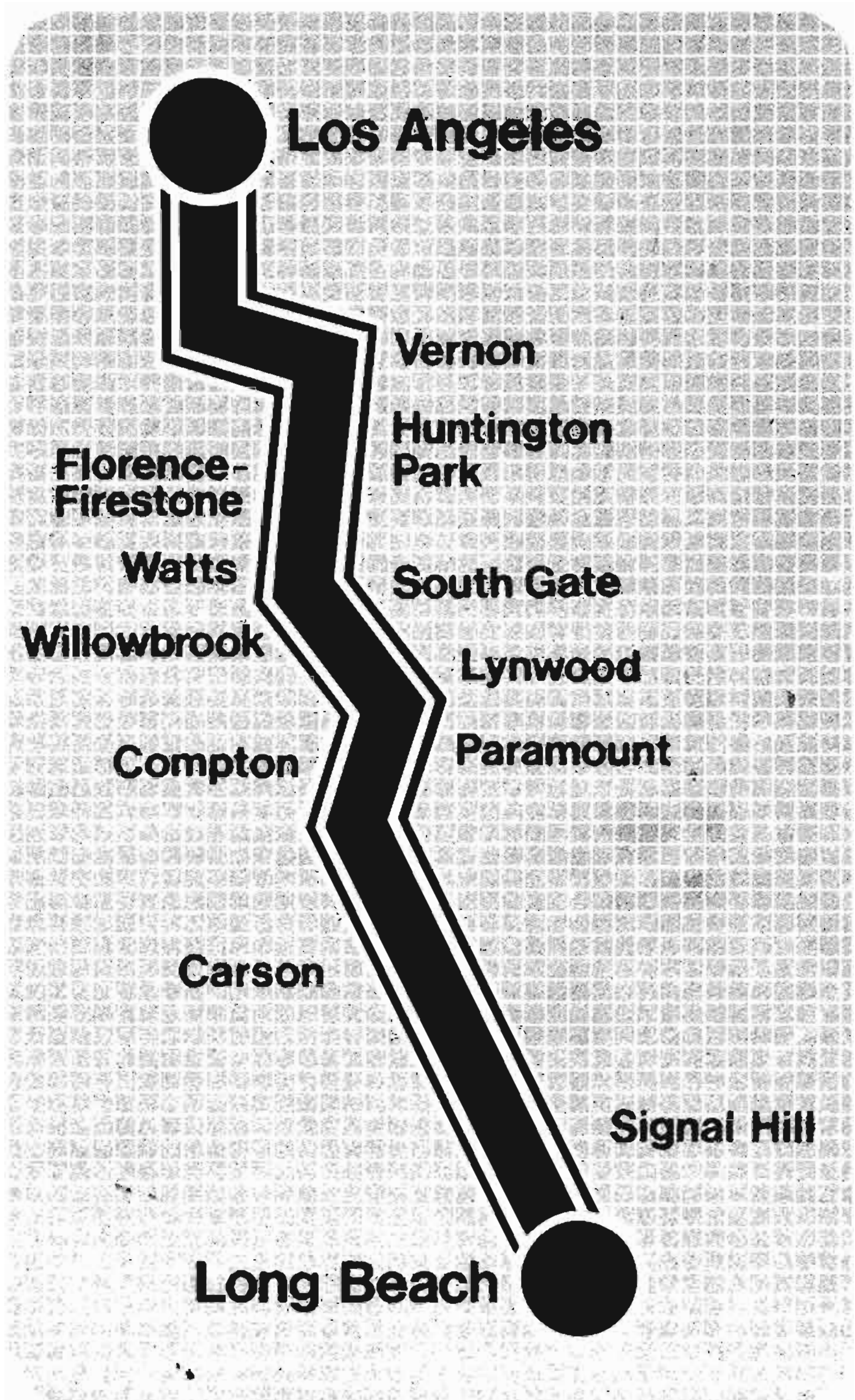
Draft Environmental Impact Report

The Long Beach - Los Angeles Rail Transit Project

May 1984



LACTC

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Draft Environmental Impact Report

(SCH No 83091415)

The Long Beach-Los Angeles Rail Transit Project

May 1984

Parsons Brinckerhoff / Kaiser Engineers
In Association With:

- MYRA L. FRANK & ASSOCIATES
- J. WARREN & ASSOCIATES
- KENNARD DESIGN GROUP
- PACIFIC INTERNATIONAL ENGINEERS
- SEDWAY COOKE ASSOCIATES
- WILLIAMS-KUEBELBECK and ASSOCIATES
- BOLT BERANEK AND NEWMAN, INC.

PARTICIPATING GOVERNMENT AGENCIES

COUNTY OF LOS ANGELES
- Department of Regional Planning
- Road Department
- Engineer - Facilities
- Community Development Commission
- Flood Control District

CITY OF LOS ANGELES
- Department of Transportation
- Planning Department
- Department of Public Works
- Community Redevelopment Agency

CITY OF COMPTON
- Planning Department
- Department of Public Works
- Community Redevelopment Agency

CITY OF LONG BEACH
- Department of Public Works
- Department of Planning and Building
- Department of Community Development
- Long Beach Transit

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
CITY OF CARSON - City Engineer
CALIFORNIA PUBLIC UTILITIES COMMISSION
CALIFORNIA DEPARTMENT OF TRANSPORTATION

IN COOPERATION WITH

SOUTHERN PACIFIC TRANSPORTATION COMPANY
SOUTHERN CALIFORNIA EDISON COMPANY
LOS ANGELES DEPARTMENT OF WATER AND POWER
UNION PACIFIC RAILROAD
ATCHISON, TOPEKA AND SANTA FE RAILWAY

LACTC

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

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May 9, 1984

Interested Persons and Businesses
Community Organizations
Elected Officials
Government Agencies

As a key step in development of the Long Beach-Los Angeles rail transit project, the Los Angeles County Transportation Commission has prepared this Draft Environmental Impact Report for review and comment by all those interested in or affected by the project.

In developing this project, the Commission has received support from hundreds of citizens, their elected representatives and many government agencies. Now, we ask for your review of our environmental assessment of the project and its various route alternatives. Your comments will help with the hard choices we must make among the route alternatives, beginning in July of this year. We must receive all written comments on this DEIR by July 2, 1984. Public hearings have been scheduled for late June in each project area community; call 620-RAIL for information.

This document is lengthy because it has to address a relatively large geographic area and many route alternatives. Use the table of contents to find the information that is important to you.

The Long Beach-Los Angeles rail transit project will substantially improve public transit in the area it serves. In addition, it is designed to link with the SCRTD Metro Rail project to begin the Countywide rail rapid transit system approved by County voters in 1980. I seek your assistance in our efforts.

Sincerely,

Mike D. Antonovich

MICHAEL D. ANTONOVICH
Chairman

MDA:gb

A two-car light rail train approaches Compton Transit Center station (alternative MC-3, railroad relocation)

LONG BEACH - LOS ANGELES RAIL TRANSIT PROJECT
Los Angeles County Transportation Commission

TABLE OF CONTENTS

V REGIONAL IMPACTS OF SYSTEM ALTERNATIVES

VIII OTHER ALTERNATIVES

APPENDICES

LIST OF TABLES

CHAPTER I

Page

CHAPTER II

CHAPTER III

CHAPTER IV

CHAPTER V

CHAPTER VI

CHAPTER VIII

LIST OF FIGURES

CHAPTER I

CHAPTER III

CHAPTER IV

Page

Page

This Draft Environmental Impact Report on the Long Beach-Los Angeles Rail Transit Project consists of the following volumes:

- o Volume I: Summary
- o Volume II: DEIR
- o Volume III: Design Appendix

Chapter

1

I PROJECT DESCRIPTION

I-100 BACKGROUND AND PURPOSE

I-110 PROJECT BACKGROUND

The proposed Long Beach-Los Angeles Rail Transit Project being planned by the Los Angeles County Transportation Commission (LACTC) is part of an ongoing transportation planning process for Los Angeles County. The transportation corridor it will serve and several others in the county have been identified as candidates for transit improvements.

On November 4, 1980 voters in Los Angeles County approved Proposition A. This measure authorized a county-wide, 1/2 percent sales tax to raise money principally for reducing bus transit fares and constructing and operating a rail transit system serving a number of designated corridors, including South-Central Los Angeles and Long Beach. Court challenges to the voter approval of Proposition A were resolved in favor of the measure in May 1982, and collection of the 1/2 percent sales tax began on July 1, 1982.

Following the passage of Proposition A, two planning studies were completed on the feasibility of constructing new transit facilities along the Long Beach-Los Angeles corridor:

- o The Long Beach to Los Angeles Light Rail Transit Feasibility Study (October 1981) prepared by the California Department of Transportation (Caltrans) District 07, Public Transportation Branch; and

- o The Los Angeles-Long Beach Light Rail Project (Preliminary Analysis, February 1982; and Summary Report, February 1982) conducted by Parsons Brinckerhoff Quade & Douglas, Inc. and Kaiser Engineers.

The latter study was undertaken to refine and further develop the Caltrans study, which evaluated transit opportunities in other corridors throughout the county and compared them to the Long Beach-Los Angeles corridor. Also included was an assessment of various forms of rail transit technologies.

The Long Beach-Los Angeles Rail Transit Project was designated by the LACTC on March 24, 1982 as the first locally financed project. The line will connect with the federally-assisted Southern California Rapid Transit District (SCRTD) Metro Rail Project, and together they will be the first projects to be implemented in the thirteen transportation corridors specified by Proposition A. SCRTD will be the operator of both systems when construction is completed.

The Long Beach-Los Angeles Rail Transit Project is being planned as a conventional light rail system extending along a transportation corridor from downtown Los Angeles to downtown Long Beach (see Figure I-11A). For planning purposes, this corridor is divided into three segments, described as the downtown Los Angeles, mid-corridor and Long Beach segments. A number of alternative routes are under consideration within the downtown Los Angeles and Long Beach segments. The proposed line will pass through the cities of Compton and Carson and through the unincorporated areas of Florence-Graham, Willowbrook, and Dominguez Hills in Los Angeles County. The total route will be approximately 22 miles in length, with about 18 miles of it following the existing Southern Pacific Transportation Company (SPTC) right-of-way (Wilmington and East Long Beach Branches). Much of the project route will be essentially the same as the last line operated by the Pacific Electric Railway's "Red Cars," which ceased operation in 1961. Design and service characteristics, however, will be upgraded and modernized to meet today's transit standards and to satisfy both present and anticipated needs.

I-120 GOALS AND OBJECTIVES OF THE PROJECT

I-121 Goals

The fundamental goal of this project, from which all other goals and objectives are derived, can be stated as follows:

- o To provide the citizens in the Long Beach-Los Angeles corridor with the benefits of improved public transportation in a cost-effective, environmentally sensitive, and socially responsible manner.

A second major goal is derived from the Proposition A Ordinance:

- o The system will be constructed as expeditiously as possible.

I-122 Objectives

The following objectives have been articulated by the LACTC in a "Goals and Objectives" statement adopted for the project in February 1983:

- o Low-cost construction.
- o Speed competitive with automobile.
- o Serve area in need of transit improvement (e.g., low auto ownership).
- o Have acceptable environmental impacts and, where possible, enhance the natural and man-made environment with respect to such issues as: energy savings, air quality improvement, noise levels, service to transit dependent, urban form and structure, economic impacts, accessibility of community services, and facilities for the handicapped.

