 3.9.3 of this chapter.

Interestingly, the marginal operating cost analysis on a per marginal passenger mile basis shows the full-length system to be more cost efficient. This results from several factors. Passengers on the full-length system make longer trips than on the Minimum Operable Segment. The combination of more boardings plus longer average trip lengths means the Locally Preferred Alternative and Aerial Option are projected to carry 74 percent more passenger miles than the Minimum Operable Segment. Moreover, even though the 18.6 mile system is longer and has more stations, its operating costs are only about 50 percent greater than the shorter rail alternative. Thus, the Locally Preferred Alternative and Aerial Option on a per marginal passenger mile basis are most cost efficient.

Revenue and Cost Analysis. A comparison of annual revenues against annual operating costs shows which alternatives would operate at a surplus or deficit. Table 2-24 indicates that operating costs for each alternative are projected to exceed revenues. The greatest deficit, therefore requiring the greatest operating subsidy, is projected for the No Project Alternative. The operating subsidy with the rail components is significantly reduced. Under the Locally Preferred Alternative, the deficit decreases by $122.05 million to $101.60 million; under the Minimum Operable Segment, the deficit decreases by $103.22 million to $120.43 million. This improvement in the financial aspects of transit operation is one of the most positive effects of the rail alternatives. With a reduction in the operating subsidy, SCRTD has the opportunity to improve services, reduce fares, reduce the demand for funding, or some combination of all of these.

TABLE 2-24

COST/REVENUE SENSITIVITY ANALYSIS - YEAR 2000
TOTAL RAIL AND BUS SYSTEM[1]
(in millions of 1983 dollars)

	No Project Alternative	Locally Preferred Alternative[2]		Minimum Operable Segment	
Annual Revenues	$179.75	$332.20	($232.54)	$296.77	($207.74)
Annual Operating Costs	403.40	433.80	(433.80)	417.20	(417.20)
Annual Operating Deficit	$223.65	$101.60	($201.26)	$120.43	($209.46)

Source: Lynn Sedway & Associates.

[1]Figures in parentheses assume projected rail and bus patronage are reduced by 30 percent. For a discussion of these figures, see section 3.9.3 of this chapter.

[2]Figures are identical for the Aerial Option.

3.9.3 PATRONAGE SENSITIVITY ANALYSIS - 30 PERCENT REDUCTION

Because of the uncertainty inherent in predicting patronage, a patronage sensitivity analysis was conducted. The analysis was undertaken to assess the cost effectiveness of the project if patronage did not reach the predicted level. For the purpose of this analysis, a reduction of 30 percent was assumed. This would mean that daily transit boardings would be 1,642,200 under the Locally Preferred Alternative and Aerial Option and 1,561,000 for the Minimum Operable Segment. These figures include a 30 percent reduction in rail boardings, so that under the Locally Preferred Alternative there would be 263,500 daily boardings and under the Minimum Operable Segment, 206,700.

The analysis was conducted assuming that there would be no reduction in the capital costs of the alternatives. The assumption, as stated above, is that the project which uses six car trains and 450 foot platforms is built as planned but patronage is less than projected. While operating costs could be lower, the analysis assumes no reduction in operating cost. In addition, patronage under the No Project Alternative has been kept at its predicted level. These "worst case" assumptions are selected to highlight the most negative effect on cost effectiveness. It is recognized that ultimately service will be matched with the realized patronage. The reduction in patronage would result in a reduction of revenue (Table 2-24).

For the Locally Preferred Alternative and Aerial Option annual transit revenue would drop from \$332.20 million to \$232.54 million, a \$99.7 million difference. For the Minimum Operable Segment, the reduction in revenue is approximately \$89.0 million. With the costs remaining the same, this decrease in revenues would increase the expected annual operating deficits of the alternatives by a like amount. The total deficit for the Locally Preferred Alternative and Minimum Operable Segment with the reduced patronage still would be \$22.4 million and \$14.2 million less, respectively, than for the No Project Alternative. This deficit would have to be compensated for by a corresponding decrease in service to reduce operating costs or an increase in revenue through higher fares or more subsidy.

Cost per passenger and cost per passenger mile would both increase if patronage was less than predicted (Table 2-21). For the rail system only (assuming a discount rate of ten percent) the cost per passenger would increase by about \$1.05 for the Locally Preferred Alternative and Aerial Option and by about 0.90 for the Minimum Operable Segment. This represents a 40 percent increase in cost per rail passenger. If bus and rail passengers are looked at together, the reduction in total transit patronage would result in a comparable percentage increase in cost per transit passenger and cost per passenger mile. The effect of a decrease in total transit patronage under the Project alternatives is to reduce their cost effectiveness. Assuming a 30 percent reduction means average costs would be higher under all Project alternatives than under the No Project Alternative.

The impacts on marginal cost per marginal passenger and marginal cost per passenger mile were reviewed (Table 2-22). A reduction in rail patronage would increase the figures for all alternatives. For the ten percent discount rate the marginal cost per marginal passenger becomes \$4.17 for the Locally Preferred Alternative (\$3.22 increase), \$4.06 for the Aerial Option (\$3.13 increase), and \$4.31 for the Minimum Operable Segment (\$3.62 increase). The increase in marginal cost per marginal passenger mile likewise increase significantly. With either the full projected patronage or the scenario assuming 30 percent less patronage, the Aerial Option has the lowest marginal cost per marginal passenger or passenger mile.

In summary, a 30 percent reduction in patronage is a major factor in choosing among alternatives: on an average cost basis, the Minimum Operable Segment is preferable, but on a marginal cost basis, the Aerial Option is preferable. Using the criterion that marginal costs should be less than average costs, the patronage reduction does influence the cost effectiveness analysis. Under the predicted patronage levels (not reduced by 30 percent), all Project alternatives would be considered cost efficient on a per passenger basis. Under the reduced patronage levels, no alternative has marginal costs less than average costs. But, as noted earlier, this scenario assumes worst case assumptions. This analysis represents only one perspective upon which to evaluate the project. If this worst case situation were to occur, system changes could be effected to reduce service and make them commensurate with the patronage levels. In turn service changes would reduce overall operating costs, and thereby, result in a smaller demand for transit subsidy.

3.10 SUMMARY EVALUATION OF ALTERNATIVES

Table 2-25 summarizes the impacts of the alternatives. Each measure is more fully discussed in Chapters 3 and 4. There, the basic information and rationale upon which the evaluations are based are presented. The summary table provides a broad overview for a comprehensive comparison of the alternatives.

4. THE NEXT STEPS IN REVIEWING THE ALTERNATIVES (Prestype)

Before selecting a recommended alternative, SCRTD will seek the community's input. After public distribution of this Draft EIS/EIR, the SCRTD Board of Directors will conduct public hearings. Specific dates and times will be announced in local newspapers. The Board will be seeking comments from the community in order to recommend a project that best reflects their needs and is environmentally sound. UMTA is also seeking public input into the decision-making process. While the document identifies many of the anticipated environmental impacts others may be raised during the commenting period. The comment period will continue after public hearings and conclude 60 days after the Draft EIS/EIR is first publicly distributed.

Responses to public comments will be prepared, and, as necessary, additional environmental analysis will be performed. These materials will then be incorporated into a Final EIS/EIR by SCRTD and UMTA. Upon approval of the document, the Board will certify the EIS/EIR. UMTA will use this documentation of significant adverse impacts along with the mitigation measures in its decision on whether to fund a rail rapid transit project.

TABLE 2-25

SUMMARY COMPARISON OF ALTERNATIVES

	No Project Alternative	Locally Preferred Alternative/ Aerial Option[1]	Minimum Operable Segment
FINANCIAL[2]			
Patronage - Annual Boardings (millions)[3]			
Rail	N.A.	116.68	91.54
Bus[4]	444.67	610.73	600.00
Total	444.67	727.41	691.54
Capital Costs (millions)			
Rail	N.A.	$2,352.2/$2,287.8	$1,548.9
Bus[4]	$323.9	$304.4	$308.0
Total	$323.9	$2,656.6/$2,592.2	$1,856.9
Annual Operating Costs (millions)			
Rail	N.A.	$45.5	$30.6
Bus	$403.4	$388.3	$386.6
Total	$403.4	$433.8	$417.2
Total Annual Operating Costs			
Per Passenger	$0.91	$0.60	$0.60
Per Passenger Mile	$0.24	$0.17	$0.17
Total Annual Costs			
Per Passenger	$0.99	$0.99/0.98	$0.90
Per Passenger Mile at 10 percent discount	$0.27	$0.28	$0.25
Total Annual Revenues (millions)[3]	$179.8	$332.2	$296.8
Operating Subsidy Per Passenger (dollars)	$0.50	$0.14	$0.17
TRANSPORTATION			
Auto Vehicle Miles Traveled Diverted (millions)	N.A.	1.73	1.69
Auto Person-Trip Diverted to Transit	N.A.	390,820	382,169
Transit Mode Split (percent)	2.5	3.27	3.25
Revenue Bus Hours Traveled	23,346	22,278	22,320
Revenue Bus Miles Traveled	272,450	264,942	261,853
Peak Hour Buses Operated	1,963	1,845	1,866
REGIONAL CORE DEVELOPMENT, YEAR 2000			
Growth			
Commercial Floor Space - 1000 sq. ft.	271,400	290,400-298,100	287,400-290,300
Employees	984,500	1,053,500-1,083,700	1,046,200-1,066,100
Dwelling Units	428,720	528,230	492,020
Population	1,021,670	1,262,560	1,189,420
Estimated Tax Revenues (millions)	$16.9	$25.5-$32.0	$23.9-$29.3
Estimated Annual Value Capture Potential (millions)			
Via Ground Leasing	N.A.	$10.65	$9.30
Via Assessment District	N.A.	$3.8 - $10.5	$3.7 - $10.0
Displacement			
Residential Units	N.A.	224/240	51
Commercial Establishments	N.A.	222/216	136
Nonprofit Establishments	N.A.	9/7	5
PHYSICAL ENVIRONMENT			
Annual Transportation Energy Requirements (billions of BTUs)			
Rail Transit	N.A.	1,433/1,371	850
Total Transportation System	544,539	541,503/541,441	540,984
Air Pollutant Emissions (tons/day)			
Carbon Monoxide	461.3	438.8	439.3
Reactive Hydrocarbons	37.7	35.9	35.9
Oxides of Nitrogen	57.9	55.0	55.0
Sulfur Dioxide	8.9	8.4	8.4
Suspended Particulates	12.4	11.7	11.7

Note: All costs and revenues are in 1983 dollars.

N.A.: Not applicable.

[1]Indicated only where it differs from the Locally Preferred Alternative.

[2]A financial comparison assuming the Metro Rail Project does not achieve predicted patronage levels has been performed. See Section 3.9.3 of this chapter for more details.

[3]Annual boardings and revenues assume 310 operating days.

[4]Only includes initial cost. Full capital cost would require two cycles of replacement costs.

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing and future environmental setting of the Regional Core, the likely effects of a rail transit project on the setting, and possible ways to minimize the adverse effects. The setting includes key land use, socio-economic characteristics, as well as natural and physical features, that may be affected by the construction and operation of the Project alternatives. The impact assessment focuses on the site-specific issues that could not be addressed in the First Tier EIS/EIR. Accordingly, the impact area receiving the greatest attention is the station area, covering approximately 1/4 mile around each station. Larger areas are used in order to properly address areawide or regional impacts. Air quality impacts, for example, extend beyond the boundaries of the Regional Core, so a larger study area was defined.

Two types of impact, **short term** and **long term**, are evaluated. The first type of impact occurs during the temporary construction period; whereas the second type occurs during Metro Rail's operation. Because of their long term nature and potential for changing environmental setting, long term impacts are covered in greater detail than short term impacts, which have all been combined into one discussion. Aside from these "timing" aspects, impacts can be **direct** or **indirect.** With direct effects, such as noise and vibration, there is an immediate connection between the Metro Rail Project and its alteration of the environmental setting. By contrast, indirect impacts occur later in time or are farther removed in distance. Growth accommodated by Metro Rail and the subsequent economic and fiscal implications are examples of indirect impacts.

Following each impact assessment, mitigation measures are described to avoid, reduce, or eliminate significant adverse impacts. The measures presented in this Draft EIS/EIR represent various strategies that can be adopted. They are divided into two groups: those mitigation strategies that will be carried out completely by SCRTD and those for which SCRTD must coordinate with or depend on other agencies for implementation. To the maximum extent possible, decisions regarding mitigation will be recorded in the Draft and Final EIS/EIR. In some instances, it may not be possible to reach these decisions within the time frame of the EIS/EIR. These decisions will be made during the Final Design process, the 1-1/2 year period following completion of the EIS. During this time, SCRTD will reach agreement as necessary with the agencies regarding the implementation of the specific measures and will certify that these measures have been, or will be, applied. Should UMTA commit funding to a rail project, the grant agreements for construction funding will include a commitment to carry out the mitigation measures contained in the Final EIS, as a condition to receiving federal funds. The following sections of this chapter discuss the timeframes and procedures that will be followed and the measures most likely to be adopted for each impact area.

While in many cases, mitigation measures will eliminate adverse impacts, there will be situations where adverse impacts cannot be completely mitigated by any reasonable means. These impacts will be identified.

1. TRANSPORTATION

1.1 INTRODUCTION

This section describes the existing transportation situation in the Regional Core, defines the transportation impacts of the alternatives, and describes mitigation measures where practicable. The transportation impacts are subdivided into transit, traffic, and parking. Transit impacts involve the transportation providers as well as riders. Traffic impacts also involve the agencies who build and maintain the road system as well as auto owners and drivers. Parking is of concern at all stations.

1.2 TRANSIT

1.2.1 EXISTING CONDITIONS

Southern California has the largest all-bus transit system in North America, dominated by SCRTD's 2,400 bus fleet including spares. The SCRTD system extends from the Ventura County line on the west to Riverside and San Bernardino on the east, a distance of approximately 90 miles, and from the north end of the San Fernando Valley to San Pedro and Long Beach on the south, a distance of 40 miles. Typical weekday patronage on SCRTD's 226 lines has risen from 1.2 million boardings per day in fiscal year 1982 to 1.5 million in 1983. This increase in ridership was in response to the fare reduction (approximately one-half) resulting from Proposition A. Within SCRTD's service area, the Regional Core accounts for approximately half of the daily service commitment of 1,950 peak buses, 280,000 revenue bus miles and 21,000 revenue bus hours, and more than half of the passengers. In contrast to the remainder of the region, where only about three percent of the population's daily trips use public transportation, 15 percent of all trips within the Regional Core are made by transit. Figures 3-1 and 3-2 illustrate the intensive bus route pattern in the Western Los Angeles (includes Wilshire area) and San Fernando Valley portions of the Regional Core, respectively. Service is provided on conventional local bus lines, express buses on freeways, and limited-stop lines on arterial streets (Table 3-1).

Speeds of both local and limited buses in the Wilshire Corridor are unusually low (Table 3-2), especially in the p.m. peak hour. For example, lines 20, 21, and 22 average only 6.7 miles per hour for 3.6 miles on Seventh Street and Wilshire Boulevard from Maple Avenue to Western Avenue. The limited lines on the same route, 308 and 309, save seven minutes over the same distance and average 8.7 miles per hour by skipping local stops. Of the bus lines in the east-west corridors to be served by Metro Rail, only the Olympic Boulevard Limited (line 311) exceeds the SCRTD system average of 14.1 miles per hour.

These low speeds result from a combination of traffic congestion, delays at closely-spaced traffic signals, and long dwell times needed to load the large number of passengers. Load factors are higher in the Wilshire Corridor (Western Los Angeles) than in other parts of the system. Over 55 percent of the buses operating in the Wilshire Corridor in the a.m. peak hour--including crosstown and express lines as well as locals--have standing passengers. More than 25 percent have over 10 standees per bus, a level where the standing passengers begin to hinder passengers leaving the

Figure 3-1 Western Los Angeles Bus Routes

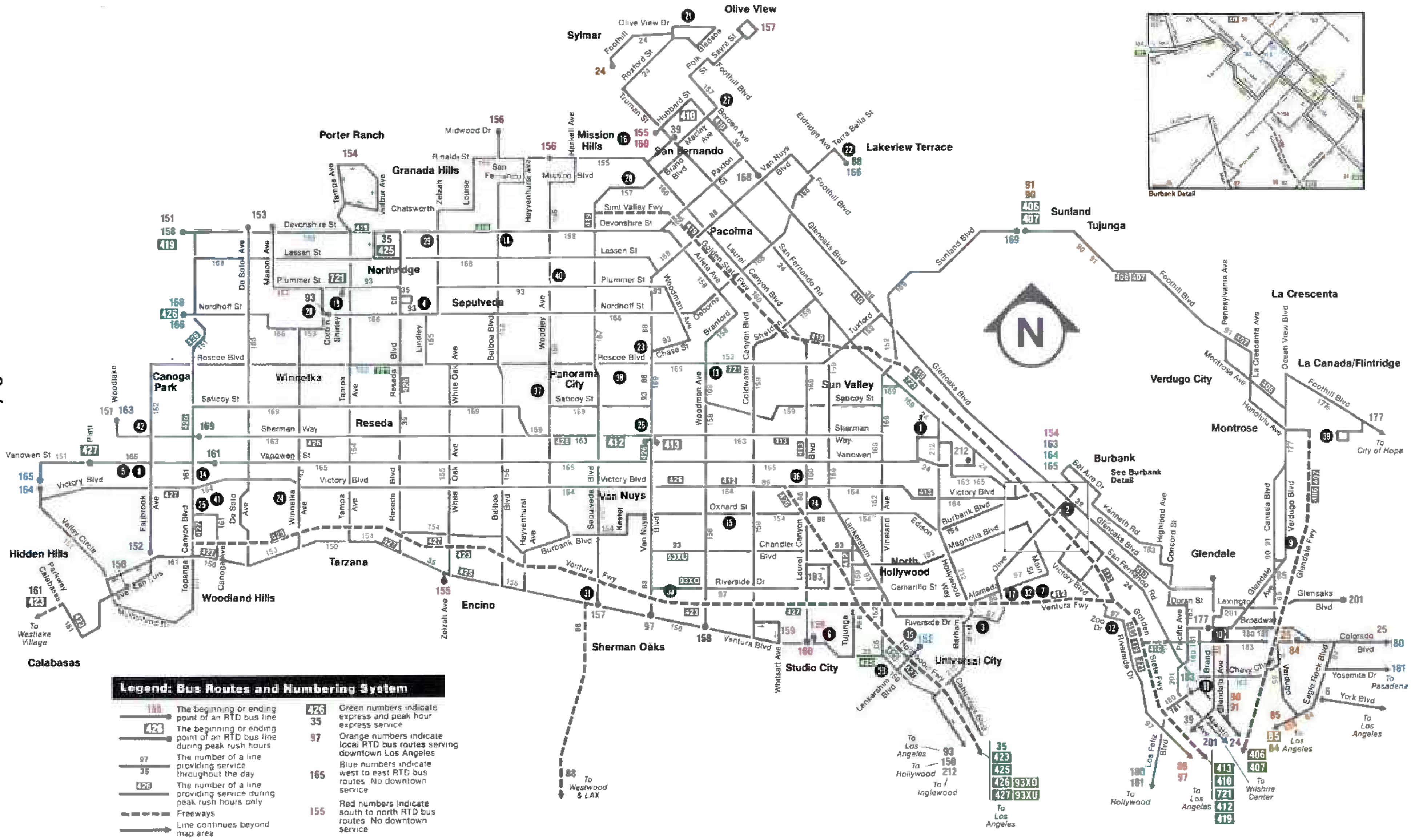


Figure 3-2 San Fernando Valley Bus Routes

TABLE 3-1

SUMMARY OF REGIONAL CORE EXISTING BUS SYSTEM

Area and Type of Line	Number of Lines	Weekday Passengers	Peak Buses Required	Revenue Bus-Hours
Western Los Angeles				
Radial-Local[1]	28	423,099	558	5,755
Crosstown-Local	13	159,820	184	2,181
Express	10	7,287	67	302
Park-and-Ride	1	737	9	31
Total	52	590,943	818	8,269
San Fernando Valley				
Radial-Local[2]	9	59,217	137	1,293
Crosstown-Local	13	54,185	94	1,168
Express	3	1,203	16	57
Park-and-Ride	1	1,127	16	41
Total	27	115,732	263	2,559
Total Regional Core[3]				
Radial-Local[1,2]	43	551,616	832	8,449
Crosstown-Local	20	208,013	266	3,013
Express	40	91,387	365	3,209
Park-and-Ride	10	7,069	77	252
Total	112	858,085	1,540	14,923

Source: SCRTD Bus Planning, Milestone 9 Report, and related analyses.

Note: Data shown is for entire routes, rather than specific segments.

[1]Includes four related limited-stop lines (308, 309, 311, and 313).

[2]Includes three related express services (410, 412, and 425).

[3]Includes all lines passing through Central Los Angeles regardless of corridor.

* * * * * * * * * * *

TABLE 3-2

TYPICAL BUS SPEEDS IN THE HOLLYWOOD/WILSHIRE CORRIDOR
IN HIGH DENSITY COMMERCIAL AREAS
(p.m. Peak Hours)

Line	Timepoint 1	Timepoint 2	Distance (miles)	Time (min.)	Speed (mph)
Local					
1	Hollywood/Vine	Hollywood/La Brea	1.0	8	7
2 & 3	Sunset/Western	Sunset/La Brea	1.9	12	9
4	Santa Monica/Western	Santa Monica/Fairfax	2.9	16	11
16	Third/Rampart	Third/Western	1.7	10	10
18	Sixth/St. Paul	Sixth/Alvarado	0.9	7	8
20, 21 & 22	Seventh/Maple	Wilshire/Western	3.6	32	7
27 & 28	Olympic/Figueroa	Olympic/Western	2.7	13	12
Limited					
308 & 309	Seventh/Maple	Wilshire/Western	3.6	25	9
311	Olympic/Figueroa	Olympic/Western	2.7	10	16

Source: SCRTD Schedules for Winter 1982-83.

Note: Average local bus speeds are 12.5 mph in West Central Los Angeles and 18.5 mph in the San Fernando Valley. Regional Core freeway express buses average 28 mph.

buses. During rush hours, on Wilshire Boulevard, buses are consistently at crush loads exceeding 70-80 passengers per bus.

Despite the relatively high average bus speeds (28 miles per hour) of freeway express lines systemwide, in the Wilshire/Hollywood/North Hollywood corridor the freeway buses are delayed in peak hour congestion just as much as autos and trucks. Only on the San Bernardino Freeway Busway are buses able to bypass stop-and-go freeway traffic during peak periods.

Bus schedule reliability is also a problem. On Wilshire Boulevard, where over 30 buses per hour are scheduled, service frequency is seldom at the rate of one bus every two minutes. More typically, a platoon of three or four buses arrives at intervals of four to ten minutes--due to a combination of traffic congestion, signal delays, and heavy passenger loading on the lead buses. The lead bus in such a platoon tends to become so overloaded that the driver will be instructed by the dispatcher to pass up stops in an effort to regain the original schedule. Waiting passengers who are passed up by the overloaded buses do not understand the operational needs of the the system and protest strongly. On other heavily used lines in the corridor, similar problems are found, though they are not so severe as on the Wilshire Boulevard lines.

1.2.2 IMPACTS

No Project Alternative. The bus system under the No Project Alternative would be based on the existing bus system, plus the Sector Improvements now underway. These improvements were approved in 1980 and have been implemented in phases since then. They should be complete by 1985 and would require 1,963 buses during peak hours and 966 at midday.

If a rail transit project were not implemented, the logical alternative would appear to be one of expanding the present system. However, neither the highway network nor the bus system can be expanded sufficiently to provide for the anticipated growth of employment in the Regional Core. Bus system expansion is constrained by the number of vehicles that can be accommodated by the street system in the downtown. Within the downtown, moreover, convenient curb space for loading commuter buses in p.m. peak hour is almost fully utilized. Accordingly, the No Project Alternative is virtually a "do-nothing" alternative, reflecting year 2000 conditions without major transit improvements. It assumes no growth in transit service to match expected population and employment increases in the region. Consequently, a reduced share of trips would be made using transit.

Without improved transit service, worsening congestion will likely retard or preclude further economic growth. Some employers and workers will endure circulation problems with correspondingly reduced efficiency. However, the more enterprising will tend to move to locations where their time can be occupied more productively than in traffic jams or late, overcrowded buses. Transit patronage may still increase, but the traffic and loading delays will require a higher commitment of drivers and vehicles in relation to results achieved, with higher operating costs per passenger as a result.

Minimum Operable Segment. The Minimum Operable Segment would provide a new, highly reliable express transit facility in the Wilshire Corridor. Table 3-3 presents some comparative bus, auto, and bus/Metro Rail travel times for selected journeys to or within the Regional Core. Further travel time comparisons, measuring changes in regional accessibility, may be found on Table 3-30. The faster rail transit system will benefit public transit commuters whose trips involve traveling along the line. For example, a commuter from Century City to Civic Center could travel by bus to a rail transit station. The time involved in transferring to a train would be offset by the much faster train, resulting in a reduced overall travel time.

TABLE 3-3

TRANSIT TRAVEL TIME COMPARISON

Origin and Destination	TRIP TIME IN MINUTES No Project Alternative	Minimum Operable Segment	Locally Preferred Alternative
North Hollywood to Financial District	53	53	38
Miracle Mile to Civic Center	42	25	24
Crenshaw/M. L. King Boulevard to Universal City	65	65	52
Beverly Hills (Wilshire/Canon) to Hollywood/Vine	47	47	36
Marina Del Rey to Wilshire/Vermont	65	48	47
Union Station to L.A. Coliseum	37	37	36

Source: SCRTD.

This alternative would not service the San Fernando Valley since it would not be feasible to reroute San Fernando Valley buses through the congested Hollywood and Fairfax District surface streets to the Fairfax/Beverly terminal of the Minimum Operable Segment. This circuitous routing would require much more time than a direct bus ride to downtown via the Hollywood Freeway.

In order to minimize total transit system operating costs, changes in the bus network are planned to coordinate with the rail transit line. The bus system would require 1,866 buses, or 97 less than the No Project Alternative. Detailed discussions of the bus route plans are presented in SCRTD's Milestone 9 Report: Supporting Services Plan. The following bus changes are associated with the Minimum Operable Segment:

- Some of the El Monte Busway lines will terminate at Union Station. The other El Monte buses will distribute passengers in the CBD but will not continue to serve the Wilshire Center area.
- The limited lines on Wilshire Boulevard will be discontinued, and some of the local buses on Wilshire Boulevard will terminate at the Metro Rail station at Wilshire/Fairfax.

- Two new rail feeder services will be initiated: S-101 Rampart Boulevard - Union Avenue, servicing the Wilshire/Alvarado Station, and S-215 Park La Brea Shuttle, serving the Wilshire/La Brea and/or Fairfax/Beverly Stations.

- The north-south lines connecting with the Metro Rail stations along Wilshire Boulevard will be reinforced in peak hours by short-service "trippers" in order to accommodate Metro Rail passenger loads.

- The SCRTD express bus lines which now use the Santa Monica Freeway will be rerouted via Fairfax Avenue to terminate at the Wilshire/Fairfax Station of Metro Rail.

- Lines on streets closely paralleling Wilshire (on Sixth, Seventh, and Eighth) will be extended to terminate at Metro Rail stations and will have service adjusted as needed to reflect changing ridership patterns.

- Some additional CBD-oriented routes would terminate at Union Station.

- At Fairfax/Beverly, bus line frequencies would be increased to accommodate increases in rail feeder ridership. Some lines may be terminated at this station for which additional bus bays would be required. Changes would not be major since North Hollywood or Hollywood buses would not be terminating here. This station will help distribute passengers arriving from the west between it and the Wilshire/Fairfax Station. See Section 2.4.1 of Chapter 2.

In addition to the improved mobility for present users and the potential to attract the auto user to a fast, reliable form of transit, rail transit will dramatically increase the passenger-carrying capacity of the corridor's transit system. The 140,000-plus passengers crossing the Harbor Freeway in buses each day approaches the capacity of the bus system, as well as the ability of buses to be loaded conveniently in downtown Los Angeles curb space. The Minimum Operable Segment would approximately double that capacity. This capacity increase would not only remove the present ceiling on transit use but also would allow existing passenger flows to be carried with a smaller commitment of vehicles, staff, and funds. Bus needs for Wilshire Corridor lines alone would be reduced substantially relative to the No Project Alternative. When it is considered that maintaining peak hour bus service is much more costly than all-day "base" service because of the substantial amount of overtime involved and the higher proportion of time needed in shuttling vehicles into and out of service, the economic advantages of rail transit to the provider are multiplied.

Locally Preferred Alternative and Aerial Option. The Locally Preferred Alternative will tap travel desires from the San Fernando Valley to the CBD, Hollywood, the Wilshire Center and Century City, as well as travel by western Los Angeles residents to Universal City and Burbank. Peak requirements will be 1,845 buses, or 118 less than the No Project Alternative. The reduction in bus requirements results primarily from terminating many San Fernando Valley lines at Universal City or North Hollywood Stations rather than continuing them on to the Los Angeles CBD.

With rail transit service to Hollywood and North Hollywood, SCRTD bus service will be modified. All changes identified for the Minimum Operable Segment would apply, in addition to the following.

- Express bus lines 429 and 601 between the westerly portion of Sunset Boulevard and the CBD will be discontinued and replaced by a limited-stop feeder service.

- Minor changes will be made in lines serving Hollywood and West Hollywood in order to provide direct station access.

- Lines 93 (Northridge-Van Nuys-Los Angeles), 150 (Ventura Boulevard), 152 (Fallbrook-Roscoe-Vineland), 159 (Lankershim), 160 (Laurel Canyon), and 423 Westlake Village will be terminated at the Universal City Station.

- Express lines 35 and 425 (Northridge-Tampa-Los Angeles) will be replaced by a new limited-stop service on Ventura Boulevard.

- Express lines 419 (Chatsworth-Downtown Los Angeles), 426 (San Fernando Valley-Wilshire Center-Downtown Los Angeles), 427 (Canoga Park-Los Angeles Park-and-Ride) and 721 (Reseda-Van Nuys-Los Angeles Park-and-Ride) are planned to be replaced by peak hour limited-stop lines terminating at either the Universal City or North Hollywood Station.

In addition to these changes, lines 86 and 97 may be either combined or replaced with a feeder line connecting Downtown Burbank and the Burbank Media Center with either the Universal City or North Hollywood Station.

Relative to the Minimum Operable Segment, patronage projections indicate that serving Hollywod and North Hollywood with rail transit will increase the number of transit riders by 3 percent while reducing bus needs slightly in the Regional Core.

1.3 TRAFFIC

1.3.1 EXISTING CONDITIONS

In the City of Los Angeles, there are 156 miles of freeways and 6,415 miles of surface streets. During a typical weekday almost half (45 percent) of the Regional Core vehicle miles traveled (VMT) occurs on the freeway system. Freeways which skirt the Regional Core are the Hollywood, Santa Monica, Golden State, and Ventura Freeways. While more than half of the Regional Core travel occurs on arterial streets, there are only six continuous arterial streets extending westward from the CBD: Beverly Boulevard, Third Street, Sixth Street, Wilshire Boulevard, Olympic Boulevard, and Pico Boulevard.

To determine traffic levels in the Regional Core, 24-hour machine traffic counts and six-hour manual counts conducted citywide in 1980 were examined. Where 1980 counts were not available, 1979 and 1981 data were utilized; approximately 100 manual counts were made at intersections within the Metro Rail station impact areas (generally a one-mile-wide corridor). The individual counts were compared with adjacent link volumes, and the data were adjusted to provide a reasonable areawide flow pattern. Development of similar information for freeways was based on counts supplied by the California Department of Transportation (Caltrans). Current VMT in the Regional Core is 14,185,000 miles per day.

In the Regional Core, 256 key intersections were studied to evaluate traffic impacts. They generally lie within a one-half-mile radius of the proposed stations in the San Fernando Valley and at Union Station, a one-mile-wide corridor along the proposed alignment from Hollywood through Fairfax and Wilshire to the Harbor Freeway, and a one-fourth-mile radius of the proposed stations in the CBD. The methodology used to calculate intersection capacity was the "Planning" application of the Critical Movement Analysis (CMA). The high bus and pedestrian volumes in the CBD were taken into account in calculating downtown intersection volume-to-capacity (V/C) ratios. (A V/C ratio represents the volume of vehicles passing through an intersection in a given time period, compared to the calculated traffic capacity of the intersection.)

The term Level of Service (LOS) is used to describe the quality of traffic flow, based on the V/C ratio. Levels of Service A to C (V/C ratio of 0.80 or below) operate quite well. LOS C normally is taken as the desirable design level in urban areas outside of a regional center. LOS D (V/C ratio between 0.81 and 0.90), typically the maximum level for which a metropolitan area street system is designed, is characterized by relatively heavy traffic on the approaches. Excessive back-up does not occur. LOS E (V/C ratio of 0.91 to 1.00) represents volumes at or near the capacity of the intersection. This condition is characterized by unstable flow with long queues and stoppages of several signal cycles. LOS F (V/C ratio over 1.00) occurs when an intersection is overloaded (demand exceeds intersection capacity) and is characterized by stop-and-go traffic with stoppages of long duration.

Rather than present all data provided by the City of Los Angeles Department of Transportation (LADOT)*, the streets and intersections at station locations were selected to show current and projected traffic conditions. The available traffic capacity of the principal Regional Core highways is fully utilized during peak hours, and delays are also common in high density areas. Figure 3-3 indicates where service levels of "E" or "F" (severe peak hour queuing delays) prevailed in 1980 in the Metro Rail Corridor. Typical freeway travel speeds, illustrated in Figure 3-4, are slow because of peak-hour congestion, which has been extending over a longer time period as demand has increased.

Even where the calculated LOS is C or D, peak arterial streets speeds may be low (15-20 mph) due to close spacing of traffic signals, high pedestrian flows, and heavy turning movements. Such conditions are presently found on Hollywood Boulevard, along Fairfax Avenue north of Wilshire Boulevard, and on Wilshire Boulevard in the "Miracle Mile" and east of Wilton Place, as well as in the CBD. A total of 46 intersections operate at or near capacity in either the a.m. or p.m. peak hours.

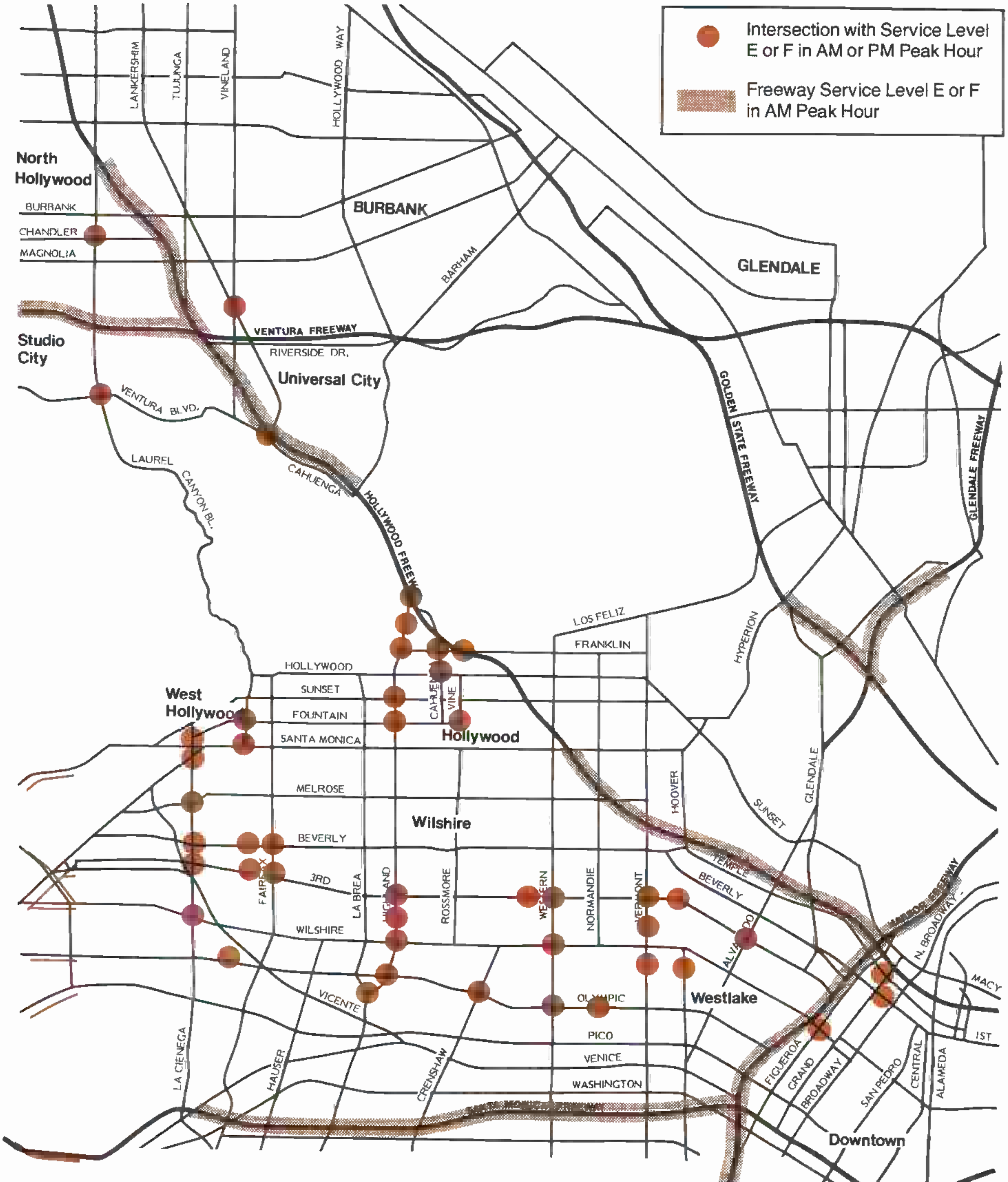
1.3.2 IMPACTS

Measures of traffic impacts in the Regional Core include:

- average daily traffic on roadway segments
- directional peak hour traffic volumes on roadway segments
- volume-to-capacity (V/C) ratios in a.m. and p.m. peak hours at key intersections

---

*A complete list of the reports prepared by LADOT and used in the preparation of this Draft EIS/EIR can be found in the References section of Chapter 6.



Source: Los Angeles City Department of Transportation

Southern California Rapid Transit District

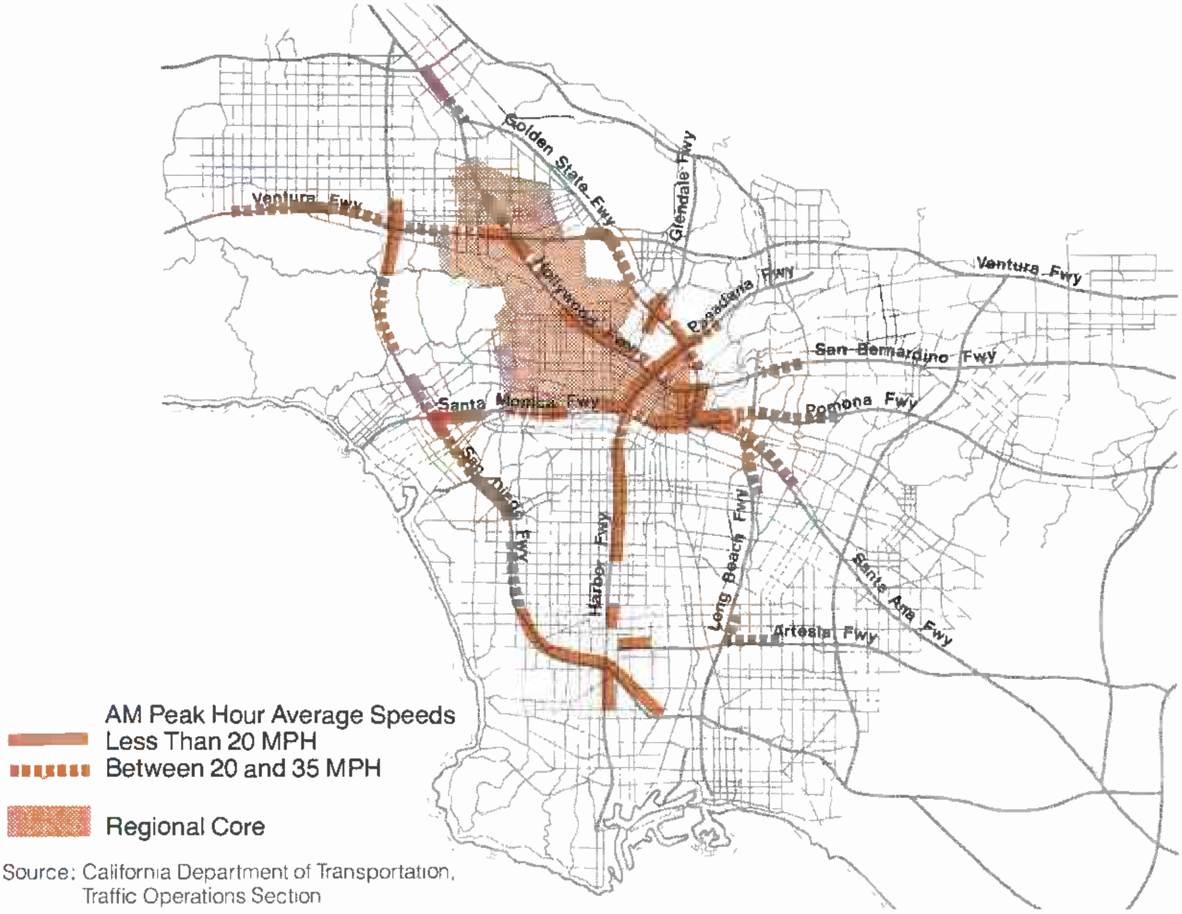
Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 1 2 3 miles

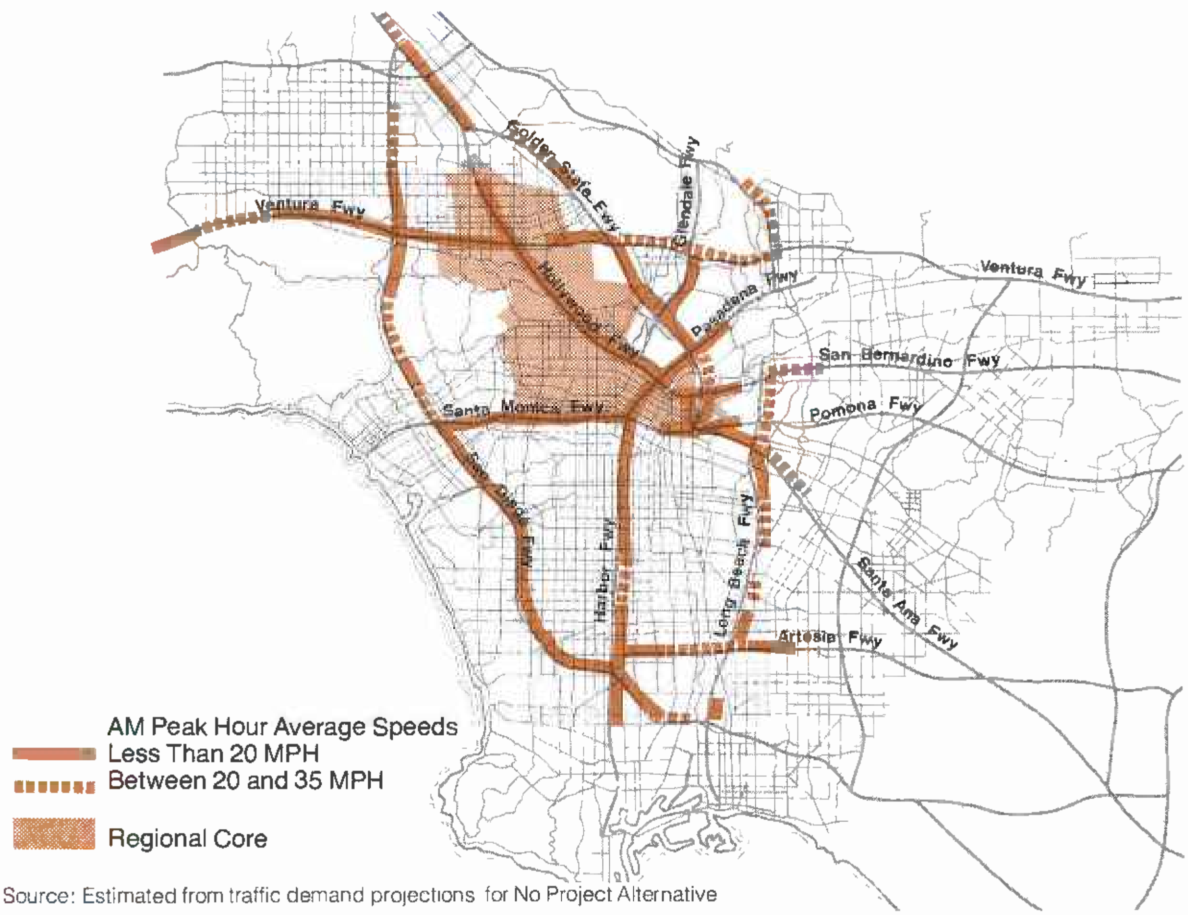
Figure 3-3 Regional Core Traffic Conditions Year 1980

SEDWAY/COOKE
Urban and Environmental Planners and Designers



Source: California Department of Transportation, Traffic Operations Section

Figure 3-4 Freeway Congestion, 1981



Source: Estimated from traffic demand projections for No Project Alternative

Figure 3-5 Estimated Freeway Congestion, 2000

- vehicle miles traveled (VMT) in the Regional Core

In addition, the intersections near each station were selected for special traffic analyses. A summary of traffic impacts for each alternative is provided in Table 3-4. Traffic impacts at intersections at station locations are shown in Table 3-5, while intersection V/C ratios at these locations are given in Table 3-6. The impacts for the Locally Preferred Alternative and the Aerial Option are the same. Impacts are discussed by alternative below.

TABLE 3-4

SUMMARY OF TRAFFIC IMPACTS, 1980 and 2000*

	1980 Existing	No Project Alternative		Minimum Operable Segment		Locally Preferred Alternative and Aerial Option	
	Condition	Volume	Change[1]	Volume	Change[2]	Volume	Change[2]
Screenline Traffic Volumes, 24-Hour Two-Way Totals							
Crossing Wilton/Arlington	784,700	1,015,600	29%	999,700	-2%	983,800	-3%
Crossing Hollywood Blvd.	370,400	486,400	31%	486,400	0	469,100	-4%
Peak Hour Traffic Volumes, Entering/Leaving L.A. CBD From/To Local Streets to the West							
Inbound-a.m. Peak Hour	14,350	20,030	40%	20,480	2%	18,860	-6%
Outbound-p.m. Peak Hour	17,380	22,610	30%	22,740	1%	22,930	1%
Number of Key Intersections in Regional Core at or Near Capacity (V/C more than 0.90, LOS E or F)							
Either a.m. or p.m. Peak Hour	46	156	239%	163	+4%	156	0
Vehicle Miles Traveled (VMT) Daily in Regional Core (thousands)							
Freeways	6,092	7,566	24%	7,397	-2%	7,393	-2%
Major/Secondary Streets	7,384	9,369	27%	8,735	-7%	8,720	-7%
Collector/Local Streets	709	891	26%	849	-5%	848	-5%
Total	14,185	17,826	26%	16,981	-5%	16,961	-5%

Source: City of Los Angeles Department of Transportation; SCRTD.

*No Project Alternative, Minimum Operable Segment, and the Locally Preferred Alternative and Aerial Option impacts reflect Year 2000 projections.

[1] Year 2000 No Project Alternative is measured against existing conditions.

[2] Minimum Operable Segment, Locally Preferred Alternative, and Aerial Option are measured against the No Project Alternative.

No Project Alternative. Projections of traffic volumes and intersection V/C ratios were made by LADOT for the year 2000 for the No Project Alternative. To project directional splits of daily traffic and a.m. and p.m. peak hour volumes it was assumed that current patterns would continue. Street widenings associated with the city's Capital Improvement Program, Community Redevelopment Agency projects, and private development were assumed to exist. In addition, possible operational

TABLE 3-5

INTERSECTION 24-HOUR TRAFFIC VOLUMES AT STATION LOCATIONS
TWO-WAY TOTALS (in thousands)

Intersection (First Street/ Second Street)	1980 Existing Conditions 1st Street	1980 Existing Conditions 2nd Street	No Project Alternative 1st Street	No Project Alternative 2nd Street	Minimum Operable Segment 1st Street	Minimum Operable Segment 2nd Street	Locally Preferred Alternative and Aerial Option 1st Street	Locally Preferred Alternative and Aerial Option 2nd Street
Alameda/Macy	23.6	23.1	28.6	27.3	30.3	29.1	29.5	29.3
First/Hill	23.1	15.4	32.3	21.4	31.0	20.9	30.6	20.1
Fifth/Hill	16.6*	18.9	23.2*	24.1	22.7*	23.7	22.5*	23.2
Seventh/Flower	17.9	16.4	31.7	25.5	31.4	25.7	30.7	25.4
Wilshire/Alvarado	22.2	24.0	29.4	32.8	28.2	33.3	28.1	32.7
Wilshire/Vermont	30.0	41.2	39.5	54.4	39.2	52.9	38.8	52.5
Wilshire/Normandie	32.7	16.6	42.5	22.0	41.4	21.9	41.3	22.2
Wilshire/Western	32.2	31.2	42.7	41.1	39.9	39.7	39.4	39.5
Wilshire/Crenshaw	36.1	17.0	48.1	22.1	46.7	22.1	45.6	22.1
Wilshire/La Brea	29.0	38.1	41.1	52.8	40.4	50.7	39.6	50.5
Wilshire/Fairfax	29.4	27.3	40.3	38.7	43.1	37.5	42.7	37.3
Fairfax/Beverly	27.7	31.9	39.0	41.5	40.2	42.7	37.8	42.1
Fairfax/Santa Monica	24.3	33.3	33.6	41.8	32.4	41.8	31.1	41.6
La Brea/Sunset	33.5	46.3	43.7	57.7	42.3	57.1	41.1	55.2
Hollywood/Cahuenga	30.1	23.2	38.7	31.1	37.9	30.3	36.6	30.9
Lankershim/Cahuenga	23.9	12.2	37.2	17.4	37.2	17.4	36.2	19.4
Chandler/Lankershim	4.3	17.1	6.8	22.2	6.8	22.2	13.1	22.6

Source: City of Los Angeles Department of Transportation

* One-Way Street

TABLE 3-6

INTERSECTION V/C RATIOS AT STATION LOCATIONS
A.M. AND P.M. PEAK HOUR, 1980 and 2000*

Location		1980 Existing Condition[1]		No Project Alternative[1]		Minimum Operable Segment[2]		Locally Preferred Alternative and Aerial Option[1]	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Alameda/Macy	- AM	.72	C	.85	D	.92	E	.92	E
	- PM	.69	B	.83	D	1.09	F	1.09	F
First/Hill	- AM	.88	D	1.19	F	1.09	F	1.09	F
	- PM	.90	E	.92	E	.92	E	.92	E
Fifth/Hill	- AM	.68	B	.82	D	.79	C	.79	C
	- PM	.70	C	.93	E	.91	E	.91	E
Seventh/Flower	- AM	.57	A	.70	C	.68	B	.68	B
	- PM	.82	D	.76	C	.77	C	.77	C
Wilshire/Alvarado	- AM	.56	A	.74	C	.73	C	.73	C
	- PM	.79	C	1.02	F	.90	E	.90	E
Wilshire/Vermont	- AM	.71	C	.94	E	.89	D	.89	D
	- PM	.82	D	1.13	F	1.05	F	1.05	F
Wilshire/Normandie	- AM	.65	B	.92	E	.81	D	.81	D
	- PM	.71	C	.96	E	1.01	F	1.01	F
Wilshire/Western	- AM	.89	D	.99	E	.93	E	.93	E
	- PM	.94	E	1.03	F	.99	E	.99	E
Wilshire/Crenshaw	- AM	.71	C	1.01	F	.96	E	.96	E
	- PM	.87	D	1.11	F	1.08	F	1.08	F
Wilshire/La Brea	- AM	.58	A	.84	D	.78	C	.79	C
	- PM	.69	B	1.06	F	1.05	F	1.05	F
Wilshire/Fairfax	- AM	.61	B	.88	D	.85	D	.85	D
	- PM	.79	C	1.11	F	1.12	F	1.12	F
Fairfax/Beverly	- AM	.85	D	.96	E	.97	E	.95	E
	- PM	.95	E	1.07	F	1.09	F	1.07	F
Fairfax/Santa Monica	- AM	.77	C	.95	E	.95	E	.90	E
	- PM	.85	D	1.05	F	1.05	F	1.04	F
La Brea/Sunset	- AM	.67	B	.85	D	.85	D	.93	E
	- PM	.85	D	1.06	F	1.06	F	.98	E
Hollywood/Cahuenga	- AM	.72	C	.95	E	.95	E	.98	E
	- PM	.90	E	1.13	F	1.13	F	1.23	F
Lankershim/Cahuenga	- AM	.53	A	.89	D	.89	D	1.01	F
	- PM	.55	A	.73	C	.73	C	.85	D
Chandler/Lankershim	- AM	.45	A	.62	B	.62	B	.71	C
	- PM	.38	A	.57	A	.57	A	1.27	F

Sources: [1]City of Los Angeles Department of Transportation
[2]SCRTD

Note: Calculations reflect ultimate park and ride facilities at Union Station (2,500 spaces), Wilshire/Fairfax (1,000 spaces), Fairfax/Beverly (1,000 spaces), Universal City (2,500 spaces), and North Hollywood (2,500 spaces).

V/C = Volume to Capacity Ratio
LOS = Level of Service

*No Project Alternative, Minimum Operable Segment, and the Locally Preferred Alternative and Aerial Option V/C ratios reflect Year 2000 projections.

improvements normally implemented by LADOT were identified for those intersections projected as operating at LOS E or F.

Resulting traffic conditions are illustrated in Figures 3-5 and 3-6. In practice, certain heavily congested points, known as critical intersections, will effectively limit volumes elsewhere in the system so that low service levels may not prevail quite as universally as Figure 3-6 indicates. What is shown, however, is that any "bottleneck" improvement on corridor arterial streets will simply transfer the problem to a neighboring intersection or street segment. In the CBD, Hollywood, Wilshire Center, and Fairfax District, the forecasts indicate a substantial risk of "gridlock" conditions, where the queues of vehicles from an intersection accumulate to a point where cross-streets, and ultimately exits from the area, are blocked.

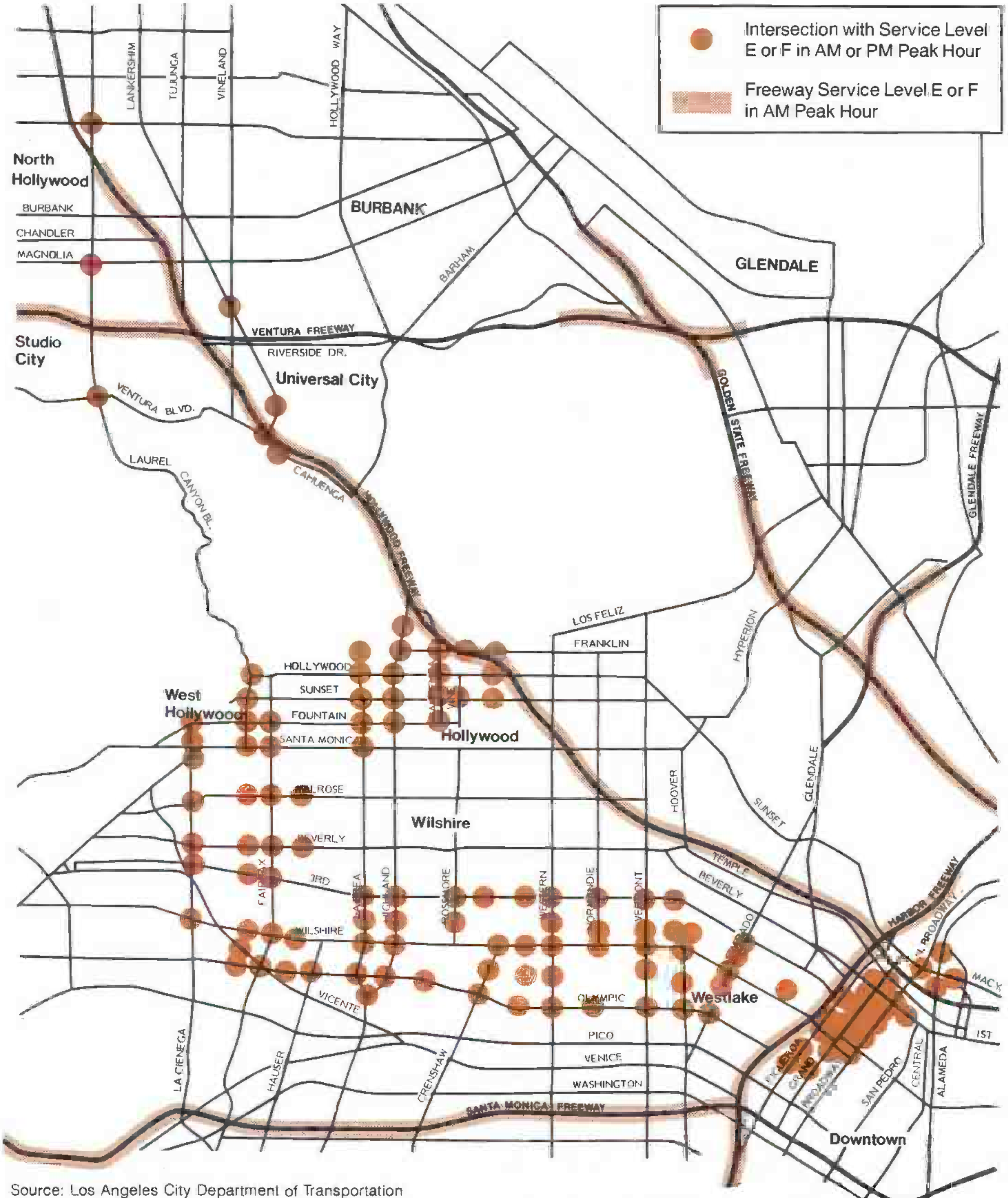
At present, freeway ramp metering tends to stabilize speeds and maintain LOS D or better in most locations. By the year 2000, p.m. peak queues at ramps meters will regularly accumulate to a point where they obstruct surface streets. In order to prevent gridlock on the surface streets, Caltrans may have to raise ramp metering rates and allow a reduction in the already low peak hour freeways speeds, approaching stop-and-go traffic flow at many locations.

The most severe traffic congestion under the No Project Alternative will occur south of the Hollywood Hills as a result of increasing population and employment densities. In contrast, traffic congestion in the North Hollywood area is expected to be relieved somewhat by street improvements. These include a new Universal City access bridge across the Hollywood Freeway and reconstruction of the six-legged complex intersection at Camarillo, Lankershim, and Vineland. Other improvements, programmed to accompany redevelopment in the North Hollywood Commercial Core (Lankershim between Magnolia and Chandler) will improve traffic flow quality, even with planned new developments. Only in the vicinity of Universal City along Lankershim Boulevard do North Hollywood traffic delays appear likely to worsen. The Universal Place on-ramp to the Hollywood Freeway will become a particular problem area. Traffic on the Hollywood and Ventura Freeways will continue to operate slowly at LOS E or F during peak hours.

Minimum Operable Segment. Traffic flow in the year 2000 with Metro Rail differs from the No Project Alternative in that auto trips are diverted to transit, while additional auto trips are made to access Metro Rail stations. These changes were estimated based on mode-of-arrival projections. Physical and operational intersection improvements assumed under the No Project Alternative were again assumed in the Minimum Operable Segment and Locally Preferred Alternative analyses.

The Minimum Operable Segment will reduce vehicle traffic across the principal screenlines by up to 2.7 percent. Even this small reduction will likely reduce congestion along Wilshire Boulevard and parallel arterial streets, relative to the No Project Alternative (Tables 3-5 and 3-6). For example, Metro Rail is expected to improve the p.m. peak hour V/C ratio at Vermont Avenue and Wilshire Boulevard from 1.13 to 1.05. Even though both ratios are LOS F, the risk of gridlock at this point would be reduced by the Minimum Operable Segment.

The general traffic impact of Metro Rail in the Wilshire Corridor would be favorable. Nevertheless, traffic at station locations is expected to worsen, especially at stations planned for parking facilities (Union Station, Wilshire/Fairfax, and Fairfax/Beverly), where peak hour commuter vehicles are expected to offset the



Source: Los Angeles City Department of Transportation

Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 1 2 3 miles

Figure 3-6
Regional Core Base Traffic Conditions Year 2000

SEDWAY/COOKE
Urban and Environmental Planners and Designers

general improvement. The greatest impacts will be at Union Station, which is planned to have the largest parking facility. For example, the p.m. peak hour V/C ratio at Alameda and Macy Streets near Union Station is expected to change from 0.83 (LOS D) for the No Project Alternative to 1.09 (LOS F) for the Minimum Operable Segment. At Wilshire Boulevard and Fairfax Avenue, the p.m. peak hour V/C ratio is projected to remain approximately the same as before Metro Rail (before and after V/C ratios of 1.11 and 1.12, respectively).

With Fairfax/Beverly as the terminal station, impacts at this location are not much different than for the Locally Preferred Alternative. Even though many passengers using the Fairfax/Santa Monica Station under the Locally Preferred Alternative would use the Fairfax/Beverly Station under the Minimum Operable Segment, this additional patronage would be offset by the loss of riders traveling between West Los Angeles and destinations in Hollywood and North Hollywood. The major destination for feeder buses from the west is the Wilshire/Fairfax Station. Most bus transfer passengers at Fairfax/Beverly will be arriving on lines which continue on past the station providing through service on Fairfax and on Beverly. Since the station is well to the north of the Santa Monica Freeway, well to the west of the Hollywood Freeway, and has the Hollywood Hills as a barrier to the north, it will not attract high volumes of long distance auto access trips to the rail line. The station is expected to have virtually the same patronage under all rail alternatives, and so traffic pressures at Fairfax/Beverly should be only somewhat worse under the Minimum Operable Segment than under the Locally Preferred Alternative.

Locally Preferred Alternative and Aerial Option. Traffic projections were made based on the same data sources as for the Minimum Operable Segment, but reflect the increased ridership on the full 18-mile Metro Rail line, and the resultant changes in travel patterns. When Metro Rail is extended to serve Hollywood and North Hollywood, a further improvement in corridor traffic conditions can be anticipated. Traffic conditions are the same whether the North Hollywood alignment is subway or elevated. For example, a further 0.8 percent reduction over the Minimum Operable Segment in traffic demand crossing Western Avenue (Wilton/Arlington) is projected. Since this percentage reduction will be concentrated in peak periods, an improvement in peak hour service levels can be anticipated. The station area traffic conditions in the downtown area and Wilshire Corridor are similar for both the Minimum Operable Segment and Locally Preferred Alternative. See Figures 3-7 through 3-9 for intersection LOS under the Locally Preferred Alternative and how they differ from the No Project Alternative.

1.3.3 MITIGATION

It is evident from Table 3-6 that traffic mitigation measures will be needed in the vicinity of Metro Rail stations with major park and ride facilities, particularly Union Station, Universal City, and North Hollywood. Factors to be considered in designing mitigation measures include costs, public acceptance, effectiveness, and responsibility for funding and/or enforcement. These measures are being developed in conjunction with Milestones 10 and 12, closely tied in with station design. Plans are being coordinated among the responsible public agencies and local community groups.

The traffic analyses upon which the mitigation measures are based were done by LADOT in late 1982-early 1983 using the most up-to-date patronage projections, bus volumes, and station access plans available at that time. As the Preliminary

Source: Los Angeles City Department of Transportation

Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 500 1000 feet

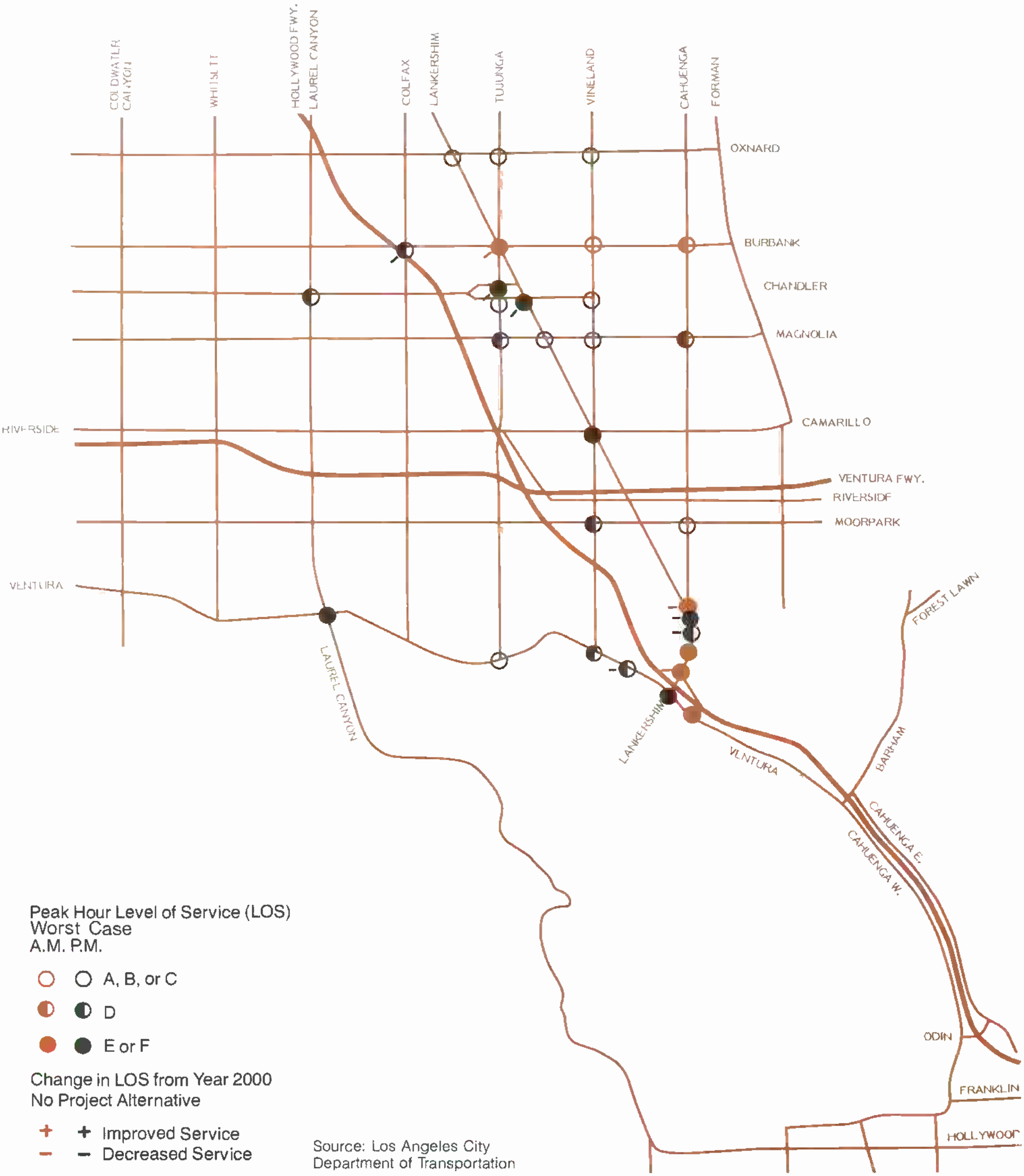
Figure 3-7
Central Business District Intersection Level of Service with Metro Rail Project Year 2000

SEDWAY/COOKE
Urban and Environmental Planners and Designers

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

0 2000 4000 feet
SEDWAY/COOKE
Urban and Environmental Planners and Designers

Figure 3-8
Hollywood-Wilshire
Intersection Level of Service
with Metro Rail Project Year 2000



Peak Hour Level of Service (LOS)
Worst Case
A.M. P.M.

A, B, or C

D

E or F

Change in LOS from Year 2000
No Project Alternative

\+ + Improved Service
\- - Decreased Service

Source: Los Angeles City
Department of Transportation

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

0 2000 4000 feet

Figure 3-9
North Hollywood
Intersection Level of Service
with Metro Rail Project Year 2000

SEDWAY/COOKE
Urban and Environmental Planners and Designers

Engineering phase proceeds, however, all of these are being refined. Accordingly, the locations needing mitigation measures, as well as the specific measures proposed, are subject to change. While some of the improvements can be finalized before publication of the Final EIS/EIR, others will have to be refined during Final Design.

SCRTD will be responsible for certain specific mitigation measures that will be implemented as part of station construction. Other measures require negotiations with, and the cooperation of other agencies, notably LADOT, for implementation. If no other funding sources are found, these must be programmed into the city's or county's Capital Improvement Program, and so they can only be identified as options at this time. Finally, there are some intersections for which no reasonable measures were found to be available to completely mitigate the adverse traffic impacts.

Traffic mitigation measures have been analyzed for the 29 intersections with projected LOS E or F after completion of Metro Rail Project, or projected V/C increase of .02 or more over the No Project Alternative. The mitigation measures considered include:

- increase approach capacity through installation of a parking restriction
- restripe approach to provide an additional through lane and/or turn lane
- install left turn restriction/prohibition
- add or revise traffic signal phase to accommodate the projected traffic pattern
- widen approach
- provide reversible lanes, if peak period traffic is highly directional.

The first two mitigation options are generally but not always implemented together. Generally, the least restrictive measure that would completely mitigate the anticipated adverse impact was chosen. If there was no measure available to completely mitigate an anticipated adverse impact, then that measure which would most effectively improve the intersection LOS was selected. Street widening was not considered feasible at locations where either extensive building demolition or remodeling would be required, or in business districts where substandard sidewalks would result. Street widening was considered to be a realistic mitigation measure at locations contiguous to station sites where property acquisition is contemplated and cut and cover construction techniques would require street reconstruction.

The intersections requiring mitigation and the measures to be employed are listed below, by station area. V/C ratios before and after mitigation are presented in Table 3-7.

The following traffic mitigation measures would be necessary **for all rail alternatives.**

Union Station Area.

Alameda/Macy. Provide left-turn channelization, three through lanes in each direction, and a northbound right-turn lane on Alameda. This requires some right-of-way acquisition, and the replacement of two railroad tracks with one, in Alameda Street. This would be LADOT responsibility.

TABLE 3-7

EFFECTS OF TRAFFIC MITIGATION MEASURES

Station Area and Intersection	No Project	Minimum Operable Segment[1]	Locally Preferred Alternative/ Aerial Option	Mitigated	Time Period
	Worse Case V/C Ratio				
Union Station					
Alameda*/Macy	.83	1.15	1.09	.88	pm
Macy/Mission	.86	.95	.99	None	am
Macy*/Vignes*	.95	1.02	1.05	.97[2]	am
Macy*/Vignes*	.88	1.07	1.10	.89	pm
Ramirez*/Vignes*	No Signal	1.04	1.08	.92	pm
Fifth/Hill					
Olive/Fifth	1.08	1.06	1.05	None	am
Wilshire/Vermont					
Vermont/Sixth*	1.17	1.22	1.21	1.18	pm
Vermont/Wilshire*	.88	.93	.93	None	pm
Virgil*/Third	1.18	1.28	1.23	1.23[2]	am
Virgil*/Third	1.15	1.34	1.22	1.07	pm
Virgil/Sixth*	.97	1.12	1.07	.93	pm
Wilshire/Normandie					
Irolo/Eighth*	.86	.98	.98	.93[2]	pm
Normandie*/Wilshire	.96	1.01	1.01	.96	pm
Normandie/Third	1.13	1.17	1.17	None	pm
Normandie/Sixth	1.02	1.08	1.06	None	pm
Wilshire/Fairfax					
Fairfax*/Olympic	1.04	1.06	1.11	.91	am
Fairfax*/Olympic	1.09	1.17	1.17	1.17[2]	pm
Fairfax*/San Vicente	.97	.98	1.03	.84	am
Fairfax/Beverly					
Beverly*/Gardner	.96	1.02	.99	.83	pm
Fairfax/Santa Monica					
Crescent Hts.*/Fountain	1.06	N.A.	1.08	.91	pm
Hollywood/Cahuenga					
Cahuenga*/Hollywood	1.13	N.A.	1.23	.98	pm
Cahuenga/Sunset	1.00	N.A.	1.02	None	pm
Universal City					
Bluffside*/Lankershim*	.74	N.A.	.92	.82	pm
Cahuenga/Hollywood Fwy/Regal	.94	N.A.	.96	.94	am
Cahuenga/Lankershim*	.89	N.A.	1.01	.81	am
Hollywood Fwy/Lankershim*/ Universal Place	.87	N.A.	1.08	.86	am
Lankershim*/North Gate	.54	N.A.	.81	.64	am
Lankershim only	.67	N.A.	1.06	.83	am
Lankershim/Tour Center	1.16	N.A.	1.31	1.31	am
North Hollywood					
Burbank*/Lankershim/Tujunga	.82	N.A.	1.41	1.28[2]	am
Chandler*/Lankershim(S)	.57	N.A.	1.27	.79	pm
Chandler*/Tujunga (N)	.54	N.A.	.96	.55	am
Chandler*/Tujunga (N)	.71	N.A.	.92	.68	pm
Chandler*/Fair	N.M.	N.M.	N.M.	N.A.	N.A.

Source: City of Los Angeles Department of Transportation, Technical Report—Traffic Mitigation Measures, March 1983.

Note: No traffic mitigation measures are required in the following station areas: Civic Center, Seventh/Flower, Wilshire/Alvarado, Wilshire/Western, Wilshire/La Brea, La Brea/Sunset, and the optional Wilshire/Crenshaw Station.

N.A. = Not Applicable.

N.M. = Not Measured.

*Street to be improved.

[1]Estimated by SCRTD.

[2]Project-related traffic impact is not fully mitigated, i.e. LOS E or F still exists and V/C increase of at least .02 over No Project Alternative still exists.

Macy/Mission. No reasonable mitigation measures were found to be feasible, beyond the widening of Mission, which is assumed in the No Project Alternative as part of the city's Capital Improvement Program. The alternative of widening Macy would only marginally improve the LOS while requiring right-of-way acquisition and bridge widening. It is therefore not recommended.

Macy/Vignes. Install right-turn lanes northbound, eastbound and westbound, requiring right-of-way acquisition. LADOT would be responsible for implementation.

Ramirez/Vignes/Santa Ana Freeway Ramps. SCRTD will construct the entrance/exit to the Union Station park and ride facility to provide two lanes in and three lanes out. The existing freeway ramps will also be reconstructed by SCRTD to streamline entrance to the park and ride lot, as part of the rail project. Additional measures are needed and would be the responsibility of LADOT: restripe Ramirez and Vignes, add a traffic island to better accommodate turning movements, and signalize the intersection.

Fifth/Hill Area.

Olive/Fifth. Since project-related traffic has only a small impact, no mitigation measures are recommended. Both streets have substandard lane widths and widening them would not increase intersection capacity.

Wilshire/Vermont Area. All mitigation options discussed would be LADOT's responsibility.

Vermont/Sixth. Install eastbound right-turn lane on Sixth within existing right-of-way.

Vermont/Wilshire. No reasonable mitigation measures were found to be available. The impact of project-related traffic is relatively small.

Virgil/Third. Restripe Virgil to provide three lanes northbound and two lanes southbound and add parking restrictions on Virgil. This does not mitigate the project-related traffic impacts in the morning; however, improvements are needed at this intersection whether or not the rail project is built.

Virgil/Sixth. Widen Sixth by four feet within existing right-of-way and stripe to provide an additional through lane westbound.

Wilshire/Normandie Area. All mitigation options discussed would be LADOT's responsibility.

Irolo/Eighth. Restripe Eighth to provide east and westbound left-turn pockets and install peak hour parking restrictions. This would not fully mitigate the anticipated impact. Other mitigations investigated would move adverse impacts to adjacent intersections.

Normandie/Wilshire. Prohibit northbound left turns in the p.m. peak.

Normandie/Third. No reasonable mitigation options were found which would improve traffic flows sufficiently to correct the overcapacity condition. Projected-related impacts, however, are relatively small, and improvements are needed at this location regardless of whether the rail line is built.

Normandie/Sixth. No mitigation measures are recommended, since widening either street would move the overcapacity condition to adjacent intersections. Some improvement is needed at this intersection with or without the rail line.

Wilshire/Fairfax Area.

Fairfax/Olympic and Fairfax/San Vicente. Widen Fairfax south of Olympic within existing right-of-way from 50 feet to 60 feet. Widen Fairfax between Olympic and San Vicente from 60 feet to 64 feet, requiring additional right-of-way. Install peak period parking restrictions northbound south of Olympic, and both directions north of San Vicente. This would not mitigate projected-related traffic impacts in the p.m. peak at Olympic. However, improvements at this intersection are needed even if the rail project is not built. All of these mitigation options would be LADOT's responsibility.

Fairfax/Beverly Area.

Beverly/Gardner. Widen Beverly within existing right-of-way to provide three through lanes and left-turn channelization in each direction. This is recommended for the one-mile section from La Brea to Fairfax and could be done in conjunction with a storm drain project administered by the Los Angeles County Flood Control District.

The following mitigations would be necessary **for the Locally Preferred Alternative and Aerial Option only:**

Fairfax/Santa Monica Area.

Crescent Heights/Fountain. Restripe Crescent Heights for three through lanes in each direction and install peak period parking restrictions. This would be the responsibility of the Los Angeles County Road Department.

Hollywood/Cahuenga Area.

Cahuenga/Hollywood. Install a reversible lane on Cahuenga, southbound in a.m. and northbound in p.m. and also prohibit left turns from Cahuenga in a.m. peak. LADOT would be the responsible agency for this improvement. (Note: Relocation of the planned kiss and ride lot from south of Hollywood Boulevard to north of Hollywood should eliminate the need for these mitigation measures.)

Cahuenga/Sunset Boulevard. No reasonable mitigation measures were found to be available, given the small impact of project-related traffic at this intersection.

Universal City Area. SCRTD will construct a new bridge over the Hollywood Freeway to provide better access to the station's auto and bus facilities from the west. This bridge will divert much of the project-related traffic away from Cahuenga and Lankershim and is therefore a mitigation measure for a number of intersections, as noted below. This bridge and the access road extending to Vineland will be built as part of station-related construction.

Lankershim/Cahuenga. Construct an additional through lane southeastbound on Lankershim. This requires widening a bridge over the Los Angeles River but no right-of-way acquisition. LADOT would be the responsible agency. Construction of the new station access bridge (see above) is also necessary to mitigate traffic impacts at this intersection.

Lankershim/Bluffside/Universal City exits. Widen southbound Lankershim north of Bluffside to provide a right-turn lane, provide a three-phase traffic signal, prohibit pedestrian crossings of the north leg, and widen Bluffside to provide two lanes in each direction west of Lankershim. Right-of-way acquisition is required and LADOT would be responsible for making these improvements. (Bluffside is the connection from the new access roadway to Lankershim.)

Lankershim/Hollywood Freeway Ramp/Universal Place. Widen Lankershim to provide a southbound right-turn lane. This requires additional right-of-way contiguous to the station site and will be the responsibility of SCRTD. Construction of the station access bridge and roadway (see above) is also a necessary mitigation measure at this location. Change Universal Place to a one-way westbound street.

Lankershim/North Gate (Universal City). Construct the new station access bridge over the Hollywood Freeway (see above).

Lankershim/Tour Center. Construction of the new station access bridge over the Hollywood Freeway will provide partial mitigation in the p.m. peak hours.

Cahuenga/Hollywood Freeway Ramp/Regal. Construct the new station access bridge over the Hollywood Freeway (see above).

North Hollywood Area.

Burbank/Lankershim/Tujunga. Install eastbound right-turn only lane and optional right-turn lane, and associated parking restrictions eastbound on Burbank. LADOT is responsible for this.

Chandler/Lankershim (south intersection). Widen the eastbound Chandler approach to provide a second left-turn lane and a through lane, as well as the existing left-turn and right-turn lanes. This requires additional right-of-way and LADOT would be responsible for this improvement. (However, relocation of all park and ride facilities to the east of Lankershim may obviate the need for this widening.)

Chandler/Tujunga (north intersection). Widen the southbound Tujunga approach to provide a through lane and a right-turn lane and install parking restrictions southbound. LADOT would have responsibility for this improvement, which requires acquisition of right-of-way. (However, the need for this improvement may be eliminated with the relocation of all park and ride facilities to the east of Lankershim.)

Chandler/Fair. Relocate Fair Avenue eastward. Widen the section of Chandler between Lankershim and Fair Avenue to add left turn lane for traffic using Fair Avenue.

Of the 29 intersections discussed above, mitigation measures are presented for all but six. Of the 23 intersections with mitigation measures, the project-related traffic impacts are fully mitigated at all except six locations.

1.4 PARKING

Parking is relevant to the Metro Rail Project in two ways:

- the rail project would reduce the need for parking facilities in the CBD and other regional centers
- rail patrons driving to and parking at a station will create a demand for parking near stations

As travel by transit to the CBD increases relative to automobile travel the demand for parking spaces in the CBD will decrease. This is a positive impact for the CBD. At stations where the demand for park and ride spaces is greater than the number of spaces provided, a potential for negative impacts will exist.

To measure current conditions and to project future parking supply and demand, LADOT inventoried parking spaces, usage, and costs within a one-quarter mile radius of the proposed rail stations. For the downtown area, this data was obtained from the Central City Parking Study, done for LADOT in 1981. Based on this data and anticipated development plans, future conditions in each station area were projected for the year 2000 under No Project and Project conditions. Results of the analyses are shown in Table 3-8.

1.4.1 EXISTING CONDITIONS

The CBD in 1979 had a total of 111,124 parking spaces. Of this total, 5,888 spaces (5 percent) were located at the curb with the remaining 105,236 spaces located off-street. Over the previous 13 years the CBD experienced only a 13 percent increase in parking spaces*. Changes in the type of parking facilities providing these spaces have been dramatic. Curb spaces have decreased by 19 percent and off-street surface lot spaces have decreased by 26 percent, while spaces in garages have increased 142 percent. Many of the surface parking lots have been replaced by new construction, and curb spaces have been eliminated to improve traffic flow. These changes have resulted in high parking charges in certain sections of the CBD. Off-street parking now costs as much as $5.00 per hour or $15.00 per day near the Financial District. In the areas surrounding each of the three proposed CBD stations, more than 80 percent of the parking supply is used.

Outside the CBD, parking is more available and less expensive, but it remains a major concern especially where residential neighborhoods adjoin commercial centers. Usage exceeds 70 percent of supply at five stations (Union Station, Wilshire/Vermont, Wilshire/Normandie, Wilshire/Western, and Universal City), resulting in some "spillover" of parking demand into neighborhoods.

In April 1983, a new Parking Management Plan was implemented by the City of Los Angeles. The plan will have the effect of reducing the costs of providing parking spaces, especially in the CBD. It allows developers to reduce by up to 40 percent the number of parking spaces provided in a building if they can implement an effective

* Based on CBD parking studies conducted in 1966 and 1979 by Wilbur Smith and Associates.

TABLE 3-8

TOTAL PARKING SUPPLY AND USAGE BY STATION AREA

Station	Parking Supply			Parking Usage		
	1980 Existing Conditions	No Project	Locally Preferred Alternative[1]	1980 Existing Conditions	No Project	Locally Preferred Alternative[1]
Union Station	5,158	5,158	8,706	3,020	3,020	5,644
Civic Center	16,443	17,166*	15,203*	13,829	15,517	15,859
Fifth/Hill	11,828	20,457*	19,187*	9,977	21,222	21,359
Seventh/Flower	17,344	22,029*	18,932*	15,013	22,010	22,808
Wilshire/Alvarado	4,899	5,265	5,847	3,231	3,681	3,617
Wilshire/Vermont	13,107	15,482	15,463	9,962	12,366	11,365
Wilshire/Normandie	13,358	15,917	16,964	9,933	12,623	15,106
Wilshire/Western	8,670	12,015	11,628	6,289	10,360	9,059
Wilshire/Crenshaw	3,254	4,294	4,158	1,521	2,601	2,132
Wilshire/La Brea	4,152	4,780	5,544	2,964	3,596	4,112
Wilshire/Fairfax	6,473	11,268	10,844	3,423	7,633	7,876
Fairfax/Beverly	5,554	8,660	12,754*	3,357	6,612	11,653
Fairfax/Santa Monica	2,753	3,233	3,838	1,523	2,067	2,386
La Brea/Sunset	5,592	6,089	6,017	3,649	4,173	4,327
Hollywood/Cahuenga	7,121	8,613	10,352	4,528	6,325	8,666
Universal City	1,175	13,978	13,743*	654	12,208	14,432
North Hollywood	4,804	6,229	8,048*	2,307	4,313	7,476
Total	131,685	180,633	187,228	95,180	150,337	167,877

Source: LADOT.

*Parking deficiency = usage greater than 90 percent of supply.

[1] Includes Aerial Option as well.

ridesharing or vanpooling program. It also allows a reduction of up to 75 percent of the required spaces on-site if a remote parking lot is provided, and an effective means of transporting employees from the remote lot to the worksite is developed. The plan provides special protection for residential neighborhoods near commercial centers by requiring participating developers to prove that the parking reduction will not result in spillover parking into residential neighborhoods.

1.4.2 IMPACTS

No Project Alternative. The demand for parking, especially in the CBD, will continue to increase as new development occurs. The supply, however, will grow more slowly, as new development replaces surface parking in many cases. The Central City Parking Study projects that the supply in the CBD will increase only slightly, to 119,000 spaces, while the peak demand will increase to over 123,000 by the year 1990.

A review of Table 3-8 shows that the parking supply is projected to increase at almost all stations, generally by 20 to 40 percent, and 37 percent overall. Demand is expected to increase even more than supply (58 percent overall). The three CBD station areas will be effectively at capacity, given the criteria that 90 percent of off-street spaces and 100 percent of curb spaces will be utilized under full conditions.