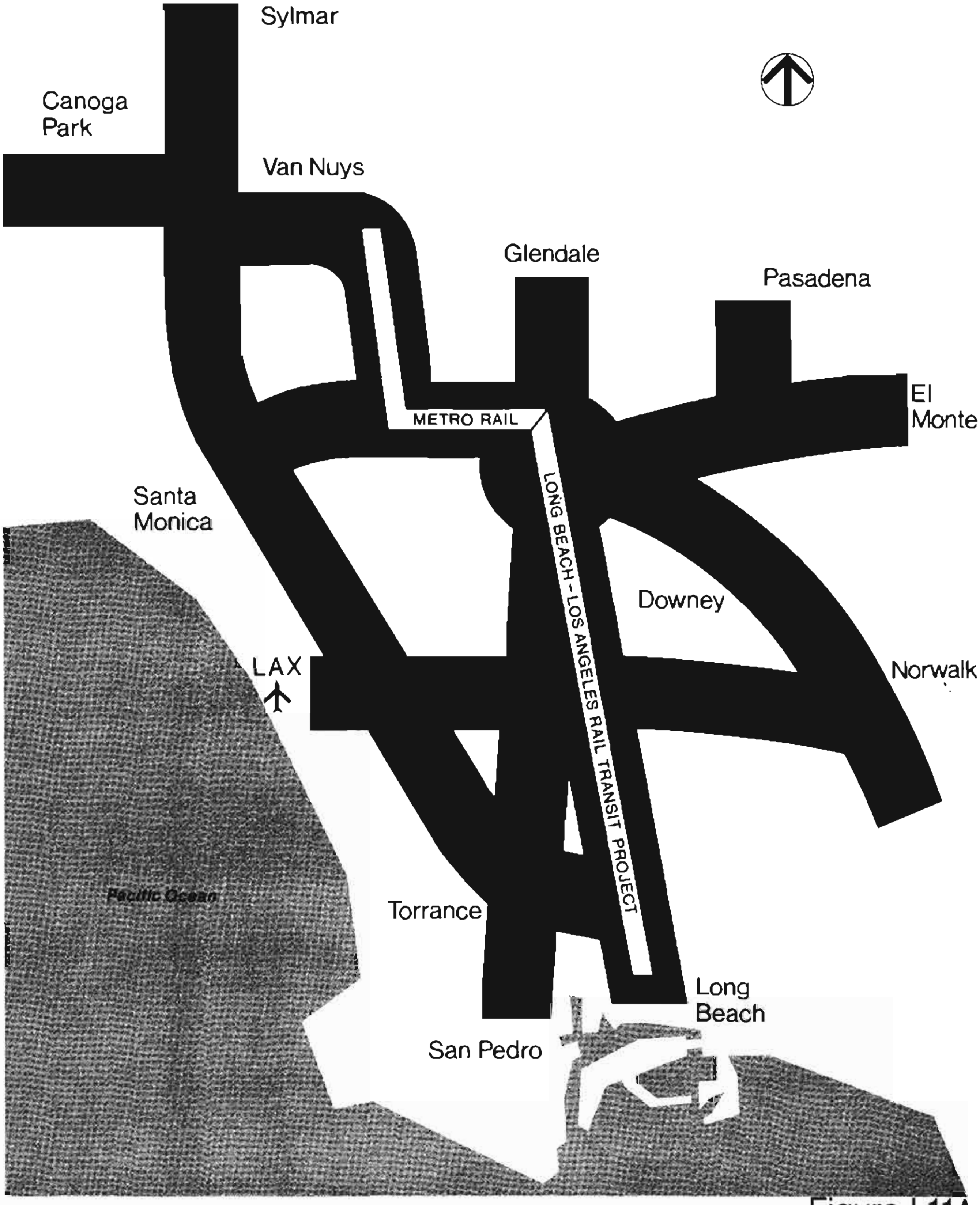


Figure I-11A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PROPOSITION A RAIL TRANSIT CORRIDORS

PARSONS BRINCKERHOFF / KAISER ENGINEERS

- Exhibit patronage potential sufficient for cost-effective operation.
- Emphasize use of existing right-of-way, shared with existing users (railroad, automobiles) wherever feasible.
- Minimum capital and operating cost, consistent with the attainment of other objectives.
- Provide an attractive level of service which equals or exceeds that provided by buses (frequency, speed, comfort, convenience, safety, security, and dependability).
- Proven, reliable, mature technology featuring hardware with minimum developmental requirements.
- Adequate capacity to meet present and anticipated future needs, including those resulting from land use changes which may be associated with transit system impacts.
- Suitable for staged construction (i.e., capable of being expanded and upgraded in the future with respect to coverage area, capacity, and service level).
- Minimal implementation difficulties for an initial segment.
- Compatible with other existing and anticipated transportation system elements.

I-200 DESCRIPTION OF PROPOSED ACTION

I-210 VEHICLE TECHNOLOGY

I-211 General Description of Light Rail Transit

Light rail is often referred to as a modern, more versatile version of the electrically powered trolley car systems that once served many American cities. Like the trolley cars, light rail can run in existing street rights-of-way amid automobile traffic while maintaining ground level traffic crossings. In addition, light rail has the flexibility of adaption to exclusive guideways in railroad rights-of-way, street medians, subways or aerial structures. Light rail vehicles also have a larger carrying capacity and can operate as single cars or in trains. Light rail vehicles are generally four-axle or six-axle, articulated, single- or double-ended vehicles.

I-212 Selection of Light Rail Technology for the Long Beach-Los Angeles Rail Transit Project

As one of the first steps in development of the project, work began on the selection of a transit vehicle for the system early in 1983. State-of-the-art light rail transit vehicles were studied to determine their suitability for this system, using data accumulated from suppliers, operating properties, and published documents. For purposes of comparison, data were also collected on proven automated guideway and heavy rail transit vehicles.

The evaluation results confirmed the choice of conventional light rail vehicle technology for several reasons. First, among the rail vehicle technologies considered, only conventional light rail vehicles can be constructed without the need for full-grade separations or exclusive guideways. Second, the light rail system is compatible with at-grade crossings of existing railroad tracks in the mid-corridor. Third, it would be possible to use the same vehicles while upgrading the guideway with more grade separations in the future, if desired. Finally, the light rail vehicle would be compatible with the tracks and tunnels of the SCRTD's Metro Rail system. If required by the future rail system, it would be possible to operate cars on the Metro Rail tracks to connect with other rail lines.

I-213 Vehicle Description

The light rail vehicles (LRV) would be designed to provide safe and dependable service, easy access, and maximum riding comfort. They would be capable of operating as single cars or in trains, and the maximum train length would allow all doors to open within the length of the station platform. They would be designed for low-platform passenger loading, unless it is possible to develop high-platform stations for the project's alignment alternatives selected for construction. In that case, the LRV's would be designed for high-platform loading. Six-axle articulated vehicles are recommended.

Expected minimum passenger capacity for each six-axle vehicle would be 64 seated passengers and 110 standees, for a total of 174.

Typical LRV dimensions, as contemplated for this project, are presented below (Table 1-21A):

TABLE 1-21A

TYPICAL LIGHT RAIL VEHICLE DIMENSIONS

Length of vehicle (articulated)	-	80' (over couplers)
Width over thresholds	-	106"
Height of floor from top of rail	-	30.6" min - 40" max
Height of roof from top of rail	-	13'8" max (equipment)
Height of ceiling from floor (min)	-	6'8"
Under car clearance (min)	-	2.5" above top of rail

Source: PB/KE, 1983.

Figure 1-21A includes photographs showing LRVs similar to those under consideration for this system. The vehicle body would be constructed of low-alloy, high-strength steel and would be painted to achieve an aesthetically pleasing appearance. Smooth performance and riding characteristics would assure a high level of passenger comfort, acceptable to both standing and seated passengers. The interior would be designed to enhance passenger comfort by providing comfortable seats, air conditioning, adequate lighting, and standee support. The sound level, both on the vehicle and at locations adjacent to the track, would be controlled by use of accepted sound-control techniques and would permit normal conversation aboard the train and normal land use in areas adjacent to the right-of-way.

Propulsion would be by electric motors and power would be collected from an overhead wire by means of a pantograph installed on the vehicle roof. Each vehicle would have at least two independently actuated braking systems, including a service brake system and an emergency brake system.

When running in the street, vehicles would operate under visual control of the operator in the same manner as a bus. On exclusive right-of-way routes, where vehicles would operate at higher speeds

Kawasaki Four Axle Light Rail Vehicle

BN Six Axle Articulated Light Rail Vehicle

Figure I-21A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Typical Light Rail Vehicles
PARSONS BRINCKERHOFF / KAISER ENGINEERS

a wayside signal control system would be provided. Maximum speed would be 55 mph in the mid-corridor and 25 mph on street-running segments.

I-220 ALTERNATIVE ALIGNMENTS

A lengthy screening and review process was conducted in early 1983 in numerous meetings the LACTC held with various agency staffs of Los Angeles County and of the cities of Long Beach, Los Angeles, and Compton. The process involved the application of selection criteria to the more than 25 original alignment alternatives in the three corridor segments, the modification of alignments as problems were identified, and recommendation of final alternatives to governing bodies for approval. A total of 10 of the most feasible and attractive alignment alternative routings in the three segments were recommended and approved for further study: 3 in downtown Los Angeles, 3 in the Compton area of the mid-corridor segment, and 4 in Long Beach. (The PB/KE Working Paper 7.4, "Prepare Preliminary Way and Structure Alternatives and Analyze Alignment," details the alternatives analysis process.) Descriptions of the alternatives recommended (with maps showing the routes in each corridor segment) are presented in the following sections. Detailed profiles are shown in the Design Appendix.

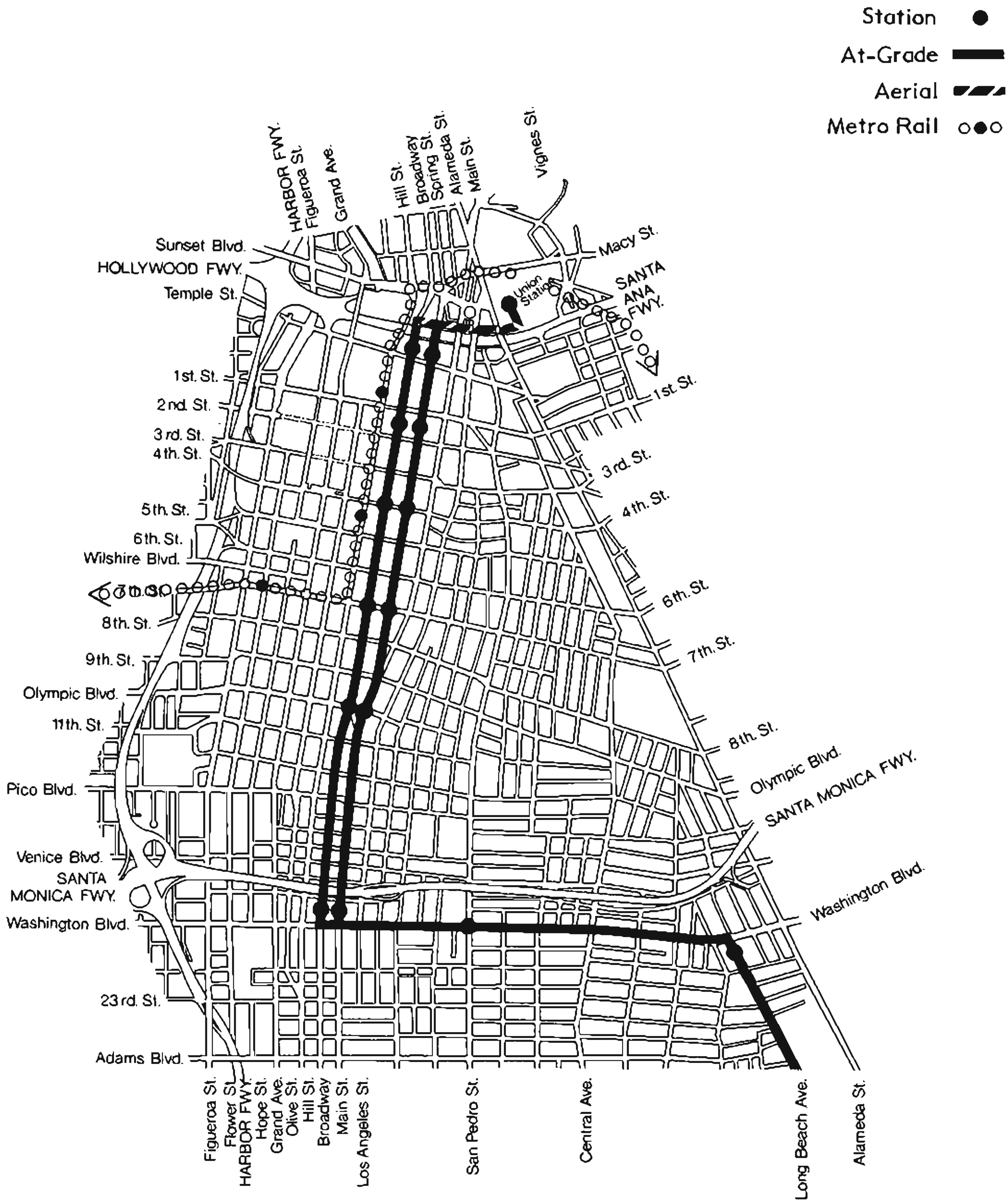
I-221 Downtown Los Angeles

The downtown Los Angeles alternatives were considered by the Los Angeles County Transportation Commission (LACTC) on May 25, 1983. In that meeting the commission adopted three alternatives for further study. These alternatives are shown in Figures I-22A to I-22C.

Descriptions of the three Los Angeles alignments are as follows:

- Alternative LA-1 (Broadway/Spring Couplet, At-Grade): From the east side of Union Station, double tracks on an aerial structure would proceed westerly, parallel to and above the Hollywood Freeway (Route 101). After crossing Alameda Street, the double tracks would separate and become at-grade at Spring Street. At that point, an at-grade, one-way track couplet would be created by a northbound track in Main and Spring Streets and a southbound track in Broadway. At Washington Boulevard the tracks would rejoin to form double tracks and proceed easterly at-grade in a median in Washington Boulevard to the SPTC right-of-way at Long Beach Avenue.

- Alternative LA-2 (Flower Street Subway): This alternative would begin as a double subway track at the proposed Metro Rail station at Seventh and Flower Streets. After proceeding southerly under Flower Street, the tracks would emerge from a portal located between 11th and 12th Streets. From the portal the double tracks would continue southerly, at-grade, in a reserved median in Flower Street. At Washington Boulevard the



LA-1

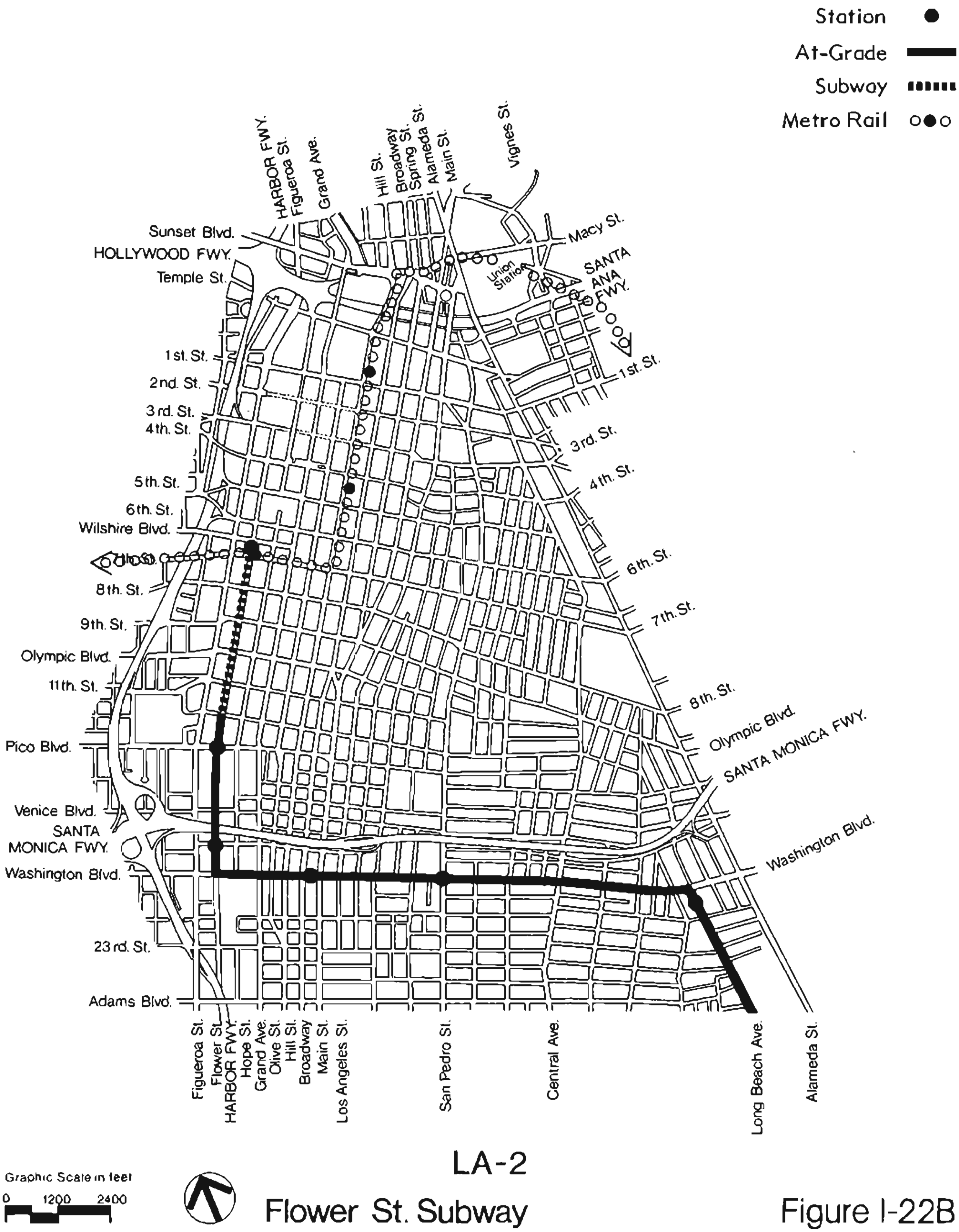
Graphic Scale in feet
0 1200 2400

Broadway / Spring At Grade

Figure I-22A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS



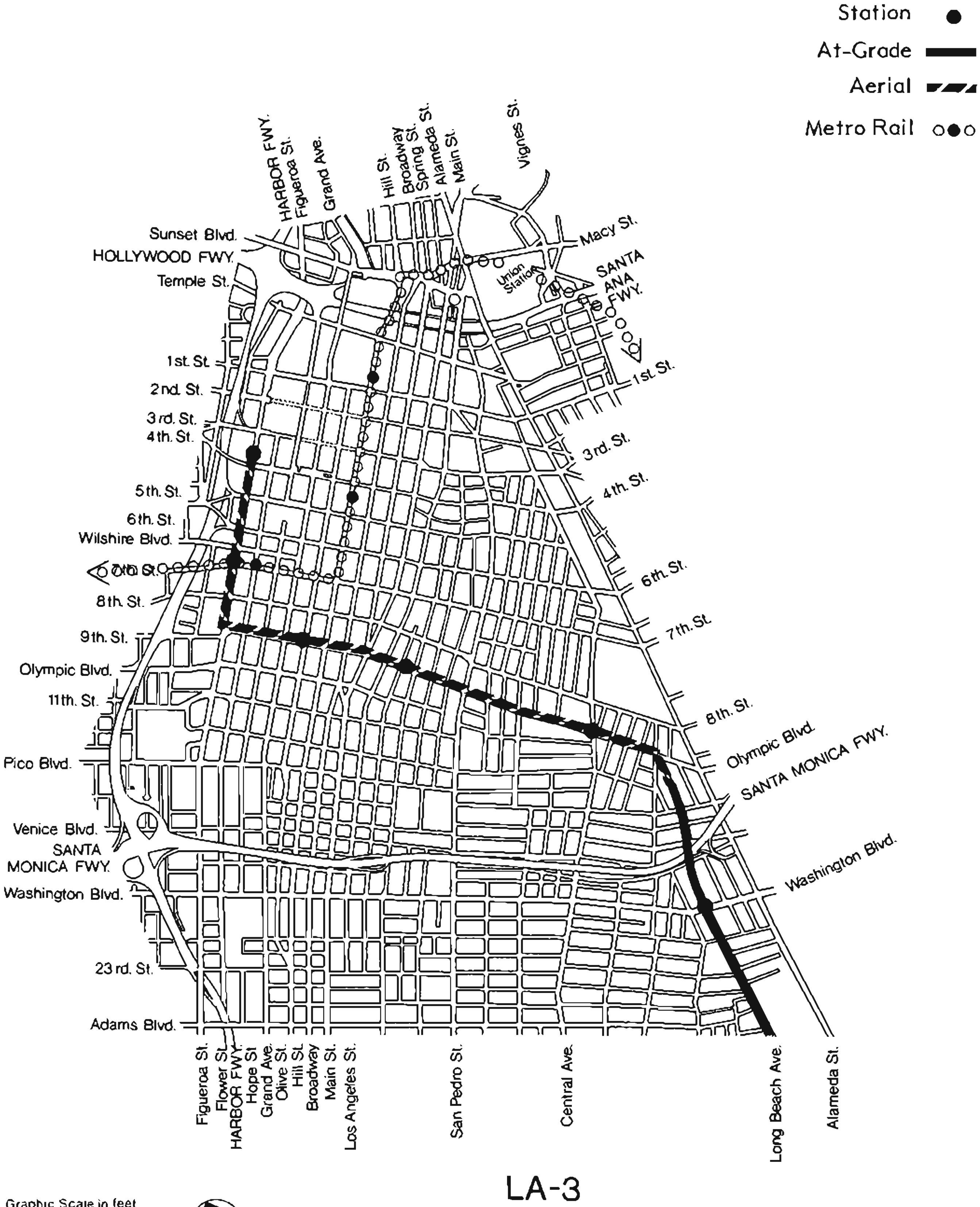
LA-2

Flower St. Subway

Figure I-22B

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS



LA-3

Olympic / Ninth Aerial

Figure I-22C

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS

double tracks would proceed, as in LA-1, to the SPTC right-of-way at Long Beach Avenue.

- <u>Alternative LA-3 (Olympic/9th Aerial)</u>: From a terminal station south of 3rd Street, double tracks on an aerial guideway would proceed southerly along the median of Figueroa Street. At 9th Street, the tracks would turn east and continue above the north curb lane of the one-way traffic roadway. At Santee Street, the aerial line would revert back to follow the median in Olympic Boulevard, which is a two-way street. At Long Beach Avenue and Olympic Boulevard, the tracks would join the SPTC right-of-way and become at-grade. Continuing at-grade in the SPTC right-of-way, the tracks would pass under the Santa Monica Freeway and join the mid-corridor section of the alignment at the intersection of Long Beach Avenue and Washington Boulevard.

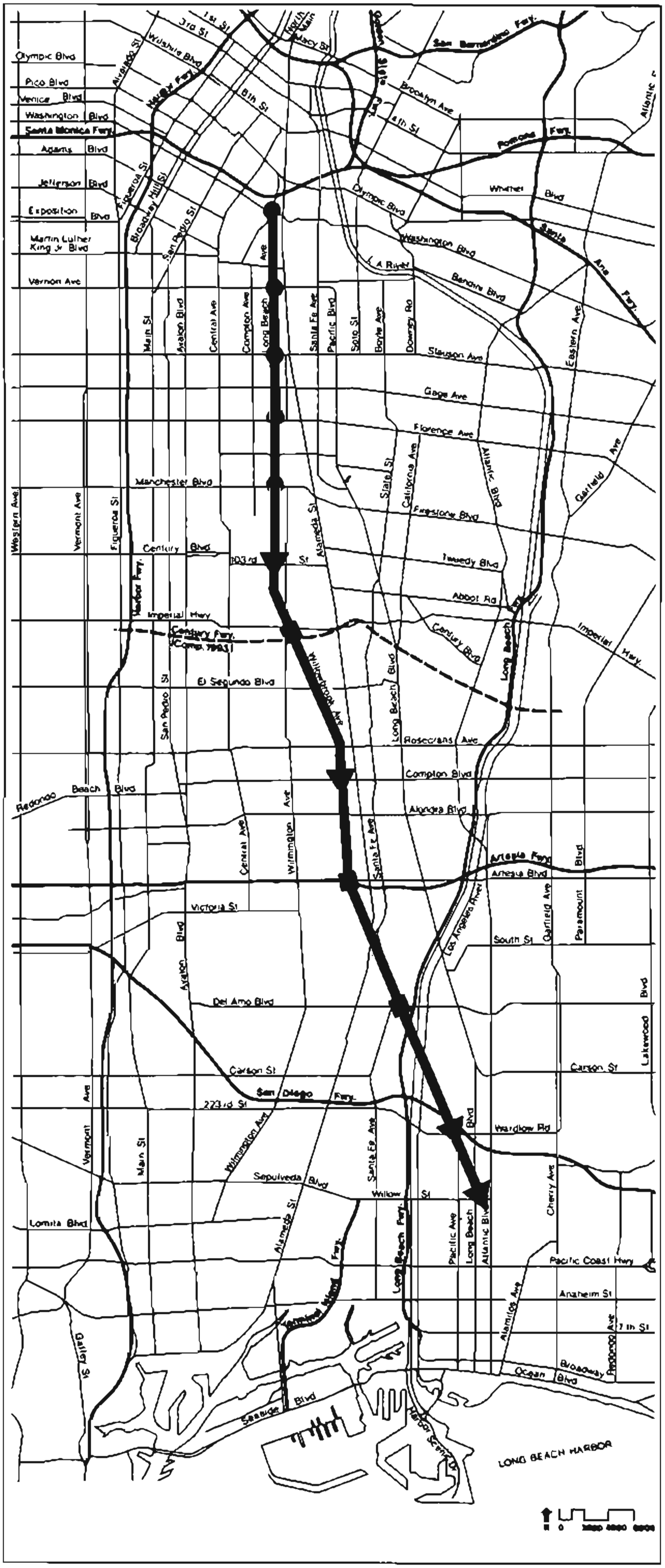
1-222 <u>Mid-Corridor</u>

At the same meeting in which downtown Los Angeles alternatives were adopted (May 25, 1983), the LACTC reviewed mid-corridor options and selected two alternatives (MC-1 and MC-2) for further study. A third alternative (MC-3) was added on September 14, 1983. The differences among these alternatives are limited to the Compton area between Watts and Dominguez Junctions. North and south of these points, only one alignment is under consideration. All three alternatives would require grade separations with principal railroad lines at Slauson and Dominguez Junctions and at Cota Crossing. Also required would be the construction of a Compton Creek rail transit bridge. Descriptions of the three mid-corridor alternatives are as follows:

- <u>Alternative MC-1 (Compton At-Grade)</u>: This "baseline" alternative would provide for an at-grade, double-track rail transit configuration adjacent to and sharing the right-of-way with the SPTC rail freight operations.

- <u>Alternative MC-2 (Compton Grade Separation)</u>: Rail transit and rail freight tracks would be grade separated (depressed) throughout the central Compton area.