Project Alternatives. The greatest projected percentage increases in parking usage occur at Union Station, Fairfax/Beverly, and North Hollywood. Parking supply will also increase at each of these stations, but only at Union Station will it increase sufficiently to avoid a parking shortage. Under the No Project Alternative, three station areas experience parking deficiencies, when usage exceeds 90 percent of the supply. Under the Minimum Operable Segment, the area around the Fairfax/Beverly Station would also experience a shortage of parking spaces. Under the Locally Preferred Alternative and Aerial Option, Fairfax/Beverly, as well as Universal City and North Hollywood would have parking deficiencies. These six stations and the amount of parking deficiencies are identified below.

Station	Parking Deficiency
Civic Center	2,176
Fifth/Hill	4,091
Seventh/Flower	5,769
Fairfax/Beverly	174
Universal City	2,063
North Hollywood	233

Park and ride facilities will be provided at three stations for the Minimum Operable Segment: Union Station, the Wilshire/Fairfax Station, and the Fairfax/Beverly Station. Under the Locally Preferred Alternative and Aerial Option, facilities will also be provided at Universal City and North Hollywood. Only these stations were selected for park and ride facilities in order to maximize reliance on the bus system and other modes not requiring parking, and to minimize capital costs. Also, the number of parking spaces provided at a station was determined by policy in addition to estimated demand. Initially, only surface parking will be provided; the ultimate supply will be accomplished by building parking structures on most of the surface parking lots. The structures, however, will be deferred until other funding sources are identified.

Table 3-9 shows the number of spaces to be supplied at each park and ride station under each alternative and the number needed based on demand. The demand exceeds the number of spaces being supplied at each of the stations. Potential for spillover parking to the surrounding neighborhood will exist. Although the potential for spillover is greatest at the Union Station, it is considered more adverse at the Wilshire/Fairfax and Fairfax/Beverly Stations. Union Station is located in a mixed land use area of industrial and commercial uses, whereas the areas around the Wilshire/Fairfax and Fairfax/Beverly Stations are more residential.

TABLE 3-9

RAIL ACCESS PARKING DEMAND AND SUPPLY BY STATION

	Minimum Operable Segment			Locally Preferred Alternative and Aerial Option		
		Supply			Supply	
Station	Demand	Initial	Ultimate	Demand	Initial	Ultimate
Union Station	4,363	300	2,500	4,352	300	2,500
Wilshire/Fairfax	1,875	200	1,000	1,894	200	1,000
Fairfax/Beverly	1,251	250	1,000	1,281	250	1,000
Universal City	N.A.	N.A.	N.A.	3,272	1,175	2,500
North Hollywood	N.A.	N.A.	N.A.	2,732	1,180	2,500

Source: SCRTD, Schimpeler-Corradino Associates.
N.A. = Not Applicable

1.4.5 MITIGATION

Mitigation measures will be needed to control the spillover parking from the stations. The difference between the demand for parking spaces and the amount to be supplied does not represent the total number of spillover parkers. Some of these potential riders would be lost to Metro Rail due to the unavailability of readily accessible parking. However, the potential for spillover parking will exist and mitigation measures are discussed below.

The stations with significant adverse parking impacts are divided into two distinct groups. The first group includes the CBD stations (Civic Center, Fifth/Hill and Seventh/Flower) where the year 2000 parking condition is already crowded even without Metro Rail. These stations are not adjacent to residential neighborhoods that may be impacted by parking usage overflow. As noted above, the impacts at these stations are based not on Metro Rail itself, but on the increased development accommodated by a rail transit system.

The second group of stations are the Fairfax/Beverly, Universal City, and North Hollywood Stations, have a relatively high park and ride demand, and are adjacent to residential neighborhoods that may be impacted by parking usage overflow.

Possible parking mitigation measures that require the cooperation of other agencies and/or the private sector and that may be applied to the CBD stations are as follows.

1. Encourage or require employer-sponsored rideshare or transit incentive programs to reduce potential parking usage.

2. Encourage developers and employers to take advantage of the city's new Parking Management Plan, as discussed in Section 1.4.1 above. Use of the provisions in this plan can effectively reduce both the cost of providing parking (by allowing off-site facilities) and the need for it (by encouraging vanpools, ridesharing, and transit).

Parking supply increases can be counterproductive to diverting auto trips to the Metro Rail system. Metro Rail itself is a principal parking mitigation measure, since it makes transit a more attractive alternative to the automobile.

The aforementioned parking measures may also be applied to the second group of stations. Additional parking measures that may be applied to the second group include:

1. Establish preferential parking districts within residential neighborhoods that are adjacent to station areas. This is an ongoing program managed by LADOT, which requires local property owners to prepare petitions and obtain City Council approval. It has already been implemented in six neighborhoods of the city.

2. Include more project-provided parking in the Metro Rail Project. This could be the responsibility of SCRTD, but at this time funding sources seem insufficient to provide for this option.

3. Operate an extensive network of feeder bus lines serving the stations and provide an alternative to the park and ride mode of station access. SCRTD will provide these bus services, as specified in the discussion of transit impacts, above. Over 60 percent of Metro Rail riders are expected to access the stations using feeder buses.

4. Provide more metered curb spaces in commercial areas, effectively reserving these spaces for short-term use by customers of commercial establishments. Implementation and enforcement would be the responsibility of the City of Los Angeles.

Use of parking prices as a policy tool for transportation system management can likely rectify the projected shortages in Downtown Los Angeles, the Wilshire Center, and at Fairfax/Beverly. People who would otherwise drive to these areas can be diverted to other Metro Rail stations that have a surplus of nearby parking--or, in the Wilshire Corridor, to feeder bus use.

The potential Universal City and North Hollywood parking problems are complicated by the planned role of these stations as park and ride railheads for the entire San Fernando Valley. To the extent that Metro Rail riders are not directly responsible for spillover parking demand (it is derived from development in conjunction with Metro Rail rather than Metro Rail park and ride passengers), it may be possible to divert these commuters to the feeder bus system through pricing policies. Increasing the Metro Rail parking supply at these two sites will be undesirable because of the traffic impacts of such parking (see previous discussion on Traffic Impacts).

2. LAND USE AND DEVELOPMENT

2.1 INTRODUCTION

Impacts on land use from construction and operation of the Metro Rail Project can be expected primarily within a one-quarter mile radius around each station, on the basis of experience with rail rapid systems in other North American cities. For each station in the Metro Rail Project, a potential impact area, or "station area," with a radius of approximately one-third mile was established. These areas generally correspond to the City of Los Angeles Department of Planning's (LADOP) and Los Angeles County Department of Regional Planning's (LADRP) Specific Plan areas and represent a walking time of about 10 minutes from any point in the station area to a station entrance. Each station area consists of 150 to 200 acres, of which about 75 percent is parcel area and 25 percent is street right-of-way. Throughout this section, the term parcel refers only to the buildable parcel and does not include the adjacent street right of way. Maps showing station area boundaries are included in the SCRTD Technical Report on Land Use and Development Impacts (1983).

2.2 EXISTING CONDITIONS

This section describes existing conditions relevant to the assessment of impacts, emphasizing conditions in station areas. It focuses on existing land use, intensity of development and economic activity, relevant land use plans and policies including community plan and zoning designations, and the capacity for new development in each station area. Further background information on land use, population growth, economic development trends, and property valuation for the community plan areas is presented in the SCRTD Technical Report on Existing Conditions--Regional and Community Setting (1982).

2.2.1 REGIONAL CORE

Planning Areas. Table 3-10 provides a profile of existing land use for the planning areas in the Regional Core. The Central City and Central City North Planning Areas have been combined as the Central Business District (CBD). The Universal City and North Hollywood Planning Areas have been combined to represent a single south San Fernando Valley area. The majority of land in all planning areas except the CBD is devoted to residential use. In all planning areas, except the CBD and Westlake, single family housing consumes more parcel area than multifamily housing although there are more than twice as many multifamily units as single family units in the Regional Core. In all planning areas multifamily units outnumber single family units.

The Regional Core contains more than half of all the high-rise commercial space in the Los Angeles Urbanized Area and represents the greatest concentration of development in the Southern California region. During the 1970s, 68 percent of the 12 million square feet of high rise commercial development in the Regional Core occurred in the CBD, 31 percent along the Wilshire Corridor, and the remaining one percent in Hollywood and the Universal City/North Hollywood areas. As of 1980 there were 40.9 million square feet of high rise commercial space in the Regional

Core. This space was generally distributed as follows: CBD, 24.9 million square feet; Westlake, 2.1 million square feet; Wilshire, 11.6 million square feet; Hollywood, 1.7 million square feet; and Universal City/North Hollywood, 0.6 million square feet.

TABLE 3-10

PERCENT OF PARCEL AREA IN GENERALIZED LAND USE CATEGORIES

Planning Areas	Total Parcel Area (acres)	Single Family Residential	Multifamily Residential	Commercial or Mixed Use	Industrial	Public Facilities/ Open Space	Parking
CBD	2,385	3.8	6.3	20.1	33.2	27.0	9.6
Westlake	1,331	15.6	40.0	22.8	3.1	11.8	6.7
Wilshire	8,148	41.7	35.3	14.4	1.2	5.5	1.9
Hollywood	14,536	39.3	13.1	4.3	1.6	40.8	0.9
Universal City/ North Hollywood	10,593	62.3	12.5	6.7	6.9	10.0	1.6
Regional Core	36,993	43.3	18.3	8.8	5.2	22.3	2.1
All Station Areas	2,340	17.0	25.0	34.0	5.0	11.0	8.0

Source: City of Los Angeles Department of Planning and Sedway/Cooke.

Table 3-10 also compares land use for all station areas with that of the Regional Core. The station areas comprise only a small percentage of the parcel area in the Regional Core, yet they contain a significant concentration of commercial and multifamily land uses. Most significant, commercial land use accounts for 8.8 percent of all parcel area in the Regional Core, but represents 34 percent of parcel area in the station areas. Similarly, while multifamily residential use accounts for 18 percent of the Regional Core parcel area, it amounts to 25 percent within the station areas. In summary, the stations are located in areas of intense use within the Regional Core.

Station Areas. Table 3-11 shows the current distribution of parcel area among general land use categories in each station area. In the CBD station areas the predominant land use is regional commercial, except in the Union Station area, where 80 percent of the land is used for industrial purposes. The Union Station site, owned by Southern Pacific Railroad, and the Terminal Annex Post Office site occupy 50 percent of the station area. All downtown station areas contain a substantial amount of land that is either vacant or used for commercial surface parking not directly serving any particular facility.

Along the Wilshire Corridor the land use mix varies among station areas. At both the Wilshire/Vermont and Wilshire/Normandie Stations over 50 percent of the land is used commercially, while only about five percent of the Wilshire/Crenshaw Station area is devoted to commercial uses. Only in the Wilshire/Normandie, Wilshire/ Fairfax, and Fairfax/Beverly Station areas does a substantial portion of the commercially developed land serve a regional market. In the Mid-Wilshire area (Vermont to Normandie and Western Avenues Station areas) residential development is primarily multifamily. Along the Miracle Mile (La Brea and Fairfax Station areas)

TABLE 3-11

STATION AREA LAND USE PROFILES, YEAR 1980[1]
Percent of Parcel Area in Generalized Land Use Categories

	Single Family Residential	Multi-Family Residential	Community (Low Intensity) Commercial[2]	Regional (High Intensity) Commercial[2]	Industrial	Public Facilities/ Open Space	Vacant/ Commercial Surface Parking[3]
UNION STATION							
Land Use	-	-	5%	-	70%	5%	20%
Community Plan	-	-	10%	-	80%	10%	-
Zoning	-	-	20%	-	80%	-	-
CIVIC CENTER							
Land Use	-	2%	-	35%	-	38%	25%
Redevelopment Project Designation	-	10%	-	40%	-	50%	-
FIFTH/HILL							
Land Use	-	2%	30%	45%	-	3%	20%
Redevelopment Project Designation	-	2%	-	95%	-	3%	-
SEVENTH/FLOWER							
Land Use	-	-	8%	50%	-	2%	40%
Redevelopment Project Designation	-	48%	-	50%	-	2%	-
WILSHIRE/ALVARADO							
Land Use	2%	45%	30%	3%	-	20%	-
Community Plan	-	34%	40%	8%	-	18%	-
Zoning	-	40%	36%	4%	-	20%	-
WILSHIRE/VERMONT							
Land Use	2%	18%	60%	12%	-	5%	3%
Community Plan	-	40%	15%	40%	-	5%	-
Zoning	-	50%	35%	10%	-	5%	-
WILSHIRE/NORMANDIE							
Land Use	5%	35%	35%	25%	-	-	-
Community Plan	-	40%	10%	50%	-	-	-
Zoning	-	48%	10%	42%	-	-	-
WILSHIRE/WESTERN							
Land Use	7%	48%	35%	10%	-	-	-
Community Plan	-	45%	20%	35%	-	-	-
Zoning	-	55%	25%	20%	-	-	-
WILSHIRE/CRENSHAW (optional)							
Land Use	70%	15%	5%	-	-	5%	5%
Specific Plan	65%	20%	10%	-	-	5%	-
WILSHIRE/LA BREA							
Land Use	40%	36%	15%	5%	-	4%	-
Community Plan	45%	31%	12%	8%	-	4%	-
Zoning	45%	31%	7%	13%	-	4%	-
WILSHIRE/FAIRFAX							
Land Use	30%	37%	5%	10%	-	18%	-
Community Plan	22%	45%	5%	10%	-	18%	-
Zoning	22%	45%	5%	10%	-	18%	-
FAIRFAX/BEVERLY							
Land Use	37%	30%	8%	25%	-	-	-
Community Plan	30%	30%	40%	-	-	-	-
Zoning	30%	30%	40%	-	-	-	-
FAIRFAX/SANTA MONICA							
Land Use	15%	71%	10%	-	-	4%	-
Community Plan	10%	76%	10%	-	-	4%	-
Zoning	10%	76%	10%	-	-	4%	-
LA BREA/SUNSET							
Land Use	25%	50%	12%	3%	-	10%	-
Community Plan	-	60%	5%	25%	-	10%	-
Zoning	-	68%	5%	15%	2%	10%	-
HOLLYWOOD/CAHUENGA							
Land Use	5%	25%	28%	25%	-	2%	15%
Community Plan	-	15%	-	85%	-	-	-
Zoning	-	20%	-	80%	-	-	-
HOLLYWOOD BOWL (optional)							
Land Use	35%	10%	5%	-	-	50%	-
Community Plan	35%	10%	5%	-	-	50%	-
Zoning	35%	10%	5%	-	-	50%	-
UNIVERSAL CITY							
Land Use	30%	12%	10%	20%	-	18%	10%
Community Plan	30%	12%	10%	30%	-	18%	-
Zoning	30%	12%	10%	30%	-	18%	-
NORTH HOLLYWOOD							
Land Use	10%	15%	35%	-	25%	15%	-
Community Plan	-	15%	40%	-	30%	15%	-
Zoning	-	25%	45%	-	15%	15%	-

Source: Sedway/Cooke

[1]Each station area contains from 100 to 150 acres of parcel area.

[2]Includes on-site parking required by Code to serve the commercial facilities.

[3]Commercial parking consists of facilities not affiliated with or required by Code to serve a commercial facility.

and at Fairfax/Beverly, residentially developed land is more evenly divided between multifamily and single family housing. At Crenshaw the housing is predominantly single family.

The Fairfax/Santa Monica and La Brea/Sunset Station areas are predominantly high density residential neighborhoods with community-serving commercial enterprises as the secondary use. The Hollywood/Cahuenga Station area is devoted primarily to a mix of regional and community commercial uses, with high density residential development as the secondary use. This station area includes a substantial amount of land that is vacant or used for commercial surface parking.

The Universal City Station area contains a mix of primarily single family residential, regional-serving commercial, and public open space uses. The North Hollywood Station area is evenly divided among community-serving commercial, industrial, and residential uses.

Table 3-12 shows the commercial floor area, employment, dwelling units, and population in Metro Rail station areas. Figures for each planning area are also provided to further illustrate that stations have been located in areas of considerable development intensity. As an example, the entire CBD Planning Area contained 81.5 million square feet of commercial space and 289,700 employees. About 45 percent of the floor space and employees are within the four Metro Rail station areas in the CBD. Overall, station areas contain 27 percent of all commercial floor area and 30 percent of all employees on just 6.3 percent of the parcel area in the Regional Core.

2.2.2 LAND USE PLANS AND POLICIES

The basic principle for the organization and planning of the Los Angeles area is the Centers Concept. The Centers Concept was developed during the late 1960s and early 1970s and adopted by the City of Los Angeles in 1974 as a fifty-year plan. The Concept Plan envisions a series of regional centers connected by a regional rapid transit system, with low to medium building intensity between centers. The city's Concept Plan identifies 16 growth centers within the Regional Core, of which 12 correspond to proposed station areas. Because all but one station are located in the City of Los Angeles, the following description of land use plans and policies will emphasize those of the city.

The Concept Plan is refined and localized in the twenty-year Citywide Plan and short-term Community Plans. In some cases the Community Plan is further refined by Specific Plans that define both the planning and the zoning for an area, like the Park Mile Specific Plan area which contains the Wilshire/Crenshaw Station. The City of Los Angeles Department of Planning (LADOP) is developing a single Specific Plan for the areas around all proposed stations. The Specific Plan is being prepared with input from Citizens' Advisory Committees in each station area.

Zoning is the regulatory mechanism by which the Community Plans are implemented, and California State law requires that zoning conform to land use plans. Zoning in most station areas basically conforms to Community Plan land use designations (Table 3-11). In a few station areas where the Community Plan land use designation has been revised to reflect "regional center" commercial development, the existing high density residential zoning has not been changed correspondingly. This inconsistency between planning and zoning occurs to the greatest degree in the Sunset/La Brea Station area.

TABLE 3-12

DEVELOPMENT IN REGIONAL CORE, YEAR 1980

	COMMERCIAL		RESIDENTIAL	
	Floor Area[1] (in 1,000 sq. ft.)	Employees[2]	Dwelling Units	Population
CBD PLANNING AREA	**81,500**	**289,700**	**12,740[8]**	**43,000[8]**
Union Station	900[3]	3,000	0[5]	0[9]
Civic Center	7,500[4]	37,000	1,030[5]	1,720[9]
Fifth/Hill	16,500[4]	44,000	780[5]	1,250[9]
Seventh/Flower	14,000[4]	41,000	1,380[5]	1,660[9]
All CBD Station Areas	38,900	125,000	3,180	4,630
WESTLAKE PLANNING AREA	**23,800**	**83,500**	**35,200[8]**	**92,450[8]**
Wilshire/Alvarado	1,400[5]	8,500	3,240[5]	7,720[9]
WILSHIRE PLANNING AREA	**65,100**	**227,000**	**137,780[8]**	**308,210[8]**
Wilshire/Vermont	4,500[5]	21,300	3,500[5]	7,720[9]
Wilshire/Normandie	3,800[5]	19,200	3,960[5]	7,860[9]
Wilshire/Western	2,900[5]	10,000	4,260[5]	8,810[9]
Wilshire/Crenshaw (optional)*	800[5]	4,200	820[5]	1,800[9]
Wilshire/La Brea	1,600[5]	4,500	3,150[5]	5,670[9]
Wilshire/Fairfax	3,000[5]	13,300	630[5]	1,070[9]
Fairfax/Beverly*	900[5]	5,000	2,390[5]	4,300[9]
All Wilshire Station Areas	17,500	77,500	18,710	37,230
HOLLYWOOD PLANNING AREA	**39,700**	**136,300**	**114,520[8]**	**216,520[8]**
Fairfax/Santa Monica*	400[6]	1,200	4,990[5]	8,480[9]
La Brea/Sunset	1,000[5]	5,500	2,320[5]	3,650[9]
Hollywood/Cahuenga	2,600[5]	12,400	2,230[5]	4,020[9]
Hollywood Bowl (optional)*	15[5]	300	460[5]	830[9]
All Hollywood Station Areas	4,015	19,400	10,000	16,980
UNIVERSAL CITY/NORTH HOLLYWOOD PLANNING AREA	**22,700**	**75,100**	**77,860[8]**	**172,740[8]**
Universal City	1,000[7]	9,100	1,170[5]	2,230[9]
North Hollywood	500[5]	2,900	560[5]	1,230[9]
DESIGNATED CENTERS	61,200	231,700	30,200	54,610
ALL STATION AREAS	63,315	242,400	38,860	70,020
REGIONAL CORE	**232,800**	**811,600**	**378,100**	**832,960**

*Station areas not designated as centers in the city's Concept Plan.

[1]Includes office, retail, and hotel space. Total estimates for the planning areas were derived by Sedway/Cooke, assuming 250 sq. ft./employee for office space and 500 sq. ft./employee for retail space.

[2]Assumes 250 sq. ft./office employee, 500 sq. ft./retail employee, and 2 rooms/hotel employee. Total estimates for the planning areas are from the Southern California Association of Governments, 1980 base for SCAG-82A and -82B projections.

[3]Sedway/Cooke estimate.

[4]City of Los Angeles Department of Transportation, 1981.

[5]City of Los Angeles Department of Planning survey.

[6]Los Angeles County Department of Regional Planning.

[7]Music Corporation of America.

[8]U.S. Census Bureau, 1980 Census. See SCRTD Technical Report on Land Use and Development (1983) for Census tracts in each planning area.

[9]Derived by multiplying dwelling units by average persons per household in corresponding census tracts.

The Los Angeles Community Redevelopment Agency (CRA), a state empowered body, has designated some areas in the Regional Core as Redevelopment Projects. In these areas, the CRA and LADOP jointly oversee the development process. Except for Union Station, all downtown stations lie within the Central Business District Redevelopment Project area. The North Hollywood Station is adjacent to the first phase commercial core development project in the North Hollywood Redevelopment Project area. The CRA may identify other areas along the Metro Rail alignment as Redevelopment Projects.

Figure 3-10 shows centers designated in the city's Concept Plan, Community Plan areas, the Park Mile Specific Plan area, and Redevelopment Projects within the Regional Core along the Metro Rail route. Figure 3-11 shows the relative development intensities established by the Community Plans for the Regional Core. The regional commercial category in the Community Plans and in zoning generally corresponds to Height District 4 (FAR 13)* and community commercial to Height District 1 or 2 (FAR 3 or 6). The multifamily residential category includes R3, R4, and R5 zoning at theoretical maximum densities of 54 units per net acre, 101 units per net acre, and 216 units per net acre, respectively. The majority of land zoned for multifamily residential use downtown, along Wilshire from Alvarado to Western, in Hollywood, and in North Hollywood is zoned R4 or R5. From Wilshire/Crenshaw to Fairfax/Beverly, the multifamily category represents primarily R2 and R3 zoning with some R4. In the Fairfax/Santa Monica Station area the county's planning and zoning permits 50 units per net acre with a 50 percent density bonus for all-rental projects and a density bonus of FAR 1 on commercially zoned land if that additional development is residential.

In the city and county lesser intensities of the zoned use as well as other less intensive uses are permitted in any given zoning category. For example, residential development, up to the intensity permitted by R5 zoning and the Height District designated for a particular parcel, is permitted within commercial zones as either single-use structures or mixed use developments with retail and/or office space. Similarly, commercial development, up to the intensity permitted by the designated Height District, is permitted on industrially zoned land. However, residential development is not permitted on industrially zoned land.

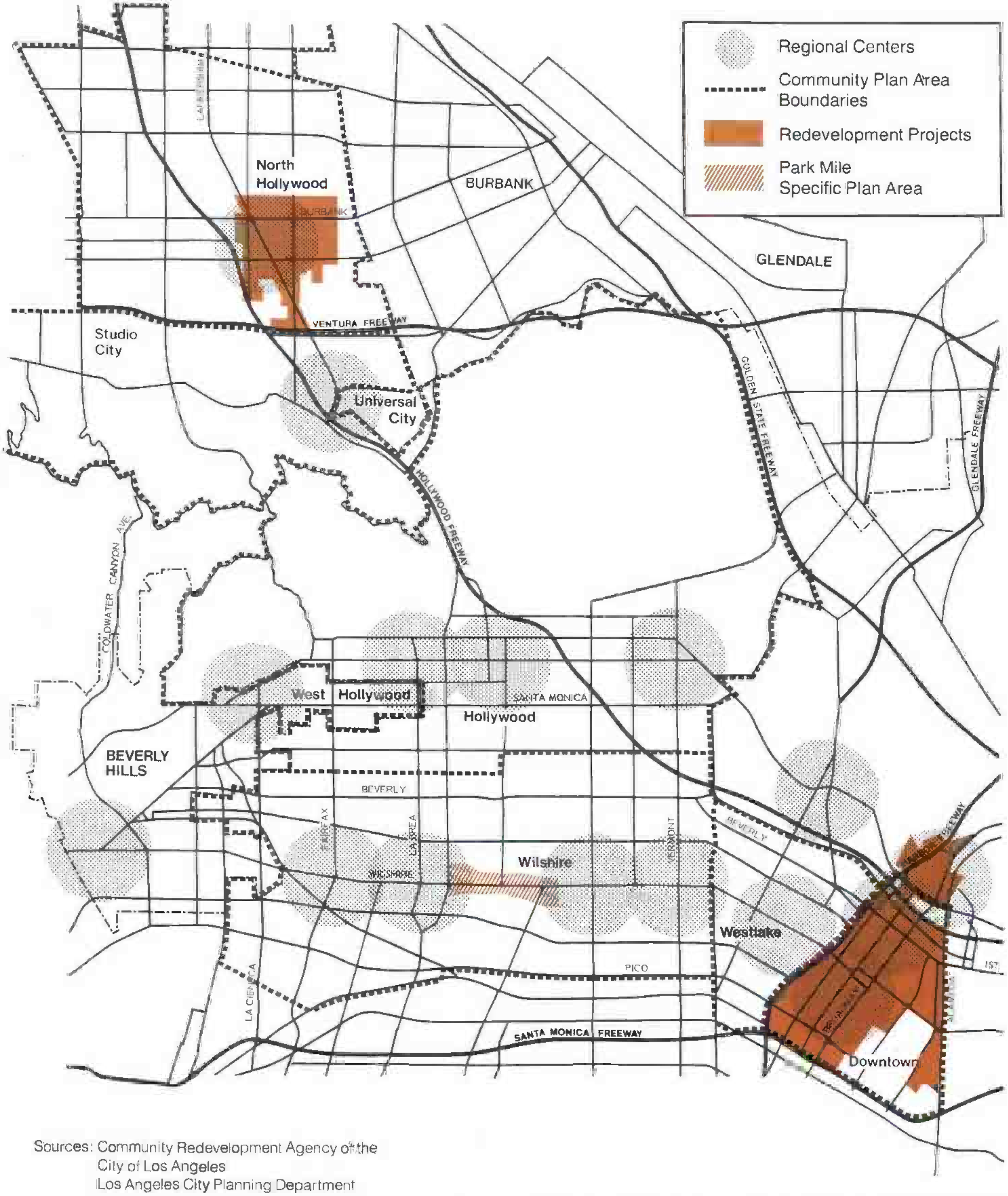
The planning and regulatory context for development within station areas and planning areas in the Regional Core is described in more detail in the First Tier EIS, the SCRTD Milestone 6 Report on Land Use and Development Policies, and in two SCRTD Technical Reports: A Summary of Public Policies and An Impact Assessment Methodology (1982), and Land Use and Development Impacts (1983).

2.2.3 A COMPARISON OF EXISTING AND PERMITTED LAND USE INTENSITIES

In general, the pattern of land use types designated in the Community Plans and zoning is consistent with existing land use. However, the intensity of development established by the plans and zoning is, in virtually all cases, substantially higher than the current intensity of use. Only in the CBD has recent development approached

---

* FAR is Floor Area Ratio, the ratio of building square footage, exclusive of parking and mechanical equipment storage, to parcel area.



Sources: Community Redevelopment Agency of the City of Los Angeles
Los Angeles City Planning Department

Southern California Rapid Transit District

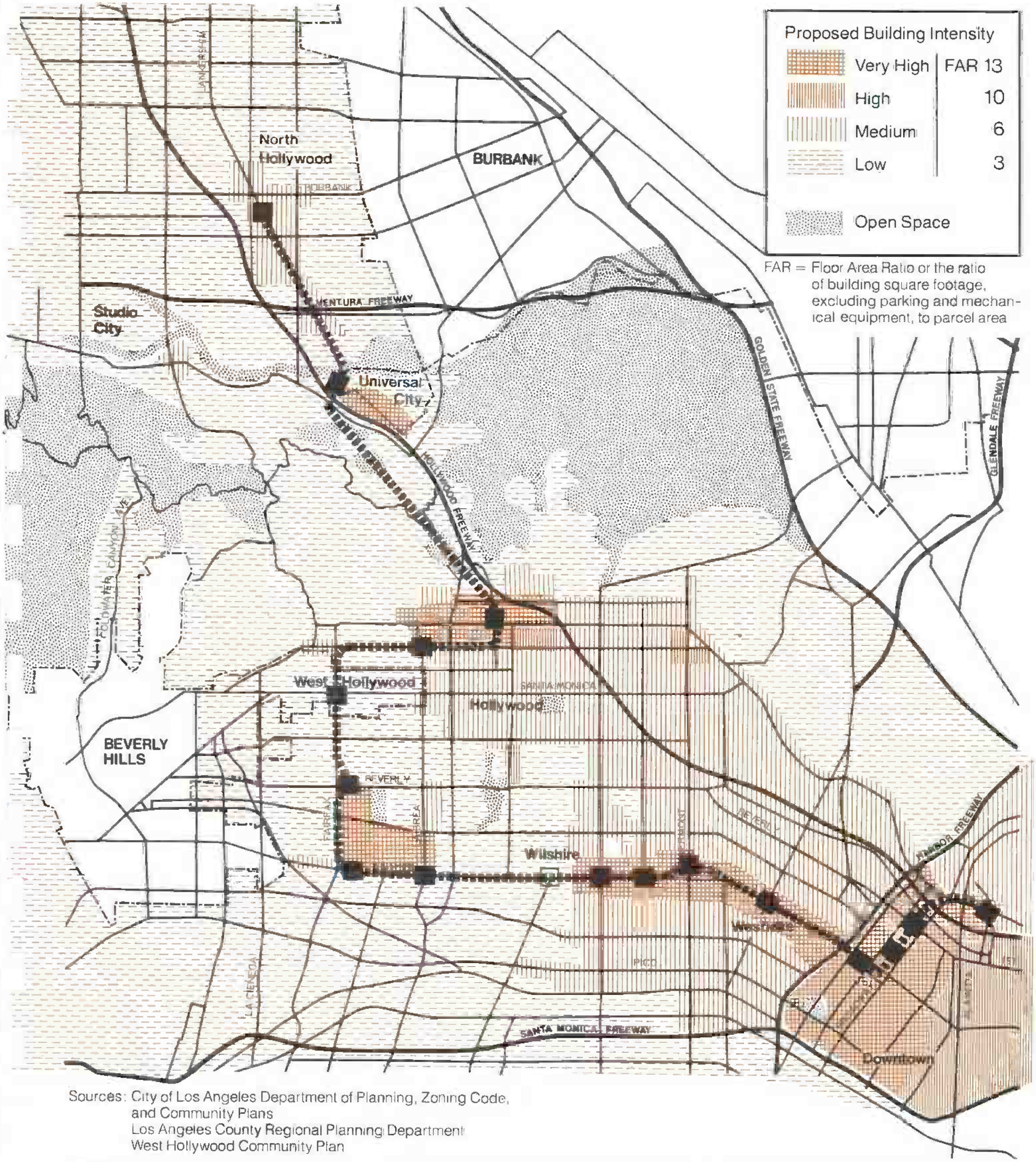
Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 1 2 3 miles

Figure 3-10 Local Land Use Development Plans

SEDWAY/COOKE
Urban and Environmental Planners and Designers



Sources: City of Los Angeles Department of Planning, Zoning Code, and Community Plans
Los Angeles County Regional Planning Department
West Hollywood Community Plan

Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 1 2 3 miles

Figure 3-11
Proposed Building Intensity

SEDWAY/COOKE
Urban and Environmental Planners and Designers

intensities permitted by zoning. Several recent projects, including the Crocker Bank towers and the O'Melveny and Meyers building, have reached an FAR of 13, the current allowable FAR. Older, stable buildings not expected to be renovated or removed for redevelopment in the CBD typically have FARs of 4 to 6. Recent residential development in the South Park Area achieves a density of 100 units per net acre, substantially less than the 216 units per net acre permitted by R5 zoning.

Along the Wilshire Corridor where FARs of 13 are permitted, mid- to high-rise buildings fronting Wilshire typically achieve FARs of 4 to 6. Community-serving commercial uses, usually located in areas zoned Height District 2 (FAR 6), are typically developed at FARs of 0.5 to 1. Recent multifamily residential development is typified by three-story wood-framed structures over parking, usually on 100-foot-wide lots (two single family parcels). A maximum density of about 90 units per net acre is achievable with this type of development, compared with densities of 101 units per net acre or 216 units per net acre currently permitted by R4 or R5 zoning.

Commercial intensities of stable buildings in station areas along Fairfax and in Hollywood, as well as in the San Fernando Valley station areas, are on the order of FAR 0.5 to 1.5. The overall FAR for the proposed North Hollywood Commercial Core development project is about 2. FARs permitted by zoning may vary from 3 to 13 along Fairfax Avenue and in the San Fernando Valley station areas; FAR of 13 is generally permitted in Hollywood. Recent residential densities are similar to those described for Wilshire. In summary, development rarely reaches the intensity permitted by zoning or by the Community Plan.

2.2.4 PARCELS SUSCEPTIBLE TO REINVESTMENT

The ability of a station area to accommodate new development is a key measure of land use impact potential. To evaluate the ability of station areas to accommodate demand for development, areas susceptible to reinvestment have been identified. These areas are mapped and presented in the SCRTD Technical Report on Land Use and Development Impacts (1983). Reinvestment is defined as either:

- replacement of existing structures (if any) on a site by a new structure or structures, or
- renovation and/or expansion of existing structures if their inherent architectural or historic value suggests that they should be preserved.

A parcel is considered to be susceptible to commercial redevelopment or renovation if it meets all the following criteria:

- It is zoned for commercial use;
- The assessed value of the existing improvement is less than the assessed value of the land--typically a vacant parcel, surface parking lot, or an older, poorly maintained low-rise structure on a parcel zoned for substantially more intensive development; and
- It can be combined with contiguous parcels into a development site comparable in size to sites recently developed in the area.

A parcel is considered to be susceptible to residential redevelopment if it meets all the following criteria:

- It is zoned for multifamily residential use--R3, R4 or R5;
- Its current use is single or two family residential;
- Other parcels on its block have already been redeveloped; and

Table 3-13 identifies the acres of residential and commercial parcel area susceptible to reinvestment, and the intensity of development that would be permitted on it by zoning as well as the intensity that would be likely to occur with current development practices. In general, the intensity of development permitted by zoning is unlikely to be achieved by current or expected development practices. The "probable" development intensity represents an intensity slightly higher than that of recent development projects in the area and substantially higher than the existing average FAR of existing development in the station area.

The parcel area susceptible to reinvestment is used in two ways in this analysis. First, in evaluating existing conditions, it provides a measure of the development opportunities in a station area and the amount of additional development needed to achieve the land use pattern established by the Community Plan or Specific Plan and by zoning. A substantial amount of land susceptible to reinvestment indicates a need for revitalization. Second, in assessing impacts, the development capacity establishes an impact "threshold." If the amount of development projected with construction of the Metro Rail Project does not consume all of the parcels susceptible to reinvestment, that development will not, in general, produce adverse impacts because it is consistent with land use planning designations. Furthermore, if the Metro Rail Project stimulates development in an area designated as a growth center and with a substantial amount of land susceptible to reinvestment, the impact is beneficial.

For example, only five percent of all parcel area in the Wilshire/Fairfax Station area is susceptible to commercial reinvestment. Zoning would permit up to 4.5 million square feet of new development at an FAR of 13. Given expected development practices, which would result in an average FAR of 8, 2.6 million additional square feet of floor area could be accommodated in addition to the existing approximately 3.0 million square feet. In contrast, 55 percent of the parcel area in the Hollywood/Cahuenga Station area is susceptible to commercial reinvestment. Zoning would permit the development of 47 million square feet at an FAR of 13. Current development practices and projected land use in the station area suggest that an average FAR of 3 better reflects the probable intensity of development and would result in the addition of 11 million square feet to the existing 2.6 million square feet of commercial development. This comparison indicates that the Wilshire/Fairfax Station area is more stable and much less in need of revitalization than the Hollywood/Cahuenga Station area.

All station areas except Wilshire/Fairfax and Wilshire/Crenshaw contain 20 or more acres of commercially zoned land susceptible to change, with probable development capacities ranging from 2.6 million square feet to 20 million square feet per station area. The supply of residentially zoned land susceptible to change varies dramatically from almost none in some station areas to over 20 acres in others.

TABLE 3-13

PARCEL AREA SUSCEPTIBLE TO REINVESTMENT

Station Area	PARCEL AREA SUSCEPTIBLE TO COMMERCIAL REINVESTMENT: Acres	As Percent of All Parcel Area in Station Area	Development Intensity (FAR[1]): Maximum Permitted by Zoning	Development Intensity (FAR[1]): Probable[2]	PARCEL AREA SUSCEPTIBLE TO RESIDENTIAL REINVESTMENT: Acres	As Percent of All Parcel Area in Station Area	Development Intensity (Net Dwelling Units[3]) Permitted by Zoning
Union Station	73	49%	13	3	0	0	0
Civic Center	28	19%	6	6	3.5	2%	760
Fifth/Hill	71	47%	6	6	0	0	–
Seventh/Flower	71	47%	6	6	0	0	–
Wilshire/Alvarado	35	23%	13	3	20.5	14%	3,780
Wilshire/Vermont	30	24%	13	6	25	20%	4,270
Wilshire/Normandie	28	25%	13	6	17	15%	2,180
Wilshire/Western	34	27%	13	6	26	21%	2,090
Wilshire/Crenshaw	15	12%	3	3	18	14%	990
Wilshire/La Brea	26	17%	13	4	10	7%	980
Wilshire/Fairfax	8	5%	13	8	21	14%	2,080
Fairfax/Beverly	48	32%	12	5.7	2	1%	170
Fairfax/Santa Monica	20	13%	2	2	30	20%	1,240[4]
					See Footnote 5		600
La Brea/Sunset	26	17%	10.4	3	21	14%	2,350
Hollywood/Cahuenga	83	55%	13	3	7	5%	700
Hollywood Bowl	0	0	–	–	3	2%	600
Universal City							
West of Lankershim	5	3%	3	3	0	0	0
East of Lankershim	20	11%	13	6	0	0	0
North Hollywood	53	35%	6	3	25	17%	2,310

Source: Sedway/Cooke

[1]FAR = Floor Area Ratio, or the ratio of floor area, excluding parking and mechanical equipment storage, to parcel area.

[2]Likely development intensities based on current land use patterns, trends, and projected land uses in each station area.

[3]Net dwelling units take into account units that would be displaced.

[4]Up to 750 additional units could be permitted through density bonuses for all-rental projects.

[5]A density bonus of FAR 1 is permitted on the 20 acres of commercial parcel area if that additional development consists of housing units. Assuming an average unit size of 1,500 square feet, an additional 600 residential units would be permitted in the station area.

2.3 IMPACT ASSESSMENT

2.3.1 METHODOLOGY AND MEASURES

Development that occurs in conjunction with the Metro Rail Project may produce both beneficial and adverse impacts. In general, the stimulation of development in the Regional Core and around stations is itself a positive land use impact. It implements the Centers Concept by concentrating development at designated growth centers, revitalizes economically stagnant areas, and provides commercial services and employment near established concentrations of population. However, it may result in some potentially adverse impacts, particularly in the neighborhoods around stations. In order to assess the impacts of the growth likely to occur in conjunction with the Metro Rail Project, it was necessary to first determine the level of development expected under each alternative both with and without a concerted effort by SCRTD and other agencies to promote development around stations.

Residential development projections for planning areas and individual station areas in the Regional Core were based on growth projections developed by SCAG. The No Project Alternative growth levels were based on SCAG-82A, a growth projection which assumes that the vast majority of population and housing growth will be dispersed throughout outlying areas, with limited growth in the Regional Core.

The residential growth levels for the Locally Preferred Alternative and its Aerial Option correspond to SCAG-82B, which assumes a concentration of new growth within the Regional Core. The adoption by SCAG of a 1982 growth projection roughly equivalent to SCAG-82A suggests that the SCAG-82B projection may be too high for the Regional Core as a whole. However, it is a reasonable projection of population growth within station areas where development would concentrate. **For the purposes of impact assessment, it is appropriate to think of the SCAG-82B projections for the entire Regional Core not as growth that would be directly induced by the Metro Rail Project but as an intensification of recent trends independent of the Metro Rail Project and an expression of the policies of the Centers Concept, which probably could not be accommodated without a rail rapid transit system in the Regional Core.**

For the Minimum Operable Segment, the growth projections for the CBD, Westlake, and Wilshire Planning Areas and for the Union Station through Fairfax/Beverly Station areas are the same as the Locally Preferred Alternative (SCAG-82B). Projected development in the balance of the Regional Core for this alternative is the same as the No Project Alternative and is based on SCAG-82A.

Under both SCAG-82A and SCAG-82B forecasts, new residential units in the Regional Core are expected to be accompanied by a slight increase in the number of persons per household in both new and existing units. In some areas, four or five people will be added for every additional dwelling unit.

Commercial growth projections were developed in a real estate market absorption study prepared by Peat Marwick Mitchell & Co and Sedway/Cooke. The market study identified commercial absorption potential for the period from 1980 to 2000 for three scenarios: 1) assuming the Metro Rail Project is not constructed, 2) assuming that the Locally Preferred Alternative or Minimum Operable Segment is constructed, and 3) assuming that SCRTD and other local agencies actively promote joint development around stations. Six categories of development were considered:

major office, community office, hotel, employee-serving retail, regional retail, and community retail. The projections reflect projects under construction or completed from January 1980 through January 1983, as well as market absorption projections for January 1983 to January 2000 based on historic growth rates, recent development trends and information provided by local developers and brokers. The figures for retail development were based on projected population growth for each alternative. (Retail projections are derived from the SCAG-82A and -82B population projections). The six commercial development categories were summarized into a single commercial value for this impact assessment. The market projections are presented in detail in the SCRTD Technical Report on Land Use and Development Impacts (1983).

Only the No Project growth projections for office space are derived from the market study. The "With Project" office space projections are ***illustrative*** of the increase in development that could occur given experiences in other cities with fixed rail systems and the constraints on the local market. Actual additional development in conjunction with the Metro Rail Project may be substantially higher or lower depending on actual population growth and the extent to which local agencies actively promote joint development.

The projected growth under each alternative is assessed for its consistency with land use plans and policies and whether it can be accommodated in station areas without adverse impacts in the surrounding community. Consistency with land use plans and policies is assessed at two geographic scales: regionwide and station area. Accommodation of growth is evaluated only for the station areas. Consistency of projected growth with land use plans and policies is evaluated at the regional scale by four measures which correspond to the following key objectives of the City's General Plan: to concentrate development at designated growth centers along the Metro Rail route; to concentrate development at designated centers in other areas of the Regional Core (first two measures are in accordance with the Centers Concept); to revitalize economically stagnant or declining areas; and to provide additional commercial services and employment near established concentrations of population. At the station area level, consistency is evaluated by the above measures as well as by the extent to which new development implements applicable Community Plans, Specific Plans, and/or redevelopment plans. Accommodation of projected growth within station areas and potential adverse impacts are evaluated at the station area level by six measures which correspond to basic planning objectives in these areas.

2.3.2 GROWTH PROJECTIONS

Regional Core. Table 3-14 summarizes the commercial and residential growth projections for each of the systemwide alternatives and compares it with total development and population in 1980. Projections are given for the Regional Core. Commercial projections are expressed as gross square footage and include office, retail, and hotel development. With construction of the Locally Preferred Alternative commercial development added within the Regional Core would be expected to increase by a range of 50 to 69 percent over development added under the No Project Alternative. The effects of the Aerial Option would be virtually identical to those of the Locally Preferred Alternative. Commercial development added under the Minimum Operable Segment would increase by a range of 41 to 49 percent over the No Project Alternative.

With the construction of the Locally Preferred Alternative, the number of dwelling units added would increase by about 200 percent over the No Project Alternative. Population added would increase about 130 percent over the No Project Alternative. With the Minimum Operable Segment, the Regional Core is projected to experience an increase in dwelling units added of about 125 percent and an increase in population added of about 85 percent over the No Project Alternative.

TABLE 3-14

PROJECTED REGIONAL CORE GROWTH FOR SYSTEMWIDE ALTERNATIVES, YEARS 1980 TO 2000

		NO PROJECT ALTERNATIVE		LOCALLY PREFERRED ALTERNATIVE		MINIMUM OPERABLE SEGMENT	
	1980 Total	Increment	Percent Change	Increment	Percent Change	Increment	Percent Change
Commercial Development (1,000 sq. ft.)	232,800	38,600	17%	57,600-65,300[1]	25%-28%	54,600-57,500[1]	23%-25%
Residential Development (dwelling units)	378,100	50,620	13%	150,130	40%	113,920	30%
Population Growth	832,960	188,710	23%	429,600[2]	52%	356,460[2]	43%

Source: Southern California Association of Governments, Droft SCAG-82 Growth Forecast Policy, 1982; LADOP; Sedway/Cooke.

[1]Range reflects amount of development both without and with a concerted effort by SCRTD and others to promote joint development.

[2]Although this level of residential development is identified by SCAG-82B for the entire Regional Core, it is more likely to occur at this intensity only within station areas and to be less for the Regional Core as a whole.

Planning Areas. Table 3-15 compares total 1980 population and population densities in planning areas and the Regional Core with those projected under the various project alternatives. Population density in the Regional Core would increase from 10,888 persons per square mile in 1980 to 13,355 persons per square mile in 2000 with No Project, 17,806 persons per square mile with the Locally Preferred Alternative, and 16,532 persons per square mile with the Minimum Operable Segment. The density of those planning areas served by the Minimum Operable Segment (CBD, Westlake, and Wilshire) would increase from 14,624 persons per square mile in 1980 to 19,251 persons per square mile in 2000 with No Project and 24,780 persons per square mile with the Minimum Operable Segment.

With respect to commercial development activity under the No Project Alternative, the CBD Planning Area is expected to capture the majority of commercial development within the Regional Core at an average annual rate of 750,000 square feet for major office space. This rate is slightly higher than the capture rate of 690,000 square feet per year during the last decade (1970-1980) and 550,000 square feet per year during the last five years of the decade (1975-1980). Westlake is expected to capture 50,000 square feet of major office space per year. The Wilshire Planning Area is expected to capture 400,000 square feet per year compared with 433,000 square feet per year during the last decade and 220,000 square feet per year during the last five years of the decade. Hollywood is expected to capture 75,000 square feet per year, continuing the trend established by a decline from 87,000 square feet per year in the 1970's to 73,000 square feet per year from 1975 to 1980. The Universal City/North Hollywood area is expected to capture 225,000 square feet of major office space per year, reflecting a continuation of recent trends. The area absorbed 105,000 square feet per year during the 1970s and 155,000 square feet per year from 1975 to 1980.

TABLE 3-15

POPULATION AND DENSITY IN PLANNING AREAS AND REGIONAL CORE, YEARS 1980 AND 2000

		1980		NO PROJECT		LOCALLY PREFERRED ALTERNATIVE		MINIMUM OPERABLE SEGMENT	
Planning Areas	Sq. Mi.	Population	Persons/ Sq. Mi.	Population	Persons/ Sq. Mi.	Population	Persons/ Sq. Mi.	Population	Persons/ Sq. Mi.
CBD	6.76	43,040	6,367	73,930	10,936	102,890	15,220	102,890	15,220
Westlake	3.53	92,450	26,190	126,620	35,870	159,410	45,159	159,410	45,159
Wilshire	20.05	308,210	15,372	383,530	19,129	489,530	24,415	489,530	24,415
Hollywood	21.21	216,520	10,208	258,290	12,178	324,870	15,317	258,290	12,178
Universal City	9.71	41,100	4,232	42,630	4,390	44,160	4,548	42,630	4,390
North Hollywood	15.24	131,640	8,638	136,670	8,968	141,700	9,298	136,670	8,968
Regional Core	76.50	832,960	10,888	1,021,670	13,355	1,262,560	16,504	1,189,420	15,548

Residential development is expected to continue at the same rate as during the last two decades except in the CBD where CRA involvement is expected to increase the rate of growth considerably. Because most stations are at established centers, development within the Regional Core planning areas will tend to concentrate within station areas even under the No Project Alternative.

With the Locally Preferred Alternative, the CBD is expected to increase its capture rate to a range of 1,000,000 to 1,050,000 square feet of major office space per year. Westlake is expected to increase its capture rate to a range of 75,000 to 125,000 square feet per year. Wilshire is expected to capture 650,000 to 750,000 square feet per year. Hollywood could increase its capture rate to a range of 100,000 to 150,000 square feet per year. The Universal City/North Hollywood capture rate is not expected to increase significantly without special incentives. Because the Music Corporation of America (MCA) owns the Universal City area, where the majority of development is expected to occur, its development costs are substantially lower than a typical developer's. Since MCA has been able to act relatively independently of the development market, its development plans under the No Project Alternative probably reflect its internal ability to accommodate development. Similarly, the current market demand has already been increased by the North Hollywood Community Core Redevelopment Project, the major development site in North Hollywood. Consequently, additional growth as a result of the Metro Rail Project is not expected, unless incentives are provided in these two areas. With incentives, the capture could increase to 275,000 square feet per year.

With the Minimum Operable Segment, the CBD, Westlake and Wilshire Planning Areas would experience increases in capture rates comparable to those experienced under the Locally Preferred Alternative. The Hollywood and Universal City/North Hollywood areas would experience no increase in capture rate.

Station Areas. Table 3-16 indicates **total** residential and commercial development in station areas for each alternative in the year 2000 and Table 3-17 shows population and employment in station areas. The level of development for the Project alternatives is presented as a range. The low end is illustrative of the development that could occur in conjunction with the Metro Rail Project and that could be absorbed by the market under normal circumstances. The high end includes the additional development that the market could absorb given special incentives by SCRTD and other agencies to encourage joint development adjacent to stations. Table 3-16 indicates that under the No Project Alternative total commercial development in the 14 station areas designated as core areas of Centers will increase by 43 percent over 1980; with the Locally Preferred Alternative it will increase by 61 to 77 percent; and with the Minimum Operable Segment 58 to 70 percent. Employment will be similarly concentrated within designated centers under the Locally Preferred Alternative, and the Minimum Operable Segment. Thus, relative to the No Project Alternative the Metro Rail Project will promote the concentration of activity within designated centers in accordance with the Centers Concept. The Locally Preferred Alternative will more effectively implement the Centers Concept in the Regional Core than will the Minimum Operable Segment. The Minimum Operable Segment will not provide the economic stimulation needed to promote revitalization in Hollywood and North Hollywood.

Table 3-18 identifies the parcel area that would be required to accommodate the growth projected under each alternative from January 1980 to January 2000 and the corresponding percentage of the total parcel area susceptible to reinvestment. Figure 3-12 depicts these results graphically. This comparison of the development projections with development capacity provides the basis for assessing impacts associated with the accommodation of growth.

2.3.3 IMPACTS OF GROWTH

Potential impacts both in the region and in station areas are listed in Table 3-19. The table contains a matrix which evaluates the Locally Preferred Alternative and the Minimum Operable Segment relative to the year 2000 No Project Alternative base conditions. Impacts are identified as potentially beneficial impacts, potentially adverse impacts which can be mitigated, and potentially adverse impacts which cannot be mitigated. Impacts of the Aerial Option are identical to those of the Locally Preferred Alternative.

Consistency With Land Use Plans and Policies. A number of local land use plans and policies are relevant in addressing the potential impacts of growth that would occur in conjunction with Metro Rail. The primary ones include the City's General Plan, Concept Plan, community plans, the Park Mile Specific Plan, and the CRA's development plans.

Regional Impacts. All Metro Rail Project alternatives benefit the region by implementing the Centers Concept within the Regional Core. Relative to the Locally Preferred Alternative, the No Project Alternative would adversely affect implementation of the Centers Concept. It would neither stimulate development in designated centers nor accommodate the transportation demands generated by such development.

The only potentially adverse impact of the Locally Preferred Alternative at the regional scale might be a shift of development from centers not on the route to

TABLE 3-16

TOTAL DEVELOPMENT IN REGIONAL CORE FOR SYSTEMWIDE ALTERNATIVES, YEAR 2000

	COMMERCIAL FLOOR AREA (1,000 Sq. Ft.)			RESIDENTIAL (OCCUPIED DWELLING UNITS)		
	No Project	Locally Preferred Alternative[1]	Minimum Operable Segment[1]	No Project	Locally Preferred Alternative	Minimum Operable Segment
CBD PLANNING AREA	**100,400**	**107,500 - 109,600**	**107,500 - 109,600**	**22,310**	33,810	33,810
Union Station	900	1,800 - 3,200	1,800 - 3,200	0	530	530
Civic Center	9,400	9,800 - 10,200	9,800 - 10,200	2,116	2,960	2,960
Fifth/Hill	24,300	26,000 - 27,300	26,000 - 27,300	1,830	2,780	2,780
Seventh/Flower	20,000	21,600 - 23,200	21,600 - 23,200	2,040	2,380	2,380
All CBD Station Areas	54,600	59,200 - 63,900	59,200 - 63,900	6,030	8,650	8,650
WESTLAKE PLANNING AREA	**25,500**	**26,200 - 26,800**	**26,200 - 26,800**	47,330	**58,660**	**58,660**
Wilshire/Alvarado	1,600	2,000 - 2,700	2,000 - 2,700	4,410	5,440	5,440
WILSHIRE PLANNING AREA	**75,600**	**83,800 - 86,100**	**83,800 - 86,100**	150,770	191,260	191,260
Wilshire/Vermont	5,300	5,700 - 6,700	5,700 - 6,700	3,690	5,920	5,920
Wilshire/Normandie	5,000	6,600 - 6,800	6,600 - 6,800	4,210	6,060	6,060
Wilshire/Western	4,300	4,800 - 5,000	4,800 - 5,000	4,570	5,140	5,140
Wilshire/Crenshaw*	1,200	1,300 - 1,500	1,300 - 1,500	880	990	990
Wilshire/La Brea	1,800	2,400 - 2,600	2,400 - 2,600	3,590	4,880	4,880
Wilshire/Fairfax	4,800	5,700 - 6,400	5,700 - 6,400	740	990	990
Fairfax/Beverly*	2,100	4,300 - 5,400	4,300 - 5,400	2,900	4,020	4,020
All Wilshire Station Areas	24,500	30,800 - 34,400	30,800 - 34,400	20,580	28,000	28,000
HOLLYWOOD PLANNING AREA	**41,800**	**44,400 - 46,000**	**41,800**	124,530	**154,840**	**124,530**
Fairfax/Santa Monica*	600	1,000 - 1,400	600	5,440	6,930	5,440
La Brea/Sunset	1,200	1,500 - 1,900	1,200	2,530	3,220	2,530
Hollywood/Cahuenga	3,200	4,200 - 5,500	3,200	2,430	3,040	2,430
Hollywood Bowl (optional)*	15	15 - 35	15	480	930	480
All Hollywood Station Areas	5,015	6,715 - 8,835	5,015	10,880	14,120	10,880
UNIVERSAL CITY/NORTH HOLLYWOOD PLANNING AREA	**28,100**	**28,500 - 29,600**	**28,100**	**83,760**	**89,660**	**83,760**
Universal City	4,100	4,300 - 4,500	4,100	1,250	1,330	1,250
North Hollywood	1,500	2,000 - 2,500	1,500	1,130	1,210	1,130
DESIGNATED CENTERS	87,400	98,400 - 108,500	96,400 - 104,100	34,580	45,880	44,420
ALL STATION AREAS	91,315	105,015 - 116,835	102,615 - 111,615	44,280	58,750	55,350
REGIONAL CORE	271,400	290,400 - 298,100	287,400 - 290,300	428,720	528,230	492,020

Source: Sedway/Cooke

*Station areas not designated as centers in the city's Concept Plan.

[1]Range reflects amount of development both without and with a concerted effort by SCRTD and others to promote joint development.

TABLE 3-17

TOTAL POPULATION AND EMPLOYMENT IN STATION AREAS, YEAR 2000

	NO PROJECT		LOCALLY PREFERRED ALTERNATIVE/AERIAL OPTION[1]		MINIMUM OPERABLE SEGMENT[1]	
	Population	Employment	Population	Employment	Population	Employment
CBD	**73,930**	**373,100**	**102,890**	**401,500-408,100**	**102,890**	**401,500-408,100**
Union Station	0	3,000	1,059	5,900-11,300	1,050	5,900-11,300
Civic Center	4,530	45,400	7,300	47,100-48,900	7,300	47,000-48,900
Fifth/Hill	3,880	78,700	6,250	87,400-93,300	6,250	87,400-93,300
Seventh/Flower	3,310	66,700	4,160	70,800-78,500	4,160	70,800-78,500
All CBD Station Areas	11,720	193,800	18,760	211,100-232,000	18,766	211,100-232,000
WESTLAKE	**126,620**	**91,400**	**159,410**	**94,400-96,900**	**159,410**	**94,400-96,900**
Wilshire/Alvarado	10,580	9,300	13,320	11,200-14,400	13,320	11,200-14,400
WILSHIRE	**383,530**	**276,200**	**489,530**	**306,500-317,300**	**489,530**	**306,500-317,300**
Wilshire/Vermont	8,960	25,100	14,120	27,100-31,500	14,120	27,100-31,500
Wilshire/Normandie	9,320	25,000	13,800	30,300-31,200	13,800	30,300-31,200
Wilshire/Western	10,030	16,900	11,210	18,900-19,700	11,210	18,900-19,700
Wilshire/Crenshaw (optional)*	2,080	6,100	2,390	6,900-7,800	2,390	6,900-7,800
Wilshire/La Brea	9,500	5,500	13,000	8,200-9,000	13,000	8,200-9,000
Wilshire/Fairfax	1,720	22,200	2,350	25,900-28,600	2,350	25,900-28,600
Fairfax/Beverly*	7,190	10,400	9,620	18,700-22,100	9,620	18,700-22,100
All Wilshire Station Areas	48,800	111,200	66,490	136,000-149,800	66,490	136,000-149,800
HOLLYWOOD	**258,290**	**145,000**	324,870	**151,100-156,800**	**258,290**	145,000
Fairfax/Santa Monica*	10,720	2,100	14,130	3,900-5,500	10,720	2,100
La Brea/Sunset	4,690	6,400	6,280	7,300-8,700	4,600	6,400
Hollywood/Cahuenga	5,020	14,900	6,380	16,900-20,500	5,020	14,900
Hollywood Bowl (optional)*	830	300	830	300-340	830	300
All Hollywood Station Areas	21,260	23,700	27,620	28,400-35,000	21,260	23,700
UNIVERSAL CITY/ NORTH HOLLYWOOD	**179,300**	**98,800**	**185,860**	**100,000-104,600**	**179,300**	**98,800**
Universal City	2,290	22,300	2,600	22,700-23,600	2,290	22,300
North Hollywood	2,350	7,700	2,460	9,900-12,100	2,350	7,700
DESIGNATED CENTERS	76,180	349,100	104,280	389,500-431,160	100,910	384,000-417,610
ALL STATION AREAS	97,000	368,000	131,250	419,300-466,900	124,470	412,000-449,900
REGIONAL CORE	**1,021,670**	**984,500**	**1,262,560**	**1,053,500-1,083,700**	**1,189,420**	**1,046,200-1,066,100**

Source: Sedway/Cooke Tables assuming 200 sq.ft./office employee (reflects the current downward trend from 250 sq.ft./employee in 1980), 500 sq.ft./retail employees and 2 rooms/hotel employee.

*Station areas not designated as centers in the city's Concept Plan.

[1]Range reflects development both without and with promotion of joint development by SCRTD and others.

TABLE 3-18

ACRES OF PARCEL AREA REQUIRED TO ACCOMMODATE GROWTH
(Percent of Parcel Area Susceptible to Reinvestment Consumed)

	NET COMMERCIAL DEVELOPMENT[1]			NET RESIDENTIAL DEVELOPMENT[1]		
	No Project	Locally Preferred Alternative	Minimum Operable Segment	No Project	Locally Preferred Alternative	Minimum Operable Segment
CBD						
Union Station	0 0	7-17 10-23%	7-17 20-23%	0 *[2]	6 *[2]	6 *[2]
Civic Center	9 32%	12-14 42-49%	12-14 42-49%	7 *[2]	16 *[2]	16 *[2]
Fifth/Hill	25 33%	37-39 52-55%	37-39 52-55%	11 *[2]	22 *[2]	22 *[2]
Seventh/Flower	23 33%	29-36 41-50%	29-36 41-50%	7 *[2]	11 *[2]	11 *[2]
WESTLAKE						
Wilshire/Alvarado	2 4%	5-7 13-20%	5-7 13-20%	7 37%	14 70%	14 70%
WILSHIRE						
Wilshire/Vermont	2 8%	8-13 27-43%	8-13 27-43%	2 5%	17 69%	17 69%
Wilshire/Normandie	9 15%	18-20 46-54%	18-20 46-54%	3 14%	19 113%	19 113%
Wilshire/Western	4 12%	5-6 15-19%	5-6 15-19%	4 15%	14 51%	14 51%
Wilshire/Crenshaw	3 21%	4-6 28-38%	4-6 28-38%	2 6%	4 18%	4 18%
Wilshire/La Brea	2 8%	4-6 15-23%	4-6 15-23%	7 70%	27 273%	27 273%
Wilshire/Fairfax	4 50%	8-10 103-127%	8-10 103-127%	2 6%	4 19%	4 19%
Fairfax/Beverly	9 17%	20-26 37-48%	20-26 37-48%	11 294%	27 1,594%	27 1,594%
HOLLYWOOD						
Fairfax/Santa Monica	2 10%	5-8 26-40%	2 10%	11 36%	47 156%	11 36%
La Brea/Sunset	2 6%	13-20 50-78%	2 6%	2 10%	9 43%	2 10%
Hollywood/Cahuenga	4 5%	15-29 18-35%	4 5%	2 32%	10 136%	2 32%
Hollywood Bowl	0 0%	0-1 *[3]	0	0.1 3%	3 100%	0.1 3%
UNIVERSAL CITY/ NORTH HOLLYWOOD						
Universal City	12 48%	15-16 60-64%	12 48%	2 *[4]	4 *[4]	2 *[4]
North Hollywood	12 23%	27-35 51-66%	12 23%	7 28%	8 31%	7 28%

Source: Sedway/Cooke

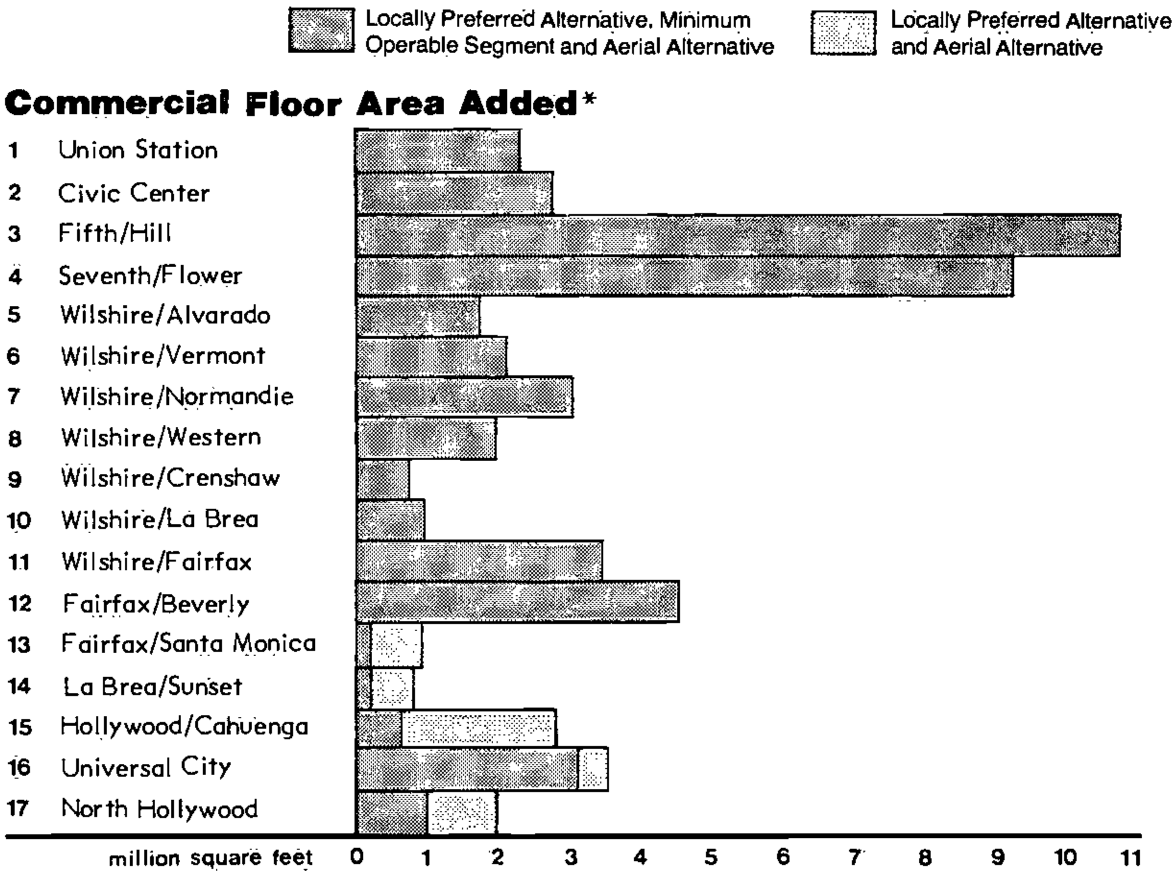
[1] Net growth is projected new development minus floor area or dwelling units displaced. An average of one single family or duplex unit would be displaced for every 13 multifamily units added in areas outside the CBD.

[2] Only 3.5 acres of land susceptible to reinvestment are zoned for residential use in the CBD station areas; most residential development would be located on commercially zoned land designated for residential development by the CRA.

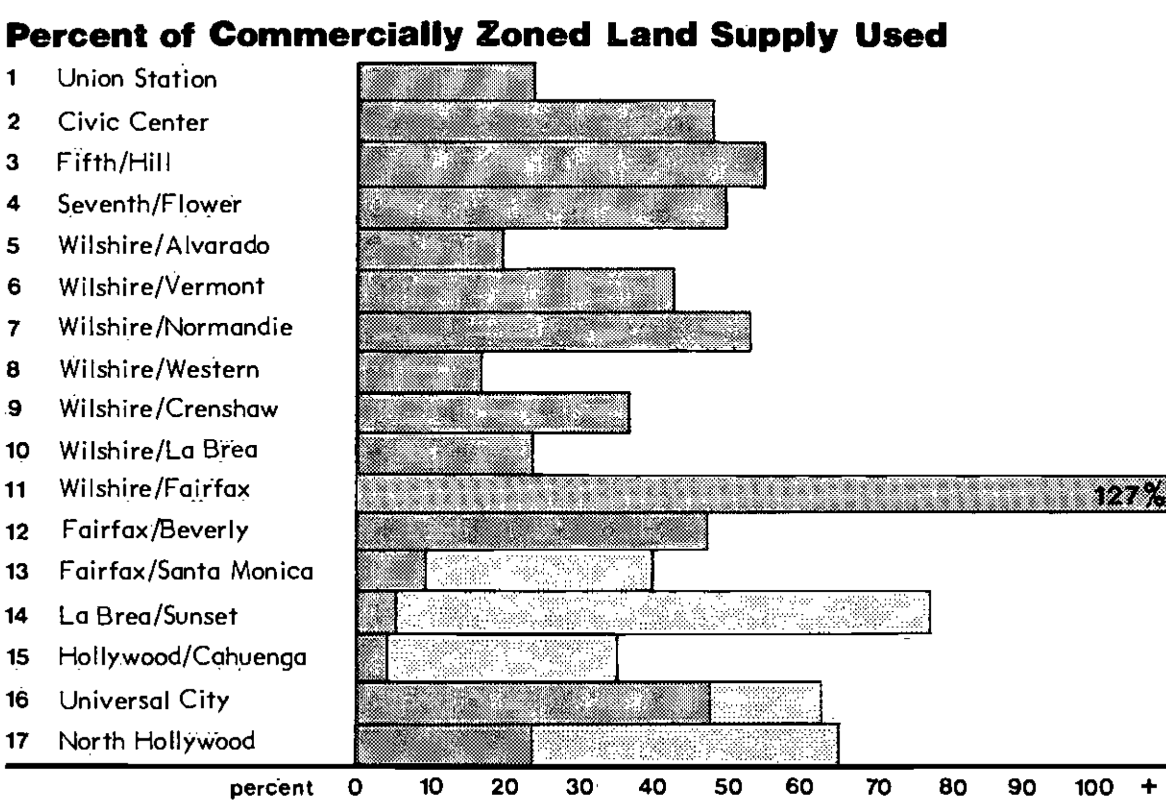
[3] Commercial development would be located on the county-owned Hollywood Bowl site.

[4] There is no residentially zoned land susceptible to reinvestment in this station area.

Figure 3-12 Growth Projections, 1980-2000



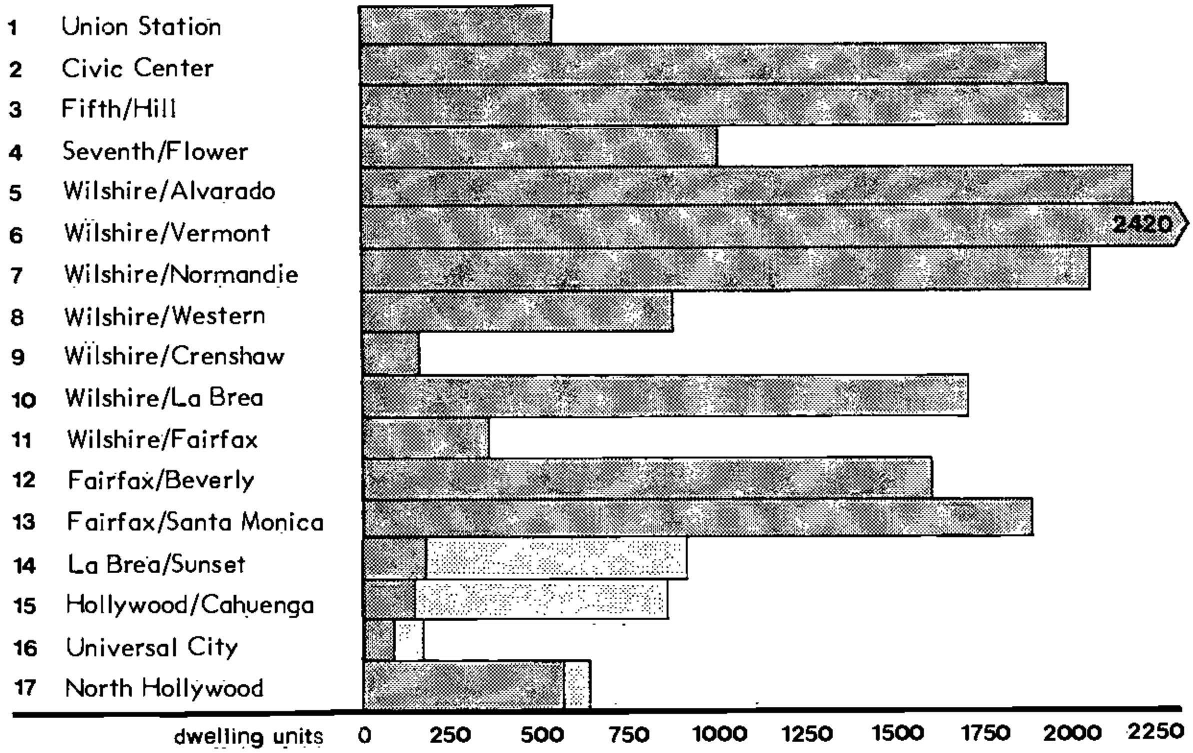
*The proposed optional station at Hollywood Bowl would add .02 million square feet under the Locally Preferred Alternative and the Aerial Option. No additional commercial floor area would be added under the Minimum Operable Segment.



Locally Preferred Alternative, Minimum Operable Segment and Aerial Alternative

Locally Preferred Alternative and Aerial Alternative

Dwelling Units Added*



*The proposed optional station at Hollywood Bowl would add 470 dwelling units under the Locally Preferred Alternative and the Aerial Option. Twenty dwelling units would be added under the Minimum Operable Segment.

Percent of Residentially Zoned Land Supply Used

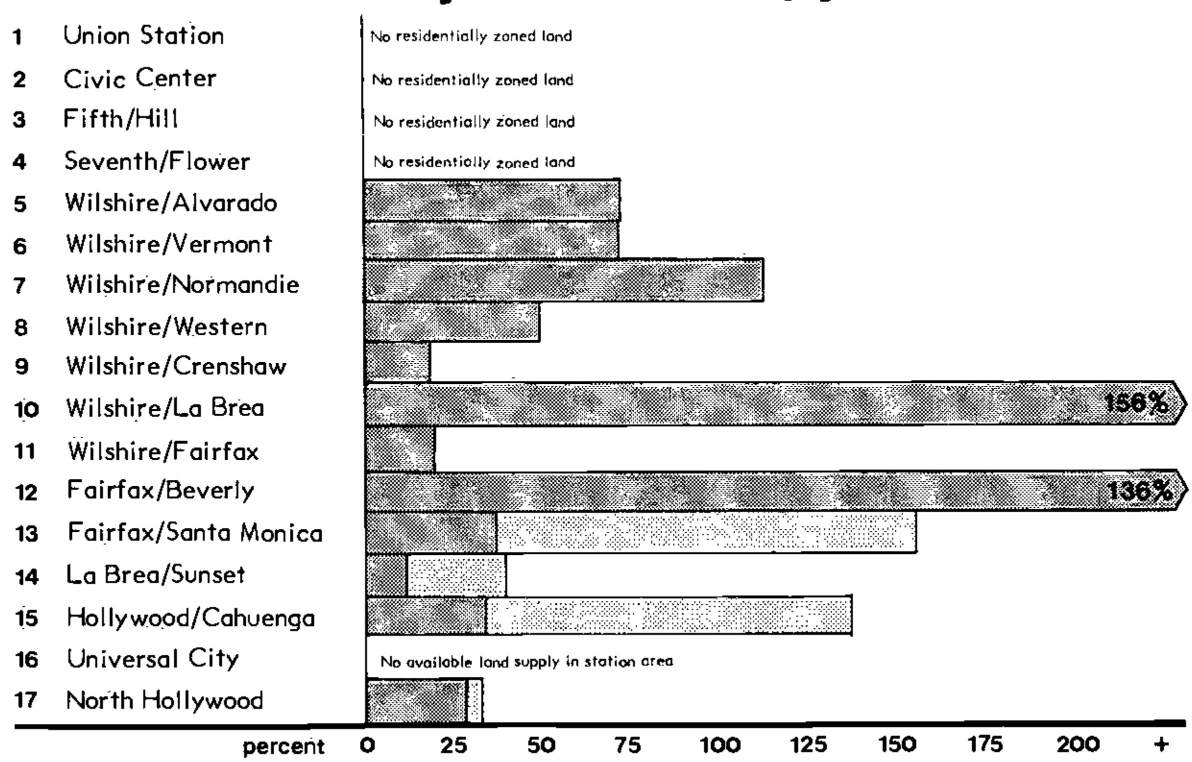


TABLE 3-19
LAND USE IMPACT ASSESSMENT FOR RAIL ALTERNATIVES

Impact Measures	1	2	3	4	5	6	7	8	9	10	11	12	13
	Consistency With Land Use Plans and Policies: Concentrate development at growth centers along Metro Rail route per Centers Concept.	Concentrate development at non-station growth centers per Centers Concept.	Revitalize economically stagnant or declining areas.	Increase commercial services/employment at or near population centers.	Implement community plan, Specific plan, or redevelopment plan objectives.	**Accommodation of Projected Station Area Growth Without Adverse Impacts:** Accommodate projected residential growth within walking distance of stations.	Accommodate projected commercial growth within walking distance of stations.	Preserve stable residential areas • Avoid pressure to increase residential densities in stable single family areas.	Preserve stable residential areas • Avoid pressure to rezone residential areas for commercial use.	Maintain stable land values in surrounding neighborhoods.	Preserve historic and/or cultural resources.	Maintain compatibility with existing land uses and community character.	MITIGATION OPTIONS (See Mitigation Text)
REGIONAL IMPACTS	□	●	□	□									
STATION AREA IMPACTS													
Union Station	□		□			◐	□				□ ◐		1
Civic Center	□					□	□						
Fifth/Hill	□				□	□	□			●	□ ◐		7
Seventh/Flower	□			□	□	□	□			●	□ ◐		7
Wilshire/Alvarado	□		□	□	□	□	□						
Wilshire/Vermont	□		□	□	□	□	□						
Wilshire/Normandie	□		□	□	□	◐	□						1
Wilshire/Western	□		□	□	□	□	□						
Wilshire/Crenshaw (optional)			□		□	□	□						
Wilshire/La Brea	□		□		□	◐	□	◐			□ ◐		1,8,9
Wilshire/Fairfax	□					□	◐		◐	●			4-7
Fairfax/Beverly	◐		□ ◐			◐	□	◐				◐	1
Fairfax/Santa Monica			□	□		◐	□	◐					1-3
La Brea/Sunset	□		□	□	□	□	◐		◐			◐	4,6
Hollywood/Cahuenga	□		□	□	□	◐	□				□ ◐		1,8,9
Hollywood Bowl (optional)						□	□						
Universal City	□			□		●	□	◐					1
North Hollywood	□		□	□	□	□	□						

Legend:
- □ Potentially beneficial impact.
- ◐ Potentially adverse impact that can be mitigated by SCRTD and/or other responsible agencies.
- ● Potentially adverse impact that cannot be mitigated.

Blank represents a neutral situation.

centers that are. The growth centers in the Regional Core which would not be connected by Metro Rail and which would attract office development under the No Project Alternative--West Hollywood, Beverly Center and Century City--as well as centers in West Los Angeles, are expected to continue to attract substantial amounts of new office development. However, as traffic congestion increases, some of the development that would occur in these areas under the No Project Alternative is likely to shift to station areas primarily along the Wilshire Corridor where congestion will have been reduced by the Metro Rail Project. Similarly, office development may be attracted away from centers outside the Regional Core as traffic congestion increases.

Increased development along the Metro Rail route is not expected to significantly impact the east Hollywood center at Vermont and Sunset. That center consists primarily of medical and related facilities and is accessible to the Hollywood Freeway. As a result, the east Hollywood area is expected to avoid direct competition with the west and central Hollywood centers and to maintain its present viability as a development center. In addition, as population of the Hollywood area increases with the support of the Metro Rail Project, retail development would be expected to increase in the east Hollywood area to serve that added population. Nonetheless, the LADOP and CRA, if it becomes involved in the redevelopment of the Hollywood area, should be particularly sensitive to the need for east Hollywood and the Vermont corridor to develop simultaneously with other centers in Hollywood.

In general, retail development will be attracted to the Regional Core and to station areas as a function of the distribution of population growth. Residential development will be attracted away from outlying areas currently experiencing rapid growth and to station areas and other parts of the Regional Core. With the Locally Preferred Alternative, community-serving retail development, which tends to be located in small centers within predominately residential areas, would increase throughout the Regional Core over the No Project levels. In contrast, regional retail development would be likely to concentrate within station areas, with a much smaller share spilling over into the surrounding communities.

Since the Locally Preferred Alternative is expected to support an increase in population and community-serving retail development throughout the Regional Core, the community retail areas in Echo Park and Koreatown, as well as in east Hollywood and the Vermont corridor, can be expected to experience no loss of development as a result of the Metro Rail Project. These areas may experience a stimulation of development due to the overall population growth and enhancement of the Regional Core's economy.

The impact of the Minimum Operable Segment will be similar to the Locally Preferred Alternative for the portion of the Regional Core along its alignment. However, office and regional retail development that might have been attracted to Hollywood and North Hollywood with the Locally Preferred Alternative would be likely to relocate instead to the Wilshire Corridor. It is possible that, in time, less lucrative businesses forced to move away from the Wilshire Corridor due to increased lease rates or new construction would relocate to Hollywood, thereby increasing economic activity in Hollywood to some extent. However, such activity would not be expected to generate new construction or to approach the magnitude expected with the construction of the Locally Preferred Alternative in Hollywood.

<u>Station Area Impacts.</u> As long as the station areas designated as centers can accommodate projected growth (see following discussion of the accommodation of

growth in station areas), the Metro Rail Project will have a beneficial effect on those centers. Since the Locally Preferred Alternative includes 14 centers compared with 10 along the Minimum Operable Segment, the Locally Preferred Alternative will promote the Centers Concept in the station areas more effectively than the Minimum Operable Segment. Both Project alternatives are more effective in promoting the Centers Concept than the No Project Alternative.

There are two station areas on the Minimum Operable Segment which are not located in the cores of centers--the optional Wilshire/Crenshaw and the Beverly/Fairfax Stations--and two additional stations on the Locally Preferred Alternative--Fairfax/Santa Monica and the optional Hollywood Bowl Station. Projected growth in "non-center" station areas is generally consistent with the intensity of development established by the applicable Community Plan or Specific Plan and, in the case of Wilshire/Crenshaw and Fairfax/Beverly, with their Concept Plan designations as a node and satellite respectively. The commercial development projected for the four non-center station areas is consistent with projected development levels in Table 3-15. The Fairfax/Beverly and Fairfax/Santa Monica station areas do not contain sufficient residentially zoned land susceptible to reinvestment to accommodate projected growth, but this potential impact can be mitigated by locating residential development on commercially zoned sites (see the following discussions of accommodation of growth in station areas and mitigation options).

In the case of the optional Wilshire/Crenshaw Station, where the commercial frontage along Wilshire Boulevard has been substantially downzoned relative to the rest of the Wilshire Corridor by the Park Mile Specific Plan, only 30 to 40 percent of the development capacity permitted by the Specific Plan would be used to absorb projected commercial growth. Under the No Project Alternative the equivalent of one or two additional low-rise offices like the one currently under construction might be expected. In general, developers would remain relatively uninterested in this area because of the stringent development restrictions established by the Specific Plan. If Metro Rail is built without a station at Crenshaw, no additional growth would be expected in the station area; development that would have occurred under the No Project Alternative would be attracted to other station areas. The commercial corridor in this area could continue to deteriorate because of the lack of any revitalizing influence. A Metro Rail station could create the incentive needed to attract developers to the Park Mile area to build out at least a portion of the Specific Plan development program. The housing growth projected for the station area could be accommodated on parcels south of Wilshire Boulevard, primarily along Crenshaw Avenue, that are zoned for multifamily use and currently occupied by single family units. The residential growth could also be accommodated on surplus commercially zoned land susceptible to reinvestment along Wilshire Boulevard.

Accommodation of Projected Station Area Growth without Adverse Impacts. Accommodation of projected growth in station areas is a desirable goal in that it implements the Centers Concept and places jobs, services, and housing within walking distance of rapid public transit. However, it may, in some cases, result in adverse impacts on the existing community.

Accommodation of growth is measured by comparing the 20-year residential and commercial growth projections with the development capacity of the station areas. More specifically, the impact assessment is based on a station area's ability to accommodate projected residential and commercial growth on land susceptible to reinvestment and within walking distance of stations. Table 3-18 summarizes the comparison of growth projections with the supply of land susceptible to reinvestment. The potential adverse impacts of not being able to accommodate the projected development levels are described below in the context of desirable development objectives. Table 3-19 identifies the particular station areas in which these impacts may occur.

Accommodation of Projected Residential Growth on Residentially Zoned Land Susceptible to Reinvestment and Within Walking Distance of Stations. Residential growth in conjunction with the Metro Rail Project is potentially beneficial if it can be accommodated without disrupting the planned land use pattern--on land that is zoned for multifamily housing and currently occupied by single family dwellings or duplexes. It is potentially adverse if there is insufficient residentially zoned land susceptible to reinvestment, since new residential development could displace existing single family housing in the station area. Alternatively, new development could be forced to locate outside of the station area and, consequently, would be less accessible to the public transit system and to the service and employment centers adjacent to stations

There is insufficient residentially zoned land to accommodate projected residential growth at Union Station, Wilshire/Normandie, Wilshire/La Brea and Fairfax/Beverly which are common to the Locally Preferred Alternative and the Minimum Operable Segment, and Fairfax/Santa Monica, Hollywood/Cahuenga, and Universal City which are only included in the Locally Preferred Alternative. In all cases, except Universal City, this potentially adverse impact could be mitigated.

Accommodation of Projected Commercial Growth on Commercially Zoned Land Susceptible to Reinvestment and Within Walking Distance of Stations. Commercial growth projected to occur in station areas is potentially beneficial if it can be accommodated on commercially zoned land susceptible to reinvestment. It is potentially adverse if the land supply is inadequate, since development may be forced to locate outside station areas. This would reduce accessibility to transit and to other activities in the center or may produce adverse impacts within the station areas. This impact is potentially adverse at Wilshire/Fairfax (Locally Preferred Alternative and Minimum Operable Segment) and at Sunset/La Brea (Locally Preferred Alternative only).

Preservation of Stable Residential Areas. Insufficient land supply to accommodate projected **residential growth** may adversely affect stable residential areas, whose preservation is a primary objective of the Centers Concept. In station areas where the supply of land susceptible to reinvestment for residential use is insufficient to accommodate projected residential growth and where there are stable single family neighborhoods, pressure to rezone and redevelop those single family neighborhoods for higher-density residential use could result. This potentially adverse impact could occur at Wilshire/La Brea, Fairfax/Beverly (Locally Preferred Alternative and Minimum Operable Segment) and at Fairfax/Santa Monica and Universal City (Locally Preferred Alternative only).

In station areas where there is not sufficient land susceptible to reinvestment to accommodate **commercial growth** projections, pressure to rezone residential areas for commercial use may result. This potentially adverse impact could occur at Wilshire/Fairfax (Locally Preferred Alternative and Minimum Operable Segment) and at La Brea/Sunset (Locally Preferred Alternative only).