- <u>Alternative MC-3 (SPTC Railroad Relocation)</u>: SPTC rail freight operations would be rerouted from the Wilmington Branch at Watts Junction to the San Pedro Branch (along Alameda Street) via the West Santa Ana Branch. The railroad's Wilmington Branch operations would follow the San Pedro Branch to Dominguez Junction. Thus, from Watts Junction to Dominguez Junction, the rail transit system would operate at-grade in an exclusive right-of-way. Also, a fourth grade separation would be built at Watts Junction to allow passage of the rerouted Wilmington Branch rail freight traffic under the rail transit tracks.



Station ●

Station with Park and Ride ■

Station with Neighborhood Park and Ride ▼

Figure I-22D

Mid-Corridor Alignment

Long Beach-Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

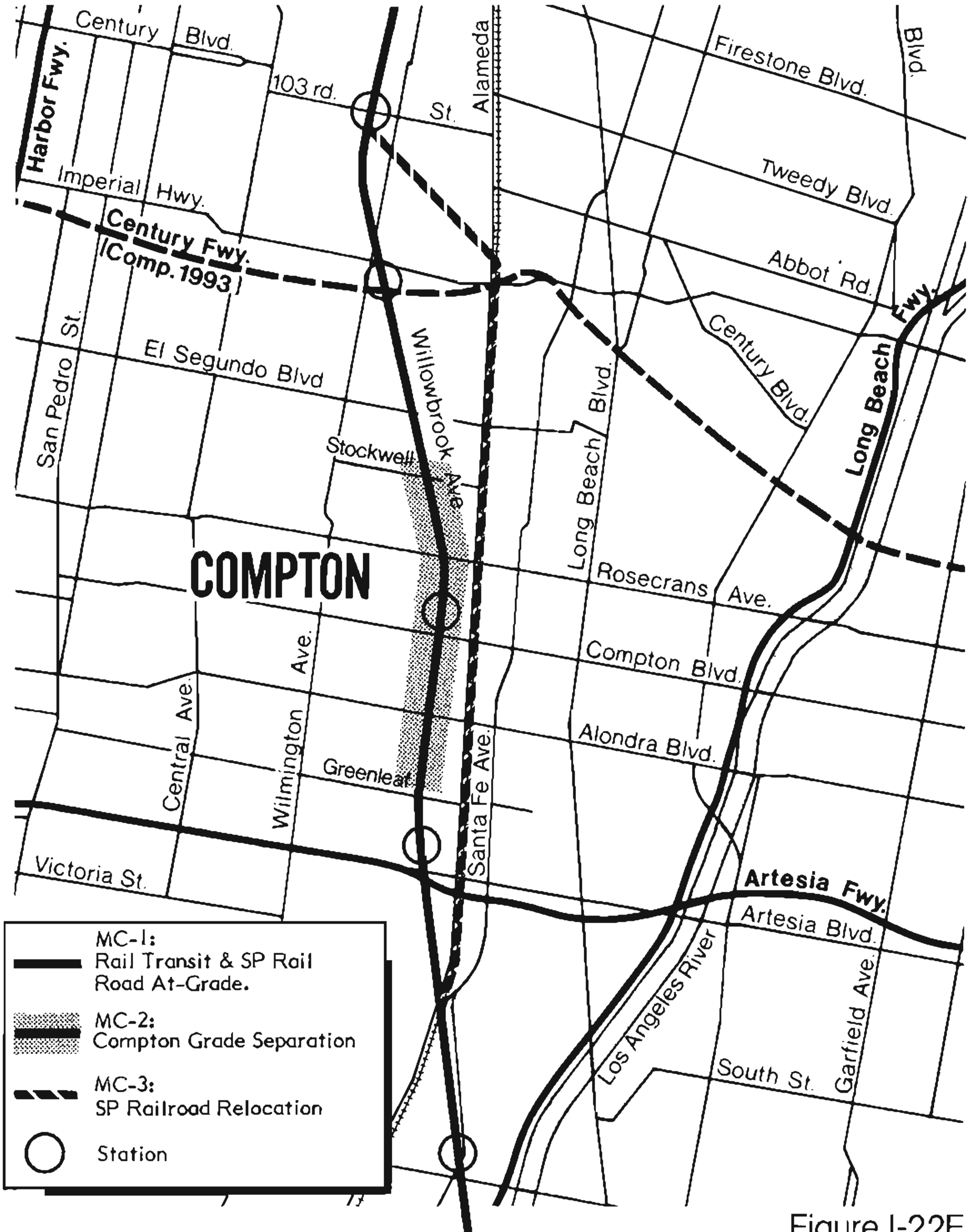


Figure I-22E

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Mid-Corridor Alignment Alternatives

PARSONS BRINCKERHOFF / KAISER ENGINEERS

The full mid-corridor alignment is shown in Figure I-22D. The three mid-corridor alternatives for the Compton area are shown in Figure I-22E.

I-223 Long Beach

Hearings by the Long Beach City Council on the alternatives for Long Beach led to the adoption on April 26, 1983 of four alternatives. Brief descriptions of these alternatives are as follows:

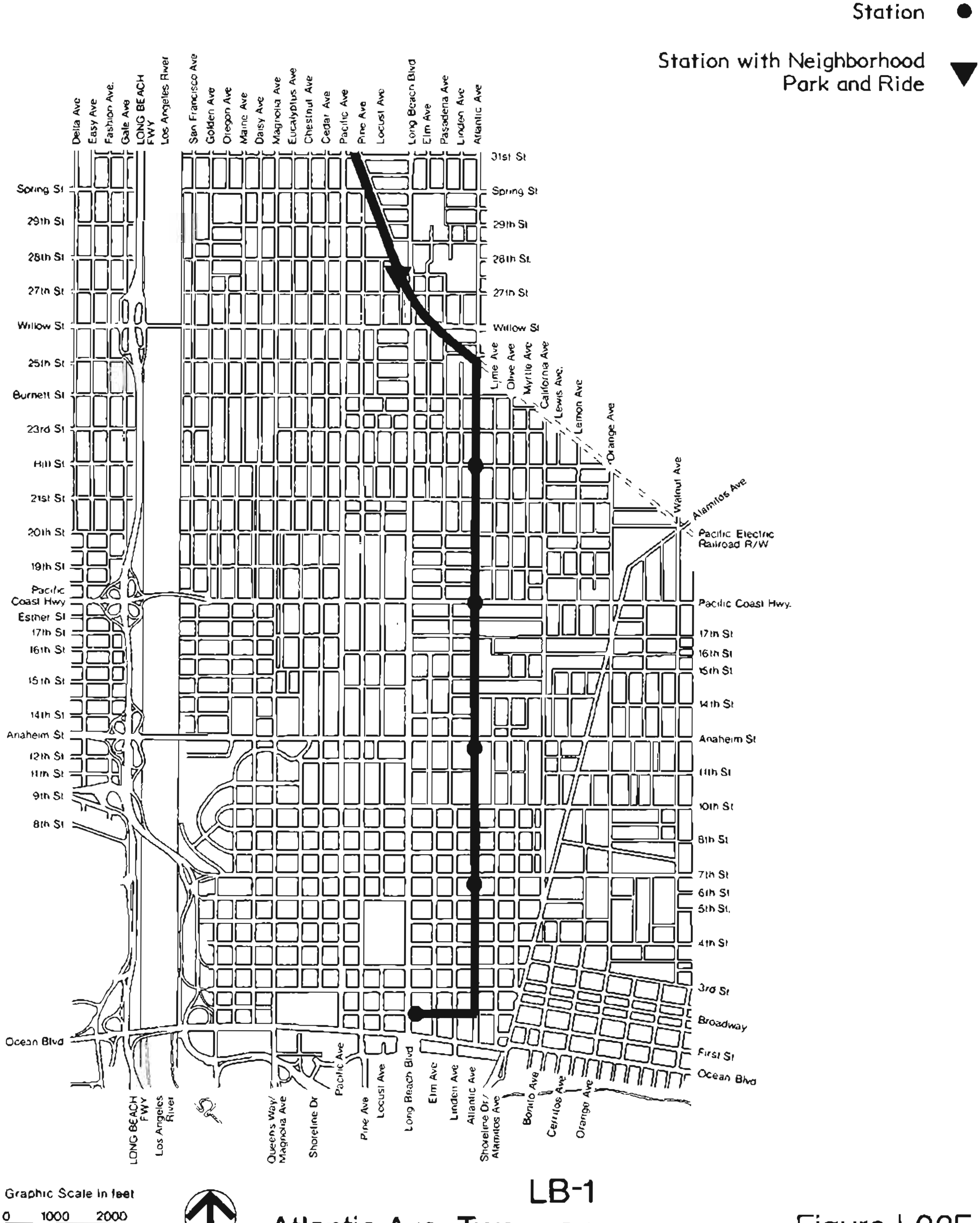
- Alternative LB-1 (Atlantic Avenue Two-Way): This alternative would provide two tracks at-grade on Atlantic Avenue to 1st Street, where the tracks would turn west and terminate at Long Beach Boulevard. The terminus would be a stub-end station with a tail track. Along Atlantic Avenue north of Anaheim Street, the rail system would run either in a reserved median or in mixed traffic. South of Anaheim Street the system would operate in mixed traffic in the second travel lane (see Figure I-22F).

- Alternative LB-2 (Atlantic/Long Beach Couplet): Beginning at the SPTC railroad right-of-way near Willow Street, a one-way, at-grade couplet would be created by a track southbound on Long Beach Boulevard, eastbound on 1st Street, and northbound on Atlantic Avenue, returning to the SPTC right-of-way (see Figure I-22G).

- Alternative LB-3 (Los Angeles River Route): This alternative would be located just outside the levee on the east side of the Los Angeles River. The alignment would proceed from the existing SPTC bridge crossing the river on retained embankment to 7th Street, along the Long Beach Freeway right-of-way, at-grade, to 4th Street, eastbound on 4th, south on Pacific Avenue to 1st Street, and then east to a terminal station near Pacific with tail tracks extending to Elm Avenue (see Figure I-22H).

- Alternative LB-4 (Atlantic with Pacific Avenue Loop). This alternative would provide two tracks on Atlantic Avenue from the SPTC right-of-way near Willow Street to 9th Street. There the southbound track would swing west to Long Beach Boulevard, south to 1st Street, west to Pacific Avenue, north to 8th Street, east back to Atlantic Avenue, and finally north to the SPTC right-of-way (see Figure I-22I). The Atlantic Avenue portion of this alternative would be similar to alternative LB-1 in that the two tracks would be in either a reserved median or in mixed traffic on Atlantic Avenue from Anaheim Street to the SPTC right-of-way near Willow Street. South of Anaheim Street the system would run in mixed traffic.

In an attempt to minimize property acquisitions while maintaining efficient rail transit operations, the following three alignment options

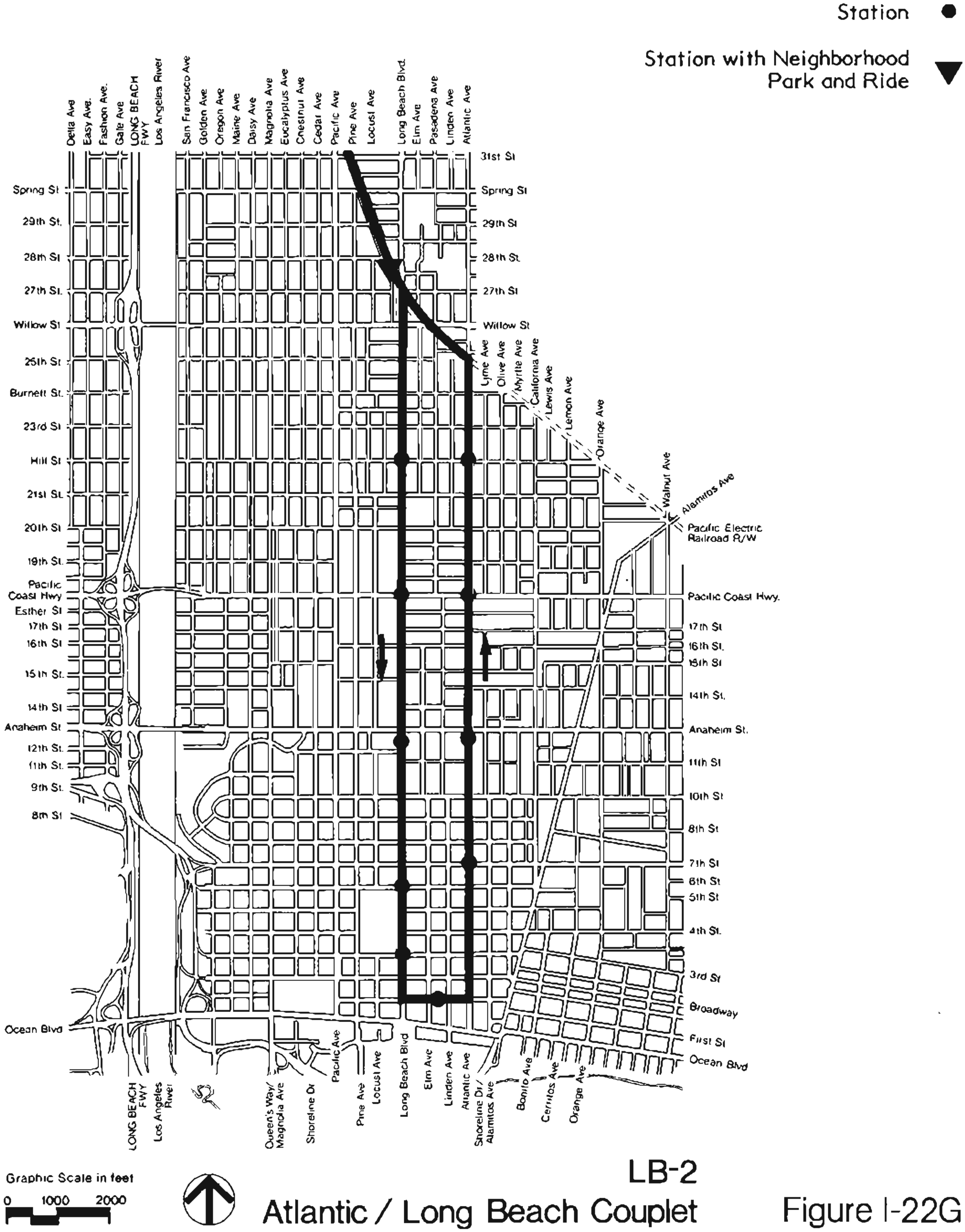


LB-1
Atlantic Ave. Two-way

Figure I-22F

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach Alignment Alternatives
PARSONS BRINCKERHOFF/KAISER ENGINEERS

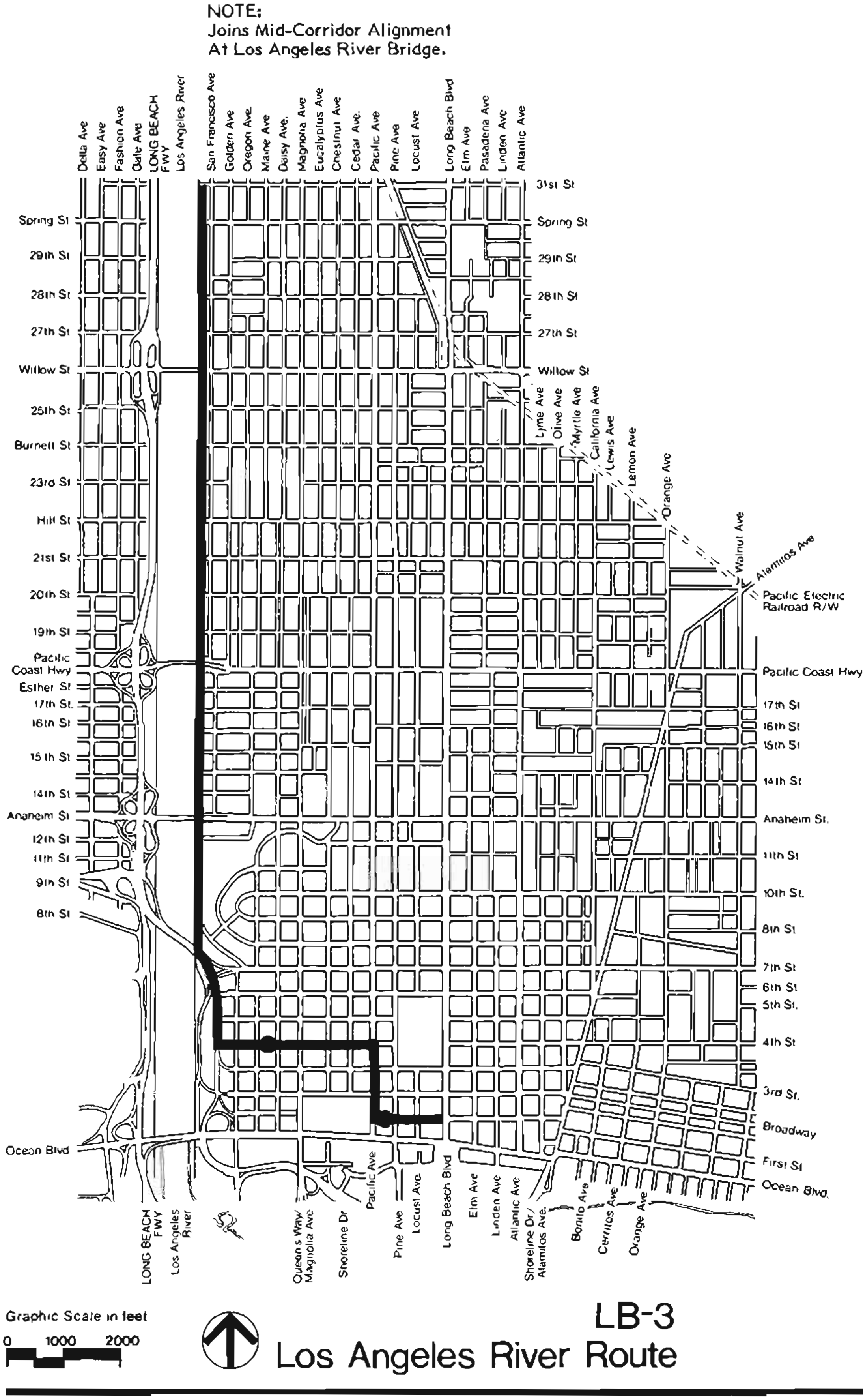


LB-2
Atlantic / Long Beach Couplet

Figure I-22G

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS



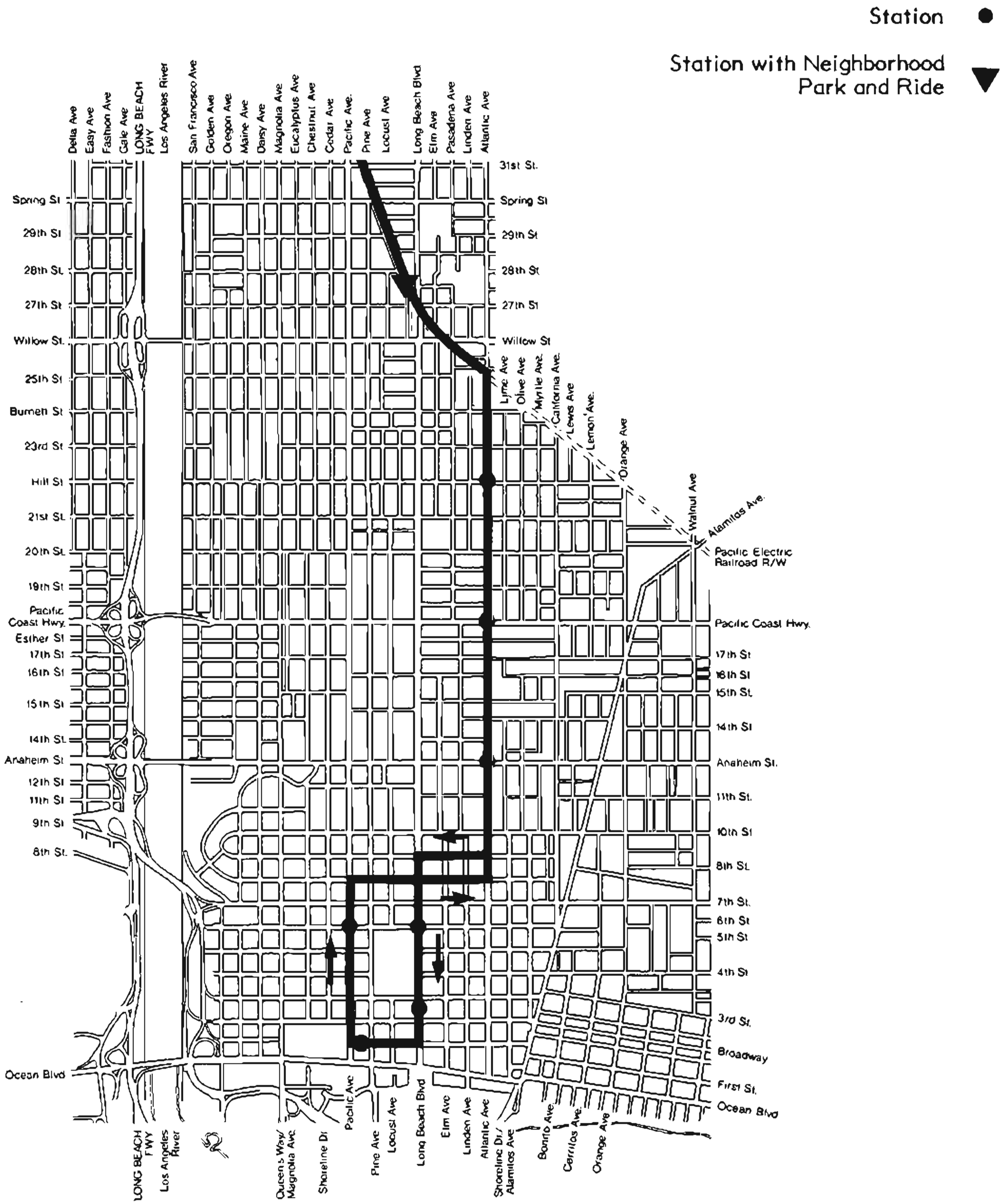
LB-3

Los Angeles River Route

Figure I-22H

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach
Alignment Alternatives
PARSONS BRINCKERHOFF/KAISER ENGINEERS



LB-4

Atlantic with Pacific Ave. Loop

Figure I-22I

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach Alignment Alternatives

PARSONS BRINCKERHOFF / KAISER ENGINEERS

are under investigation for the portions of alternatives LB-1 and LB-4 along Atlantic Avenue north of Anaheim Street.

- o Option A: Rail transit tracks in reserved median with on-street parking generally maintained.
- o Option B: Rail transit tracks in reserved median with on-street parking generally eliminated.
- o Option C: Rail transit tracks generally in mixed traffic but in reserved median in vicinity of stations. On-street parking would be maintained except in the vicinity of stations.

I-224 Baseline System Alternative

A baseline system alternative has been defined for the purposes of comparing and evaluating the performance, cost, and impact characteristics of each of the alternative rail transit systems. The baseline system alternative includes the following at-grade alternatives (Table I-22A):

TABLE I-22A

BASELINE SYSTEM

Number	Name	Location
LA-1	Broadway/Spring Couplet, At-Grade	Downtown Los Angeles
MC-1	Compton At-Grade	Mid-Corridor
LB-4	Atlantic with Pacific Avenue Loop, At-Grade	Long Beach

Source: Los Angeles County Transportation Commission, 1983.

I-230 SYSTEM ALTERNATIVES

Although a baseline system has been identified, the final system will be selected from the 36 possible system alternatives comprised of downtown Los Angeles, mid-corridor, and Long Beach alternatives. These system alternatives and their individual characteristics are summarized in Table I-23A.

TABLE 1-23A

CHARACTERISTICS OF SYSTEM ALTERNATIVES

		Distance (Miles)		End-to-End Travel Time* (Minutes)		Number of Stations	Number of Miles Grade Separated		Number of Grade Separated Crossings
		South Bound	North Bound	South Bound	North Bound		Aerial	Subway	
1)	LA-1, MC-1, LB-4	22.7	22.6	68	67	32	1.5	0	3
2)	LA-1, MC-2, LB-4	22.7	22.6	-	-	32	1.5	1.0	8
3)	LA-1, MC-3, LB-4	22.7	22.6	-	-	32	2.0	0	4
4)	LA-1, MC-1, LB-3	22.3	22.2			24	1.5	0	3
5)	LA-1, MC-2, LB-3	22.3	22.2	-	-	24	1.5	1.0	8
6)	LA-1, MC-3, LB-3	22.3	22.2	-	-	24	2.0	0	4
7)	LA-1, MC-1, LB-2	22.4	22.6	-	-	36	1.5	0	3
8)	LA-1, MC-2, LB-2	22.4	22.6	-	-	36	1.5	1.0	8
9)	LA-1, MC-3, LB-2	22.4	22.6	-	-	36	2.0	0	4
10)	LA-1, MC-1, LB-1	22.7	22.8			30	1.5	0	3
11)	LA-1, MC-2, LB-1	22.7	22.8	-	-	30	1.5	1.0	8
12)	LA-1, MC-3, LB-1	22.7	22.8	-	-	30	2.0	0	4
13)	LA-2, MC-1, LB-4	21.6	21.7	57	57	24	1.5	.7	3
14)	LA-2, MC-2, LB-4	21.6	21.7	-	-	24	1.5	1.7	8
15)	LA-2, MC-3, LB-4	21.6	21.7	-	-	24	2.0	.7	4
16)	LA-2, MC-1, LB-3	21.2	21.2			17	1.5	.7	3
17)	LA-2, MC-2, LB-3	21.2	21.2	-	-	17	1.5	1.7	8
18)	LA-2, MC-3, LB-3	21.2	21.2	-	-	17	2.0	.7	4
19)	LA-2, MC-1, LB-2	21.5	21.7	-	-	27	1.5	.7	3
20)	LA-2, MC-2, LB-2	21.5	21.7	-	-	27	1.5	1.7	8
21)	LA-2, MC-3, LB-2	21.5	21.7	-	-	27	2.0	.7	4
22)	LA-2, MC-1, LB-1	21.8	21.9			22	1.5	.7	3
23)	LA-2, MC-2, LB-1	21.8	21.9	-	-	22	1.5	1.7	8
24)	LA-2, MC-3, LB-1	21.8	21.9	-	-	22	2.0	.7	4
25)	LA-3, MC-1, LB-4	21.5	21.5	49	48	23	4.2	0	3
26)	LA-3, MC-2, LB-4	21.5	21.5	-	-	23	4.2	1.0	8
27)	LA-3, MC-3, LB-4	21.5	21.5	-	-	23	4.6	0	4
28)	LA-3, MC-1, LB-3	21.1	21.1	42	42	18	4.2	0	3
29)	LA-3, MC-2, LB-3	21.1	21.1	-	-	18	4.2	1.0	8
30)	LA-3, MC-3, LB-3	21.1	21.1	-	-	18	4.6	0	4
31)	LA-3, MC-1, LB-2	21.2	21.4	-	-	26	4.2	0	3
32)	LA-3, MC-2, LB-2	21.2	21.4	-	-	26	4.2	1.0	8
33)	LA-3, MC-3, LB-2	21.2	21.4	-	-	26	4.6	0	4
34)	LA-3, MC-1, LB-1	21.5	21.6			20	4.2	0	3
35)	LA-3, MC-2, LB-1	21.5	21.6	-	-	20	4.2	1.0	8
36)	LA-3, MC-3, LB-1	21.5	21.6	-	-	20	4.6	0	4

* These are end-to-end travel times used in patronage modeling; figures include 20-second station dwell times.