Maintenance of Stable Land Values in Surrounding Neighborhoods. Speculative increases in land value could lead to increased rental and lease rates for both existing and new commercial and residential space which could, in turn, displace current tenants.

Land values will increase to some extent at all stations where development occurs. They may increase abruptly when construction on the Metro Rail Project begins and when operation begins. However, land costs are likely to stabilize except where there is a limited supply of land relative to demand for development. This situation could occur at Fifth/Hill and Seventh/Flower. However, land values are already relatively high in these areas due to current development activity. Thus, additional increases may not be as dramatic as might otherwise be expected and could not be attributed specifically to the Metro Rail Project. The land supply is also limited relative to demand at Wilshire/Fairfax, where land speculation may occur. The above station areas would be impacted both under the Locally Preferred Alternative and Minimum Operable Segment.

In areas where property values and the local tax base may be declining due to lack of business activity and new development, the Metro Rail Project may have a beneficial impact. It may stabilize or increase property values and thereby increase the tax base of the community. This impact would be expected to occur with the Locally Preferred Alternative in Hollywood and North Hollywood.

Preservation of Historic and Cultural Resources. Historic and cultural resources within station areas could be affected either positively or negatively by growth induced by the Metro Rail Project. Where zoning permits an FAR of 13, historic structures frequently represent an underutilization of the parcels on which they are located. As described in section 3.3.2, underutilized parcels are prime candidates for reinvestment, which can take the form of either renovation and expansion or removal and replacement of existing structures. This situation is possible at Union Station and Wilshire/La Brea (Locally Preferred Alternative and Minimum Operable Segment), and Hollywood/Cahuenga (Locally Preferred Alternative only). Mitigation measures would be required in these areas to ensure that reinvestment takes the form of renovation rather than removal.

The Fifth/Hill and Seventh/Flower Station areas (Locally Preferred Alternative and Minimum Operable Segment) also contain historic and cultural resources. Zoning in these areas permits an average FAR of 6, while many of the historic structures are developed at an FAR of 6 or greater. This situation creates an incentive for renovation rather than removal.

Maintenance of Compatibility with Surrounding Land Uses and Community Character. Generally, a determination of whether development at station areas will be compatible with surrounding land uses or with the existing or desired community character cannot be made. Nearly any development program can be planned and designed to be compatible with surrounding uses and to create the image desired by the surrounding community. However, that development can just as easily--or more easily--be designed to do the opposite. A process for controlling the form of development would have to be provided to achieve the objectives of compatibility with surrounding uses and with the character desired by the local community. This process would include local community input

At the Fairfax/Beverly Station areas (Locally Preferred Alternative and Minimum Operable Segment) and La Brea/Sunset Station area (Locally Preferred Alternative only), it is highly probable that development will not be compatible with surrounding uses or with the community's goals concerning the form of development. A discussion of these potential impacts and their mitigation is also provided in section 3.4 of this chapter.

2.4 MITIGATION

Table 3-20 identifies mitigation measures, techniques for implementing them, agencies responsible for implementation, and applicability of techniques to affected station areas. SCRTD has limited authority in implementing all of the stated mitigation measures, but the District's cooperation and support with the responsible agencies listed on Table 3-20 will be required. Measures encouraging the use of joint development techniques will require active participation by SCRTD in cooperation with the CRA, LADOP, the Los Angeles County Department of Regional Planning (LADRP), and other responsible agencies. The LADOP and LADRP are currently preparing specific plans for all station areas with funding from the SCRTD in order to help mitigate many of the potential adverse impacts and enhance development opportunities, where appropriate. In addition, the SCRTD is currently negotiating a joint powers agreement with LADOP, LADOT, and CRA, and possibly comparable Los Angeles County agencies. The joint powers agreement would clarify the distribution of responsibility for planning and impact mitigation and establish a mechanism for coordination among agencies.

The following discussion describes eight mitigation measures for each impact in each affected station area. Table 3-20 identifies the station areas where each mitigation measure is applicable.

1. **Develop residential projects on commercially zoned land.**

2. **Increase density of new residential development in existing multifamily residential zones.**

These two measures are designed to mitigate impacts occurring where the availability of residentially zoned land susceptible to reinvestment limits the opportunity for residential development within walking distance of the stations. New residential development on commercially zoned land could occur in any of the following forms: as vertical mixed use development with residential units above retail and/or office space; as a horizontal mixed use development with commercial development fronting on the commercial corridor and residential use behind it; or as an exclusively residential project on a commercially zoned parcel.

Union Station. Residential development would be most appropriately located on commercially zoned land in the northwest corner--in Chinatown, where the CRA would be responsible for implementation.

Wilshire/Normandie Station. Residential development could be dispersed throughout this area on commercially zoned parcels, especially as mixed use projects in conjunction with retail development, or it could be located on the southern portion of the Ambassador Hotel site.

Wilshire/La Brea. Residential development in this area could be accomplished through either vertical or horizontal mixed use development in order to avoid pressure for increasing the density of stable single family areas.

TABLE 3-20
LAND USE IMPACT MITIGATION

Mitigation Measure	Effectiveness	Responsible Agencies	Union Station	Civic Center	Fifth/Hill	Seventh/Flower	Wilshire/Alvarado	Wilshire/Vermont	Wilshire/Normandie	Wilshire/Western	Wilshire/Crenshaw	Wilshire/La Brea	Wilshire/Fairfax	Fairfax/Beverly	Fairfax/Santa Monica	La Brea/Sunset	Hollywood/Cahuenga	Universal City	North Hollywood
1 Develop residential projects on commercially zoned land:																			
Rezone surplus commercially or industrially zoned land for residential uses.	Moderate	LADOP	●						●								●		
Require the construction of housing as part of large scale commercial projects or the contribution to a housing fund for small commercial projects.	High	LADOP, LADRP CRA	●						●			●		●	●		●	●	
Encourage the construction of housing as mixed use or independent projects through density bonuses and other incentives.	Low	LADOP, LADRP, CRA	●						●			●		●	●		●		
Undertake joint development projects which include a housing component.	High	SCRTD, CRA, CEDO, CDD, CDC	●						●			●		●	●		●		
2 Increase density of new residential development in existing multifamily residential zones.	Moderate	LADRP													●				
3 Accommodate commercial development within station area by rezoning select residential parcels for commercial use.	High	LADOP											●			●			
4 Redirect commercial development to other station areas by providing joint development opportunities elsewhere.	Moderate	LADOP, SCRTD											●						
5 "Expand" station area by directing commercial development to adjacent areas through the Specific Plan and master planning processes.	Low	LADOP, SCRTD											●			●			
6 Create financial incentives for preservation																			
Provide low-interest rehabilitation loans.	Moderate	CRA			in effect							●					●		
Promote use of existing tax incentives.	Moderate	CRA, LADOP, SCRTD			in effect							●					●		
7 Downzone and permit TDRs.	High	CRA, LADOP			in effect							●					●		

Legend:

LADOP	=	City of Los Angeles Department of Planning
LADRP	=	Los Angeles County Department of Regional Planning
CRA	=	Los Angeles Community Redevelopment Agency
CEDO	=	City of Los Angeles Economic Development Office
CDD	=	City of Los Angeles Community Development Department
CDC	=	Los Angeles County Community Development Commission

Fairfax/Beverly. To avoid pressure to increase the density of existing residential neighborhoods, residential development on the CBS/Gilmore site would be necessary--possibly in the southeast portion.

Fairfax/Santa Monica. Currently higher densities on residential sites and mixed use projects are encouraged through a density bonus program. Developers would have to take advantage of these incentives in order to accommodate projected residential growth.

Hollywood/Cahuenga. The majority of the land to be developed between 1980 and 2000 is expected to accommodate regional-serving retail uses generally limited to an FAR of 1 and a height of one, two, or three stories. There is insufficient market demand for office space to permit a mix of offices over retail facilities on all sites, so most sites would be underutilized whether the permitted FAR is 13 or is reduced to 6. A mix of residential and retail development on these sites would increase the intensity of use, thus returning investment to developers, and provide additional housing.

Universal City. Impacts resulting from an insufficient supply of residential land in this area would be difficult to mitigate. The existing very low density residential zoning and Community Plan designations reflect substantial public input, suggesting that increases in the density of existing residential areas will not be likely in the next 20 years. The portion of MCA's Universal City within and adjacent to the station area is not well-suited for residential development. Consequently, it is expected that the Universal City station area will not develop as a residential center dependent on transit, but will serve as an employment and visitor center and as a transfer station for Metro Rail riders arriving by bicycle, bus, or automobile.

3. **Accommodate the demand for commercial development within the station area by rezoning residentially zoned parcels for commercial use which are currently vacant or used for parking and are adjacent to existing commercial development.**

4. **Redirect commercial development to other station areas by creating incentives to develop elsewhere.**

5. **"Expand the station area" by directing commercial development to sites adjacent to the currently defined station area boundaries through the Specific Plan and master planning process.**

These three measures are designed to mitigate impacts where the available commercially zoned land supply is inadequate for the projected level of development and where speculative increases in land values could result in tenant displacement. These measures are applicable in the following station areas.

Wilshire/Fairfax. Commercial development in this area is constrained by the proximity of stable residential neighborhoods to both the north and the south of the Wilshire frontage. This impact could be mitigated in several ways:

- One or two major sites partially zoned R4-P (multifamily residential or parking) which are presently occupied by surface parking and are adjacent to commercially zoned parcels could be rezoned and developed commercially. This would facilitate strong commercial activity around the Metro Rail station, reinforcing the public activity centered at the County Museum.

- Development could be redirected to the Wilshire/La Brea Station. There is a substantial supply of underutilized commercial land and limited market interest in development at the Wilshire/La Brea Station. Promotion of development at the Wilshire/La Brea Station early in the station area "master planning" process by SCRTD could remove some of the pressure for development from Wilshire/Fairfax and, at the same time, enhance the potential of Wilshire/La Brea to develop as a transit-oriented center.

- Development could be encouraged to expand westward along Wilshire. Because the commercial frontage along Wilshire is shallow (100- to 150-foot parcel depth) a corridor of activity rather than a focal point would develop, with decreasing accessibility to the Metro Rail Project as development moves west.

La Brea/Sunset. See discussion under mitigation measure 8.

6. Promote use of existing tax incentives and rehabilitation loans.

7. Downzone and create a mechanism to transfer unused development potential.

These two measures are designed to mitigate impacts where the construction of the Metro Rail Project increases pressure for redevelopment of historic or cultural resources. These measures are applicable in the following station areas.

Fifth/Hill. This station is adjacent to the Broadway and Spring Street historic districts. Substantial tax incentives and current CRA policies, including the following, have been successful in encouraging preservation of historic structures in this area:

- The average permitted FAR for new construction is 6 (reduced from an FAR of 13). This FAR is exceeded by many historic structures, creating an incentive to preserve them.

- When a historic building's FAR is less than 6, its unused density can be transferred to other sites in the CBD.

- Low interest loans are available for rehabilitation.

There are several groups of underutilized parcels in the Fifth/Hill Station area on which one or two historic structures are located. The historic/cultural value of these structures should be reevaluated and, if they are determined to be valuable, they should be preserved and integrated into a larger development project.

Seventh/Flower. Although Seventh Street, the CBD's original shopping street, is not a historic district, it includes numerous historic buildings and provides a very pleasant pedestrian-scale streetscape. All the tax incentives and CRA policies described above apply to historic buildings in this area as well. The FAR limit and transfer of density policies apply to all buildings. In the CBD, then, preservation of historic buildings has been effectively integrated into CRA's development program, but careful monitoring will be necessary to ensure their preservation as pressure for development increases. SCRTD and private developers should cooperate with this program.

Wilshire/La Brea. At Wilshire/La Brea the grouping of Art Deco buildings under consideration for a historic district designation would encounter limited development pressure since little developer interest in this area is expected during the initial years of Metro Rail operation. However, if the mitigation measure of redirecting development to Wilshire/La Brea proposed in response to other impacts were implemented, pressure would increase. Mitigation measures modeled after the CRA's CBD policies could be initiated. It would be difficult to reduce the FAR enough to discourage redevelopment. Even if the area were downzoned from FAR 13 to 6, no incentive for preservation would be created, since many of the buildings in the area do not reach that intensity. However, a downzoning to FAR 6 would make a transfer of density or transfer of development rights (TDR) mechanism feasible.

Hollywood/Cahuenga. The approach described for Wilshire/La Brea could also be applied at Hollywood/Cahuenga. Again, an overall downzoning would be required to create a market for TDRs.

8. Develop special station area mitigation measures to preserve community character.

Fairfax/Beverly. Two basic goals of the Fairfax community are to preserve the character of commercial and residential areas and to revitalize the commercial area. All of the commercial development projected for the Fairfax/Beverly Station area could be accommodated entirely on the CBS/Gilmore site and on the May Company site at Third and Fairfax, thereby avoiding impacts on the existing retail area. However, because the existing retail area represents an underutilization of land and retail revenues are marginal in some cases, location of all new commercial space on the two large development sites cannot be assured, nor would it necessarily benefit the existing shopping area. An approach more beneficial to the community might be to locate most new commercial space on the large development sites, avoiding retail uses that would compete with existing shops. Allowances for some development in the existing Fairfax shopping area through a carefully designed and controlled revitalization program could be made. Community groups including Vitalize Fairfax should be involved. Major components of this program should include the following:

- Clustered parking either in small, partially subterranean structures behind the existing strip commercial development or in a single location, perhaps in conjunction with Metro Rail parking provided by SCRTD. This would permit more intensive development of the small parcels along the strip.
- Preservation of the fine-grained character of the shopping strip.
- Guaranteed tenancy for current tenants with regulated increases in rent, possibly tied to increased revenues expected from the combination of Metro Rail and revitalization.
- Enhancement of pedestrian spaces through landscaping and street furniture.

The Project alternatives may result in redevelopment pressures along the existing retail area of the Fairfax/Beverly station area. This potential impact will depend largely on the supply of parking in the station area. An insufficient supply of parking is projected for this station area under the Project alternatives (see Transportation section of this chapter). Due to this, Metro Rail passengers will have to park in the surrounding neighborhood and walk to the station past the existing shops. Metro riders can be expected to shop at these facilities and thus increase their retail sales. This increase could result in pressure to redevelop some of the underutilized and marginal properties. Because the parking supply and daily passenger boardings in this station area are similar under each of the Project alternatives, the pressure for redevelopment would also be comparable. However, should access to the station by auto or bus be greater under the Minimum Operable Segment, as this station is the western terminus of the system, the pressure for redevelopment and the resulting impacts under this alternative would be more severe. Under this alternative the need to cluster new commercial development onto the large development sites adjacent to the station location becomes even more important towards preserving the character of the local retail community.

The potential impact of development pressure on the stable residential neighborhoods in the area was included in the discussion of the impacts of an insufficient residential land supply.

La Brea/Sunset. This station is on the western edge of the Hollywood commercial core. Land to the east between Sunset and Hollywood Boulevards is designated and zoned for regional commercial use; land to the west is designated and zoned primarily for high density residential use. There are several blocks in this transitional zone where Community Plan and zoning designations are not consistent. The blocks between La Brea and Orange, northeast of the station, are zoned and used for multifamily housing but are designated for regional commercial use in the Community Plan. The adjacent block to the east between Orange and Highland is occupied by Hollywood High School. The station's location on the fringe of the commercial core, surrounded by residential uses, and its isolation from the rest of the commercial core area limit the opportunity for large scale development immediately around it.

If the population growth projected for the Hollywood Planning Area under the high growth projections were to occur, the level of development identified in Table 3-17 would be expected and would consist predominantly of retail space. As such, much of it would be developed at an FAR of 1 or less as a regional shopping center and would require redevelopment of large amounts of land. Development would be expected to extend to the east around Hollywood High School. Substantial development directly adjacent to the station could occur only if the two blocks northeast of the station were rezoned to be consistent with the Community Plan. The development of these blocks would result in the displacement of existing multifamily dwellings and could disrupt activities at the adjacent high school.

The La Brea/Sunset Station is too far from the Hollywood/Cahuenga Station (one mile) and too isolated to create two "anchors" between which pedestrian-oriented development could occur. For commercial revitalization and joint development, it would be better to have the station at Las Palmas or Highland (0.5 to 0.7 miles from the Hollywood/Cahuenga Station). Then the two stations would establish activity centers between which development could expand to create a contiguous, integrated commercial core. At their currently proposed locations they will develop as independent centers, with development tending to radiate in all directions. Besides inhibiting the creation of a single integrated commercial core, this will create pressure for rezoning and redeveloping land west of the La Brea/Sunset Station from residential to commercial use.

If the station cannot be relocated, the pattern of development should be carefully planned and managed to extend north around Hollywood High School and east toward the Hollywood/Cahuenga Station. This will help minimize development pressure on residential neighborhoods to the west, facilitate revitalization, and minimize impacts on Hollywood High School. Mixed use projects should be developed on parcels adjacent to the station to create concentrations of both commercial and residential uses immediately around the stations, and to reinforce the transition between residential use to the west and commercial use to the east.

Universal City. The conflict between the Universal City Station's growth inducing impact and community development goals was discussed under the mitigation of "insufficient residentially zoned land to accommodate housing growth." There may also be pressure to develop the commercial areas along Lankershim and Vineland at greater intensities than presently permitted. Current zoning and land use plan designations, based on substantial community input, limit the FAR to 3 and the height to three or six stories. Revision of current regulations would require community involvement and consensus comparable to that which produced the current community plan.

3. ECONOMIC AND FISCAL IMPACTS

3.1 INTRODUCTION

Metro Rail construction may cause regional and subregional economic and fiscal impacts. Potential economic impacts involve changes in the level of economic activity in the Los Angeles region and each of the station areas. Potential fiscal impacts are the revenues and service costs that the Metro Rail Project would generate to local governments in the Regional Core, particularly the City of Los Angeles.

3.2 LOCAL EMPLOYMENT IMPACTS

The Metro Rail system will generate both short term employment opportunities related to the construction of the project and long term jobs required for the day-to-day operation of Metro Rail.

Construction of the Locally Preferred Alternative is projected to produce between 3,000 and 5,000 jobs per year over approximately five years. Peak employment could be as much as twice this number. The size of any short term employment impact varies directly with the total construction costs. The Aerial Option would result in only slightly fewer construction jobs than the Locally Preferred Alternative. The Minimum Operable Segment would generate the fewest construction-related jobs, while the Locally Preferred Alternative would generate the most. The jobs created would be primarily in the construction, employment, material, manufacturing, and service industries (not including employment generated in the manufacture of the system's stock and electrical equipment and in industries that support construction).

Under the Locally Preferred Alternative or the Aerial Option the operation of the Metro Rail system is expected to require between 800 and 850 permanent employees. These jobs will be primarily in management, operation, maintenance, and security. The Minimum Operable Segment, with fewer track miles, would generate fewer long term jobs.

3.3 REGIONAL ECONOMIC IMPACTS

Gross regional product (GRP) is defined as the total income within a region (like the gross national product, except applied regionally rather than nationally). The GRP can be increased through expenditures and their "ripple" effect, resulting from construction and operation of the Metro Rail Project. The operation of Metro Rail will entail recurring expenditures and should therefore have a long term effect on the regional economy. When the cumulative effect of direct, indirect, and induced impacts is considered, a dollar spent on operations is conservatively expected to generate between one and two additional dollars in total regional economic activity. The largest potential impact on GRP, between $91.0 million and $136.5 million per year, would result from the Locally Preferred Alternative. The impacts of the Aerial Option are identical to the Locally Preferred Alternative. The smallest economic impact would result from the Minimum Operable Segment: between $61.2 million and $91.8 million per year. The economic sectors likely to benefit from Metro Rail operating expenditures are maintenance and repair services; electric utilities; finance, insurance, and real estate; business services; wholesale and retail trade; and medical services.

3.4 MINORITY BUSINESS PARTICIPATION

SCRTD is committed to the meaningful and maximum participation of minority and women-owned businesses in all contract and joint development efforts related to the proposed rail rapid transit project. Presently, SCRTD staff is engaged in an aggressive effort to collect the needed data with which to plan for such minority and women-owned business participation. Major input for this planning process is being solicited from the local minority business community and from the CRA. SCRTD is forming a minority business enterprise (MBE) advisory and joint development committee for the purpose of refining joint development and MBE goals, objectives and procedures.

SCRTD has formulated a five-point program to solicit minority business participation. Once Final Design and its associated procedures are established, this program will be revised into final form and fully implemented. The five key areas of this program are:

- A draft policy statement on minority economic development opportunities and objectives along the Wilshire Corridor. The District has shown already its intent in this area through the SCRTD Board adoption of the policies in the Milestone 6 Report: Land Use and Development, which seek to include the interests, concerns, and full participation of the minority business community in all SCRTD land use and development policies.

- A draft policy statement on equity as well as relocation rights of property owners, particularly minority property owners, displaced by joint development around transit. In the Milestone 5 Report: Right-of-Way Acquisition and Relocation Policies and Procedures, the SCRTD Board adopted the CRA's policy for relocation rights of property owners which protects minority property owners displaced by possible joint development projects around Metro Rail stations.

- Initial discussions on development roles with members of the minority development committee. Subsequent to the Draft EIS/EIR, SCRTD will do further economic analysis on the various station projects and, in conjunction with the MBE joint development committee, identify economic development opportunities along the Wilshire Corridor. SCRTD will then be able to further identify the most plausible and possible opportunities for minority development.

- Identification of other opportunities in real estate for MBEs along the Metro Rail line. In consultation with the SCRTD minority advisory and joint development committees, other real estate opportunities for MBEs will be identified during this project. These shall include, but will not be limited to, brokerage, appraisal, market analysis, commercial leasing, and commercial management.

- Preparation of a report indicating minority business contracting and subcontracting, supply and service opportunities likely to derive from the construction and operation of the Metro Rail Project. With the completion of the Preliminary Engineering phase of the Metro Rail Project, SCRTD will identify the potential construction packages in which MBE participation is most likely, based upon analyses of the available minority contractor capacity.

3.5 VALUE CAPTURE FROM JOINT DEVELOPMENT OF SCRTD PROPERTY

SCRTD could capture a share of the revenues generated by development in the station areas which would benefit from the presence of the Metro Rail Project through value capture mechanisms (decribed in the Milestone 6 Report). To illustrate the potential for value capture, this section will estimate the revenues potentially available to SCRTD through two common value capture mechanisms: leasing of air rights above parcels acquired by SCRTD for transportation purposes (for example, station and ancillary facility construction, parking, and bus bays) and a special benefit assessment district.

Table 3-21 describes development programs for parcels that have been preliminarily identified for acquisition for the construction of stations and ancillary facilities. The commercial development programs in Table 3-21 reflect probable development patterns on each site given physical characteristics of the site, absorption potential and current trends in development intensity. Land costs reflect the market-based development potential for each site first in 1982 and second in 1984 assuming that construction of Metro Rail is underway. The increase in land value from 1982 to 1984 is attributable to the reduced risk to private developers as a result of SCRTD's ability to assemble parcels and carry them until development can begin, to the increased ease of leasing the development because of the Metro Rail station's presence and, in some cases, to the increased development potential on the site as a result of Metro Rail.

TABLE 3-21

VALUE CAPTURE FROM DEVELOPMENT ON SCRTD PROPERTY

Station	Parcel Area (Sq.Ft.)	Land Costs Per Sq.Ft. (in 1982 dollars) 1982	1984	1982 Acquisition Costs (millions of 1982 dollars)	Market-Based Commercial Development Program Office 1,000 sq.ft.	Retail 1,000 sq.ft.	Parking (spaces)	Ground Lease Income: 9% of 1984 reuse value (in millions of 1982 dollars) Annual	65 Yrs.	Floor Area Ratio Market Demand	Market Demand w/Metro Rail	Physical Capacity w/Metro Rail	Potential Residential Use of Unused Development Capacity (dwelling units)
Fifth/Hill	50,000	300	325	15.000	250	50	300	1.463	95.063	6	6	6	0
Wilshire/Alvarado	155,000	35	50	5.425	500	120	1,240	.698	45.338	3	4	6	210
Wilshire/Vermont	350,000	85	120	29.750	1,100	300	2,800	3.780	245.700	4	4	6	470
Wilshire/Western	100,000	85	120	8.500	500	100	1,200	1.080	70.200	5	6	6	0
Wilshire/Crenshaw	50,000	50	65	2.500	135	15	300	.293	19.013	2.5	3	3	0
Wilshire/La Brea	55,000	80	110	4.400	250	25	550	.545	35.393	4	5	6	0
Wilshire/Fairfax	100,000	140	160	14.000	500	50	1,200	1.440	93.600	6	6	6	0
Fairfax/Santa Monica	22,500	40	55	.900	55	10	130	.111	7.239	2.5	3	3	0
Hollywood/Cahuenga	250,000	40	55	10.000	500	250	1,000	1.238	80.438	2.5	3	4	165
TOTALS													
Locally Preferred Alternative	1,335,000			90.475				10.648	692.120				845
Minimum Operable Segment	1,062,500			79.575				9.299	604.443				680

Source: Sedway/Cooke.

In some cases the amount of commercial development that could be absorbed by the market (expressed as Floor Area Ratio (FAR) or the ratio of building floor area to parcel area) is less than the amount that could be physically accommodated on the site without adverse impacts. In such cases the unused development capacity could be dedicated to residential use. SCRTD could, in effect, subsidize the cost of land for residential development by leasing the land at rates reflecting only its commercial development potential. Developers could then construct rental or low to moderate income housing as part of mixed use projects.

The total land acquisition costs for potential lease sites along the Locally Preferred Alternative or the Aerial Option amount to $90.5 million (in 1982 dollars). Assuming a simple ground lease rate of 9 percent of the reuse value of the land in 1984 tied to the inflation rate, an annual income to SCRTD of about $10.6 million (in 1982 dollars) would be generated by all the sites listed in Table 3-21. Over a representative 65-year lease life, approximately $692.1 million (in 1982 dollars) would be generated. With the Minimum Operable Segment an annual income of $9.3 million and $604.4 million over a 65-year lease life could be generated.

Special benefit assessment districts could be established in all station areas. If all development in station areas were assessed at an annual rate of 4 cents to 10 cents per leasable square foot (leasable floor area equals about 90 percent of gross floor area values used in this report), typical of recent U.S. transit-related assessment rates, from $2.3 million to $5.7 million could be generated in 1984 and from $3.8 million to $10.5 million per year in the year 2000 with the Locally Preferred Alternative or the Aerial Option. With the Minimum Operable Segment from $2.1 million to $5.2 million in 1984 and from $3.7 million to $10 million in the year 2000 could be generated.

3.6 FISCAL IMPACTS

This section examines the revenues and service costs Metro Rail would generate to local governments in the Regional Core, particularly the City of Los Angeles. These fiscal impacts can be both direct and indirect. Direct impacts are the public service costs associated with the construction and operation of the Metro Rail System. Indirect impacts are caused by the changes in land use stimulated by Metro Rail. This impact analysis focuses on the annually recurring revenues and costs (such as operating and maintenance costs) rather than on direct capital costs, which are part of the Metro Rail Project's construction costs. All costs and revenues are shown in 1982 dollars.

SCRTD's security force will be responsible for system security and will limit the potential for crime on Metro Rail. As a result, the system is not expected to affect demand for police services. Similarly, the Los Angeles City Fire Department has indicated that the existing fire protection services in the Regional Core, combined with the SCRTD's fire safety measures, would adequately serve Metro Rail. On balance, then, the Metro Rail Project would not adversely affect the city's fiscal situation.

3.6.1 REDUCTION OF TAX REVENUE

Acquisition of parcels for the Metro Rail system would remove land from the property tax base, thus reducing property tax revenues. Land condemnation for the Locally Preferred Alternative or the Aerial Option would take an estimated $34 million in assessed valuation from the county tax rolls, leading to an annual loss of at least $340,000 in property taxes. However, this impact would be lessened through joint development, which would bring Metro Rail land back into productive use and onto the tax rolls. Because joint development would result in a much more intensive use of land than what had existed before Metro Rail, the negative fiscal impacts of land condemnation would be entirely eliminated.

Land acquisition would also displace existing businesses, thus affecting sales tax revenues. Because SCRTD is committed to helping displaced businesses relocate, in accordance with federal and state laws, this impact would be only temporary. (Displacement effects and mitigation measures are discussed in section 4 of this chapter.) Its magnitude would depend largely upon the length of the time between the closure of a business and its reopening at another site. The more intensive development and greater potential customer traffic attracted by Metro Rail would also, in the long run, increase overall sales in station areas and thus also increase sales tax revenues.

3.6.2 GROWTH AND REVENUE IMPLICATIONS

The Metro Rail Project is expected to stimulate land development around many of the transit stations. This growth in conjunction with the rail project would both generate tax revenues and require public services. Much of this growth would actually be an intraregional shift of population and employment, the fiscal implications of which are complex. For example, if all of the shifts occur within one jurisdiction, such as the City of Los Angeles, then the net fiscal impact on the city would likely be insignificant. However, the increases in density and the development associated with this type of shift might significantly improve the efficiency of services and thereby reduce average service costs.

In part because the extent of shifts between and within jurisdictions is unknown, an analysis of indirect fiscal impacts is not now appropriate. Presented below, however, are illustrations of the potential order of magnitude of indirect revenues to the City of Los Angeles that would be attributable to the Metro Rail system assuming none of the new development represents an intrajurisdiction shift and that all development occurs at approximately the same time. (The timing of development is an important consideration under Proposition 13, which, upon completion of construction, limits the annual increase in assessed value to two percent.) Revenues have been calculated for individual station areas and aggregated into four market areas within the Regional Core. These market areas generally correspond to the planning areas presented in Land Use and Development (section 2 of this chapter), except that Westlake is included as part of the Wilshire market area and Universal City is included as part of the North Hollywood market area.

Table 3-22 presents projections of the growth through the year 2000 that could be stimulated in Metro Rail station areas by the Locally Preferred Alternative relative to the No Project Alternative. This assessment assumes SCRTD actively pursues joint development around its stations in cooperation with local agencies. As the table indicates, without joint development the majority of new space would be residential (approximately 13.9 million square feet). With joint development, offices would become the dominant use (approximately 17.4 million square feet). It is important to note, however, that this assessment does not include hotel development nor the secondary, but substantial, revenue benefit likely to be generated in the Regional Core outside of station areas.

TABLE 3-22

DEVELOPMENT STIMULATED BY METRO RAIL
BY MARKET AREA
Year 1982 to 2000
(Thousands of Square Feet)

	INCREMENTAL SQUARE FOOTAGE WITH METRO RAIL			INCREMENTAL SQUARE FOOTAGE WITH JOINT DEVELOPMENT		
Market Area	Office	Retail	Residential	Office	Retail	Residential
CBD	2,960	1,036	2,620	6,944	1,386	2,620
Wilshire	4,750	1,219	8,295	7,870	1,807	8,295
Hollywood	560	795	2,790	1,600	1,387	2,790
North Hollywood	400	395	168	1,000	438	168
Total	8,670	3,445	13,873	17,414	5,018	13,873

Source: Sedway/Cooke

By influencing the amount of new development projected in the Regional Core, Metro Rail will likewise influence the amount of property tax accruing to the City of Los Angeles (Table 3-23). In the year 2000 the city could receive approximately $15.6 million in property taxes from new development occurring since 1980 under the No Project Alternative. This amount could rise to $23.7-$29.7 million if the Locally Preferred Alternative is implemented. Though much shorter, the Minimum Operable Segment includes the most heavily developed areas and would thus generate about 90 percent of the property tax revenues of the Locally Preferred Alternative, between $22.1-$27.2 million.

Additional sales tax revenues will be generated through the increase in employment associated with new development in the Regional Core* (Table 3-24). These incremental revenues could total approximately $1.26 million under the No Project Alternative. Development under the Locally Preferred Alternative or the Aerial

* The sales tax revenue projections are conservative in that they exclude revenues attributable to the households occupying new dwelling units developed as a result of Metro Rail. Sales taxes from these households will depend on household income, the percent of income spent on taxable items, and the location of the stores where households shop. (This latter variable is important in that spatial shopping patterns will determine the amount of sales tax revenues received by different jurisdictions.)

TABLE 3-23

PROPERTY TAX REVENUES
ACCRUING TO CITY OF LOS ANGELES, YEAR 2000
(in thousands of 1982 dollars)

	NO PROJECT ALTERNATIVE		LOCALLY PREFERRED ALTERNATIVE				MINIMUM OPERABLE SEGMENT			
			Market Value[1]		Property Tax Revenues[2]		Market Value[1]		Property Tax Revenues[2]	
Market Area	Total Market Value[1]	Property Tax Revenues[2]	Total	Total With Development Incentives[3]	Total	Total With Development Incentives[3]	Total	Total With Development Incentives[3]	Total	Total With Development Incentives[3]
CBD	$3,005,000	$9,830	$3,743,000	$4,756,000	$12,240	$15,550	$3,743,000	$4,756,000	$12,240	$15,550
Wilshire	1,057,000	3,450	2,330,000	2,844,000	7,620	9,300	2,330,000	2,844,000	7,620	9,300
Hollywood[4]	173,000	570	532,000	722,000	1,740	2,360	173,000	173,000	570	570
North Hollywood	538,000	1,760	653,000	774,000	2,140	2,530	538,000	538,000	1,760	1,760
Total	$4,773,000	$15,620	$7,258,000	$9,096,000	$23,740	$29,740	$6,784,000	$8,311,000	$22,190	$27,180

Source: Peat, Marwick, Mitchell & Co.; Lynn Sedway & Associates

[1]Compares market value for office, retail and residential land uses.

[2]Approximately 32.7 percent of the one percent tax rate (based on current year tax increments allocation factors).

[3]Development incentives are those tools used to encourage joint development of SCRTD property.

[4]Excludes the Fairfax/Santa Monica Station (an unincorporated area).

* * * * * * * * * * * * * * * * * * * *

TABLE 3-24

SALES TAX REVENUES
ACCRUING TO CITY OF LOS ANGELES, YEAR 2000
(1982 dollars)

	NO PROJECT ALTERNATIVE		LOCALLY PREFERRED ALTERNATIVE				MINIMUM OPERABLE SEGMENT			
			Employment[1]		Sales Tax Revenues[2]		Employment[1]		Sales Tax Revenues[2]	
Market Area	Total Employment[1]	Sales Tax Revenues[2]	Total	Total With Development Incentives[3]	Total	Total With Development Incentives[3]	Total	Total With Development Incentives[3]	Total	Total With Development Incentives[3]
CBD	68,800	$688,000	86,100	107,000	$861,000	$1,070,000	86,100	107,000	$861,000	$1,070,000
Wilshire	34,500	345,000	61,200	78,200	612,000	782,000	61,200	78,200	612,000	782,000
Hollywood[4]	4,300	43,000	9,000	15,600	90,000	156,000	4,300	4,300	43,000	43,000
North Hollywood	18,000	180,000	20,600	23,700	206,000	237,000	18,000	18,000	180,000	180,000
Total	125,600	$1,256,000	176,900	224,500	$1,769,000	$2,245,000	169,600	207,500	$1,696,000	$2,075,000

Source: Lynn Sedway & Associates

[1]Based on projections of office and retail square footage from Table 3-22. Assumes 250 square feet per office employee and 500 square feet per retail employee.

[2]Assumes: (a) Each employee spends an average of $4.00 per business day; (b) 250 business days per year; and (c) 1.0 percent of retail expenditures are retail sales taxes accruing to the City of Los Angeles.

[3]Development incentives are those tools used to encourage joint development of SCRTD property.

[4]Excludes the Fairfax/Santa Monica Station (an unincorporated area).

Option could increase these sales tax revenues to \$1.77-\$2.25 million. The additional sales taxes attributable to the Minimum Operable Segment could total slightly less than those projected for the Locally Preferred Alternative, between \$1.70-\$2.08 million.

Table 3-25 shows that when projected property tax and sales tax revenues are aggregated, the Locally Preferred Alternative could increase total tax revenues by approximately 50 to 90 percent above the amount received under the No Project Alternative. The Minimum Operable Segment could increase total tax revenues by approximately 40 to 70 percent above the amount received under the No Project Alternative.

TABLE 3-25

TOTAL PROPERTY AND SALES TAX REVENUES
ACCRUING TO CITY OF LOS ANGELES BY ALTERNATIVES, YEAR 2000
(Thousands of 1982 Dollars)

	NO PROJECT ALTERNATIVE	LOCALLY PREFERRED ALTERNATIVE Total	LOCALLY PREFERRED ALTERNATIVE Total With Development Incentives	MINIMUM OPERABLE SEGMENT Total	MINIMUM OPERABLE SEGMENT Total With Development Incentives
Property Taxes	\$15,620	\$23,740	\$29,740	\$22,190	\$22,180
Sales Taxes	1,256	1,769	2,245	1,696	2,075
Total Revenue	\$16,876	\$25,509	\$31,985	\$23,886	\$29,255
Increment of Revenue Above No Project Alternative	—	\$8,633	\$15,109	\$7,010	\$12,379
Percentage Increment	—	51%	90%	42%	73%

Source: Lynn Sedway & Associates

3.7 MITIGATION

Wherever it appears desirable or necessary for SCRTD to acquire property, the existing level of the revenues contributed by that property will be identified. SCRTD will then seek to identify any feasible and desirable residual development potential that property has and, in coordination with local taxing jurisdictions, to promote use of the property. To the extent commercial use of these development potentials can be achieved, SCRTD will seek to levy "in lieu" fees upon its development that, at least in part, will compensate taxing jurisdictions on an overall basis for the tax base losses they incur when SCRTD takes a parcel out of private ownership.

Additionally, SCRTD joint development programming will identify residual joint development capacity in excess of foreseeable or likely commercial demand. In cooperation with local public and nonprofit agencies concerned with housing, SCRTD will seek to have housing development incorporated into station area development where its site costs can effectively be "carried" by commercial development. This additional housing supply should, in turn, reduce pressures on housing costs in station areas.

4. LAND ACQUISITION AND DISPLACEMENT

4.1 INTRODUCTION

Displacement deals with the removal of existing land uses for project right-of-way (ROW) requirements. The right-of-way is the composite of total requirements of all interests and uses or real property needed to construct, maintain, protect, and operate the transit system, including tunnels and the land on either side of the tracks for street-level or aerial sections. SCRTD will either acquire the land or obtain easements from the owners. This section provides an inventory of the residences, businesses and non-profit organizations which would be displaced as a result of SCRTD's ROW program.

4.2 EXISTING CONDITIONS

SCRTD has the power to acquire "by grant, purchase, gift, devise, or lease, or by condemnation . . . real and personal property of every kind within or without the District to the full or convenient exercise of its powers," as outlined in the California Public Utilities Code Section 30600. Section 30503 of the Code gives SCRTD the power to "exercise the right to eminent domain within the boundaries of the District to take any property necessary or convenient to the exercise of the powers granted in this part." The exercise of the right of eminent domain must comply with the requirements of the California Eminent Domain Law. (Code of Civil Procedure Section 1230.010 et seq.)

During the construction and operation of Metro Rail, SCRTD would need to make different types of real property acquisitions. Full and partial acquisition of parcels would be necessary for right-of-way requirements, for stations, and for equipment storage. Easements, which are interests in land owned by another that entitles its holder to a specific limited use, would be necessary for both construction and the underground alignment. Temporary construction easements would be necessary for construction sites, and underground easements would be required for the alignment to pass under private property.

4.3 IMPACT ASSESSMENT

Construction of the Metro Rail Project would directly displace residents, homes, businesses, social services, and public facilities. Indirect displacement because of development induced by the Metro Rail Project may also occur. This section discusses only the direct physical removal of structures for project construction and operation. Indirect displacement is discussed in the Social and Community Impacts section of this chapter. In all cases the acquisition of property and the relocation of residents and businesses by SCRTD will be in accordance with the federal Uniform Relocation and Real Property Acquisition Policies Act of 1970 (Uniform Relocation Act) and the procedures adopted under this law.

4.3.1 IMPACT MEASURES

The specific measures used to assess the impact of direct displacement from Metro Rail construction are identified below.

Direct Displacement of Local Residents. This measure identifies the number of housing units to be acquired along the right-of-way. The hardships posed by dislocation of the residents are immediate and include losses of time, money, and quality of life.

Displacement of Business Concerns. This measure identifies the number of business firms to be acquired along the right-of-way. The hardships to owners and employees posed by displacement are immediate and include losses of time, money, and quality of life. The elimination of commercial firms adversely affects local residents not only because it eliminates local employment opportunities, but because it also forces residents to either forego certain services or products or to travel farther to obtain them.

Displacement of Sociol Services and Public Facilities. This measure identifies the number of social services and public facilities to be removed along the right-of-way. Community groups most affected by the loss of social services and public facilities are special users, who generally have a greater overall need for social services and who, because of mobility problems, must often depend more on their local area's services and facilities. The elimination of local services and facilities will mean that the local population in general, and special user groups in particular, must forego certain services or travel farther to obtain them.

4.3.2 METHODOLOGY

SCRTD land acquisition maps were reviewed and a field survey of commercial land uses was conducted to identify the types of businesses subject to displacement. The field survey did not cover demographic characteristics of residential displacement. Instead, 1980 census tract data were analyzed to determine likely characteristics of displaced residents. After land acquisition requirements are refined, it will be necessary to identify more precisely the characteristics of both residential and commercial displacement in order to suggest comparable relocation sites as required by the Uniform Relocation Act.

4.3.3 DISPLACEMENT IMPACTS

Table 3-26 presents general information on the type and extent of displacement that would occur because of construction of the Metro Rail Project. Off-street siting of stations creates considerable displacement, as shown by the high number of commercial establishments displaced around the Wilshire/Alvarado, Wilshire/Fairfax, and Hollywood/Cahuenga Stations and the numerous residential displacements around the Wilshire/Alvarado, Wilshire/Fairfax, and Universal City Stations. The number of social services and public facilities displaced would be low for all alternatives, with five being displaced under the Minimum Operable Segment and nine displaced under the Locally Preferred Alternative and seven displaced under the Aerial Option.

Displacement of residential structures under the Minimum Operable Segment (the Wilshire/Alvarado and Wilshire/Fairfax Station areas) would include one single family

TABLE 3-26

METRO RAIL DISPLACEMENT[1]

Affected Areas	Total Residential Units	Total Commercial Establishments	Total Nonprofit/Services/ Facilities
Main Yard and Shop	0	2	0
Station			
Union Station	0	8	0
Civic Center	0	0	0
Fifth/Hill	0	0	0
Seventh/Flower	0	14	0
Wilshire/Alvarado	26	23	1
Wilshire/Vermont	0	12	0
Wilshire/Normandie	0	0	0
Wilshire/Western	0	2	0
Wilshire/Crenshaw	0	0	0
Wilshire/La Brea	0	4	0
Wilshire/Fairfax[2]	25	48	4
Fairfax/Beverly	0	23	0
Fairfax/Santa Monica	0	3	0
La Brea/Sunset	0	5	0
Hollywood/Cahuenga	38	51	2
Hollywood Bowl	0	0	0
Universal City	135	11	0
North Hollywood Underground[3]	0	16	2
North Hollywood Aerial[3]	0	5	0
Aerial Corridor	16	5	0
Locally Preferred Alternative	**224**	**222**	**9**
Aerial Option	**240**	**216**	**7**
Minimum Operable Segment	**51**	**136**	**5**

Source: SCRTD Staff Report on Preliminary Property Acquisition and Relocation Costs, April 1983; The Planning Group.

[1]These estimates are subject to change during Final Design as more detailed information is developed.

[2]As a mitigation measure to avoid potential paleontological resources at this site, an alternative station location is being proposed to the west, possibly as far as Fairfax. Should this option be adopted, different properties would be impacted. Initial examination shows that displacement in this case would be comparable and possibly lower than for the current station site.

[3]Does not include parking structures or tail tracks.

and 50 multifamily dwellings. The Locally Preferred Alternative would displace an additional four single family and 169 multifamily units. The Aerial Option requires more residential land acquisition than the Locally Preferred Alternative, involving six additional single family and ten additional multifamily units. Table 3-27 presents population and housing characteristics of residents in the affected areas. The characteristics are derived from 1980 census tract data. If displaced residents are typical of those in the surrounding census tract, low income minority residents would be displaced only at the Wilshire/Alvarado Station. It is expected to be most difficult to find replacement housing for this population group. The majority of residents likely to be displaced are renters.

Service and office businesses account for the overwhelming majority of displaced commercial and nonprofit establishments. On the average, they are small to medium-sized businesses. The one exception is at Universal City, where the displacement of 11 businesses affects nearly 210 employees. Table 3-28 presents detailed information about displacement of commercial/service establishments.

A total of nine nonprofit/services facilities would be displaced under the Locally Preferred Alternative, seven under the Aerial Option, and five under the Minimum Operable Segment. A city fire station would be displaced in the Wilshire/Alvarado Station area. The four nonprofit agencies displaced in the Wilshire/Fairfax Station area are primarily service organizations that serve the regional population rather than residents of that community. The two facilities in the Hollywood/Cahuenga Station area cater primarily to the local residents and consist of a religious organization and a social service agency. The two facilities in the North Hollywood Station area are both thrift stores with local clientele.

4.4 MITIGATION

The federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) mandates certain relocation services and payments by SCRTD to eligible residents, business concerns, and nonprofit organizations displaced by the Metro Rail Project.* The Act provides for uniform and equitable treatment of persons displaced from their homes, businesses, or farms by federal and federally assisted programs and establishes uniform and equitable land acquisition policies. The State of California revised Government Code Section 7260 et seq. brings the California Relocation Act into conformance with the Federal Uniform Relocation Act.

In the acquisition of real property by a public agency, both the federal and state acts seek to insure consistent and fair treatment for owners of real property; to encourage and expedite acquisition by agreement in order to avoid litigation and relieve congestion in the courts; and to promote confidence in public land acquisition. One of the fundamental requirements of the legislation is that no person be required to move from his or her home unless affordable, decent, safe, and sanitary replacement housing is available and not generally less desirable with regard

---

* UMTA's Circular 4530.1 dated March 1, 1978 covers the appraisal and acquisition of real property, relocation services, moving and replacement housing payments, and other allowable expense payments mandated by the Uniform Relocation Act.

TABLE 3-27

ESTIMATED POPULATION AND HOUSING CHARACTERISTICS OF RESIDENTIAL DISPLACEMENT[1]

	HOUSING TYPE			UNIT TENURE (%)			HOUSEHOLD		
Affected Area	Single Family	Multi-Family	Number of Residents	Owner	Renter	Vacant	Size	Median Income	Percent Minority[2]
Wilshire/Alvarado[3]	0	26	60	3	92	5	2.3	$ 10,045*	78
Wilshire/Fairfax[3,5]	1	24	43	12	85	3	1.7	$ 22,040	22
Hollywood/Cahuenga[4]	0	38	61	9	85	6	1.6	$ 13,649	41
Universal City[4]	4	131	230	30	66	4	1.7	$ 48,645	14
Aerial Corridor	6	10	27	30	66	4	1.8	$20,872	15

Source: SCAG, 1980 Population and Housing Report.

*Since the median income in these areas is less than 80 percent of the County's median income, they are considered low income by the State of California.

[1]These estimates are subject to change upon confirmation of Final Design.

[2]Minority is defined to include Hispanic, Black, Asian, Indian, and other.

[3]Common to all Project alternatives.

[4]Relevant only to the Locally Preferred Alternative and Aerial Option.

[5]As a mitigation measure to avoid potential paleontological resources at this site, an alternative station location is being proposed to the west, possibly as far as Fairfax. Should this option be adopted, different properties would be impacted. Initial examination shows that displacement in this case would be comparable and possibly lower than for the current station site.

TABLE 3-28

DISPLACEMENT OF COMMERCIAL/NONPROFIT ESTABLISHMENTS[1]

Affected Areas	Commercial Parking	Retail	Service/ Office	Res- taurant	Indus- trial	Total Commercial Establishments	Total Nonprofit/ Services	Preliminary Estimate of Total Employees
Main Yard and Shop	0	0	0	0	2	2	0	65
Stations								
Union Station	0	0	0	1	7	8	0	35
Seventh/Flower	0	4	8	2	0	14	0	81
Wilshire/Alvarado	1	14	2	6	0	23	1	109
Wilshire/Vermont	1	2	7	2	0	12	0	162
Wilshire/Western	0	2	0	0	0	2	0	36
Wilshire/La Brea	0	0	4	0	0	4	0	5
Wilshire/Fairfax[2]	1	5	41	1	0	48	4	265
Fairfax/Beverly	0	22	1	0	0	23	0	40
Fairfax/Santa Monica	0	3	0	0	0	3	0	15
Sunset/La Brea	0	2	3	0	0	5	0	20
Hollywood/Cahuenga	3	17	28	3	0	51	2	276
Universal City	0	0	10	1	0	11	0	210
North Hollywood Underground[3]	0	4	11	1	0	16	2	72
North Hollywood Aerial[3]	0	3	2	0	0	5	0	46
Aerial Corridor	0	1	4	0	0	5	0	75
Locally Preferred Alternative	6	75	115	17	9	222	9	1,391
Aerial Option	6	75	110	16	9	216	7	1,440
Minimum Operable Segment	6	49	63	12	9	136	5	798

Source: SCRTD Staff Report on Preliminary Property Acquisition and Relocation Costs, April, 1983.

[1]These estimates are subject to change upon confirmation of Final Design.

[2]As a mitigation measure to avoid potential paleontological resources at this site, an alternative station location is being proposed to the west, possibly as far as Fairfax. Should this option be adopted, different properties would be impacted. Initial examination shows that displacement in this case would be comparable and possibly lower than for the current station site.

[3]Does not include parking structures or tail tracks.

to public utilities and public and commercial facilities than the home from which the individual is being displaced.

In addition to the legislation discussed above, owners of private property acquired for public use have a federal and state constitutional guarantee that their property will not be taken or damaged for public use unless they first receive just compensation. Just compensation is measured by the market value of the property taken. Generally, the fair market value of property taken is the

> "highest price on the date of valuation that would be agreed to by a seller, being willing to sell but under no particular or urgent necessity for so doing, nor obliged to sell, and a buyer, being ready, willing and able to buy but under no particular necessity for so doing, each dealing with the other with full knowledge of all the uses and purposes for which the property is reasonably adaptable and available." (Code of Civil Procedure Section 1263.320a.)

The preferred approach to dealing with displacement is avoidance, by modifying either the alignment or entrance locations. However, where this is infeasible, SCRTD will follow the provisions of the Uniform Relocation Act by including replacement sites for housing, businesses, and nonprofit organizations. A detailed relocation plan is currently being developed. The plan contains an inventory of all displaced persons and businesses and will identify those that may be especially difficult to relocate such as low-income persons and marginal businesses. The plan will also evaluate the availability of replacement facilities. SCRTD will establish a relocation advising program that will coordinate all such assistance efforts from field offices in areas of concentrated relocation activity. SCRTD could also directly involve itself in the construction of replacement sites as part of a joint development package. Both of these approaches should be pursued to ensure maximum assistance is offered to those displaced.

Activities to ensure that displaced residents and business people obtain information and relocation services are prescribed in SCRTD's Milestone 5 Report: Right-of-Way Acquisition and Relocation Policies and Procedures. The policies and procedures stipulate that all real property acquired by SCRTD be appraised for its fair market value and an amount for compensation determined. An offer is made based on the appraisal. Each person or business required to relocate will be given 90 days notice and will be eligible for certain relocation services and payment. No resident will be asked to move until offered other available housing that is decent, safe, sanitary, and within the financial means of the displaced person. No business will be required to move until comparable facilities are made available. If it is determined that a sufficient number of comparable dwellings are not available for replacement purposes for those persons displaced by the Project, there is the possibility of supplementing relocation payments to ensure that everyone displaced will have decent, safe, and sanitary housing. This last resort housing will be implemented only if it is documented that there is no other means to provide comparable, decent, safe and sanitary housing.

In some cases businesses may be unwilling or unable to relocate, as it may not be possible to relocate without a substantial loss of its existing patronage due to a well-formed clientele. A business may also be unwilling to relocate if its annual income is marginal. Such cases represent negative impacts which cannot be mitigated. The business, however, may be eligible for a fixed payment in lieu of actual moving and related expenses and may choose to receive this compensation rather than relocate.

5. SOCIAL AND COMMUNITY IMPACTS

5.1 INTRODUCTION

The Metro Rail alignment will traverse communities with many diverse social characteristics. This section identifies those communities which comprise the station environs and focuses on neighborhoods within one-half mile around each station. It discusses existing characteristics, community values, and trends and identifies impacts specific to the construction and operation of the Metro Rail Project, as well as those that may result from increased development stimulated by the Project alternatives in the station environs.

5.2 EXISTING CONDITIONS

Sociologically similar stations have been grouped together in the following discussion which provides a backdrop against which the Locally Preferred Alternative, the Aerial Option, and the Minimum Operable Segment can be evaluated.*

CBD. The downtown station environs have relatively low residential populations, consisting primarily of minorities with relatively even age distributions. Downtown residential development would probably change the ethnic and economic composition of these station environs. Middle- to upper-income-oriented condominium projects are likely to attract new residents who will raise the median income while decreasing the percentage of the minority population. The elderly population may also increase when additional housing for the elderly is built.

<u>Union Station</u>. The immediate station area borders on the industrial periphery of the CBD and is near several ethnic communities on the east side of the downtown area: Chinatown, Little Tokyo, and expanding Hispanic areas. The social fabric of the area is characterized by an overall resident population approximately 45 percent Asian, primarily Chinese, and 39 percent Hispanic, mostly Mexican. These residential areas are transitional low-income areas strongly divided by ethnic background with very territorial populations. The Union Station architecture, important public places nearby, and ethnic contrasts create a strong image and draw significant tourist and pedestrian trade to the area. Olvera Street, the Pueblo, and Chinatown are regional attractions, generating activity both day and night. The primary traffic artery is Alameda Street, although pedestrian movement is concentrated in the areas around Olvera Street and on parking areas to the west and north.

<u>Civic Center</u>. Government buildings, Civic Center Plaza, the Mall, and the Music Center Complex to the north are the major focuses of the station area. Along Hill Street, just to the west of the proposed station entrances, lies a portion of the high density Bunker Hill housing development primarily for the elderly.

---

*Data collection and survey techniques are detailed in the SCRTD Technical Report on Social and Community Impacts (1983).

Fifth/Hill. This station area lies in the heart of the CBD. The Pershing Square area offers pedestrian access to a number of important activity centers--retail commercial shopping on Broadway, the Jewelry Mart, Grand Central Market, Spring Street, the Biltmore Hotel, and the Main Library. The focus of the area for residents, employees, and tourists is Pershing Square. The plaza is heavily used during daylight hours, attracting tourists, vagrants and youth gangs, and downtown employees during lunch. After office hours the area becomes unsafe for pedestrian activity.

Seventh/Flower. This station area contains the important office, retail shopping, and financial buildings of the CBD, with access to Seventh Street retail stores. As a result, Seventh Street is a major auto and pedestrian artery through the Central Business District. Pedestrian volume is heavy during the day. Housing is located on the periphery of the station environs in the South Park and the Convention Center areas.

Westlake. The Wilshire/Alvarado Station area is in transition and contains a predominantly young, Hispanic population. The area serves as a port of entry for Central Americans. Shops and services are well patronized by this largely low income population. Residents value the ethnic homogeneity of the area, as well as its central location and good public transportation, characteristics all expected to continue. The Hispanic population will probably increase in the area because rental rates are comparatively low; the lack of new housing units may increase the already high level of overcrowding.

Mid-Wilshire. The Wilshire/Vermont, Wilshire/Normandie, and Wilshire/Western Station environs are ethnically similar, with considerable white, Asian, and Hispanic populations. In the last decade, the Asian population has formed Koreatown, which continues to grow. Hispanics represent a larger percentage of the population at Wilshire/Vermont than at either of the other station environs. North of Wilshire Boulevard, incomes are higher and white residents constitute a larger percentage of the population. Overall, the papulation tends to be young. Important attributes of the area include central location, good public transportation, and convenient amenities. In the future, Koreatown will probably expand and Hispanics will continue to migrate westward along Wilshire Boulevard. The relatively large increase in younger members of minority groups suggest that the median age will become more youthful.

Wilshire/Vermont. The generally low-income resident population reflects a diversity of ethnic groups. The papulation is 45 percent Hispanic, 30 percent white, and 15 percent Asian and, in general, is relatively young--the median age is 30 years--residing almost exclusively in renter occupied units. The area is an important Wilshire Corridor location, with a very high daytime employment population and heavy volume of pedestrian and auto traffic. The hierarchy of primary auto and pedestrian traffic arteries supports the definition of the land use pattern. Wilshire Boulevard and Vermont Avenue are clearly primary, Seventh and Sixth Streets are secondary, and there are "tertiary" residential streets. The intersection of Wilshire and Vermont is a main bus transfer point.

Wilshire/Normandie. Residential areas north and south of Wilshire (north of Sixth, south of Seventh) support a large, ethnically diverse resident population: 30 percent Hispanic, 32 percent white, 10 percent Black, and 25 percent Asian. There is little overlap in the spatial and movement patterns between the area's employment and resident populations. High rise office buildings, between Howard Avenue and the Ambassador Hotel or Wilshire Boulevard, attract a large daytime employment population.

Wilshire/Western. The station area is a blend of regional and local influences: major office buildings are near neighborhood churches, retail stores, and housing. The resident and employment population are fairly independent of each other. A relatively dense population lives north and south of the office, commercial, and retail uses along Wilshire Boulevard. This population is ethnically diverse--22 percent Hispanic, 35 percent white, 25 percent Asian, and 14 percent Black--and predominantly low and low-middle income.

Crenshaw. The Wilshire/Crenshaw Station environs are relatively high income areas containing sections of Hancock Park and Windsor Square. The majority of the population is white, though Hispanics and Asians together comprise 40 percent. These minority populations reside primarily south of Wilshire Boulevard. There are few public services and commercial shops in the station environs, so residents must leave the area for shopping and social services and facilities. Important attributes of the community are stability, atmosphere, and central location. The area is likely to change little because of restrictive zoning, community organization, and the relatively high incomes required to live in most of the environs. Ethnic diversity will slowly increase, however, as minority groups move west along Wilshire Boulevard.

Miracle Mile. The Miracle Mile area, containing the Wilshire/La Brea and Wilshire/Fairfax Station environs, consists of a largely elderly, white population with middle incomes. Much of the population is Jewish and identifies with the nearby Fairfax/Beverly neighborhood. The commercial section of these environs is currently undergoing a gradual revival. Community surveys show the area's central location, convenient amenities, low housing costs, and good public transportation were most important. In the future, the minority population in these station environs is likely to increase slightly as middle income Asians and Hispanics move west along Wilshire, replacing elderly residents. Middle income Blacks now living south of Wilshire Boulevard are likely to move northward. Relative to other station environs, income in this cluster would remain high.

Wilshire/La Brea. The middle income resident population in the station area is 68 percent white, 18 percent Black, 8 percent Asian, and 6 percent Hispanic. The area is currently characterized by very light pedestrian traffic and mostly through auto traffic. The area has no major destinations or public spaces and attractions.

Wilshire/Fairfax. This station area serves as residential community and major regional, public activity center. It includes the following attractions: the Los Angeles County Art Museum, the Rancho La Brea Tar Pits, and the Page Museum of Natural History. The area draws visitors and tourists seven days a week, and is especially busy on weekend afternoons, when auto traffic and pedestrian activity around Hancock Park are high. The resident population in the station area is homogeneous--80 percent white and predominantly middle income.

Fairfax. The Fairfax/Beverly and Fairfax/Santa Monica Station environs have large Jewish populations to which the commercial area is generally oriented. A large percentage of the population is elderly, with low to middle incomes, but in recent years many young singles and couples have moved in. Attributes valued by residents include convenient amenities and good public transportation, as well as neighborhood atmosphere and ethnic homogeneity. Though projections show few land use changes for the Fairfax/Santa Monica Station environs, the Fairfax/Beverly area is projected to experience large scale office, residential, and retail development. Higher densities and a more diverse, regionally oriented commercial atmosphere would change the character of the area. The average age would continue to decline, and new residential units would probably be oriented toward middle to upper income professionals who identify less with the area's Jewish orientation than current residents.

Fairfax/Beverly. The resident population is of predominantly eastern European, Jewish descent. The area has the highest median age (50.2 years) and the highest percentage of population over 65 years old (34 percent) of any Metro Rail station area in the Regional Core. The population is socially stable and homogeneous. The cultural and religious homogeneity is readily apparent in the physical structure of the neighborhood and in activity patterns of residents. Generally, residents are low and middle income. More than seventy percent are renters. Their territorial definition of the area is further enhanced by the proximity of neighborhood shopping, banking, cultural, religious, and entertainment facilities. In addition, two regional scale retail, tourist, and employment centers in this immediate vicinity--Farmers Market and CBS Television City-- are important regional destinations.

Fairfax/Santa Monica. The proposed station is at the intersection of Fairfax and Santa Monica Boulevards on the juncture of two very distinct communities, the Fairfax district and the west Hollywood "gay" strip. The area is high density, ethnically homogeneous (90 percent white), and 40 percent single. The resident population spans the full range of income groups.

Hollywood. The population in the La Brea/Sunset and Hollywood/Cahuenga Station environs is mainly white, although there is a Hispanic minority population and a recent influx of immigrants from the Middle East. The current residents are low to middle income and many identify with the entertainment and tourist-oriented atmosphere of Hollywood Boulevard. The community survey revealed that Hollywood residents value the area's central location and proximity to work, as well as convenient amenities and good public transit. These environs would probably experience slight increases in minority and immigrant populations. New residential developments, however, would probably be oriented to higher income residents and draw new residents to the area.

La Brea/Sunset. The resident population is 75 percent white, with a Hispanic population of 15 percent. Approximately 55 percent of this population live in single person households. The area is primarily a commercial and regional employment and activity center. The commercial area includes a diverse mix of retail stores, motels, and entertainment uses, and pedestrian activity is high most of the day.

Hollywood/Cahuenga. In the heart of Hollywood, this station area has a resident population, a transient population, and a significant population of tourists, visitors, and patrons. The resident population is predominantly white, with 24 percent of the population Hispanic. Both auto and pedestrian activities are high most of the day. At night, pedestrian movement is particularly heavy.

San Fernando Valley. The Universal City and North Hollywood Station environs, like the CBD, are not heavily populated. Predominantly, residents are white and have higher incomes, but the North Hollywood commercial district also contains large Hispanic communities. In the Universal City area, residents reported neighborhood stability and atmosphere to be important community qualities. Inexpensive housing and convenient amenities are the valued characteristics in the North Hollywood Station environs. Both station environs would experience dramatic land use changes by the year 2000. Office space in Universal City would increase significantly. This may not, however, affect the relatively isolated, well-buffered residential communities within the station environs. The North Hollywood Station environs are within a CRA project area, which is expected to induce a major expansion of retail, office, and residential land uses. This CRA project would increase the elderly population and would also make North Hollywood a more regionally oriented office center.

Universal City. Most of the small, predominantly white, middle-upper income resident population live in single family dwellings in the hills south of the proposed station site, south of Ventura Boulevard. The station area has direct access to major planned and existing corporate facilities, the Campo de Cahuenga historical landmark, Weddington Park, and the residential areas south of Ventura Boulevard. Universal Studios is a major tourist attraction.

North Hollywood. The site is a juncture of light industrial, retail, public, and residential uses. The resident population is 66 percent white and 27 percent Hispanic, and predominantly lower-middle income.

Aerial Corridor. Ethnic distributions along the Aerial Corridor are similar to those in the environs of the Universal City and North Hollywood Stations. There is a large percentage of whites and a substantial Hispanic population. The community survey revealed the existing neighborhood quality to be highly valued, with visual appearance, stability, and neighborhood atmosphere the most important components. Communities along the corridor would probably experience few changes from the present trend of an increasing percentage of Hispanics and young people. Deterioration, mentioned by residents as a negative characteristic of the area, may also continue unless the proposed commercial anchors at North Hollywood and Universal City revitalize the areas near Lankershim Boulevard.

5.3 IMPACT ASSESSMENT

Social impacts have been assessed in two broad categories: community cohesion and accessibility. Impacts affecting community cohesion include land use and displacement, traffic, aesthetics, and noise and vibration. Both regional and local accessibility are addressed particularly as they affect special user groups.

5.3.1 COMMUNITY COHESION

Social change in neighborhoods can be perceived as both positive and negative, depending on the social values and characteristics of the community. As discussed in the Community Participation chapter, a significant effort has been made to involve the community in the planning process. As a result, the maintenance of essential neighborhood qualities, which are important to a community's cohesiveness, has been an integral objective in the planning of station design and location.

Land Use and Displacement. Two types of displacement could occur as a result of the construction and operation of the rail rapid transit system which could affect community cohesion directly and indirectly. Direct displacement, which involves acquisition and removal of existing residences and facilities for Metro Rail construction, are discussed in the Land Acquisition Displacement section of this chapter. Generally, displacement in most station areas is minimal relative to the total population, and a loss of cohesiveness for the majority of station environs has been determined to be insignificant if occurring at all.

Indirect displacement could occur as a result of increased development accommodated by the project. As documented in the Land Use and Development section of this chapter, increased development is a primarily positive impact in all station environs, especially those within designated centers. Economically stagnant or declining areas would be revitalized; additional commercial services and jobs would be more accessible to the surrounding community; and opportunities would be created for pedestrian-oriented activity. Additionally, the increased suitability of station environs for residential uses could lead to a net increase in housing for all station environs. In most of the station environs, La Brea/Sunset and Hollywood/Cahuenga for example, increased development could increase community cohesion by fostering social and economic interaction. However, development can also adversely impact the existing community activities.

Increased development may be seen as negative when it displaces existing uses, such as housing, commercial services, and public facilities, which are perceived by residents as vital to community cohesion. This displacement may occur either as a direct result of redevelopment or indirectly if rents were to rise beyond the financial means of existing tenants. Generally, the degree of impact on cohesion due to these indirect as well as direct displacements can be considered proportional to a neighborhood's degree of ethnic homogeneity, its frequency of daily social interaction at local social or religious institutions, and cultural and social perceptions. Potential changes to community cohesion within each station's environs is described below.

Central Business District. The Metro Rail Project would increase both residential and commercial development here, although much less than in other station environs. As middle and upper income professionals seeking to live closer to work move in, the demographic profile in the CBD would begin to change toward a higher median income, a higher level of auto ownership, and a greater percentage of whites. The rise in population in the downtown area will increase the demand on existing social services. While this is primarily a fiscal impact, it also affects the "quality of life" in the CBD. Displacement of commercial establishments at the Fifth/Hill and Seventh/Flower Stations could reduce the availability of local services, thus somewhat altering local activity patterns.

Wilshire/Alvarado. Under the Locally Preferred Alternative or the Minimum Operable Segment, population is expected to increase substantially over what would have occurred under the No Project Alternative. The Project alternatives could change the demographic characteristics of the area, as median income might increase slightly if new residential units appeal to higher income groups. If this occurs, current residents might not be able to afford higher rents in the new housing. New commercial development in the currently vital lower income Hispanic commercial center might jeopardize the area's many small marginal businesses which cater to this population.

Under the Locally Preferred Alternative and the Minimum Operable Segment, 23 commercial establishments and 26 residential units will be directly displaced. It is likely that these residents to be displaced may belong to the highly cohesive Hispanic community and this may negatively impact community cohesion to some degree. Additionally, since most of these commercial establishments to be displaced are typical of the many small marginal businesses in the area which cater to the predominantly Hispanic population, this may negatively impact community cohesion. Mitigation measures have been identified, however, which may assist these establishments in remaining in the community so as to serve the same population. A fire station will also be displaced in the environs, however, since this facility will be functionally replaced, no adverse impacts are anticipated.

Wilshire/Crenshaw. The area around the optional Wilshire/Crenshaw Station has a high median income and is almost entirely residential. Residents in the area have expressed concern that a station would result in high-intensity development that would be inconsistent with the Park Mile Specific Plan and would create pressure to redevelop single family housing. As the Land Use and Development section indicates, under the Project alternatives market projections and development capacity permitted under the Specific Plan would lead to only 28 to 38 percent of the capacity for new commercial development and 18 percent of the capacity for new residential development to be used by the year 2000. Furthermore, as long as the Specific Plan remains intact, and it cannot be altered without the same public input that went into its formation, overdevelopment of the Specific Plan area cannot occur.

Increased pedestrian activity around the station and the additional development of a low-rise office building along Wilshire Boulevard, consistent with the Park Mile Specific Plan, would be the only changes expected with the Locally Preferred Alternative or Minimum Operable Segment. Restrictive zoning would deter significant land use changes in the station environs. The community's two most valued characteristics--social stability and neighborhood atmosphere--are not likely to be affected by the addition of a Metro Rail station. Accordingly, community behavior and activity patterns are unlikely to change and community cohesion would be maintained.

Wilshire/La Brea. Impacts in this segment of the Wilshire Corridor include major increases in residential and commercial development. In particular, the amount of residential acreage developed in the Wilshire/La Brea Station area is projected to triple over the growth projected under the No Project Alternative. The increased development is expected to improve the availability of local shopping and services. However, the new residential development might be unaffordable to lower income minorities. The currently high percentage of elderly residents is also projected to decline.

Wilshire/Fairfax. Under all rail alternatives, 24 multifamily units, one single family residence, 48 commercial establishments, and four nonprofit/services facilities would be directly displaced. It is likely that residents in the environs being displaced may belong to the highly cohesive Jewish and elderly population. The percentage of total displaced residents, however, is small relative to the total number of residents and, since all but one of the residences involved are multifamily units and 85 percent are renter occupied, it is highly likely that under the relocation assistance program discussed in the Land Acquisition Displacement section, that it may be possible to relocate residents within the community. The 48 commercial establishments that will be displaced generally will have minimal effect on community cohesion since most provide services which cater to the general regional population rather than to residents of the local community. Examples are insurance, financial and professional offices and trade associations. Mitigation measures, however, have been identified which may provide the means for them to remain in the community and serve the same population if desired. Mitigation measures have also been identified which would aid in retaining the nonprofit/service facilities within the neighborhood.

Fairfax/Beverly. Significant pressures for social change are expected to occur with or without the Metro Rail Project. The area is projected to be a major new development center. Under the Minimum Operable Segment, this station would be the terminal station. With the Locally Preferred Alternative or Minimum Operable Segment, the amount of growth is expected to be comparable. It would more than double the No Project Alternative estimates. As a result, the demand for residential land in the station area would far exceed the supply of residentially zoned land. The new commercial development would be oriented towards more regional uses and could conflict with the area's many small businesses which cater to local residents. Valued by its residents for its convenient services, good public transportation, ethnic homogeneity, and neighborhood atmosphere, this largely Jewish community could begin to lose some of its cohesiveness and character as a result of growth in conjunction with the rail project.

Fairfax/Santa Monica. With Metro Rail, the amount of induced growth would more than double the No Project Alternative estimates at this station. This is perceived by many residents as a positive impact since it may revitalize the community through additional services, jobs and accessibility. At the same time, however, residents who perceive the area as a stable residential community, view this as a negative impact, as the demand for housing may increase the available supply of housing causing indirect displacements.

Hollywood. Metro Rail would triple the projected residential development for both the La Brea/Sunset and Hollywood/Cahuenga Station areas. Hollywood/Cahuenga is already a large retail and entertainment area; Metro Rail would double the projected commercial square footage expected under the No Project Alternative. La Brea/Sunset is not currently a strong retail area, but Metro Rail would stimulate retail development in the immediate station area. This increased demand for commercial space could increase current rents and adversely affect existing social services agencies in the environs if they were unable to afford these higher rents.

Increases in commercial, particularly retail activities would have a greater impact at La Brea/Sunset than at Hollywood/Cahuenga. Demographically, the area's median income would increase as new housing units would probably attract wealthier residents, possibly curtailing the flow of many different immigrant groups to the Hollywood area, and slowing the growth of the youth population.

Universal City. Under the No Project Alternative, development for the Universal City Station environs is substantial. MCA, a private corporation, has plans for a substantial amount of development in the area. The environs will change significantly by the year 2000 regardless of the Metro Rail construction. It is likely, however, that Metro Rail would have a role in supporting these trends to some degree. Under the Locally Preferred Alternative, 135 residential units will be directly displaced as well as 11 commercial establishments. Four of these residences are single family units and 66 percent of the total units are renter occupied. The majority of all residences to be displaced can be attributed to a relatively new condominium project consisting of a diverse, middle-income population.

North Hollywood. Under the No Project Alternative, development for the North Hollywood station environs is substantial. Under both the Locally Preferred Alternative and the Aerial Option, the proposed station environs would be located within a Community Redevelopment Agency project area and large projects are being proposed for this area. These projects make neighborhood trends and perceptions difficult to analyze since the environs will change significantly by the year 2000 regardless of Metro Rail construction. It is likely, however, under the Locally Preferred Alternative, that Metro Rail would have a role in supporting these developments to some degree.

Concern has been expressed by residents of North Hollywood that the Aerial Option alignment would have a negative impact on community cohesion. Residents are concerned that the visual impact of the alignment could cause decreases in surrounding property values, cause indirect displacements, and lead to eventual neighborhood decline. The experiences of relatively new aerial systems in other cities indicate that this occurence is unlikely. Nevertheless, the community perception that the Aerial Option will detract from the community character is an impact which cannot be mitigated.

Traffic and Congestion. Mobility within neighborhoods and accessibility to activity centers and other desired destinations is currently impaired in many neighborhoods in the Regional Core, largely due to congestion and parking deficiencies. As documented in the Transportation section, the Project alternatives are projected to have a significant positive impact on such conditions by diverting a significant number of automobile users to transit. In the station environs, however, Metro Rail will lead to increased vehicular and pedestrian volumes on streets leading to and surrounding the stations as users seek access in a variety of modes. The impacts of traffic and parking demands due to direct effects of the stations as well as the indirect impacts of increased development, if unmitigated, could result in the reduction of community cohesion in the environs where it occurs. It could reduce the current level of daily social interaction at local facilities by reducing mobility and have an adverse impact on the residents' perception of neighborhood quality. These potential impacts were all given significant consideration in the planning of stations and supporting facilities. As discussed in Milestones 10 and 12, specific measures were taken throughout the station and system design process to mitigate such impacts.

An example of this is the Fairfax/Beverly Station, which has been designed as an off-street station so that direct traffic impacts are minimized. As in many of the station designs, bus bays have been included to mitigate the impact of on-street bus boardings and alightings. Parking has been planned at the stations at the outer ends of the alignment, at Union Station and in North Hollywood at Lankershim and Chandler, and at the Wilshire/Fairfax Station with the objective of intercepting riders at these locations. This would prevent an excessive parking demand at other stations along the line. Additional design considerations include kiss and ride facilities at stations and an adequate level of feeder bus service to the stations. While system and station design is expected to mitigate the impacts of traffic spillover and increased parking demand in adjacent neighborhoods, additional mitigation options have been identified and are discussed in the traffic and parking sections of this chapter (1.3 and 1.4).

Fairfax/Wilshire, Fairfax/Beverly. Park and ride facilities will be provided at both of these stations under all rail alternatives. The number of parking spaces which will be provided by these facilities, however, is less than the projected demand for parking at these stations. As a result, it is likely that Metro Rail patrons may seek parking in the surrounding, predominately residential, neighborhoods. This spillover parking demand would mean more traffic on the surrounding residential streets. Under the Minimum Operable Segment, the Fairfax/Beverly Station would be the terminal station. The Fairfax community has expressed concern that under this option, the station might attract additional vehicles through the residential streets north of the station, instead of just from the west along Beverly.

Universal City/North Hollywood. The designation of these stations as park and ride facilities for the San Fernando Valley will significantly increase traffic congestion in the station environs. To mitigate impacts on Bluffside Drive, considered to be particularly sensitive due to its quiet residential character, design measures such as a new station access bridge over the Hollywood Freeway and landscape berms have been proposed, as documented in Milestones 10 and 12 and Section 1.3 of this chapter. Additional mitigation measures, however, may also be taken.

Aesthetics. Through design, stations can enhance community activity centers and promote the revitalization of declining areas. As discussed in the Aesthetics section, an important objective in the design of stations and joint development projects will be to ensure that the station blends well with its surroundings so that it represents an attractive architectural addition to its immediate environs. A station can add to the sense of pride, prestige, and satisfaction felt by its neighbors. An additional design consideration for all stations will be the inclusion of attractive art work. In other systems, stations have become symbolic gateways to a neighborhood or community, such as BART's Lake Merrit station with its sculpture wall, and the Louvre station of the Paris Metro with its artwork and statuary.

Under the Locally Preferred Alternative and the Minimum Operable Segment, the aesthetic aspects of all stations will have a positive impact on community cohesion. They have been designed so that they will be attractive, be easily maintained, and be safe and secure. Impacts of the visual appearance of an aerial alignment on neighborhood stability and atmosphere were the most important concern arising from public meetings held to obtain comments from North Hollywood citizens on several alternative proposals. The Aerial Option could negatively impact community cohesion for those who perceive it as detracting from their neighborhood.

Noise and Vibration. In community meetings, especially those which were held in Hollywood and North Hollywood to determine the route alignment and design, possible noise and vibration effects of the Project alternatives were raised as a primary factor which could disrupt overall neighborhood quality and cohesion. Under the Locally Preferred Alternative and the Minimum Operable Segment, the rail alternatives would not increase ambient noise and vibration levels except in a few locations. The Aerial Option, however, would generate more noise which could possibly disrupt neighborhood quality. These impacts are documented in the Noise and Vibration section of this chapter.

5.3.2 ACCESSIBILITY

Special User Groups. A major social impact of transit improvements is the mobility and accessibility they provide to "special user groups" within the population. These are sectors of the population which have limited access to the private auto as a means of transport and thus may derive particular benefit from improved accessibility. This section identifies six groups which may rely heavily on transit. Table 3-29 is a breakdown of these groups by station environs and is indicative of the degree to which their needs may be met by the Project alternatives. Overall, Metro Rail would significantly improve accessibility to these special user groups.

Minority Populations. The station environs of Wilshire/Alvarado, Wilshire/Normandie, Wilshire/Western, and Wilshire/Crenshaw have large minority populations. This characteristic is important because nearly 70 percent of the tran-

TABLE 3-29

SPECIAL USER GROUPS

Station Environs	Total Population	Percent Minority[1]	Percent Aged 5-19 yrs	Percent Aged 65+ yrs	Percent Transit Disabled[2]	Percent Households Without Vehicle Access	Median Annual Family Income($)
Union Station	6,194	92%	26%	11%	4.0%	55%	9,091*
Civic Center	6,300	71%	11%	16%	6.6%	80%	9,215*
Fifth/Hill	9,721	56%	6%	19%	6.0%	92%	8,486*
Seventh/Flower	14,065	72%	14%	16%	4.5%	75%	9,818*
Wilshire/Alvarado	39,530	76%	16%	13%	5.7%	54%	10,045*
Wilshire/Vermont	24,966	70%	13%	14%	3.6%	45%	11,376*
Wilshire/Normandie	33,575	68%	12%	13%	3.3%	38%	12,368*
Wilshire/Western	29,164	64%	11%	13%	4.2%	30%	16,010*
Wilshire/Crenshaw	14,472	55%	12%	17%	5.1%	26%	18,874
Wilshire/La Brea	13,344	33%	10%	33%	7.6%	31%	21,482
Wilshire/Fairfax	13,905	22%	7%	42%	8.0%	27%	22,040
Fairfax/Beverly	12,088	9%	10%	34%	5.4%	28%	19,284
Fairfax/Santa Monica	20,893	11%	9%	26%	4.5%	24%	14,637*
La Brea/Sunset	19,282	27%	9%	19%	4.2%	26%	15,260*
Hollywood/Cahuenga	14,398	41%	12%	12%	3.2%	32%	13,649*
Universal City	5,133	14%	8%	13%	2.2%	8%	48,695
North Hollywood	8,959	34%	15%	12%	4.0%	14%	15,978*
Aerial Corridor	6,585	15%	11%	15%	3.6%	10%	20,872

Source: U.S. Bureau of Census, 1980

*Station environs with an asterisk have median income defined by State of California as low income (less than 80 percent of L.A. County median income.)

[1]Minority includes Hispanic, Black, Asian & Indian & Other populations as identified by U.S. Census. Percentages have been rounded off. Exact percentages can be found in the SCRTD Technical Report on Social and Community Impacts (1983).

[2]Transit disability refers to those residents of working age (16 to 65 years) with physical handicaps who cannot easily use normal transit.

sit users in SCRTD's service area are minorities. The largest ethnic group is Hispanics, who account for 20 to 60 percent of the total population in these station environs. Many Asians also live in these areas, making up approximately 25 percent of the environs' populations. The Fairfax/Beverly Station environs have a large Jewish population and serve as an important center for the Los Angeles Jewish community.

Youths and Elderly. The age distribution in the station environs is important to transit planning because certain age groups, particularly youths (ages 5-19) and the elderly (ages 65 and older), rely more on transit. Station environs with the highest percentages of elderly include Wilshire/La Brea, Wilshire/Fairfax, Fairfax/Beverly, and Fairfax/Santa Monica--all with 25 percent or more of their total population 65 or over. Stations with 15 percent or more of their population aged 5 to 19 years include Union Station, Wilshire/Alvarado, and North Hollywood.

Low Income Families. The median family income for Los Angeles County in 1980 was $21,334. Station environs defined by the State of California as low income (less than 80 percent of the median) include all the CBD station environs, all the Wilshire Corridor station environs from Wilshire/Alvarado to Wilshire/Western, all Hollywood station environs, and the North Hollywood Station environs.

Handicapped Persons. Many handicapped persons depend on transit for mobility. Station environs with comparatively large populations of transit disabled include Civic Center, Fifth/Hill, Wilshire/Alvarado, Wilshire/La Brea, and Wilshire/Fairfax.

Households Without Vehicle Access. As shown on Table 3-29, 75 percent or more of all households in the CBD station environs do not have access to vehicles. Wilshire/Alvarado and Wilshire/Vermont Station environs also have comparatively high numbers of households without vehicle access (54 percent and 45 percent, respectively). In the remainder of the station environs except Universal City and North Hollywood, 24 percent to 38 percent of all households do not have access to the use of a vehicle, a substantially higher percentage than for the county or city as a whole.

Local Accessibility. The Metro Rail Project could improve local accessibility in two ways. First, as the number of commercial services around stations increases, those services become more accessible to residents, particularly to those without automobiles. Residents in the station environs can typically walk to commercial services adjacent to the station in less than 15 minutes. Access to commercial services adjacent to stations would be particularly convenient for residents who commute by transit, since they would be able to shop on their way home from work. Second, accessibility to other destinations along the corridor is increased. A resident of the Wilshire/Crenshaw Station environs would be able to travel to the County Art Museum and to Farmers Market on either the Locally Preferred Alternative or Minimum Operable Segment, or to a movie in Hollywood on the Locally Preferred Alternative. All rail alternatives would significantly increase accessibility to all station environs relative to the No Project Alternative. The Locally Preferred Alternative, however, would increase accessibility more effectively than the Minimum Operable Segment.

Regional Accessibility. Improved accessibility throughout the Los Angeles region is one of the single most important social effects arising from the rail project. Area residents will likely gain direct and immediate benefits that reduce travel times attributable to the Project alternatives. There are a number of regionally significant employment, shopping, educational, and cultural sites within the Los Angeles region

TABLE 3-30

REGIONAL ACCESSIBILITY UNDER SYSTEMWIDE ALTERNATIVES
(Travel Time in minutes for Selected Trips)

Selected Trip Origins	Destination Within the Regional Core: CBD 7th/Flower				L.A. City College 855 N. Vermont Ave.				Museum 5801 Wilshire Blvd.				Universal City Universal Studios			
	No Project Auto	No Project Bus	LPA	MOS	No Project Auto	No Project Bus	LPA	MOS	No Project Auto	No Project Bus	LPA	MOS	No Project Auto	No Project Bus	LPA	MOS
E. San Gabriel Valley -- El Monte Station																
Estimated	37	37	36	37	40	53	51	52	52	60	47	48	50	52	60	N.A.
Measured	48	34							56	63						
Westwood -- U.C.L.A.																
Estimated	39	62	57	58	37	73	68	69	25	41	N.A.	N.A.	39	73	59	N.A.
Measured	52	67							29	38						
San Fernando Valley -- Galleria																
Estimated	42	59	59	N.A.	34	44	59	N.A.	40	70	42	N.A.	25	24	N.A.	N.A.
Measured	53	58							46	79						

Source: SCRTD

Note: Auto travel times based on the following average speeds reflecting existing peak hour conditions: freeways -- 30mph; arterials -- 25mph (20 in Western LA); CBD streets -- 12mph. Transit travel times based on current bus schedules, projected Metro Rail schedules, and bus routings under each condition. Current travel time for the selected trips has also been measured and is indicated under the "No Project" column.

Speeds on non-grade separated modes (auto, bus) are projected to decrease by the year 2000, due to increased development and activity in the Regional Core.

N.A.: Not Applicable

MOS: Minimum Operable Segment

LPA: Locally Preferred Alternative

to which the Metro Rail alternatives can improve access. Additionally, the effective integration of bus interface with Metro Rail stations, as discussed in Milestone 9, will further enhance regional accessibility.

Table 3-30 exemplifies how accessibility may be improved in the Los Angeles region. Four regionally significant locations within the region were selected and the travel times with and without the Project alternatives were estimated to destinations within the region. The table indicates, for example, that if a person traveling from the Los Angeles County Museum to the El Monte bus station in the San Gabriel Valley chose travel on the Locally Preferred Alternative over auto, he could save 5 minutes in travel time, and a 13-minute savings would be realized over a bus trip. All trips reflect travel from points outside the Minimum Operable Segment (shown on the left) to points within the Regional Core (shown on top).

5.4 MITIGATION

Table 3-31 summarizes mitigation measures and options, their effectiveness, and their applicability to affected station areas or environs. Mitigation measures are identified which SCRTD will implement and the mitigation options are those which may be implemented by other public agencies, possibly in coordination with SCRTD. SCRTD is assisting the City and County of Los Angeles in the development of Specific Plans for each station and Citizens' Advisory Committees have been established as part of this process. Objectives identified in these plans will, in most cases, determine which mitigation options will be pursued by each community.