Source: PB/KE, 1983.

To estimate year 2000 ridership, patronage modeling was conducted by the Southern California Association of Governments (SCAG). In this effort SCAG used the Los Angeles Regional Transportation System (LARTS) model in conjunction with system and service characteristics provided by LACTC and a background transit network based on SCAG's Regional Transportation Plan (RTP).

Due to the costliness and duplication involved in generating forecasts for all possible system alternatives, a representative sample of four system alternatives was selected for modeling. The selection of these alternatives was based on a need to analyze patronage associated with various cost and environmental scenarios as well as to cover the full range of possible ridership estimates.

For all four system alternatives chosen for modeling, the full RTP was used as a background transit network. The RTP assumes that a number of major transit projects proposed for the Los Angeles metropolitan region will be completed by the year 2000. Those RTP projects which would affect ridership on the Long Beach-Los Angeles rail transit system are described as follows (and are shown on Figure I-80A):

- o Century Freeway (I-105) from Sepulveda Boulevard to the San Gabriel River Freeway (I-605) with a bus/high occupancy vehicle (HOV) lane in the center median.
- o Artesia Freeway (Route 91) extension to the Harbor Freeway (I-110).
- o A Santa Ana Freeway (I-5) transitway from Newport Avenue (Tustin) to Esperanza Street (1 mile south of the Santa Monica Freeway, I-10).
- o A Harbor Freeway (I-110) transitway from Washington Boulevard to Artesia Boulevard.

In order to evaluate the extent to which project patronage would be affected by implementation of less than the full RTP, the baseline system alternative was modeled with a modified RTP which does not include the Harbor or Santa Ana transitways. The results of this analysis indicate that the system should be able to accommodate any additional ridership attributable to the absence of the two transitways.

The four project system alternatives selected for modeling are listed below.

- o Broadway/Spring Couplet, At-Grade, and Atlantic with Pacific Avenue Loop (LA-1, MC-1, LB-4) -- Baseline

- o Flower Street Subway and Atlantic with Pacific Avenue Loop (LA-2, MC-1, LB-4)

- o Olympic/9th Aerial and Atlantic with Pacific Avenue Loop (LA-3, MC-1, LB-4)

- o Olympic/9th Aerial and Los Angeles River Route (LA-3, MC-1, LB-3)

MC-1 is used for every system alternative as no appreciable difference in patronage is expected among the mid-corridor alternatives.

Due to the wide variation among downtown Los Angeles alignment alternatives in terms of areas served and construction methods employed, system-wide ridership would be more sensitive to alignment selection than in the other corridor segments. For this reason, it was decided to model all downtown Los Angeles alignment alternatives.

Because the LARTS model lacks the sensitivity to distinguish among central Long Beach alignment alternatives LB-1, LB-2, and LB-4, only the alignment included in the baseline system alternative (LB-4) was modeled. The Los Angeles River route (LB-3) was modeled separately, however, because its service area differs significantly from the other Long Beach alternatives. No significant differences in patronage are expected among alternatives LB-1, LB-2 and LB-4.

Table 1-24A summarizes the daily total and daily home-to-work boardings for the four modeled system alternatives. Also included in this table are corridor and countywide mode splits for comparison purposes. Tables 1-24B and 1-24C show stations ons and offs for the alternatives. The numbers contained in these tables should be used with caution. All models are limited in their ability to portray human behavior on a large scale. Therefore, these ridership estimates should not be taken as absolute values but should be used for order of magnitude comparisons between alternatives and as a general indication of project corridor travel patterns.

1-250 STATIONS

Using a process similar to that employed for identifying and evaluating alignment alternatives, staff of the LACTC, of Los Angeles County, and of the cities of Los Angeles, Long Beach, and Compton identified candidate station locations for each of the alternative alignments. Prior studies and a review of former Pacific Electric stops were the initial points of departure for this work. Potential station locations were then evaluated using such criteria as system operating speed, proximity to traffic generators, passenger security and safety, ridership potential, availability of land, development impact potential, and relative cost, among others. Selecting station locations required striking a balance between the competing objectives of providing frequent stops for passenger convenience and the need to achieve a relatively high operating speed to attract riders. The resultant

TABLE I-24A

MODAL SPLIT AND RIDERSHIP OF REPRESENTATIVE SYSTEM ALTERNATIVES*

Trip Type	1980 Base Year	Year 2000 w/o Project	LA-1/MC-1/LB-4	LA-2/MC-1/LB-4	LA-3/MC-1/LB-4	LA-3/MC-1/LB-3
Project Boardings						
Home-Work Trips	-	-	29,401	29,539	41,204	38,040
All Other Trips	-	-	25,045	25,163	35,099	32,404
TOTAL DAILY	-	-	54,446	54,702	76,303	70,444
Corridor Mode Split (Home-Work Trips)						
Via Transit	53,200	78,778	80,334	80,163	80,564	80,128
Auto Drivers	250,824	271,318	270,157	270,321	269,930	270,314
Auto Passengers	49,845	61,414	61,019	61,026	61,016	61,068
Total Trips	353,869	411,510	411,510	411,510	411,510	411,510
Countywide Mode Split (Home-Work Trips)						
Via Transit	394,478	645,581	648,436	647,034	648,059	647,188
Auto Drivers	3,709,710	4,132,554	4,130,430	4,131,579	4,130,641	4,131,430
Auto Passengers	496,901	644,092	643,361	643,614	643,527	643,609
TOTAL TRIPS	4,601,089	5,422,227	5,422,227	5,422,227	5,422,227	5,422,227

* All modeled project alternatives are representative of using any mid-corridor alternative and any of the Long Beach alternatives LB-1, LB-2, and LB-4, except as noted, with respect to patronage.

Source: Southern California Association of Governments, 1983.

TABLE I-24B

PASSENGER LOADINGS BY STATION

SYSTEM ALTERNATIVES[1]

(LA-1/MC-1/LB-4) Baseline

Station	Total Daily Boardings
Union Station	82
Temple Street[2]	389
1st/2nd Streets[2]	537
4th Street[2]	170
7th Street[2]	2,866
Olympic Boulevard[2]	1,663
18th Street[2]	1,998
San Pedro Street	1,159
Washington Boulevard	1,540
Vernon Avenue	3,806
Slauson Avenue	1,779
Florence Avenue	2,334
Firestone Boulevard	2,778
103rd Street	676
Imperial Highway	8,429
Compton Boulevard	2,329
Artesia Boulevard	2,740
Del Amo Boulevard	3,674
Wardlow Road	3,254
Willow Street	1,358
Hill Street	668
Pacific Coast Highway	3,296
Anaheim Street	1,911
6th Street[2]	1,856
3rd Street[3]	0
1st Street	3,154
TOTAL	54,446

LA-2/MC-1/LB-4

Station	Total Daily Boardings
7th Street	3,959
Pico Boulevard	412
18th Street	937
Broadway	2,396
San Pedro Street	3,148
Washington Boulevard	1,583
Vernon Avenue	3,181
Slauson Avenue	1,752
Florence Avenue	2,420
Firestone Boulevard	2,531
103rd Street	646
Imperial Highway	8,207
Compton Boulevard	2,272
Artesia Boulevard	2,687
Del Amo Boulevard	3,582
Wardlow Road	3,173
Willow Street	1,289
Hill Street	655
Pacific Coast Highway	3,176
Anaheim Street	1,862
6th Street[2]	1,809
3rd Street[3]	0
1st Street	3,025
TOTAL	54,702

[1] System alternatives are representative of using any mid-corridor alternative and any of the Long Beach alternatives LB-1, LB-2, and LB-4, except as noted, with respect to patronage.

[2] Includes combined boardings of both the northbound and southbound stations of couplet or loop.

[3] Proximity of this station to nearby terminal station does not permit data isolation from LARTS model.

Source: Southern California Association of Governments, 1983.

TABLE I-24C

PASSENGER LOADINGS BY STATION

SYSTEM ALTERNATIVES[1]

LA-3/MC-1/LB-4

Station	Total Daily Boardings
4th Street	2,381
7th Street	6,681
Olive Street	5,280
Maple Avenue	4,939
Central Avenue	3,867
103rd Street	954
Imperial Highway	9,417
Compton Boulevard	2,676
Artesia Boulevard	3,724
Del Amo Boulevard	3,877
Wardlow Road	3,413
Willow Street	1,362
Hill Street	663
Pacific Coast Highway	3,560
Anaheim Street	1,939
6th Street[2]	1,882
3rd Street[3]	0
1st Street	3,209
TOTAL	76,303

LA-3/MC-1/LB-3

Station	Total Boardings
4th Street	2,379
7th Street	6,544
Olive Street	5,187
Maple Avenue	4,861
Central Avenue	3,809
Washington Boulevard	1,515
Vernon Avenue	3,903
Slauson Avenue	2,347
Florence Avenue	4,724
Firestone Boulevard	3,810
103rd Street	952
Imperial Highway	9,029
Compton Boulevard	2,505
Artesia Boulevard	3,734
Del Amo Boulevard	3,819
Daisy Avenue	5,652
1st Street	5,674
TOTAL	70,444

[1] System alternatives are representative of using any mid-corridor alternative and any of the Long Beach alternatives LB-1, LB-2, and LB-4, except as noted, with respect to patronage.

[2] Combines boardings of both the northbound and southbound stations of loop.

[3] Proximity of this station to terminal station does not permit data isolation from LARTS model.

Source: Southern California Association of Governments, 1983.

station locations selected for each of the alignments under consideration are described below.

I-251 Downtown Los Angeles

Table I-25A lists the proposed stations for each downtown Los Angeles alignment alternative, and lists the physical characteristics of each station. The locations of the downtown Los Angeles stations are shown in Figure I-22A for LA-1, Figure I-22B for LA-2, and Figure I-22C for LA-3.

With the at-grade alternative (LA-1) the stations along Broadway would be designed as extensions of the sidewalk which would meet the rail project tracks in the outer travel lane. This approach to station development would still permit truck servicing, bus loading, and parking at curbside between light rail stops without disrupting light rail operations.

The typical station stop along Spring Street would be located on the sidewalk adjacent to the contra-flow transit lane. The recommended station treatment along Washington Boulevard (at Broadway and San Pedro Street) would be platforms in the middle of the street, as the light rail line would be operating at-grade in an exclusive center median. With this latter type, station platforms would be located to permit auto left-turn lanes.

The aerial stations would be located above the center median of the street, except along 9th Street where one station would be above the north curb. Access to the platforms would be by escalators, stairs, and elevators located in the sidewalk area.

The subway station at 7th and Flower would have side platforms with street level access via escalators, stairs, and elevators in the sidewalk area.

I-252 Mid-Corridor

Table I-25B lists the mid-corridor stations (from north to south) and their physical characteristics. The locations of mid-corridor stations are shown in Figure I-22D.

In general, the proposed station locations have been chosen because they: (1) occur at major cross streets and, as a result, would provide good vehicular access and visibility, (2) are served by at least one cross-corridor bus route, (3) offer good station spacing, and/or (4) are near a significant existing or proposed ridership generator. A brief description of each proposed station follows.

o Washington Boulevard Station would be sited just south of Washington Boulevard on the SPTC right-of-way. It would be an at-grade station with a center platform. This station would generally serve as a transfer station for Washington Boulevard

TABLE I-25A

DOWNTOWN LOS ANGELES

STATION LOCATIONS AND CHARACTERISTICS

	Profile	Placement in Right-of-Way	Platform Location	Additional Parking
At-Grade (LA-1)				
Union Station	aerial	-	center	none
Temple Street*	at-grade	curbside	side	none
1st/2nd Streets*	at-grade	curbside	side	none
4th Street*	at-grade	curbside	side	none
7th Street*	at-grade	curbside	side	none
Olympic Boulevard*	at-grade	curbside	side	none
18th Street*	at-grade	curbside	side	none
San Pedro Street	at-grade	median	center	none
Subway (LA-2)				
7th Street	subway	-	side	none
Pico Boulevard	at-grade	median	center	none
18th Street	at-grade	median	center	none
Broadway	at-grade	median	center	none
San Pedro Street	at-grade	median	center	none
Aerial (LA-3)				
4th Street	aerial	median	center	none
7th Street	aerial	median	side	none
Olive Street	aerial	curbside	center	none
Maple Avenue	aerial	median	side	none
Central Avenue	aerial	median	side	none

* Includes northbound and southbound stations of couplet.

Source: PB/KE, 1983.

TABLE I-25B

MID-CORRIDOR STATION LOCATIONS AND CHARACTERISTICS

	Profile	Placement In Right-of-Way	Platform Location	Additional Parking
Washington Boulevard	at-grade	west of SPTC track	center	none
Vernon Avenue	at-grade	west of SPTC track	center	none
Slauson Avenue	aerial	west of SPTC track	center	none
Florence Avenue	at-grade	east of SPTC track	center	none
Firestone Boulevard	on existing embankment	east of SPTC track	center	none
103rd Street	at-grade (MC-1, MC-2) aerial (MC-3)	east of SPTC track	center	neighbor-hood park-and-ride (50 spaces)
Imperial Highway	at-grade	east of SPTC track (exclusive transit ROW for MC-3)	center	park-and-ride (500 spaces)
Compton Boulevard	at-grade (MC-1, MC-3) below-grade (MC-2)	east of SPTC track (exclusive transit ROW for MC-3)	center	neighbor-hood park-and-ride (50 spaces)
Artesia Boulevard	at-grade	east of SPTC track (exclusive transit ROW for MC-3)	center	park-and ride (650 spaces)
Del Amo Boulevard	at-grade	east of SPTC track	center	park-and ride (400 spaces)
Wardlow Road*	at-grade	east of SPTC track	center	neighbor-hood park-and-ride (50 spaces)
Willow Street*	at-grade	east of SPTC track	center	neighbor-hood park-and-ride (100 spaces)

* SPTC is expected to abandon its East Long Beach Branch south of Cota Crossing. This would permit Wardlow Road and Willow Street stations to be in exclusive rights-of-way.

Source: PB/KE, 1983.

buses and walk-on patronage from the surrounding industrial and residential areas.

- o Vernon Avenue Station would be just south of Vernon Avenue in the SPTC right-of-way. It would be an at-grade station with a center platform. It would serve the Vernon industrial area to the east and a residential neighborhood to the west.

- o Slauson Avenue Station would be an aerial station with a center platform located south of Slauson Avenue, just north of Slauson Junction. At Slauson Junction, the project's tracks would shift from the west side to the east side of the railroad right-of-way. This station would serve the surrounding residential, commercial, and industrial areas. Although this station would be a block away from the population concentration at the Pueblo Del Rio Housing Project, it is considered a better location than 55th Street because it would be served directly by feeder buses and would be visible from a highly traveled street (Slauson Avenue). The proposed location would offer better areawide accessibility and provide better passenger security.

- o Florence Avenue Station would be an at-grade, center platform station just south of Florence Avenue. It would serve the Florence commercial district and surrounding residential area.

- o Firestone Boulevard Station would be sited on the embankment just south of Firestone Boulevard and would have a center platform. There are already stairs leading up to the over-crossing, which would be restored. Retaining walls would have to be heightened to accommodate the proposed station.

- o 103rd Street Station, located south of 103rd Street, would be at-grade if either the MC-1 or MC-2 is selected, and aerial if the MC-3 alternative is implemented. In either case, it would have a center platform. This station would serve the existing and proposed retail and institutional uses adjacent to the site as well as surrounding residences. There is the opportunity to provide park-and-ride facilities adjacent to the tracks and the potential to re-use the existing historic station building for commercial or community purposes. Such restoration would not be a part of this project however.

- o Imperial Highway Station would be a major park-and-ride station located underneath the proposed Century Freeway. The park-and-ride lots would serve both Long Beach-Los Angeles rail passengers as well as Century Freeway transit riders. The station would be at-grade with a center platform. Provision would be made for convenient feeder bus connections for rail transit and freeway transit passengers. Under alternative MC-3, the SPTC freight tracks would not traverse this station area, as required under alternatives MC-1 and MC-2.

- <u>Compton Boulevard Station</u> would be on the north side of Compton Boulevard in either an at-grade (MC-1) or a below-grade (MC-2) configuration. In either case, the station would be constructed with a center platform. The City of Compton is planning for a multi-modal transportation center, which would be an integral part of this station. The Civic Center and retail area next to the site already serves as a hub for a number of SCRTD and City of Gardena bus routes. The transit center would reinforce this role. A limited number of parking spaces would be provided. Under alternative MC-3, the SPTC freight tracks would not traverse this station area, as required under alternatives MC-1 and MC-2.

- <u>Artesia Boulevard Station</u> would be an at-grade, center platform station within a major park-and-ride facility for residents of North Long Beach, Compton, and Carson. The parking lot would be on vacant City of Compton property to the west of the SPTC tracks. Access to the site would be via Acacia Avenue. Under alternative MC-3, the SPTC freight tracks would not traverse this station area, as required under alternatives MC-1 and MC-2.

- <u>Del Amo Boulevard Station</u> would be at-grade, center platform station within a major park-and-ride facility offering nearby access from the Long Beach Freeway. Two parcels, one on each side of the tracks, would be used for a park-and-ride facility. Future expansion of the park-and-ride capacity at this station could be provided by placing a deck over the Comption Creek channel, although such is not proposed as part of the project.

- <u>Wardlow Road Station</u> would be an at-grade, center platform station located along the existing embankment just south of Wardlow Road. Local park-and-ride facilities would be provided in the existing right-of-way. This station would serve the adjacent neighborhood, which includes a number of residential developments and senior citizen housing units.

- <u>Willow Street Station</u> would be an at-grade, center platform station located slightly north of Willow Street between 27th and 28th Streets where Long Beach Boulevard crosses the SPTC tracks. This station would serve the surrounding commercial and residential uses, as well as the Long Beach Memorial and Pacific Hospitals. Local park-and-ride facilities would be provided in the railroad right-of-way.

Though located in Long Beach, the stations at Wardlow Road and Willow Street have been included in the mid-corridor segment because they would be situated in the SPTC right-of-way and would share design characteristics with the other mid-corridor stations. For the purpose of environmental impact assessment, however, the impact areas surrounding these stations are considered a part of the Long Beach segment.

I-253 Long Beach

Recommended stations associated with each of the four Long Beach alternatives are shown in Figures I-22E through I-22H. The locations and general characteristics of each of these stations are described in Table I-25C. In general, these stations are recommended because they (1) would provide reasonable station spacing for maximizing service coverage and operating speed, (2) would provide cross-corridor bus connections, (3) would serve major generators, and (4) are for the most part in highly visible locations.

I-254 General Station Design Features

For concept planning and environmental impact purposes, an array of station concept plans was developed to assist in establishing station locations and preliminary costs. Rather than include plans for each site in this document, plans and profiles were drafted which reflect generic station prototypes for different right-of-way conditions (in street and in exclusive right-of-way), different vertical alignment possibilities (aerial, at-grade, and below-grade), different horizontal alignments (in median and curbside), and various platform configurations (center island, side, and staggered). These plans and profiles can be found in Figures I-25A through I-25G. Additional concept plans are provided in the Design Appendix.

The following features are incorporated into the station plans:

o For "rapid transit" performance characteristics, high-level station platforms (station platforms at the same level as the light rail vehicle floor) are proposed, where such stations can be fitted appropriately into their surroundings. High-level platforms provide for easier, hence faster, boarding and exiting for all patrons. This is especially true for patrons who use wheelchairs, since ramps, rather than lift devices, would be used. The high-level platforms would be approximately 2½ feet above the sidewalk level (or top of rail). It appears possible to develop high-level station platforms that are attractive and compatible with their surroundings for all alignment alternatives, with the possible exception of the Broadway/Spring Couplet (LA-1) alternative in downtown Los Angeles. Typical high-level and low-level light rail transit station platforms are illustrated in Figure I-25H. In the event that it is not possible to develop high-level platforms at all station locations for the system alternative selected for construction, then the light rail vehicles will be equipped with moveable steps ("high-low" steps) which permit change in the access/egress level to and from the light rail vehicles between high-level stations and low-level stations. However, good rail transit operating practices require that no more than one such level change occur in the course of a run from one end of the rail transit line to the other. In addition to considering site-specific conditions for each station, this requirement will be a principal factor during detailed design of

TABLE I-25C

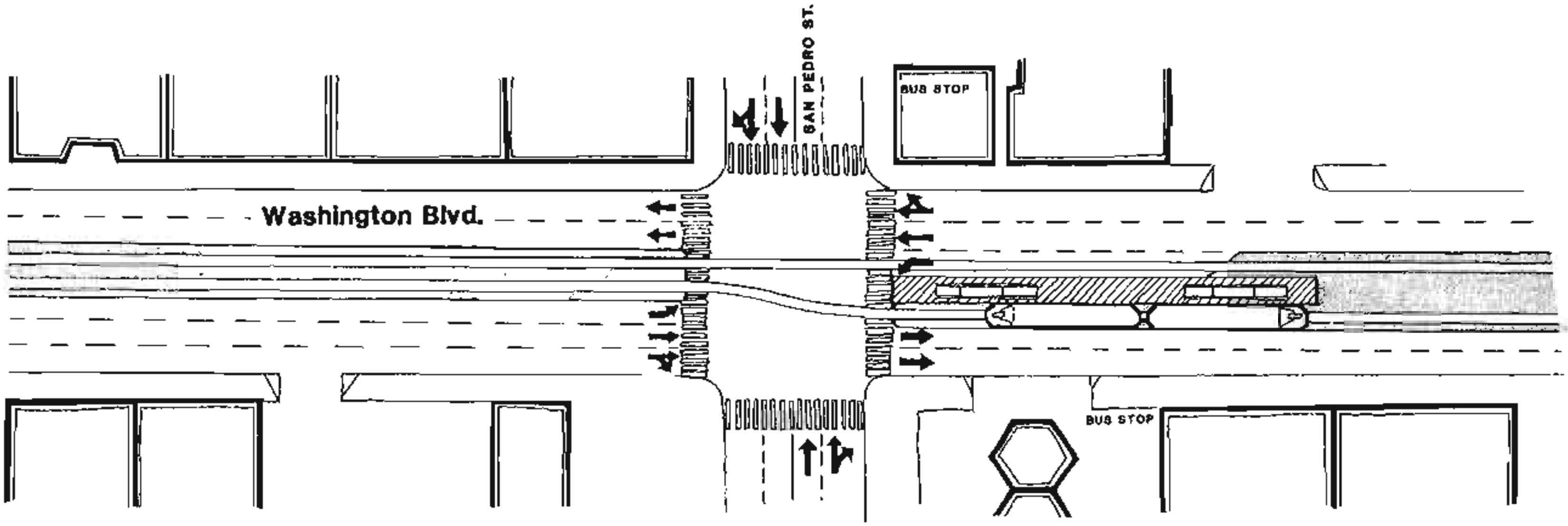
LONG BEACH STATION LOCATIONS AND CHARACTERISTICS

	Profile	Placement in Right-of-Way[1]	Platform Location	Additional Parking
Atlantic Avenue Two-Way (LB-1)				
Hill Street	at-grade	median	center	none
Pacific Coast Highway	at-grade	median	center	none
Anaheim Street	at-grade	median	center	none
6th/7th Streets	at-grade	median	center	none
1st Street	at-grade	curbside	side	none
Atlantic/Long Beach Couplet (LB-2)				
Hill Street[2]	at-grade	curbside	side	none
Pacific Coast Highway[2]	at-grade	curbside	side	none
Anaheim Street[2]	at-grade	curbside	side	none
6th/7th Streets[2]	at-grade	curbside	side	none
3rd Street	at-grade	curbside	side	none
1st Street	at-grade	curbside	side	none
LA River Route (LB-3)				
Daisy Avenue	at-grade	median	center	none
1st Street	at-grade	curbside	side	none
Atlantic with Pacific Avenue Loop (LB-4)				
Hill Street	at-grade	median	center	none
Pacific Coast Highway	at-grade	median	center	none
Anaheim Street	at-grade	median	center	none
6th Street	at-grade	curbside	side	none
3rd Street	at-grade	curbside	side	none
1st Street	at-grade	curbside	side	none

[1] Curbside stations will generally be extensions of the sidewalk to meet the light rail track located in the outer travel lane.