The mitigation options which will be implemented by other public agencies, however, cannot be ascertained with certainty at this time. Most will require further consultation with the responsible public agencies throughout the design process. While some may possibly be implemented during early stages of the project's construction and operation, it is possible that others may be implemented after several years of operation as the impacts of induced development are realized.

The following are mitigation measures which SCRTD will implement.

1. Relocation assistance will be provided for all displaced residents and businesses in accordance with state and federal regulations.

2. SCRTD will assist the City and County of Los Angeles in the development of Specific Plans for each station. This process began during Preliminary Engineering and will be completed during the project's Final Design.

The following are mitigation options which may be implemented by SCRTD and/or other public agencies. Table 3-31 identifies the public agencies which could be responsible for implementation.

1. To preserve stable residential neighborhoods subject to possible development pressure as a result of Metro Rail, zoning should reflect the existing use. At the Wilshire/La Brea, Fairfax/Beverly, Fairfax/Santa Monica, and Universal City Stations, this would require simply leaving the existing land use plans and zoning designations unchanged in some neighborhoods. In other neighborhoods in these station areas, as well as in other station areas, it might be necessary to revise the current zoning downward from R-3 or R-4 (multifamily) to R-1 (single family) or R-2 (duplexes) to reflect current usage.

TABLE 3-31
SOCIAL AND COMMUNITY IMPACT MITIGATION

Mitigation Measures that SCRTD Will Implement	Effectiveness	Applicable Station Areas
1. Relocation assistance to all residents and businesses directly displaced by the project.	Moderate-High	All except Civic Center, Wilshire/Normandie, Wilshire/Crenshaw, Hollywood Bowl.
2. Assist City and County of Los Angeles in the development of Specific Plans for each station.	High	All except Hollywood Bowl

Mitigation Options	Effectiveness[1]	Responsible Agencies	Applicable Station Areas
1. Maintain existing low density residential zoning or downzone to preserve stable residential neighborhoods.	Moderate -High	LADOP, LADRP	Wilshire/Crenshaw, Fairfax/Beverly, Fairfax/Santa Monica, Universal City
2. Provide relocation assistance to residential tenants displaced by new development in station areas.	Low	SCRTD, LA City Housing Authority, LACDC, CDC	All except Hollywood Bowl
3. Include affordable and market rate housing at stations on commercially zoned sites in lieu of increasing density in adjacent neighborhoods	Moderate	SCRTD, LADOP, LADRP	Wilshire/Normandie, Wilshire/Crenshaw, Fairfax/Beverly, Fairfax/Santa Monica, La Brea/Sunset, Hollywood/Cahuenga
4. Establish special rent control districts to avoid severe increases in rental rates in station areas.	Moderate-High	LA City Council, LA County Board of Supervisors, CDD	All except Hollywood Bowl
5. As a last resort, provide housing assistance for low income residential tenants in station areas to mitigate severe increases in rental rates.	Low	LA City Housing Authority, LACDC, LACRA, CDD	Downtown Station, Wilshire/Alvarado, Wilshire/Vermont, Wilshire/Normandie, Wilshire/Western, Fairfax/Beverly, Fairfax/Santa Monica, La Brea/Sunset, Hollywood/Cahuenga
6. Implement measures to reduce traffic spillover into adjacent neighborhoods (see Transportation section)	Low-Moderate	LADOP, LADOT, LADRP	All except Hollywood Bowl
7. Provide relocation assistance to business tenants displaced by new development in station areas.	Low	SCRTD, CEDO, CDD, LACDC, LACRA	All except Hollywood Bowl
8. Establish special commmercial zoning or development review procedures to preserve existing small business that provide community services in station areas.	Moderate-High	SCRTD, LADOP	All except Hollywood Bowl, Wilshire/La Brea
9. Offer tenancy and investment in joint development to displaced firms.	High	SCRTD, LADOP, LACRA, LACDC, CDD	All except Hollywood Bowl
10. Provide relocation assistance to social services or facilities displaced by new development.	Low	SCRTD, CEDO, CDD, LACDC, LACRA	All except Hollywood Bowl

Table 3-31 (continued)

Mitigation Options	Effectiveness	Agencies That Could Implement	Applicable Station Areas
11. Establish special zoning or development review procedures to preserve existing and accommodate new social services and facilities in station areas.	Moderate-High	SCRTD, LADOP, LADRP	All except Hollywood Bowl
12. Include displaced and new social services and facilities in joint development projects/ stations.	Moderate	SCRTD, LADOP, LACRP, LACDC, LACRA, CDD	All except Hollywood Bowl

[1] The following scale has been devised to rate the probable degree of effectiveness in mitigating a potential impact:

- Low - Options designed to offer compensatory assistance after the fact to local residents, businesses or Institutions experiencing hardship.
- Moderate - Options intended to soften, but not eliminate the impact on the community.
- High - Option essentially mitigates the impact, largely by preventive action.

Legend: LACRA = City of Los Angeles Community Redevelopment Agency
LACDC = Los Angeles County Community Redevelopment Commission (including the Economic Development Corporation)
LADOP = City of Los Angeles Department of Planning
LADOT = City of Los Angeles Department of Transportation
LADRP = Los Angeles County Department of Regional Planning
CEDO = City of Los Angeles Economic Development Office
CDD = City of Los Angeles Community Development Department

2. Where residents of rental units are displaced by the construction of new residential or commercial development within a station area, relocation assistance could take a variety of forms. It could range from the identification of comparable units and payment of moving expenses to the extreme case of providing subsidized replacement housing as a "last resort". Such assistance is likely to be required in all station areas and could be provided, in part, by developers.

3. Where the demand for residential development within existing neighborhoods would create pressure for rezoning of existing residential areas to higher densities, housing could be provided on commercially zoned sites to reduce that pressure. The Land Use and Development section of this report describes implementation techniques for achieving this objective.

4. To mitigate the impact of residential rent increases due to increased land value in station areas, the existing rent control policy of the city could be modified as needed to address problems unique to Metro Rail station areas. This measure may be required in all station areas.

5. In cases where the above measure proves inadequate, direct housing assistance might be required for low-income tenants as a "last resort".

6. To mitigate the traffic and parking impacts likely to "spill over" from stations into surrounding neighborhoods, the mitigation options identified in the Transportation section could be implemented.

7. Where existing business tenants are displaced by new development in station areas, relocation assistance should be provided. It could range from tenancy in the new development project at rates comparable to current rates, which could increase as sales increase over time, or to the identification of comparable sites and payment of relocation expenses. This impact could occur at all stations and mitigation could be provided by developers.

8. Where it is desirable to preserve an existing shopping area because of its value to the community, zoning or development review procedures could be formulated to achieve that objective. The need for this mitigation option may emerge as a community goal in any station area during the Specific Plan process. It is expected to be a major concern at the Fifth/Hill, Seventh/Flower, Fairfax/Santa Monica, Fairfax/Beverly, and Hollywood/Cahuenga Stations. Potential implementation techniques include downzoning to reflect current development intensities and transfer of development rights. These techniques are discussed in the Land Use and Development section of this report.

9. SCRTD could offer tenancy and an opportunity to invest in its joint development projects to businesses displaced by development throughout the station area.

10.-12. Options 10 through 12 are identical to Options 7 through 9 except that Options 10 through 12 apply to displacement of social services and facilities.

6. SAFETY AND SECURITY

6.1 INTRODUCTION

The Metro Rail Project will create new public areas and change the daily travel patterns of residents and employees of the Regional Core. Attention to the design of these new areas and their relationship to the surrounding community can both encourage ridership on the system and contribute to the vitality of the urban environment. System design can help achieve both of these benefits by creating a safe and secure environment. This section provides an overview of the safety, fire/life safety, security and system assurance design requirements which will ensure construction and operation of a safe, secure and reliable system.

6.2 SAFETY

Safety refers to the prevention of accidents to passengers resulting from such things as fires, faulty equipment, and improper boarding. The safety record of rail rapid transit (measured in deaths per millions of passenger miles) is better than any other form of urban transportation. To ensure that the operation of the Metro Rail system will either equal or exceed the safety systems currently in operation, safety planning has been a primary focus of preliminary architectural design and site planning work.

SCRTD has formulated policies and a system safety program plan as part of the Milestone 7 Report: Safety, Fire/Life Safety, Security, and Systems Assurance. Basic to the program are safety procedures, training programs, accident reporting procedures, system hazard tests, and fire/life safety requirements drawn from applicable local, state, and federal codes. Specific guidelines cover safety features for stations, communications, passenger vehicles, automatic train control, electrification, central control, ways and structures, and personnel.

6.3 SECURITY

Security refers to the prevention of acts defined as unlawful, criminal or intended to bring harm to another or damage property. Criminal activity has been effectively controlled on new rail systems because of a better understanding of security problems and how to avoid them through design. As a result, most of the security problems rail transit riders are likely to experience do not differ from security problems in other public places. Nevertheless, there is a general perception that people around or in the stations or even aboard the trains are subject to higher crime risks.

To create a secure and crime-free environment, SCRTD has adopted an approach to security which emphasizes the deterrence of criminal activity, the detection of criminal activity when it occurs, and the apprehension of the criminals once they are detected. Potential security problems for the project have been examined for each station complex, station area, and station environs so that the potential for criminal activity could be reduced through preliminary architectural design and site planning. Each of these areas and the conditions affecting crime risks are outlined below.

Station Complex. The station complex consists of station components such as parking facilities, entrances, pedestrian passages, bus bays, and bus terminals. These components are designed to avoid areas that are remote, dark, or out of public view, so that potential impacts--including a greater risk of muggings, assaults, robberies, and auto thefts--can be avoided.

Station Area. This impact area includes the immediate vicinity around a station. Security concerns within this area include increased pedestrian activity; increased bus and auto boardings, exits, and drop-offs; increased curbside parking; and increased off street parking. These concerns require specific measures to control the risk of crime to people and property.

Station Environs. The more territorially defined the residential base of a community, the more it will resist crime impacts. Metro Rail will induce development into communities around stations. New development should be properly integrated with the existing communities to preserve or to better perceptions of neighborhood security, boundaries, and territory. With adequate security, increases in the risk of robberies and burglaries can be avoided in higher density development, with high rise offices and multiple occupancy residential buildings.

6.4 IMPACT ASSESSMENT

The most significant determinant of crime seems to be the type of community through which the transit system runs. Thus, the likelihood of criminal activities varies with the "ambient" crime level of the communities served. At the station complex level it is expected that crime impacts would be minimal. The attention SCRTD has focused on the problem of crime control coupled with the general and specific measures for mitigation discussed in this section suggest that any potential for increased crime in and around stations can be controlled. Particular attention is needed to provide adequate surveillance where long passages are needed to connect the station entrance and loading platforms. In station environs and station areas, the impact of Metro Rail depends on the character of the surrounding development. Areas with many vacant lots and parking areas are considered "porous", allowing criminals to escape easily. In other areas, well-defined land uses and stable neighborhoods, reduce opportunities for crime. The No Project Alternative neither creates opportunities for crime nor presents a way to reduce crime risks. Neither the Minimum Operable Segment nor the Locally Preferred Alternative creates any unmitigable adverse impacts, and at several locations, such as Wilshire/Alvarado and Hollywood/Cahuenga, they provide a stimulus for redevelopment that can help reduce existing high ambient crime levels. An aerial configuration can be properly designed to prevent crime, so the Aerial Option is not expected to affect crime risks any differently than the Locally Preferred Alternative.

6.5 MITIGATION

6.5.1 SAFETY CONSIDERATIONS

Safety considerations involved the mitigation of potential hazards and prevention of accidents so that passengers and employees are not injured and transit system property is not damaged. SCRTD has carefully determined the criteria which are essential to the design and operation of a safe system and developed a safety program plan. Design criteria associated with the prevention of accidents in stations, aboard vehicles, and in other areas of the transit system place heavy emphasis on architectural features that will minimize the potential for accidents. Following are some of the design criteria which have been utilized.

- The station and surrounding site have been designed so that bus and automobile traffic patterns will safely interface with pedestrian and street traffic. Clear, comprehensible signs, as well as high levels of visibility between pedestrians and vehicle drivers, will also be utilized to achieve this.

- Station architectural design criteria include provisions such as those for adequate lighting, walking surfaces constructed of nonslip materials, safe pedestrian access to station entrances, and fail safe train control apparatus.

- Design criteria focusing primarily on protection of people and property include planning for adequate emergency exits, stand-by electrical power supplies, appropriate alarming systems and emergency communications systems. The communications system will include closed circuit television monitors, a public address system, and emergency telephones.

6.5.2 FIRE/LIFE SAFETY CONSIDERATIONS

Fire/life safety deals with emergency preparedness for all types of major incidents including fires and other major disasters. Fire/life safety considerations involve preventive design criteria and those which provide protection for people and property in the event an emergency should occur.

Preventive Measures. Preventive design considerations rely on the use of low combustion or non-combustible materials to the maximum extent possible. Where low-combustion materials are used, as in seat cushions or electrical wiring, the materials will be low smoke and toxic fume producing substances. Preventive criteria include those requiring extensive fire sprinklers and standpipe installations, smoke and gas detectors, alarm systems, adequate exits and other emergency provisions for safety walkways, exits to streets and cross passages for safe egress to an adjacent tunnel should a fire occur. Tunnel ventilation equipment will keep smoke and toxic fumes to safe levels until patron evacuation is completed.

Protective Measures. Protective criteria include planning emergency procedures and responses by and for SCRTD personnel and local emergency response agencies. Periodic and extensive training drills will be developed and conducted by these various agencies to assure rapid and effective emergency response.

6.5.3 SECURITY CONSIDERATIONS

The security of patrons and property requires the application of the principles of deterrence, detection, and apprehension.

Deterrence. The reduction and discouragement of crime is primarily a result of careful design. Some of the system security designs include provisions for open, well-lit parking areas, and stations with clear visibility and open sight lines. These designs will afford little or no hiding places for criminals. Use of vandal-resistant and graffiti-resistant materials for stations and vehicles will also help to create an atmosphere that discourages inappropriate activities.

Detection. The observation of potential criminal activity, is primarily the responsibility of SCRTD Transit Police and employees and, to some extent, the general public. Significant provisions for the detection of crime include obvious and extensive presence of transit police in the Metro Rail System, close circuit television coverage of station areas and other parts of the system the public will use, emergency telephones in stations and intrusion alarms in non-public areas and around fare equipment.

Apprehension. Apprehension is the responsibility of law enforcement agencies. SCRTD Transit Police will work cooperatively with the Los Angeles Police Department and the Los Angeles County Sheriff's Department. Design criteria involving interagency law enforcement will include extensive communications systems, as well as detection and alarming apparatus.

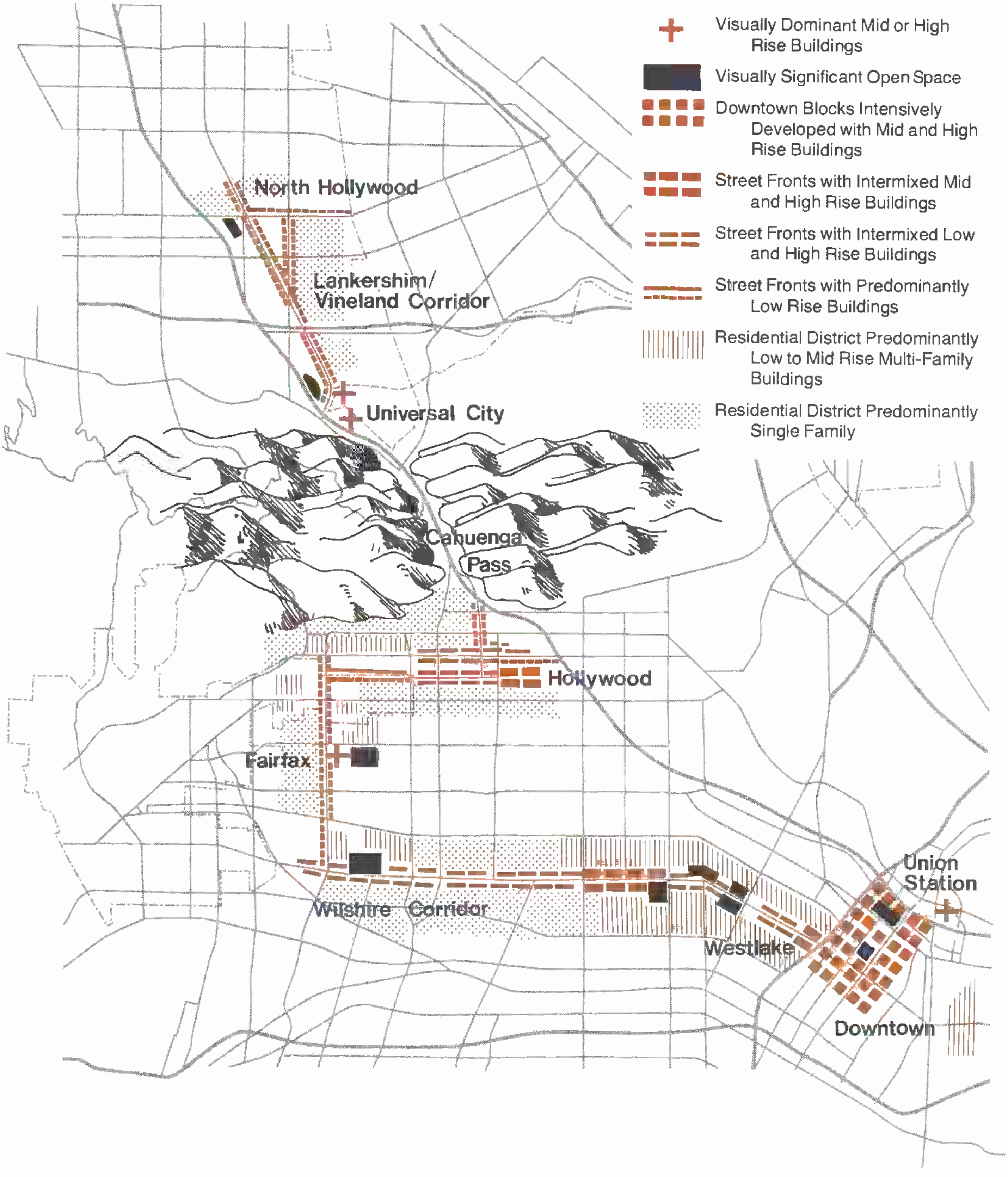
7. AESTHETICS

7.1 INTRODUCTION

The rail transit facilities will alter the visual setting and appearance of the communities through which the system passes. The changes brought about by the construction of stations, possibly an elevated guideway, ventilation shafts and ancillary structures can either enhance or impair the visual setting, depending on the scale and design of the transit facilities and the physical and visual characteristics of the areas along the system's route. A summary analysis of the more significant visual changes follows, and a fuller description of findings is provided in the SCRTD Technical Report on Aesthetics (1983).

7.2 EXISTING CONDITIONS

Mountains form a natural backdrop for Metro Rail facilities, and the street and freeway grids are the man-made key to the Regional Core's visual organization. Within these grids is a series of districts served by Metro Rail, each with its own visual character. Some areas, such as the Central Business District and Wilshire Boulevard with their prominent high-rise buildings, are visible from many locations, thus serving as regional orientation points. Figure 3-13 describes the urban form along the proposed alignment.



Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 3-13 Urban Form

SEDWAY/COOKE
Urban and Environmental Planners and Designers

The visual character of each district along the alignment is described to provide a sense of how surface or above ground rail transit facilities may affect the visual setting. Such facilities include park and ride areas, traction power substations, cooling towers, and elevated components of the Aerial Option.

Union Station. The large space surrounding and including Union Station feels open and pleasant, largely because of extensive landscaping. This space is bounded by the Terminal Annex Post Office and El Pueblo de Los Angeles State Historic Park and is dominated by the freestanding Union Station. The San Gabriel Mountains to the north are highly visible from here.

Central Business District. The Los Angeles CBD incorporates a dense downtown area distinguished by its rectilinear street grid and the clusters of mid-rise and high-rise commercial structures visible from many points in the region. The eastern portion of downtown contains a number of older, underutilized commercial structures interspersed with parking lots and vacant land, creating a visually fragmented pattern. In the western portion of the CBD, newer mid-rise and high-rise buildings, as well as more fully utilized older structures, contribute to visually continuous street frontages and strongly defined street spaces.

Wilshire/Alvarado. This district comprises three blocks between 7th Street, Wilshire Boulevard, Alvarado Street, and the east side of Bonnie Brae Street. The interior of the blocks consists primarily of a large open area used for surface parking, bounded by structures with distinctly different frontages. Alvarado Street's continuous one- and two-story facilities are part of a vital lower-income ethnic commercial center. While many of these buildings are older, they contribute to an intimate scale and an active street life extending to the adjacent MacArthur Park. This park is a major visual feature, incorporating extensive landscaping as well as a lake and a variety of other recreational facilities.

Wilshire Corridor. This district includes the building frontages on Wilshire Boulevard between Vermont and Curson Avenues and can be seen as a linear extension of downtown's mid- and high-rise uses, though fronting on a single boulevard instead of a grid. As with the downtown district, the corridor skyline is visible from many points in the region. The district has several consistent visual attributes: the width of Wilshire Boulevard (105-foot right-of-way for most of its length), well-defined street space, a high level of building investment and maintenance, and good street landscaping. Wilshire Boulevard at Vermont contains a mixture of low-, medium-, and high-rise commercial structures that define the street space adequately but create inconsistent scale. At Normandie Avenue, Wilshire Boulevard is a well-defined, maintained and landscaped street incorporating mid- and high-rise buildings with such architecturally distinguished buildings as the Wilshire Christian Church. The intensity of corridor development continues at Western Avenue, but the spatial definition and scale are more fragmented, partly because of several architecturally distinct complexes (Pellissier Building, Ahmanson Plaza, Beneficial Plaza) that do not consistently relate to the Wilshire Boulevard frontage. Crenshaw Boulevard marks the transition between the high level of commercial development to the east and the lower level of residential, retail, and office development including some vacant lots and surface parking that extend to La Brea Avenue. From La Brea Avenue to Hauser Boulevard, Wilshire Boulevard narrows, with a consistent low- to mid-rise scale and strongly defined street space.

Wilshire/Fairfax. The dominant visual element in this district is the extensively landscaped Hancock Park, which contains major cultural resources. The eastern boundary of the district is strongly defined by Museum Square and other mid-rise structures. The southern boundary includes low- to high-rise commercial buildings and a large vacant parcel, resulting in inconsistent scale and weakly defined street space.

Fairfax/Beverly. South of Beverly Boulevard the predominant visual character is established by the free standing, five-story CBS studios as well as the one- to two-story Farmers Market, both surrounded by a large parking area. To the north of Beverly Boulevard on Fairfax Avenue is an area of one- and two-story commercial structures, housing a number of small shops oriented to the Jewish community. Their consistent scale and placement on the property line, coupled with the narrow street width of 70 feet, create a well-defined street space.

Fairfax/Santa Monica. This low-rise community commercial center for West Hollywood creates a fragmented visual impression, with street space poorly defined. The Hollywood Hills to the north on Fairfax Avenue are a major visual feature.

Hollywood. The Hollywood district incorporates three distinct types of settings, having in common closeness to and a view of the Hollywood Hills. In the La Brea Avenue/Sunset Boulevard area, a number of low and often freestanding commercial structures are at varying distances from the property line, resulting in weak and fragmented street space. By contrast, Hollywood Boulevard is a distinctive and strongly defined east-west corridor serving as a regional commercial and entertainment center. The clear spatial definition and the distinctive urban image of Hollywood Boulevard are not maintained in the area to the north centering on Cahuenga Boulevard, which typically contains low commercial and residential structures alternating with parking lots. In this section, only portions of the block fronts on Cahuenga Boulevard, Yucca Street, and Franklin Avenue have continuous building faces.

Universal City. This district incorporates Universal City, the commercial structures and residential community to the north, Weddington Park, and the mountains sloping to Ventura Boulevard south of the Hollywood Freeway. The freeway and the mountains are visible from many locations. The mid- to high-rise office structures of Universal City on Lankershim Boulevard establish a strong and varied block face, as well as a unique visual image not reflected on the north side of the street. Here, large surface parking lots are interspersed with a few low commercial structures and the landmark, Spanish-styled Campo de Cahuenga. To the north, on both sides of Bluffside Drive and Willowcrest Avenue, is a well-established single family and multifamily residential community with one- to four-story structures, mature landscaping, and consistent scale. Weddington Park, a neighborhood facility with a large open grass area, is adjacent to the residential area on the north side of Bluffside Drive. The hills to the west of the Hollywood Freeway and Ventura Boulevard are densely developed with single family homes. Low-rise commercial structures form a consistent block frontage at the base of the hills on the west side of Ventura Boulevard.

Lankershim Boulevard. Lankershim Boulevard contains predominantly one- to three-story commercial buildings interspersed with a few mid-rise office structures, with most buildings at or near the property line. Road right-of-way width varies from 90 to 100 feet. Lankershim Boulevard between Chandler and Magnolia Boulevards narrows (80-foot right-of-way) and is bordered by older low-rise commercial buildings that establish a continuous frontage at the property line. The consistency of commercial uses, the utility power poles, the Ventura Freeway overpass, and the view of the mountains to the south contribute to a well-defined but somewhat chaotic visual and spatial character.

North Hollywood. The strong street space definition along Lankershim Boulevard gives way north of Chandler Boulevard to a more fragmented development pattern, including several freestanding commercial and industrial buildings surrounded by surface parking and storage yards. Chandler Boulevard west of Lankershim Boulevard to the Hollywood Freeway contains the historic Hendrick's Builders Supply Company building, and a variety of uses. The inconsistent setbacks from the street and alteration of structures with open lots result in a weak and fragmented definition of street space. Mountains to the north and the Hollywood Freeway to the west establish the regional visual setting.

7.3 IMPACT ASSESSMENT

Metro Rail stations will be designed with individual, unique identities and to provide a visually enjoyable experience. The station complex will be further enhanced by an artwork program that will include procedures for accepting donated artwork and for the commissioning of artwork by SCRTD. A percentage of each station's construction cost is proposed to be dedicated to artworks.

While the stations themselves will be visually pleasing, aesthetics are also concerned with how the system relates to the community. The rest of this impact assessment addresses this relationship.

7.3.1 IMPACT MEASURES

Impact measures have been used to document a range of significant visual changes, including significant contrast in scale between transit facilities and nearby development, changes in the appearance of streets as viewed by pedestrians or motorists, and increased visual exposure of occupants of residential and commercial structures.

View Alteration. The visual relationship between a specific area and the larger community and regional setting has both aesthetic and functional importance. If Metro Rail construction blocks or obscures views of major natural features, plazas, or distinctive buildings, the impact is negative. Conversely, if Metro Rail construction opens up new views, such as those created by an aerial alignment, or improves existing views by channeling the eye toward visually important structures or natural features, the impact is positive.

Change in Visual Setting. Displacement of existing uses and construction of major facilities such as parking areas, elevated stations, and subway station entrances could significantly alter physical conditions and appearance along the Metro Rail line. When this change removes negative elements, such as unsightly buildings and disorganized, unlandscaped parking areas, or eliminates uses which disrupt the prevailing function of the area, the impact is positive. Conversely, when uses that contribute to the vitality of the area or structures that lend visual interest are displaced, the result is negative.

Street Facade Appearance. An attractive, comfortable setting for pedestrians is important to the success of urban commercial streets. Essential to this setting is a relatively consistent and continuous commercial facade, uninterrupted by vacant parcels, parking lots, or buildings with inconsistent or deep setbacks. Ground level uses offering visual interest and variety, and such factors as carefully considered walkways, signs, and landscaping are also critical to the success of such streets. Where Metro Rail construction requires removal or disruption of buildings or other features that contribute to the scale, continuity, appearance, and utility of pedestrian-serving streets, the impacts are negative. When, however, Metro Rail construction eliminates buildings or spaces that detract from the street facade or creates opportunities for future construction that could enhance the pedestrian portions of the street space, the result is positive.

Street Space Appearance. The public--as motorists, pedestrians, and transit riders--sees the Metro Rail route primarily from the street. One's visual impression of the streets along the route is formed by the width of the street, its landscaping, the height of facing buildings, and the continuity or discontinuity of the structures along each side. As the basis for determining likely impacts of Metro Rail construction (1) the street space should be sufficiently contained o both sides to provide a sense of enclosure and a visual channel; (2) continuous or nearly continuous building facades should be maintained along each side of the street, with the buildings high enough to provide a sense of enclosure; (3) the heights of adjoining buildings should relate to the function and scale of the street--for example, two or three stories along narrow, 60- to 80-foot retail streets and five or more stories along broad boulevards; and (4) a clear distinction should be established between space for pedestrians and space for vehicles. Where Metro Rail construction produces or promotes development consistent with the above principles, the impact is positive. The impact is negative where construction and location of Metro Rail facilities eliminate existing features contributing to a well-defined street space or preempt future development that would be in accord with these principles.

Compatibility of Scale. The visual fit of Metro Rail facilities within the commercial and residential districts through which Metro Rail passes is a major concern. Where Metro Rail structures conform to the prevailing scale (height, bulk, proportions) of neighboring buildings, street spaces, and other outdoor public spaces, the result is positive. However, where Metro Rail structures produce an abrupt contrast with surrounding structures and spaces, the effect is negative. Examples of the latter include elevated guideway structures that tower above adjoining buildings and multilevel parking structures immediately adjacent to low rise residential units.

Visual Proximity. The users of Metro Rail facilities and the occupants of adjacent residential and commercial structures can see each other where elevated guideways, stations, and the upper levels of a proposed parking structure are close to occupied buildings. Such effects are considered very serious when the outer edge of the guideway, elevated station, or station parking structure, is within 60 feet of the facing residential or commercial buildings. This is the approximate range in which facial expressions can be discerned. The effect is considered serious when the outer edge of the guideway, elevated station, or parking structure is within 61 to 120 feet of adjoining residential or commercial buildings. Within this range personal recognition is possible. Beyond 120 feet the adverse effects are considered negligible.

7.3.2 LOCALLY PREFERRED ALTERNATIVE

The Locally Preferred Alternative will have relatively insignificant adverse impact on the overall character, scale, and form of the visual setting in the Regional Core, however, in particular localized areas visual impacts are considerable. In various instances, the rail transit system will produce positive effects. For example, the location of station entrances will enhance the visual setting by increasing exposure to and channelizing views of parks and historic properties at Union Station, Civic Center, Fifth/Hill, Wilshire/Alvarado, and Universal City. Moreover, at Wilshire/Vermont, Wilshire/Crenshaw, and Fairfax/Santa Monica, station construction removes fragmented development and creates an opportunity for joint development to reinforce the street space and a continuous commercial facade.

In contrast, the displacement of buildings at other locations will adversely affect the visual setting by breaking the continuity of the building facade or by detracting from an otherwise consistent street appearance. Into these vacant sites, Metro Rail facilities like station entrances and vent shafts (box-like structures 10 feet from the ground) will be erected. The significance of the impact generally varies with the extent of demolition at each station and is most severe at Wilshire/Alvarado, Wilshire/Western, Hollywood/Cahuenga, and Universal City.

This disruption of the visual setting and scale relationships at the first two stations will be mitigated when new construction is erected and the continuity of the facade is restored. Moreover, if the cooling towers are carefully sited and acquisition or development agreements can be made with owners of adjacent property, these structures can eventually be incorporated into new on-site development, and visual problems can be eliminated. At the latter two stations, however, the off-street location limits further development of the site and thus mitigation of the adverse impacts. Construction of the Universal City Station removes portions of the Bluffside residential area, which helps enclose and define the street space of the area. The demolition of these small-scale residential buildings constitutes a permanent alteration of the area's coherent visual setting.

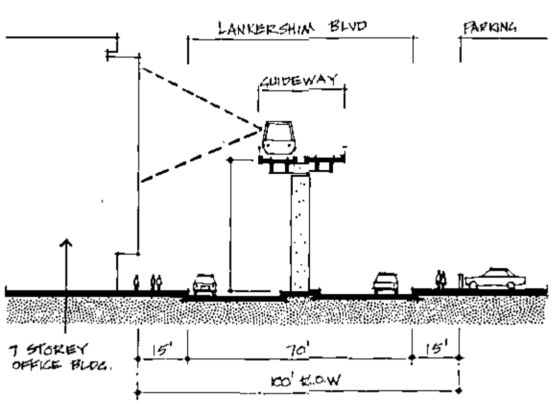
The system's parking structures, while not to be constructed initially, will have visual impacts when they are built. At Union Station and Fairfax/Beverly, the proposed structures will help organize and create visual definition for what are currently abandoned or open, visually fragmented areas. At Fairfax/Beverly the opportunity exists to incorporate street level commercial uses along Beverly Boulevard and Fairfax Avenue to reinforce the continuity of the commercial street facade. At Wilshire/Fairfax, the east half of the parking structure removes commercial structures that contribute to the well-defined street facade and it will contrast incongruously in use and bulk with adjacent residences. The multilevel garage is within 60 feet of new condominiums and existing residences to the south. This potential intrusion of privacy represents a serious adverse impact. The parking facility at Universal City would replace the existing Hewlett-Packard building, which because of its size and appearance is visually compatible with the adjacent Campo de Cahuenga, a state landmark. Parking at Universal City could be shared between two sites, one just north of the Campo de Cahuenga and the other along and north of Ventura Boulevard east of Vineland Avenue (Figure 2-25). Either site may have a surface parking lot, a three-story building or a six-story building. The parking structures would be bulkier than the Hewlett-Packard Building they replace, thereby exaggerating the contrast in scale between the Campo de Cahuenga and the surrounding building. The parking structures would nevertheless be more in scale with the nearby Universal City buildings and offer better street space definition than the current building. Consequently, overall, the parking structure will not have a negative impact. At North Hollywood, the multilevel parking structure, approximately 50 feet high, will contrast with the relatively small existing structures. However, as development progresses under the Community Redevelopment Agency's Redevelopment Project, this adverse impact is expected to be eliminated.

7.3.3 AERIAL OPTION

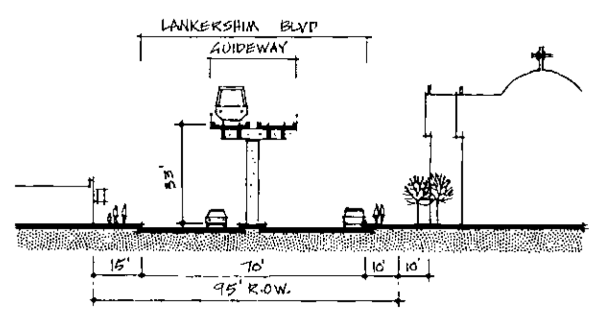
Visual impacts of the Aerial Option are identical to the Locally Preferred Alternative, except in the San Fernando Valley. In this segment, the alignment is elevated and its impacts on the visual character of the area become much more pronounced. The elevated guideway will be 20-42 feet high, about 25-30 feet wide, and supported by 6-foot wide columns. The aerial stations at Universal City and North Hollywood would stand approximately 20-33 feet above ground, be 84 feet wide at the platform level, and extend about 450 feet (Figure 3-14). Key impacts of the portal, stations and elevated guideways are described below.

- The portal where the transit system emerges from the mountains is incongruous in scale to and will be constructed within 60 feet of the residential area below (Figure 3-15).

- The station at Universal City, while creating regional views to the east, degrades the outdoor space and introduces a structure incompatible in scale with surrounding land uses. The guideway is much taller than most buildings fronting onto Lankershim Boulevard and essentially will cut Lankershim Boulevard in half, creating two relatively narrow visual channels when viewed diagonally (Figure 3-16).

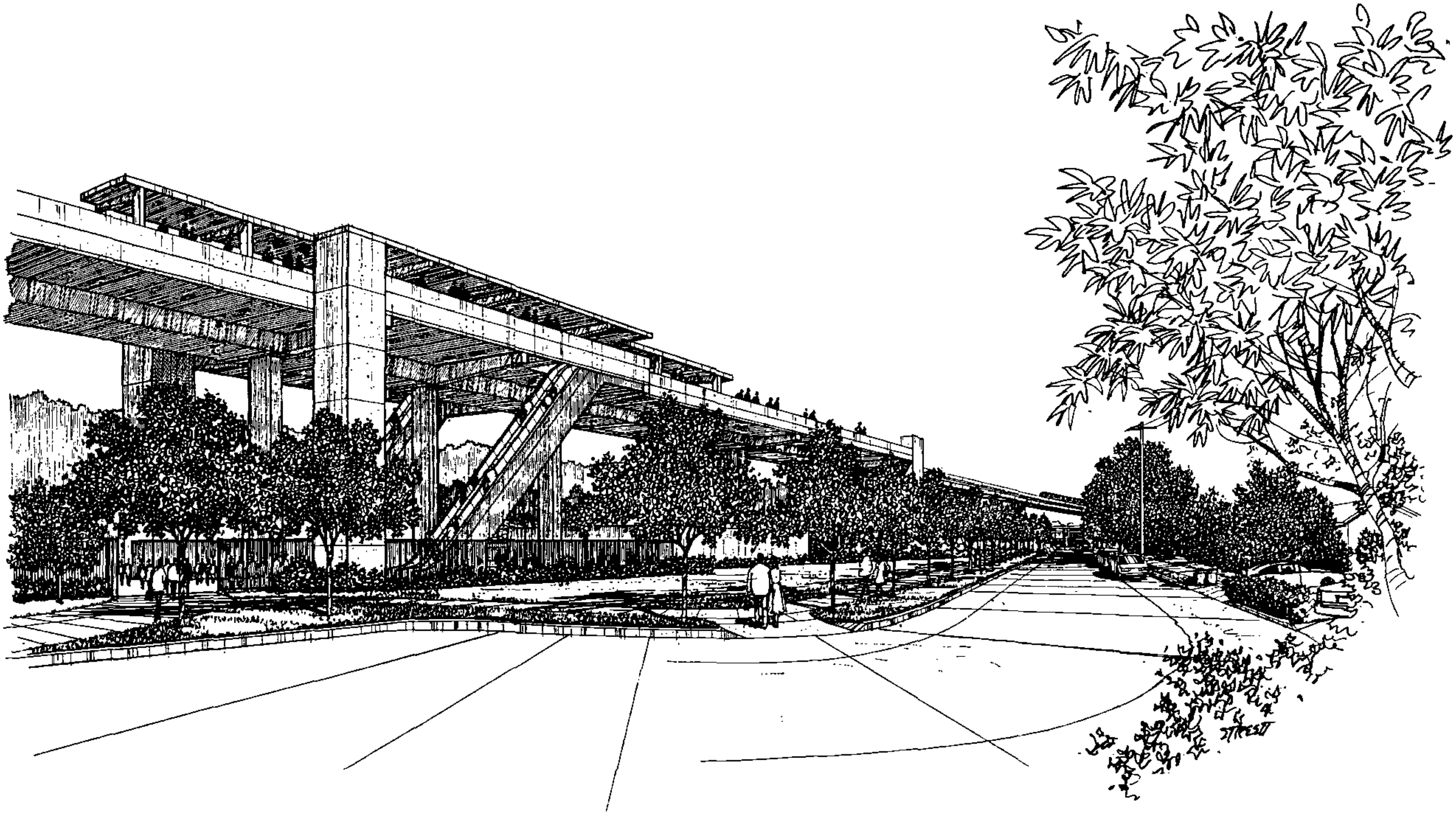


Lankershim Blvd. north of Ventura Freeway.
Section looking south. 0 15 30 60 feet



Lankershim Blvd. north of Moorpark St.
Section looking south 0 15 30 60 feet

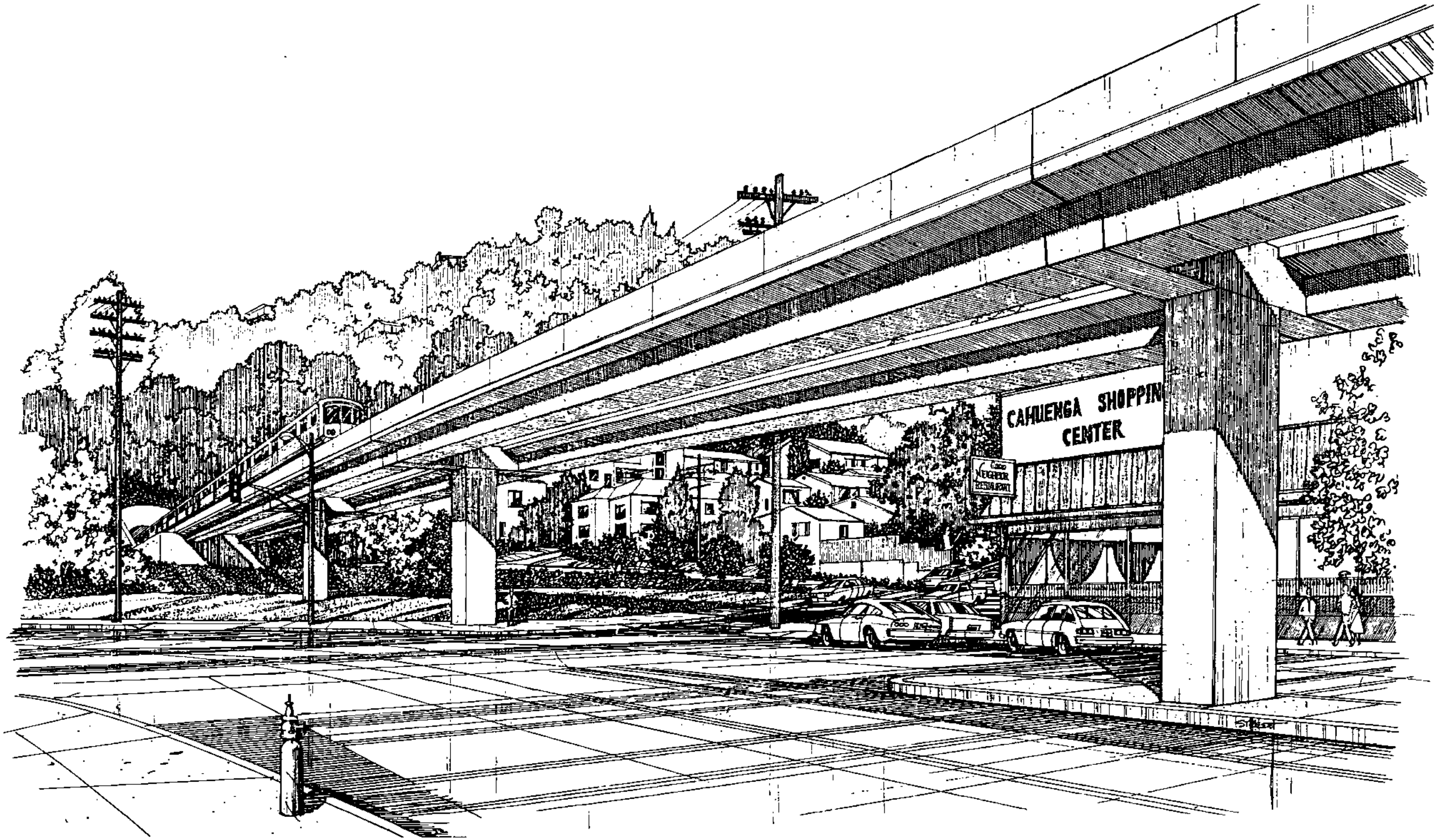
- The elevated guideway will also be within 60 feet of structures along the west side of Lankershim Boulevard for its entire length and along the east side of Camarillo Street. At this distance, the visual privacy of about 3,000 feet of residential frontage, all south of Camarillo Street, would be adversely affected. About 11,900 feet of commercial frontage would also be affected, although not necessarily adversely since such exposure may enhance local businesses by increasing their visibility.



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 3·14 Prototypical Aerial Station

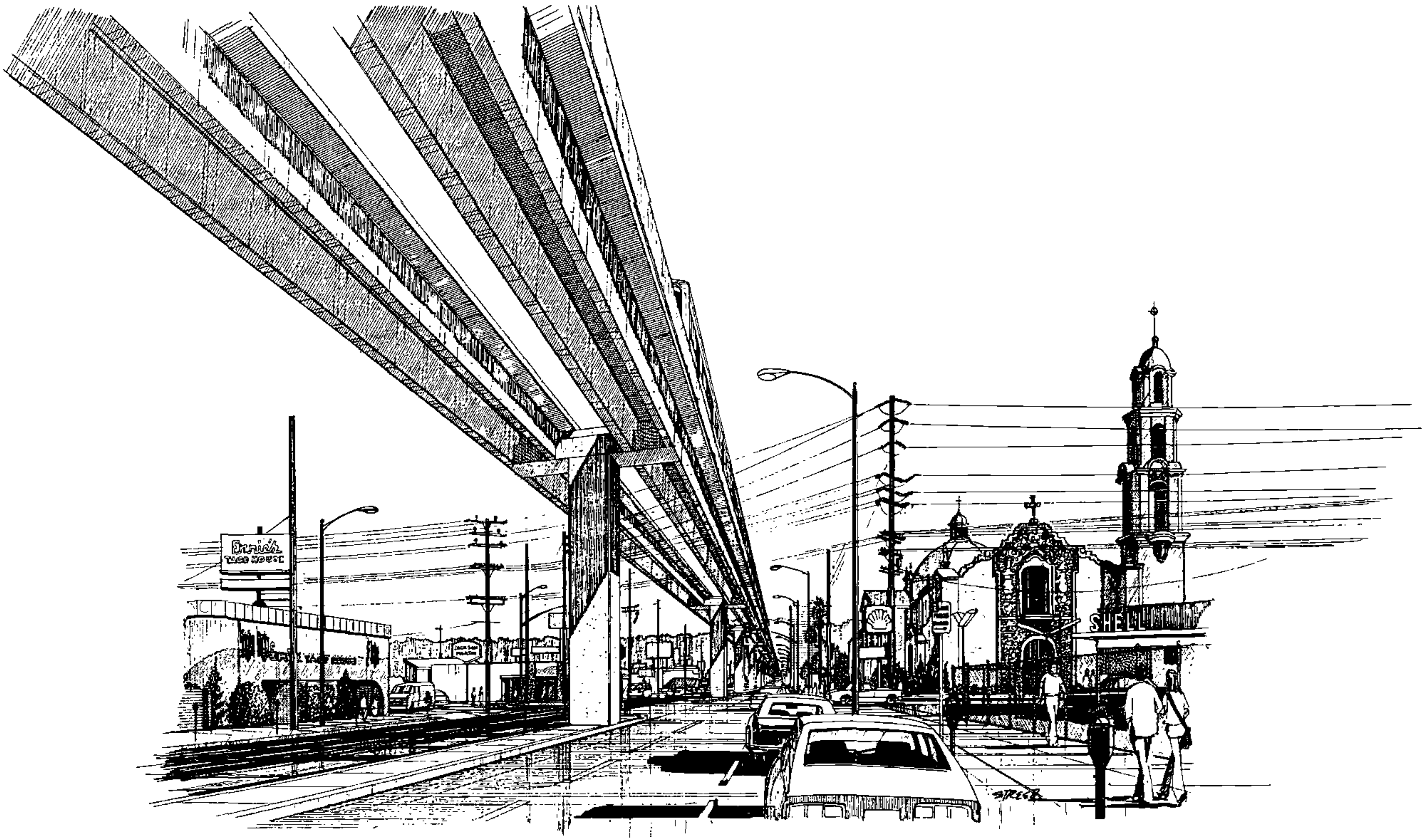
Harry Weese & Associates



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 3-15 North Hollywood Portal, Aerial Option

Harry Weese & Associates



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 3-16 Lankershim General View - Aerial

Harry Weese & Associates

- At North Hollywood, the design of the station and landscaped environment would have a beneficial effect by replacing a visually fragmented and unorganized setting. However, the parking structure's bulk and height is incompatible with the relatively small structures along Chandler Boulevard. As noted earlier, this impact is only short term, until the Community Redevelopment Agency's Redevelopment Project is implemented.

7.3.4 MINIMUM OPERABLE SEGMENT

The beneficial and adverse impacts of this project alternative are identical to those described for the Locally Preferred Alternative from the Main Yard at Union Station to the Fairfax/Beverly Station.

7.4 MITIGATION

Two types of mitigation measures are described below. The first type involves actions that SCRTD can effectively implement alone. They involve small modifications to the station plans during final design to eliminate adverse visual effects or some landscaping treatment to improve the visual impression of the facilities after they are constructed. These measures are identified below.

Main Yard at Union Station. Relocate the buildings at the property line or utilize a landscaped berm with a continuous planting of street trees to reach a height of 30 to 40 feet to reinforce the spatial definition of Santa Fe Avenue.

Civic Center. Replace trees along the south side of station entrance.

Wilshire/Fairfax. Integrate the structures along Wilshire Boulevard into joint development that includes station entrances and street level commercial space along Wilshire Boulevard to retain the continuity of the commercial street facade, and to reinforce the street space definition. Design the parking structure so that the visual privacy of neighboring residents is protected and their view is varied.

Fairfax/Beverly. The parking structure offers the oppartunity to incorporate street level commercial uses along Beverly Boulevard and Fairfax Avenue to reinforce the continuity of the commercial street facade. Relocate the parking structure over the station close to Fairfax Avenue. Replace the landscaped berm and add a continuous planting of street trees to reach a height of 30 feet to reinforce the spatial definition of Fairfax Avenue. Replace or relocate the displaced portions of the Farmers Market facility.

Universal City. Utilize a landscaped berm with continuous planting of street trees to reach a height of 30 to 40 feet to reinforce the spatial definition of Lankershim Boulevard and Bluffside Drive and to screen and reduce the impact of the kiss and ride area, the bus terminal, station, and access roads.

North Hollywood. Relocate the parking structure over the station entrance closer to Lankershim Boulevard. The parking structure would then offer the oppartunity to incorporate street level commercial uses along Lankershim Boulevard that will reinforce the continuity of the commercial street facade.

Specific to the Aerial Option are the following measures.

Universal City Station. Utilize a landscaped berm with continuous planting of street trees to reach a height of 30 to 40 feet to reinforce the spatial definition of Lankershim Boulevard and Bluffside Drive and to screen and reduce the impact of the large parking area. To minimize adverse impacts of the portal, there are two possible mitigation options.

- Relocate the portal southeast to avoid having the elevated guideway pass over residences west of Ventura Boulevard.

- Relocate the elevated station underground, to the south, with its entrances on both sides of the Hollywood Freeway. Relocate the portal north of the Universal City Aerial Station so that the transition to the aerial guideway to Lankershim Boulevard will be high enough to clear Bluffside Drive.

Aerial Corridor. Acquire a strip of land one parcel deep along the east side of Lankershim Boulevard. Reconstruct Lankershim Boulevard and locate the elevated guideway in a central median strip. The edge of the elevated guideway would be 86 feet from adjoining property lines, providing more visual privacy for the occupants of facing structures. The location of the elevated guideway would improve the street space definition and scale. The street section of a reconstructed Lankershim Boulevard could include a 30-foot median strip with left-turn lanes, a 42-foot roadway on each side with three moving lanes and one curbside parking lane, 15-foot sidewalks, and 28-foot landscaped buffer strips.

North Hollywood. Create a retail frontage along Lankershim Boulevard integrated with the entrance and elevated station to reinforce the continuity of the commercial street facade and street space definition.

The second type of mitigation is actions that require the cooperation of other parties, generally in joint development opportunities. Applicable where buildings have been displaced, this mitigation requires the erection of new commercial, residential, or mixed use buildings that complement the station entrance and other Metro Rail facilities, reinforce the continuity of commercial street facade and street space definition, and restore visual scale and integrity. This process can be supported by the specific plans currently being formulated by the city and county.

8. NOISE AND VIBRATION

8.1 INTRODUCTION

This section presents information on noise and vibration impacts from transit train operation and ancillary facilities and discusses ways of minimizing impacts on the community. Material for this section is from a series of special studies conducted by Wilson, Ihrig and Associates, Inc. (1982a through g), the noise and vibration engineering design consultant to SCRTD. These special studies have been summarized in the SCRTD Technical Report on Noise and Vibration (1983).

8.2 EXISTING CONDITIONS

8.2.1 AMBIENT NOISE ENVIRONMENT

Seventy-eight sites were chosen from which to characterize the ambient noise level along the Metro Rail route. "Spot check," or short term noise and vibration measurements were made at all locations, and 24-hour, or long term, noise measurements were also made at 16 locations.* Each measurement location was in a representative area or near a potentially noise sensitive building. Data presented in Table 3-32 provide a representative sampling of the monitoring sites and cover the diversity of conditions found in the Regional Core. Full documentation of the locations and measurements of all the monitoring sites is available in the SCRTD Technical Report on Noise and Vibration (1983). The short term measurements were made over a 10-minute period during four characteristic periods of the day: daytime, 10:00 a.m. to 2:00 p.m.; rush hour, 4:00 p.m. to 6:00 p.m.; evening, 7:00 p.m. to 10:00 p.m.; and night, 11:00 p.m. to 2:00 a.m. No measurements were made during morning rush hour because noise levels are essentially the same as during evening rush hour. The typical minimum noise level during a measurement period is called the residual, or background, level. Survey measurements show that residual levels range from 37 to 69 dB(A) during the rush hours (and daytime), and 34 to 64 dB(A) during evening and nighttime, when levels decrease significantly at most locations monitored. The median noise level for the different sites ranges from 40 to 72 dB(A) during rush hour, 39 to 72 dB(A) during the day, 43 to 69 dB(A) in the evening, and 38 to 65 dB(A) at night. At many locations the maximum noise levels were over 70 dB(A), with some areas reaching 80 dB(A) or more one percent of the time. Levels above 80 dB(A) are usually considered high for either commercial or residential areas. At several locations the maximum levels did not decrease significantly during evening and night hours because of a high level of vehicular traffic at night.

The survey data show that during any one time period, the noise varies by 20 to 30 dB(A) over the length of the route, indicating a great diversity in the local noise environment. Despite this wide range, the data indicate a high level of ambient noise along most of the alignment, primarily from vehicular traffic.

8.2.2 AMBIENT VIBRATION ENVIRONMENT

Existing exterior vibration sources include automobiles, trucks, buses, underground mechanical equipment, and pedestrians. The vibration level data were taken at the same time and place as the sound level data and were analyzed to obtain a single-

---

* There are three commonly used measures for environmental noise exposure: the Energy Equivalent Level, L_{eq}; the Community Noise Equivalent Level, CNEL; and the Day-Night Sound Level, L_{dn}. L_{eq} is a single number which represents the energy averaged sound level over the measurement period. The CNEL and L_{dn} measures are variations of L_{eq} and characterize the environmental noise exposure over a 24-hour period and differ only slightly. These two measures take into consideration the fact that people are generally more annoyed by a given sound level at night than during the day. All three measures are presented in terms of A-weighted sound level in decibels (dBA), which correlates well with people's subjective reaction to noise.

TABLE 3-32

SELECTED AMBIENT & PROJECT RELATED NOISE AND VIBRATION DATA BY METRO RAIL SEGMENT

Approximate Location[2]	N-Noise[3] V-Vibration[4]	EXISTING CONDITIONS[1] Leq PM Rush	Night	Estimated Ldn/CNEL[5]	SUBWAY OPERATIONS Ground-Borne Noise Standard (dB(A))	Predicted Noise Level	Track and Bed Treatment[6]	AERIAL OPERATIONS Air Borne Noise Ldn With Side Barriers	Maximum Passby With Side Barriers	Allowable Maximum
CBD										
102 Hill Street north	N	70	63	74*	50	31-37	RRF			
of Third Street	V	59	51	—	—	—	—			
103 Seventh Street at	N	69	58	67-69	45-50	38-44	RRF			
Hartford Avenue	V	64	50	—	—	—	—			
4 Wilshire and Flower	N	75	NM[7]	72-74	40-45	34-40	FST			
	V	48	NM[7]	—	—	—	—			
104 Travelodge Motel,	N	66	60	67-69	40	30-36	RST			
1710 W. Seventh Street	V	55	49	—	—	—	—			
Wilshire										
105 Near Mid-Wilshire	N	63	54	64-66	40	29-35	RST			
Convalescent Hospital	V	54	46	—	—	—	—			
8 Wilshire Boulevard	N	71	61	69-71	40	28-34	RST			
and Commonwealth	V	61	55	—	—	—	—			
10 Wilshire Boulevard	N	74	NM[7]	73-75	35	29-35	RST			
and Normandie	V	57	NM[7]	—	—	—	—			
19 South end of	N	58	49	61*	50	43-49	RRF			
Orange Grove Avenue	V	48	44	—	—	—	—			
12 Wilshire near St. James	N	72	67	69-71	35-40	28-34	FST			
Espiscopal Church	V	52	52	—	—	—	—			
15 Longwood Avenue	N	67	58	65-67	40	30-36	RST			
40' South of Wilshire	V	50	38	—	—	—	—			
20 CBS TV Studio	N	57	NM[7]	56-58	25	18-24	RRF			
	V	47	NM[7]	—	—	—	—			
22 Country Villa	N	68	59	68-70	40	41-47	FST			
Convalescent Home	V	49	46	—	—	—	—			
Hollywood										
110 Sunset Boulevard	N	69	67	72-74	50	34-40	RRF			
and Fuller Avenue	V	51	46	—	—	—	—			
115 Selma Avenue and	N	65	58	66-68	50	44-50	RST			
Hudson Avenue	V	51	47	—	—	—	—			
29 Vine Street and	N	72	NM[7]	69-71	NA	NA	NA			
DeLongpre Avenue	V	60	NM[7]	—	—	—	—			
32 Las Palmas Avenue	N	60	55	77*	35-40	25	RRF			
and Milner Terrace	V	41	34	—	—	—	—			
31 Cerritos Place and	N	59	54	60-62	35-40	25	RRF			
Holly Hill Terrace	V	42	44	-	—	—	—			
35 7010 Pacific View Dr.	N	56	46	53-55	35	30	RRF			
	V	36	25	-	—	—	—			
36 3149 Oakshire Drive	N	59	52	58-60	35	30	RRF			
	V	43	43	—	—	—	—			
39 3623 Cahuenga Blvd.	N	72	NM[7]	70-72	50	37-43	RRF			
	V	50	NM[7]	—	—	—	—			
North Hollywood										
43 Vineland Avenue and	N	67	59	68-70	35-40	29-35	RST	70-72	74-76	75
Hartsook Street	V	57	55	—	—	—	—	—	—	—
119 Parking Lot, Lanker-	N	61	57	64-66	35-45	20	RRF	64-66	69-71	85
shim and Valley Heart	V	53	47	—	—	—	—	—	—	—
123 10705 Bloomfield	N	60	50	56-58	50	40-46	RST	58-60	79-81	85
	V	46	40	—	—	—	—	—	—	—
124 10830 Camarillo Street	N	64	58	66-68	45-55	38-44	RST	66-68	82-84	85
	V	52	44	—	—	—	—	—	—	—
126 10932 Morrison Street	N	62	49	56-58	35-40	29-35	RST	58-60	70-72	75
	V	50	39	—	—	—	—	—	—	—

Source: Wilson, Ihrig and Associates, Inc., 1982 a, d, and e. Noise and Vibration Survey for the Metro Rail Project, Supplemental Noise and Vibration Survey, Noise and Vibration Study for Alternative Route Alignments, 1982.

[1]These measured levels are expected to also represent No Project condition in the year 2000 because expected traffic volume increases, the factor most likely to affect ambient noise conditions, will not result in detectable noise increases.

[2]Numbers refer to measurement locations, as defined during the noise monitoring survey.

[3]Noise levels — dB(A).

[4]*Weighted vibration velocity levels — dB re1 micro in/sec.*

[5]Ldn and CNEL seldom vary more than 1 dB and are essentially equal measures.

[6]RRF = Resilient Rail Fasteners; FST = Floating Slab Trackbeds; RST = Resiliently Supported Ties.

[7]NM = Not Measured

*Reflects actual 24-hour measurement.

number velocity level weighted to approximate the human response to vibration. The weighting methodology, known as CHABA[1], is described in the SCRTD Technical Report on Noise and Vibration (1983). Weighted vibration velocity levels below about 69 dB are normally imperceptible or just perceptible.

The lowest vibration levels were measured in the Hollywood Hills and Santa Monica Mountains, where there are few vibration-producing activities, especially during evening and nighttime. These locations may also be on or near rock, which takes a greater vibration energy level to produce the same vibration amplitude at the receiver.

The L_1 level[2] at a number of locations exceeds 69 dB, meaning that for approximately 6 seconds in 10 minutes the vibration from passing vehicles was at least barely perceptible. These locations include two along Hill Street in the CBD segment, three along Wilshire between Union Avenue and Vermont, one near Sunset and Vine, and one on Vineland near Whipple in North Hollywood. Weighted vibration velocity Leqs at other locations generally ranged from 34 to 64 dB, typical of commercial and residential areas near heavily traveled streets and comparable to levels in other large cities (such as Baltimore and Chicago). In general, locations with the highest noise levels also have the highest vibration levels. Selected vibration data are provided in Table 3-33.

8.2.3 NOISE AND VIBRATION DESIGN STANDARDS AND CRITERIA

Since noise and vibration produced by operation of transit vehicles and associated ancillary facilities can cause significant environmental impacts, there has been considerable legislative action--at the federal, state, and local levels--which has produced regulations that may affect the design and operational requirements of the Metro Rail Project. The criteria require control of airborne and ground-borne noise and vibration from transit train operations and from transit ancillary areas and facilities such as yard operations, vent and fan shafts, electrical substations, emergency service buildings, and air conditioning chiller plants. The criteria specify numeric limits for allowable noise emissions and establish criteria for determining compliance with standards.

SCRTD has developed a comprehensive set of noise and vibration design criteria, based upon a review of federal and American Public Transit Association (APTA) guidelines, local guidelines, and industry practice. The detailed descriptions and explanations of specific noise and vibration standards are contained in SCRTD Technical Report on Noise and Vibration (1983) and are summarized in Table 3-33. The salient features are discussed below.

Federal Guidelines. No federal agencies have produced regulations which directly apply to rapid rail transit noise. There are EPA regulations which affect construction equipment noise emission.

---

1 CHABA = Committee on Hearing Bioacoustics and Biomechanics.

2 The vibration velocity level exceeded 1 percent of the time, representing the occasional maximum or "peak" vibration level.

TABLE 3-33

NOISE AND VIBRATION CRITERIA FOR THE METRO RAIL PROJECT

Noise Source	Noise or Vibration Measure	BASED ON LAND USE: Res.	Comm.	Ind./ Hwy.	Sensitive Receptors	Other Sensitive Uses	BASED ON OTHER CRITERIA*
Transit Trains							
Single Event Passby (airborne noise)	Maximum A-weighted noise level in dB(A), applied at receiver's distance from track centerline	75	85	85	75	70	
Single Event Passby (ground-borne noise)	Maximum A-weighted noise level in dB(A), applied at receiver's distance from track centerline	35	50	50	35	25-30	
Single Event Passby (vibration)	Maximum CHABA-weighted vibration velocity level in dB, applied at receiver's distance from track centerline	70	75	75	70	70	
Noise Exposure Levels	L_{dn} and CNEL in dB(A), applied at receiver's distance from track centerline (Aerial Option)	65	65	80	65	65	0-3 dB(A) over ambient
Yard							
Maximum Expected Noise (train moving)	Maximum noise level in dB(A) applied at receiver's distance from track centerline						at grade: 70 dB(A), 50' from track centerline aerial: 68 dB(A), 50' from track centerline with side barriers
Maximum Expected Noise (train stationary)	Maximum noise level in dB(A) applied at specific distances from auxiliary equipment						at grade: 61 dB(A), 50' from track centerline aerial: 61 dB(A), 50' from track centerline with side barriers
Vent Shaft							
Maximum Allowed Noise	Maximum noise level in dB(A) applied at 50 feet from source	55	65	75	50	50	
Ancillary Facilities (including fan shafts)							
Maximum Allowed Noise	Maximum noise level in dB(A) applied at 50 feet from continuous source	45	55	65	40	40	
Traffic	Community average noise level (qualitative determination)						0-3 dB(A) over ambient

Sources: Southern California Rapid Transit District, "Noise and Vibration," March 1983; Wilson, Ihrig and Associates, Inc., "Noise and Vibration Study," November 1982; Wilson, Ihrig and Associates, Inc., "Noise and Vibration Design Criteria," April 1982; Wilson Ihrig and Associates, Inc., "Local and Federal Regulation Affecting Noise from the Construction and Operations of the Metro Rail System," April 1982; Noise Control Act of 1972, Public Law 92-574, enacted by Congress October 18, 1972, signed by the President October 27, 1972; American Public Transit Association (APTA), "Guidelines for Design of Rapid Transit Facilities," January 1979; California Health and Safety Code, "California Noise Control Act of 1973," Division 28, Noise Control Act, approved October 2, 1973, Laws of 1973, Chapter 1095, amended by Laws of 1975, Chapters 957, 1124; Laws of 1976, Chapter 1063; Los Angeles County Board of Supervisors, "Noise Control Ordinance of the County of Los Angeles (Ordinance No. 11,778)," undated; and Administrative Code of the City of Los Angeles, "Noise Control Ordinance of the City of Los Angeles (as proposed for amendment)" (Ordinance No. 144,331), 1973.

*Experience indicates that an increase of ambient noise of less than 3 dB(A) is generally not perceptible.

American Public Transit Association (APTA) Guidelines. APTA works very closely with transit-related government agencies, as well as local transit operators, in developing standards of performance. In the case of transit operations, the pertinent noise and vibration criteria are generally based on the American Public Transit Association document "Guidelines for Design of Rapid Transit Facilities," usually referred to as the "APTA Guidelines" (APTA, 1979). These criteria are fully considered in SCRTD's adopted Noise and Vibration Design Criteria for the Metro Rail Project. However, APTA guidelines do not include standards regarding construction noise and vibration.

Local Guidelines. The State of California has enacted a number of laws intended to control noise. None of these laws directly affect the Metro Rail Project. The California Administrative Code, Title 25, does indirectly establish a noise exposure limit standard for airborne noise from rail transit vehicle operation.

Both the County and City of Los Angeles have complied with the requirements of the California Government Code Section 65302(g) by adopting a Noise Element to the General Plan. These Noise Elements in combination with the city and county Noise Ordinances contain specific guidelines relevant to the Metro Rail Project. Primarily these restrictions apply to construction noise and vibration and to ancillary facility noise during operation. They do not apply to vehicle operation during revenue service. The county ordinance adopts measurement standards, establishes community noise criteria, and defines prohibited actions; while the city ordinance establishes standards for ambient noise levels within various land use zones and the criteria for maximum noise levels.

Transit Industry Practices. Transit industry practices generally follow the noise and vibration goals as outlined in the APTA's "Guidelines for Design of Rapid Transit Facilities." This includes all of the newer system facilities and equipment recently designed and built in Washington, D.C., Atlanta, Baltimore, and Buffalo. Specifications for the rail projects built in these cities can be used as the starting point for developing appropriate construction noise and vibration criteria for the SCRTD project.

8.3 IMPACT ASSESSMENT

8.3.1 IMPACT MEASURES AND METHODOLOGY

For commercial areas, noise from transit train operations is primarily a daytime consideration. In residential areas, noise from trains can be problematic during evening and nighttime, when the community ambient noise level is generally lowest. In commercial areas, daytime noise measurements are therefore the most relevant for transit system design. In residential areas, the evening and nighttime operations and noise levels are of primary concern.

To assess the noise and vibration impacts from the Metro Rail Project, the expected levels from rolling stock, maintenance and yard operations, auxiliary equipment, feeder transit systems, and ancillary facilities have been examined and compared with existing ambient levels and the Metro Rail Noise and Vibration Criteria (Wilson, Ihrig, 1982a, b, e). Projections were made of the expected ground-borne noise levels from train operations in subway sections, and for the Aerial Option of the expected airborne noise levels produced by trains operating on aerial structures. Special attention was placed on identifying potential impacts on noise sensitive land uses including schools, hospitals, rest homes, and medical facilities. A summary of this data for representative sample sites along the alternative routes is projected in Table 3-32.

8.3.2 SUBWAY OPERATIONS

Underground rail rapid transit systems create ground-borne vibration and noise, which are transmitted from the subway structure to adjacent buildings. This vibration comes from wheels rolling on the rails and is generally perceived in nearby buildings as a low pitched rumbling. The vibration occasionally may be perceptible as mechanical motion. Ground-borne vibration transmitted to buildings near the subway is of such a low level that there is no possibility of structural damage.

The evaluation of subway operations has utilized the effectiveness of resilient rail fasteners, resiliently supported ties, and floating slab trackbeds in reducing ground-borne vibration. Resiliently supported ties reduce ground-borne noise and vibration by 6 to 10 dB, while floating slab trackbeds reduce them by 15 to 20 dB. These reductions are relative to trains operating on direct fixation resilient rail fasteners, which already significantly reduce noise and vibration better than the direct fasteners used on older systems. These special design features reduce noise and vibration in the frequency range most perceptible in the buildings near the subway structure. With the recommended track fixation methods, the ground-borne vibration from transit train operations should not be perceptible at any point along the Metro Rail subway alignment; thus there will be no impact from ground-borne vibration.

The results of the assessment of ground-borne noise for each line segment follow. The No Project Alternative will not result in noise and vibration impacts.

CBD - Wilshire. This segment is common to the Locally Preferred Alternative, the Aerial Option, and the Minimum Operable Segment. Calculations show that ground-borne noise along a large portion of this segment would require resiliently supported ties or floating slab trackbed. However, there are several locations where these measures would not reduce the ground-borne noise from transit train operations to acceptable levels. These locations include the following: the theater at Second and Hill Streets, Theater of Arts on Wilshire east of Bronson Avenue, King Solomon Home for the Elderly on Fairfax north of Clinton Street, Country Villa Wilshire Convalescent Hospital on Fairfax south of Willoughby Avenue, Garden of Palms Rest Home on Fairfax south of Romaine Street, and the apartments on Fairfax midblock between Romaine Street and Santa Monica Boulevard. The somewhat higher noise levels expected in these buildings are due primarily to a very shallow tunnel (depth to top-of-rail of 30 to 40 feet) and/or a crossover in the tunnel raising the expected noise level about 10 dB. Significant impact would occur unless additional measures were taken to reduce ground-borne noise.

Hollywood. Only the Locally Preferred Alternative and the Aerial Option affect this segment. Substantial sections of the alignment would require resiliently supported ties or floating slab trackbeds to reduce ground-borne noise levels. Even with these measures ground-borne noise from transit train operations might not be reduced to an acceptable level at the Blessed Sacrament School on Sunset Boulevard east of Cherokee Avenue. Additional measures must be considered here.

North Hollywood. The Locally Preferred Alternative is in a subway configuration through this segment. (The Aerial Option to the Locally Preferred Alternative is discussed separately in the next section.) There are several sections where resiliently supported ties or floating slab trackbeds would be needed. On Lankershim Boulevard near the Los Angeles River, there is a commercial building where the ground-borne noise from transit train operations may exceed the appropriate criterion even with the use of a floating slab trackbed.

8.3.3 AERIAL OPERATIONS

Concrete deck and all-concrete aerial structures effectively reduce wayside and in-car noise over older all-steel structures, as they have at BART, WMATA Metro, and MARTA. It is also possible to use a sound barrier wall to further reduce wayside noise, since the noise is primarily radiated from the transit car and rails. Therefore, the impact predictions for wayside noise include sound barrier walls as part of the transit system facilities. If the Aerial Option is selected, sound barrier walls will be incorporated into the project for the length of the aerial alignment.

The predicted wayside noise levels from the Metro Rail transit trains take into account operational characteristics such as train length, speed, and auxiliary equipment noise. It has been assumed that solid wheels with either steel or aluminum hubs will be used on all vehicles and that the maximum speed would be 70 miles per hour. It should also be noted that rail train noise is strictly a function of speed.

Most of the areas along Lankershim Boulevard are strip commercial development, with medium density residential neighborhoods off the alignment. Applicable criteria* for maximum airborne noise from a single transit train passby are 75 dB(A) at single family residences, 80 dB(A) at multifamily residences, and 85 dB(A) at commercial buildings. In addition, the criteria indicate that the maximum airborne noise from a single transit train passby should not exceed 75 dB(A) at churches, theaters, schools, hospitals, museums, or libraries.

Calculating the noise from a single passby does not necessarily indicate the cumulative effect of noise, since it does not consider the duration of each passby or the number every hour or day. A loud noise occurring very infrequently may be less annoying or intrusive than a moderate noise occurring many times, and most of the noise from train operations would occur at fairly frequent, regular intervals.

With sound barrier walls, the noise from trains on aerial structures would raise the Ldn levels at the noise measurement locations by 0 to 3 dB(A), with an average of less than 1 dB(A). Increases of less than 5 dB(A) are not considered significant. Along the Aerial Option the maximum single-event airborne noise criteria are exceeded even with sound barrier walls at approximately 30 single family residences by 2 to 6 dB(A), with an average of about 4 dB(A). The criteria are also exceeded at approximately 10 apartment buildings by up to 3 dB(A), with an average of about 1 dB(A). Most of these residences are within 150 feet of the proposed aerial structure

---

* These criteria were established by APTA in a publication called "Guidelines and Principles for Design of Rapid Transit Facilities," January 1979.

and where the trains will be operating up to the maximum speed of 70 miles per hour. At such locations, where standards are exceeded with sound barrier walls, the adverse impacts may be mitigated by additional mitigation measures, described in section 8.4 of this chapter.

8.3.4 STORAGE AND MAINTENANCE YARD

Storage and maintenance yard noise would result from a number of major sources, including transit cars rolling on the tracks, transit car auxiliary equipment, coupling and uncoupling of cars, train horns, maintenance work, workers shouting, telephone buzzers, and public address systems. The North Hollywood storage yard for the Aerial Option is the only area that could conflict with residential uses. The Union Station main yard would be in a train switchyard area with already high noise levels. The North Hollywood Station tail tracks for the subway would be designed to avoid any potential adverse impacts. The Aerial Option tail tracks would generate noise levels that intrude on nearby residential areas.

8.3.5 METRO RAIL SUBSYSTEMS

Vent Shafts. With no acoustical treatment in the shafts, most sounds from the system would be transmitted to the surface. The levels permitted in the noise and design criteria are generally lower than typical ambient levels. Acceptable levels are keyed to land use and are measured 50 feet from the source. Since noise will be kept within ambient limits, no significant adverse impacts will occur.

Ancillary Facilities. The final location of all ancillary facilities has not been determined, so only a general discussion of the noise from them follows. As with vent shaft openings, the noise from ancillary facilities is subject to the Metro Rail design criteria for maximum permissible noise levels. The Metro Rail design criteria would ensure that the noise generated by ancillary facilities, regardless of their final location, would be compatible with the ambient noise of the surrounding area.

The criteria for noise from ancillary facilities are similar to those for vent shafts (see SCRTD Technical Report on Noise and Vibration, 1983), except that equipment generating continuous noise levels shall be limited to 5 dB(A) lower because its tonal components can make it more obtrusive. Most power transformers will be below ground to mitigate noise impact. The design of each ancillary facility will incorporate noise reduction features including sound barrier walls around noise sources, complete enclosures around noise sources, and sound attenuators on fans, blowers, and cooling towers.

8.3.6 TRAFFIC

With the construction of the Metro Rail Project, traffic analysis shows that there would be some reduction in traffic (from the year 2000 base condition), primarily on freeways (especially the Hollywood Freeway) and major arterial streets. Traffic reductions of between 1 and 15 percent are projected in some locations, but these will not significantly reduce noise levels, since traffic flow would have to drop by at least 50 percent before a reduction in the noise level would be noticeable.

The changes in traffic patterns around proposed stations would primarily consist of an increase in feeder buses and an increase in the local traffic because of trips to park and ride and kiss and ride areas. Stations most affected by increased traffic are at North Hollywood, Universal City, Fairfax/Beverly, Wilshire/Fairfax, and Union Station. The resulting total change in automobile traffic (up to a 20 percent increase) would not cause significant changes in cumulative noise levels.

8.4 MITIGATION

Mitigation of transit operational noise and vibration is approached by establishing performance standards, design criteria, and vehicle specifications. SCRTD is committed to enforcement of established design criteria and ensuring that such designs perform in accordance with specifications. The major tool utilized to accomplish this will be the contract documents developed between the District and designers, construction contractors, and vehicle suppliers.

Subway Operations. The detailed descriptions and explanations of specific impact mitigation measures and associated design criteria are contained in the report "Noise and Vibration Design Criteria" (Wilson, Ihrig and Associates, 1982) prepared for the Metro Rail Project. The key features of the mitigation measures described therein include:

- Using "continuous welded rail" instead of "jointed" rail on the steel wheel/rail interface.
- Utilizing rail vehicles with lightweight trucks rather than heavyweight trucks in order to provide minimum unsprung weight.
- Using special grinding ("truing") equipment to ensure the smoothness of wheel/ rail interaction.
- Using "Resilient" Rail Fasteners (RRF) instead of "Fixed" Rail Fasteners (rigidly attached rails) as a track fixation method.
- If necessary, utilizing Resiliently Supported Ties (RST) where Resilient Rail Fasteners (RRF) are inadequate to satisfy applicable noise standards and criteria.

SCRTD is committed to the above design configurations and will include them in both subway and aerial systems. These "built-in" mitigation measures are "proven technology" which automatically reduce noise and vibration levels by a significant degree, and satisfy noise abatement criteria in most cases without the need for additional mitigation. This is especially true of the Resilient Rail Fasteners (RRF) and Resiliently Supported Ties (RST) mentioned above, to which SCRTD is firmly committed.

Certain locations require more effective noise mitigation measures. The complete detailed description of noise predictions and recommended track fixation methods (RRF, RST, FST) for each of the rail alternatives is in the SCRTD Technical Report on Noise and Vibration (1983). In this report, there are several locations identified at which Floating Slab Trackbed (FST) fixation methods are needed for the Locally Preferred Alternative, Aerial Option, and Minimum Operable Segment in order to reduce noise levels to acceptable levels. For the Locally Preferred Alternative, 32 of the 287 locations will require FST fixation. For the Aerial Option, 31 of the 320 locations will require the FST, and for the Minimum Operable Segment 13 of the 154 locations will require FST mitigation measures. The FST along with other techniques can provide greater sound reductions. The feasibility of using FST for sections of the Metro Rail Project will be determined prior to the Final EIS/EIR. The noise assessment and mitigation measures, specified in the Final EIS/EIR, will take the feasibility of using FST into account. During Final Design, the mitigation measures specified in the Final EIS/EIR will be implemented to meet the noise and vibration criteria adopted for the project. Other measures include the following:

1. Minor shifts in horizontal and/or vertical alignment

2. Crossover relocation

3. Rail system structure modification

4. *Non-Standard Floating Slab Design*

The subway system has special mitigation measures which include, but are not limited to, the following:

1. "Vibration Isolation" by blocking direct transmission of vibration where the subway structure is unusually close to buildings and their foundations. This can be accomplished by using elastomer pads and intervening soil as special resilient elements.

2. Tunnel noise abatement to improve the interior acoustical environment for employees and passengers. This can be accomplished by integrating an acoustical absorption system within the tunnel structure.

Aerial Operations. The aerial system has special mitigation measures which include, but are not limited to, the following:

1. All-concrete or combination concrete/steel structures rather than all-steel structures.

2. Sound barrier walls with sufficient height to "shadow" the noise transmitted from the train to the wayside. Such barriers could be constructed in a variety of forms such as:

   - Non-absorptive barriers associated with ballast and tie track installations.

   - Absorptive barriers treated with special acoustical absorbing material on the interior face of the wall.

   - Earth berm or earth cut barrier for at-grade portions.

If the aerial option were selected, sound barrier walls will be constructed for the entire length of the aerial segment.

Fan and Vent Shafts. These facilities will be designed to minimize noise intrusion by including the following specific mitigation measures.

1. Cellular glass and mineral fiber applied to the wall and ceiling surfaces of the shafts to maximize absorption.

2. Standard duct attenuators.

3. Contract specifications requiring certified maximum sound power levels for the fans.

Ancillary Facilities. These facilities, including power substations and emergency power generation equipment, can be modified to minimize noise and vibration using the following specific mitigation measures:

1. Below-ground location of power transformers.

2. Total enclosure of noise source.

3. Absorption material embedded within the facility.

4. Barrier walls surrounding the source.

5. Sound attenuators on fans and ducts.

6. Special mufflers.

9. AIR QUALITY

9.1 INTRODUCTION

The Metro Rail Project is located within the South Coast Air Basin (SOCAB), which includes approximately 6,580 square miles of the Los Angeles metropolitan area. Included within the air basin are the highly urbanized portions of Los Angeles, San Bernardino, and Riverside Counties, and all of Orange County.

For purposes of the air quality analysis, project-related air pollution emissions will be assessed for an approximately 140-square-mile study area. The area quality study area and the smaller 75-square-mile Regional Core are shown on Figure 3-17. The study area boundary is the same as the area used in the assessment of transportation impacts. Approximately 15 percent of the air basin's VMT are traveled within this area.

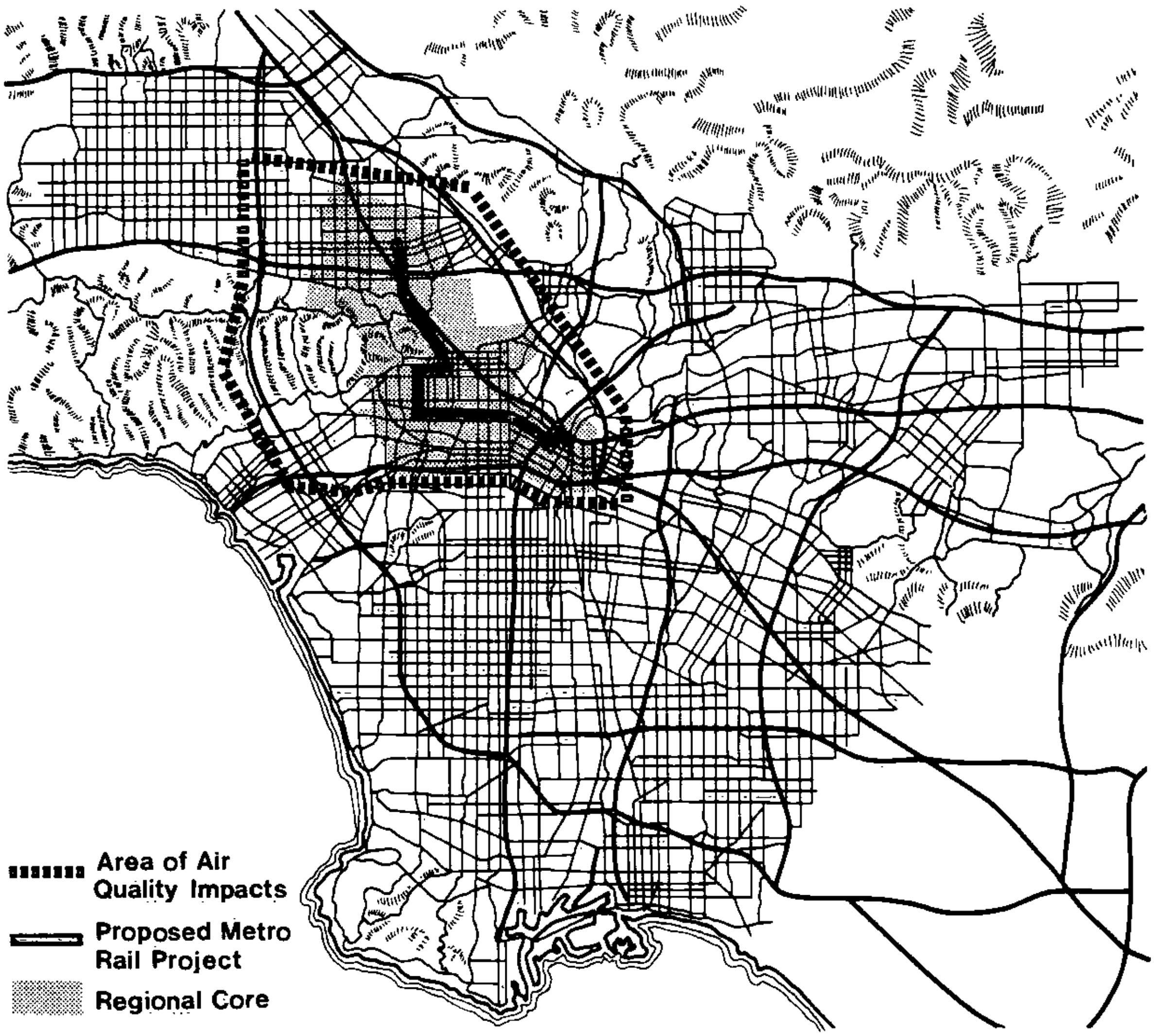


Figure 3-17 Study Area for Air Quality Impacts

9.2 EXISTING CONDITIONS

9.2.1 AIR POLLUTION METEOROLOGY

SOCAB is an area of high air pollution potential, particularly from June through September. The poor ventilation afforded by the generally light winds (5.6 miles per hour average in the downtown area) and shallow vertical mix of air in the area frequently keep emissions from being diluted. Added to this is the plentiful sunshine, whose energy converts emissions of the primary contaminants (nitrogen oxides and hydrocarbons) into ozone, photochemical aerosol, and other secondary products (SCAQMD, 1979).

Ambient air pollution levels at any particular SOCAB location are affected by air patterns. The land-sea breeze dominates the local wind patterns, resulting generally in onshore winds during the day and offshore winds at night. Pollutants move inland during the day, often causing high pollution readings in valley areas, and move seaward at night, often to be blown back in the next day. Thus ambient pollution levels at any given time do not always reflect the level of emissions actually generated within the immediate area.

TABLE 3-34

AIR QUALITY SUMMARY FOR STUDY AREA MONITORING STATIONS, YEAR 1980

Contaminant/Station	Days Exceeding State Standards	Days Exceeding Federal Standards	Annual Average of Monthly 1-Hr Max. Air Contaminant Concentrations	State Standard	Federal Standard
OZONE					
West Los Angeles	89	35	0.21 ppm	0.10 ppm/hr	0.12 ppm/hr
Los Angeles CBD	109	59	0.29 ppm		
Burbank	137	99	0.35 ppm		
CARBON MONOXIDE					
West Los Angeles	19[a,b]	36[b]	25 ppm	9 ppm/8 hr	9 ppm/8 hr
Los Angeles CBD	7[a,b]	14[b]	19 ppm	and	and
Burbank	39[a,b]	54[b]	29 ppm	20 ppm/hr	35 ppm/hr
NITROGEN DIOXIDE					
West Los Angeles	18	annual standard exceeded	0.37 ppm	0.25 ppm/hr	.05 ppm/annual avg.
Los Angeles CBD	16	annual standard exceeded	0.44 ppm		
Burbank	23	annual standard exceeded	0.35 ppm		
SULFUR DIOXIDE					
West Los Angeles	0	0	.017 ppm	.05 ppm/24 hr	0.14 ppm/24 hr
Los Angeles CBD	0	0	.037 ppm		
Burbank	0	0	.028 ppm		
PARTICULATE MATTER					
West Los Angeles	29	0	79[c] ug/m^3	100 ug/m^3/24 hr	260 ug/m^3/24 hr
Los Angeles CBD	55	0	108[c] ug/m^3		
Burbank	NM	NM	NM		
LEAD					
West Los Angeles	2 months	1 quarter	2.02[d] ug/m^3	1.5 ug/m^3	1.5 ug/m^3
Los Angeles CBD	5 months	1 quarter	2.68[d] ug/m^3	30 day avg.	quarterly avg.
Burbank	NM	NM	NM		

NM = Not monitored.

ug/m^3 = Micrograms per cubic meter.

Source: SCAQMD, May 1981. SCAQMD, September 1981.

[a]Data shown are for the old ppm 10 hr standard which was revised in December 1982. The State eliminated the 12 hr CO standard and adopted the Federal 8 hr standard. The 40 ppm/hr CO standard was changed at the same time to 20 ppm/hr.

[b]Data is for 8 hr standard; 1 hr standard was not exceeded.

[c]Annual average of total samples.

[d]Annual average of monthly concentrations.

9.2.2 AIR QUALITY STANDARDS

The state and federal governments have each established air quality standards for various pollutants, set at or below levels at which air is defined as essentially clean, and with a sufficient margin to protect public health and welfare.

The federal standards, established by the Environmental Protection Agency (EPA), are statutory requirements to be achieved and maintained as required by the Clean Air Act of 1970 (as amended). The Clean Air Act stipulates that primary ambient air quality standards for particulate matter, sulfur dioxide, and nitrogen dioxide were to be attained by the end of 1982. Primary standards for ozone and carbon monoxide were also to be attained, except where extensions were granted under strictly prescribed statutory provisions. California was among the states granted an extension until 1987 to meet the standards for carbon monoxide and ozone. Except for sulfur dioxide, SOCAB has been designated a nonattainment area for each of the primary pollutants; that is, they do not meet the established air quality standards. While some progress is being made, it is not expected that SOCAB will reach attainment of federal standards in the immediate future. State of California standards, established by the California Air Resources Board (CARB), represent the goals of existing and planned air pollution control programs. The applicable federal and state air quality standards for various pollutants of interest are included in Table 3-34.

9.2.3 STUDY AREA AIR QUALITY

The South Coast Air Quality Management District (SCAQMD) monitors air quality at numerous locations in SOCAB. Three monitoring stations are located within the study area: the West Los Angeles station (near the southwest corner of the study area), the Los Angeles CBD station, and the Burbank station (near the northeast corner of the study area). A summary of air quality data collected at study area monitoring stations for the year 1980 is provided in Table 3-34. Federal standards were not met for ozone, carbon monoxide, nitrogen dioxide, and lead. A brief description of air quality trends follows.

Ozone. Between 1976 and 1980 the number of days exceeding the state standard of 0.10 parts per million (ppm)/hour at the Los Angeles CBD station has steadily declined. Still, the standard was exceeded on 109 days in 1980. Ozone concentrations at the West Los Angeles station showed a marked increase in 1979 and 1980 over the previous three years. At Burbank, no discernible trend is evident, but ozone levels remain relatively high in comparison with those measured at other SOCAB stations. The federal standard is frequently exceeded at all three monitoring locations and most frequently at Burbank.

Carbon Monoxide. From 1976 to 1980 the number of SOCAB station days exceeding the federal eight-hour CO standard decreased by almost 50 percent. The one-hour 35 ppm federal standard has not been exceeded at any study area monitoring stations since 1975. In 1980, the one-hour CO standard was not exceeded anywhere in the Basin. The eight-hour standard remains difficult to achieve, however. Levels at the Los Angeles CBD station continued to decline in 1980, with West Los Angeles remaining about the same between 1976 and 1980. The Burbank station levels have stabilized in 1978-80 at levels well below 1976-77. The federal eight-hour standard is still frequently exceeded at West Los Angeles and Burbank and occasionally in the Los Angeles CBD.

Nitrogen Dioxide. In 1980, the state nitrogen dioxide standard of 0.25 ppm/hr was exceeded on 23 days at Burbank, more than at any other SOCAB monitoring station. NO_2 concentrations at the Los Angeles CBD station have exceeded the federal standard by some 50 percent since 1965, with little overall change since then. The three monitoring stations in the study area have recorded some of the highest NO_2 levels in SOCAB, and each has exceeded the federal (annual) standard in 1980 and previous years.

Sulfur Dioxide. During 1980, there were no violations of state or federal SO_2 standards at any SOCAB monitoring stations.

Particulate Matter. The 100 microgram per cubic meter (ug/m^3) state standard continued to be regularly exceeded at Los Angeles CBD and West Los Angeles with no apparent tendency towards improvement. The federal standard was not exceeded in 1980. Particulate matter is not monitored at Burbank.

Lead. Violations of the lead standard occur in SOCAB areas with high traffic volumes. The Los Angeles CBD station recorded violations of the state lead standard for five months in 1980, while West Los Angeles recorded two months in violation. Each station exceeded the federal quarterly standard once in 1980. Lead is not monitored at Burbank. Because of continued progress in reducing atmospheric lead concentrations in SOCAB, the federal standard should be attained by the mid-1980s (SCQAMD, 1981).

9.2.4 LOCAL AIR QUALITY SETTING

The use of SCAQMD station data to reflect conditions at specific locations has been determined to be extremely reliable. Correlation coefficients for any two stations in the air quality study area are generally within 0.90, indicating that CO distributions follow a clear regional pattern. As older cars have been retired from service and replaced by newer cars that pollute less, baseline CO levels have slowly dropped and will continue to do so. Table 3-35 summarizes baseline CO measurements in 1980 and the projected background levels for the year 2000. The morning rush hour has the highest CO concentration and is therefore the period selected for detailed analysis in microscale CO impact analysis.

9.2.5 CONSISTENCY WITH REGIONAL TRANSPORTATION PLANNING

An assessment of a project's consistency with local, regional, state, and federal plans is required for all projects receiving federal funding. Two plans are of particular concern for the Metro Rail Project: the Regional Transportation Plan (RTP) and the Air Quality Management Plan (AQMP). This project is one part of the RTP for Southern California. The RTP provides the basis for projecting future growth and associated traffic patterns and for determining the emissions changes associated with that growth. The AQMP currently has a long range target of reducing reactive organic gases (nitrogen oxides and hydrocarbons) by 50 tons per day through transportation management and design (AQMD/SCAG, 1982). To the extent that Metro Rail reduces VMT, trip generation, or congestion by diverting automobile trips, it is consistent with the long range strategies of the AQMP.

TABLE 3-35

EXISTING AND PROJECTED MAXIMUM BACKGROUND CO LEVELS (ppm)

Location	1980 Baseline (hourly)	2000 Projection* (hourly)	1980 Baseline (8-hour)	2000 Projection* (8-hour)
Downtown Los Angeles (Union Station)	18.0	14.0	12.5	9.7
West Los Angeles (Fairfax area)	18.0	14.0	12.9	10.0
Burbank (Universal City, North Hollywood)	24.0	18.7	19.3	15.0

Source: WESTEC Services, Inc.

*SCAG, Air Quality Management Plan (AQMP), Appendix No. VI-B, Revised 1982.

Year 2000 projections calculated as follows: Ratio of $\frac{\text{year 2000 emissions}}{\text{year 1980 emissions}} \times$ 1980 CO Levels

Consistency with the AQMP is not strictly applicable in this case, though, since the plan for ozone and carbon monoxide developed in the 1979 AQMP was disapproved by EPA on January 21, 1981. Had the plan and its transportation-related measures been approved, this would have been incorporated into the State Implementation Plan (SIP), a statewide program for improving air quality. However, as a result of EPA's action, the proposed Metro Rail Project is in an area where there is no approved State Implementation Plan with any enforceable Transportation Control Measures (TCMs). Because the 1982 SIP revisions containing TCMs do not predict the attainment of ozone standards by 1987, as required by the Clean Air Act, these revisions may also not be approved by EPA. If they were approved, the Metro Rail Project would satisfy consistency requirements as part of the regional transportation improvement program.

9.3 IMPACT ASSESSMENT

9.3.1 IMPACT MEASURES AND METHODOLOGY

Impacts on air quality have been assessed from two perspectives: a subregional analysis and a micro-scale analysis. The subregional analysis estimates emissions savings due to Project alternatives for the five primary pollutants. Emissions were calculated using trip generation factors for each alternative developed from traffic modeling tasks. Trip characteristics, such as hot start/cold start emissions and trip speeds, were obtained from Caltrans. The microscale analysis, examining carbon monoxide concentrations at each proposed parking structure, used a combination of methodologies including CALINE3, and Gaussian dispersion. Carbon monoxide concentrations pertinent to both the federal one-hour and eight-hour standards were assessed.

9.3.2 SUBREGIONAL ANALYSIS

The No Project Alternative is predicted to have a VMT level within the air quality study area of 35,254,000 in the year 2000. These VMT include only light-duty vehicles associated with commuter home-to-work trips. The Locally Preferred Alternative with and without the Aerial Option is expected to divert 1,730,000 VMT per average workday. The Minimum Operable Segment is expected to divert 1,690,000 VMT per day in the study area. According to the preliminary traffic modeling results, the average trip length does not change as a result of implementing any Project alternative.

Table 3-36 shows that the resulting direct air quality benefit is substantial. The rail project will have a major impact on reducing the incidence of air quality nonattainment in the region. Even when taking into account the pollutants resulting from project-related power generation, net impacts are still favorable in all cases except sulfur dioxide, for which the small net increase would not result in any air quality standards being exceeded.

TABLE 3-36

DIRECT REGIONAL AIR QUALITY BENEFITS
FROM THE METRO RAIL ALTERNATIVES, YEAR 2000

	No Project Alternative	Locally Preferred Alternative[1]		Minimum Operable Segment	
Pollutant	Regional Vehicular Emissions (tons/day)	Regional Vehicular Emissions (tons/day)	Regional Emissions Benefit (tons/day)	Regional Vehicular Emissions (tons/day)	Regional Emissions Benefit (tons/day)
Carbon Monoxide	461.3	438.8	22.5	439.3	22.0
Reactive Hydrocarbons	37.7	35.9	1.8	35.9	1.8
Oxides of Nitrogen	57.9	55.0	2.9	55.0	2.9
Sulfur Dioxide	8.9	8.4	0.5	8.4	0.5
Suspended Particulates	12.4	11.7	0.7	11.7	0.7

Source: WESTEC Services, Inc.; SCRTD.

[1]Locally Preferred Alternative and Aerial Option have the same impact.

Not only is the direct VMT reduction from the Project alternative significant, the secondary benefits, notably reduced congestion, involving the interaction of all AQMP TCMs appear substantial as well. Using outputs from various runs of the Caltrans Direct Travel Impact Model (DTIM-A Regional Air Emissions Simulation Model), the effects of implementing various traffic reduction measures including Metro Rail are shown to have a significant benefit on regional air quality. Decreases in emissions of HC, CO, and NO_x, ranging between two and four percent within Regional Statistical Areas comprising the City of Los Angeles, have been projected by the year 2000 relative to a scenario involving no transportation system improvements. Thus, the Metro Rail Project creates cumulative regional air quality benefits by providing a system that reduces auto use in association with other planned strategies.

9.3.3 MICROSCALE ANALYSIS

From a review of the traffic modeling results, Union Station, Universal City, and sections of Fairfax were identified as areas affected by a significant change in traffic volumes or in the level of service at key intersections. Traffic around the proposed parking structures at the North Hollywood Station would change, but such changes could be accommodated by planned improvements to the roads. The exception is the Lankershim/Burbank intersection, where increased congestion is predicted. Accordingly, the Lankershim/Burbank intersection and the four stations at Union Station, Wilshire/Fairfax, Fairfax/Beverly, and Universal City were selected for microscale CO analysis.

Microscale air quality impacts are generally related to exposure to air pollutants at any sensitive sites, including residences, parks, hospitals, and schools. Most of the stations are in areas with commercial, office, or similar uses, where there are few potentially sensitive sites or the sites are far enough from areas of increased project-related vehicular activity to keep microscale impacts to a minimum.

CALINE3 calculations were carried out for the morning rush hour at the five selected locations using traffic conditions predicted by the Los Angeles City Department of Transportation and conservative estimates of the eight-hour traffic volumes at parking structures and kiss and ride locations. Emission factors for various traffic elements were developed by Caltrans LARTS staff.*

Calculations at each location were made first for winds parallel to the most significant emissions source near the five sites and then for winds perpendicular to the major roadway near the Metro Rail station. Parallel winds tend to maximize CO concentrations adjacent to the roadway, while perpendicular winds create higher CO concentrations farther from the source, often near potentially sensitive receptor sites. The maximum hourly and estimated eight-hour CO concentrations at sites

* The factors were based on ENV028 composite emissions factors, which in turn were derived from the EMFAC6C vehicular emissions model. For purposes of this analysis, traffic volumes that resulted in an increase in CO concentrations of 2 ppm are considered *significant*.

where a significant population exposure is possible are summarized in Table 3-37. The following conclusions can be drawn:

- Microscale CO impacts from Metro Rail-related traffic, in conjunction with baseline traffic levels, are highly localized.

- Violations of the national ambient air quality standards for CO for eight-hour exposures will continue at about the same rate with or without the project within the air quality study area.

- Violations of the state one hour 20 ppm standard are projected at the Macy/Vignes intersection, at the corner of Beverly and Fairfax, at the Universal City Station, and at the Lankershim and Burbank intersection. Because the CO standard has been recently revised and implementing regulations have not been published, the full implications of these excess levels are not known.

It is expected that CO levels at the selected receptor sites under the Project alternatives would be higher than under the No Project Alternative. This result is expected because the parking and bus facilities associated with the Project alternatives will attract additional traffic in the station area.

9.3.4 ATMOSPHERIC LEAD ANALYSIS

The use of unleaded gasoline in new cars has caused significant reductions in atmospheric lead levels. Minor increases, ranging from 0.04 to 0.07 ug/m^3, have been projected above ambient levels at Metro Rail stations with parking structures. Such minor increases will have no significant adverse impact.

9.4 MITIGATION

The Metro Rail Project constitutes a significant air quality benefit for the region, but also creates some localized adverse air quality impacts. The project contributes incrementally to local CO concentrations at several intersections by increasing congestion and reducing the intersection's level of service. But since CO standards will be exceeded at these locations with or without the project, the project does not of itself create unhealthful air quality. The traffic mitigation measures discussed in the Transportation section of this chapter are proposed in order to improve the level of service at Macy/Vignes, Lankershim/Tour Center, Lankershim/Burbank, and other locations; however, they would also improve air quality. Traffic measures that prevent CO concentrations from exceeding the 2 ppm significance threshold would be effective air quality measures.

The following measures would provide additional air quality benefits by diverting more auto users to Metro Rail and/or by reducing the number of patrons using their cars to drive to and park at Metro Rail stations.

Measures which will be adopted are:

- Provide secure facilities at stations for bicycle and motorcycle parking

- Improve feeder bus service to the transit stations

TABLE 3-37

PROJECTED CO LEVELS (PPM) AT POTENTIALLY SENSITIVE RECEPTOR SITES,[1] YEAR 2000

Receptor Site	ONE-HOUR CONCENTRATION[2] Local	Background	Total	EIGHT-HOUR CONCENTRATION[3] Local	Background	Total
UNION STATION[4]						
Macy/Vignes Intersection	6.6	14.0	20.6	3.3	9.7	13.0
Metro Rail Entrance	3.4	14.0	17.4	1.7	9.7	11.4
WILSHIRE/FAIRFAX[4]						
West Entry Canopy	4.4	14.0	18.4	2.2	10.0	12.2
Museum Bus Drop-Off	4.0	14.0	18.0	2.0	10.0	12.0
Parking Structure	3.8	14.0	17.8	1.9	10.0	11.9
Curson Condos	2.2	14.0	16.2	1.1	10.0	11.1
Tar Pits	1.8	14.0	15.8	0.9	10.0	10.9
Museum Steps	1.8	14.0	15.8	0.9	10.0	10.9
Spaulding Condos	1.2	14.0	15.2	0.6	10.0	10.6
FAIRFAX/BEVERLY[4]						
Corner of Beverly/Fairfax	6.0	14.0	20.0	3.0	10.0	13.0
North Platform Entry Canopy	3.8	14.0	17.8	1.9	10.0	11.9
CBS Television City	1.6	14.0	15.6	0.8	10.0	10.8
UNIVERSAL CITY[5]						
Kiss and Ride Lot	10.0	18.7	28.7	5.0	15.0	20.0
Tram Pickup	7.0	18.7	25.7	3.5	15.0	18.5
Campo de Cahuenga	6.0	18.7	24.7	3.0	15.0	18.0
Station Entrance	5.4	18.7	24.1	2.7	15.0	17.7
Bus Unloading Area	4.8	18.7	23.5	2.4	15.0	17.4
Bluffside Residential Area	4.0	18.7	22.7	2.0	15.0	17.0
Weddington Park	4.0	18.7	22.7	2.0	15.0	17.0
LANKERSHIM/BURBANK INTERSECTION[5]						
Southwest Corner	8.8	18.7	27.5	4.4	15.0	19.4
50' W on Burbank	7.4	18.7	26.1	3.7	15.0	18.7
50' SE on Lankershim	6.8	18.7	25.5	3.4	15.0	18.4
100' W on Burbank	6.0	18.7	24.7	3.0	15.0	18.0
100' SE on Lankershim	5.2	18.7	23.9	2.6	15.0	17.6

Source: WESTEC Services, Inc.

[1]Projected CO concentrations are presented for the wind conditions that result in the highest concentration (the worst case condition).

[2]For comparison purposes, the state standard is 20 ppm/hour and the federal standard is 35 ppm/hour.

[3]For comparison purposes, the federal and state standard is 9 ppm/8 hours.

[4]Applies to Locally Preferred Alternative, Aerial Option, and Minimum Operable Segment.

[5]Applies to Locally Preferred Alternative and Aerial Option.

- Conduct public information programs to promote voluntary trip reductions and publicize feeder line possibilities.

An additional measure under consideration is to offer parking cost benefits to carpoolers.

10. ENERGY

10.1 INTRODUCTION

This section discusses the energy implications of Metro Rail alternatives. The general approach involves compiling energy use estimates for automobiles and buses, based on Vehicle Miles Traveled (VMT), and adding, where applicable, a comprehensive energy use analysis of the rail alternatives. All calculations have been converted to British thermal units (BTUs) to allow direct comparison. The area of analysis for this impact category is the six-county region.

10.2 EXISTING CONDITIONS

Electricity for the Regional Core is primarily supplied by the City of Los Angeles Department of Water and Power (LADWP), whose service area encompasses the 464-square-mile City of Los Angeles. Principal power system facilities are located throughout much of the Western states. During fiscal year (FY) 1980-81, approximately 20.1 billion kilowatt hours (kWh) of electricity were produced or purchased to satisfy LADWP customer demand, including an allotment for energy losses within the system. Nearly half this amount was produced within the Los Angeles Basin by steam generating plants. One-third was produced by the Coronado, Mohave, and Navajo Generating Stations. Hydroelectric sources supplied approximately 13 percent, and 6 percent of the demand was purchased or provided by net interchange supplies from other Western utilities.

To maintain a continued supply of reliable and economical electricity, LADWP is participating in a number of energy development projects both alone and in cooperation with other public agencies. In addition to the gas, coal, and nuclear projects now underway, fuel sources under consideration include geothermal, solar, and cogeneration.

By the year 2000 LADWP expects their peak power supply to be 7,628 megawatts and their average annual demand to be approximately 40.1 billion kWh. Nearly half of LADWP's power supply will be produced by coal (46 percent). The remaining electricity will be produced by gas and oil (17 percent), nuclear (8 percent), hydroelectric (7 percent), and geothermal, solar, and cogeneration (13 percent), with the remaining 9 percent of the power supply purchased.

In the Los Angeles region, the reduction in gasoline consumption from 1979 to 1980 exceeded the Air Quality Management Plan's projected reduction of 1.4 percent for this same period, indicating a faster rate of decrease in gasoline consumption than expected (SCAG, 1981). Further reduction in gasoline sales will depend on the user population and increased fuel economies for vehicles. Assuming a conservative one percent reduction in gasoline sales per year, annual gasoline sales for Los Angeles region will be 4,140 million gallons by the year 2000.*

10.3 IMPACT ASSESSMENT

Automobiles and buses are the primary means of transporting people within Los Angeles. Most energy used for cars and buses is expended in propulsion, maintenance, vehicle manufacturing, roadway construction, and roadway maintenance. Energy required to support transportation was calculated for each of the above components per VMT. Table 3-38 represents the estimated year 2000 baseline, or No Project Alternative, energy demand. The factors in this table assume an average life span of 80,000 miles for autos and 100,000 miles for buses.

TABLE 3-38

LOS ANGELES REGION TRANSPORTATION ENERGY DEMAND, YEAR 2000[1]

Component	Energy Use Factor[2] (BTUs/VMT)	Annual VMT (millions)	Total Annual Energy (billion BTUs)
Vehicle Manufacturing			
Auto	1,100	68,445	75,290
Bus	1,200	105	126
Subtotal			75,416
Vehicle Maintenance			
Auto	1,600	68,445	109,512
Bus	1,000	105	105
Subtotal			109,617
Vehicle Propulsion			
Auto	5,208	68,445	356,461
Bus	29,000	105	3,045
Subtotal			359,506
Total			544,539

[1]These figures do not include the energy needed in the maintenance, repair, and replacement of streets and freeways. These roadways generally have a life expectancy of 15 to 25 years. Nearly all road pavement is petroleum-based.

[2]Energy use factors derived from Transportation Research Board, 1982, and Kulash and Mudge, Urban Transportation Energy, December 1977. Bus energy is for SCRTD buses only. It does not include smaller municipal operators, or public transportation outside Los Angeles County.

* This figure is for all taxable gasoline sales (except aviation fuel) and includes heavy-duty gasoline-powered vehicles not included in the analysis of energy requirements for the various alternatives.

Table 3-39 presents the assumptions used to analyze the energy demand of the rail system. Construction energy for rail guideways is estimated at 10,900 billion BTUs using a process analysis method. Construction energy for vehicles assumes 4.1 billion BTUs per vehicle and a year 2000 fleet of 130 rail vehicles. These estimates are converted to BTUs per VMT assuming a conservative 50 year life and 10,533,000 rail vehicle miles traveled in the year 2000. The vehicle manufacturing factor here has been inflated to account for replacement of some rail vehicles. The energy requirement for vehicle maintenance propulsion and station operation are based on specific studies prepared for the Metro Rail Project.

TABLE 3-39

METRO RAIL ENERGY USE ASSUMPTIONS[1]

Component	BTUs/VMT
Guideway Construction	20,697
Vehicle Manufacturing	1,557
Vehicle Maintenance	9,684
Vehicle Propulsion	60,951
Station Operation	43,008

Source: Booz, Allen, & Hamilton, SCRTD Subsystems and Systems analysis for Metro Rail factors.

[1]These factors apply to the Locally Preferred Alternative. They vary slightly for the Aerial Option and Minimum Operable Segment, and these variations are reflected in the calculations shown in Tables 3-41 through 3-43.

10.3.1 NO PROJECT ALTERNATIVE

Energy requirements for each component of the No Project Alternative are shown in Table 3-38. The total annualized energy demand is 544,539 billion BTUs. Of this total, the bus sector would account for .6 percent and the automobile the remaining 99.4 percent. Propulsion energy totals 359,506 billion BTUs which translates to 2.85 billion gallons of gasoline for automobiles and 24.4 million gallons of diesel fuel for buses consumed annually.

10.3.2 LOCALLY PREFERRED ALTERNATIVE

The Locally Preferred Alternative would result in a total annualized energy demand of 541,503 billion BTUs (Table 3-40). The bus sector would account for .6 percent, the rail sector for .3 percent, and the automobile sector for the remaining 99.1 percent. SCRTD preliminary estimates show that operation of the Metro Rail Project and the associated bus network will decrease projected year 2000 annual automobile VMT by approximately 554 million (0.8 percent) and bus VMT by approximately 3 million (2.9 percent). Considering year 2000 projected automobile energy requirements for vehicle propulsion, maintenance, and manufacturing, these reductions would save an annual total of 4,380 billion BTUs from autos and 89 billion BTUs from buses, for a total energy savings of 4,469 billion BTUs (2,967 billion for vehicle propulsion, 889 billion for vehicle maintenance, and 613 billion for vehicle manufacturing). Looked at another way, a reduction of 554 million automobile VMT would conserve 23 million gallons of gasoline, and a reduction of 3 million bus VMT would conserve 650 thousand gallons of diesel fuel.

TABLE 3-40

ANNUALIZED ENERGY REQUIREMENTS
FOR THE LOCALLY PREFERRED ALTERNATIVE, YEAR 2000
(in billions of BTUs)

Component	Auto	Bus	Rail	Total
Guideway Construction	not calculated	not calculated	218	218
Vehicle Manufacturing	74,680	123	18	74,821
Vehicle Maintenance	108,626	102	102	108,830
Vehicle Propulsion	353,577	2,962	642	357,181
Station Operation	not applicable	not calculated	453	453
Total	536,883	3,187	1,433	541,503

Source: SCRTD

In the year 2000 the propulsion, maintenance, and station operation energy requirements of the Locally Preferred Alternative rail component total 1,197 billion BTUs. This energy would be supplied as electricity by LADWP and the Southern California Edison Company. The needed energy would represent less than one-half of one percent of the LADWP's projected year 2000 electricity demand, a total too insignificant to have an adverse effect on LADWP's ability to supply electricity to its customers.

10.3.3 AERIAL OPTION

The Aerial Option would result in a total annualized energy demand of 541,441 billion BTUs (Table 3-41). Compared to the Locally Preferred Alternative, energy savings are realized in guideway construction and station operation. The bus and rail sectors would account for .6 and .3 percent of the total, respectively. Looking at just the bus and auto components, this alternative, relative to the No Project Alternative, would save 23 million gallons of gasoline and 650 thousand gallons of diesel fuel.

TABLE 3-41

ANNUALIZED ENERGY REQUIREMENTS FOR THE AERIAL OPTION, YEAR 2000
(in billions of BTUs)

Component	Auto	Bus	Rail	Total
Guideway Construction	not calculated	not calculated	200	200
Vehicle Manufacturing	74,680	123	18	74,821
Vehicle Maintenance	108,626	102	102	108,830
Vehicle Propulsion	353,577	2,962	642	357,181
Station Operation	not applicable	not calculated	409	409
Total	536,883	3,187	1,371	541,441

Source: SCRTD

10.3.4 MINIMUM OPERABLE SEGMENT

The Minimum Operable Segment would result in a total annualized energy demand of 540,984 billion BTUs (Table 3-42). The resulting annual savings in gasoline and diesel fuel relative to the No Project Alternative would be 22.5 million and 870,000 gallons, respectively. Like the other rail alternatives, the Minimum Operable Segment would not have a significant impact on the ability of LADWP to supply electricity to its customers.

TABLE 3-42

ANNUALIZED ENERGY REQUIREMENTS FOR
THE MINIMUM OPERABLE SEGMENT, YEAR 2000
(in billions of BTUs)

Component	Auto	Bus	Rail	Total
Guideway Construction	not calculated	not calculated	103	103
Vehicle Manufacturing	74,694	121	6	74,821
Vehicle Maintenance	108,646	101	87	108,834
Vehicle Propulsion	353,644	2,928	343	356,915
Station Operation	not applicable	not calculated	311	311
Total	536,984	3,150	850	540,984

Source: SCRTD

10.3.5 COMPARISON OF PROJECT ALTERNATIVES

For all Project alternatives, propulsion energy—largely made up of automobile and bus energy associated with VMT--is the largest single consumer of energy for the system. While the rail project of the Locally Preferred Alternative will require a total energy demand of 1,433 billion BTUs per year, it would save a net of 3,036 billion BTUs per year in reduced automobile and bus energy that would otherwise be consumed if the project were not built. Table 3-43 shows that the energy demand for transportation in the Los Angeles region would decrease .5 percent, from 544,539 billion BTUs per year with the No Project Alternative to 541,503 billion BTUs with the Locally Preferred Alternative.

TABLE 3-43

LOS ANGELES REGION TRANSPORTATION ENERGY DEMAND
UNDER SYSTEMWIDE ALTERNATIVES, YEAR 2000
(billions of BTUs)

Energy Demand	No Project[1]	Locally Preferred Alternative	Aerial Option	Minimum Operable Segment
Guideway Construction	--	218	200	103
Vehicle Manufacture[2]	75,416	74,821	74,821	74,821
Vehicle Maintenance[3]	109,617	108,830	108,830	108,834
Vehicle Propulsion[3]	359,506	357,181	357,181	356,915
Station Operation	--	453	409	311
Total	544,539[4]	541,503	541,441	540,984

Source: SCRTD

[1]To maintain consistency within the EIS/EIR, the No Project Alternative assumes that no major additional transportation facilities will be built in the region. However, as the traffic analyses of the existing condition shows, little or no additional capacity is available on the existing street and freeway system.

[2]It is a coincidence that these numbers are the same for the Locally Preferred Alternative and the Minimum Operable Segment. As shown in previous tables, the increase in auto manufacturing energy in the Minimum Operable Segment offsets exactly the decrease in rail and bus energy from the Locally Preferred Alternative.

[3]Does not include highway repair and reconstruction, maintenance, energy consumed by gasoline stations and so forth. Does include rail transit maintenance energy consumption.

[4]Does not incorporate reductions in fuel economy resulting from the aggravated congestion that would occur.

10.4 MITIGATION

SCRTD has evaluated numerous energy conservation options for the construction and operation of Metro Rail. Major adopted mitigation measures are listed below in two separate groups: propulsion energy and station and facilities design. A third section lists energy mitigation options for which decisions have not yet been made due to their technical complexity. The feasibility of the items listed in this third section will be determined in the final engineering process.

Although energy conservation measures during construction and in support activities (stations, maintenance, adminstration) will help, the most significant savings are likely to occur from reducing the traction energy required to stop and start vehicles and, secondorily, from diverting more patrons from their automobiles to transit.

10.4.1 PROPULSION ENERGY CONSERVATION*

Significant kinetic energy is created when a rail train accelerates and decelerates. This energy is typically wasted. A propulsion energy conservation measure Metro Rail will utilize is "chopper" (semiconductor) traction motor speed controls instead of conventional "cam" (mechanical) speed controls. Although somewhat heavier and bulkier, the new "chopper" control technology is considered to offer, on balance, significant energy benefits for Metro Rail. Use of extra-high voltages (1,000 volts or more) and AC current have also been investigated for their energy saving potential but have been found to involve too many technical uncertainties to be feasible.

SCRTD will equip Metro Rail vehicles to recapture some of the energy used to stop trains through regenerative electrical braking, a generally proven technique. Regenerative braking captures energy that would otherwise be dissipated into the subway as heat. This heat would, in turn, require additional ventilation and cooling energy. The real benefits of regenerative braking depend, however, on the ability to make use of the electrical power pumped back into the traction power system. If another nearby train is just starting up, one train's braking energy can be effectively absorbed by this other train. This is often not the case, but SCRTD will provide regenerative braking energy use or energy storage wherever feasible.

A variety of other mitigation measures will improve propulsion energy efficiency. A special aluminum-clad steel "third rail" which would be a much more efficient conductor than the conventional steel rail will be used. Initial installations of this compound rail have been promising. An automatic control system for train speed which promotes coasting will be implemented. Rail vehicles will be designed and operated so that they are switched off whenever not in service. In addition, the traction system will be designed so that it can eventually be integrated with any adjacent future electrical transit systems such as trolley buses and light rail systems, facilitating more efficient utilization of Metro Rail regenerative braking energy.

10.4.2 STATION AND FACILITIES DESIGN

Opportunities for saving energy in and around stations can come from integrating station design and construction into stores, offices, and apartment complexes. These sorts of joint development and mixed use design concepts not only save building construction and operating energy but also internalize travel that otherwise would require vehicular energy.

---

* For greater detail and additional measures see Kaiser Engineers, Draft Report for the Development of Milestone 8: Systems and Subsystems; Alternative Analyses for Traction Power Report, November 1982; Alternative Analyses of Auxiliary Power Report, December 1982.

Integrated station area design can achieve energy conservation in other ways as well. Interconnected heating and cooling (or other "districting" systems), for example, might save considerable amounts of energy. Building cooling systems might also be used to capture regenerative braking energy; one new CBD building, for instance, already stores off-peak electrical ventilating energy for up to 24 hours in a 50,000 gallon ice tank. In pursuing joint development, Metro Rail will utilize existing elevators to satisfy handicap accessibility requirements whenever possible.

During Final Design, every aspect of station design will be reviewed in order to minimize lighting, heating, ventilating, and air conditioning loads. Air conditioning requirements will be minimized by designing the stations to facilitate ram air exchange by utilizing the piston effect of the trains. Passenger areas within stations will be designed so that lights can be turned off during off-service hours. Any station hot water will include solar hot water pre-heating where feasible.

In the maintenance yard, cold water will be utilized for vehicle washing. The track layout will be designed to minimize non-revenue vehicle movements, and solar hot water pre-heating will be used for hot water and steam needs.

All major Metro Rail facilities (the yard, the car wash, administrative buildings, individual stations, sections of the traction rail, etc.) will have separate electric meters to facilitate energy consumption monitoring and conservation.

10.4.3. ENERGY CONSERVATION DECISIONS IN FINAL DESIGN

Energy conservation will be a continual goal through Final Design. One specific issue to be resolved in the Final Design is the possible contouring of the vertical profile of the tunnels so that gravity helps to "pull" a train away from a station and to slow it down as it approaches a station. Sometimes called "gravity profiling," this technique still has a very high degree of technical uncertainty. Complete models simulating train behavior have indicated that this technique could save moderate amounts of propulsion energy (as much as 8 percent) or, alternatively, could actually require significant additional amounts of energy under various operating conditions. Because of these risks, in addition to cost and safety issues, profile grading requires further evaluation.

11. GEOLOGY AND HYDROLOGY

11.1 INTRODUCTION

Because the design of the proposed Metro Rail Project includes extensive tunneling and surface excavation, geotechnical evaluation of such factors as soils engineering and slope stability, seismicity and other potential geologic hazards, and hydrology/water quality is necessary. To this end, a major geotechnical study has been prepared (Converse, Ward, Davis, Dixon, 1981), and a second study on seismicity is currently undergoing technical review (Converse Consultants, 1982).

These studies are the resource used to describe existing geologic, seismic, and hydrologic characteristics along the Metro Rail alignment and identify potential impacts of the system and measures to mitigate them.

11.2 EXISTING CONDITIONS

The Locally Preferred Alternative and the Aerial Option of the proposed Metro Rail Project traverse parts of three major geomorphic and topographic features: the Los Angeles Basin, the Santa Monica Mountains, and the San Fernando Valley. The Los Angeles Basin and San Fernando Valley are large alluvial basins characterized by relatively low relief, with natural slopes of 1 to 4 percent. In the project area, the Santa Monica Mountains rise steeply to elevations of nearly 1,200 feet along slopes with average gradients of 20 percent to as much as 30 percent. The Minimum Operable Segment, which terminates at the Fairfax/Beverly Station, stays entirely within the Los Angeles Basin.

The Los Angeles River, Tujunga Wash, and Bollona Creek provide drainage for the Regional Core. Each of these drainage systems have been channelized by flood control projects. As a result, their natural capacity to accommodate runoff has been increased considerably and flood hazards to nearby land uses have been minimized.

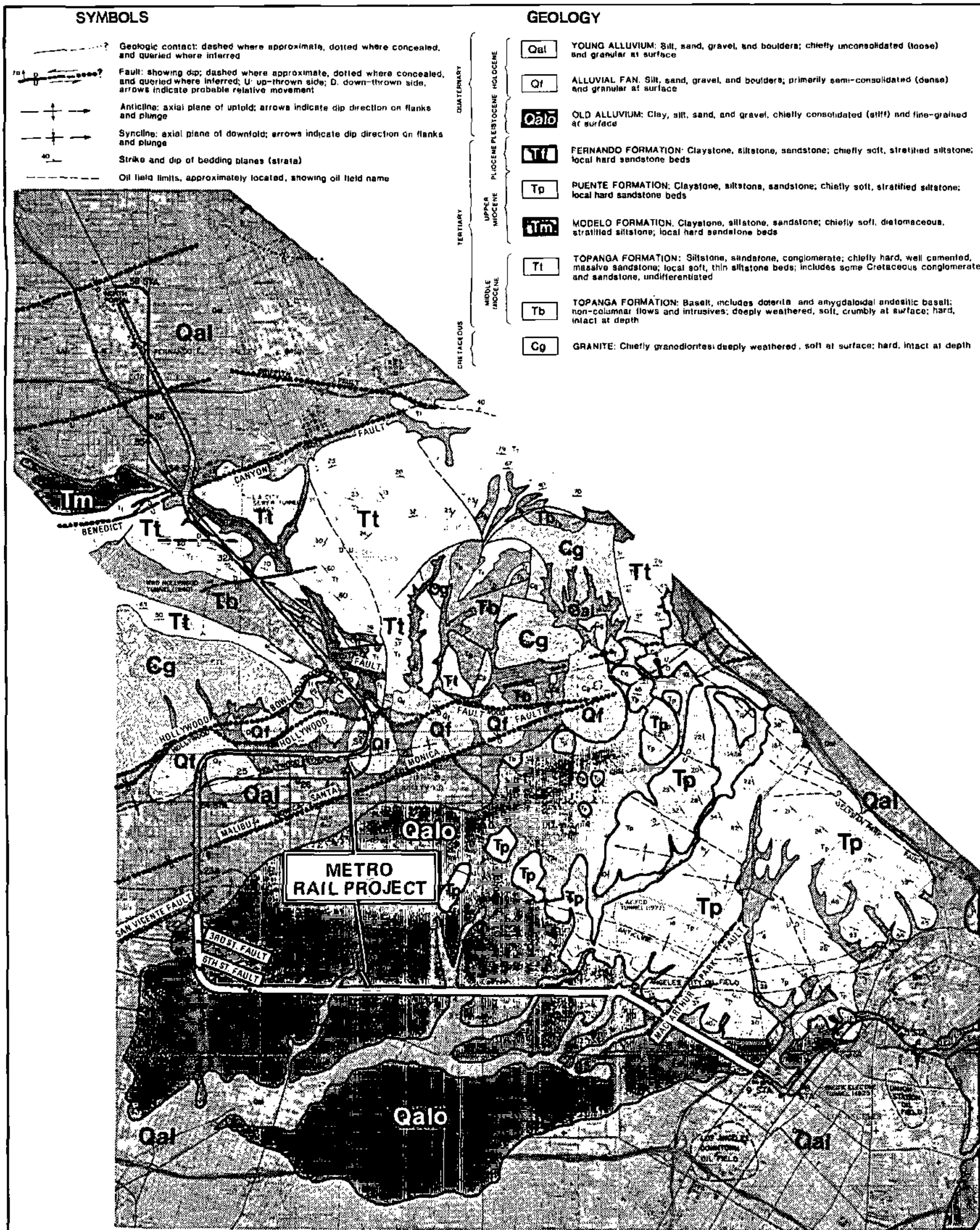
Geologic features in the vicinity of the Metro Rail Project are shown in Figure 3-18. These features along each of the four line segments are described in the following paragraphs. The discussions of the Los Angeles CBD segment and the Wilshire Corridor Segment apply to the Locally Preferred Alternative, the Aerial Option, and the Minimum Operable Segment. The discussions of the Hollywood and North Hollywood segments do not apply to the Minimum Operable Segment.

11.2.1 LOS ANGELES CBD SEGMENT

The Los Angeles CBD segment is underlain by up to 130 feet of loose to dense, stream-deposited young alluvium. Beneath the young alluvium and exposed at the ground surface in the central portion of the Los Angeles CBD are soft-rock claystones, siltstones, and sandstones of the Fernando and Puente Formations. There are no known faults in this segment.

The permanent groundwater level in the eastern portion of this segment near Union Station was found about 25 feet beneath the ground surface. In the rest of the CBD the permanent groundwater table is below 90 feet. Groundwater quality in the area is poor.

In the Los Angeles Basin the alignment passes through or near several oil fields. Oil or gas in sediments to be excavated is of concern because hydrocarbons may affect soil strength and tunneling safety. Soil borings in the CBD segment revealed minor amounts of oil in the underlying sediments, with larger concentrations in the Union Station area. The ground in this segment is therefore rated as potentially gassy to oily and gassy.



SOURCE: Converse et al. (1981, Drawing No.1)

Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 2000 4000 8000 feet

Figure 3-18
Local Geology

SEDWAY/COOKE
Urban and Environmental Planners and Designers

11.2.2 WILSHIRE CORRIDOR SEGMENT

East-West Reach. The east-west reach of the Wilshire Corridor from the CBD to Fairfax Avenue is mantled by about 20 to 90 feet of dense old alluvium over clays and silts of the Fernando and Puente Formations. West of Normandie Avenue, a westward-thickening wedge of dense, saturated sandstone of the San Pedro Formation lies between the bedrock clays and silts and the overlying alluvium. The MacArthur Park Fault, considered seismically inactive, crosses the Wilshire Corridor near Alvarado Street (Figure 3-18).

The permanent groundwater table in the east-west reach of the Wilshire Corridor is at a depth of over 100 feet; however, a shallow (20 to 50 feet deep) perched water table is encountered in the alluvium throughout the area. With the exception of MacArthur Park Lake, surface waters in the vicinity are limited to stormwater runoff.

The entire Wilshire Corridor from the Los Angeles CBD to Fairfax is rated as potentially gassy to oily and gassy, particularly west of La Brea, where sediments saturated with oil and tar are at or near the surface.

Fairfax Reach. Along the Wilshire Corridor segment from Wilshire Boulevard north along Fairfax, the claystone Fernando and Puente Formations are at depths of 100 to over 300 feet. These materials are overlain by 50 to about 100 feet of San Pedro Formation sands and 40 to nearly 200 feet of old alluvium. A northward-thickening wedge of young alluvium up to 60 feet thick mantles the ground surface.

As shown on Figure 3-18, the Sixth Street, Third Street, and San Vicente Faults cross Fairfax Avenue in this reach. These faults are seismically inactive, but the Malibu-Santa Monica fault, which crosses the Metro Rail alignment near Melrose Avenue, is potentially active.

The regional water table is below 100 feet in the area, but perched groundwater is found at depths of no more than 10 feet in places. Storm runoff constitutes the only surface water in this reach.

From Wilshire north to Melrose Avenue, the ground beneath the proposed alignment is oily and gassy. North of Melrose Avenue along the remainder of the Metro Rail Project, underlying sediments are nongassy.

11.2.3 HOLLYWOOD SEGMENT

From Santa Monica Boulevard north to the base of the Santa Monica Mountains, dense young and old alluvium over 200 feet thick overlies the claystone bedrock formations. Near the mountain front, semiconsolidated alluvial fan deposits cover the ground surface at the mouths of major canyons. The seismically active Hollywood Fault crosses the proposed rail alignment at the northern edge of this reach.

The segment through the Santa Monica Mountains consists predominantly of a relatively thin layer of weathered bedrock over hard rock. Both basalts and well-cemented sediments of the Topanga Formation will be encountered in this reach. Several faults cross the alignment in the Santa Monica Mountains (see Figure 3-14). Of these, only the Hollywood Bowl Fault, a branch of the active Hollywood Fault, is of possible concern.

The permanent water table is deeper than 200 feet in the Hollywood segment south of the mountains, although small amounts of shallow perched groundwater were noted in the upper alluvium. Groundwater is also expected in fractures and fault zones in the Topanga Formation through the Santa Monica Mountains. Near the mouths of canyons in this area, there is short term flooding during peak stormwater runoff.

11.2.4 NORTH HOLLYWOOD SEGMENT

North of the Santa Monica Mountains the proposed alignment is underlain by approximately 50 feet of dense young alluvium over old alluvium. The bedrock Topanga Formation lies more than 200 feet beneath this segment. Two unnamed faults (see Figure 3-18) have been postulated in the area, but neither is considered seismically active.

The deep alluvial deposits in the San Fernando Valley are used for groundwater storage by the L.A. Department of Water and Power. In the project area the permanent water table is below 100 feet. Storm runoff in the area collects on surface streets, then drains into the Los Angeles River near the northern edge of the Santa Monica Mountains. Localized surface flooding occurs during heavy rains.

11.3 IMPACT ASSESSMENT

The No Project Alternative would not result in any geologic or hydrologic impacts. Accordingly, the following impact assessment on landform, geology, and hydrology focuses on each of the four Metro Rail line segments. A summary of the assessment is presented in Table 3-44. It should be noted that even though the Minimum Operable Segment is considerably shorter than the Locally Preferred Alternative and Aerial Option, any impact category that could affect the longer alignments also affects the Minimum Operable Segment.

TABLE 3-44

SUMMARY OF POTENTIAL LANDFORM AND GEOLOGY IMPACTS BY LINE SEGMENT

Line Segment	Landform Alteration	Seismic Ground Shaking	Fault Rupture	Soil Liquefaction Densification	Tunnel and Excavation Stability	Hydrocarbon Accumulation	Subsidence	Loss of Mineral Resources	Flooding	Water Quality
Los Angeles CBD	○	◑	○	◑	◑	◑	○	○	○	◑
Wilshire Corridor	○	◑	●	○	◑	◑	○	○	◑	◑
Hollywood	○	◑	●	○	◑	○	○	○	◑	○
North Hollywood	○	◑	○	○	◑	○	○	○	◑	○

○ Indicates no significant impact expected.

◑ Potential for significant impact exists, but measures to mitigate impact have been incorporated into project.

● Potential for unavoidable adverse impact exist, but probability of occurrence is extremely low.

11.3.1 LANDFORM ALTERATION

For the Locally Preferred Alternative and the Minimim Operable Segment, all of the proposed Metro Rail alignment and most of the stations will be underground and thus not evident from the land surface. Above-ground station elements, maintenance yards, and street-level rail segments are all located where very little landform alteration, such as the creation of artificial cut and fill slopes, will be necessary. The aerial components of the Aerial Option are also designed to minimize landform alteration. Thus, once construction is complete and the Metro Rail Project becomes operational, no significant, long term impacts to existing landforms are expected.

11.3.2 SEISMICITY

Seismic Ground Shaking. All four segments of the Metro Rail Project, like most of California, are in seismically active areas. The design of critical Metro Rail facilities takes into account not only the probable magnitude of earthquakes likely to occur once in the next 200 years but also the maximum credible ground motion possible. Thus, critical facilities could withstand the .22g (22 percent of gravity) horizontal ground movement from any likely earthquake in the next two centuries and even the .70g movement of the maximum credible earthquake. In contrast to the strong ground shaking effects that would be experienced by elevated structures of the Aerial Option, such effects are minimal in deep tunnels because underground structures vibrate as one with the surrounding ground. Thus normal design parameters are sufficient to withstand ground distortions and absorb vibrations. However, damage to Metro Rail tunnels, though not likely during the project's life, could occur primarily at the contact of different geologic formations. This impact would most likely occur in the Santa Monica Mountains, where only the Locally Preferred Alternative and the Aerial Option would be affected. Also, under intense ground shaking, it is conceivable the Aerial Option could also suffer damage to its support structures.

Fault Rupture. Movement along a fault displaces a portion of the earth's crust at or below the ground surface. Such displacement can be either rapid, as during an earthquake, or gradual, as with fault "creep."

The only seismically significant faults crossing the proposed alignment are the potentially active Malibu-Santa Monica Fault in the Wilshire Corridor segment and the active Hollywood Fault in the Hollywood segment. The estimated maximum, single-event displacements, based on geologic data concerning fault slip rates, are 3.3 feet along the Malibu-Santa Monica Fault and 1.0 feet along the Hollywood Fault. However, it is very unlikely that these displacements would occur during any reasonable service life. For example, a 1-foot displacement in the Hollywood Fault crossing would be expected to occur an average of once every 60,000 to 70,000 years. Similarly, the 3.3-foot displacement on the Malibu-Santa Monica Fault crossing might occur an average of once every 20,000 to 30,000 years (Converse Consultants, 1982).

Soil Liquefaction/Densification. Soil liquefaction is a process whereby loose to medium dense, water-saturated, granular sediments lose their shear strength and become liquefied from increased pore water pressure resulting from cyclical, dynamic (usually seismic) loading. Densification is a similar phenomenon occurring when loose, granular soils become more compact because of seismic ground shaking or vibrations from facility construction, or possibly, system operations.

In general, the granular deposits (primarily young and old alluvium) along the proposed Metro Rail alignments are dense to very dense and would not liquefy or densify. However, some of the granular alluvium in the Los Angeles CBD segment beneath the Union Station, Fifth/Hill, and Seventh/Flower Stations was found to be only loose to medium dense. Such materials may liquefy below the water table or densify because of vibrations. Soil liquefaction or densification could cause overlying structures to fail through the loss of bearing capacity, lateral spreading, and settlement.

11.3.3 TUNNEL AND EXCAVATION STABILITY

Tunnel and excavation stability will be of concern primarily during construction when tunnels or slopes may be unsupported for short periods. Directly after tunneling, however, precast concrete or steel ring tunnel liners will be installed to ensure support and stability. These measures will offset the possibility of a tunnel caving upward to or near the ground surface and causing the settlement of overlying facilities.

Upon completion of cut and cover excavations for Metro Rail stations, reinforced concrete base slabs, exterior walls, intermediate level horizontal slabs, and roof slabs will be installed and temporary construction bracing removed. The cross-station slabs and side walls, when fully installed, will provide adequate support against lateral soil and groundwater pressures as well as imposed vertical loads.

Special noncorrosive concrete mixtures and metal protection will be required for underground project elements in areas where corrosive groundwaters could otherwise eventually cause tunnel liners and station walls to deteriorate. Groundwater containing corrosive concentrations of substances such as sulfates or sodium chloride has been identified in parts of all four Metro Rail line segments.

11.3.4 HYDROCARBON ACCUMULATION

All Project alternatives pass through areas of known shallow hydrocarbon accumulation in the Los Angeles CBD and Wilshire Corridor line segments. Such accumulations can take the form of gas, asphalt, tar, or free oil. Where tunnels and stations are completed in areas of shallow hydrocarbons, long term buildups of liquid tar or oil may occur. Thus, where necessary, a system of gravel-filled drainage channels will be provided to collect these substances and carry them to a series of sumps. From the sumps they will be removed to the surface and disposed of in accordance with discharge requirements of the Regional Water Quality Control Board (RWQCB).

Long term accumulations of gaseous hydrocarbons are not considered likely following project construction. However, where such buildups appear possible, special tunnel linings will be installed to prevent gas from entering the subway system, or a gas collection and ventilation system will be provided to dissipate any hazardous concentrations.

11.3.5 SUBSIDENCE

Subsidence, or sinking, of the land surface can result from several causes. In the Metro Rail Project area the withdrawal of fluids, such as groundwater or hydrocarbons, has apparently caused the compaction of underlying sediments, resulting in land subsidence in the Union Station Oil Field in the CBD and near Burbank in the San Fernando Valley. Reported subsidence rates are on the order of 0.03 to 0.06 feet per year.

Vertical movement of the land surface would become a hazard to the Project alternatives only if it happened within a small area, and such differential subsidence does not appear to be occurring in the project vicinity, where relatively uniform subsidence affects areas of several square miles. Average subsidence of up to about 0.1 feet per year over a linear distance of approximately 3 miles in the Los Angeles area has been calculated (Yerkes et al., 1977). As presently known, subsidence would probably not be a problem in the construction of tunnels. Elevated structures with properly designed foundations of the Aerial Option also would not encounter subsidence problems.

11.3.6 LOSS OF MINERAL RESOURCES

The Los Angeles Basin has been one of California's most prolific oil producing districts for nearly 100 years, but the Project alternatives would not significantly affect operations in any producing oil field.

All four line segments of the Metro Rail Project pass through geologic materials that might strictly be considered mineral resources, such as sand and gravel, which could be used as construction aggregate. In the Santa Monica Mountains the Locally Preferred Alternative and Aerial Option pass through granitic or volcanic rock, which could be used as riprap. However, the poor mineral value of most of these materials and their proximity to fully urbanized areas makes mining them uneconomical and impractical.

11.3.7 FLOODING

It is not expected that the Metro Rail Project will contribute to surface flooding, even though the alignment passes under the Los Angeles River and several areas identified as flood hazard zones on the Flood Hazard Maps of the National Flood Insurance Program.

As a result of flood control projects, the Los Angeles River within the Regional Core served by the Metro Rail Project is a fully channelized river without a floodplain. Nevertheless, because the subway alignment would be tunnelled under the Los Angeles River (in the vicinity of Universal City) floodplain encroachment will occur.

The Department of Transportation Order 5650.2, titled "Floodplain Management and Protection," "prescribes policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs, and budget requests." The order requires that attention be given and findings made in environmental review documents to specific issues:

- Examine any risk to or resulting from, the proposed transportation facility. At this location, the river is well contained in a (largely open) concrete box culvert. Urban residential and commercial facilities have been long established up to the culvert right-of-way without incident. The fact that the County Flood Control District is actively pursuing joint development (including enclosure of the culvert) of this right-of-way attests to the compatibility of well-designed structures with the river's facilities.

- Examine the impacts upon natural and beneficial floodplain values. The river is completely channelized with vertical walls. Bicycle paths and other recreational facilities adjoin at some locations. Bored-tunnel construction under the river will not disturb any of these surface features.

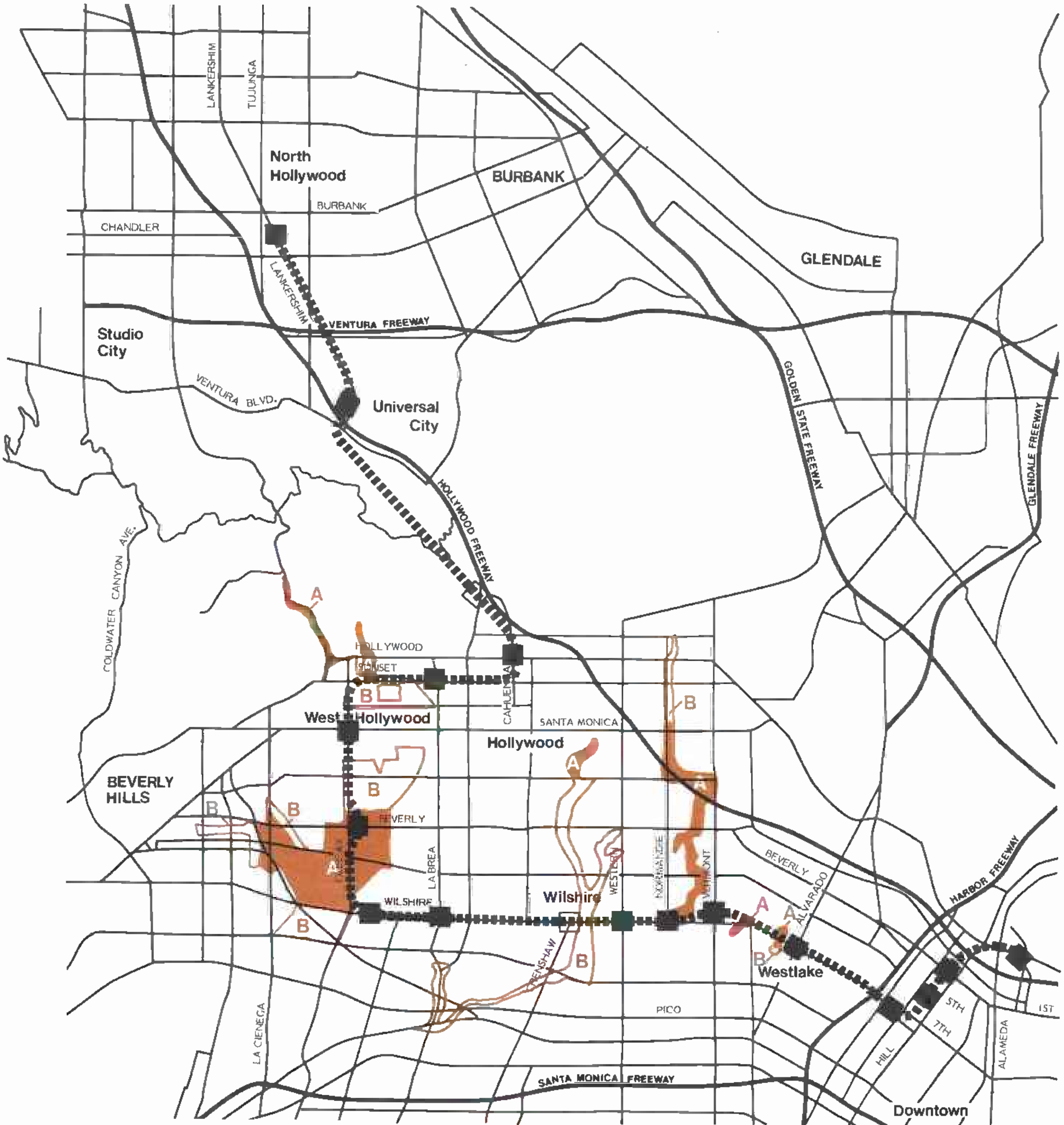
- Examine the degree to which the action provides direct or, indirect support for development in the floodplain. The proposed tunnel would have no contact with the area immediate to the river itself. Only the station would lend support to development activity. These station areas are well removed from any potential floodplains, and have been designated by local government as areas suitable for intense development.

Thus, the Metro Rail alignment will not result in a significant encroachment of a floodplain as defined in DOT Order 5650.2.

Six areas along the Metro Rail Alignment have been identified as flood hazard zones on the Flood Hazard Maps of the National Flood Insurance Program. This federal program has determined that a flood which has one percent chance of being exceeded in any given year (commonly known as the 100-year flood) is the base-flood for which flood protective measures are designed. The six areas are MacArthur Park, Lafayette Park, Wilshire Boulevard between Mariposa and Normandie Avenue, Wilshire Boulevard between Wilton and Norton Avenues, Fairfax Avenue from Wilshire Boulevard to Willoughby Avenue, and Fairfax Avenue in the vicinity of Sunset Boulevard (Figure 3-19). The first three areas and portions of Fairfax Avenue and Sunset Boulevard lie within the anticipated 100 year flood boundaries or Flood Hazard Zone A. While Flood Hazard Zone A is considered a critical flood hazard zone, no significant impacts are anticipated from the construction and operation of the subway system. Any direct increase of runoff due to the Metro Rail Project is not significant enough to affect the carrying capacity of the existing storm drain systems.

The other three flood hazard areas along the Metro Rail Alignment lie between the limits of the 100 year and 500 year floods in Flood Hazard Zone B. Flood Hazard Zone B is not considered to be a critical flood hazard zone by the Federal Flood Insurance Administration. Consequently, no significant impacts are anticipated from the construction and operation of the subway system in Zone B.

Alternately, if flooding should impact the subway system, the water can be removed by sumps and pumping systems and discharged into the local storm drains. In addition, planned city drainage projects from Laurel Canyon to Pan Pacific Park would eliminate any current shallow flooding problems in the vicinity of Sunset Boulevard and Fairfax Avenue.



Proposed Metro Rail Alignment Locally Preferred Alternative

Proposed Metro Rail Station

Optional Metro Rail Station

A Zone A—Areas of 100 Year Storm Flooding

B Zone B—Areas Between 100 and 500 Year Storm Flooding

Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 1 2 3 miles

Figure 3-19 Flood Hazard Areas

Source: Federal Flood Insurance Program Flood Hazard Maps

SEDWAY/COOKE
Urban and Environmental Planners and Designers

11.3.8 WATER QUALITY

Water could collect in the lower portions of Metro Rail's underground facilities, through either rainfall runoff or groundwater draining from perched or fluctuating water tables. Such water will be collected in sumps and pumped to the surface for discharge. In the eastern portion of the CBD segment and the Wilshire Corridor from La Brea to Melrose Avenue, this water may contain oil and dissolved gas and require special treatment before being discharged. Dewatering excavated areas during construction would require the disposal of wastewater high in suspended solids. These activities will require monitoring as discussed under Mitigation. Further details on dewatering are presented in the section on Construction.

An additional source of contaminated water will be runoff from the maintenance yard in the Los Angeles CBD segment, where about 160 cars will be washed weekly. Chemicals used for vehicle cleaning include solvents, detergents, and surfactants. The wash area will be constructed to drain into a designated collection area, where all effluents will be contained for treatment before discharge.

Other sources of contaminated runoff include secondary maintenance yards, parking lots, kiss and ride areas, and bus bays, but even without the Metro Rail Project the pollutant from these areas would be generated elsewhere in similar or even greater quantities. Thus, on balance, project-related impacts are negligible.

11.4 MITIGATION

11.4.1 SEISMICITY

Seismic Ground Shaking. The mitigation of seismic ground shaking impacts will be achieved through project design and construction. For instance, internal structural elements of the Metro Rail Project considered "life critical" (that is, facilities whose structural failure during an earthquake would endanger many lives) will be designed and built to resist strong ground motions from the maximum credible earthquake, the largest seismic event reasonably expected to occur in the project region. Life critical Metro Rail facilities include such high occupancy structures as stations, tunnels, and aerial structures. System facilities considered to represent lower risk to life and safety in the event of structural failure include the maintenance yards and other at-grade, low occupancy structures. Ground shaking parameters associated with the maximum probable seismic event will be used in the design and construction of life critical elements. Such articulated design features might include using joints in the tunnel structures where they pass through soil/rock interfaces or where they enter the station boxes; and for the Aerial Option, designing the support structures with larger and deeper foundations using stronger materials. In addition, the guideway sidewalls will be designed with sufficient height to prevent rail cars from toppling over sideways (for additional details see Converse Consultants, 1983).

Fault Rupture. Fault movement could possibly occur at the potentially active Malibu-Santa Monica Fault and the active Hollywood Fault. Where this potential exists geologic studies were undertaken to determine the frequency of movement. Maximum credible fault displacements were inferred to occur on an average of once every 20,000 to 30,000 years for the Malibu-Santa Monica Fault and once every 60,000 to 70,000 a year for the Hollywood Fault.

Thus, the fault rupture hazard for those faults crossing the route is extremely low for any reasonable service life. The 100-year probably fault displacement for each of the two faults known to cross the alignment is very small (20 mm for Malibu-Santa Monica fault and 10 mm for the Hollywood fault). Moreover, there is no practical way to prevent severe local damage in the unlikely event of a Maximum Credible fault rupture occurring across the alignment. However, in general, tunnels are safer than above-ground structures for a given level of shaking (Converse Consultants, 1983).

Soil Liquefaction/Densification. Before construction, more detailed geotechnical work will be completed in the CBD and in Universal City, where liquefaction or densification may be possible, to define fully the horizontal and vertical extent of loose granular soils above and below the water table. Should soils subject to liquefaction or densification be found, more conservative site preparation and foundation design measures will be taken. Depending on the specific conditions encountered, such measures could include compaction of soils, permanent lowering of the water table, special foundations such as pilings or additional underpinnings, and boring the tunnels below less dense soil into the more dense soil.

11.4.2 TUNNEL AND EXCAVATION STABILITY

The Metro Rail Project design documents address the long term operational stability of the proposed tunnels and excavations in considerable detail. Additional technical design information beyond that provided in the Impact Assessment section is contained in the "Report on Construction Methods" (DMJM/PBQD, 1982).

11.4.3 HYDROCARBON ACCUMULATION

As described previously, drains and sumps will be installed in the portions of the Metro Rail system constructed in sediments impregnated with oil and tar. Any gas buildups will be dissipoted by a strong ventilation system, or special tunnel linings will be installed to prevent gas from entering the facilities.

11.4.4 WATER QUALITY

The disposal of wastewater removed from areas containing oil and gas will require a National Pollutant Discharge Elimination System (NPDES) permit. The permit will be issued by the RWQCB and would be expected to require wastewater treatment to remove hydrocarbons before discharge. This can be done by an oil/water separator, with the separated oil removed by truck to a Class I or II-1 disposal site. Wastewater from the maintenance yard cleaning facility will also be treated before disposal.

12. BIOLOGICAL RESOURCES

12.1 INTRODUCTION

The Metro Rail routes for the Locally Preferred Alternative, the Aerial Option, and the Minimum Operable Segment pass primarily through a highly urbanized environment. Except for the North Hollywood Aerial Corridor of the Aerial Option, all alignments call for a subway configuration. In addition, all station entrances are located in urban areas. Wildlife and vegetative resources in urban areas consist of species introduced by man, as well as native species that have adapted. Accordingly, the Metro Rail Project would not adversely affect biological resources over much of its route. The only significant biological resources are in the Cahuenga Pass. Thus, the impact analysis of biological resources focuses on habitats in the Santa Monica Mountains portions only.

12.2 EXISTING CONDITIONS

The route of the Locally Preferred Alternative and the Aerial Option passes under the Santa Monica Mountains, where there is a mixture of low density residential areas and natural open space, which includes chaparral and steep slopes covered with coastal sage scrub. The chaparral areas are on the ridge tops and the more easterly and north-facing slopes. The chaparral is generally referred to as mixed chaparral (Thorne, 1976), a dense combination of medium to large shrubs. It is most developed on the north-facing slopes in the area north of Mulholland Drive and on the east-facing slope of Nichols Canyon.

Coastal sage scrub occupies the more arid south- and west-facing slopes in the area. This habitat, sometimes referred to as impoverished chaparral, is composed of low scrubs such as California sagebrush, California buckwheat, laurel sumac, and sage. Many of the plants associated with this habitat are drought-deciduous.

No truly natural riparian habitats are in the area, although urban runoff and drainage modifications have contributed to the development of a few riparian habitats in Nichols Canyon, as well as a few wetland habitats consisting of some arroyo willows and cattail marsh near several retention basins in the lower part of the canyon. The areal extent of the riparian habitats is very limited, and they are not expected to represent significant habitat for declining bird species.

Wildlife along the Metro Rail route is what one would expect throughout the Santa Monica Mountains: species naturally adapted to rugged shrublands along with a mixture of urban-adapted species. Because there are few open and grassy habitats in the study area, raptors are not particularly common.

No state or federally listed rare, endangered, or threatened plant or animal species are expected in the area (USFWS, 1979, 1980; CDFG, 1980, 1981). The California Native Plant Society (CNPS, 1980, 1981) identifies several declining species of interest listed in the SCRTD Technical Report on Biological Resources that might exist in the area, and a number of unlisted but declining species may also occur.

Portions of the Regional Core lie within the Santa Monica Mountains National Recreation Area (Department of Interior, 1982). However, no areas designated as sensitive, vital, or representative within the Santa Monica Mountains are found in the study area. (California Natural Areas Coordinating Council, 1975; England and Nelson, 1976).

12.3 IMPACT ASSESSMENT

The purpose of this analysis is to assess possible impacts to significant biological resources which include state and federally designated rare, threatened, or endangered species of wildlife, any locally designated sensitive habitats or ecological areas, and any species of vegetation or wildlife given a "protected" status by local or state laws or statutes. The analysis involved research of previous biological documentation for the Metro Rail Project (UMTA, 1980), as well as numerous other sources including the Los Angeles City Planning Department (1978) and the Santa Monica Mountains Comprehensive Planning Commission (1979). A field survey overview also was made.

As currently proposed, the Locally Preferred Alternative would pass through the Santa Monica Mountains in a subway configuration, and would not generally affect natural biological communities. The aerial configuration in North Hollywood associated with the Aerial Option would require a tunnel portal and aerial structures through a portion of the North Hollywood Hills. However, these hillsides are urbanized, so project construction would have little impact on natural vegetation. Therefore, significant adverse effects on native plant communities are not expected.

Under the Locally Preferred Alternative, two vents and substations are to be built in the mountain areas. As a result, small areas (less than 1 acre) may be disturbed in a few locations. A significant impact could occur if these facilities are located in natural zones, where native vegetation and sensitive plant species might be disturbed. These facilities do not fall within the SMMNRA or the Mulholland Scenic Parkway. Neither the No Project or Minimum Operable Segment Alternatives would affect the Santa Monica Mountains area.

12.4 MITIGATION

Sensitive resources and habitats will be disturbed as little as practically possible, with surface disturbance limited to more urbanized areas. Any surface facilities in the mountains will be reached via existing rather than new roads. If vents or other facilities are absolutely necessary within the natural zones of the Santa Monica Mountains, biological review of detailed plans will be undertaken and site-specific surveys conducted as necessary to confirm that there are no plants listed as rare or endangered by CNPS.

13. CONSTRUCTION IMPACTS

This section examines activities during Metro Rail construction, briefly describing the various construction techniques to be used and analyzing their impacts. Key impact areas include circulation, community activities, business disruption, utility impacts, noise and vibration, air quality, energy requirements, and geology and hydrology. It should be stressed that these impacts are temporary, as opposed to the long term impacts from operation of the system.

13.1 CONSTRUCTION METHODS

13.1.1 TECHNIQUES FOR LINE CONSTRUCTION

Cut and Cover Line Construction. Aside from stations, cut and cover construction would be used only in limited sections of the alignment and for special structures such as crossovers, pocket tracks, vent shafts, and ancillary structures. In an urban area this construction technique generally begins by opening the ground surface to an adequate depth to permit support of existing utility lines and to set piles or other means of retaining the excavation. After the surface opening is covered with a temporary decking so traffic and pedestrian movement can continue, excavation proceeds to the necessary depth. A concrete structure is then built, the excavated material replaced, and the surface restored.

The excavation must be retained by temporary walls, and adjacent building foundations, very often, must be supported. Because of the disruptive characteristics of this process, cut and cover construction is minimized for line segments. However, there are some areas where the underlying soil is not suitable for conventional tunneling methods, and cut and cover may, therefore, be preferred.

After the station or track structure has been completed, backfilling operations will commence. One half of a street will be restored at a time in order to maintain the surface traffic flow. The backfill material will be trucked in, placed, and compacted. During backfill operations, all utilities are restored to their permanent locations. New sewer manholes and cable/duct vaults are built. Any sidewalks removed during construction are restored following backfill and/or the restoration of below sidewalk vaults. Finally, the street is repaved.*

Tunneled Line Construction. Tunneling has less effect on surrounding areas than the cut and cover method since the street surface and utilities are not appreciably disturbed and there is less dust, noise, and traffic disruption. The specific tunneling technique used depends largely on the type of material to be tunneled. In soft ground, tunnels are constructed using full-face tunnel boring or digger-arm machines mounted inside shields in order to hold the ground in place and prevent surface settlement. In hard rock sections, tunnel boring machines (TBM) will be used, although some localized drilling and blasting may be required. A tunnel staging site,

---

*Construction techniques are described and illustrated in detail in SCRTD's Milestone 10 Report: Fixed Facilities (1983).

roughly 2,500 square yards in area, would be required at the starting point of each tunnel drive for tunnel segment storage, loading facilities, construction equipment, personnel facilities, and offices. Excavated materials would be removed through isolated construction shafts or at cut and cover station excavations. Precast concrete or steel tunnel lining would then be placed inside the excavated area.

The tunnels for the Metro Rail may have several configurations. In soft ground, two circular tunnels bored side-by-side are proposed. Through hard rock formations, the tunnels would again be side-by-side, possibly horseshoe-shaped but most likely circular. A third alternative is the one over one configuration, in which one tunnel is bored directly above the other; this stacked arrangement is recommended only where an interchange with another line might be required in the future.

13.1.2 LINE CONSTRUCTION DETAILS

The subway tunnel construction would generally be carried out by TBMs. The tunnels will be driven from staging sites selected to minimize disruption of streets and utilities. It is expected that several tunneling contracts will be let at the same time so that some construction can occur simultaneously on different segments. The time to permit the construction or retrofitting of TBMs and the completion of necessary excavation at the stations is approximately nine to twelve months. Total time to construct the tunnels is approximately 3 to 3-1/2 years for the Locally Preferred Alternative and about 2-1/2 years for the Minimum Operable Segment, barring unanticipated delays.

Softground and Hardground Tunneling. The tunneling for the Locally Preferred Alternative and the Aerial Option can be divided into two basic types: softground tunnels in all areas except through the Santa Monica Mountains and rock tunnels through the Santa Monica Mountains. The Minimum Operable Segment would not require tunneling through the mountains.

Typical soft ground tunneling rates are expected to be approximately 40 to 60 feet per day and 30 feet per day for difficult conditions. Each tunneling contract will thus take 18 to 24 months to complete using two machines per contract. Under the Santa Monica Mountains, an overall average rate of 40 to 60 feet per day is expected, excluding the installation of the cast-in-place concrete liner. The Santa Monica Mountains tunnel contract will take approximately 2-1/2 years to complete if work proceeds on schedule. The rock tunnel may require blasting if the contractor does not elect to use TBMs. Blasting, if required, will involve specific safeguards and controls.

Excavation and Disposal of Tunnel Material. Excavated tunnel material will be transported from the tunnel faces in rail cars and hauled to the shaft or pit bottoms and then raised to the surface by a crane or hoist. From any one staging site this material will be produced at a maximum rate of 100 cubic yards per hour from two tunneling machines operating simultaneously. The tunnel waste will be loaded onto trucks for removal to the disposal site. The loading and hauling of tunnel waste will be restricted to minimize disturbance to residences and other noise-sensitive areas. For the Locally Preferred Alternative the total volume of material excavated from the tunnels will be approximately 6.55 million cubic yards, requiring approximately 766,000 truckloads. The Aerial Option would generate approximately 20 percent less tunnel material for disposal and the Minimum Operable Segment about 64 percent less.

The distance to the various landfill sites will vary. A special study examining tunnel waste disposal reviewed existing landfills within 20 miles of the Regional Core and indicated an available capacity for all waste generated by the Project alternatives. Also, demand for fill by other construction projects in the Los Angeles region, such as the Century Freeway, may facilitate the disposal of excavated tunnel material.

Pocket Tracks and Crossovers. The system will require crossovers and pocket tracks for proper operation. Crossovers allow trains to move from one track tunnel to the other. A pocket track is a third track set between the existing two running tracks for temporary storage of defective trains and use as an emergency crossover. Each pocket track and crossover track will be constructed using cut and cover construction.

Each crossover will be approximately 450 feet long, 60 feet wide, and 55 feet below ground (depending upon the distances between track center). Pocket tracks will be approximately 1,100 feet long, 60 feet wide, and 55 feet below ground. The material removed from the cut and cover crossovers and pocket tracks will be hauled along established routes to landfill sites. The constructed cut and cover crossovers and pocket tracks will require backfilling with transported material, but it may not be economical to reuse excavated material for backfill because of storage, handling, and compositional problems.

13.1.3 STATIONS

Cut and cover construction will be used for Metro Rail stations. Each cut and cover station will be designed somewhat differently, but all stations have similar dimensions: approximately 650 feet long, 60 feet wide, and 55 feet below street level. Entrances would each be about 60 feet long, 20 feet wide, and 25 feet deep. Approximately 100,000 to 150,000 cubic yards of material will be excavated from each station site.

Construction Scheduling. Construction of each cut and cover station will take about 27 months to complete. The construction process would be similar to that used for cut and cover line construction.

Traffic. Traffic flow will be affected during the entire period of construction of approximately two years at a given location. Depending on the traffic flow and location, a variety of mechanisms are available to control and maintain traffic in constricted intersections, including heavy wood decking to replace street pavement and sidewalks and temporary bridges. Decking will contain hatches and removable planks to facilitate lowering odd-shaped and outsize items to the station level with minimal traffic disruption. Cross streets will be carried through intersections on wood decked bridges. Sidewalks may be removed, but pedestrian access to stores will be maintained by bridges, temporary walkways, and other means. Some streets will also have to be closed under certain circumstances.

Disposal of Excavated Material. The material from the cut and cover station excavation will be removed at an average rate of 860 cubic yards of material per day per station and brought to the surface and loaded on trucks for disposal. This rate yields approximately eight truckloads per hour.

Backfilling. Excavation at the station will require backfilling with transported material. Backfilling will be primarily carried out in the last three or four months as the project is completed. As with backfilling in tunnel construction, it may not be economical to reuse excavated material for backfill. Each station will require approximately 11,500 cubic yards (or 1,150 truckloads) of backfill. Approximately 15-20 trucks per day would be expected to bring backfill into the site.

Construction Material. The cut and cover stations will be constructed with poured-in-place concrete, with an estimated total of 3,390 truckloads of concrete required for each station. Reinforcement steel will average a total of 3,040 tons per station.

Water Removal. Water will be pumped out of sump pits as the excavation proceeds downward. Ditches and gravity flow will be used to drain the water into the low-lying sumps. Water will be passed through a settling basin to remove solids before being pumped into the local storm drain system.

13.1.4 AERIAL STRUCTURES

For the elevated portion of the Aerial Option, each track will be carried independently by precast prestressed concrete box or T-beams, in turn supported by cast-in-place reinforced concrete piers. The pier foundations consist of piling or spread footing, depending on expected loads and soil conditions. A typical construction sequence for an aerial guideway system would involve three phases of activity: foundation installation, installation of guideway supports, and installation of guideway sections. For a typical four-block segment, the three major construction phases would take about 14 to 18 weeks.

13.2 CIRCULATION IMPACTS

13.2.1 LOSS OF MOBILITY

Since Metro Rail would be routed through urban areas, motorists and pedestrians would at times be delayed and inconvenienced during the construction period. These impacts would be most acutely felt in the CBD and along Wilshire Boulevard, where stations are in areas with high auto, bus, and pedestrian volumes. Traffic capacity may be temorarily reduced by as much as 50 percent on streets parallel to the long axis of the station and intermittently on intersecting streets during decking installation and removal. Factors such as the presence of a large number of heavy-duty construction vehicles on these streets, narrow lane widths and unusual detour configurations, uneven or poor roadway surfaces, and signal timing which is inefficient for construction conditions will also contribute to the reduction in capacity.

Traffic disruptions would increase around pocket tracks or crossovers, currently proposed at Union Station, Wilshire/Alvarado, Wilshire/Vermont, Wilshire/La Brea, Wilshire/Fairfax, Fairfax/Beverly, La Brea/Sunset, Hollywood/Cahuenga, and North Hollywood Stations. The disruption would also vary depending on whether a station is built on- or off-street. Off-street stations will generally have less of an impact on traffic circulation and are planned for Union Station, Wilshire/Alvarado, Wilshire/Vermont, Fairfax/Beverly, Hollywood/Cahuenga and Universal City.

While no streets would be permanently closed entirely to vehicular or pedestrian traffic, the congestion would likely spill over to other parallel streets. In addition, heavy duty vehicles delivering and hauling construction materials at each station site would reduce street capacity. These factors will have the effect of broadening the impacts of construction activity to area streets and neighborhoods. With a reduced width on streets near station construction sites and the temporary shifting of lanes, traffic control devices may have to be relocated and temporary supplemental devices installed. Circulation impacts for each station area are discussed in a Technical Report, Traffic Control Policies During Construction (LADOT, 1983).

In addition to the disruption to auto movement, construction activities would affect parking, pedestrian activities, and bus service. On-street parking would be temporarily eliminated to accommodate construction operations and vehicular flow on streets where stations are to be located. Pedestrian movement would be inconvenienced due to the temporary loss or narrowing of sidewalks. This impact would be greatest in the CBD, where pedestrian traffic is heavy and the sidewalks are relatively narrow. Some bus stops, bus schedules, and routes would need to be temporarily changed.

Vehicular and pedestrian traffic impacts during construction would be identical for all three Project alternatives along the alignment from Union Station to the Fairfax/Beverly Station. The Hollywood and North Hollywood areas are not affected by construction of the Minimum Operable Segment. The Aerial Option would create traffic impacts all along its approximately three-mile route on Lankershim Boulevard and Vineland Avenue. Construction of the support structures for the elevated guideway and station would occupy the median and portions of the inside traffic lanes of these two streets. By contrast, the impacts of the Locally Preferred Alternative would be localized around the Universal City Station and North Hollywood Station construction sites only.

13.2.2 MITIGATION

- Cut and cover construction will be minimized and used only at stations and other special structure locations.

- Construction in the CBD will be phased so that all station areas are not impacted at the same time.

- Cut and cover construction will substitute integrated panel decking (typically asphaltic coated steel) in place of wooden plank decking wherever feasible. (Integrated panel decking presents a neater appearance and a smoother roadway surface; it is typically much thinner in cross-section, thereby minimizing the difference in levels between decking and existing grade. It is often, however, more expensive.)

- Contractors will be required by SCRTD to control traffic during construction by following the "Work Area Traffic Control" Manual (1976 or most recent edition) prepared by the City of Los Angeles; Standard Plan S-610-12, "Notice to Contractors--Comprehensive" (1982 or most recent edition), prepared by Bureau of Engineering, City of Los Angeles; and "Standard Specifications for Public Works Construction" (1982 or most recent edition).

- Before the start of construction, possibly during Final Design, traffic control plans, including detour plans, will be formulated in cooperation with the City of Los Angeles and other affected jurisdictions (County, State).

- The plans will be based upon lane requirements and other special requirements obtained from the Los Angeles City Department of Transportation for construction within the city and from other appropriate agencies for construction in those jurisdictions. The excavation and decking of arterial streets crossing the rail alignment will be phased so that the capacity of these streets is not reduced unnecessarily.

- Unless unforeseen circumstances dictate, no designated major or secondary highway will be closed to vehicular or pedestrian traffic. No collector or local street or alley will be completely closed preventing local vehicular or pedestrian access to residences, businesses, or other establishments.

13.3 COMMUNITY IMPACTS

In addition to the impacts discussed above, the two most important construction impacts on nearby residents are diminished access to local facilities and disruption of community activities.

13.3.1 LOSS OF ACCESS TO LOCAL FACILITIES

Diminished access would result primarily from street closures, which would worsen parking problems, perhaps causing drivers to seek areas with fewer parking difficulties and thereby affecting use of stores and services in the station environs. Pedestrian activity may also decline when sidewalks are blocked. The resulting detours and closures would be especially difficult for special user groups, who are less able to leave the area for shopping and services. The handicapped and elderly may perceive construction as both a psychological and physical barrier to local accessibility and thus be forced to take different, longer routes to their destinations. Special users forced to remain in the construction area could feel, and be, unsafe.

Impacts due to diminished access to local facilities would be identical for all three Project alternatives from Union Station to the Fairfax Beverly Station. Impacts to the Hollywood and North Hollywood areas do not apply to the Minimum Operable Segment. The Aerial Option would temporarily diminish access to all facilities along its aerial segment. There would be temporary diminished access to facilities near the Universal City and North Hollywood stations under the Locally Preferred Alternative.

13.3.2 DISRUPTION OF COMMUNITY LIFE

Noise from construction equipment can bother residents and employees near construction sites. The most significant noise impacts would occur during installation of piles to support stations and other excavations, which may last three months at any one station. Bus stops and bus routes at construction sites may also be changed temporarily.

Impacts due to the disruption of community life would be identical for all three Project alternatives from Union Station to the Fairfax/Beverly Station. Under the Aerial Option, construction at the portal in the Hollywood Hills may adversely affect adjacent residents because disposal trucks would require queuing space on local residential streets for waste material hauling. Further, the physical and psychological barriers temporarily presented by construction of an aerial guideway would diminish pedestrian access to local facilities.

13.3.3 MITIGATION

Times of day for soldier pile drilling or driving by vibrating hammers can be controlled by terms of the construction contract. This procedure should be used only in locations where noise is a problem, such as residential areas at night. Other areas, such as the commercial zones near the Union Station, would not be disturbed by round the clock operations.

Specific traffic control measures for the construction period have been formulated by the Los Angeles Department of Transportation and were described earlier. Although little can be done to mitigate the temporary impacts from psychological barriers, access to all businesses as well as the safety of all walkways will be maintained by the contractor.

13.4 BUSINESS DISRUPTION

13.4.1 PHYSICAL IMPACTS

The physical impacts from the construction of a rapid transit system are usually confined within one block of the construction site and include modified pedestrian and vehicular access; reduced visibility for store fronts and signs; reduced on-street parking and, in some cases, less convenient access to off-street parking; and temporary disturbances from noise and dust. The largest impacts are caused by cut and cover construction; aerial line construction is much less disruptive. Tunneling creates an insignificant impacts except where muck must be removed and where materials and equipment need to be lowered.

Stores most affected by the physical impacts of construction are marginal businesses and those that rely heavily upon impulse buying and foot traffic. Less affected are establishments that primarily serve other businesses, provide unusual services, or sell unique or expensive merchandise. Other types of specialized businesses that might suffer some disruption are theaters, motels and hotels, and retail businesses sensitive to noise impact (for example, stores selling stereo equipment).

Along the route of a transit line the greatest impacts of construction are most frequently experienced in the downtown of central cities, where the density of pedestrian-oriented business is high and the circulation pattern is congested. Significant economic impacts are also felt in business districts serving minority and ethnic communities, which may contain many marginal businesses.

13.4.2 ECONOMIC IMPACTS

The potential economic impacts resulting from construction of Metro Rail are difficult to project, but their significance can be estimated from the following indicators:

- linear feet of cut and cover construction
- linear feet of commercial space (retail uses, auto-related businesses, services, and hotels) abutting cut and cover construction
- ratio of linear feet of commercial space to linear feet of cut and cover construction
- streets intersecting cut and cover construction

The first two measures indicate the probable extent of direct construction impact such as declines in sales resulting from impaired visibility, dust, and noise. The third measure, the ratio of commercial frontage to cut and cover construction, shows the relative severity of impact per linear foot of construction. The fourth indicator, intersecting streets, notes the possibility for indirect impacts caused by interference with the automobile circulation pattern. Table 3-45 applies these four measures to each station area along the Metro Rail route.

Length of Cut and Cover Construction. By this measure, the Locally Preferred Alternative would physically disrupt about 17,000 linear feet, and the Minimum Operable Segment would disrupt over 11,000 linear feet. The Aerial Option would disrupt about 15,000 linear feet through cut and cover construction; however, the entire aerial segment, about 15,000 linear feet, would also physically disrupt adjacent properties. Accordingly, the Aerial Option would have the greatest impact during construction.

Length of Commercial Frontage. The Locally Preferred Alternative has the potential of affecting at least 6,000 feet of commercial frontage during construction. The Minimum Operable Segment would potentially affect nearly 5,000 feet of business frontage. Again, the Aerial Option would have the greatest potential effect, directly affecting over 5,000 feet through the Central Business District, Wilshire Corridor, and Hollywood, as well as the numerous commercial establishments along Lankershim Boulevard and Vineland Avenue in the San Fernando Valley.

Ratio of Commercial Frontage to Cut and Cover Construction. Using this measure, the most severe impacts are expected in the CBD at the Fifth/Hill Station and the Seventh/Flower Station, where retail density is particularly high. Conversely, the least severe impacts are expected at the following stations: Union Station, Civic Center, Wilshire/Vermont, Fairfax/Beverly, and Universal City.

Intersecting Streets. Automobile circulation is impaired whenever cut and cover construction crosses a street. This, in turn, impedes access to businesses and can cause a decline in sales. The economic impacts, however, depend on the number of automobile trips affected and the extent to which particular businesses rely on an auto-oriented clientele. Construction of the North Hollywood Station would intersect the largest number of streets (four), while the Wilshire/Fairfax and Hollywood/Cahuenga Stations each intersect three streets. The remaining stations

TABLE 3-45

INDICES OF BUSINESS DISRUPTION BY STATION

Station	Length of Cut and Cover Alignment[1] (feet)	Length of Commercial Frontage[2] (feet)	Ratio of Commercial Frontage to Length of Cut and Cover Construction	Streets Intersecting Cut and Cover Construction	Comments
Union Station	2,850	Insignificant[3]	N.A.	N.A.	Station area currently oriented towards manufacturing uses.
Civic Center	450	Insignificant	N.A.	First/Hill	Uses in immediate area are public and quasi-public. Construction may affect indirectly.
Fifth/Hill	450	800	1.8	Fifth/Hill Fourth/Hill	Nearby retail and service uses are oriented toward the Hispanic community. Density of commercial use is high. Construction may indirectly affect downtown L.A. by disrupting circulation patterns.
Seventh/Flower	450	1,000	2.2	Seventh/Flower	Area of high commercial density, although some office buildings are underutilized and/or deteriorating.
Wilshire/Alvarado	950	200	0.2	Alvarado[4] Westlake[4]	Area typified by small retail establishments (strip commercial) along arterials. Primarily serves the Hispanic community.
Wilshire/Vermont	1000	Insignificant	N.A.	Shatto[4] Vermont	Uses are mixed, but predominantly office with some ground floor retail.
Wilshire/Normandie	450	500	1.1	Wilshire/ Ardmore Wilshire/Normandie	Nearby uses are offices of 8-12 stories. Some ground floor retail. Little development over the last decade.
Wilshire/Western	450	500	1.1	Wilshire/Western Wilshire/Oxford	Mixed use area with offices and retail.
Wilshire/Crenshaw (Optional)	450	500	1.1	Wilshire/Lorraine Wilshire/Crenshaw	Some retail is near station. Area is primarily residential.
Wilshire/La Brea	1,650	700	0.4	Wilshire/La Brea Wilshire/Sycamore	Neighborhood retail along La Brea interspersed with offices. Surrounded by a relatively old, stable multifamily residential area. On "Miracle Mile."
Wilshire/Fairfax	1,300	500	0.4	Wilshire/Sierra Bonita Wilshire/Curson Wilshire/Stanley	An important community retail area with some office development. Little vacant land available, but interest in development exists on "Miracle Mile." Two blocks along alignment are proposed for acquisition or joint development.
Fairfax/Beverly	1,000	Insignificant[4]	N.A.	Beverly First	Nearby uses are primarily neighborhood strip commercial (underutilized) with some tourist related development (Farmers Market, CBS). Area has an ethnic character. Motel near alignment may suffer some impact.
Fairfax/Santa Monica	450	500	1.1	Fairfax/Santa Monica	Retail uses nearby.
La Brea/Sunset	1000	500	0.5	Sunset/La Brea Sunset/Detroit	On edge of Hollywood commercial core. Some commercial nearby.
Hollywood/Cahuenga	1,650	200	0.1	Hollywood[4] Yucca[4] Franklin[4]	Nearby uses are primarily retail and services. Area is experiencing some development pressure. Proposed alignment is along west side of Cahuenga.
Universal City	450	Insignificant	N.A.	----	Alignment runs along an alley behind commercial establishments and residences.
North Hollywood	1,850	600	0.3	Lankershim/Weddington Lankershim/Chandler Lankershim/Cumpston Lankershim/Killion	Central business area generally located between Chandler and Magnolia. Commercial uses are declining. Some light industry located along alignment.

Source: Lynn Sedway & Associates

[1]The lengths of cut and cover construction are estimates based on 1"=200' plan and profile drawings prepared by DMJM/PBQD.

[2]The lengths of commercial frontages are based upon a station area land use inventory by the City of Los Angeles, and upon the 1"=40' architectural footprints drawn for each station by Harry Weese and Associates.

[3]"Insignificant" is generally defined as less than 200 linear feet.

[4]Off-street alignment.

intersect two or fewer streets. Thus, the indirect impacts in the CBD, where traffic congestion and commercial densities are higher, are expected to be more severe than at other stations.

Conclusion. Short term economic impacts resulting from the construction of Metro Rail are expected to be most intense in downtown Los Angeles, where the density of businesses, particularly ground-floor retail establishments, is very high. These businesses also rely heavily on pedestrian accessibility. Construction impacts are also expected at most stations along the Wilshire Corridor and at the Fairfax/Santa Monica and La Brea/Sunset Stations. These impacts are expected to be less severe than those projected for the CBD because of lower commercial density and more limited pedestrian orientation. The fewest construction impacts will be at stations having little or no commercial space nearby.

In summary, the Locally Preferred Alternative affects about 20 percent more commercial frontage than the Minimum Operable Segment as a result of cut and cover construction. The Aerial Option, because of the need to construct an elevated guideway for about three miles in the San Fernando Valley, would probably create the greatest disruption for Regional Core businesses.

13.4.3 MITIGATION

As noted earlier under "Circulation Impacts," SCRTD with the City Department of Transportation will develop a traffic maintenance plan to minimize traffic disruption. Because some cut and cover operations will overlap the sidewalk, a logical program of pedestrian traffic movement and sidewalk restoration also will be established. Possible options include restricting construction during peak commute hours, allowing some construction at night in the CBD where there would be little impact on residents, and maintaining access to commercial establishments.

13.5 UTILITY IMPACTS

13.5.1 UTILITY RELOCATION AND SERVICE INTERRUPTION

Cut and cover construction requires initial excavation of all material within the construction site, thereby removing the existing support of underground utilities in that area. All affected utilities at or near the station site must be temporarily supported or rerouted during the construction period, and utilities in spaces occupied by accessways must be permanently rerouted. Subject to other constraints, stations have been located to avoid relocation of major utilities, and station elevations are selected to leave a reasonable (approximately 8 feet) space between the top of the structure and the surface so that as many of the utilities as possible can be temporarily supported in their present locations or rerouted within the construction site.

Utility impacts at station area construction sites would be similar for all Project alternatives, and construction methods will be predicated on keeping disruptions to utility service at an absolute minimum. Utilities which represent a hazard during cut and cover construction and which will not be permanently relocated will be temporarily moved to avoid accidental damage. Service connection lines will require multiple reroutings as excavation supports are placed. The North Outfall Sewer under Fourth Street conflicts with the station structure, but this can be resolved by raising the sewer's grade a few feet.

13.5.2 MITIGATION OPTIONS

Because the entire station construction procedure is already planned to minimize any interruptions of utility service for all Project alternatives, additional mitigation measures are not necessary. Despite these efforts, some unintended temporary disruptions are likely, so some allowance should be made in design and construction plans to ensure that utility work does not upset the construction schedule.

13.6 NOISE AND VIBRATION IMPACTS

13.6.1 DISTURBANCE FROM EQUIPMENT NOISE

Measurements at other transit system construction project sites provide the best indication of expected noise levels from Metro Rail construction (see Table 3-46). Considerable progress has been made recently in the reduction and control of construction noise through modifications in equipment and modification and selection of construction procedures. Noise limits or standards will be included in construction contracts.

Project construction will require considerable earthwork, including the hauling of material to acceptable disposal sites. Noise from heavy duty trucks can have a substantial impact on the community, so haul routes for the disposal of excavated material have been proposed in a special report, "Disposal of Tunnel and Station Excavation Material" (Sedway/ Cooke, 1983). The proposed haul routes would avoid sensitive land uses such as residential areas. Use of these routes plus limitations on hauling hours should avoid significant noise impacts from disposal truck traffic.

13.6.2 DISTURBANCE FROM GROUND-BORNE VIBRATION

Blasting, drilling, and excavation procedures for cut and cover and tunneled subways can cause ground-borne vibration levels perceptible in adjacent community areas, although the amplitude of vibration from such activities is limited for safety reasons by procedural techniques. For example, time delay charges in blasting limit the maximum amplitude to a level well below the criteria for structural damage to adjacent facilities. Impact pile drivers, which create considerable noise and vibration, also produce vibrations too low to damage adjacent buildings and other facilities.

TBMs create ground-borne vibration and noise but considerably less than blasting or pile driving. The noise levels from TBMs would depend on the type of building structure and type of activities in the building. Because the ground-borne noise and vibration from TBMs is of very short duration since the machine passes by an area in a few days at most, there will be only limited impact. Vibration levels would be imperceptible more than 75 to 100 feet away; even at 50 feet, the TBM would create only barely perceptible vibration. For building occupants, noise impact from TBMs would be the same as from operations of subway transit trains. For the deep tunnels (approximately 125 feet below grade), the ground-borne noise from the TBM should be unnoticeable in buildings 100 feet or more in horizontal distance from the alignment. If the tunnel is about 35 feet below ground, then ground-borne noise may be noticed by building occupants approximately 100 feet in horizontal distance from the alignment.

TABLE 3-46

TYPICAL NOISE LEVELS OBSERVED AT RAIL TRANSIT SYSTEM CONSTRUCTION PROJECTS

Equipment or Process	Distance (ft)	Noise Levels (dBA)
Air Hammer (cutting concrete)	50	85-90
Crane and Pile Drilling Rig		
Moving Drill	50	90
Emptying Auger	50	86
Idling	50	82
Drilling	50	83-88
Placing Pile	50	74
Setting Pile	50	88
Concrete Mix Truck (placing Concrete)	50	81-85
Diesel Hammer Pile Driver	24	95-106
Compressor	24	83-90
Hydraulic Crane	24	88-90
Derrick Crane	50	88
Tamper	50	88
Scraper	50	88
Rock Drill	50	98
Truck	50	85-91
Paver	50	89

Source: Wilson, Ihrig and Associates, Inc., Noise and Vibration Study, 1982.

During Final Design, SCRTD will conduct a survey to pinpoint sensitive structures adjacent to tunneling and surface excavation activities that require special construction stability techniques. While primarily developed in response to possible geology and hydrology construction impacts, this survey will include consideration of ground-borne noise and vibration impacts upon adjacent structures.

A special study has been made of construction vibration impact on the St. Charles Borromeo Church at the corner of Lankershim Boulevard and Moorpark Street in North Hollywood (Wilson, Ihrig and Associates, Inc., 1982). At 65 feet deep (top of rail to ground surface) and 30 feet from the subway centerline and the nearest part of the church, the TBM will create vibration levels less than the established criterion for churches and, at most, just perceptible to people in the church. During boring of the far tunnel, the ground noise should be considerably less noticeable, if at all. The relative impact would be minor since the TBM would be near the church for a few days at most, and arrangements could be made with the contractor to ensure that the TBM would not be operated near the church during any scheduled service or function.

13.6.3 MITIGATION

Construction noise and vibration impacts are mitigated by the performance standards and design criteria established for the project. Section 8.2.3 describes in detail these performance standards as they relate to construction activities as well as Metro Rail operations. Further detail and analyses are contained in various technical reports listed in section 8 of this chapter.

Conformance to these standards (including all applicable local regulations and codes) will need to be monitored by SCRTD. SCRTD will make these performance standards a part of the contract requirements for all applicable contractors.

Among the measures identified for mitigating construction noise and impacts are the following:

1. Use of alternative procedures of construction and selection of the proper combination of techniques that would generate the least overall noise and vibration. Such alternative procedures include, but are not limited to, the following:

    - Using a Tunnel Boring Machine in place of conventional blasting techniques as a method of excavation;

    - Using welding instead of riveting.

    - Mixing concrete offsite instead of onsite.

    - Employing prefabricated structures instead of assembling them onsite.

2. Use of construction equipment modified to dampen noise and/or vibration emissions, such as:

    - Using electric instead of diesel-powered equipment.

    - Using hydraulic tools instead of pneumatic impact tools.

    - Using drilled piles or vibratory pile drivers instead of impact pile drivers.

    - Utilizing "time-delay" charges instead of "instantaneous" charges, where drill and blast techniques must be used and the TBM is impracticable.

3. Maximize the physical separation, to the extent feasible, between noise generators and noise receptors. Such separation includes, but is not limited to, the following measures:

   - Selection of truck routes for muck disposal so that the noise from heavy duty trucks will have minimal impact on sensitive land uses (e.g., residential). Specific routes and measures for accomplishing this objective have been developed and specified in the SCRTD Technical Report on Disposal of Tunnel and Station Excavation Material (1983).

   - Providing enclosures for stationary items of equipment and barriers around particularly noisy areas on the site or around the entire site.

4. Minimize noise-intrusive impacts during the most noise sensitive hours. Some of the key techniques used for this purpose could be as follows:

   - Plan noisier operations during times of highest ambient levels.

   - Keep noise levels at relatively uniform levels; avoid peaks and impulse noises.

   - Turn off idling equipment.

13.7 AIR QUALITY IMPACTS

13.7 1 FUGITIVE DUST

Dust from construction projects commonly termed fugitive dust and caused by wind and construction machinery, is the primary air quality impact during construction. Activities generating fugitive dust during project construction include cut and cover and open cut excavations; spoil loading, hauling, and disposal; construction of surface facilities such as stations and aerial guideways; and building demolitions. Dust impacts will be most severe at station sites and at tunnel shafts which also serve as locations for muck removal.

Station construction sites involving excavation from the surface and tunnel waste disposal have a high potential for fugitive dust emissions. Construction duration of a year or more will protract the period of noticeable dust generation. Cut and cover, as opposed to open cut, techniques will mitigate fugitive dust, since the construction site will be less exposed to wind. Fugitive dust would affect land uses immediately surrounding the portal location in North Hollywood near Fredonia Drive and Regal Place and around a fan shaft vent at Wilshire and Windsor.

Another source of fugitive dust emissions is building demolition. While reliable emissions factors for particulate generation have not been established by air pollution control agencies, dust generation varies dramatically from building to building as a function of size, materials of construction, and the choice of demolition methods. Demolition of buildings is required for all Project alternatives with the greatest amount required for the Aerial Option, especially near the portal location in the North Hollywood Hills.

Though there may be more fugitive dust than other kinds of particulate matter generated during construction, the fugitive dust is less of a problem, because the particle size tends to be larger, allowing much of the material to settle a short distance from the source (CARB, 1982). However, considerable amounts of fine particles are also emitted, contributing to the ambient suspended particulate concentrations over a larger area. Dust emissions are generally proportional to the volume of earth moved, although a large portion of emissions also results from heavy equipment traffic in construction areas. The type of material excavated can affect the quality of fugitive dust generated; however, in the Regional Core the difference is probably not significant.

13.7.2 OTHER AIR POLLUTANT EMISSIONS

Air quality in the Regional Core would be affected by increases in emission of CO, HC, NO_x, SO_2, and PM from direct and indirect sources during Project construction. Direct sources include emissions from the operation of gasoline and diesel powered construction machinery, including earth hauling equipment, and emissions generated by the construction work force traveling to and from job sites. Indirectly, construction activities may cause local traffic delays, detours, and congestion which increase the rate at which motor vehicles emit pollutants. In addition, some of the energy construction demand may be met by using locally available power for which there would be indirect air pollutant emissions due to power generation. Overall, the air pollutant emissions are expected to be insignificant on a regional basis and potentially significant on a local basis if substantial traffic congestion occurs.

13.7.3 MITIGATION

Fugitive Dust. South Coast Air Quality Management District Rules and Regulations apply to the proposed project and will govern construction operations. SCRTD has responsibility for the enforcement of these criteria. Standards for both amount and duration of fugitive dust emissions will be written into all construction contracts. SCRTD will monitor all construciton sites for compliance.

The detailed descriptions and explanations of specific impact mitigation measures are contained in the South Coast Air Quality Management District (SCAQMD) Rules and Regulations (Rule #403, "Limitation on Fugitive Dust Emissions"). The key features of the mitigation options described therein are as follows:

- A person shall not cause or allow the emissions of fugitive dust from any transport, handling, construction or storage activity so that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source.

- A person shall take every reasonable precaution to minimize fugitive dust emissions from wrecking, excavation, grading, clearing of land and solid waste disposal operations.

- A person shall not cause or allow particulate matter to exceed $100mg/m^3$ when determined as the difference between upwind and downwind samples collected on high volume samples at the property line for a minimum of five hours.

- A person shall take every reasonable precaution to prevent visible particulate matter from being deposited upon public roadways as a direct result of their operations. Reasonable precautions shall include, but are not limited to, the removal of particulate matter from equipment prior to movement to paved streets or the prompt removal of any material from paved streets onto which such material has been deposited.

To implement these regulations, SCRTD will require contractors to take the following steps regarding trucks used to transport materials and debris to and from construction sites:

- Establish regular cycles and location for washing the trucks.

- Tarp loads of debris leaving sites.

- Water down and sweep the streets which have heavy volumes of construction vehicles at least daily.

Site watering is most commonly used to suppress dust, because it is effective if done frequently and water is generally available at construction sites. Site watering can reduce construction site dust emissions up to 50 percent. Watering will receive particular attention during materials handling associated with waste removal and disposal.

Other Air Pollutants. SCRTD will require all contractors to establish and maintain records of a routine maintenance program for all internal combustion engine powered vehicles and equipment. The mitigation measures described in the Transportation seciton of this chapter for reducing traffic congestion will also have a positive impact on air quality.

13.8 ENERGY REQUIREMENTS

13.8.1 ENERGY USE

Construction energy will be required to build Metro Rail guideways, stations, and associated facilities. Assuming total system construction energy requirements to be 585 billion BTUs per mile (the best estimate given available data), construction of the Locally Preferred Alternative would require 10,900 billion BTUs. Construction energy requirements will be less for the Aerial Option than for the Locally Preferred Alternative, because the line segment from Universal City to the North Hollywood Station would be elevated rather than underground. Elevated rail systems require less construction energy than do subway systems: 277 billion BTUs per mile for elevated versus 585 billion BTUs per mile for subway (International Business Services, Inc., 1979). Assuming 15.8 miles of subway and 2.8 miles of aerial rail, the Aerial Option would require 10,019 billion BTUs to construct. Because of its shorter length the Minimum Operable Segment would require 5,148 billion BTUs to construct, 5,733 billion BTUs less than the Locally Preferred Alternative.

13.8.2 MITIGATION

The choice of construction energy mitigation measures will in many cases depend on detailed design decisions that will be made during Final Design. However, SCRTD has identified a number of energy conservation measures during the course of Preliminary Engineering that will be used in building the rail project. These measures have been separated into two broad categories: those related to construction and those related to street restoration at cut and cover construction sites.

Construction Measures. SCRTD will include energy conservation standards in construction contracts and monitor compliance.* Material deliveries will be consolidated where feasible in order to insure efficient vehicle utilization. Deliveries to construction sites will be scheduled for non-rush hours both to minimize traffic disruptions and to maximize delivery vehicle fuel efficiency. A routine maintenance program for gasoline and diesel equipment will be required of all contractors (pumps and injectors must be calibrated for optimal fuel consumption). Wherever feasible, material will be directly hauled to construction sites as needed, avoiding stockpiling and double handling.

Street Restoration Measures. Several techniques will be utilized to minimize the energy consumed in restoring streets following the cut and cover construciton of stations and crossover tracks. Emulsified asphalts will be used instead of cut-back asphalts wherever possible. To the extent possible, slip form construction will be used for curbs and gutters, traffic separators, barrier walls and concrete pavement, reducing the need for wood and steel forms. Petroleum product delivery, disbursement and accounting will be monitored to document that usage is efficient and justified.

13.9 GEOLOGY AND HYDROLOGY IMPACTS

13.9.1 EXCAVATION

Excavation would create the largest potential for construction-related environmental impacts on geology, hydrology, and water quality.

Tunneling. There are two primary environmental (as opposed to engineering) concerns associated with excavation stability when tunneling: possible caving of the tunnel upward to or near the ground surface (generally occurring in soft ground at the tunnel working face ahead of the TBM) and settlement of the land surface above the tunnel. The potential for caving and settlement would be greater in the Los Angeles CBD (affecting all Project alternatives) and in the North Hollywood segment (applicable only to the Locally Preferred Alternative) where tunneling would be through poorly consolidated young alluvium. Caving and settlement would be of less concern in tunnels through the better consolidated old alluvium and bedrock formations in the Wilshire Corridor and soft rock portions of the Hollywood segments. Caving or settlement is very unlikely through the Santa Monica Mountains.

---

* Energy conservation standards will be adapted from those reported by the Transportation Research Board of the National Academy of Science in "Optimizing the Use of Material and Energy in Transportation Construction (1976)."

Surface Excavations. Cut and cover or open cut excavations will be necessary for the Metro Rail stations, several short line segments, crossovers, pocket tracks, and ventilation shafts. The primary environmental concern associated with the stability of such excavations is the protection of adjacent properties. Many of the proposed stations, shafts, and potential cut and cover line segments will be constructed close to existing structures. In several areas, especially in the Los Angeles CBD and Wilshire Corridor segments, there may be no more than 10 to 20 feet between the excavation and existing building foundations. If unsupported, such surface excavations could result in the later movement of soils supporting adjacent foundations and severe damage to the overlying structures.

13.9.2 MUCK HANDLING

Substantial volumes of saturated and unsaturated soil will be generated by the boring of tunnels and construction of stations and maintenance yards for the Metro Rail Project. These soil materials, known collectively as muck, will be removed from the excavation areas, possibly stored temporarily in the vicinity, and then transported by truck to available solid waste disposal sites in the region. Approximately 6,550,000 cubic yards will be generated during the construction period under the Locally Preferred Alternative, of which an estimated 560,000 cubic yards may be contaminated by oil or tar and require disposal at a Class I or II-1 landfill. The remainder of the excavated soil is expected to be inert and suitable for disposal as Class III waste. Quantities of waste generated under the Aerial Option and Minimum Operable Segment are roughly 20 percent and 64 percent, respectively, less than under the Locally Preferred Alternative.

Environmental impacts associated with transporting muck from project excavations to disposal areas fall primarily into the categories of air quality (dust), truck traffic, noise, energy consumption, water quality, and landfill capacity. Except for water quality, these impacts are described elsewhere. Mitigation options suggested for muck-related impacts would minimize any potential adverse impacts from this activity.

13.9.3 HYDROCARBON ACCUMULATIONS

Common to all Project alternatives are the liquid and gaseous hydrocarbons in relatively shallow sediments in portions of the Los Angeles CBD and Wilshire Corridor segments (Converse Ward Davis Dixon, 1981). Granular soils impregnated with liquid hydrocarbons, commonly referred to as tar sands, are found in the western part of the Wilshire Corridor segment. These tar sands are a potential environmental and engineering concern for two reasons. When they are rapidly unloaded, as during excavation or tunneling, dissolved natural gas in the tar comes out of solution, causing the sediment to expand and lose much of its strength. There is also some evidence tar sands may exhibit considerable creep, especially at higher temperatures, causing excavation, shoring, and bearing capacity problems.

In addition to tar sands, free natural gas in sediments to be tunneled can be of significant concern. The proposed Metro Rail alignment passes over or near six major oil fields and, according to geotechnical studies (Converse Ward Davis Dixon, 1981), over 50 percent of this alignment is in ground classified as gassy or potentially gassy.

13.9.4 WATER RESOURCES

Groundwater. The principal engineering problems encountered in tunnels or deep surface excavations under all Project alternatives are often related to the presence of groundwater. Large volumes of groundwater entering an excavation can seriously disrupt operations, and the presence of interstitial water significantly reduces soil strength, sometimes causing such soils to flow as a viscous fluid.

Geotechnical investigations indicate that shallow groundwater is present in the young alluvium in the eastern portion of the Los Angeles CBD segment and near the Los Angeles River crossing in the North Hollywood segment. Relatively shallow groundwater also appears to be present in the non-tar-impregnated sands of the San Pedro Formation in the central portion of the Wilshire Corridor segment. Shallow perched groundwater is believed to exist within the alluvium throughout much of the alignment; it may also exist in isolated packets, or lenses, of granular soils.

Water Quality. Common to all Project alternatives are potential water quality problems associated with disposal of groundwater flowing into excavated areas and with surface excavation and muck hauling. Groundwater flowing into tunnels or surface excavations during construction reaches volumes of up to 6,000 gallons per hour. The largest flows would be expected where construction takes place below the permanent water table. Groundwater will be removed from excavations either by gravity flow to sumps and pumping system or by direct pumping to lower the water table. Wastewater discharge from water removal systems will be high in suspended solids and, in areas of hydrocarbon accumulation, high in oil and dissolved gas concentrations. Surface excavation and muck hauling may deposit sediment on neighboring streets. Given the volume of material to be excavated for the project, the amounts of soil thus deposited could be substantial.

No additional significant water quality impacts are expected during construction although there may be limited impacts including fuel spills and small losses of greases, oils, and lubricating fluids from vehicles operating in tunnels, surface excavations, and other construction areas.

13.9.5 MITIGATION

Sensitive Structures Survey. During Final Design, SCRTD will conduct a survey to pinpoint sensitive structures adjacent to tunneling and surface excavation activities that require special construction stabilization techniques. While primarily developed in response to possible geology and hydrology construction impacts, this survey will include consideration of ground-borne noise and vibration impacts upon adjacent structures.

Tunneling. Several alternative tunnel support systems have proven to be effective and economical in similar tunneling projects locally and elsewhere to avoid caving or settlement. To support the proposed tunnels through soft ground segments of the Metro Rail alignment, a shield driven ahead of the TBM will be utilized and all excavation will take place within the shield. A permanent support system of precast concrete, cast-in-place concrete, or steel ring segments will be installed immediately behind the shield as the tunnel is driven. In the hard rock tunnels, support will be provided by rock bolts or other temporary support systems.

Potentially unstable reaches through blocky ground or fault zones in hard rock will be supported by shotcrete or arch ribs and lagging.

Surface Excavations. Several measures to mitigate potential surface excavation stability impacts have been incorporated into the design of the Metro Rail Project. These measures include the following:

- To the extent possible, major surface excavations will be adjacent to undeveloped areas (such as parking lots).

- Small or relatively inexpensive structures adjacent to proposed excavations may be removed. In many cases, excavation to protect such structures may be more costly than the structures themselves.

- In some areas, it may be feasible to construct temporary shoring systems which--with adequate bracing, limited excavation stages, and controlled water removal--would minimize earth movements and allow excavation next to existing structures.

- There will be locations where the risk and consequence of damage from earth movements will be unacceptable, and underpinning may be prudent. These include areas of poor soil conditions, deep excavation close to existing structures, and areas of major structures. Underpinning consists of installing concrete piers or piles beneath a structure to provide additional foundation support. Such piles or piers must extend beneath the structure through the zone of influence of the excavation. In lieu of pier or pile underpinning, there are two ways to provide additional foundation strength. One is chemical grouting in sandy soils to prevent soil runs and strengthen soil in critical areas, with grout injected from the surface under existing foundation elements. The second approach calls for compaction grouting in sands, silts, and clays. This can be effective in lifting and supporting lightly loaded structures. Again, the grouting is carried out from the surface. Both approaches have been successfully used in the Los Angeles area, in the Washington, D.C., and Baltimore Metro projects, throughout Europe, and in Japan.

Hydrocarbon Accumulation. The mitigation of potential impacts related to the presence of tar sands will include the following activities:*

- Additional soil borings will be made in critical areas to precisely define the vertical and horizontal extent of tar sands. These borings will also include in situ measurements of gas content and soil expansion potential.

- Laboratory testing of tar and sand samples from the borings will be conducted to provide information on their strength and deformation characteristics at different temperatures, confining pressures, strain rates, and stress levels.

- Based on data derived from the above tests, specific excavation, shoring, and foundation design criteria will be formulated to ensure short and long term stability of project facilities in tar sand areas. Conversely, once the location of shallow tar sands is precisely known, it may prove more economical to increase tunnel depth or change station locations to avoid problem areas.

---

* For additional information, see Converse Ward Davis Dixon, 1981.

The avoidance of safety hazards from explosive gas in tunnels will be a major element in project planning and construction efforts. The following measures are planned for tunneling in gassy or potentially gassy ground:*

- A multiple-station, constant gas monitoring system will be used in tunnel excavations.

- Small-diameter holes will be drilled at least 20 feet into the tunnel working face ahead of the TBM to relieve pressurized gas packets before they are encountered by heavy excavation equipment.

- An adequately sized collection and ventilation system will be installed to prevent the buildup of explosive gas concentrations anywhere in the tunnel.

Groundwater. To avoid the engineering and environmental problems associated with excavating or tunneling in soils below the perched or permanent water table, it will be necessary to remove water (dewatering) from these materials before and possibly during construction. 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. Alternatively, groundwater may be removed by pumping from shallow ditches or sumps within an excavation.

When any dewatering activities occur, they will be limited to the immediate excavation area by utilizing a variety of methods such as compressed air, chemical grouting, freezing, slurry shields or earth pressure balance where local geologic or other constraints dictate, thus avoiding potential ground subsidence or differential settlement of adjacent structures. (For more details, see DMJM/PBQ&D, 1982.) Moreover, by confining groundwater control activities to the immediate area of excavation, the Metro Rail Project will avoid potential adverse impacts on urban flora (trees, shrubs, etc.) caused by a lowered water table.

Water Quality. Wastewater discharge from excavation water removal will contain suspended solids and, in some areas, hydrocarbons. Related water quality impacts will be avoided by removing the suspended solids in siltation basins and, where necessary, removing hydrocarbons in oil/water separators. The monitoring of treated discharge water and periodic filing of water quality monitoring reports will probably be a requirement of the NPDES permit necessary for dewatering activities. This will help ensure the continued effectiveness of wastewater treatment procedures and equipment.

Surface accumulations of sediment from excavation and muck handling activities should not be allowed to reach significant volumes. As part of their contractual obligation, the Metro Rail construction contractors should be required to immediately clean up any accidentally spilled materials, including not only sediment but also vehicle fuels and lubrication fluids. In addition, the periodic cleaning of streets and sidewalks in the construction area should be required to regularly remove the more nominal, day-to-day operational spills.

* For additional information, see Converse Ward Davis Dixon, 1981.

13.10 CONSTRUCTION IMPACTS WHICH CANNOT BE MITIGATED

Mitigation techniques have been identified for all the construction impacts of the Metro Rail alternatives. However, no combination of mitigation techniques completely offsets all of these impacts. Therefore, for each of the construction impacts discussed in this chapter, some residual, unmitigated impacts would occur.

Business Disruption. Even with the application of the identified mitigation measures, some disruption of commercial activity will occur. Two basic types of construction activity are involved: cut and cover construction and aerial guideway and station construction.

Aerial segments will require support piers, typically every 90 feet for guideways and somewhat more in station locations. Preformed concrete cross-members are then placed on these piers and trackwork and other appurtenances installed.

Tunnel segments require construction activity primarily only at stations and at crossovers and pocket tracks. The cut and cover type of construction involved, however, is of a more continuous, disruptive sort and may be as much as twice as long in duration.

The Aerial Option would impact approximately 15,000 feet of Lankershim (and other streets) with overhead guideway construction and another 5,000 feet of disruption due to cut and cover construction. The Locally Preferred Alternative would disrupt about 6,000 feet of commercial frontage with cut and cover construction, while the Minimum Operable Segment would disrupt almost 5,000 feet with cut and cover construction.

Dust and Noise. Under all construction alternatives, some temporary increase in dust and noise will occur at construction sites and along the muck disposal routes, even after mitigation techniques are applied.

Vehicular Traffic Congestion. Some increase in traffic congestion in the vicinity of station construction sites will probably occur, despite the application of mitigation techniques, because of constricted road areas and the addition of construction traffic.

Parking. Parking availability will be reduced in station environs where off-street yards for construction employee parking and equipment are not established.

14. LONG TERM AND CUMULATIVE IMPACTS

14.1 UNAVOIDABLE ADVERSE IMPACTS

Although most construction impacts will be temporary and can be mitigated by SCRTD and most of the long term operation impacts can also be mitigated, the Metro Rail Project will result in some adverse impacts which cannot be completely avoided or mitigated. Long term unavoidable adverse impacts are identified below; unavoidable short term or construction impacts are identified in section 13 of this chapter.

- Speculative increases in land value around station locations may increase rental and lease rates for residential and commercial space, particularly in the Wilshire/Fairfax, and to a lesser degree, the Fifth/Hill and Seventh/Flower Station areas.

- A total of 222 commercial and nine nonprofit establishments, and five single family and 219 multifamily units will be displaced under the Locally Preferred Alternative. A total of 216 commercial and seven nonprofit establishments, and 11 single family and 229 multifamily units will be displaced under the Aerial Option. Under the Minimum Operable Segment, 136 commercial and five nonprofit establishments, and one single family and 50 multifamily units will be displaced. SCRTD is committed to the relocation of all businesses and residents displaced by the Metro Rail Project. However, it is possible that some businesses and residents will not be relocated within the same station area.

- Land may be acquired for station entrances at one designated and three potentially historic sites under the Locally Preferred Alternative and under the Minimum Operable Segment. Feasible mitigation options do not exist to avoid removal or alteration of a segment of the Union Station District, a National Register District; alteration to the Title Guarantee and Pershing Square Buildings; and alterations to a portion of Hancock Park/La Brea Tar Pits Area. Adverse impacts to these properties will be mitigated, however, by employing designs which are architecturally compatible. Were the Aerial Option to be adopted, an additional 26 potentially historic structures in the North Hollywood area may be adversely affected.

- Local and regional views in the North Hollywood area will be obstructed by elevated guideways under the Aerial Option.

- Views from residential areas north of Chandler Boulevard to North Hollywood Park will be obstructed by the minor yard under the Locally Preferred Alternative and the Aerial Option. These adverse visual impacts could be mitigated only through extensive relocation of residents and businesses, itself a potentially adverse impact.

- Because the exact nature and location of archaeological sites cannot be determined, some archaeological resources are likely to be inadvertently affected under the project alternatives. The most likely impacts will be the disruption of resources in the Los Angeles Passenger Terminal District during cut-and-cover construction at the Civic Center and Hill Street Station locations, and in the Rancho La Brea Tar Pits area. To insure protection of these resources, an archaeologist will observe construction activities at these sites. In addition, the Locally Preferred Alternative and the Aerial Option may disrupt resources in the Campo de Cahuenga area of Universal City (See Chapter 4 for further discussion.)

- Paleontological resources may be disrupted when the Metro Rail alignment traverses areas of high sensitivity, particularly the Rancho La Brea Tar Pits resource area. The station location in this area may be moved west if test drilling reveals the likelihood of encountering fewer paleontological resources. Marine invertebrates and vertebrates also may be encounted in the CBD and along Wilshire Corridor. This impact will be mitigated by the temporary halting of excavation when important or potentially important fossils are discovered. (See Chapter 4 for further discussion.)

- In some locations along the Metro Rail alignment increases in noise and vibration levels may still be experienced under all alternatives, even with proven mitigation measures. Under the Locally Preferred Alternative, eight sites would experience noise levels in excess of standards. Two sites would be affected under the Minimum Operable Segment. In addition to the eight sites under the Locally Preferred Alternative, the Aerial Option would impact 30 additional single family residences and 10 apartment buildings with airborne noise. Further options exist to lower noise levels and thus avoid adverse impacts such as reducing train speed and converting adversely affected land use to uses more compatible with noise and vibration by condemning or purchasing it.

- Annualized energy requirements for the Metro Rail Project would be 1,433 billion British thermal units (BTUs) for the Locally Preferred Alternative, 1,371 billion BTUs for the Aerial Option, and 850 billion BTUs for the Minimum Operable Segment.

- The neighborhood character and stability of the Fairfax/Beverly and Fairfax/Santa Monica Station areas may change because of new development facilitated by Metro Rail.

- The presence of Metro Rail facilities themselves, and the changes that the system will precipitate in certain areas, will cause a shift in some people's perception of the nature and quality of certain communities.

- Under the Aerial Option, visual privacy of residential structure will be affected as the elevated guideway will be within 60 feet of structures along the west side of Lankershim Boulevard for its entire length and along the east side of Camarillo Street.

14.2 RELATIONSHIP BETWEEN LOCAL SHORT TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY

14.2.1 TRADEOFFS BETWEEN SHORT TERM USES OF RESOURCES AND LONG TERM BENEFITS OF METRO RAIL

Construction of the Metro Rail Project will require the use and commitment of resources which must be weighed against the long term benefits of building the system. Uses of resources associated with the project include the following:

- acquisition of commercial, industrial, and residential land uses for Metro Rail right-of-way

- displacement of residents and businesses

- potential destruction of one National Register site and three sites which may be eligible for listing on the National Register (see Chapter 4)

- potential for disrupting archaeological and paleontological resources (see Chapter 4), especially notable in the Rancho La Brea Tar Pits Area.

- obstruction of local and regional views and possible visual intrusion
- increased noise and vibration levels along the right-of-way
- increased use of electricity
- changes in neighborhood stability and character in certain station areas.

The use of these resources is a recognized expenditure worth the investment when weighed against the benefits of construction of the system. By improving transit service and efficiency, the Metro Rail Project will achieve the following:

- increase accessibility to employment, commercial, and recreational centers within the Regional Core
- improve travel time throughout the Regional Core by providing the only efficient means of transportation between certain areas
- decrease total vehicle miles traveled throughout the Regional Core
- accommodate more concentrated yet regulated growth and development, thus satisfying regional growth goals
- help to satisfy land use and environmental goals and objectives in local and regional plans
- through joint development, increase property tax revenues to the City of Los Angeles generated by joint development sites by more than 50 percent and sales tax revenues at these sites by 85 percent by the year 2000
- through transit induced development, increase the supply of residential and commercial units

14.2.2 JUSTIFICATION FOR A PROJECT NOW

Rather than deferring the project, there are several reasons why the Metro Rail Project is justifiable:

- Traffic congestion (vehicle trips and VMT) is severe now and is expected to increase steadily in the Regional Core if no project is implemented.
- Energy consumption, particularly the use of petroleum by autos, will continue to increase if no attractive alternative to the auto is implemented.
- The present public transit (bus) system in the Regional Core is at or over capacity, and a more efficient system is needed to help accommodate the riders that can be attracted to public transit.
- A more efficient and balanced transit system will significantly reduce net transit operating deficits in the Regional Core.
- A more efficient transit system will save its users time and money.

- The project will accelerate the achievement of current governmental and regional goals and plans for transportation, air quality, energy policy, redevelopment, the centers concept, and commercial growth.

14.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The construction of the Metro Rail Project will require the irreversible and irretrievable commitment of various resources, including land, manpower, energy, construction materials, and money.

Under all of the systemwide alternatives, the alignment for all or the majority of the system will run underground. However, the taking of privately owned land would be required at some station locations, yards, and parking lots and along the aerial guideway under the Aerial Option. The conversion of land from residential, commercial, and industrial uses to transit uses is an irreversible commitment of land resources.

The manpower expended to design, construct, and operate the rail system cannot be recovered. However, local and regional economic benefits would result from this expenditure of manpower.

Construction and operation of the system would require the use of both electricity and petroleum products. Energy for system operation would be primarily electricity supplied by the City of Los Angeles Department of Water and Power. Energy would also be used in construction of the rail vehicles. Annual energy uses for the Locally Preferred Alternative have been estimated to include 218 billion BTUs for construction, 18 billion BTUs for vehicle manufacturing, 642 billion BTUs for traction power, and 453 billion BTUs for station operation and maintenance. Total energy demand would be 1,433 billion BTUs per year. Annual energy demand for the Aerial Option and the Minimum Operable Segment is estimated to be 62 and 583 billion BTUs less, respectively, than the Locally Preferred Alternative.

Consumption of construction materials such as asphalt, cement, steel, lumber, and fabricated metals represents a commitment of resources that would not occur under the No Project Alternative, assuming that no new highway improvements would be undertaken.

The financial resources committed to the construction and operation of the Metro Rail Project cannot be completely recovered, although the project would result in increased property and sales tax revenues to the City of Los Angeles. The estimated capital cost for the rail component of the Locally Preferred Alternative is $2.35 billion, and $64.4 million less for the Aerial Option. The rail capital cost for the Minimum Operable Segment would be $1.55 billion.

14.4 GROWTH INDUCING IMPACTS

An additional 14,470 dwelling units within station areas, most of which correspand to designated growth centers, can be accommodated with the Locally Preferred Alternative and Aerial Option over the No Project Alternative by the year 2000. This represents a 33 percent increase and an additional 34,250 persons within station areas. Under the Minimum Operable Segment, the Metro Rail Project would help accommodate an additional 11,070 dwelling units and 27,470 persons within station areas.

Commercial development with Metro Rail is expected to increase substantially over the No Project Alternative. The Locally Preferred Alternative and the Aerial Option are estimated to increase the level of new commercial square footage by about 15 to 27 percent over the No Project Alternative within the station areas in the year 2000. Commercial development within station areas in the Minimum Operable Segment would increase by about 12 to 22 percent.

Total employment in station areas for the year 2000 under the Locally Preferred Alternative and the Aerial Option is expected to increase by 51,300 to 98,900 employees over the No Project Alternative (14 to 27 percent increase) while station areas on the Minimum Operable Segment would experience a slightly less, but still considerable, growth in total employment. The growth projected to occur under all three Metro Rail alternatives is consistent with regionwide land use and development plans, which call for a concentration of development at designated centers in the Regional Core.

Metro Rail is expected to have an impact on the city's economy, increasing both sales and property tax revenues as a result of development induced by the project. In the year 2000, assuming the city receives 32.7 percent of the one-percent tax rate applied to this value, the growth accommodated by the Locally Preferred Alternative and the Aerial Option would generate nearly $8.1 million more in property tax revenues and $513,000 in additional sales tax revenues compared to the No Project Alternative. If SCRTD pursues an active joint development posture, revenues could increase by 90 percent over the No Project Alternative on joint development sites.

CHAPTER 4

CULTURAL RESOURCES

CHAPTER 4

CULTURAL RESOURCES

1. INTRODUCTION

This chapter presents an inventory and impact assessment of four types of cultural resources: historic/architectural, archaeological, paleontological, and parklands.

2. HISTORIC PROPERTIES

2.1 GENERAL REQUIREMENTS AND COMPLIANCE

A cultural resources inventory and assessment was conducted to satisfy the requirements of the National Historic Preservation Act of 1966 (Public Law 89-665 as amended), the National Environmental Policy Act of 1969 (Public Law 91-190), Section 4(f) of the Department of Transportation Act (Public Law 89-670), and Executive Order 11593. Section 106 of the National Historic Preservation Act (NHPA) affords the Advisory Council on Historic Preservation the opportunity to review and comment on Federal undertakings that affect properties included in or eligible for inclusion in the National Register of Historic Places. Procedures for implementing Section 106 are provided in 36 CFR 800 Protection of Historic and Cultural Properties.

2.1.1 COORDINATION WITH THE STATE HISTORIC PRESERVATION OFFICER (SHPO)

SCRTD has coordinated with the SHPO since the preparation of the Alternatives Analysis/First Tier EIS/EIR in 1978-1980. SCRTD staff has continued this coordination through meetings, field trips, and correspondence to resolve issues on scope of work, Areas of Potential Environmental Impact (APEI), project timing and scheduling, and documentation content. The SHPO was provided with the scope of work, project definition, a draft copy of a preliminary cultural survey, and a copy of the preliminary Draft EIS/EIR. The SHPO will continue to participate actively in the environmental review process and will review station plans and final designs prior to construction.

2.1.2 COORDINATION WITH THE LOS ANGELES CONSERVANCY

The Los Angeles Conservancy (LAC) has also participated actively in this study. The LAC Executive Director has been consulted about architectural significance, areas of particular interest to LAC, and definition of potential impact areas. An LAC volunteer served as a researcher and field surveyor for portions of the Wilshire

Corridor. LAC has participated in field visits to sites in question and in joint meetings with staffs of SCRTD and the SHPO. LAC will continue to be important in the review process.

2.2 IDENTIFICATION OF HISTORIC PROPERTIES

2.2.1 AREAS OF POTENTIAL ENVIRONMENTAL IMPACT

Based on discussions with the SHPO and LAC and a review of similar projects, APEIs were defined as one parcel deep around all cut and cover locations. These include all stations and auxiliary facilities such as crossovers, pocket tracks, power substations, and vent shafts. Larger areas were defined for particularly sensitive station locations and acquisitions, including the Fifth/Hill, Wilshire/Alvarado, Wilshire/Fairfax (Miracle Mile), Campo de Cahuenga, and Universal City Stations. Maps of the APEIs are contained in the SCRTD Technical Report on Cultural Resources (1983).

2.2.2 METHODS AND TECHNIQUES

Preliminary research for the cultural resource inventory involved the following steps.

- Consulting national, state, and local registers.

- Compiling information from cultural resource surveys within the project area, such as those by the Hollywood Revitalization Committee, Los Angeles County Museum of Natural History, Community Redevelopment Agency (City of Los Angeles), and City of Los Angeles Bureau of Engineering.

- Contacting historical and architectural reseachers who have conducted research in the project area, including the Los Angeles Conservancy, Los Angeles Cultural Heritage Board, Western History Research Center at the Los Angeles County Museum of Natural History, Hollywood Heritage, El Pueblo de Los Angeles State Historic Park, and numerous other institutions.

Field surveys for the Metro Rail Project were made of 294 properties within the APEIs. The surveys were conducted at each station location by both a historian and an architectural advisor. Historical and architectural data to be used to complete California Historic Resources Inventory forms (DPR 523) were collected for each noteworthy structure within the APEI. These forms include property name and address, type of ownership, present use, previous use, architectural style, National Register status, significance, and date of construction as well as photographs of the property.

2.2.3 SURVEY RESULTS

Of the total 294 properties surveyed, 63 were considered to be historically significant. Since the remaining 231 properties may be deemed significant in the future, brief inventory forms have also been completed for each property and are included in the SCRTD Technical Report on Cultural Resources (1983).

STATE OF CALIFORNIA—THE RESOURCES AGENCY — EDMUND G. BROWN JR., Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
POST OFFICE BOX 2390
SACRAMENTO, CALIFORNIA 95811
(916) 445-8006

In reply, refer to: UMTA 820708A

February 23, 1983

RECEIVED
SCRTD
FEB 25 1983
OFFICE OF
MGR/CHIEF ENGINEER
METRO RAIL PROJECT

Mr. Richard Gallagher, Manager
Metro Rail Project
Southern California Rapid Transit District
425 South Main Street
Los Angeles, California 90013

Dear Mr. Gallagher:

Re: Determinations of Eligibility for Properties Within the Area of Potential Environmental Impact (APEI), Metro Rail Project.

A copy of the cultural resources survey, "Historical/Architectural Resources, Parts A and B" was received in this office on January 23, 1983. This document has been reviewed by my staff. On the basis of that document and extensive on-site inspection, we have reached the following conclusions regarding the presence of Properties listed in or eligible for listing in the National Register within the Metro Rail APEI.

First, we have concluded that the survey adequately identifies all potentially eligible properties within the project's APEI. Indeed, we feel that SCRTD has acted responsibly and cooperatively in its dealings with this office and the historic preservation community of Los Angeles during the identification phase of 36 CFR 800 compliance. The creditable cultural resource survey conducted by your office adds greatly to our understanding of historic resources in Los Angeles, especially along the Wilshire corridor. We would appreciate receiving the original survey forms for inclusion in our master inventory of statewide resources.

We have determined that the Metro Rail APEI includes nine properties previously listed in or eligible for listing in the National Register.

Property	Address	Status
Pellissier Building	3870 Wilshire	Listed
Union Station	800 N. Alameda	Listed
Broadway Mart	401 Broadway	Listed in National Register Dist.
Title Guarantee Bldg.	401 W. 5th Street	Determinied Eligible
Pershing Square Bldg.	448 S. Hill Street	" "
Barker Bros. Bldg.	700 W. 7th Street	" "
Federal Title Bldg.	437 Hill Street	" "
Myrick/Markham Hotel	324-326 Hill Street	" "
Subway Terminal Bldg.	415-425 Hill Street	" "

We note as well that the property, Campo de Cahuenga, at 3919 Lankershim Blvd., has been determined not to be eligible by the Keeper of the National Register. The state of California disagreed with the 1973 ruling and continues to disagree. For 36 CFR 800 compliance, however, the Keeper's judgement prevails.

We have in addition concluded that the following fifteen properties appear to be eligible for National Register listing, but have not yet been determined eligible by the Keeper of the National Register:

1.	Crocker Bank	1926-1930 Wilshire
2.	Post Office Terminal Annex	900 N. Alameda
3.	Wilshire Christian Center	634 S. Normandie
4.	Hollywood Bowl	2301 N. Highland
5.	Toluca Southern Pacific Depot	5401 Lankershim
6.	MacArthur Park	2200 Wilshire
7.	Global Marine Bldg.	807 W. 7th Street
8.	Hotel Clark	400-426 Hill
9.	McKinley Bldg.	3747-3763 Wilshire
10.	Zephyr Club	5209 Wilshire
11.	Clem Wilson Bldg.	5217-5231 Wilshire
12.	May Company	6067 Wilshire
13.	Security Pacific Bldg.	6381-6385 Hollywood
14.	Roosevelt Bldg.	648 Flower
15.	Miracle Mile Historic District	5318-5514 and 5519-5353 Wilshire

If you concur in the Eligibility of these properties, Please Prepare a Formal Request for Determination of Eligibility for each. My staff has supplied your staff with examples of Determinations of Eligibility commonly used in transportation projects. Completed requests should be sent with a copy of this letter to the Urban Mass Transit Administration for submission to the Keeper of the National Register.

The remainder of the properties surveyed in the project APEI not discussed above are, in the view of this office, not Eligible for listing in the National Register of Historic Places.

As it appears we agree on the eligibility of properties within the project's APEI, I recommend that you apply the criteria of Effect and adverse effect (36 CFR 800.3) to the 24 properties listed above. When we have reached agreement as to the effect, you may proceed to the drafting of a Memorandum of Agreement, if necessary, to complete consultation on this undertaking.

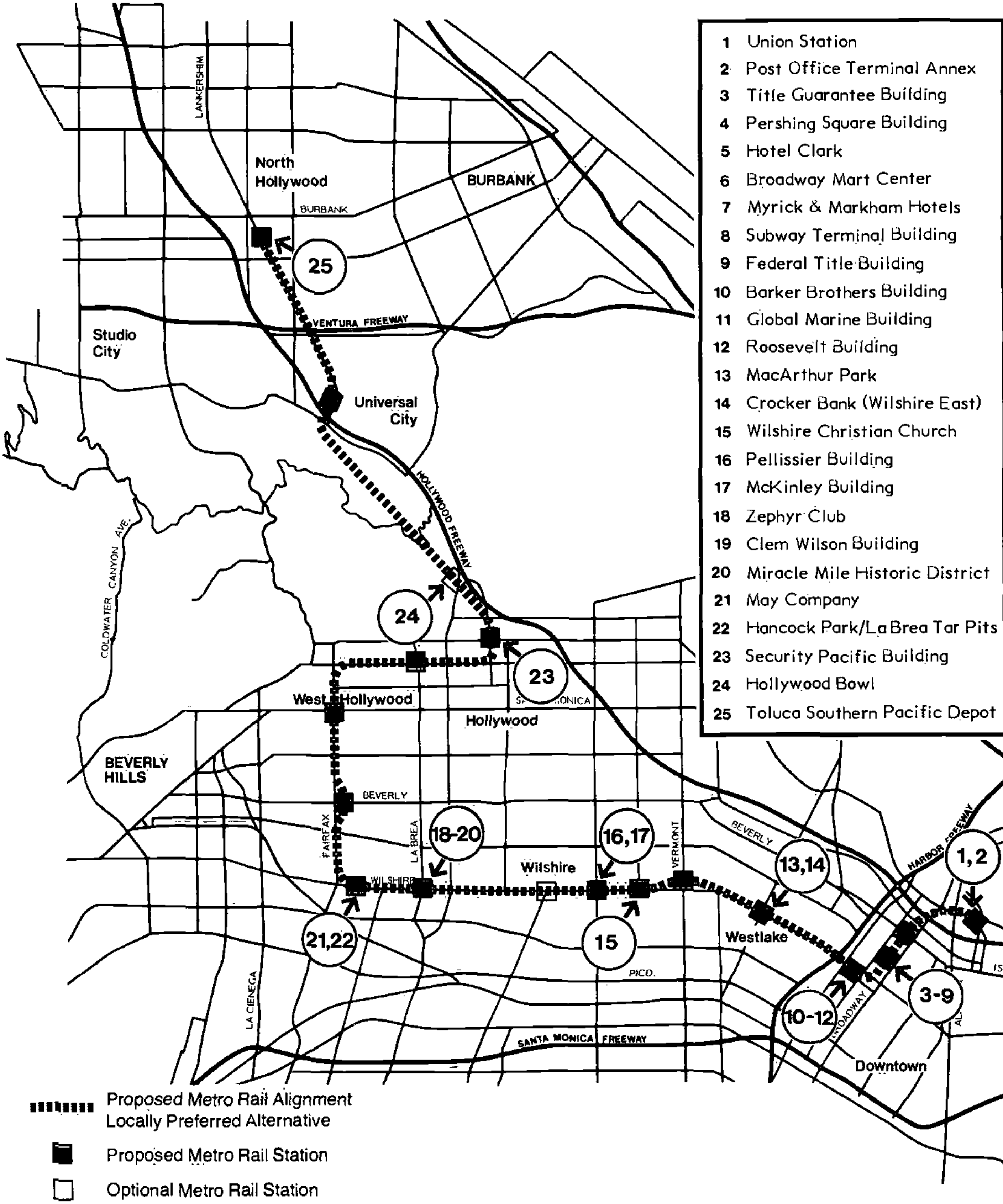
Again, we greatly appreciate your cooperation in this large and complex undertaking. If you have any questions, feel free to contact Stephen Mikesell of my staff at (916) 758-1813.

Sincerely,

Knox Mellon

Dr. Knox Mellon
State Historic Preservation Officer

Figure 4-1 SHPO Determination of Eligibility



Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 1 2 3 miles

Figure 4-2
Affected Historic Properties

SEDWAY/COOKE
Urban and Environmental Planners and Designers

Staff of the SHPO reviewed the inventory forms for these 63 properties and made field inspections. As a result, the SHPO agreed that 24 of the 63 were historically significant (Figures 4-1 and 4-2). Of these properties nine are either listed or have been determined eligible for the National Register of Historic Places. The nine, all in the downtown district or Wilshire district, include Union Station, Title Guarantee Building, Pershing Square Building, Subway Terminal Building, Broadway Mart Center, Myrick and Markham Hotels, Federal Title Building, Barker Brothers Building, and the Pellissier Building. The SHPO has also agreed that another 15 properties are potentially eligible for the National Register. Requests for Determination of Eligibility for these properties have been forwarded to the Keeper of the National Register. A Determination of Eligibility Request has been forwarded for one additional property, Hancock Park/La Brea Tar Pits. Discussion of impacts to this property is included in both the Historic Properties and 4(f) Evaluation sections of this Draft EIS/EIR. The addition of this property brings the total properties listed or determined potentially eligible for the National Register within the APEIs to 25.

2.3 APPLICATION OF CRITERIA OF EFFECT

Section 106 directs federal agencies to assess the effect of their project on any district, site, structure, or object included in or eligible for the National Register of Historic Places. Federal agencies must obtain the review and comment of the Advisory Council on Historic Preservation (ACHP) before the approval of projects that affect such properties. As cited in 36 CFR 800.3a, a project or undertaking shall be considered to have an effect:

> . . . whenever any condition of the undertaking causes or may cause any change, beneficial or adverse, in the quality of the historical, architectural, archaeological, or cultural characteristics that qualify the property to meet the criteria of the National Register. An effect occurs when an undertaking changes the integrity of location, design, setting, materials, workmanship, feeling, or association of the property that contributes to its significance in accordance with the National Register criteria. An effect may be direct or indirect. Direct effects are caused by the undertaking and occur at the same time and place. Indirect effects include those caused by the undertaking that are later in time or farther removed in distance, but are still reasonably foreseeable. Such effects may include changes in the pattern of land use, population density or growth rate that may affect on properties of historical, architectural, archaeological, or cultural significance.

2.4 DETERMINATION OF NO EFFECT

2.4.1 NO PROJECT ALTERNATIVE

No foreseeable effects to any of the 25 National Register properties are expected if the project is not implemented.

2.4.2 LOCALLY PREFERRED ALTERNATIVE

The Criteria of Effect were applied, in consultation with the SHPO, to the properties listed in or eligible for the National Register. It was determined that the Locally Preferred Alternative would have No Effect on 13 resources: Post Office Terminal Annex, Broadway Mart Center, Federal Title Building, Barker Brothers Building, Global Marine Building, Roosevelt Building, MacArthur Park, Crocker Bank (Wilshire East), McKinley Building, Zephyr Club, Clem Wilson Building, May Company, and the Miracle Mile District. Only the Broadway Mart Center is on the National Register. The other properties are eligible. In all of the above cases, the station entrances would not be clearly visible from the resource, nor would they change the integrity of the location, design, setting, materials, workmanship, feeling, or association of the property.

2.4.3 AERIAL OPTION

The Criteria of Effect were applied, in consultation with the SHPO, to the properties listed in or eligible for the National Register. It was determined that the Aerial Option would have No Effect on 13 resources: Post Office Terminal Annex, Broadway Mart Center, Federal Title Building, Barker Brothers Building, Global Marine Building, Roosevelt Building, MacArthur Park, Crocker Bank (Wilshire East), McKinley Building, Zephyr Club, Clem Wilson Building, May Company, and the Miracle Mile District. Only the Broadway Mart Center is on the National Register. The other properties are eligible. In all of the above cases, the station entrances would not be clearly visible from the resource, nor would they change the integrity of the location, design, setting, materials, workmanship, feeling, or association of the property.

2.4.4 MINIMUM OPERABLE SEGMENT

The Criteria of Effect were applied, in consultation with the SHPO, to the properties listed in or eligible for the National Register. It was determined that the Minimum Operable Segment would have No Effect on 13 resources: Post Office Terminal Annex, Broadway Mart Center, Federal Title Building, Barker Brothers Building, Global Marine Building, Roosevelt Building, MacArthur Park, Crocker Bank (Wilshire East), McKinley Building, Zephyr Club, Clem Wilson Building, May Company, and the Miracle Mile District. Only the Broadway Mart Center is on the National Register. The other properties are eligible. In all of the above cases, the station entrances would not be clearly visible from the resource, nor would they change the integrity of the location, design, setting, materials, workmanship, feeling, or association of the property.

2.5 DETERMINATION OF NO ADVERSE EFFECT

This section discusses the application of the Criteria of Adverse Effect. In a letter dated April 5, 1983 (Figure 4-3) the SHPO gives his opinion on effect, including those with "No Adverse Effect" and those with "Adverse Effect," on the historically significant properties along the rail alignment.

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
POST OFFICE BOX 2390
SACRAMENTO, CALIFORNIA 95811
(916) 445-8006

RECEIVED
APR 12 1983
GENERAL MANAGER
S.C.R.T.D.

April 5, 1983

In reply, refer to UMTA 820708A

John A. Dyer, General Manager
Southern California Rapid Transit District
425 S. Main Street
Los Angeles, California 90013

Dear Mr. Dyer:

Re: Determination of Effect, Metro Rail Project

Your letter requesting my concurrence in a determination of effect for the Metro Rail project was received on March 17, 1983.

With these conditions listed below, I concur in your determination of effect as stated in Section 4 of "(Preliminary Draft) Environmental Impact Statement and Environmental Impact Report, Los Angeles Rail Rapid Transit Project, Metro Rail," March 1983, Section 4. For the record, I will summarize my understanding of your determination of effect:

Properties for which there will be no effect:

1. Post Office Terminal Annex
2. Broadway Mart Center
3. Federal Title Building
4. Barker Brothers Building
5. Global Marine Building
6. Roosevelt Building
7. MacArthur Park
8. Crocker Bank
9. McKinley Building
10. Zephyr Club
11. Clem Wilson Building
12. May Company
13. Miracle Mile District

Properties for which there will be no adverse effect:

1. Myrick/Markham Hotel
2. Subway Terminal Building
3. Hotel Clark
4. Wilshire Christian Church
5. Pellissier Building
6. Hollywood Security Building
7. Hollywood Bowl
8. Toluca Southern Pacific Depot

Properties for which there will be an adverse effect:

1. Los Angeles Union Passenger Terminal
2. Title Guarantee Building
3. Pershing Square Building

My concurrence in the aforementioned determination of effect is conditional upon the following three provisions:

1. The Draft EIS/EIR should clarify the National Register status of each of the 24 properties, i.e., whether it is listed previously determined eligible, or determined eligilbe as part of this project.

2. My concurrence in a determination of adverse effect for three properties should not be interpreted as an endorsement of the recommended measures for mitigating that adversity. I do no mean to suggest that I object to those mitigation measures; I simply reserve judgement on mitigation until your agency has prepared a Preliminary Case Report and until we can negotiate the terms for a Memorandum of Agreement.

3. The section of the Draft EIS-EIR dealing with archeology (pages 4-29 to 4-30) should state than an archeological treatment plan for known resources and resources discovered during construction will be included as part of the project-wide Memorandum of Agreement.

I trust this letter clarifies our position with respect to the effect of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places. If you have any questions on this matter, feel free to contact Stephen Mikesell of my staff at (916)322-8599.

Sincerely,

K. Mellon

Dr. Knox Mellon
State Historic Preservation Officer

Figure 4-3 SHPO Determination of Effect

As defined in 36 CFR 800.3b:

> . . . adverse effects on National Register or eligible properties may occur under conditions which include but are not limited to the following:
>
> - destruction or alteration of all or part of a property
> - isolation from or alteration of the property's surrounding environment
> - introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting
> - neglect of a property resulting in its deterioration or destruction
> - transfer or sale of a property without adequate conditions or restrictions regarding preservation, maintenance, or use

2.5.1 NO PROJECT ALTERNATIVE

No foreseeable Adverse Effects to the 25 National Register properties are expected if the project is not implemented.

2.5.2 LOCALLY PREFERRED ALTERNATIVE

The Criteria of Effect were applied, in consultation with the SHPO, to the properties listed in or eligible for the National Register. It was determined that, under the Locally Preferred Alternative, there would be No Adverse Effects on eight properties listed or eligible for inclusion in the National Register. These properties are the Myrick and Markham Hotels, the Subway Terminal Building, the Hotel Clark, the Wilshire Christian Church, the Pellissier Building (Wiltern Theatre), the Security Pacific Bank at 6381-6385 Hollywood Boulevard, the Hollywood Bowl, and the Toluca Southern Pacific Depot. Only the Pellissier Building is listed on the National Register. All the other properties have been found eligible.

Myrick and Markham Hotels (324 - 326-1/2 Hill Street).

Description and Significance of Affected Property. The Myrick Hotel is a four-story brick Victorian, its prominent characteristics being a three-story set of recessed, double sashed windows with a fanlight on the fourth story, edged on both sides of the building by a three-story set of projecting, decorated oriel windows. Molding trim decorates all the windows. The ground floor entryway has been heavily modified, but the raised-letter "Myrick" name remains above the door.

Next door, the Markham Hotel is a three-story brick Victorian, its prominent characteristics being a set of arched two-story oriel windows (double-sash) with decorative columns. The central set of windows, partially obscured by a fire escape, are triple sashed with small, geometric glass paned doors, topped by the "Markham" name in raised letters. The main entrance has been modified to storefront. One small entrance exists on the left side of the building--a narrow door with a transom.

Built in the late Nineteenth Century, these two hotels now are used as commercial structures on the ground floor with apartments and transient quarters in the upper stories. Although slightly altered on the ground floor levels, these adjacent bay window structures are two of the last of their kind in downtown Los Angeles. The

Myrick was built in 1893 and the Markham in 1897. The Myrick and Markham Hotels have been determined eligible for inclusion in the National Register of Historic Places.

Inapplicability of the Criteria of Adverse Effect. The Locally Preferred Alternative would not result in the destruction or alteration of all or any part of the Myrick and Markham Hotels. The Locally Preferred Alternative would not isolate the property from its surrounding environment, nor would it significantly alter that environment. The nearest station entrance would be approximately 130 feet across Hill Street from the Myrick and Markham Hotels. The station entrances would be in view of the property but would not be out of character with the Myrick and Markham Hotels; nor alter this environment. The design of the station would be compatible with the existing urban environment. The Locally Preferred Alternative would not introduce visual, audible, or atmospheric elements that are out of character with the property. The Locally Preferred Alternative would not lead to neglect of the property, resulting in its deterioration or destruction. Implementation of the project would not require transfer or sale of the building.

Views of the State Historic Preservation Officer. In a letter dated April 5, 1983, SHPO stated that, in his opinion, the Locally Preferred Alternative would have No Adverse Effect on the Myrick and Markham Hotels (Figure 4-3).

Determination. UMTA, in consultation with the SHPO, has determined that there would be No Adverse Effect on the Myrick and Markham Hotels.

Subway Terminal Building (415-425 Hill Street).

Description and Significance of Affected Property. The building is thirteen stories high arranged in four wings. The bottom two floors are faced with alternating strips of wide and narrow blocks, punctuated with entryway arches two stories high, with coffered ceiling in the doorways. The entrance lobby is columned with mosaic over an entryway with arched openings to each side. The upper three floors have an Italian Renaissance flavor, with slender, graceful arched windows and tile roof. A renovation in 1970 involved installation of new elevators, restrooms, and central air conditioning and improvement of the building's electrical capacity.

The Subway Terminal Building is historically important in Los Angeles' rapid transit system. It was built at the same time as, and in conjunction with, Los Angeles' one-mile-long subway, and was to be the terminal for the electric car lines as well as the headquarters for the Pacific Electric Company. The structure became a focal point of the city's streetcar lines and in so doing, stabilized the center of business activity, which had been shifting with the streetcar line changes. The Subway Terminal Building, apart from its links to Los Angeles' transportation history, was at the time of construction one of the tallest office structures west of the Mississippi. Some of the important investors associated with its erection included Harry Chandler, I. H. Hellman, and J. J. Sartori. The Subway Terminal Building has been determined eligible for inclusion in the National Register of Historic Places.

Inapplicability of the Criteria of Adverse Effect. The Locally Preferred Alternative would not cause the destruction of or any alteration to the Subway Terminal Building, nor would it cause this building to be isolated from its surroundings. The nearest initial station entrance would be approximately 260 feet from the Subway Terminal Building. A proposed future entrance may be 100 feet away. Although the station entrances would be in view of this historic resource, they would not be out of character with the building or alter its setting. The design of the station would be compatible with the existing urban environment. The Locally Preferred Alternative would not lead to neglect of this building and would not introduce visual, audible, or atmospheric elements that are out of character with the building. The proximity of the subway station would add to the economic vitality of and generate interest in this historic subway structure. Implementation of the Locally Preferred Alternative would not require transfer or sale of the property.

Views of the State Historic Preservation Officer. In a letter dated April 5, 1983, the SHPO stated that, in his opinion, the Locally Preferred Alternative would have No Adverse Effect on the Subway Terminal Building (Figure 4-3).

Determination. UMTA, in consultation with the SHPO, has determined that there would be No Adverse Effect on the Subway Terminal Building.

Hotel Clark (426 Hill Street).

Description and Significance of Affected Property. The Hotel Clark is an eleven-story, classically detailed structure divided into seven bays with a two-story base and a large classical cornice. The base features original storefronts and windows and a projecting, bracketed marquee over the entrance. A broad, detailed entablature caps the base section. Another entablature with an egg and dart molded cornice and frieze with medallions at the piers tops the rusticated stone piers of the third floor. Each bay in the facade above has three double-hung windows divided by decorative spandrels and piers. The top two floors are set off by a projecting band supported by brackets at each bay and accented with flat capitals at each pier. The decorative projecting cornice has modillions, dentils, flat capitals at the piers and large brackets serving as capitals at each bay. The building also has an ornamental fire escape and a large perpendicularly hung sign. Exterior modifications include a new marquee and ground floor storefront alterations adjacent to the entrance.

This structure, built in 1913, was a lavish 11-story "skyscraper" (the sixth one on Hill Street) which took two years to build. Constructed of concrete, steel, and marble, the fireproof "palace" cost $2 million to build. Eli P. Clark, a prominent businessman, real estate investor, and contributor to the electric railway construction in Los Angeles, was responsible for building the hotel. Historically and architecturally, the Hotel Clark was the "fashionable" place to go in L.A. for many years. The hotel retains many of its original features. Some of the notable characteristics of the hotel include the largest marble lobby in the west, a bath in every room, banquet rooms and halls, a Dutch Grill, a ladies parlor, 555 rooms, and an engine room and pumping plant three stories below the pavement. F. M. Dimmick, formerly with the Hotel Alexandria, became the first lessee of the Hotel Clark. Plans were made to upgrade the Hotel Clark in 1979.

Inapplicability of the Criteria of Adverse Effect. The Hotel Clark is located on Hill Street directly across from the Subway Terminal Building. The Locally Preferred Alternative would not cause the destruction of or any alteration to the Hotel Clark; nor would it cause this building to be isolated from its surroundings. The nearest initial station entrance would be approximately 270 feet from the Hotel Clark. A proposed future entrance may be 110 feet away. The subway entrances would be visible from this building; however, the entrances would not be out of character with the Hotel Clark, nor alter its setting. The design of the station would be compatible with the existing urban environment. The Locally Preferred Alternative would not introduce visual, audible, or atmospheric elements that are out of character with the building. The Locally Preferred Alternative would not lead to neglect of the Hotel Clark. Instead, it would increase the economic viability of the building. Implementation of the Locally Preferred Alternative would not require transfer or sale of the Hotel Clark.

Views of the State Historic Preservation Officer. In a letter dated April 5, 1983, the SHPO stated that, in his opinion, the Locally Preferred Alternative will have No Adverse Effect on the Hotel Clark (Figure 4-3).

Determination. UMTA, in consultation with the SHPO, has determined that there would be No Adverse Effect on the Hotel Clark.

Wilshire Christian Church (634 South Normandie Avenue).

Description and Significance of Affected Property. The church is a tan-colored reinforced concrete building faced with art stone designed in an Italianate style. The main building has a basement, main floor, and gallery. There is a tall campanile roofed with red tiles on the Wilshire Boulevard side. The Normandie Avenue side is punctuated by a triple doorway above which is a deeply recessed rose window. The window is a copy of the rose window in the Rhiems Cathedral (France). To the north of the basilica structure is the three-story and basement Sunday School building. Palm trees line the street sides of the building.

Samuel J. Chapman, wealthy Los Angeles capitalist and partner with his brother, Charles, in the Chapman Brothers Company, donated the land for this church and was also on the building committee. Distinguished religious architect Robert H. Orr was the designer. The church is notable not only for its beautiful design, but also because it is one of a group of large, elegant houses of worship which were erected on Wilshire Boulevard during the 1920s. This particular section of the avenue attracted other important structures such as the Ambassador Hotel, the Wilshire Boulevard Temple, and the Immanuel Presbyterian Church.

Inapplicability of the Criteria of Adverse Effect. The Locally Preferred Alternative would not cause the destruction of or any alteration to the Wilshire Christian Church, nor would it cause it to be isolated from its surroundings. The Wilshire Christian Church is located approximately 250 feet away from the proposed station entrance. The building may view the subway entrance, but the view would not be out of character with the present surrounding. The design of the station would be compatible with the existing urban setting. Additionally, the Locally Preferred Alternative would not introduce visual, audible, or atmospheric elements that are out of character with the Wilshire Christian Church. The Locally Preferred Alternative would not lead to neglect of the church nor will it require transfer or sale of the property.

Views of the State Historic Preservation Officer. In a letter dated April 5, 1983, the SHPO stated that, in his opinion, the Locally Preferred Alternative would have No Adverse Effect on the Wilshire Christian Church (Figure 4-3).

Determination. UMTA, in consultation with the SHPO, has determined that there would be No Adverse Effect on the Wilshire Christian Church.

Pellissier Building/Wiltern Theatre/Franklin Life Building (3780 Wilshire Boulevard).

Description and Significance of Affected Property. The Pellissier Building, an example of Zig Zag Moderne style, with its blue green terra cotta veneer exterior and black granite base, is divided into four distinct parts that include the theatre, shop section, office section, and tower. The main entrance to the 2,500-seat theatre is distinguished by a large neon marquee with raised ornamental detail. The theatre, with its foyer diagonal to the street, is located in a tower with an Art Deco detailed marble and metal lobby entrance. The mercantile portion of the structure is two stories with twenty-one individual shops--eleven on Wilshire Boulevard, nine on Western Avenue, and one on Oxford Avenue. The tower is 190 feet in height. Several stories and levels are found on the tower, but the primary section consists of

12 stories. A garage is located in the basement. A small corner pavillion, diagonally situated to the street, is featured on the corner of Oxford and Wilshire streets. The pavillion carries out the Art Deco motif of the structure.

The reinforced concrete building has an ornamental terra cotta band over the second-story shop windows. Below these windows are decorated pressed metal bands which serve as a backdrop for the commercial neon signs. The store windows on the second floor have been dropped several feet below the normal second floor level. All windows, including those located on the tower, have spandrels constructed on steel with lead-coated copper. These window voids reflect the same blue-green color of the terra cotta building. A rounded bay window is located over the marquee.

The Pellissier Building has been placed on the National Register of Historic Places (1979). Originally known as the Pellissier Building, the structure was later purchased by the Franklin Life Company. The office and shop portion of the structure was designed by renowned architect Stiles O. Clements, while the theatre portion was planned by well-known theatre architect G. Albert Lansburgh. The Los Angeles architectural firm of Morgan, Walls and Clements first experimented with the vertical Art Deco styling, and the Pellissier Building is one of the finest remaining examples of this type of architecture in Los Angeles. The building has significance to the community in that it marks the gradual westward movement of the Los Angeles cultural and business sector from downtown to Wilshire Boulevard.

The theatre foyer well reflects the building's unique styling. The oval-shaped area is designed in a Moderne pattern with colorful terrazo floors and black marble walls and white metal walls with accents of Tennessee and Loredo Chiaro marbles. The Art Deco lobby adjoining the office building has ornamental white metal and black walnut panels on some of the walls and elevators, and copper and glass lighting. Except for present restoration, both the theatre and the office building have not been altered in any way since their construction; this is unusual for such a long period. The theatre lobby retains most of the original fixtures and furnishings. The foyer includes numerous chandeliers, ceilings painted in floral design, and floral wrought iron staircases leading up to the center of the main staircase. Ornate wrought iron grilles are found on all floors. The columns on the balcony overlooking the main theatre foyer have carved linear designs highlighted with copper. Although there have never been any live performances in the Wiltern Theatre, it retains its full working stage.

The theatre opened its doors on October 9, 1931, with George Arliss' "Alexander Hamilton." The auditorium itself is impressively tiered. Ornate three dimensional plaster decorations are found throughout the theatre. These are dominated by vertical detail. The main decorating motif is spear-like with copper and plaster carvings pointing downward. The lighting illuminates from the front of the theatre in a sunburst design which was one of architect Lansburgh's characteristic designs. The theatre pipe organ is the largest ever constructed by the Kimball Organ Company and is considered the largest theatre organ still in use in the United States.

Due to the Depression and a shortage of money for such elaborate projects, the Wiltern is the only Art Deco theatre that was ever built from Lansburgh's designs. The carefully planned decorative color scheme is retained in the theatre section. This is most unusual and makes the Wiltern one of the few remaining theatres that can make this claim. The structure vividly illustrates the characteristics generally associated with Art Deco styling. The central portion of the building consists of several set-backs and recessed windows separated by slender vertical bands, and the flat roof is capped by zig zag parapets and an off-set tower. The verticality of the structure is carried out so well that architectural historians David Gebhard and Robert Winter have commented that the "narrowness of the vertical recessed band windows and the spandrels so remove any reference to scale, that from a distance you would think that you were looking at a large skyscraper." The facade is further ornamented by zig zag motifs, geometrical leaf patterns, and a bright blue-green terra cotta veneer. The highly ornamental interior of the theatre carries out the Art Deco motif in its use of sunbursts, floral patterns, geometric designs, and elaborate fixtures.

Unlike many structures built during this period, the Pellissier Building has not been appreciably altered since its completion, testimony to the quality of its design and construction. Large neon signs have been placed on the top of the tower for the Franklin Life Company but do not alter the original construction. The theatre, originally known as the Warner Brother's Western Theatre, has had only the name changed on the neon signs. The marquee has been altered slightly; a narrow strip of ornamental wrought iron was removed, probably to meet earthquake standards. A band of iron backing located beneath the neon marquee is constructed of steel with lead-coated copper and carries out the geometric Art Deco vertical design. Presently the Pellissier Building is under complete restoration.

Inapplicability of the Criteria of Adverse Effect. A station entrance is planned for the northeast corner of Wilshire and Western Boulevards directly across the street, approximately 130 feet, from the Pellissier Building. The Thrifty building, which now occupies this location, would be replaced with an entrance that would be designed in character with the surrounding structures so as not to alter the setting of the Pellissier Building. The design of the station would be compatible with the existing urban setting. The Locally Preferred Alternative would not cause the destruction of or any alteration to this building, nor would it introduce visual, audible, or atmospheric elements that are out of character with the buildings. The Locally Preferred

Alternative would not lead to neglect of the Pellissier Building but would enhance use of this complex. The Locally Preferred Alternative would not require transfer or sale of this property.

Views of the State Historic Preservation Officer. In a letter dated April 5, 1983, the SHPO stated that, in his opinion, the Locally Preferred Alternative would have No Adverse Effect on the Pellissier Building (Figure 4-3).

Determination. UMTA, in consultation with the SHPO, has determined that there would be No Adverse Effect on the Pellissier Building.

Security Pacific Bank Building/Hollywood Security Building (6381-6385 Hollywood Boulevard).

Description and Significance of Affected Property. The Security Pacific Building, an example of the Italian Renaissance Revival/Beaux Arts architectural style, is a six-story structure of reinforced concrete, terra cotta ornaments, and a granite base. The facade on both Cahuenga and Hollywood Boulevards is identical except for the lintel above the Cahuenga Boulevard entrance. The Hollywood Boulevard entrance cornice has been removed to accommodate a sign. The bottom floor (two stories high) is a thin pink granite-over-sandstone with black granite around the bottom four feet. There are recessed panel windows at this level. Between the ground and upper floors there is a double terra cotta band. The next five floors have Moorish columns. The top windows are arched, and this arch is repeated in the stonework above that. The roof is flat and non-parapeted with a heavily decorated bracketed cornice and entablature. Small gargoyle heads run the length of both sides just below the roof line. The brackets are scrolled with fanned trim separated by rosettes. The door on the Cahuenga side has a massive scroll bracketed shelf. Both entries have bas relief urns on the facade in a repeating pattern. The doors are recessed, double glass and framed in brass. Above and around them is massive iron with filigreed trim. The building has a basement. Landscaping includes gumdrop-shaped trees on Hollywood Boulevard. The terrazzo "Walk of Fame" light fixtures on Hollywood Boulevard are white bars with red stars.

The building was the first downtown Los Angeles bank to open offices in Hollywood. In 1921, Security Pacific bought the local Hollywood National Bank founded in 1905 by prominent early citizens C. G. Greenwood and E. O. Palmer. Security Pacific Bank brought needed capital to the growing Hollywood commercial area. This bank was one of the earliest publishers of local historical pamphlets. Donald and John Parkinson, who designed the bank building, also designed Bullocks Wilshire, Santa Monica City Hall, and the Pacific Coast Stock Exchange. This is clearly one of the outstanding Beaux Arts structures in Hollywood. This structure holds the distinction of being the first "high rise" on what would later be referred to as "Skyscraper Mile."

The Security Pacific Bank Building is presently under complete restoration and will be leased as office space in the future.

Inapplicability of the Criteria of Adverse Effect. The Locally Preferred Alternative would not cause the destruction of or any alteration to the Security Pacific Bank Building, nor would it cause it to be isolated from its surroundings. Two station entrances would be located across the street from this building; the nearest would be approximately 80 feet away. The design of the entrances would not be out of character with the present surroundings. The design of the station would be compatible with the existing urban setting. The Locally Preferred Alternative would not introduce visual, audible, or atmospheric elements that are out of character with the building. The Locally Preferred Alternative would not lead to the neglect of the building; it would, instead, increase its economic viability. No transfer or sale of the Security Pacific Bank Building would be required.

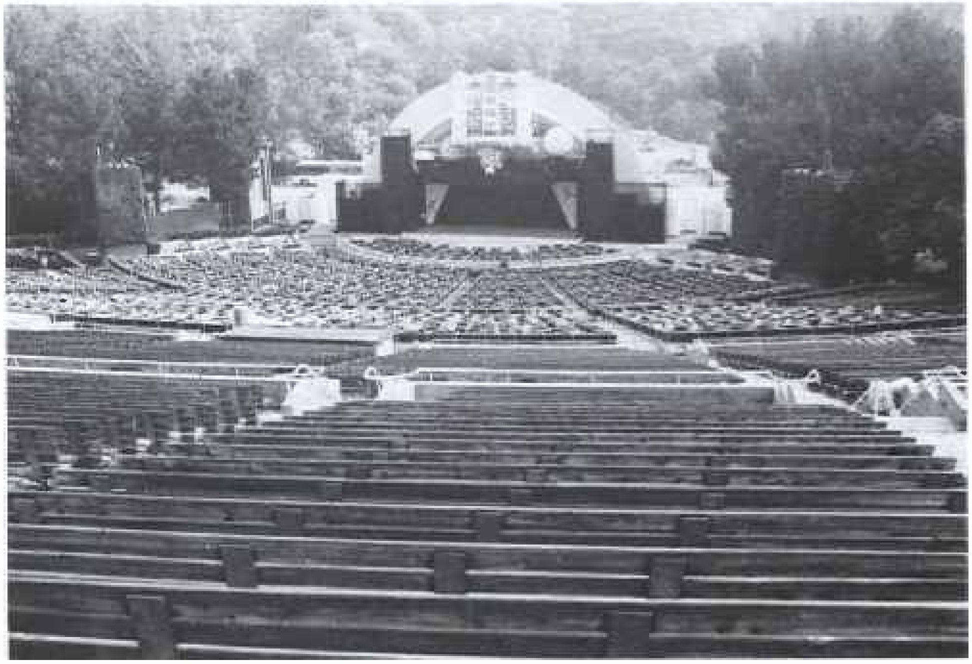
Views of the State Historic Preservation Officer. In a letter dated April 5, 1983, the SHPO stated that, in his opinion, the Locally Preferred Alternative would have No Adverse Effect on the Security Pacific Bank Building (Figure 4-3).

Determination. UMTA, in consultation with the SHPO, has determined that there would be No Adverse Effect on the Security Pacific Bank Building.

Hollywood Bowl (2301 North Highland Avenue).

Description and Significance of Affected Property. Hollywood Bowl is located on large undeveloped acreage in Cahuenga Pass and consists of a concrete acoustical shell, seating approximately 20,000, and several supportive structures including offices, concessions, and restroom facilities. The classical horn-shaped shell design is composed of welded steel, concrete, fiberboard, and wood with various structural modifications. The Hollywood Bowl with its horn-shaped shell design has become a landmark and a gathering place in Southern California. The gate to Hollywood Bowl on Highland Avenue is decorated by three Federal Arts Project statues representing music, drama, and dance. The statues were sculpted by George Stanley around 1935. The area around the Hollywood Bowl contains over 2,000 trees, hundreds of shrubs, picnic spots, and fountains.

Hollywood Bowl had its beginnings with a search for a natural outdoor amphitheatre in which concerts and plays could be staged "under the stars." H. Ellis Reed discovered the potential spot in Cahuenga Pass in the early 1920s. The area, originally known as Daisy Dell, became Hollywood Bowl. Easter sunrise services were first held on the site in 1922 and, when the Hollywood Bowl Association was established, funds were raised for the construction of improved facilities. In 1924, it was decided to improve the carrying power of the sound by building a shell, and Lloyd Wright was chosen as the designer. The wood shell was successful both visually and acoustically. In 1928, Wright constructed a shell elliptical in shape. In 1931, the Allied Architects replaced the wood shell with a concrete one. Because of difficulty in the acoustics, this shell has been continually remodeled. The Hollywood Bowl is currently owned and operated by the County of Los Angeles as a cultural activity area.



Inapplicability of the Criteria of Adverse Effect. The Hollywood Bowl Station is an optional station still under consideration by the SCRTD Board of Directors. If the station is built, an entrance may be constructed on Bowl property approximately 280 feet from the Bowl's shell. Two vent shafts 20 feet in diameter and standing 10-12 feet above the ground would be placed at either end of the station, one approximately 110 feet behind the structure and another approximately 625 feet away. The entrance would be sited to enhance the flow of patrons and would be compatible with the setting and character of the Hollywood Bowl. If the Hollywood Bowl Station is not built, a vent shaft and a traction power substation (basically a building with dimensions 50 feet by 150 feet) would be constructed in the Bowl's maintenance area approximately 900 feet away near an existing access road. The Locally Preferred Alternative would not cause the destruction of or any alteration to the Bowl structure itself. A station or a vent and traction power substation at this location would not introduce visual, audible, or atmospheric elements that are out of character with the facility. The vent shafts and substation would be equipped with buffers to prevent any possibility of perceptible noise. The Locally Preferred Alternative would not require transfer or sale of any part of the Hollywood Bowl. It would not cause the facility to be isolated from its surroundings nor would it lead to neglect. Rather, the Locally Preferred Alternative would make the Hollywood Bowl more easily accessible.

For discussion of impacts to the Hollywood Bowl Recreation Area, refer to section 5.2.2 of this chapter.

Views of the State Historic Preservation Officer. In a letter dated April 5, 1983, the SHPO stated that, in his opinion, the Locally Preferred Alternative would have No Adverse Effect on the Hollywood Bowl (Figure 4-3).

Determination. UMTA, in consultation with the SHPO, has determined that there would be No Adverse Effect on the Hollywood Bowl.

Toluca Southern Pacific Depot/Backstage Car and Truck Rental Lot (5401 Lankershim Boulevard/11275 Chandler Boulevard).

Description and Significance of Affected Property. The structure located at 11275 Chandler Boulevard consists of a one-story wood frame building. It is a rectangular building and is designed in a utilitarian manner with applied decoration. Major architectural features include a pitched roof and a loading dock with open-shed construction. Architectural details include sawn bargeboards and brackets, and a flat window and door openings. The structure has minor alterations including a new loading dock, fencing, and signage. These alterations do not affect the architectural integrity of the structure, which has retained the majority of its original detailing. In addition, the site plan of the building remains virtually unaltered.

A portion of the supply company property is now used as a truck and car rental lot. The lot faces Lankershim Boulevard. New manufacturing warehouses and offices are being built along Chandler Boulevard.

The Toluca Southern Pacific Depot is significant for its association with the growth and settlement of North Hollywood, and for its relatively unaltered condition. Southern Pacific built the first line through Toluca (North Hollywood) in 1896, and the station appears to have been built at this time. A photograph of 1927 indicates that the station was known as the "Southern Pacific - Pacific Electric" station. In December of 1911 the Pacific Electric Company opened its line through North Hollywood, and the station was incorporated into dual service between the Southern

Pacific and Pacific Electric. The Southern Pacific station is one of the few remaining wood frame, nineteenth century railroad stations in Southern California.

Inapplicability of the Criteria of Adverse Effect. The station entrances and parking facilities would be across Lankershim and 270 and 330 feet away from the Toluca Southern Pacific Depot. The entrances would not result in the destruction of or alteration to the building. The Locally Preferred Alternative would not isolate the Toluca Southern Pacific Depot or alter its surrounding environment. The design of the station would be compatible with the existing urban setting. The Locally Preferred Alternative would not introduce visual, audible, or atmospheric elements that are out of character with the property. The Locally Preferred Alternative would not lead to neglect of the building, resulting in its destruction or deterioration. Implementation of the Locally Preferred Alternative would not require sale or transfer of the property.

Views of the State Historic Preservation Officer. In a letter dated April 5, 1983, the SHPO stated that, in his opinion, the Locally Preferred Alternative would have No Adverse Effect on the Toluca Southern Pacific Depot (Figure 4-3).

Determination. UMTA, in consultation with the SHPO, has determined that there would be No Adverse Effect on the Toluca Southern Pacific Depot.

2.5.3 AERIAL OPTION

Application of Criteria of Adverse Effect. The Criteria of Adverse Effect were applied, in consultation with the SHPO, to properties along the alignment of the Aerial Option which are listed or eligible for listing in the National Register. It was determined that the Aerial Option would have No Adverse Effect on eight such properties. Indicated on Figure 4-1, they include: Myrick and Markham Hotels, Subway Terminal Building, Hotel Clark, Wilshire Christian Church, Pellissier Building, Security Pacific Bank Building (6381-6385 Hollywood Boulevard), Hollywood Bowl, and Toluca Southern Pacific Depot.

Inapplicability of the Criteria of Adverse Effect. Because the Aerial Option route is beneath the surface at all of these locations, except the Toluca Southern Pacific Depot, the discussion of the inapplicability of the Criteria of Adverse Effect for these properties is identical to the discussion for the Locally Preferred Alternative (see section 2.5.2 of this chapter). It is further determined that the aerial North Hollywood Station would not be out of character with the Toluca Southern Pacific Depot and would, therefore, have no adverse effect on this property.

2.5.4 MINIMUM OPERABLE SEGMENT

Application of Criteria of Adverse Effect. Because the Minimum Operable Segment is essentially a shortened version of the Locally Preferred Alternative, the effects are virtually the same for the stretch from Union Station to the Fairfax/Beverly Station. Application of the Criteria of Adverse Effect indicated that the Minimum Operable Segment would have No Adverse Effects on the following five properties which are listed or eligible for listing in the National Register: Myrick and Markham Hotels, Subway Terminal Building, Hotel Clark, Wilshire Christian Church, and Pellissier Building.

Inapplicability of the Criteria of Adverse Effect. Discussion of the inapplicability of the Criteria of Adverse Effect for these properties is included in the discussion for the Locally Preferred Alternative in section 2.5.2 of this chapter.

2.6 DETERMINATION OF ADVERSE EFFECT

The Criteria of Adverse Effect were applied in consultation with the SHPO to the remaining properties, listed in the National Register or eligible for such inclusion, that could be affected by the Metro Rail Project.

2.6.1 NO PROJECT ALTERNATIVE

It has been determined that, under this alternative, no properties would be adversely affected.

2.6.2 LOCALLY PREFERRED ALTERNATIVE

It has been determined that the following properties would be adversely affected: Union Station, Title Guarantee Building, Pershing Square Building, and Hancock Park/La Brea Tar Pits. Union Station is on the National Register. The other three properties are potentially eligible.

Union Station (800 North Alameda Street).

Description and Significance of Affected Property. Los Angeles Union Station is an historic district. It consists of the main terminal building; the Mail, Baggage, and Express Building east of the main terminal; rail tracks east of the express building; interconnecting tunnels and passageways; and canopies, loading docks, and other ancillary rail facilities.

The main terminal building is a large, 850-foot long, one- and two-story building built of reinforced concrete. Primary emphasis is placed on the entrance facade, a gigantic arch matched by the windows to the north. Immediately to the south is a 125-foot observation tower and clock. The building is characterized by its simplicity of strength and form. The building's features are largely overscaled; the entrance imparts the illusion of great wall thickness. The roofs are all red clay tile. The interior features two patios, beautifully landscaped to the south and the north of the main waiting room. The entrance and waiting rooms have high-beamed ceilings, marble floors and black walnut woodwork. Waiting room windows have iron grilles. Landscape features include garden courtyards and a ring of bay figs surrounding the parking lot area. Today, Union Station is landscaped with palms, eucalyptus trees, shrub hedges, and various other plants. 1930s style furniture, constructed of concrete, still stands on the train station grounds.

The Mail, Baggage, and Express Building is approximately 1,000 feet long, is a two-story building with a third story at both ends. The building is largely unused and in disrepair.

Union Station was opened in 1939, costing $11 million and involving five architects. It typified the Los Angeles of that period, its gorgeously landscaped patios with lemon, orange, and pepper trees, and its quiet but lavish Spanish style. During the war years it was a busy, vital hub in the civilian and military transportation and cargo interchange, accommodating three of the nation's most important railways: Southern Pacific, Santa Fe, and Union Pacific. Union Station has been designated Cultural History Landmark number 101 by the Los Angeles Cultural Heritage Board and has been placed on the National Register of Historic Places (11-30-80).

Today, the station is handling only a fraction of the volume of passengers and cargo it previously did, but still is in excellent condition and is functioning as Los Angeles' main terminal for trains.

Application of the Criteria of Adverse Effect. The Criteria of Adverse Effect were applied in consultation with the SHPO and it was determined that Union Station would be adversely affected according to the first criterion: destruction and alteration of part of the property. SCRTD is considering two alternative designs for station related facilities that would affect the Union Station District to different degrees. Alternative A proposes a small bus facility next to a surface parking lot located east of the track area (Figure 4-4). Alternative B would construct a bus facility at track level directly behind the main structure and a surface parking lot east of the track area (Figure 4-4.1).

Alternative A, which is the SCRTD preferred alternative, would involve the staged removal and replacement of Union Station rail track during cut and cover construction, the removal of the north end of the Mail, Baggage, and Express Building (currently being used as the Superintendent's offices), and the removal and reconstruction of part of a ramp and a section of an architecturally integrated wall at the north end of the property. The west entrance to the station would require the removal of an additional section of the Mail, Baggage, and Express Building (at which point it is a baggage handling shed) to make room for a walkway. Lastly, Alternative A would require the removal of a canopied loading dock east of the track area.

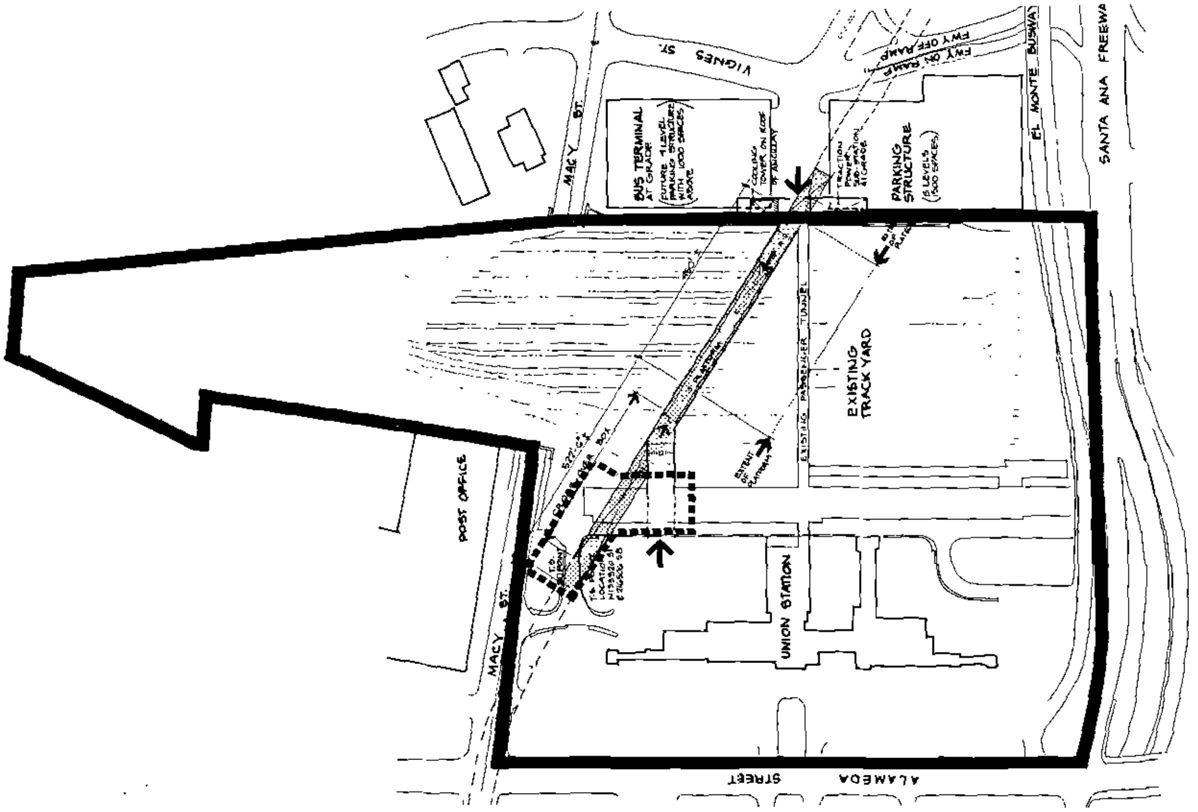


Figure 4-4 Los Angeles Union Passenger Terminal District Union Station-Alternative A

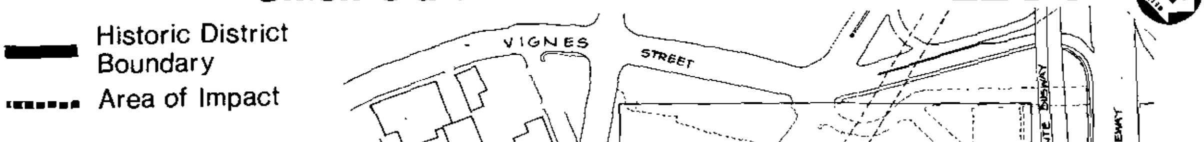


Figure 4-4.1 Los Angeles Union Passenger Terminal District Union Station · Alternative B

Alternative B would involve the same actions as Alternative A, plus the removal of the Mail, Baggage, and Express Building at and above track level. The removal and alteration of the ramp and the covered parking area at track level near the south end of the station would also be required to provide bus access from the proposed Busway Extension.

Views of the State Historic Preservation Officer. In his letter of April 5, 1983, the SHPO concluded that the project would have an Adverse Effect on this property and has reserved judgement on mitigation until a Preliminary Case Report and the terms for a Memorandum of Agreement have been prepared.

Views of Others. Formal comments concerning potential impacts to this property are expected when this Draft EIS/EIR is circulated.

Alternatives That Would Avoid Adverse Effect. Alternatives that would avoid adverse effects to Union Station would be to eliminate the station or to move it to another location.

If the station were eliminated, service to this major transit interface area would be denied. This would be contrary to plans and current projects to make Union Station a major transportation center, linking the El Monte busway extension, Amtrak operations, CBD circulator buses, and the Metro Rail Project. If the alignment were moved north to avoid Union Station, the Post Office Terminal Annex, another historic property, would be impacted. If the alignment were moved south, the architecturally significant main terminal building would be impacted by the cut and cover construction. This would involve removing and later reconstructing a portion of the structure itself. Additionally, a more southerly alignment would run directly under the El Pueblo de Los Angeles Historic District and possibly impact these structures.

Track geometry considerations preclude relocating the station or track. The availability of the rail yard behind Union Station makes this the logical start of the system. Acquiring land elsewhere for rail storage and maintenance activity would most certainly involve great displacement and considerably more environmental impact.

Alternatives That Would Mitigate Adverse Effect. Some adverse effects to Union Station could be mitigated by deleting the west station entrance. If this were done, all passengers would be received at the east entrance. Walking distances for most of the daily 2,400 passengers expected to walk to the station would be increased by approximately 900 feet. This would cause a major inconvenience to pedestrians and, therefore, is not recommended.

If Alternative A is constructed, the architecturally integrated wall and the north ramp would be reconstructed after the cut and cover construction is completed. The Superintendent's office in the Mail, Baggage, and Express Building would be reconstructed. The west entrance to the station would be covered by an archway compatible with the other archways at Union Station.

Like Alternative A, if Alternative B is constructed, the architecturally integrated wall and the north ramp would be reconstructed and the west entrance to the station would be covered by an archway compatible with other archways at Union Station. In contrast to Alternative A, under Alternative B, the Superintendent's Office and Mail, Baggage, and Express Building would be reconstructed only to track level. A preliminary examination of the feasibility of reusing this structure has been performed. Reuse for bus operation appears infeasible because of the difference in grade between the loading platform and the bus roadway. If Alternative B is selected for construction, the feasibility of reusing this structure will be examined in further detail.

As a matter of design, new construction would be compatible in terms of scale, massing, color, and materials and would be responsive to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Original ornamental materials would be reused whenever possible. Recording and architectural salvage would be undertaken according to the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) prior to demolition or alteration. A Memorandum of Agreement between the ACHP, UMTA, the SHPO, and SCRTD will include specific mitigation measures to be implemented.

Determination. The Locally Preferred Alternative has two alternative designs for Union Station. Alternative A would cause the staged removal and replacement of Union Station rail track; removal of the north end of the Mail, Baggage, and Express Building; the removal and later reconstruction of a ramp and an architecturally integrated wall on the north side of the station; the partial removal of the baggage handling shed of the Mail, Baggage, and Express Building; and the removal of a canopied loading dock east of the track area.

Alternative B would cause the same actions as Alternative A, plus the following: the removal of the entire Mail, Baggage, and Express Building at and above track level; the removal of a covered parking area at track level; and the removal and redesign of the ramp at the south end of the station.

These actions would have an adverse effect on Union Station. Measures that would mitigate the adverse impacts have been analyzed and the project as proposed includes a provision to record existing conditions prior to construction and to design the Metro Rail station to be compatible with the historic Union Station structure.

Title Guarantee Building (401 West Fifth Street).

Description and Significance of Affected Property. The Title Guarantee Building is a vertical modern skyscraper sheathed in light buff terra cotta. It is an irregular, multistory building, ranging up to 13 stories, with a basement. The structure is fireproof and built of steel frame construction with reinforced concrete and tile. Major architectural details include vertical ribs, twin sash windows, and panels of zig-zag ornaments above the eleventh floor. The stepped-back tower is flanked by flying buttresses, with modern grilles. The bottom story windows are surrounded by decorative copper metal frames. The bottom two stories also contain bas relief panels. The building shows a possible combination of the Gothic and the Moderne. With the exception of some alteration to the street-level shop frontage, the building facade is intact.

Designed by the prominent Southern California architectural firm formed by John and Donald Parkinson, the Title Guarantee Building is one of the better zig-zag structures in Los Angeles. It is part of a noteworthy group of structures relating both to the Wells Fargo Building on Fifth and to the other side of the Federal Title and Subway Terminal Building. This building is the kind of monumentally scaled structure appropriate to an important urban space like Pershing Square.

Application of Criteria of Adverse Effect. The Criteria of Adverse Effect were applied in consultation with the SHPO, and it was determined that the Title Guarantee Building would be adversely affected according to the criteria of alteration of part of the structure and introduction of visual and audible elements that are out of character with the building. The Locally Preferred Alternative would require the renovation of the ground floor to include an initial station entrance. This action would include the removal or alteration of part of the architectural fabric of the building, but would not alter the main lobby or the building's facade, which contribute to the building's significance. A new building entrance also may be required. (Figures 2-7 and 4-5.)

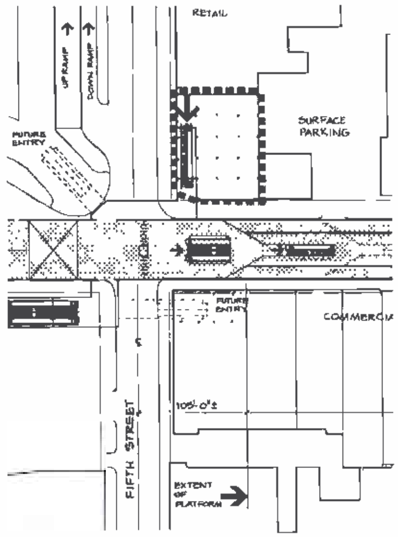


Figure 4-5
Title Guarantee Building

Views of the State Historic Preservation Officer. In his letter of April 5, 1983, the the SHPO concluded that the project would have an Adverse Effect on this property and reserved judgement on mitigation until a Preliminary Case Report has been prepared and the terms for a Memorandum of Agreement have been negotiated.

Views of Others. Formal comments concerning potential impacts to this property are expected when this Draft EIS/EIR is circulated.

Alternatives That Would Avoid Adverse Effects. The adverse effects could be avoided by deleting or relocating the station or by deleting or relocating the entrance proposed for this building.

The Fifth/Hill Station location was selected to serve the following nearby activity centers: Bunker Hill, the Grand Central Market, the Biltmore Hotel, and the International Jewelry Center. Future additions to this area include the renovation of the Philharmonic Auditorium, the construction of a multi-use complex on Fifth between Hill and Olive, and the California Plaza, a major mixed use development at Fourth and Hill Streets. Because patronage projections for this station are among the heaviest of the entire alignment, it is not recommended that the Fifth/Hill Station be deleted.

The station could be moved either north or south on the alignment and still serve these centers. However, if the station were moved north, it would be too close to the Civic Center Station. If it were moved south, it would be too close to the Seventh/Flower Station. An alternative route alignment along Broadway was studied but dropped, because it was determined that a Hill Street alignment would be able to serve the west side of the CBD and the Broadway area without impacting the buildings in the historic Broadway shopping district.

The passenger volume at the Fifth/Hill Station is projected to be the highest of all the stations. Initially, at least two entrances would be required and in the future, it may be necessary to have an entrance at all four corners. One of the initial station entrances is planned at the southeast corner of Fifth and Hill Streets in a parking lot which has no historic connection. The other is planned inside the Title Guarantee Building. The remaining corners at this intersection, both scheduled for future entrances, are occupied by the historic Pershing Square Building and Pershing Square parkland. Moving the Title Guarantee Building entrance to one of these sites would neither avoid impact to an historic property or parkland nor eliminate the possibility of an entrance in this building in the future. Midblock station entrances have been considered but are unsatisfactory because they do not provide direct access for pedestrians arriving at the station along Fifth Street from the Broadway shopping district.

A sidewalk location for the station entrance just off the property was considered, but this location was also unsatisfactory. The sidewalks would become too narrow to accommodate the high passenger volume expected to board the system at this station and still maintain adequate pedestrian flow.

Alternatives That Would Mitigate Adverse Effect. The ground floor would be altered to include a station entrance designed to be compatible with the architectural aspects of the structure. All new construction would be compatible in terms of scale, massing, color, and materials and would be responsive to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Recording and architectural salvage would be undertaken according to the HABS/HAER. A Memorandum of Agreement between the ACHP, UMTA, the SHPO, and SCRTD will include these mitigation measures.

Determination. The Locally Preferred Alternative would require the renovation of the ground floor of the Title Guarantee Building to include an initial station entrance. This would include the removal or alteration of the architectural fabric of the building. This action constitutes an adverse effect on the Title Guarantee Building. Alternatives that would mitigate the adverse impacts have been analyzed, and the project as proposed includes measures to minimize harm to this property, which is eligible for the National Register.

Pershing Square Building (448 South Hill Street).

Description and Significance of Affected Property. This example of Italian Rennaissance is a Class A steel frame and reinforced concrete structure with 13 stories and a basement. It is terra cotta with patterns resembling cut stone. Small balconies are located in the third level at both ends of the Hill Street and Fifth Street facades; larger balconies are located on the seventh level in the mid-facade area. There is a frieze of garlands on the fourth story, metal-framed windows with special colorettes on the second, and a frieze of decorative--Ram and Griffin-head--panels above the first floor. Additional decorative features include metal scrollwork, bronze cherub heads, and architectural terra cotta. The floor of the lobby area is real travertine, cut in oblong blocks and laid in a herringbone pattern. The lobby area has been altered, but the major decorative features are still apparent. The exterior is also altered, but intact. Streetlights along Fifth Street are double-luminaire, metal fixtures with torch-style luminaires.

The Pershing Square Building was designed by the prominent architectural firm of Curlett and Beelman. It is a moderate example of a utilitarian office structure with applied decoration. It suggests Italian influence in the masonry effect of the gray terra cotta exterior and in the massive, overhanging projection of the structure above the eleventh floor. The utilitarian plan and decorative detailing of the building mark an important step in the evolution of corporate architecture in Los Angeles.

Application of Criteria of Adverse Effect. The Criteria of Adverse Effect were applied in consultation with the SHPO, and it was determined that if the future entrance is constructed, the building would be adversely affected by the criteria of alteration of part of the structure and introduction of visual and audible elements that are out of character with the building. If a future station entrance planned for this location is built, the ground floor would be renovated, removing or altering part of the architectural fabric of the building. This would not alter the main lobby or the upper floors' facade which contribute to the building's significance (Figures 2-7 and 4-6). A new building entrance also may be required.

Views of the State Historic Preservation Officer. In his letter of April 5, 1983, the SHPO concluded that the project would have an Adverse Effect on this property and reserved judgement on mitigation until a Preliminary Case Report has been prepared and the terms for a Memorandum of Agreement have been negotiated.

Views of Others. Formal comments concerning potential impacts to this property are expected when this Draft EIS/EIR is circulated.

Alternatives That Would Avoid Adverse Effect. The adverse effects could be avoided by deleting or relocating the station or by deleting or relocating the station entrance proposed for this building.

The Fifth/Hill Station location was selected to serve the following nearby activity centers: Bunker Hill, the Grand Central Market, the Biltmore Hotel, and the International Jewelry Center. Future additions to this area include the renovation of the Philharmonic Auditorium, the construction of a multi-use complex on Fifth between Hill and Olive, and the California Plaza, a CRA Project at Fourth and Hill Streets. Because patronage projections for this station are among the heaviest of the entire alignment, it is not recommended that the Fifth/Hill Station be deleted.

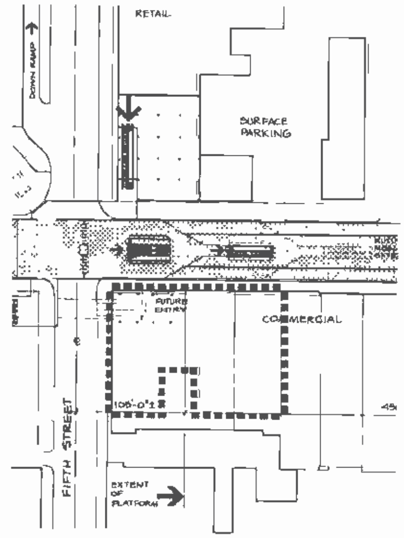


Figure 4-6
Pershing Square Building

The station could be moved either north or south on the alignment and still serve these centers. However, if the station were moved north, it would be too close to the Civic Center Station. If it were moved south, it would be too close to the Seventh/Flower Station. An alternative route alignment along Broadway was studied but dropped, because it was determined that a Hill Street alignment would be able to serve the west side of the CBD and the Broadway area without impacting the historic buildings in the Broadway shopping district.

The passenger volume at the Fifth/Hill Station is projected to be the highest of all the stations. Initially, at least two entrances are required. Although the Pershing Square Building entrance is not in the current scope of the project or time frame, it is designated as a future entrance. If actual patronage levels require and cost considerations permit additional entrances at this station, the Pershing Square Building entrance would be constructed.

The remaining corner at this intersection is Pershing Square parkland. This location is also designated as a future entrance. Using the parkland as an alternative to the Pershing Square Building may not eliminate the future need for an entrance in this building.

Midblock entrances have been considered but are unsatisfactory because they do not provide direct access for pedestrians from the Broadway shopping district or for persons transferring from buses on Fifth Street. A sidewalk location for the station entrance just off the property was considered, but this location was also unsatisfactory. The sidewalks would become too narrow to accommodate the high volume of passengers expected to board the system at this station and still maintain adequate pedestrian flow.

Alternatives That Would Mitigate Adverse Effect. The ground floor would be altered to include a station entrance designed to be compatible with the architectural aspects of the Pershing Square Building. All new construction would be compatible in terms of scale, massing, color, and materials and would be responsive to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Recording and architectural salvage would be undertaken according to the HABS/HAER. A Memorandum of Agreement between the ACHP, UMTA, the SHPO, and SCRTD will include these mitigation measures.

Determination. The Locally Preferred Alternative may require the renovation of the ground floor of the Pershing Square Building to include a future station entrance. This would include the removal or alteration of the architectural fabric of the building. This action constitutes an Adverse Effect on the Pershing Square Building. Alternatives that would mitigate the adverse impacts have been analyzed, and the project as proposed includes measures to minimize harm to this property, which is eligible for the National Register.

Hancock Park/La Brea Tar Pits.

Description and Significance of Affected Property. Hancock Park is a 23-acre parcel located in the west Wilshire District bounded by Sixth Street on the north, Curson Avenue on the east, Wilshire Boulevard on the south, and Ogden Drive on the west. The park's significance centers around the La Brea Tar Pits which are within the park's boundary. The locality is world-famous as more than one million fossil bones, as well as specimens of insects, shelled invertebrates and plant remains have been recovered since excavations began here in 1906.

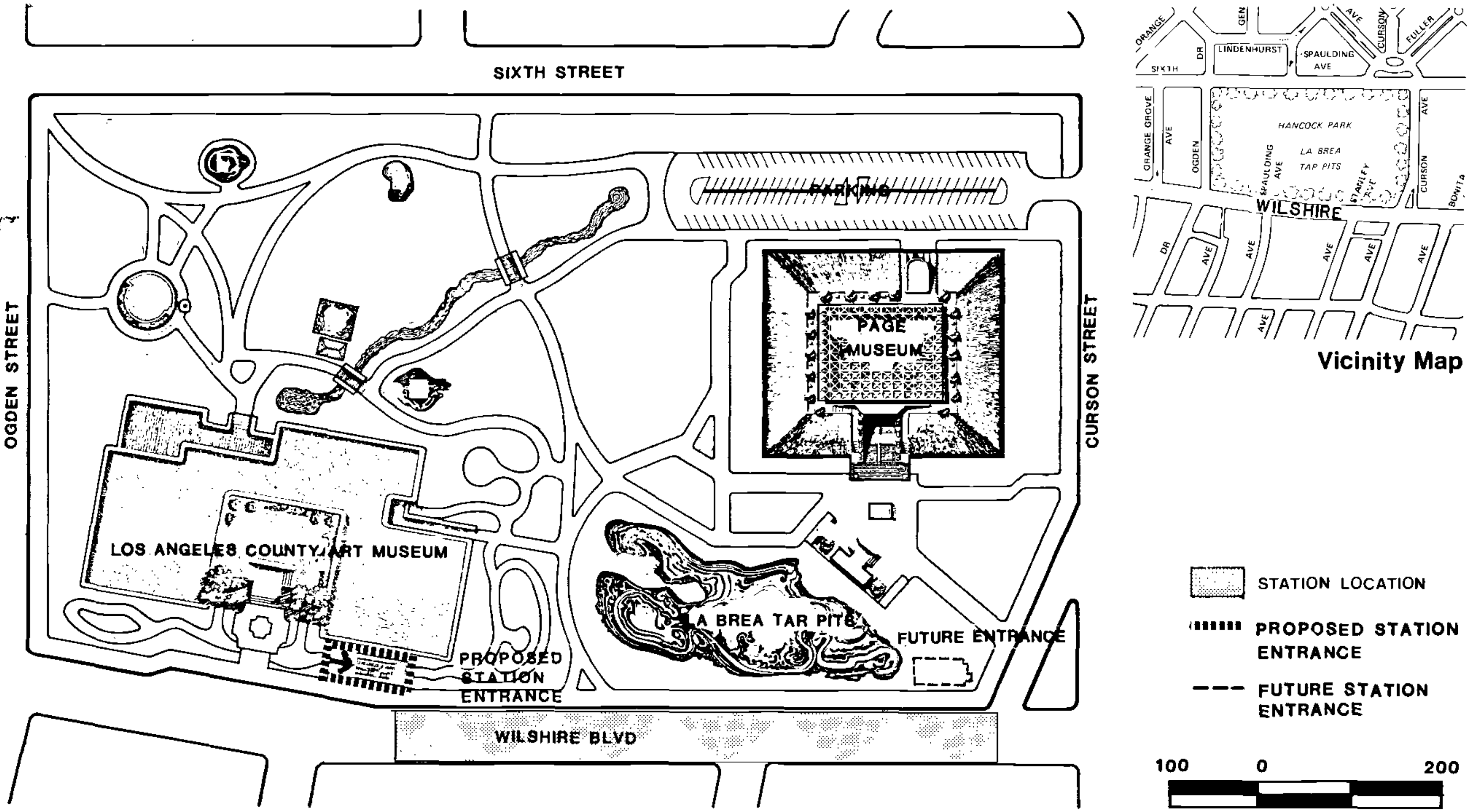
G. Allan Hancock sold the parcel to the County of Los Angeles in 1916 with the condition that the land be used for public park purposes. The park contains large man-made lakes and several streams with life-size cement replicas of the reconstructed animals embedded in the pits. These animals include the Jefferson Mammoth, Harlan's Ground Sloth, the Sabertooth Tiger, and a Short Face Bear.

The Los Angeles County Art Museum located on 5-1/2 acres inside Hancock Park/La Brea Tar Pits was built as a result of the great demand from the public for a separate art museum in Los Angeles. The museum was originally located in Exposition Park. As part of the Los Angeles County Museum of History, Science and Art, privote citizens under the direction of museum Trustee, Edward W. Carter, raised approximately $12 milliion for the museum's construction. Upon its completion in 1965, the Los Angeles County Board of Supervisors was deeded the building as a gift to the people of Los Angeles. The Museum of Art was dedicated on March 30, 1965 and opened its doors to the public the following day. It is considered to be the youngest general art museum in America.

In 1965, Mr. George C. Page donated $2 million for the construction of a 60,000 square foot museum for the purpose of exhibiting the fossil remains found at the site. Previously, many of these remains had been on display at the Museum of Natural History in Exposition Park. In 1978, the George C. Page Museum was opened to the public. Its staff of scientists is engaged in research, preparation, and curation of the tremendous volume of specimens that has amassed over the years.

Application of Criteria of Adverse Effect. The Criteria of Adverse Effect were applied in consultation with the SHPO, and it was determined that the Hancock Park/La Brea Tar Pits would be adversely affected according to the criterion of destruction or alteration of part of the property. The Locally Preferred Alternative would place a station entrance on the property near the Museum of Art and possibly another in the southwest corner of the park sometime in the future (Figures 2-17 and 4-7). Two other entrances would be constructed at either end of the station across from the park on Wilshire Boulevard. An off-street bus terminal and a surface parking area is planned on Wilshire Boulevard between Spaulding and Curson Avenues, also across the street from the park. Initial studies indicate that the proposed station location is in the area of highest paleontological sensitivity. Therefore, the construction activity of the proposed station and ancillary facilities would have the greatest potential for encountering paleontological resources associated with the La Brea Tar Pits. For this primary reason, two alternative station locations are being examined.

View of the State Historic Preservation Officer. In a meeting with SCRTD and the SHPO on April 12, 1983, it was concluded that the project would have an Adverse Effect on this property. Judgement was reserved on mitigation which includes alternative station sites, pending results of a comprehensive test drilling program along Wilshire Boulevard.



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 4·7 Hancock Park / La Brea Tar Pits

Views of Others. Formal comments concerning potential impacts to this property are expected when this Draft EIS/EIR is circulated.

Alternatives That Would Avoid Adverse Effect. There are two basic options to avoid adverse effect to Hancock Park/La Brea Tar Pits: delete the station or relocate it to another area.

The Adverse Effect could be avoided by deleting the Wilshire/Fairfax Station. This is not recommended for the following reasons. The proposed location is the most desirable for intercepting buses and autos coming from the southwest and west portions of Los Angeles. Both Wilshire Boulevard and Fairfax Avenue are major travel corridors, and it is expected that this intersection would become the major transfer point for the system. Also, the Wilshire/Fairfax area is a major attraction center, with the Los Angeles County Museum of Art, the George C. Page Museum, the Mutual Benefit Life Plaza and the California Federal Plaza office buildings, and the May Company and Ohrbach's Department Stores located near the station.

Preliminary investigation has determined that the proposed station location has a high likelihood of affecting paleontological resources. SCRTD studies and staff discussions with the Page Museum indicate that a westward movement will reduce the possibility of encountering paleontological resources during station construction. Alternative station locations that could avoid adverse effect are being examined. Alternative A (Figure 4-7.1) would place the station box on Wilshire Boulevard between Ogden and Fairfax. This station location would require a westward swing in the alignment to curve back to run north on Fairfax. Alternative B (Figure 4-7.2) would place the station box on Wilshire just west of Fairfax. This station location would involve two types of service. One branch of the alignment will swing north from the Wilshire/La Brea Station directly to the Fairfax/Beverly Station, while another branch would go straight on Wilshire Boulevard stopping at the Wilshire/Fairfax Station in its new location.

A study program proposed by SCRTD to identify the presence of the paleontological resources and their extent is currently being reviewed by the Page Museum and others. This study will use seismic techniques and test drillings to determine the locations and magnitudes of the resources at the preferred and alternative station locations. If the program demonstrates the existence of significant resources in front of the preferred station and an alternative location is selected, consideration would be given to designing the tunnel to avoid the resources. A survey of historic buildings has been performed in the areas under consideration for the alternative station locations. In consultation with the SHPO, the May Company is the only property identified as potentially eligible for inclusion in the National Register, and neither of the alternative station locations would affect this property.

Alternatives That Would Mitigate Adverse Effect. The latter phase of the study mentioned above will define the appropriate data recovery plan for resources encountered during construction of the preferred or alternative station locations.

Alternative A would include a future entrance outside the May Company Building which has been determined eligible for inclusion in the National Register of Historic Places. If this entrance is built, it would have no adverse effect on the May Company Building. The entrance itself would be designed so that it would not be out of character with the existing urban setting and would not isolate the May Company Building. It would not introduce visual, audible, or atmospheric elements that would be out of character with the building.

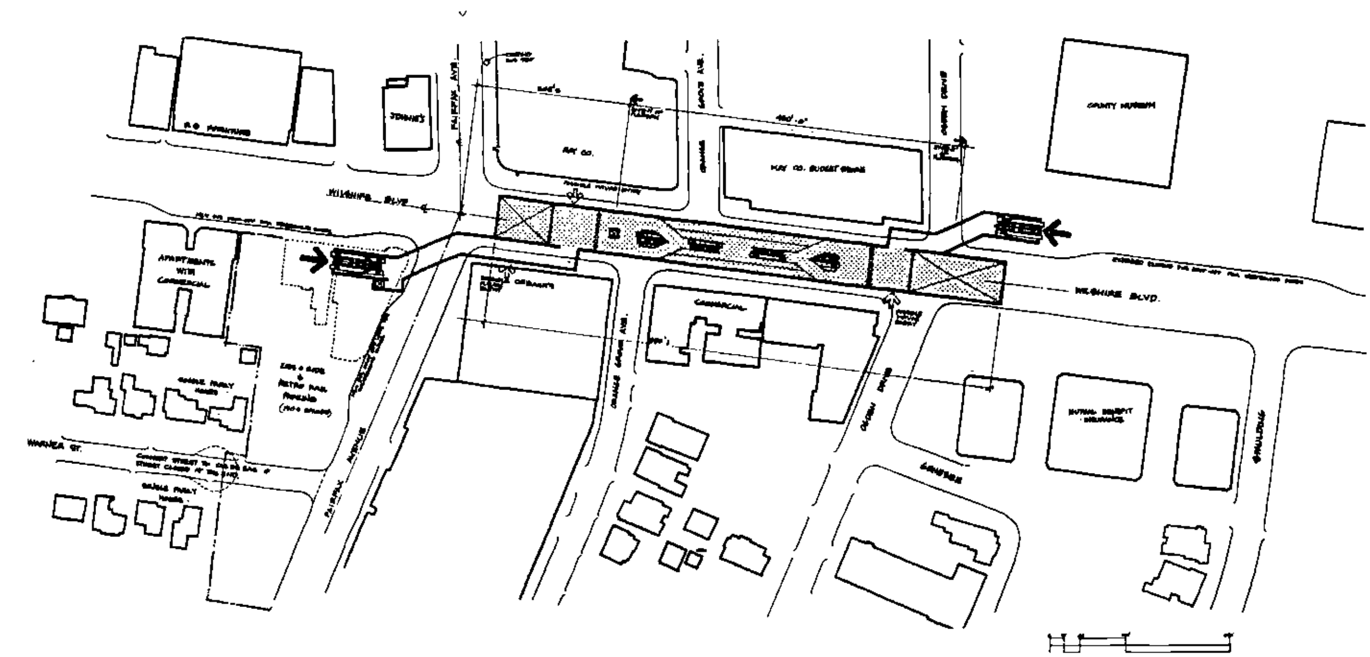


Figure 4·7.1 Wilshire/Fairfax Station · Alternative A

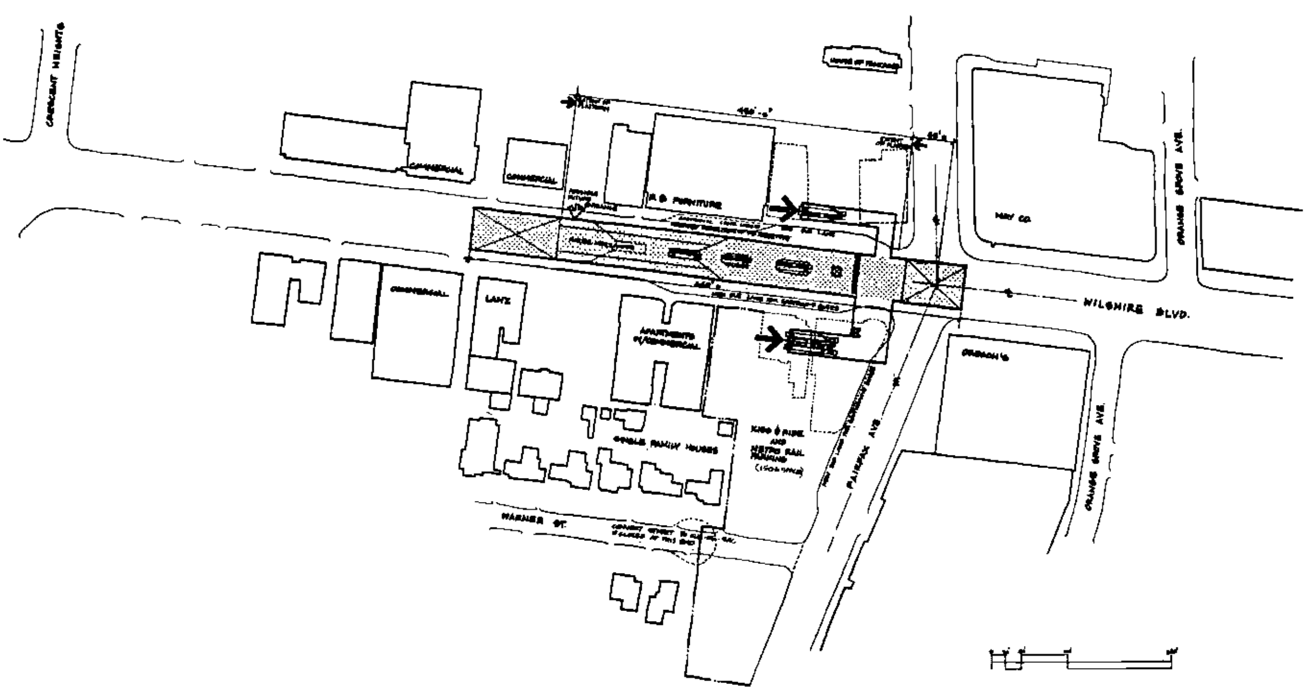


Figure 4·7.2 Wilshire/Fairfax Station · Alternative B

If the proposed station location is adopted and entrances are placed inside Hancock Park/La Brea Tar Pits, the design of the station and the entrances would be responsive to the Secretary of the Interior's Standards, and recording would be undertaken according to the HABS/HAER.

If either Alternative A or B is adopted, the potential impacts on cultural and historic resources of tunneling west of Fairfax Avenue and north of Wilshire Boulevard will be covered in appropriate detail when the test drilling program is complete and a decision is made on alignment and station location.

Determination. The Locally Preferred Alternative would place a station entrance in Hancock Park/La Brea Tar Pits near the Museum of Art and in the future, possibly place a station in the southeast corner of the park. The construction of this station and these entrances may cause removal of paleontological resources associated with the La Brea Tar Pits. The action constitutes an adverse impact on Hancock Park/La Brea Tar Pits. Alternatives that would avoid or mitigate this impact are being analyzed and include two alternative station locations and a shift in the depth of the tunnel.

2.6.3 AERIAL OPTION

It has been determined that, under the Aerial Option, the following properties included or eligible for inclusion in the National Register would be affected: Union Station, Title Guarantee Building, Pershing Square Building, and Hancock Park/La Brea Tar Pits. The adverse effects to these properties are identical to those of the Locally Preferred Alternative. For discussion of these properties, their effects, and mitigation measures, refer to section 2.6.2 of this chapter.

The Aerial Option may adversely affect additional historic properties. Analyses performed indicated that the properties listed in Table 4-1 are of potentially historic quality and may be adversely affected by the Aerial Option. The adverse effects to these properties would most likely result from the introduction of visual and audible elements that would be out of character with the properties or would alter their settings. The alternative that would avoid such impacts on these properties is the preferred subway alignment which involves an additional $64.4 million in capital costs. The properties listed in Table 4-1 have not been examined for eligibility by the SHPO. Under agreement with the SHPO, further analyses will be conducted if, during the decision-making process, the Aerial Option becomes the preferred alternative.

2.6.4 MINIMUM OPERABLE SEGMENT

It has been determined that the following properties included or eligible for inclusion in the National Register would be adversely affected: Union Station, Title Guarantee Building, Pershing Square Building, and Hancock Park/La Brea Tar Pits. The adverse effects to these properties are identical to those of the Locally Preferred Alternative. For discussion of these properties, their effects, and mitigation measures, refer to section 2.6.2 of this chapter.

TABLE 4-1

POTENTIAL HISTORIC PROPERTIES WHICH MAY BE ADVERSELY AFFECTED BY AERIAL OPTION

Resource	Address
Toyota Dealership	4100 Lankershim
Stained Glass Center	4209 Lankershim
Law Office	4224 Lankershim
Marco Mufflers	4340 Lankershim
Quisenberry Insurance	4342 Lankershim
Wellingtons	4354 Lankershim
St. Charles Borromero Catholic Church	S.W. Corner--Moorpark and Lankershim
Porsche Service	4429 Lankershim
Residence	10944 Kling
Ralph's Supermarket	N.W. Corner--Camarillo and Lankershim
Vic's Instant Printing	5001-5007 Lankershim
Craftsman Bungalow	11043 Hesby
1895 Queen Anne Residence	11104 Ostego
Office Building	5077 Lankershim
Italmotor	5101 Lankershim
H. Jaye Stern Valley Furriers	5112 Lankershim
Structure	5143-5147 Lankershim
Structure	5151-5157 Lankershim
Merchant Drugs	5169 Lankershim
World Tile Unlimited	11212 Magnolia
Western Surplus	5201-5209 Lankershim
Woolworths	5244-5248 Lankershim
Bank of America	5278 Lankershim
Optometrist	5308 Lankershim
El Portal Theatre	5269 Lankershim
Paperback Shack	5303 Lankershim

Note: It has been determined that adverse effects to these properties would most likely result from the introduction of visual and audible elements that are out of character with the properties or would alter their settings.

3. ARCHAEOLOGICAL RESOURCES

3.1 INTRODUCTION

The Metro Rail Project route follows existing right-of-way through extensively urbanized areas. Very little undisturbed original ground surface is visible, and little is known of archaeological sites in the Regional Core. Few archaeological sites have been recorded with the California State Clearinghouse in the vicinity of the proposed Metro Rail Project. Other sites in the area (such as of the village of Yangna in downtown Los Angeles) have been hypothesized from ethnographic and historic data as well as rumor, but exact locations have not been confirmed.

Although no archaeological resources have been reported in the area on the northeastern side of Cahuenga Pass near Universal Studios since a 1932 exploration of the historic foundations of Campo de Cahuenga, artifacts may be encountered here during construction of the Metro Rail Project.

3.2 IDENTIFIED ARCHAEOLOGICAL RESOURCES

Los Angeles Union Passenger Terminal (Union Station) National Register of Historic Places District. The Los Angeles Union Passenger Terminal National Register District (Figure 4-4), bounded by Macy, Alameda, and Aliso Streets, was placed on the National Register of Historic Places in 1980 because of its architectural and historic significance. Intact archaeological remains have been recovered within the district's boundaries below the present parking lot west of the main terminal buildings, further enhancing the Union Station District's significance.

As much as 20 feet of fill has been brought in to build up the Union Station property, which before construction fell within the active Los Angeles River floodplain and was periodically and severely flooded. Cultural materials apparently were buried beneath this fill and preserved rather than destroyed during construction.

Native American artifacts were found during construction of Union Station, and one archaeologist suggested that these remains were from the Gabrielino village of Yangna. However, it seems unlikely that Yangna would have been located in the active floodplain of the Los Angeles River. Recent researchers consider a more likely location for Yangna to be on higher ground, in the vicinity of the Bella Union Hotel, where artifacts were encountered during construction in 1870. It has been suggested that artifacts recovered at Union Station are related to the later post-contact (1836) Rancheria de Poblanos, a segregated Indian district established near the corner of Commercial and Alameda Streets.

Soil borings in the southwestern corner of the Union Station parking lot revealed an intact, historic refuse deposit below the present paved surface. Historic documents place the Mathew B. Keller residence and wine cellar and Hotel de France in the southern half of Union Station parking lot west of the terminal buildings. Although these soil borings did not reveal subsurface structural remains, the refuse deposit contained artifacts assignable to the periods of occupation of the Mathew Keller residence and business, and the Hotel de France.

Historical and archaeological investigations at Union Station clearly demonstrate that significant intact archaeological resources are present. Unfortunately, no extensive, systematic excavation has taken place here, and these buried cultural deposits are not unquestionably assignable to either the Mathew Keller residence and business or the Hotel de France.

El Pueblo de Los Angeles State Historic Park (National Register District). El Pueblo de Los Angeles State Historic Park is adjacent to Union Station on the west, and is bounded by Sunset Boulevard and Ord Street to the north, Hill and New High Streets to the west, the Santa Ana Freeway and Arcadia Street to the south, and Alameda Street to the east. Two previously recorded archaeological sites here (LAn-7 and LAn-887) have yielded material from every historic period in Los Angeles' downtown occupation, beginning with the Spanish/Mexican Period and extending into the recent American Period.

The Locally Preferred Alternative would tunnel under the north end of this District; however, since the top of the tunnel would be at least 20 feet below the original grade, it is expected that no resources would be encountered.

Civic Center and Fifth/Hill Station Locations. Isolated artifacts and buried human skeletal remains were recovered from a construction site at Temple and Hill, and remnants of Zanja No. 8 may be located below the Title Guarantee Building at Hill and Fifth Streets.

Hancock Park/La Brea Tar Pits. A site labeled LAn-159 is in Hancock Park and is represented by artifacts recovered from the La Brea Tar Pits. Artifacts recovered indicate the La Brea Tar Pits may have been visited for hunting purposes and for acquiring pitch and tar rather than for settlement. The first non-Indian visitors to the La Brea Tar Pits were scouts of the Portola expedition on August 3, 1769, and no mention of Native American settlement at that location was made in diaries kept by these explorers. The La Brea Tar Pits, containing Pleistocene to Early Recent fossil deposits, are considered one of the most significant paleontological sites in the world and have been designated California State Historic Landmark No. 170.

Campo de Cahuenga. Listed as California State Historic Landmark No. 151, Campo de Cahuenga is approximately at the site where the treaty signed on January 13, 1847 by General Andres Pico and Lieutenant Colonel John C. Fremont surrendered Mexican California to the United States. The structures now on the site of Campo de Cahuenga are replicas built in 1949. Excavations undertaken in 1932 exposed wall foundations and tile floors of the original Casa de Cahuenga. This structure measured 39 feet by 99.5 feet, with a 13-foot, 10-inch-wide pillared corridor extending along the entire north side of the building.

A map by Giffen (1937), located at City of Los Angeles Engineering Department, places the original Casa de Cahuenga north of the reconstructed building. As shown on the map, the northeast corner of the original Casa de Cahuenga is below Lankershim Boulevard, and an "old road" runs in front of the original building below the southeast corner of the reconstructed building. It is possible the original Casa de Cahuenga is located below the surface of the Hewlett-Packard parking lot north of the reconstructed Casa de Cahuenga. According to the 1932 explorations of the Campo de Cahuenga site, there were very little architectural remains left at the time of excavation.

The potential for affecting subsurface archaeological resources in the remaining areas is unknown, because no archaeological sites or artifacts have been recorded in the vicinity.

3.3 IMPACT ASSESSMENT AND MITIGATION

3.3.1 NO PROJECT

No impacts on archaeological resources are expected if the Metro Rail Project is not implemented.

3.3.2 LOCALLY PREFERRED ALTERNATIVE

The Locally Preferred Alternative has the most potential for disrupting archaeological resources in the Los Angeles Passenger Terminal District (Union Station), at the cut and cover location for the crossover northwest of the track area extending to Macy Street. SCRTD would begin construction in this area at least six months ahead of any major construction work on the station proper. This would allow time for archaeological testing, development of a data recovery plan, and proper recovery if resources are found. A qualified archaeologist will observe the cut and cover phase of this construction.

If archaeological resources exist at the Civic Center station location, they would be revealed during the cut and cover phase of construction. The exact location of the Zanja No. 8 (irrigation ditch) is unknown, but it is suggested that it may exist near Fifth and Hill Streets. A qualified archaeologist would observe the cut and cover construction phase at these stations to ensure avoidance of impacts and proper recovery of any finds.

It is unknown whether archaeological remains would be found at Hancock Park/La Brea Tar Pits, although it is quite likely that Pleistocene and recent fossil remains would be uncovered. A qualified archaeologist would be on site during work performed by paleontologists to assist in the identification of cultural remains. If a substantial archaeological deposit is encountered, the deposit's significance and eligibility for the National Register would be determined.

All initial surface modification activities at Campo de Cahuenga will be monitored by a qualified archaeologist. If significant archaeological remains are encountered, construction would be delayed or diverted from the site, until after recording and evaluation for National Register eligibility.

Construction in these areas would be scheduled to allow maximum time for investigating and recovering any archaeological material uncovered during construction. The construction schedules would be reviewed with the SHPO. If resources are discovered during construction, SCRTD will involve the SHPO and the Department of the Interior in expediting the data recovery plan. A qualified archaeologist would be retained by the project to monitor construction of these sites.

3.3.3 AERIAL OPTION

Based on current information on the location of known archaeological resources along the aerial segment of the Aerial Option, the impacts of this alternative are identical to those of the Locally Preferred Alternative.

3.3.4 MINIMUM OPERABLE SEGMENT

Since the Minimum Operable Segment is identical to the segment of the Locally Preferred Alternative from Union Station to the Beverly/Fairfax Station, the impacts of the Minimum Operable Segment on archaeological resources are the same as for the Locally Preferred Alternative except that Campo de Cahuenga is unaffected.

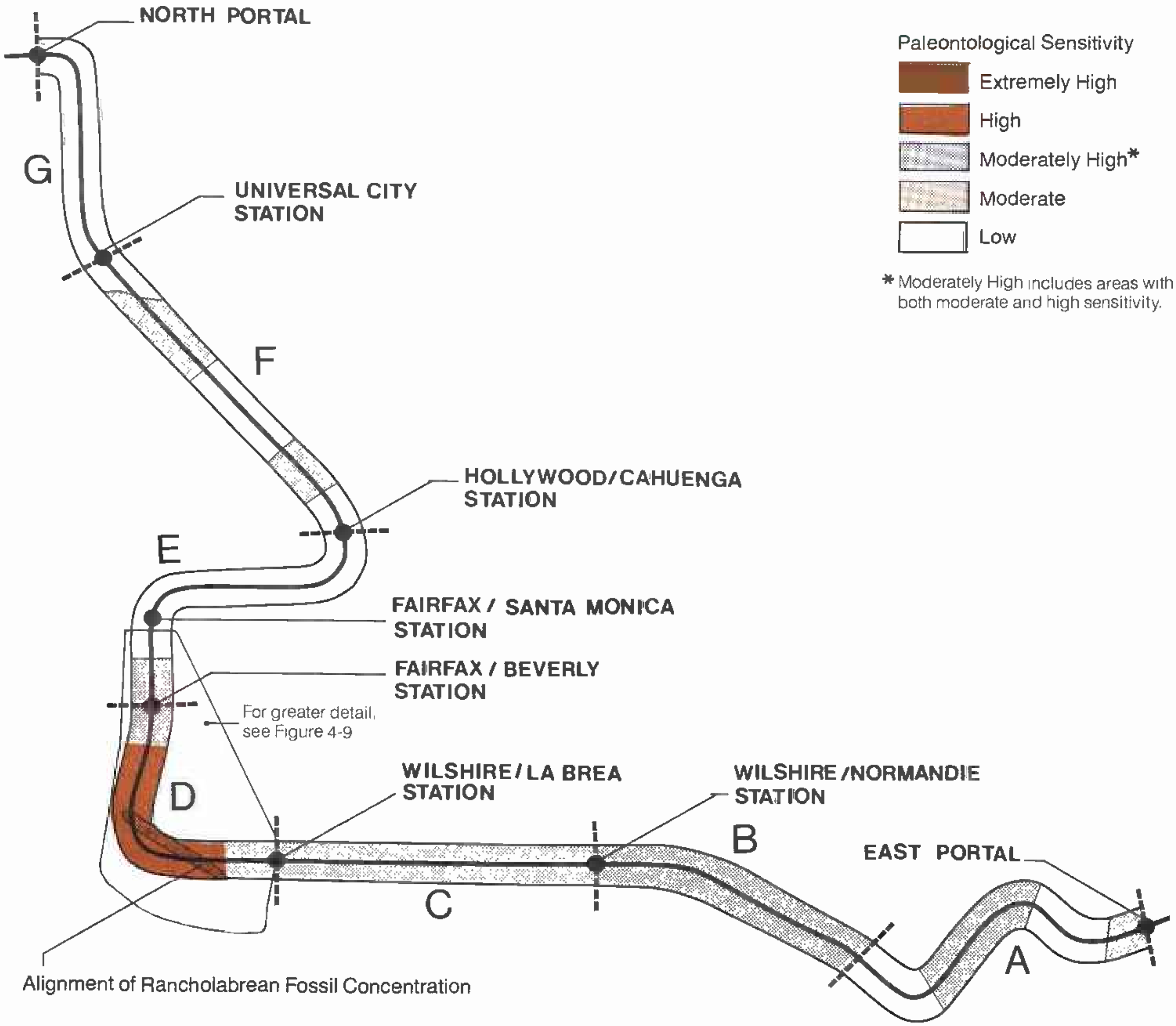
4. PALEONTOLOGY

4.1 EXISTING CONDITIONS

The Metro Rail route has been divided into seven segments for purposes of reviewing the subsurface soil/rock strata (or stratigraphy) and the potential for encountering paleontological resources (sites of fossils or ancient life forms). The paleontological resources of an area are largely a function of the kinds of sedimentary deposits found there. Figure 4-8 is a sensitivity map of the proposed route. The sensitivity ratings are based on the paleontologic potential, or sensitivity, of the stratigraphic units within the proposed depth of surface excavation for stations and subsurface excavations for tunnels. Except for the La Brea Tar Pits area, there are no recorded paleontological resources that would be affected by the proposed Metro Rail Project. However, the route would pass through and disturb a variety of marine and nonmarine sedimentary deposits ranging in age from Medial Miocene to Holocene. All stratigraphic units except the Holocene alluvium (young Quaternary alluvium) and the intrusive basalts and andesites in the Topanga Formation are considered to have at least moderate potential for paleontological resources.

4.1.1 UNION STATION TO HARBOR FREEWAY

This segment includes Fernando and Puente Formations at 50 to 60 feet below the surface. Other units affected are old and young Quaternary alluvium. Invertebrate remains have been reported from holes bored in the Puente and Fernando Formations; thus, there is a potential for encountering marine invertebrates in this segment. There may be marine vertebrates in the Puente Formation between the East Portal and the Hollywood Freeway and the Fernando Formation between the Hollywood Freeway and Harbor Freeway. There may also be nonmarine vertebrates in old alluvium at Civic Center Station.



Source: Westec Services

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 4-8 Paleontological Sensitivity Along Alignment

SEDWAY/COOKE
Urban and Environmental Planners and Designers

4.1.2 HARBOR FREEWAY TO WILSHIRE/NORMANDIE STATION

The Fernando Formation would be encountered between the Harbor Freeway and the Wilshire/Alvarado Station more than 25 feet to 30 feet beneath the surface. The Puente Formation would be encountered from the Wilshire/Alvarado Station to the Wilshire/Normandie Station at depths greater than 30 to 40 feet beneath the surface. Old alluvium is present at shallower levels. Bivalve mollusks have been found in bore hole samples from the Puente Formation, so marine invertebrates and vertebrates may be encountered in the Puente Formation between the Wilshire/Alvarado and the Wilshire/Normandie Stations. Similarly, marine invertebrates and vertebrates may exist in the Fernando Formation between the Harbor Freeway and the Wilshire/Alvarado Station, and nonmarine vertebrates may be in the old alluvium.

4.1.3 WILSHIRE/NORMANDIE STATION TO WILSHIRE/LA BREA STATION

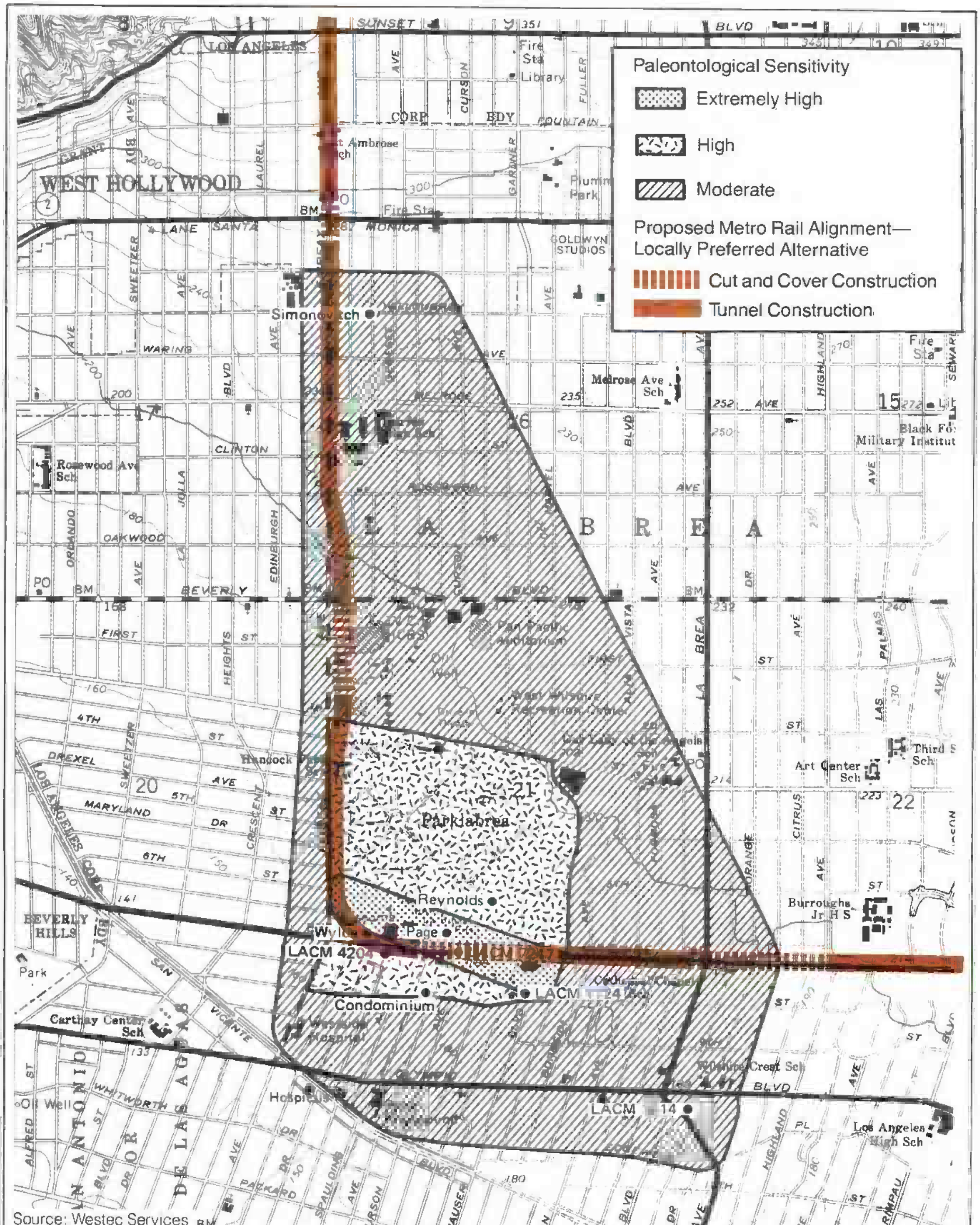
This segment would encounter old Quaternary alluvium from the surface down to depths of 50 to 60 feet. Deeper tunneling would also reach the San Pedro, Puente, and Fernando Formations. There are no known paleontological resources along this segment of the Metro Rail route, but there is a moderate potential for finding nonmarine vertebrates, as well as mixed nonmarine and marine invertebrates, in the old alluvium (Palos Verdes Sand).

4.1.4 WILSHIRE/LA BREA STATION TO FAIRFAX/BEVERLY STATION

This segment includes old Quaternary alluvium (Palos Verdes Sand) from the surface down to depths between 30 and about 60 feet. The San Pedro Formation would be reached in some areas below about 30 feet. This segment includes the La Brea Tar Pits area, which has produced abundant marine and nonmarine invertebrates, plants, and world-famous ice-age land animals.

Because of the abundance and extraordinary preservation, the Rancho La Brea area has provided the most prolific record of Late Pleistocene vertebrate animal life discovered anywhere in the world. Rancholabrean fossils are abundant in the upper 11 to 26 feet (under recent fill) of the area studied. Figure 4-9 shows the area with the heaviest concentration of known fossil deposits and, therefore, of extremely high paleontological sensitivity. This area starts at approximately Hauser Boulevard and ends at Fairfax Avenue. It is rectangular in shape with a width of 700 feet, running from east-south-east to west-north-west. The area described as high in sensitivity is roughly bounded by Third Street on the north, Eighth Street on the south, Fairfax Avenue on the west, and Burnside Avenue on the east. Deposits in this area tend to occur in large cone-shaped pockets, oriented vertically and tapering downward.

More than one million fossil bones, as well as specimens of insects, shelled invertebrates, and plant remains, have been recovered from about 35 excavations of various size (from approximately 100 that have been dug) since excavations began in 1906 in the La Brea Tar Pits area. Additional excavations outside the park area also have produced fossils, indicating that fossils are not concentrated in the La Brea Tar Pits area alone. The fossiliferous deposits at Rancho La Brea appear to be confined to the uppermost 55 feet below the present surface and particularly within the uppermost 25 to 30 feet.



Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

Figure 4-9
Paleontological Sensitivity in the La Brea Tar Pits Area

0 1000 2000 4000 feet

SEDWAY/COOKE
Urban and Environmental Planners and Designers

4.1.5 FAIRFAX/BEVERLY STATION TO HOLLYWOOD/CAHUENGA STATION

Along this segment, young Quaternary alluvium would be encountered from about 30 to 85 feet beneath the surface, with increasing alluvium thickness from south to north along Fairfax Avenue. Below this level old Quaternary alluvium extends for 100 feet or more. No fossils are expected in young alluvium, but there may be some terrestrial vertebrates in old alluvium. This segment is of low sensitivity because excavations are not likely to reach below the base of young alluvium. The young alluvium at the Fairfax/Santa Monica, La Brea/Sunset, and Hollywood/Cahuenga Stations is between 75 and 100 feet thick.

4.1.6 HOLLYWOOD/CAHUENGA STATION TO UNIVERSAL CITY STATION

Most of this segment includes the Topanga Formation. Topanga sedimentary rocks occur in the southern part of the segment between the Hollywood/Cahuenga Station and the Hollywood Bowl, and in the northern part beyond the Cahuenga Pass. The central part from the Hollywood Bowl to west of Cahuenga Pass includes the intrusive basalt and andesite part of the Topanga Formation. There are no known resources along the proposed route, but numerous invertebrate (and some plant) discoveries in the eastern Santa Monica Mountains indicate a potential for fossils. There is also some chance of discovering marine vertebrate fossils (for example, desmostylans, whale, and shark teeth). No fossils are expected in the igneous rocks within the Topanga Formation.

4.1.7 UNIVERSAL CITY STATION TO NORTH HOLLYWOOD STATION

Along this segment young Quaternary alluvium would be encountered from the surface down to about 50 to 80 feet. The thinnest section occurs near Lankershim Boulevard. Old alluvium, consisting mainly of sand and gravel, lies beneath the younger alluvium. No fossils are expected in this geologically young material.

4.2 IMPACT ASSESSMENT AND MITIGATION

4.2.1 METHODOLOGY

The plans and profile for the Project alternatives were reviewed against Figure 4-8. In essence, the disruption of paleontological resources is of greatest concern where Figure 4-8 indicates extremely high sensitivity. Sections with a mix of moderate and high sensitivity have been designated moderately high in Figure 4-8. Sensitivity was determined by the likelihood of paleontological resources being present in any particular soil associations or rock formations, the presence of those associations or formations at or near the surface and in the project right-of-way, and their relationship to other associations or formations (stratigraphy). The assessment of impacts was accomplished through the following: 1) a thorough records and literature search for recorded paleontological localities along the proposed Metro Rail route, and also for information on the regional paleontological context of the stratigraphic units that will be affected by the project; 2) communication with scientists at the George C. Page Museum at the La Brea Tar Pits regarding impacts on the La Brea Tar Pits area, the most paleontologically sensitive part of the entire route; and 3) examination of the geotechnical report and appendix by SCRTD's geotechnical consultants, as well as engineering maps and cross-sections showing planned depth and dimensions of excavations for tunnels and stations.

4.2.2 NO PROJECT ALTERNATIVE

The No Project Alternative would result in no construction, and therefore no alteration or destruction of paleontological resources, no alteration of the resources surrounding environments, no introduction of visual, audible, or atmospheric elements that would be out of character with or alter the setting of the resources. The resources would not be neglected, transferred, or sold.

4.2.3 LOCALLY PREFERRED ALTERNATIVE

The sensitivity of the segments of the Metro Rail Project is related to the probability of finding scientifically significant fossils during excavation. Figure 4-8 generally summarizes the sensitivity of the various segments of the project. If important or potentially important fossils are discovered during the cut and cover excavation phase, excavation would be temporarily halted or diverted until the findings can be appraised and, if necessary, the fossils removed by a qualified paleontologist. The proper repository for significant specimens is one of the most important elements in the mitigation of adverse impacts on paleontological resources. Invertebrate fossils and fossil plant material would be donated to an appropriate educational/research institution as dictated by the significance of the materials. This decision can be made by the project paleontologist.

Union Station to Harbor Freeway. Impacts would include the potential for uncovering marine invertebrate fossils in the Fernando and Puente Formations and other vertebrates in old alluvium deposits at the Civic Center Station. Excavations exposing young alluvium will require no examination. The Civic Center Station excavation would be closely monitored by a qualified paleontologist. Fifth/Hill and Seventh/Flower Stations excavations need not be monitored, but spot checking would be done.

Harbor Freeway to Wilshire/Normandie Station. Impacts would include the potential for uncovering marine invertebrates and marine vertebrates from Puente and Fernando Formations and other vertebrates from old alluvium deposits. Surface excavations for stations at Alvarado Street, Vermont Avenue, and Normandie Avenue would be monitored by a qualified paleontologist.

Wilshire/Normandie Station to Wilshire/La Brea Station. Impacts would consist of the potential for uncovering marine and other invertebrate fossils in the old alluvium (Palos Verdes Sand). Surface excavations for stations on Wilshire at Western Avenue, Crenshaw Boulevard, and La Brea Avenue would be monitored for fossils, with closest scrutiny at the Wilshire/La Brea Station because of its proximity to the La Brea Tar Pits area.

Wilshire/La Brea Station to Fairfax/Beverly Station. There is high potential for discovery of scientifically significant fossils during excavation of most of the segment. As presently projected, the station would front on Hancock Park/La Brea Tar Pits and intersect the known pattern of fossiliferous accumulations in the La Brea Tar Pits area, which is shown in Figure 4-9. The preferred Wilshire/Fairfax Station location, centered on Spaulding, would be in the area of highest sensitivity and therefore has the highest potential for adverse impacts. Two alternative station sites west of this location are therefore being considered. They are discussed in detail in section 2.6.2 of this chapter.

A work program is being finalized in consultations with the Page Museum and the SHPO. This program will include a seismic testing/soil borings phase to determine the extent and specific location of possible paleontological resources in the areas of extremely high and high paleontologic sensitivity (as shown on Figure 4.8) and will cover the areas of the proposed Wilshire/Fairfax Station site and the two alternative station locations in the area. This information will be used to determine the most feasible measures for minimizing impacts to paleontologic resources. Also included in this program will be a recovery and salvage plan with time and cost estimates. The results of the testing phase will determine the nature and extent of the recovery and salvage plan.

Fairfax/Beverly Station to Hollywood/Cahuenga Station. Most of this segment has low sensitivity with a small chance of finding some terrestrial vertebrates in old Quaternary alluvium. Only the stretch immediately north of the Fairfax/Beverly Station is considered of moderate sensitivity. No monitoring is necessary for excavation of stations.

Hollywood/Cahuenga Station to Universal City Station. The area where igneous rocks would be encountered is of low sensitivity. Areas where sedimentary rocks of the Topanga Formation would be encountered are of moderate sensitivity. There is reasonable likelihood of invertebrate fossils being discovered during excavation. Some monitoring of excavation for the Universal City Station, particularly in the deeper station excavations, would be conducted by a qualified paleontologist.

Universal City Station to North Hollywood Station. This segment is of low sensitivity. No monitoring of station excavations would be required.

4.2.4 AERIAL OPTION

The impacts on paleontological resources for the Aerial Option would be identical to those of the Locally Preferred Alternative from Union Station to the portal on the north slope of the Santa Monica Mountain. For a discussion of impacts and mitigation, see section 4.2.3 of this chapter. From the portal north to the North Hollywood Station, there is little potential for impacts since construction would be limited to relatively shallow foundations for the aerial structure. Strata that would probably be encountered would be young Quaternary alluvium which contains no fossils.

4.2.5 MINIMUM OPERABLE SEGMENT

The impacts on paleontological resources from the Minimum Operable Segment would be the same as those discussed for the Locally Preferred Alternative from Union Station to the Fairfax/Beverly Station. For a discussion of impacts and mitigation, see section 4.2.3 of this chapter.

5. SECTION 4(f) EVALUATION

5.1 INTRODUCTION

Section 4(f) of the Department of Transportation Act of 1966 (49 USC 1653(f)) declares a national policy that special effort be made to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Section 4(f) permits the Secretary of Transportation to approve a project that requires the use of publicly owned land from a park, recreation area, or wildlife refuge, or any land from a historic site of national, state, or local significance only if the following determinations have been made: there is no feasible and prudent alternative to the use of such land, and all possible planning has been undertaken to minimize harm to the 4(f) lands resulting from such use.

Because of their interest in the project and its relation to 4(f) issues, the following agencies have been sent a copy of the Draft EIS/EIR for their review and comment: U.S. Department of the Interior, the SHPO, Los Angeles City Department of Recreation and Parks, and Los Angeles County Department of Parks and Recreation.

5.2 USE OF PARKLANDS AND RECREATION AREAS

Recreational opportunities ranging from the neighborhood parks to a National Recreation Area (NRA) are located within the Regional Core. The First Tier EIS/EIR analysis of the use of local parks and recreation lands provided sufficient detail for the recreational description of existing conditions (UMTA and SCRTD, 1979). Field surveys for the current cultural resource studies provided specific information for areas along the Metro Rail alignment. Twenty-six parks and senior citizen centers lie within a one-half mile of the Metro Rail route. These parks are listed in Table 4-2 and shown in Figure 4-10. Actual use of parkland for each alternative is discussed below.

5.2.1 NO PROJECT ALTERNATIVE

No use of public park or recreation lands, as defined by Section 4(f), would occur. However, with the Metro Rail Project many parks and recreation areas could benefit through increased use, since they would become more accessible to Metro Rail users. This potential increase in visitors would be lost if the No Project Alternative is accepted.

5.2.2 LOCALLY PREFERRED ALTERNATIVE

As currently proposed, the Locally Preferred Alternative would potentially affect five parks and recreation areas covered under Section 4(f) guidelines: the Court of Flags, Pershing Square, Hancock Park/La Brea Tar Pits, the Hollywood Bowl, and Campo de Cahuenga.

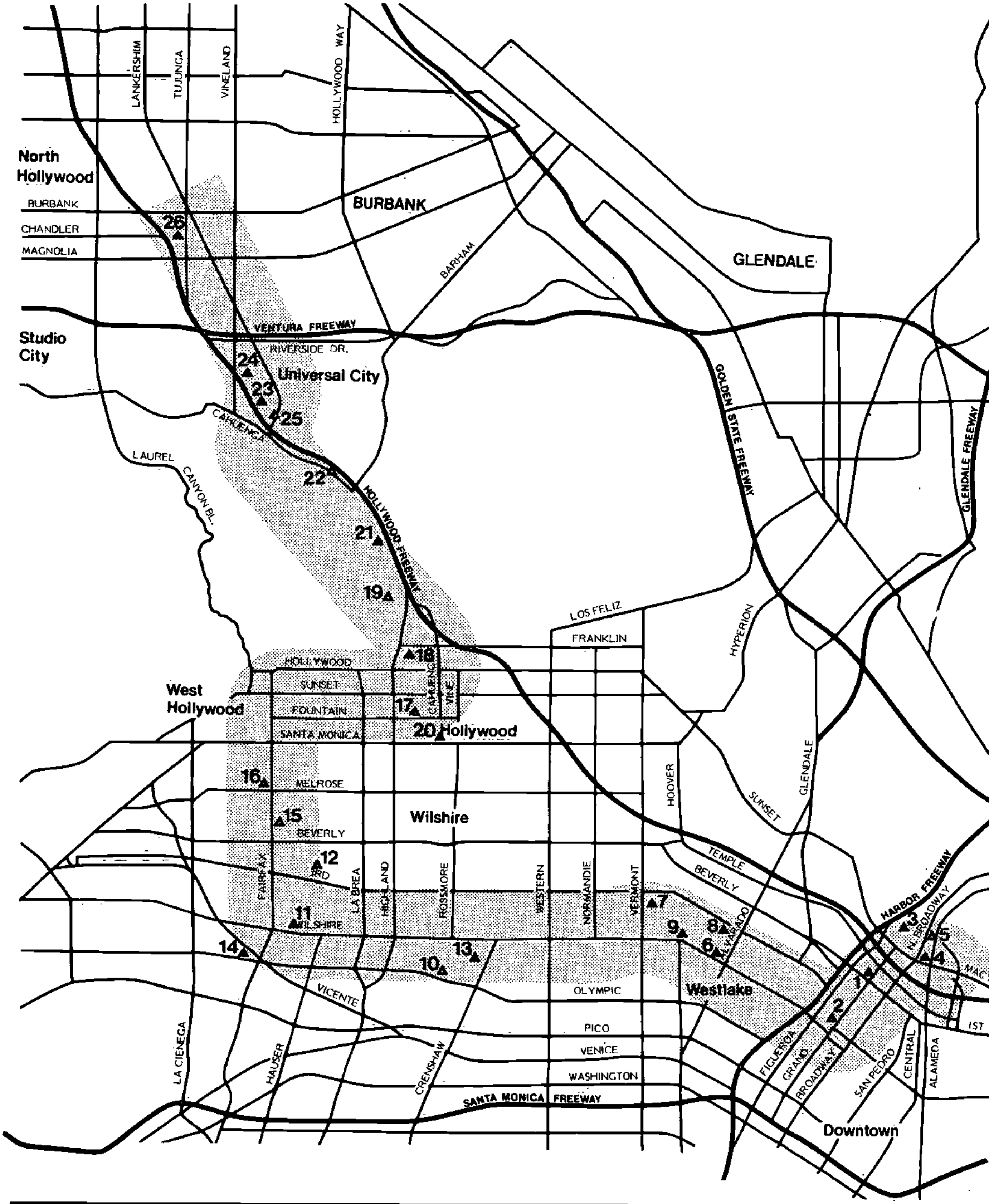
TABLE 4-2

PARKS AND RECREATIONAL FACILITIES

Parks Facilities by Community Plan Area	Acreage
Central City	
1. City Hall Park First and Spring	4.0
2. Pershing Square Fifth and Olive	5.0
3. Alpine Recreation Center College and North Hill	1.9
4. El Pueblo de Los Angeles Macy and Spring	11.0
5. Pueblo de Los Angeles Alameda and Spring	1.7
Westlake	
6. MacArthur Park Wilshire and Alvarado	32.1
7. Shatto Recreation Center Shatto and Fourth	5.4
8. Park View Photo Center Carondelet and Ocean View	1.3
Wilshire	
9. LaFayette Park & Rec Center Wilshire and Hoover	9.7
10. L.A. High Memorial Park Olympic and Muirfield	2.5
11. Hancock Park/La Brea Tar Pits Wilshire and Curson	23.0
12. West Wilshire Rec. Center Gardner by Third	4.9
13. Harold A. Henry Park Ninth and Lucerne	1.7
14. Romana Gardens Park Crescent Heights and Romana	1.9
15. Rosewood Park Rosewood and Fairfax	.03

Parks Facilities by Community Plan Area	Acreage
Hollywood	
16. Fairfax Senior Center Melrose by Fairfax	1.8
17. De Longpre Park De Longpre and Cherokee	1.4
18. Los Palmas Senior Center Los Palmas and Franklin	1.1
19. Hollywood Bowl Cahuenga Blvd. West	77.4
20. Hollywood Recreation Center Santa Monica and Cahuenga	2.95
21. Santa Monica Mountains National Recreation Area including Mulholland Scenic Parkway Corridor Mulholland near Hollywood Freeway	150,000
North Hollywood-Studio City	
22. El Pasco de Cahuenga Cahuenga West and Ellington	1.3
23. South Weddington Park Lankershim and Heart	14.5
24. North Weddington Park Acama and Riverton	9.2
25. Campo de Cahuenga Lankershim between Hollywood 26. Freeway and the Los Angeles River	0.4
North Hollywood Park and Recreation Center	58.1

Source: Los Angeles City Planning Department



Southern California Rapid Transit District

Metro Rail Project

PRELIMINARY ENGINEERING PROGRAM

0 1 2 3 miles

Figure 4-10 Park and Recreation Facilities

SEDWAY/COOKE
Urban and Environmental Planners and Designers

Court of Flags.

Description and Significance. The Court of Historic American Flags consists of a concrete mall with 14 flagpoles and associated metal plaques, and a series of stairs with a granite-based pedestal and dedication plague. Decorative lamp posts and black granite facings accent the Court of Flags. The Court of Flags is an integral part of the open space which forms the Civic Center Mall between Los Angeles County and City buildings and serves as a principal pedestrian corridor.

The construction of the Court of Historic American Flags in the 1960s was sponsored by the County of Los Angeles Board of Supervisors and the Los Angeles County Council of the Veterans of Foreign Wars. This court is in an important open space in Los Angeles' Civic Center Mall.

Proposed Use. An entrance to the Metro Rail subway and a bus stop would be constructed at Hill Street inside the Court of Flags (Figures 2-6 and 4-11). The entrance would be designed to fit in with existing pedestrian flows thereby increasing access to the park.

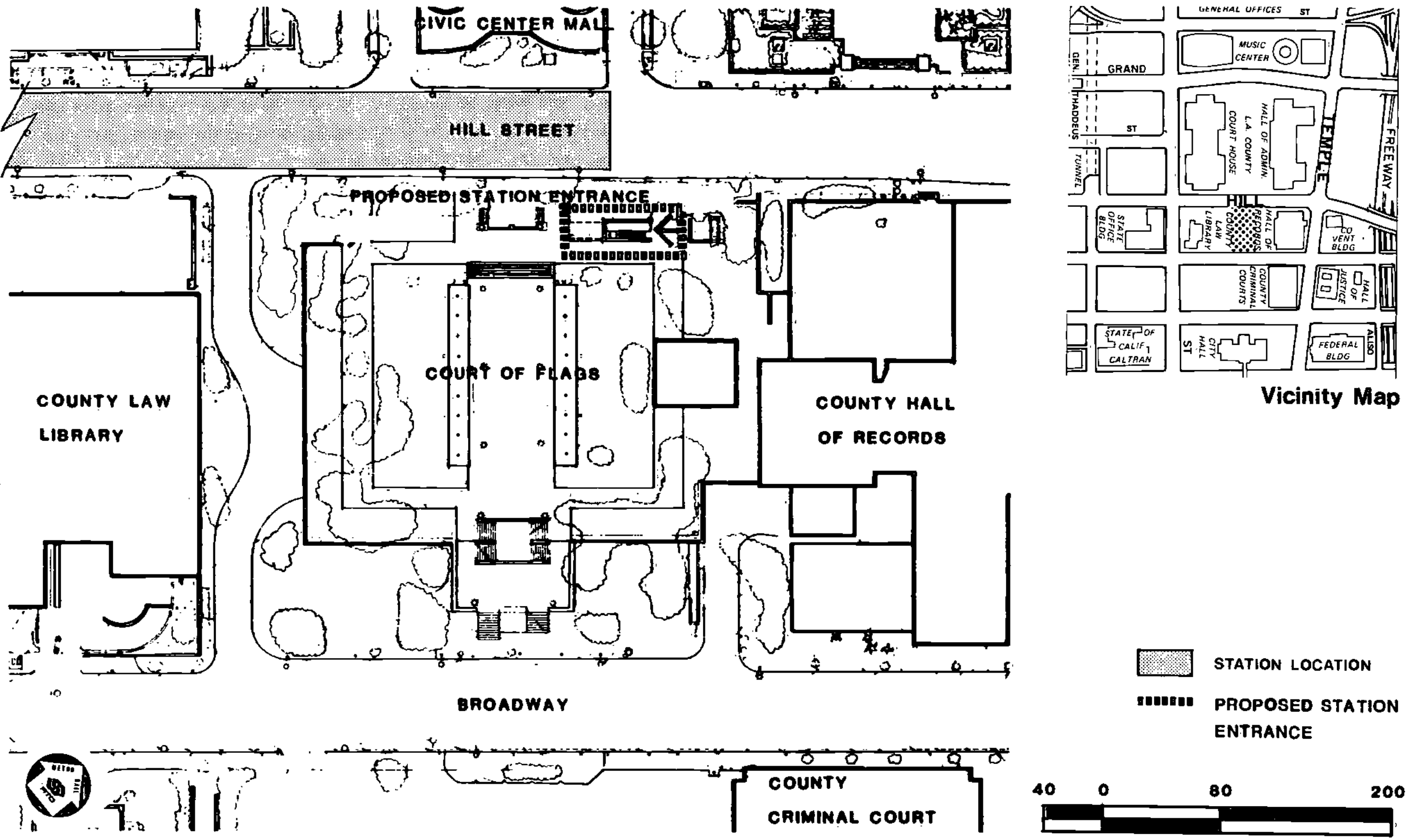
Alternatives. The alternatives to using Court of Flags parkland are to change the route alignment to miss this area, to move or eliminate the Civic Center Station, and to move or eliminate the Court of Flags entrance.

The Civic Center Station location was chosen because of the opportunity to serve the following buildings: City Hall, County Hall of Administration, Hall of Records, County Courthouse, Law Library, and State Office Building. Variations in the alignment were studied but dropped because the proposed alignment best served this focal point of activity. An alignment along Broadway was studied but dropped to better serve the west side of the CBD and avoid the historic Broadway District.

The station could be moved north on the proposed alignment to straddle the Court of Flags parklands. In this case, one station entrance would be possible in front of the Hall of Records building, and another across the street at the Hall of Administration. Another entrance could be placed on the same side of Hill Street between the Court of Flags and First Street, but this would involve the removal of the existing underground parking structure west of the Law Library. Since the remaining possibility is occupied by the County Courthouse building, this station would have entrances at only one end. Any further northerly movement of the station is not possible due to the curving of the alignment which is necessary at that point to make the turn to Union Station. A southerly movement of the station would place it too close to the Fifth/Hill Station.

Given the proposed station location, there are no real options for moving the Court of Flags entrance. There is an underground parking structure across the street from the park and the remaining corners are already proposed for entrances. Mid-station entrances are not possible, because they would involve removal of the Los Angeles County Courthause and an underground parking structure directly across from the courthouse. Finally, elimination of the Court of Flags entrance is not recommended because it will require at least one entrance at either end of the station to handle the daily boardings expected for the Civic Center Station.

Mitigation. Removal of sidewalks, trees, shrubs, and grass would be required in constructing the station entrance. These elements would be replaced with carefully integrated walkways and landscaping upon completion.



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 4-11 Court of Flags

Coordination. The County of Los Angeles' Department of Parks and Recreation has been consulted throughout the Preliminary Engineering phase of this project.

Pershing Square.

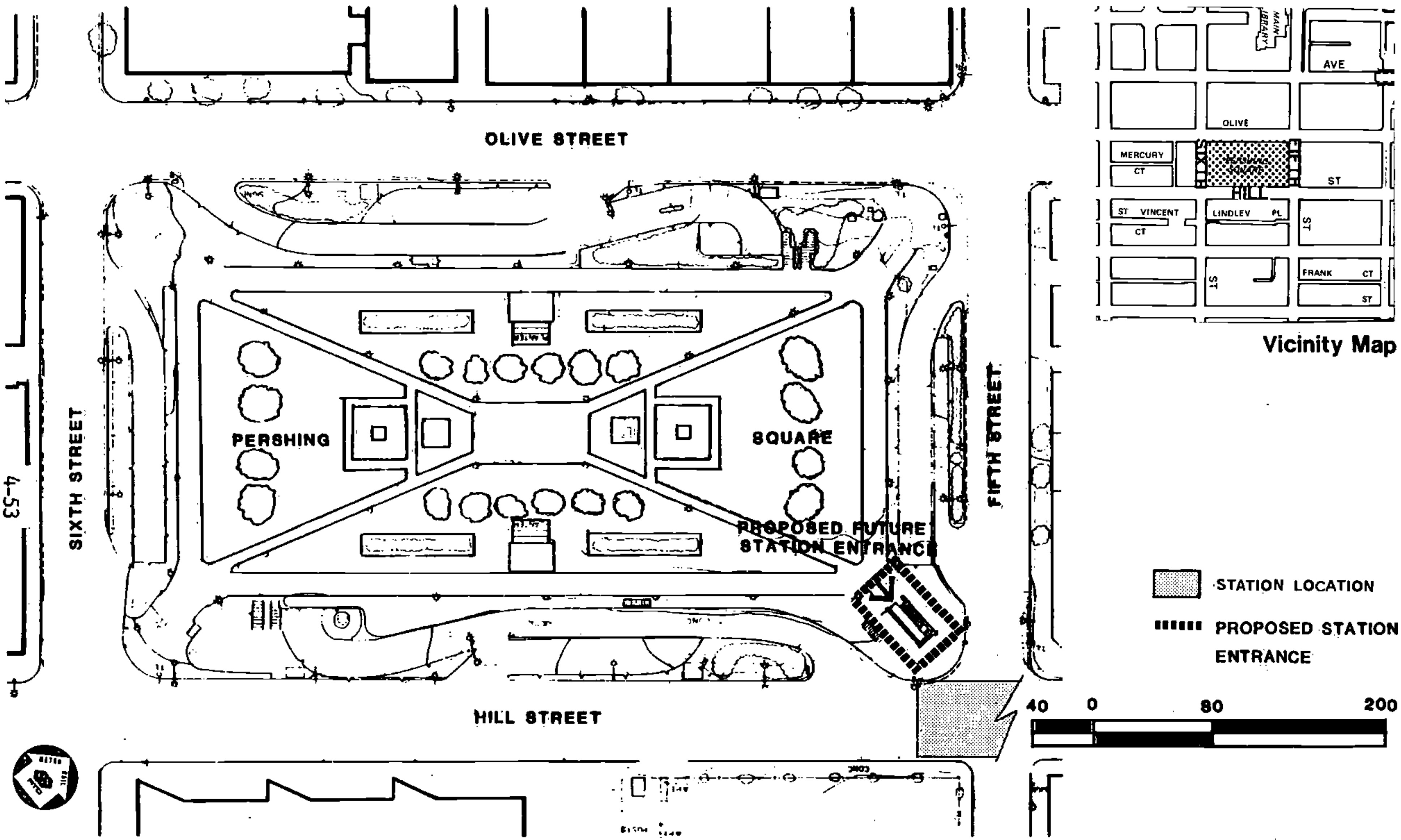
Description and Significance. Pershing Square, in downtown Los Angeles between Fifth, Sixth, Hill, and Olive Streets, consists of approximately five acres of landscaped area over an underground parking lot. The central plaza of the park is brick-paved with a large pool and 16-foot fountain. Three flagpoles also stand in the plaza. Four sculptured cherubs are part of the fountain's central motif. Several pieces of statuary have been erected throughout the park. The Spanish War Memorial by S.M. Goddard is located at the northeast corner of the park and is a 20-foot granite depiction of a Spanish War veteran at parade rest. A statue of Beethoven, donated in 1932 by Philharmonic Orchestra personnel in honor of William Clark Jr., its founder, is on Fifth Street. Humberto Perdretti's World War Memorial, an 18-foot granite obelisk with a bronze doughboy at the top is located in the northwest corner of the park. Other memorials include an iron cannon from the USS Constitution donated by the American Legion in 1935, a 1751 French bronze cannon captured in 1898 by Major George William R. Shafter and given to the city by him, and a plaque inscribed "In the memory of Benny, a squirrel," who was sorely missed when he was killed by an automobile in 1934.

Street furniture in the park includes concrete benches and sidewalks dedicated in 1952. Lighting is comprised of 35 aluminum poles with centrally pedestalled globes. Fixtures of this type with more ornamentation were present in the park in the 1920s. Plants in the park include banana trees, agapanthas, lilies, magnolia, ivy, and bird-of-paradise.

The Square dates back to 1866, when Mayor Cristobal Aguilar approved an ordinance providing for a public square. This land had been left as unsold land from original pueblo holdings. Over the years the square was known as St. Vincent Park, Los Angeles Park, Central Park, La Plaza Abaja, Sixth Street Park, Public Square, and other names. In its early years this park was used as a campground for travelers entering the city. By the early 1870s, the square was plowed, graded, planted, and fenced. Trees and pathways decorated the park. By 1886, graveled pathways divided ornamental lawns and flower gardens; later a bandstand was constructed. John Parkinson was commissioned to redesign "Central Square" in 1910. The bandstand was replaced with a fountain, wide pathways laid out, tropical foliage planted, and ornamental streetlights put in. In 1918, the park was renamed Pershing Square in honor of General John J. Pershing.

Proposed Use. A station entrance may be built in the future, although it is not in the current scope of project, at the northeastern corner of the park and, therefore, a 4(f) evaluation is appropriate (Figures 2-7 and 4-12). If this entrance is built, a portion of the existing sidewalk and vegetation contained in planters would need to be removed during construction. Public access would also be restricted during construction.

Alternatives. Alternatives to using Pershing Square parkland are deleting or relocating the station or deleting or relocating this entrance. The reasons why eliminating or relocating the station are infeasible are discussed in section 2.6.2 of this chapter. With respect to the alternative of relocating the entrance, the passenger volume at the Fifth/Hill Station is projected to be the highest of all the stations. Initially, at least two station entrances are required and, in the future, it may be necessary to have an entrance at all four corners. The entrance in Pershing



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 4·12 Pershing Square

Square parkland would be built last of the four and only if patronage levels require and funding allows.

Mitigation. Parts of the sidewalk and plantings in the northeast corner would be removed to allow placement of the entrance. The new entrance and associated landscaping would be blended in with the remaining plantings. The main green area of the park would not be affected. At present, Pershing Square serves as a pedestrian mall, a use the Fifth/Hill Station would enhance.

Coordination. The City of Los Angeles' Department of Recreation and Parks has been consulted throughout the Preliminary Engineering phase of the Metro Rail Project.

Hancock Park/La Brea Tar Pits.

Description and Significance. The description and significance of Hancock Park/La Brea Tar Pits is discussed in section 2.6.2 of this chapter.

Proposed Use. Plans for the Locally Preferred Alternative include a proposed station entrance north of Wilshire near the east wing of the Los Angeles County Museum of Art and a future entrance on the northwest corner of Wilshire and Curson (Figures 2-17 and 4-7).

Alternatives. Alternatives to using Hancock Park/La Brea Tar Pits are discussed in section 2.6.2 of this chapter. These include relocating the station to another area or deleting it entirely.

Mitigation. Measures to mitigate the use of Hancock Park/La Brea Tar Pits are discussed in section 2.6.2 of this chapter. These include testing for a less paleontologically sensitive location, designing station entrances which are responsive to the Secretary of the Interior's Standards, and conducting the recording and architectural salvage according to the HABS/HAER. A qualified paleontologist would observe excavation and construction as appropriate.

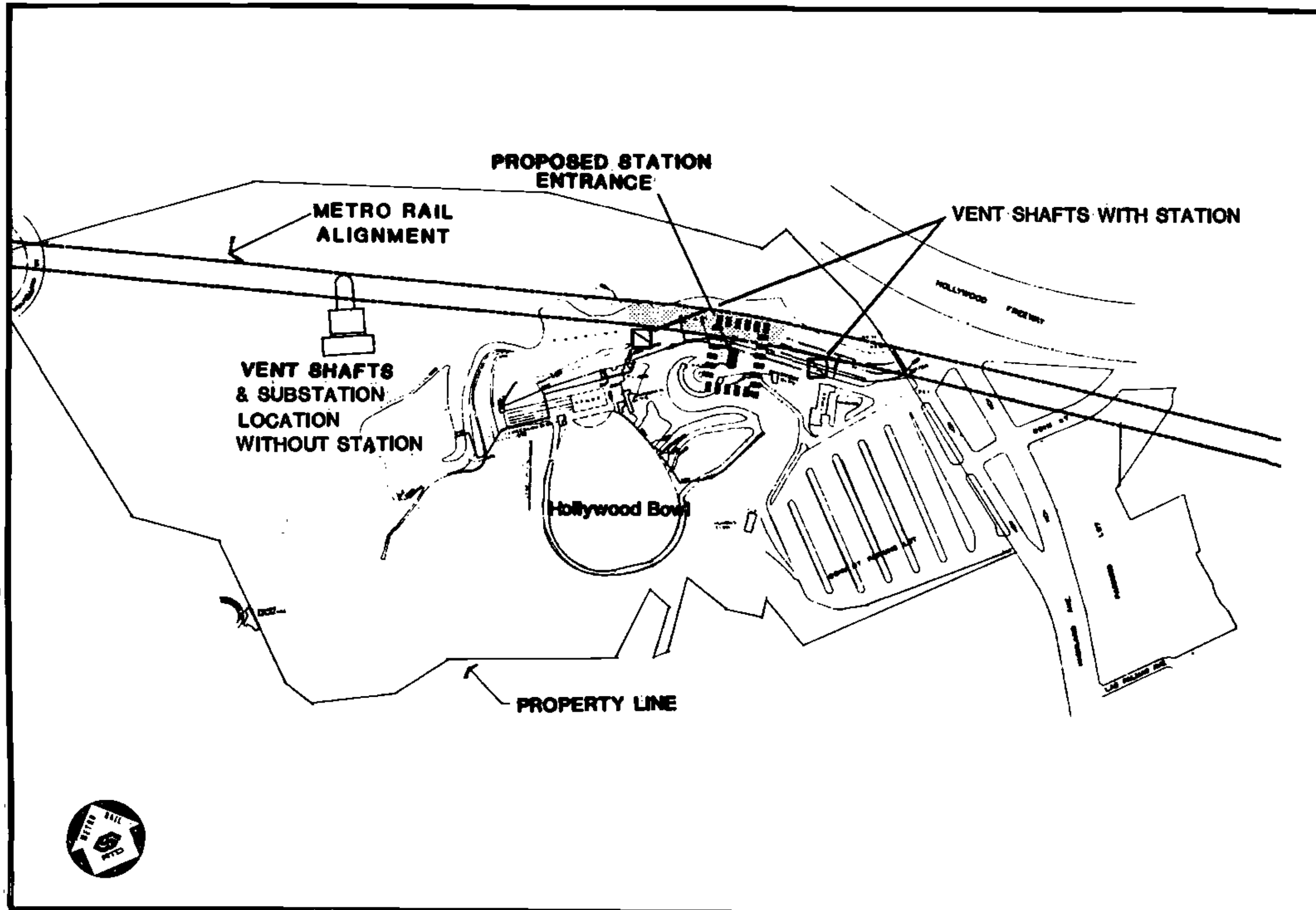
Coordination. The County of Los Angeles and the Page Museum have been consulted through the Preliminary/Engineering phase of this project.

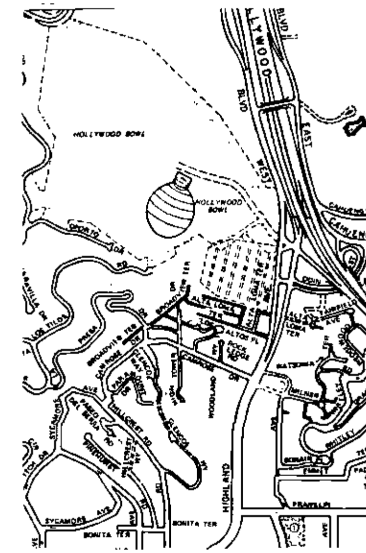
Hollywood Bowl.

Description and Significance. The description and significance of the Hollywood Bowl is discussed in section 2.5.2 of this chapter.

Proposed Use. The Locally Preferred Alternative includes an optional station at the Hollywood Bowl which would serve the performances at the Bowl (Figures 2-24 and 4-13). However, as ridership projections for this station do not indicate a need for a station based on daily travel patterns, a decision whether to include this station has not yet been made.

If the Hollywood Bowl station is built, it would have an entrance on Bowl property at the upper level parking and bus unloading areas. The entrance would lead into the area of the ticket booths. There would also be a vent shaft at either end of the station. Each would be approximately 20 feet in diameter and stand 10-12 feet above the ground. One would be located approximately 110 feet behind the Bowl shell and the other approximately 625 feet away.





Vicinity Map

STATION LOCATION

VENT SHAFTS

PROPOSED STATION ENTRANCE

100 0 200 400 600 800

Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 4·13 Hollywood Bowl

If the Hollywood Bowl Station is not built, a similar vent shaft and a traction power substation would be constructed in the Bowl Maintenance Area, approximately 900 feet from the Bowl shell near an existing access road.

Alternatives. The alternatives to using land from the Hollywood Bowl recreation area are to move the route alignment to miss this area, to delete or move the station and to delete or move the entrance.

The geometry of the alignment has been determined by the siting of a pocket track north of the Hollywood/Cahuenga Station and the need to avoid the Whitley Heights Historic District. The station may be deleted if it is decided this station is not warranted; however, this will not eliminate the need for the vent shaft and traction power substation. These facilities are necessary either as part of a station or as separate facilities because of the long distance between the Hollywood/Cahuenga and Universal City Stations. Moving them north on the alignment would place them in the Mulholland Scenic Parkway, an entrance to the Santa Monica Mountains National Recreation Area, and increase the cost of installing these facilities because of the rapid increase in grade. Moving the facilities south would require the taking of one or more residences.

Because the purpose of this station is to serve the Hollywood Bowl, it is not practical to move the station or the entrance out of the proximity of the Bowl's entrance. It is possible to provide an entrance near Highland Avenue and still serve the Bowl; however, this would increase walking distances to the Bowl and reduce considerably the effectiveness of the station. Since this is the only entrance planned for this station, deletion is not possible.

Mitigation. If built, the Hollywood Bowl Station would be sited to enhance the flow of patrons and would be designed to be compatible with the setting and character of the Hollywood Bowl. The two vent shafts would be designed to blend in with the surroundings and would be sufficiently buffered to prevent all possibility of perceptible noise.

If the separate traction power substation and vent shaft facility are necessary, they would be constructed in the Bowl's maintenance area and sufficiently buffered against noise. The facilities would be designed to blend in with the surroundings.

Coordination. The County of Los Angeles' Department of Parks and Recreation has been consulted throughout the Preliminary Engineering phase of this project. The Los Angeles Philharmonic Association has voiced support for the possibility of a Hollywood Bowl Station.

Campo de Cahuenga.

Description and Significance. Campo de Cahuenga is State Historic Landmark #151 and is the location of an event of major historical importance in California and the West. The original adobe structure, the hacienda of Don Tomas Feliz, was erected at the foot of the north slope of the Santa Monica Mountains. Campo de Cahuenga was originally part of the Mission San Fernando land grant and was included in the boundaries of the "Ex-Mission San Fernando" land patent. On January 13, 1847, representatives of the U.S. Army and the Californians met at this adobe to end hostilities in California during the Mexican-American Treaty of Cahuenga, putting an end to the war within California. This military treaty, or capitulation, was followed the next year with the signing of the Treaty of Guadalupe Hidalgo in Mexico, by which California became a part of the United States.

Over the years, the adobe disintegrated and was demolished in 1900. In 1923, the City of Los Angeles purchased the property and established the Fremont-Pico Memorial Park. A replica of the original adobe was constructed in 1949, and has served as a meeting place for many recreational and historical groups. This excellent reconstruction of the adobe hacienda stands as a reminder of a major historic event for both the Southwest and the entire nation. The Campo de Cahuenga Memorial Association developed a museum for the structure, and in glass cases are many relics of the occupation of California in 1846-1847. Oil paintings and portraits of the period, historical maps, resolutions, and plaques are also part of the museum. The reconstructed adobe structure is located in Universal City, across Lankershim Boulevard from the Music Corporation of America's World Headquarters. It is set off the street in a fenced landscaped courtyard with palms, magnolia trees, shrubs, lawns, fountains, and tiled walkways. The square-shaped structure is a single-story adobe with a slanted overhanging red-tile roof. Floors are tiled and walls are whitewashed plaster. A minimal number of windows are multipaned; doors are wooden; both windows and doors are accented by wooden lintels. The Campo de Cahuenga was submitted by the SHPO to the Keeper of the National Register of Historic Places but was determined not eligible for inclusion. It is, however, a City park and is therefore included in the Section 4(f) evluation of this document.

Proposed Use. The Locally Preferred Alternative would not require the use of any of the Campo de Cahuenga property. The Univeral City station would be located behind the Campo de Cahuenga and a proposed station entrance would be located south of this historic landmark (Figures 2-25 and 4-14). A possible future parking structure would be located north of the state landmark.

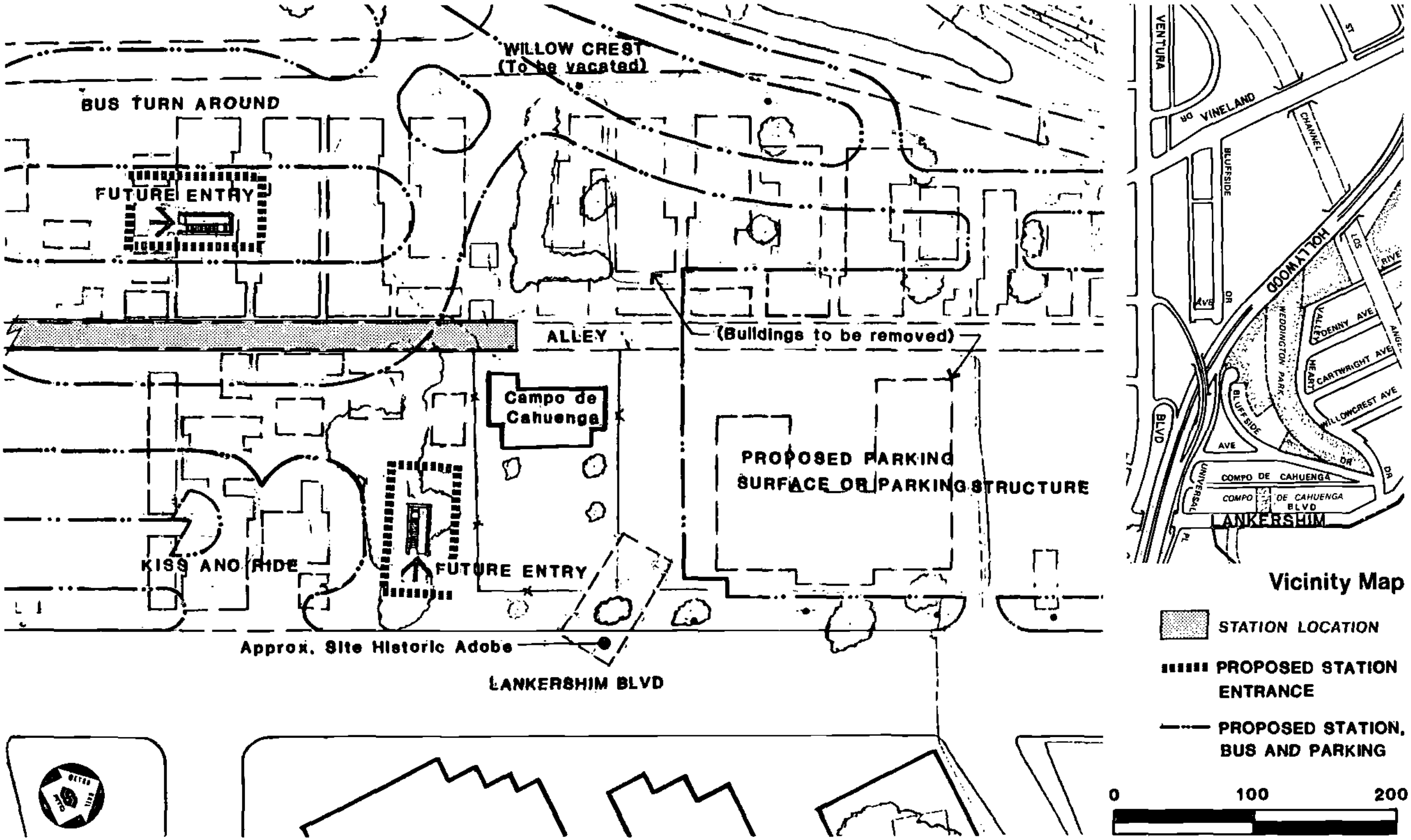
Although no actual use of parkland would occur as defined in Section 4(f), consideration is being given to the potential impacts during construction of the Universal City Station and its ancillary facilities. Specifically, these impacts include vibration damage and settling, the possibility of encountering any remains of the foundation of the original adobe during construction of the future parking structure, and visual intrusion of the same parking structure.

Alternatives. The alternatives to avoid impacts on the Campo de Cahuenga parkland area are deleting or relocating the station.

The location of the proposed station at the Campo de Cahuenga was recommended as the result of an extensive public analysis. During this analysis, the public decided that the proposed location would best serve the extensive development in Universal City as well as the needs of the surrounding commercial and residential areas. Deletion or relocation of this station would ignore this input.

Most of the alternatives to the proposed future parking structure have been eliminated because of difficulty in providing adequate bus or automobile access, high costs, or more serious environmental impacts. The site located on the northeast corner of Ventura Boulevard and Vineland Avenue will be combined with the location north of Campo de Cahuenga to provide necessary parking space for the station. Initially, parking would be provided as surface lots and ultimately, as a parking structure of up to six-levels. It is possible that only one six-level parking structure would be built at the Ventura/Vineland site, with no structure at the other site.

Mitigation. Although cut and cover construction of the station is very near the property, the building is about 35 feet away from the proposed excavation. The



Southern California Rapid Transit District
Metro Rail Project
PRELIMINARY ENGINEERING PROGRAM

Figure 4-14 Campo de Cahuenga

structure could be affected by vibration from heavy equipment used during excavation and construction. At this site in particular, construction equipment and techniques will be selected to minimize ground-borne vibration to the structure. There is also the potential for lateral soil movement during and after excavation which could lead to settlement of the building. Techniques will be determined during Final Design to shore-up excavation to prevent any settlement to the Campo de Cahuenga structure. A qualified archaeologist will observe excavation for the proposed parking structure.

Coordination. The County of Los Angeles' Department of Parks and Recreation has been consulted throughout the Preliminary Engineering phase of this project.

5.2.3 AERIAL OPTION

The Aerial Option to the Locally Preferred Alternative would affect the same parks and recreation areas covered for the Locally Preferred Alternative in section 5.2.2 of this chapter: the Court of Flags at the Civic Center Station, Pershing Square at the Fifth/Hill Station, Hancock Park/La Brea Tar Pits at the Wilshire/Fairfax Station, the Hollywood Bowl at the Hollywood Bowl Station, and the Campo de Cahuenga at the Universal City Station.

5.2.4 MINIMUM OPERABLE SEGMENT

The Minimum Operable Segment operating from Union Station through Fairfax/Beverly Station would have impacts on the following parks: the Court of Flags at the Civic Center Station, Pershing Square at the Fifth/Hill Station, and Hancock Park at the Wilshire/Fairfax. For a discussion of the impacts on these parks, see section 5.2.2 of this chapter.

5.3 USE OF HISTORIC PROPERTIES

The project proposes the use of land of four historic properties under the Locally Preferred Alternative and the Minimum Operable Segment. The Aerial Option may use land from more than four properties.

5.3.1 NO PROJECT ALTERNATIVE

Under the No Project Alternative, there would be no use of land of any of the properties that are eligible for the National Register.

5.3.2 LOCALLY PREFERRED ALTERNATIVE

The Locally Preferred Alternative would have an adverse impact on the Union Station, the Title Guarantee Building, the Pershing Square Building, and Hancock Park/La Brea Tar Pits.

Union Station.

Description and Significance. The description and significance of Union Station is discussed in section 2.6.2 of this chapter.

Proposed Use. Both station design alternatives for Union Station would affect the Union Station District to different degrees. Alternative A, the preferred design, proposes a small bus facility next to a surface parking lot located east of the track area. Alternative B proposes a bus facility at track level directly behind the main structure and a surface parking lot east of the track area.

The construction of the station itself and the two entrances would involve the staged removal and replacement of Union Station track during cut and cover construction, the removal and reconstruction of the north end of the Mail, Baggage, and Express Building (currently being used as the Superintendent's offices), and the removal and reconstruction of part of a ramp and a section of an architecturally integrated wall at the north end of the property. The west entrance to the station would require the permanent removal of an additional section of the Mail, Baggage, and Express Building (at which point it is a baggage handling shed) to make room for a walkway. Alternative A would also require the removal of a canopied loading dock east of the track area (Figures 2-5 and 4-4).

Alternative B would require the same actions as Alternative A, plus the removal of the floors of the Mail, Baggage, and Express Building at and above track level, the removal and alteration of the ramp at the south end to provide bus access from the proposed Busway Extension, and the removal of the covered parking area at track level near the south ramp and a canopied loading dock east of the track area (Figures 2-5.1 and 4-4.1).

Alternatives. Alternatives to the proposed use were discussed. They include moving the route alignment and moving or eliminating the station. Section 2.6.2 of this chapter provides greater detail on these alternatives and explains why they are not feasible.

Mitigation. Mitigation measures are discussed in section 2.6.2 of this chapter. These include the following:

- deleting the west station entrance
- reconstructing the architecturally integrated wall demolished by the cut and cover construction
- reconstructing the ramp(s) demolished for construction
- designing an archway over the west entrance to be compatible with the other archways at Union Station
- recording and architectural salvage before demolition
- incorporating design elements of the structure in the alteration
- reusing ornamental materials whenever possible.

Coordination. The SHPO has been consulted throughout the Preliminary Engineering phase of this project.

Title Guarantee Building.

Description and Significance. The description and significance of the property is contained in section 2.6.2 of this chapter.

Proposed Use. The Title Guarantee Building will have an initial subway entrance constructed in ground floor retail space now occupied by Thrifty Drugs. A new street entrance for the building may be constructed. This action would remove or alter part of the architectural fabric of the building but would not affect the lobby or the facade of the building which contribute to its significance (Figures 2-7 and 4-5).

Alternatives. The alternatives that would avoid using land of this historic property are discussed in section 2.6.2 of this chapter. They include deleting the station or relocating it to another site and deleting or relocating the entrance proposed for this building. Section 2.6.2 of this chapter explains why these alternatives are not feasible.

Mitigation. Mitigation measures for the Title Guarantee Building are discussed in section 2.6.2 of this chapter. As stated in that section, all new construction would be responsive to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitation of Historic Buildings. Also, recording and documentation would be undertaken according to the HABS/HAER.

Coordination. The SHPO has been consulted throughout the Preliminary Engineering phase of this project.

Pershing Square Building.

Description and Significance. These elements are discussed in section 2.6.2 of this chapter.

Proposed Use. If additional entrances to the Fifth/Hill Station are required, the Pershing Square Building would have a subway entrance constructed. This action would remove or alter part of the architectural fabric of the building but would not alter the main lobby or the upper floors' facade which contribute to its significance (Figures 2-7 and 4-6).

Alternatives. The alternatives that would avoid using land at this historic property are discussed in section 2.6.2 of this chapter. They include deleting the station or relocating it to another site and deleting or relocating the entrance proposed for this building. Section 2.6.2 of this chapter explains why these alternatives are not feasible.

Mitigation. Mitigation measures for the Pershing Square Building are discussed in section 2.6.2 of this chapter.

Coordination. The SHPO has been consulted throughout the Preliminary Engineering phase of this project.

Hancock Park/La Brea Tar Pits. (Refer to section 2.6.2. of this chapter.)

5.3.3 AERIAL OPTION

It has been determined that, under the Aerial Option, land from the following properties included or eligible for inclusion in the National Register would be used: Union Station, Title Guarantee Building, the Pershing Square Building, and Hancock Park/La Brea Tar Pits. Because the use of land from historic properties is the same for the Aerial Option as for the Locally Preferred Alternative, the discussions of each are identical (see section 5.3.2 of this chapter). In addition to these identified historic properties, the Aerial Option may use land from potentially historic properties (see section 2.6.3 of this chapter) along the aerial segment for station entrances and ancillary facilities. If the Aerial Option is selected as the preferred alternative, further design of station entrances and ancillary facilities will determine the need for 4(f) lands. As stated in that section, all new construction would be responsive to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Also, recording and documentations would be undertaken according to the HABS/HAER.

5.3.4 MINIMUM OPERABLE SEGMENT

It has been determined that under the Minimum Operable Segment, land from the following properties included or eligible for inclusion in the National Register would be used: Union Station, Title Guarantee Building, Pershing Square Building, and Hancock Park/La Brea Tar Pits. Because the use of land of historic properties is the same for the Minimum Operable Segment as for the Locally Preferred Alternative, the discussions of each are identical (see section 5.3.2 of this chapter).

CHAPTER 5

COMMUNITY PARTICIPATION

CHAPTER 5

COMMUNITY PARTICIPATION

1. BEGINNING OF A PUBLIC MANDATE

In June of 1974, a solid majority of Los Angeles County voters passed Proposition 5, allowing for the use of a portion of state gasoline taxes for rapid transit development. This measure provided a local source of funds for SCRTD to begin its rail rapid transit development program in Los Angeles. It was one of the first solid demonstrations of the voters' commitment to rapid transit and its financing.

2. FIRST TIER EIS/EIR AND THE ALTERNATIVES ANALYSIS

From 1977 through 1980, SCRTD, with the aid of UMTA and Proposition 5 funds, conducted an analysis of the transportation needs of the Los Angeles Regional Core and the transportation system alternatives that might best address those needs. As part of the First Tier EIS/EIR, there were four cycles of evaluation, entailing several hundred meetings in the Regional Core communities. At the meetings, major alternative routes, systems, and configurations were identified. From the alternatives analysis process emerged a locally preferred alternative, consisting of a subway system of 16 or 17 stations. Significantly, Regional Core residents rejected solutions involving more familiar surface transportation modes and chose an entirely new approach for Southern California. This alternative was recommended, in part, because it best fulfilled the communities' needs and priorities.

3. "PROPOSITION A" REFERENDUM

By June of 1981, the community had not only reached agreement on a particular transportation system, route, and configuration for the Regional Core, but a vote of the whole electorate of Los Angeles County had mandated that the Metro Rail Project become the keystone of a regionwide transportation plan. In this referendum, called "Proposition A," the people of Los Angeles County voted by the largest margin of any such election in the nation to add a half percent to the county sales tax to provide local share funding to implement the regionwide plan. This was only three years after the passage of the "Proposition 13" tax-cutting measure.

4. "SCOPING" OF THE SECOND TIER EIS/EIR PROCESS

The diversity of Regional Core needs, together with the complexity of transportation system choices, precluded the citizenry from making a single, all-encompassing decision about the region's transportation improvements. Not all alternatives could be designed and engineered in detail for the purposes of the Alternatives Analysis. Thus, a "scoping" process was conducted at the outset of the Second Tier process which encompassed detailed engineering and impact analyses.

On November 2 and 3, 1981, SCRTD, with UMTA staff participating, conducted three widely advertised "scoping" meetings. The meetings' primary objectives were to give the public and other agencies an early opportunity to indicate which environmental issues were important to the community and should be addressed in the Second Tier EIS/EIR. More than 100 persons attended the meetings. A wide variety of interests were represented including chambers of commerce, neighborhood associations, civil rights organizations, public agencies, and other special interest groups.

SCRTD took the concerns identified for further consideration in the First Tier process and those identified during the "scoping" meetings and distilled them into some 15 categories and 122 issues.* Each of these issues was responded to and targeted for resolution in the Second Tier process. Prominent among the identified issues were:

<u>Alternative Routes</u>

- Use Broadway, Hill or Flower in the Central Business District.
- Interface with Caltrans' light rail transit proposals to Santa Monica Boulevard.
- Use Sunset Boulevard instead of Fountain Avenue in Hollywood.

<u>Vertical Profiles</u>

- Study limited aerial segments for their cost effectiveness and appropriateness.

<u>Circulation and Parking</u>

- Insure adequate parking at projected key park and ride stations.
- Insure adequate accessibility and mobility around stations.

---

* A detailed discussion of these issues and SCRTD responses is contained in "Scoping" Issues and Their Implications for the EIS/EIR Work Program (Report for Tasks 18AAA, 18AAB, by Sedway/Cooke, September, 1982).

5. MILESTONE PROCESS

A key element of the Community Participation Program for the Metro Rail Project is centered around 12 basic interrelated decisions, termed "Milestones," for the Metro Rail Project engineering and design. (See Chapter 2, Section 1, for a list of Milestones.) The Milestones are an integral part of the process of designing and developing the rail system. They address all of the issues raised at the scoping and earlier community participation meetings.

To maximize awareness of public concerns, SCRTD has established an extensive community participation and data input process to accompany the Milestone Process. This element of the Community Participation Program,* as adopted by the SCRTD Board of Directors, enables concerned citizens of the Los Angeles area to communicate with SCRTD staff, city and county officials, and the SCRTD Board of Directors regarding Metro Rail Preliminary Engineering issues and related areas of planning and development.

The public has three opportunities to review and comment on the issues covered in each Milestone. The first opportunity is in a Data Presentation Meeting, where the Project Team presents its initial data and discusses the pros and cons of alternatives relative to a particular Milestone. Copies of the data report are distributed to each participant for review and comment, and subsequent meetings are scheduled if necessary to answer participants' questions. The second opportunity is the Draft Report Meeting, where the public reviews and comments on a draft Milestone report and the Project Team responds. The third opportunity is the SCRTD Board hearing, which the Board of Directors convenes before adopting each Milestone Report to give participants a final opportunity to comment on that specific Milestone. This process, which takes about 45 to 60 days for each Milestone, will be completed by the mid-1983 conclusion of Preliminary Engineering.

Public interest in the Milestone Process was low at first, but the continuing information programs have yielded greater attendance at each successive Milestone meeting. An average of over one hundred persons were attending each meeting by the culmination of Milestone 8.

6. SPECIAL ALTERNATIVES ANALYSIS

At the SCRTD Board public hearing on July 29, 1982, the Board and the General Manager determined that although the public participation process for Milestones 3 and 4 (route alignment and station location) had been completed, significant issues had not been resolved for various communities. The Board directed the staff, under the leadership of the General Manager, to undertake joint studies with the Hollywood and North Hollywood communities to resolve the outstanding issues.

---

* SCRTD Community Relations, Community Participation Program Work Program, February 1982.

The Community Relations Department organized representatives from both communities into citizens' committees of approximately 40 members each. Each group met weekly in a work session with SCRTD staff and a special team of consultants. The sessions covered the alternatives analysis methodology, community goals and objectives, environmental impacts, and cost data. The results of these intensive studies were presented in two reports and appendices to the SCRTD Board at a final public hearing on December 8, 1982. During the process, the community groups identified and ranked their collective goals and objectives, compared environmental and cost data for alternative alignments and, finally, ranked each alternative before selecting a community-preferred alternative for each area.

Even though their initial agendas have been successfully concluded, each of the study groups has continued to meet and aggressively participate in the Metro Rail Project's design and development. These groups' continuing efforts are indicative of a growing community commitment to rapid transit in Los Angeles.

7. CONTINUING PUBLIC PARTICIPATION EFFORTS

An effective community participation effort must deal with the immediate issues as well as maintain long term, ongoing communications with segments of the community. Briefly summarized below are some of the efforts used to achieve this goal as they relate to the EIS and ongoing planning and engineering efforts.

7.1 CONTACTS WITH CIVIC ORGANIZATIONS

To initiate and maintain public awareness of the Metro Rail Project, meetings have been held with numerous civic and professional organizations, such as chambers of commerce, professional groups, labor organizations and homeowners' and tenants' associations. These have also included regionwide organizations such as the League of Women Voters, the Sierra Club, the Urban League, Rail Transit for California, the Los Angeles County Employees Association, and the Los Angeles NAACP.

These organizations have shown an appreciation for being involved in the Project and have indicated that they want to be kept involved in its progress until the final design decisions are made and the necessary funding committed. Most have expressed their support of the project with formal resolutions transmitted to local decision-making bodies.

7.2 CONTACTS WITH BUSINESS AND COMMERCIAL INTERESTS

Contacts have been made with the private sector through several chambers of commerce, other business organizations and direct contact with individual property owners and developers. These organizations and individuals have been thoroughly briefed on the current status and the projected development of the project. As a result, the organizations and individuals have increasingly sought out and identified their priorities to the Metro Rail staff.

7.3 CONTACTS WITH GOVERNMENT STAFFS AND ELECTED OFFICIALS

Continually updated printed information and personal briefings by Metro Rail staff have been provided to interested federal, state, and local elected officials whose jurisdictions fall within the Regional Core or who are specifically interested or involved in the eventual decisions on this Project. These include City Council members, County Supervisors, State Legislators, and U.S. Congressional Representatives. Elected officials and/or their representatives also have attended many of the community meetings and public hearings.

7.4 COORDINATION WITH THE MEDIA

A number of information briefings have been held with media representatives to encourage publicity for the Community Participation Program and to insure accurate media coverage of the Project. All regional newspapers and electronic media were contacted, but particular emphasis was given to the local newspapers circulated in the Regional Core area. The media, while paying cursory attention to the Project at the very beginning of Preliminary Engineering, has provided continuous coverage since May of 1982 when decisions on route alignment and station locations were first discussed in public meetings. Radio spots, radio and television talk shows, and regionwide newspaper articles have kept the general public of Los Angeles aware of the progress of the Metro Rail Project.

7.5 SPECIAL MEETINGS

In addition to regularly scheduled meetings in support of Milestones, land use plans, or EIS concerns, the Community Relations staff holds meetings with many other groups and individuals to insure that their concerns are made known and addressed. These meetings have brought together Metro Rail Project Team members, the SCRTD General Manager, members of the SCRTD Board of Directors, elected officials and the public. The practice of keeping the decision-making process open to the public early in Preliminary Engineering has enabled SCRTD's staff and consultants to identify, analyze, and evaluate important environmental impacts of the Metro Rail Project. A direct result of such special meetings was the creation of the previously discussed Special Alternatives Analysis.

7.6 PUBLIC INFORMATION AND COMMUNICATION

Basic to the success of Metro Rail's Community Participation Program has been the coordinated dissemination of public information to the Regional Core and the entire Los Angeles metropolitan community. A few of the most heavily used techniques are noted below.

7.6.1 METRO RAIL NEWSLETTER

The Community Relations Department has published and distributed a newsletter on the Metro Rail Project since 1978. The newsletter provides current information on the Project as well as insight into the transit industry as a whole. A direct mailing of 3,000-4,000 of each issue is made to governmental agencies, civic and service organizations, businesses, and members of the public. Additional copies are distributed to all community meetings and presentations conducted by Metro Rail staff.

7.6.2 METRO RAIL NEWS BULLETINS

Metro Rail News Bulletins, covering one or two subjects or possibly a meeting notice, are used between newsletter editions. The bulletins allow news items to be tailored to specific geographic areas along the Metro Rail alignment.

7.6.3 NEWS RELEASES

For each community meeting, public hearing, and major development a news release is issued to some 250 radio stations, television stations, and newspapers in the Los Angeles metropolitan area.

CHAPTER 6

REFERENCES

CHAPTER 6

REFERENCES

1. GLOSSARY

Aerial Option: A variation of the Locally Preferred Alternative, with an aerial alignment and two aerial stations in San Fernando Valley

alignment: the route of the Metro Rail Project, including both its vertical and its horizontal extension

ALRT: advanced light rail transit

APEI: Area of Potential Environmental Impact (for cultural and historic resources)

APTA: American Public Transit Association

AQMP: Air Quality Management Plan

ATP: Automatic Train Protection

BART: (San Francisco) Bay Area Rapid Transit

BPL: City of Los Angeles Bureau of Power and Light

bus bays: on-street areas for loading and unloading Metro Rail bus passengers without impeding traffic flow

bus terminals: off-street structures for loading and unloading Metro Rail bus passengers

CARB: California Air Resources Board

CBD: Los Angeles Central Business District

CCTV: closed circuit television

CHABA: weighting methodology used in measuring vibration levels

CNEL: Community Noise Equivalent Level, which measures subjective response to noise over 24 hours, expressed in A-weighted decibels

CNPS: California Native Plant Society

concourse entrance: a street-level semienclosed structure that serves as both an entrance and a ticketing area for a station

cooling towers: heat and cool ambient air for the station

CRA: Los Angeles Community Redevelopment Agency

crossover tracks: a stretch at which the ordinarily parallel sets of tracks cross each other, primarily so that trains can change direction easily

db(A): A-weighted decibels, which correspond to subjective perception of noise levels

EIR: Environmental Impact Report (a State of California environmental document)

EIS: Environmental Impact Statement (a federal environmental document)

elevated guideway: a support structure with two tracks, electrified rails, and an evacuation walkway

elevated stations: have platforms approximately 20-30 feet above ground level connected by escalator, elevator, and stairs to a concourse entrance

EPA: Environmental Protection Agency

ETS: emergency trip station, which shuts off third rail power

FAR: Floor Area Ratio, the ratio of building square footage, excluding parking and mechanical equipment storage, to parcel area

FY: fiscal year

GRP: gross regional product: the total sales and income within a region

ICTS: Intermediate Capacity Transit System

kiss and ride: auto drop-off and pick-up of transit riders

kWh: kilowatt hours

LAC: Los Angeles Conservancy

LACM: Natural History Museum of Los Angeles County

LADOP: City of Los Angeles Department of Planning

LADOT: City of Los Angeles Department of Transportation

LADWP: City of Los Angeles Department of Water and Power

LAG&E: Los Angeles Gas and Electric

LAPD: Los Angeles Police Department

LARTS: Los Angeles Regional Transportation Study branch of Caltrans

Ldn: Day-Night Sound Level, which measures subjective response to noise levels over 24 hours, expressed in A-weighted decibels

Leq: Energy Equivalent Level, a number representing average sound energy over a measurement period, expressed in A-weighted decibels

Locally Preferred Alternative: An 18.6-mile all-subway route, with 16 stations and 2 optional ones. It includes the CBD alignment along Hill Street, the Wilshire Corridor alignment with off-street stations at Wilshire/Alvarado and Wilshire/Vermont, the northward turn along Fairfax Avenue with an off-street station at Fairfax/Beverly, the Cahuenga Bend, and the Lankershim alignment north and south of Camarillo Street.

LRT: light rail transit

LUPAMS: Land Use Planning and Management Subsystem (City of Los Angeles Department of Planning)

MARTA: Metropolitan Atlanta Regional Transit Authority

Minimum Operable Segment: As required by UMTA, this alternative represents the minimum segment for a practical and meaningful transit operation in the Regional Core. It is identical to the other Project alternatives, but is 8.8 miles long, ending at the Fairfax/Beverly Station, and includes 11 stations plus an optional one at Wilshire/Crenshaw.

MMcf: million cubic feet

NHPA: National Historic Preservation Act

No Project Alternative: The most likely set of transportation improvements to be implemented if the Metro Rail Project is not built.

NPDES: National Pollution Discharge Elimination System

NRA: National Recreation Area

O & M: operations and maintenance

pocket track: a third pair of tracks between the usual two, allowing for storage of cars--for peak periods, for example

PTT: Pacific Telephone and Telegraph

Regional Core: encompasses the Central City North, Central City, Westlake, Wilshire, Hollywood, Studio City, and North Hollywood community plan areas, and part of the West Hollywood area. This area, served by Metro Rail, is the financial, retail, cultural, and entertainment center of Southern California.

ROW: right-of-way

RTD: Southern California Rapid Transit District

RTDP: Regional Transit Development Plan

RTP: Regional Transportation Plan

RWQCB: Regional Water Quality Control Board

SCAG: Southern California Association of Governments

SCAQMD: South Coast Air Quality Management District

SCG: Southern California Gas Company

SCT: Southern California Telephone

SCRTD: Southern California Rapid Transit District

setback: the distance of a structure from the street

SHPO: State Historic Preservation Officer

SIP: State Implementation Plan (when referring to air quality); Sector Improvement Plan (when referring to SCRTD bus system)

SMMNRA: Santa Monica Mountains National Recreation Area

SOCAB: South Coast Air Basin

street space: the public right-of-way for both vehicles and pedestrians along a street

subway station entrance (covered): located within buildings

subway station entrance (open): escalators and a stairway surrounded by a protective parapet connecting the ground and station mezzanine levels

TCM: Transportation Control Measure

TDR: transfer of development rights

UMTA: Urban Mass Transportation Administration

VMT: vehicle mile traveled

WMATA: Washington Metropolitan Area Transit Authority

2. REFERENCE DOCUMENTS

Akersten, W. A., R. L. Reynolds, and A. E. Tejada-Flores. 1979. New Mammalian Records From the Late Pleistocene of Rancho La Brea. In Bulletin, Southern California Academy of Sciences, Vol. 78, No. 2, p. 141-143.

American Public Transit Association (APTA). January 1979. Guidelines for Design of Rapid Transit Facilities.

Angel, S. 1969. Discouraging Crime Through City Planning. University of California, Berkeley.

Arthur Young & Company. 1979. Evaluation of the Cabrini-Green Hi-Impact Program.

Barclay, P. 1979. Preliminary Draft of an Archaeological Report on Parking Lot No. 1 (unpublished, unedited manuscript). On file, El Pueblo de Los Angeles State Historic Park, Los Angeles.

Bean, L. J. and C. R. Smith. 1978. In: Handbook of North American Indians Volume 8: California, by R. F. Heizer (ed.), p 538-549. Smithsonian Institution, Washington.

Bolton, H. E. 1971. Fray Juan Crespi, Missionary Explorer on the Pacific Coast 1769-1774. AMS Press, Inc., New York.

Booz, Allen, & Hamilton, Inc. 1982. Additional Investigations of Energy Management Alternatives for the Starter Line of the SCRTD Metro Rail Project.

__________. December 23, 1982. Preliminary Operating Analysis, Union Station to Beverly/Fairfax.

Brantingham, P. J. and P. L. Brantingham. 1980. Crime, Occupation, and Economic Specialization: A Consideration of Inter-Metropolitan Patterns, in Crime: A Spatial Perspective, K. D. Harries and G. Abeye.

Brattstrom, B. H. 1953. The Amphibians and Reptiles From Rancho La Brea, in Trans. San Diego Society of Natural History, Vol. 11, No. 14, p. 365-392.

California Air Resources Board. 1980. California Air Quality Data, Summary of 1980 Air Quality Data, Vol. XII.

__________. 1982. California Ambient Air Quality Standards for Particulate Matter (PM_{10}).

California Department of Fish and Game, The Resources Agency. September 15, 1980. Endangered, Rare, and Threatened Animals of California.

__________. June 16, 1981. List of Designated Endangered or Rare Plants.

California Department of Parks and Recreation. 1974. Procedural Guide Historic Resources Inventory.

__________. 1978. El Pueblo de Los Angeles State Historic Park Resource Management Plan.

__________. 1979. Instructions for Completing California Historic Resources Inventory Forms (D-8966C).

__________. 1981. California Historical Landmarks.

California Energy Commission. 1982. Securing California's Energy Future, 1983 Biennial Report.

California Native Plant Society. 1980. Inventory of Rare and Endangered Vascular Plants of California, Special Publication No. 1 (2nd edition). J. P. Smith, Jr., R. J. Cole, and J. O. Sawyer, Jr., (eds.), in collaboration with W. R. Powell.

__________. 1981. Inventory of Rare and Endangered Vascular Plants of California: First Supplement. Special Publication No. 1 (2nd edition). J. P. Smith, Jr., (ed).

California Natural Areas Coordinating Council. 1975. Inventory of California Natural Areas. Berkeley.

Chartkoff, J. L. and K. K. Chartkoff. 1972. Archaeological Research Potential in Urban Los Angeles, in Pacific Coast Archaeology Society Quarterly 8(2):57-66.

Chace, P. G. 1979. Assessment of an Archaeological Feature Beneath the Merced Theatre Building, El Pueblo de Los Angeles State Historic Park. On file, El Pueblo de Los Angeles State Historic Park, Los Angeles.

__________. 1980. An Archaeological Research Design for the Sepulveda Block Restoration-Rehabilitation Project. Prepared for the City of Los Angeles, El Pueblo de Los Angeles State Historic Park.

__________. 1980. An Archaeological Review and Tests for the Tree Planting Programs, El Pueblo de Los Angeles State Historic Park. On file, El Pueblo de Los Angeles State Historic Park, Los Angeles.

__________. 1980. Two Archaeological Projects: An Archaeological Monitoring Program of the "W-4" Shop Site Renovation, Olvera Street; An Archaeological Monitoring Program of the "W-20" Shop Site Renovation, Olvera Street. On file, El Pueblo de Los Angeles State Historic Park, Los Angeles.

__________. 1980. An Archaeological Monitoring Program of the Trash Compactor Project, El Pueblo de Los Angeles State Historic Park. On file, El Pueblo de Los Angeles State Historic Park, Los Angeles.

__________. 1981. Archaeological Monitor for Emergency Plumbing Repairs within the La Luz del Dia Grocery-Gibbs Brothers Electric Company Building, El Pueblo de Los Angeles State Historic Park. Escondido, California.

City of Los Angeles. 1980. Historic-Cultural Monuments as Designated by the Cultural Heritage Board.

Congressional Budget Office. September 1977; October 5, 1977. Urban Transportation and Energy: The Potential Savings of Different Modes.

Converse Ward Davis Dixon, Earth Sciences Associates, Geo/Resource Consultants. 1981. Geotechnical Investigation Report, Vol. I and II. Prepared for Southern California Rapid Transit District Metro Rail Project.

Converse Consultants. 1982. Seismological Investigation and Design Criteria, Draft Report, Vol. I, Seismological Investigation. Prepared for Southern California Rapid Transit District Metro Rail Project.

__________. 1983. Seismological Investigation and Design Criteria.

Costello, J. G. 1980. Los Angeles Downtown People Mover Program Archaeologcial Resource Survey Phase 2. Prepared for the Community Redevelopment Agency.

Costello, J. G. and L. R. Wilcoxon. 1978. An Archaeological Assessment of Cultural Resources in Urban Los Angeles, El Pueblo de Los Angeles, La Placita de Dolores. Prepared for City of Los Angeles, Department of Public Works, Bureau of Engineering.

DMJM/PBQD. 1982. Report on Construction Methods. Prepared for Southern California Rapid Transit District Metro Rail Project.

__________. January 6, 1983. Pre-Preliminary Cost Estimate.

Downtown Circulation Task Force. 1982. An Issue of Equity: Federal Transportation Funding for Los Angeles.

England and Nelson. 1976. Los Angeles County Significant Ecological Areas Study. Prepared for County of Los Angeles, Department of Regional Planning and Environmental Systems Research Institute.

Fenenga, F. (ed.). 1973. The Archaeology of the Avila Adobe on Olvera Street in Los Angeles. (Four papers edited and assembled by Franklin Fenenga, California State University at Long Beach for El Pueblo de Los Angeles State Historic Park Commission.)

Fowler, F. August 1979. Reducing Residential Crime and Fear: The Hartford Neighborhood Prevention Program. Center for Survey Research, University of Massachusetts, Boston, Joint Center for Urban Studies of MIT and Harvard University, Boston.

Frankel, M. August 1981. Policing the Rails: Washington Proves It Can Be Done; in Mass Transit, p. 8-9, 54-60.

Frierman, J. D. 1980. A Look at Sonoratown: Cultural Resources Study, Chinatown Senior Citizens Housing Site. Prepared by Greenwood and Associates for Los Angeles Community Redevelopment Agency.

Frost, F. H. 1927. The Pleistocene Flora of Rancho La Brea: University of California Pub. Botany, Vol. 14, No. 3, p. 73-98.

Gardiner, R. A. 1979. The Environmental Security Planning Process. Unpublished manuscript, Gardiner and Associates.

Giffen, A. 1937. Sketch Map of Campa de Cahuenga. Los Angeles City Bureau of Engineering, City Hall, Room 8093. Map #HS287.

Gilian, J. and M. Wachs. March 1976. Lifestyles and Transpartation Needs of the Elderly in Los Angeles. Transportation, 5(1), 45-61.

Greenwood, R. S. and R.J. Wlodarski. 1978. Los Angeles Downtown People Mover Project. Prepared by Greenwood and Associates for the Community Development Agency.

Harries, K. D. and George-Abeye (eds.). 1980. Crime: A Spatial Perspective. Columbia University Press.

Hatheway, R. 1980. Union Terminal Appraisal Study: Historical, Architectural and Archaeological, 2 Vols. Prepared for Albert C. Martin Associates, Los Angeles.

Heizer, R. F. 1968. The Indians of Los Angeles County Hugo Reid's Letters of 1852. Southwest Museum Papers No. 21. Highland Park, Los Angeles, California, Southwest Museum.

Howard, H. 1930. A Census of the Pleistocene Birds of Rancho La Brea from the Collection of the Los Angeles County Museum: Condor, Vol. 32, p. 81-88.

Hudson, D. T. 1971. Proto-Gabrielino Patterns of Territorial Organization in South Coastal California. Pacific Coast Archaeological Society Quarterly 7(2):179-192.

Huey, G., J. Romani, and L. Webb. 1980. Archaeological Survey Report for the El Monte Extension in the City of Los Angeles, Los Angeles, California. Route 07-LA-101-0.0/0.5 07202-417801.

International Business Services, Inc. December 1979. Analysis of Transit Energy Consumption and Federal Policy.

Johnston, B. E. 1962. California's Gabrielino Indians. Frederick Webb Hodge Anniversary Publication Fund Volume 8. Southwest Museum, Los Angeles.

Kroeber, A. L. 1925. Handbook of the Indians of California. Bureau of American Ethnology Bulletin 78. Washington.

Los Angeles City Department of Planning. 1982. Existing Land Use Reports.

Los Angeles City Department of Transportation. March 1982. Working Paper--1980 Traffic Volumes.

__________. October 1982. Working Papers—1980 Parking Inventory.

__________. October 1982. Working Paper—Year 2000 Base Traffic Volumes.

__________. March 1983. Working Paper--2000 with Project Traffic Volumes.

__________. March 1983. Technical Report—Traffic Control Policies During Construction.

__________. March 1983. Technical Report--Traffic Mitigation Measures.

__________. April 1983. Technical Report--2000 with Project Condition V/C Ratios and Impacts.

__________. May 1983. Technical Report--2000 Parking Conditions.

Los Angeles County. 1980. County of Los Angeles General Plan.

Los Angeles County, Department of Regional Planning. 1979. Final Environmental Impact Report for the Los Angeles County Proposed General Plan.

Los Angeles Police Department. 1978-1981. Statistical Digests.

Marcus, L. F. 1960. A Census of the Abundant Large Pleistocene Mammals from Rancho La Brea: Los Angeles County Museum Contribution in Science, Vol. 38, p. 1-11.

Meighen, C. 1951. LAn-7, Archaeological Site Record Form. On File, University of California, Los Angeles.

Metropolitan Transportation Commission. January 1978. The Economic and Financial Impacts of BART. Berkeley: BART Impact Program Land Use and Urban Development Project Final Report.

Miller, J. M. 1932. The Fremont-Pico Memorial Park (Campo de Cahuenga) The Home of Don Tomas Feliz Its Excavation and Proposed Restoration. Historical Society of Southern California. Quarterly Vol. 28:1:278-279.

Newman, O. 1972. Defensible Space: Crime Prevention Through Environmental Design. Macmillan.

Padon, B. 1980. Historical Archaeological Status Report for the Expanded Monitoring at the Los Angeles Union Passenger Terminal for the El Monte Busway Extenstion, Route 07-LA-10 50.0/50.1, Route 07-101 0.0/0.3 07218-417801.

Perlstein, A. and M. Wachs. November 1981. Crime in Public Transit Systems: An Environmental Design Perspective. School of Architecture and Urban Planning, UCLA.

Pierce, W. D. 1949. The Silphid Burying Beetles in the Asphalt Deposits; in Bulletin of Southern California Academy of Science, Vol. 48, No. 2, p. 5570.

Rand, G. 1980. Multiple Housing; in Handbook of Security Design, P. Hopf (ed.). McGraw Hill.

__________. 1983. The Nature of Urban Crime. Urban Innovations Group, Los Angeles, in press.

Regional Plan Association. November 1980. Urban Rail in America. Prepared by B. Pushkarev and J. Zupan for Urban Mass Transportation Administration, UMTA-NY-06-0061-80-1.

Richards, L. G. and L. A. Hoel. 1980. Planning Procedures for Improving Transit Station Security. U.S. Department of Transportation, DOT-OS-50233. Traffic Quarterly (34) July, 1980, p. 355-376.

Robinson, W. W. 1959. Los Angeles From the Days of the Pueblo. California Historical Society, San Francisco.

Rouse, V. W. 1980. Predicting Automated Guided System Station Security Requirements, UMTA. Transportation Systems Center, Cambridge, Massachusetts.

Sanborn Map Company. 1906. Updated 1925. Insurance Maps of Los Angeles. 11 Broadway, New York.

Savage, D. E. 1951. Late Cenozoic Vertebrates of the San Francisco Bay Region; in University of California Public. Geological Sciences, Vol. 28, p. 215-314.

Sedway/Cooke. 1983. Disposal of Tunnel and Station Excavation Material. Prepared for Southern California Rapid Transit District Metro Rail Project.

Shellow, R., J. Romvaldi, and E. Bartel. 1974. Crime in Rapid Transit Systems: An Analysis and Recommended Security and Surveillance System; in Crime and Vandalism in Public Transportation. Transportation Research Record #487.

Siegel, L. et al. April 1977. An Assessment of Crime and Policing Responses in Urban Mass Transit Systems. The Mitre Corporation. NILECJ/LEAA No. 76-NI-99-011.

Singer, C. 1978. Preliminary Evaluation of Cultural Resources Located Along Proposed Urban Mass Transit System Alignment Alternatives in the City of Los Angeles, Los Angeles County, California. Southern California Rapid Transit District, Los Angeles

Singer, C., J. Romani, and R. Edberg. 1981. Preliminary Historic Archaeological Investigations at the Los Angeles Plaza Church. Northridge Archaeological Research Center, California State University, Northridge.

South Coast Air Quality Management District. 1979. Air Quality Trends in the South Coast Air Basin.

__________. 1981. Air Quality Handbook for Environmental Impact Reports.

__________. 1981. Air Quality Reasonable Further Progress.

__________. 1981. Annual Report for 1980 on the South Coast Air Quality Management Plan.

__________. 1982. Air Quality Trends in the South Coast Air Basin, 1965-1981.

__________. Rules and Regulations (including various amendments) Regulation IV Prohibitions.

Southern California Association of Governments. 1975. Draft 1976 Transportation Plan: Towards a Balanced Transportation System.

__________. 1978. SCAG-78 Growth Forecast Policy.

__________. 1980. 1980 Regional Transportation Plan.

__________. 1981. Issue Paper on Alternative Urban Forms.

__________. January 1982. Draft SCAG-82 Growth Forecast Policy.

__________. September 1982. Final SCAG-82 Forecasts.

Southern California Association of Governments/South Coast Air Quality Management District. 1979. Air Quality Management Plan.

__________. 1982. Air Quality Management Plan, 1982 Revision, Carbon Monoxide Analysis for the South Coast Air Basin.

Southern California Rapid Transit District. June 1982. Appendix A: Responses to Community Questions and Issues for Preliminary Draft Reports for Milestone 3 and Milestone 4.

__________. February 1982. Task Report—Existing Conditions—Regional and Community Setting. Prepared by Sedway/Cooke.

__________. June 1982. Preliminary Draft Report for Milestone 4: Station Location Alternatives.

__________. June 1982. 1981 Ridership Tracking Study: Systemwide Survey.

__________. July 1982. Draft Report for Milestone 3: Route Alignment Alternatives.

__________. July 1982. Preliminary Draft Report for Milestone 5: Right-of-Way Acquisition and Relocation Policies and Procedures.

__________. August 1982. Milestone I Report: Preliminary System Definition and Operating Plan. Prepared by Booz, Allen & Hamilton Inc.

__________. September 1982. A Summary of Public Policies and a General Environmental Impact Methodology. Prepared by Sedway/Cooke.

__________. September 1982. Preliminary Draft Report for Milestone 6: Land Use and Development.

__________. September 1982. Task Report--"Scoping Issues" and Their Implications for the EIS/EIR Work Program. Prepared by Sedway/Cooke.

__________. September 1982. Technical Report--Growth Scenarios. Prepared by Sedway/Cooke.

__________. October 1982. Total Ridership Profile and Peak Factor Analysis for the Wilshire and Hollywood Corridors.

________. November 1982. Preliminary Draft Report for Milestone 7: Safety, Fire/Life Safety, Security and Systems Assurance.

________. November 1982. Preliminary Draft Report for Milestone 8: Systems and Subsystems.

________. December 1982. Preliminary Draft Report for Special Alternatives Analysis, Hollywood Area.

________. December 1982. Final Draft Report for Special Alternatives Analysis, North Hollywood Area.

________. January 1983. Preliminary Draft Report for Milestone 9: Supporting Services Plan.

________. January 1983. Technical Report--Cultural Resources. Prepared by WESTEC Services, Inc.

________. February 1983. Preliminary Draft Report for Milestone 10: Fixed Facilities.

________. March 1983. Technical Report--Biological Resources. Prepared by WESTEC Services, Inc.

________. March 1983. Technical Report--Geology and Hydrology. Prepared by WESTEC Services, Inc.

________. April 1983. Draft Report for Milestone 11: Preliminary Cost Estimate.

________. April 1983. Staff Report on Preliminary Property Acquisition and Relocation Costs.

________. April 1983. Technical Report--Aesthetics. Prepared by Sedway/Cooke.

________. April 1983. Technical Report--Air Quality. Prepared by WESTEC Services, Inc.

________. April 1983. Technical Report--Crime Impact Analysis of SCRTD Metro Rail Project. Prepared by George Rand Associates.

________. April 1983. Technical Report--Noise and Vibration. Prepared by WESTEC Services, Inc.

________. April 1983. Technical Report--Seismological Investigation and Design Criteria. Prepared by Converse Consultants.

________. June 1983. Technical Report--Land Use and Development Impacts. Prepared by Sedway/Cooke.

________. June 1983. Technical Report--Social and Community Impacts. Prepared by The Planning Group.

Stock, C. 1956. Rancho La Brea: A Record of Pleistocene Life in California in Los Angeles County Museum Sci. Ser. 20, Paleo. 11, p. 1-81.

Stringham, M. G. P. April 1982. Travel Behavior Associated with Land Uses Adjacent to Rapid Transit Stations; in the ITE Journal. April 1982.

Stevenson, H. J., U.S. Department Surveyor. 1884. Map of the City of Los Angeles, California. Copy at Los Angeles City Bureau of Engineering, City Hall, Room 803.

Teggert, F. J. (ed.). 1911. The Portola Expedition of 1769-1770: Diary of Miguel Costanso. Publications of the Academy of Pacific Coast History, 2(4). University of California Press, Berkeley.

Thorne, R. F. 1976. The Vascular Plant Communities of California, in June Latting (editor) Symposium Proceedings--Plant Communities of Southern California, California Native Plant Society, Special Publication No. 2.

Thrasher, E. J. and J. B. Schell. 1974. Studies of Public Attitudes Toward Transit Crime and Vandalism, in Crime and Vandalism in Public Transportation. Transportation Research Record #487.

Tien, J. M., et al. July 1977. Street Lighting Project: National Evaluation Program, Phase One. Public Systems Evaluation. Cambridge, Massachusetts.

United States Department of the Interior. 1966. National Historic Preservation Act (Section 106) (PL 89-665).

_________. 1979. Advisory Council on Historic Preservation, Code of Federal Regulations. (Title 36 CFR Part 800).

_________. U.S. Fish and Wildlife Service. 1979. List of Endangered and Threatened Wildlife and Plants (republication). Federal Register 4(12):3636-3654, Wednesday, January 17, 1979.

_________. 1980. Endangered and Threatened Wildlife and Plants: Review of Plant Taxa for Listing as Endangered or Threatened Species. Department of Interior, Federal Register 45(242):82480-82509, Monday, December 15, 1980.

_________. 1970s-1982. National Register of Historic Places; Annual Listing of Historic Properties. National Park Service: Washington, D.C.

_________. 1982. How to Apply the National Register Criteria for Evaluation. National Park Service, Washington, D.C.

_________. National Park Service. April 1982. Santa Monica Mountains National Recreation Area, General Management Plan.

U.S. Department of Transportation, Urban Mass Transportation Administration. 1976. Federal Policy of Assistance for Major Urban Mass Transportation Investments. Federal Register 41(185):41513-41514, Wednesday, September 22, 1976.

__________. 1980. Final Environmental Impact Statement - Los Angeles Downtown People Mover Project.

U.S. Department of Transportation, Urban Mass Transportation Administration, in cooperation with Southern California Rapid Transit District. April 1979. Draft Alternative Analysis/Environmental Impact Statement/Environmental Impact Report on Transit System Improvements in the Los Angeles Regional Core.

__________. 1980. Final Alternatives Analysis/Environmental Impact Statement/Report on Transit System Improvements in the Los Angeles Regional Core.

U.S. Environmental Protection Agency. 1977. AP-42 Compilation of Air Pollutant Emissions Factors, third edition.

United States Senate and House of Representatives. 1966. Department of Transportation Act, Section 4-F (PL89-670).

Valentine, J. W. and J. H. Lipps. 1970. Marine Fossils at Rancho La Brea; in Science, Vol. 167, p. 277-278.

Van Fliet, W. 1981. Vandalism: A Review of the Literature. Presentation to International Colloquim on Vandalism, Paris.

Warter, J. K. 1976. Late Pleistocene Plant Communities--Evidence from the Rancho La Brea Tar Pits: Symposium Proceedings on Plant Communities of Southern California, Spec. Public. California Native Plant Society, Vol. 2, p. 320-39.

Weil, M. E. 1980. Historic Structures Report: Sepulveda Block, Appendix C, Archaeological Investigation for the Sepulveda Block Restoration Project, El Pueblo de Los Angeles State Historic Park, by Paul G. Chace. On file, El Pueblo de Los Angeles State Historic Park, Los Angeles.

Weitze, K. 1980. Aliso Street Historical Report for the El Monte Busway Extension in the City of Los Angeles. Caltrans, District 07, Los Angeles.

Westec Services, Inc. April 1983. Noise and Vibration

Westinghouse National Issues Center, Crime Prevention Through Environmental Design. May 1978. Final Report on Schools Demonstration, Poroward County, Florida. Prepared for Law Enforcement Assistance Administration, U.S. Department of Justice.

__________. June 1978. Final Report on Residential Demonstration, Minneapolis, Minnesota.

__________. 1979. Report on Commercial Demonstration, Portland, Oregon.

Wilbur Smith & Associates. October 1981. Central City Parking Study. Prepared for City of Los Angeles Department of Transportation.

Wilson, Ihrig and Associates, Inc. April 1982. Noise and Vibration Survey for the Metro Rail Project, Draft Report.

__________. April 1982. Noise and Vibration Design Criteria for the Metro Rail Project.

__________. May 1982. Review of Regulations and Industry Practice Affecting Control of Noise and Vibration.

__________. July 1982. Noise and Vibration Survey for the Metro Rail Project, Final Report.

__________. October 1982. Supplemental Noise and Vibration Survey for the Metro Rail Project, Preliminary Draft Report.

__________. November 1982. Noise and Vibration Study, Alternative Route Alignments for the Metro Rail Project, Draft Report.

__________. 1982. Letter Report on Noise and Vibration Levels at St. Charles Borromeo Church.

Wlodarski, R. J. 1978. Archaeological Resources Survey, the Proposed Downtown People Mover Project Corridor Area. Prepared by Greenwood and Associates for Los Angeles Community Redevelopment Agency.

Woodward, G. D. and L. F. Marcus. 1973. Rancho La Brea Fossil Deposits: A Reevaluation From Stratigraphic and Geological Evidence; in Journal of Paleontology, Vol. 47, No. 1, p. 54-69.

Yerkes, R. F., J. L. Tinsley, and K. M. Williams. 1977. Geologic Aspects of Tunneling in the Los Angeles Area: U.S. Geological Survey Misc. Field Studies Map MF-866, 5 sheets, scale 1:12,000, 67 p.

Zimbardo, P. G. 1969. The Human Choice: Individuation, Reason and Order Versus Deindividuation, Impulse and Chaos; in Nebraska Symposium on Motivation, W. J. Arnold and D. Levine (eds.). Lincoln-University of Nebraska Press.

3. LIST OF PREPARERS

URBAN MASS TRANSPORTATION ADMINISTRATION, Washington, D.C. Lead Federal agency responsible for EIS. Key personnel include:

Abbe Marner: Environmental Protection Specialist
Sue Kaminsky: Environmental Consultant

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT, Los Angeles, California. Project proponent and responsible for preliminary engineering and managing environmental documentation and analysis. Lead agency for EIR, cooperating agency for EIS. Key personnel include:

EXECUTIVE OFFICE

John Dyer: General Manager
Albert Perdon: Assistant to the General Manager

METRO RAIL PROJECT STAFF

Robert Murray: Assistant General Manager, Transit Systems Development
James Crawley: Deputy Chief Engineer, Ways & Structures
William Rhine: Deputy Chief Engineer, Systems Analysis and Subsystems Design
Douglas Low: Director of Architecture
Nadeem Tahir: Planning Manager (EIS Project Manager)
Jeff Carpenter: Supervising Planner, EIS Staff
Jim Sowell: Supervising Planner, EIS Staff
James Callaway, Paulette Cunningham, Steve Brye, Marianne Payne, Steve Roth, Robert Vance: EIS Staff

LEGAL DEPARTMENT

Suzanne Gifford: Assistant Legal Counsel

COMMUNITY RELATIONS

Lou Collier: Manager of Community Relations
Cheryl Browne: Community Relations Representative

PLANNING DEPARTMENT

Gary Spivack: Director of Planning
Keith Killough: Planning Manager, Systems

CITY OF LOS ANGELES. Responsible for traffic, circulation and parking analysis; land use data, specific plan preparation; assistance in utility and safety plans.

DEPARTMENT OF TRANSPORTATION

Alice Lepis: Principal Transportation Engineer (City Contract Coordinator for the Metro Rail Project)
Joe Kennedy: Transpartation Engineer (City Program Manager for the Metro Rail Project)
Sam Furuta: Civil Engineer (Parking Studies Supervisor)
Ray Wellbaum, James Okazaki, John Vance, Ray Nakamura, Walter Okitsu, Ray Bolduc, Stan Frolichstein, Al Proescholdt, Bernard Hicks, Pramod Athalye, Karin Friss, Paula Sorokin: LADOT Staff

DEPARTMENT OF CITY PLANNING

Peter Broy: Senior City Planner
Robert Rogers: City Planner (Specific Plan Program Manager)
John Tomita, Karin Hodin, Leonard Levine, Artis Rhodes, Lourdes Bravo, Andy Montealegre, Ed Ezra, Sol Blumenfeld, Deborah Wittwer, Gilani Mohiuddin, Joyce Odell: LADOP Staff

COUNTY OF LOS ANGELES. Responsible for land use data and specific plan preparation for the Fairfax/Santa Monica Station and portions of the Universal City Station. Key personnel include:

Robert Chave: Assistant Director of Planning (Specific Plan Project Manager)
Eric Wickland: Regional Planning Assistant II (Specific Plan Project Coordinator)

SEDWAY/COOKE, San Francisco and Los Angeles, California. Responsible for EIS/EIR management, coordination, and preparation; and land use, joint development, and visual analyses. Key personnel and their titles include:

Paul Sedway: Principal-in-Charge
Tom Cooke: Participating Principal
Fred Etzel: Project Manager
Rod Jeung: Assistant Project Manager
Pat Smith: Project Coordinator
Juliana Pennington: Graphics Coordinator
Ben Rosenbloom, Neil Hart, Sue Hyde, Robert Rhine, Greg Sutter, Karin Pally, Candy Rupp, Leah Culberg, Michael Frisbie, Rita Fuhr-Hunt, Jack Schnitzius, Lynda Wagstaff, Christine Rains, Debra Shishkoff, Faith Dunham, Pamela Bailey-Boyle, Grace Wright, Garrett D'Aloia: Staff

THE PLANNING GROUP, INC., Los Angeles, California. Responsible for social and community impact analysis, surveys of local residents, and interviews with key community informants. Key personnel and their titles include:

Eugene Grigsby: Principal
Richard Platkin: Project Manager
Ben Darche, Sharon Robinson Sivad-el, Wade Carter, Neil Baumler, Marcello Cruz, Frank Harper, Joan Ling: Staff

WESTEC SERVICES, INC., San Diego, California. Responsible for geology and hydrology, noise and vibration, air quality, energy, biology, and cultural resources analyses. Key personnel and their titles include:

Michael Wright: Principal
Thomas Ryan: Project Manager
Kurt Klein, Richard Carrico, John Westermeier, Frank Kingery, John Porteous, Stephen Lacy, Terri Jacques, Dennis Quillen, Allan Schilz, Otto Bixler, Hans Giroux: Staff

LYNN SEDWAY & ASSOCIATES, San Rafael, California. Responsible for regional economics, fiscal, and cost efficiency analyses. Key personnel and their titles include:

Lynn Sedway: Principal
Richard Anderson, Alyse Jacobson, Peter Nelson: Staff.

PEAT, MARWICK, MITCHELL & CO., Los Angeles, California. Responsible for employment and market analyses and joint development data. Key personnel and their titles include:

Eric Hansen: Principal
William Masterson: Project Manager
Darrel Cohoon, Don Bredberg, Neal Polachek: Staff

ROBERT CONRADT, San Rafael, California. Responsible for reviewing traffic analysis.

GEORGE RAND & ASSOCIATES, Los Angeles, California. Responsible for crime impact analysis. Key personnel and their titles include:

Dr. George Rand: Principal
Scott Senauke: Staff

URS/JOHN A. BLUME & ASSOCIATES, San Francisco, California. Responsible for reviewing construction methods, muck disposal, and utility impact analysis. Key personnel and their titles include:

Jim Keith: Senior Consultant

SCHIMPELER-CORRADINO ASSOCIATES, Houston, Texas. Responsibility for patronage estimates and assistance in EIS review. Key personnel include Peter Stopher and Steven Beard.

4. DISTRIBUTION LIST

AGENCIES

A number of governmental agencies, businesses, professional groups, and community organizations have been sent copies of the Draft Second Tier EIS/EIR. They have been invited to express their comments on the document. Others interested in obtaining copies of this Draft EIS/EIR should contact the Planning Manager of the Metro Rail Project staff or the Community Relations Department of the Southern California Rapid Transit District, 425 South Main Street, Los Angeles, California 90013. Agencies and organizations receiving this document are identified below.

FEDERAL AGENCIES

1. U.S. Department of Transportation
   Office of the Secretary of Transportation
   Federal Highway Administration
   Federal Railroad Administration
2. U.S. Department of Agriculture
3. U.S. Department of Energy
4. U.S. Department of the Interior
5. U.S. Department of Commerce
6. U.S. Department of Housing and Urban Development (HUD)
7. U.S. Department of Health and Human Services
8. U.S. Environmental Protection Agency (EPA)
9. U.S. Army, Corps of Engineers
10. Interstate Commerce Commission
11. General Services Administration
12. Office of Management and Budget
13. Advisory Council on Historic Preservation

STATE AGENCIES

1. Office of the Governor
2. California Transportation Commission
3. State Department of Transportation
4. State Air Resources Board
5. State Resources Agency
6. State Department of Water Resources
7. State Office of Planning and Research
8. State Energy Resources Conservation and Development Commission
9. State Department of Rehabilitation
10. State Legislative Audit Committee
11. State Office of Historic Preservation
12. Public Utilities Commission
13. State Lands Commission
14. State Department of Housing and Community Development
15. State Department of Parks and Recreation
16. State Department of Conservation
17. Regional Water Quality Control Board
18. State Department of Education
19. State Department of Public Health
20. State Department of General Services
21. Division of Mines and Geology
22. Santa Monica Mountains Conservancy
23. California State Publications Librarian
24. El Pueblo de Los Angeles State Park

REGIONAL AND LOCAL AGENCIES

1. Southern California Association of Governments
2. South Coast Air Quality Management District
3. Los Angeles County Transportation Commission
4. Los Angeles County (Board of Supervisors & Chief Administrative Officer)
5. Los Angeles County Regional Planning Commission
6. Los Angeles County Community Development Commission
7. Los Angeles County Road Department
8. Los Angeles County Regional Planning Department
9. Los Angeles County Health Services Department
10. Los Angeles County Hospital and Clinics Services
11. Los Angeles County Public Social Services Department
12. Los Angeles County Parks and Recreation Department
13. Natural History Museum of Los Angeles County (George S. Page Museum)
14. Los Angeles County Museum of Art
15. Los Angeles County Assessor
16. Los Angeles County Engineer
17. Los Angeles County Fire Department
18. Los Angeles County Sheriff's Department
19. Los Angeles Senior Citizen Affairs Department
20. Los Angeles County Commission on Human Relations
21. Los Angeles County Commission on Women
22. Los Angeles County Commission on Disabilities
23. Los Angeles County Superintendent of Schools
24. Los Angeles County Flood Control District
25. Los Angeles County Sanitation District
26. Los Angeles County Library Department (see Libraries, below)
27. Los Angeles County Clerk
28. Los Angeles City (Mayor and Council & Chief Administrative Officer)
29. Los Angeles City Transportation Department
30. Los Angeles City Planning Commission
31. Los Angeles City Planning Department
32. Los Angeles City Public Works Department
33. Los Angeles City Bureau of Engineering
34. Los Angeles City Bureau of Street Maintenance
35. Los Angeles City Recreation and Parks Department
36. Los Angeles City Police Department
37. Los Angeles City Fire Department
38. Los Angeles City Library Department (see Libraries, below)
39. Los Angeles City Cultural Affairs Department
40. Los Angeles City Cultural Heritage Board

41. Los Angeles City Social Service Department
42. Los Angeles City Community Redevelopment Agency Board
43. Los Angeles City Community Redevelopment Agency
44. Los Angeles City Housing Authority
45. Los Angeles City Community Development Department

46. Los Angeles City Building and Safety Department
47. Los Angeles City Department of Water and Power
48. Los Angeles Community College District
49. Los Angeles City Board of Education
50. Los Angeles City Legislative Analyst

51. City of Beverly Hills
52. City of Santa Monica
53. City of Burbank
54. City of Glendale
55. Southern California Edison Company

56. Southern California Gas Company

BUSINESS, COMMUNITY, AND PROFESSIONAL ORGANIZATIONS

1. Citizens Advisory Committee, Los Angeles County Transportation Commission
2. Sierra Club/City Care
3. National Association for the Advancement of Colored People
4. League of Women Voters
5. Urban League

6. National Organization for Women
7. Countywide Citizens Planning Council
8. Los Angeles County Federation of Labor
9. Los Angeles Conservancy
10. Los Angeles Grand Jury

11. Van Nuys Chamber of Commerce
12. North Hollywood Chamber of Commerce
13. North Hollywood Project Area Committee
14. Universal City Specific Plan Citizens Advisory Committee
15. Hollywood Heritage

16. Hollywood Chamber of Commerce
17. Hollywood Specific Plan Citizens Advisory Committee
18. Hollywood Coordinating Council
19. West Hollywood Planning Advisory Committee
20. West Hollywood Chamber of Commerce

21. West Hollywood Community Alliance
22. Beverly Fairfax Chamber of Commerce
23. Vitalize Fairfax Project
24. Beverly Fairfax Specific Plan Citizens Advisory Committee
25. Miracle Mile Specific Plan Citizens Advisory Committee

26. Park Mile Specific Plan Design Review Committee
27. Crenshaw Station Specific Plan Citizens Advisory Committee
28. Wilshire Chamber of Commerce
29. Korean Chamber of Commerce of Southern California
30. Southwestern University

31. West Coast University
32. Central City Association
33. Central Business District Redevelopment Project Area Committee
34. Los Angeles Area Chamber of Commerce
35. Little Tokyo Businessmens Association

36. Little Tokyo Project Area Committee
37. Chinatown Project Area Committee
38. Chinese Chamber of Commerce of Los Angeles
39. Los Angeles Convention and Visitors Bureau
40. Institute of Electrical and Electronics Engineers

41. American Institute of Architects
42. American Planning Association
43. American Society of Civil Engineers
44. American Society of Mechanical Engineers

Additional copies of the report will be made available to other interested agencies, groups, or individuals as appropriate.

AVAILABILITY TO PUBLIC

In addition to the distribution listed above, copies of this Draft EIS/EIR are available for review at the locations identified below.

PUBLIC LIBRARIES

1. RTD Library and Information Center
   425 South Main Street
   Los Angeles, CA 90013

2. Central Library
   630 West Fifth Street
   Los Angeles, CA 90071

3. City of Los Angeles Municipal Reference Library
   City Hall East, Room 530
   200 North Main Street
   Los Angeles, CA 90012

4. North Hollywood
   5211 Tujunga Avenue
   North Hollywood, CA 91601

5. Studio City
   4400 Babcock Avenue
   North Hollywood, CA 91604

6. West Los Angeles
   11360 Santa Monica Boulevard
   Los Angeles, CA 90025

7. Cahuenga Library
   4591 Santa Monica Boulevard
   Los Angeles, CA 90029

8. Fairfax Library
   161 South Gardner Street
   Los Angeles, CA 90029

9. Felipe de Neve Library
   2820 West Sixth Street
   Los Angeles, CA 90057

10. San Vicente Library
    715 North San Vicente
    West Hollywood, CA 90069

11. John C. Fremont Library
    6121 Melrose Avenue
    Los Angeles, CA 90038

12. West Hollywood Library
    1403 North Gardner Street
    Los Angeles, CA 90004

13. Wilshire Library
    149 North St. Andrews Place
    Los Angeles, CA 90004

SCHOOL LIBRARIES

14. University of Southern California
    Architecture and Fine Arts Library
    Watt Hall, University Park
    Los Angeles, CA 90007

15. California State University, Los Angeles
    John F. Kennedy Memorial Library
    5151 State College Drive
    Los Angeles, CA 90032

16. University of California Los Angeles
    Public Affairs Service/
    Local, University Research Library
    Los Angeles, CA 90024

17. California State University
Northridge Library
18111 Nordhoff Street
Northridge, CA 91324

18. Institute for Transportation Studies
University of California
Irvine, CA 92717

19. American Public Transit Association Library
1225 Connecticut Avenue, N.W.
Washington, D.C. 20036

20. Southwestern University School of Law Library
675 South Westmoreland Avenue
Los Angeles, CA 90020

21. West Coast University Library
440 Shatto Place
Los Angeles, CA 90020

22. Otis/Parsons Art Institute Library
2401 Wilshire Boulevard
Los Angeles, CA

23. Woodbury University Library
1027 Wilshire Boulevard
Los Angeles, CA 90017

24. Los Angeles Valley College
Reference Library
5800 Fulton Avenue
Van Nuys, CA 91401

25. Los Angeles City College
Reference Library
855 North Vermont Avenue
Los Angeles, CA 90029

26. Fairfax High School Library
7850 Melrose Avenue
Los Angeles, CA 90036

27. Hollywood High School Library
1521 North Highland Avenue
Los Angeles, CA 90028

28. Castelar Elementary School Library
536 W. College Street
Los Angeles, CA 90012

INDEX