[2] Includes both northbound and southbound stations of couplet or loop.

Source: PB/KE, 1983.

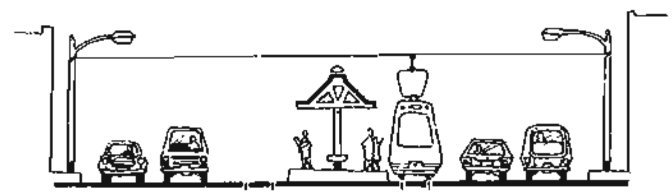


PLAN

0 10 25 50

NORTH

As shown, station platform is low-level, 180', 2-car train length, corresponding to baseline system alternative. Under other system alternatives, platform is proposed as high-level (but also 270', 3-car train length).



Washington Blvd. at San Pedro St
At Grade in Downtown Los Angeles

SECTION

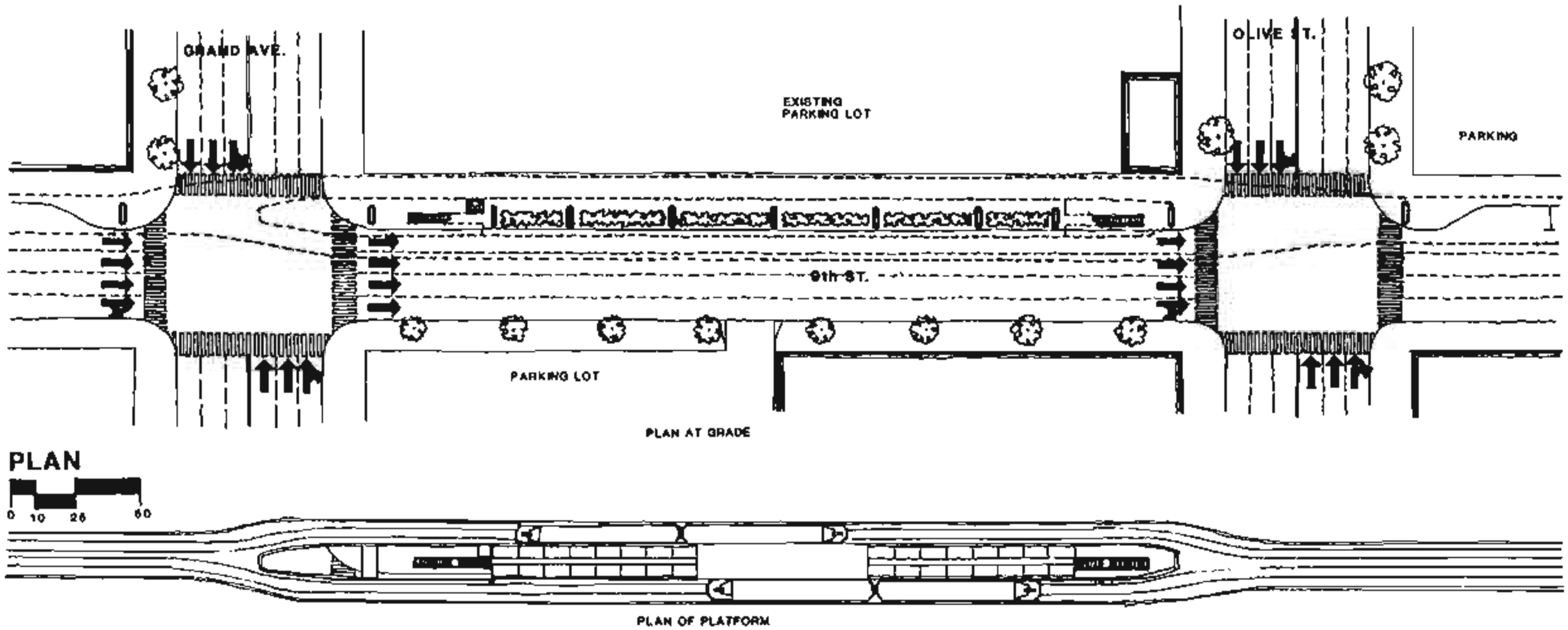
0 4 10 20

Station Concept Subject To Change In Final Design

Figure I-25A

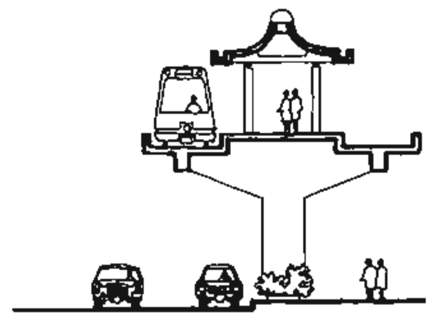
Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS



As shown, platform is low-level, as proposed under some system alternatives platform for this station would be high-level.

NORTH



9th Street at Olive Street
Aerial At Sidewalk In Downtown Los Angeles

SECTION
0 4 10 20

Station Concept Subject To Change In Final Design

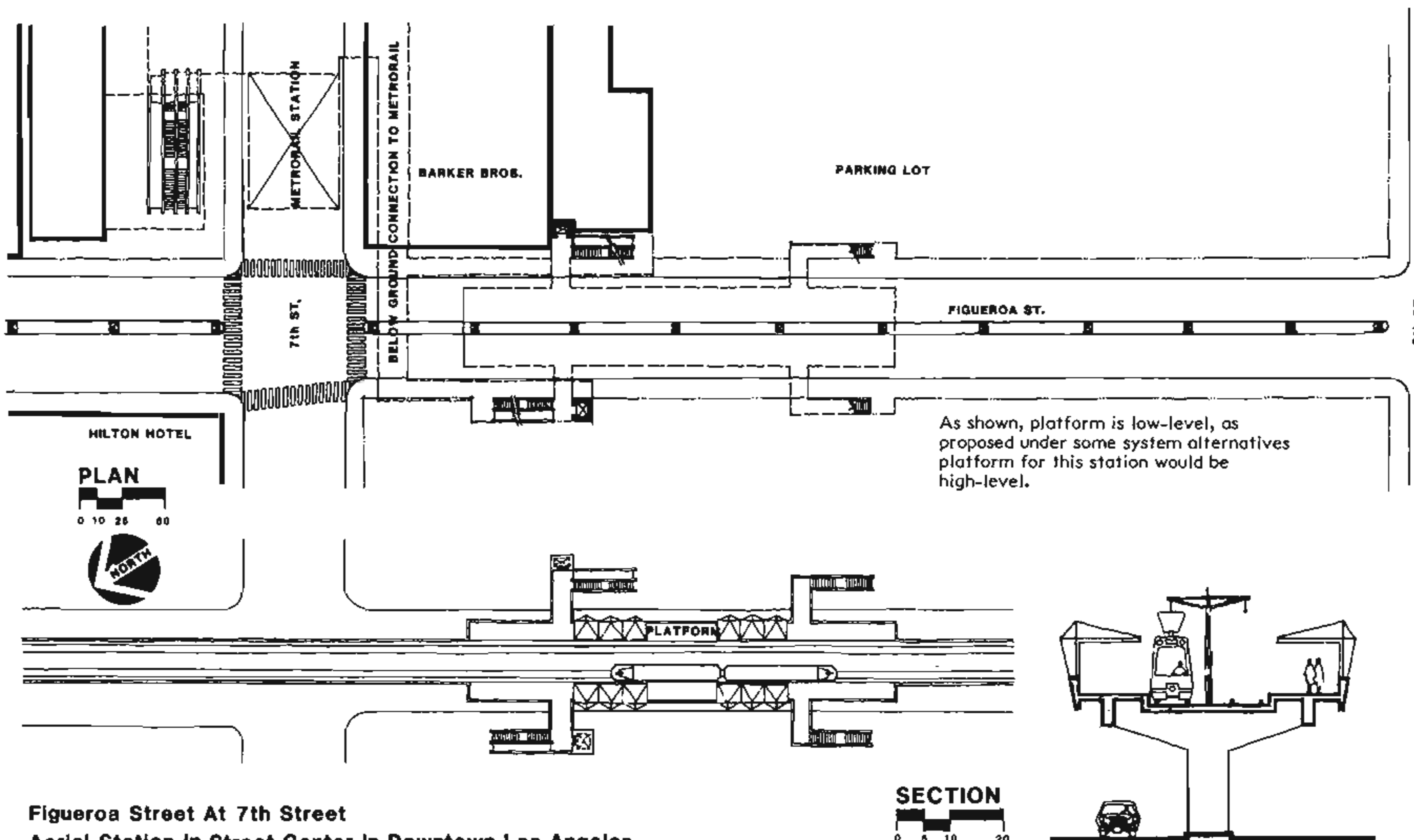
Figure I-25B

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Station Concept

PARSONS BRINCKERHOFF / KAISER ENGINEERS



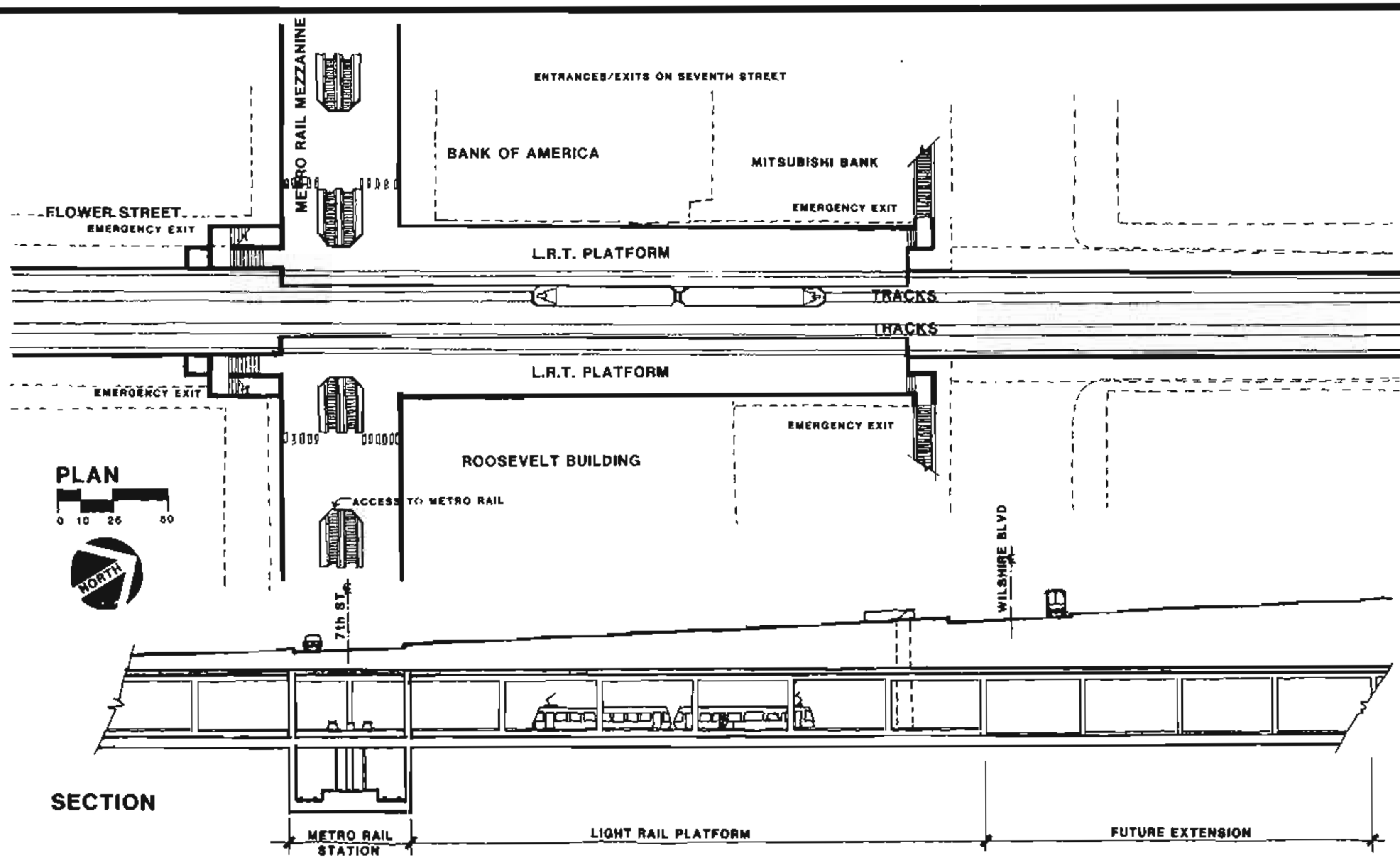
Figueroa Street At 7th Street
Aerial Station In Street Center In Downtown Los Angeles

Station Concept Subject To Change In Final Design

Figure I-25C

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS



Flower Street At 7th Street
Below Grade In Downtown Los Angeles

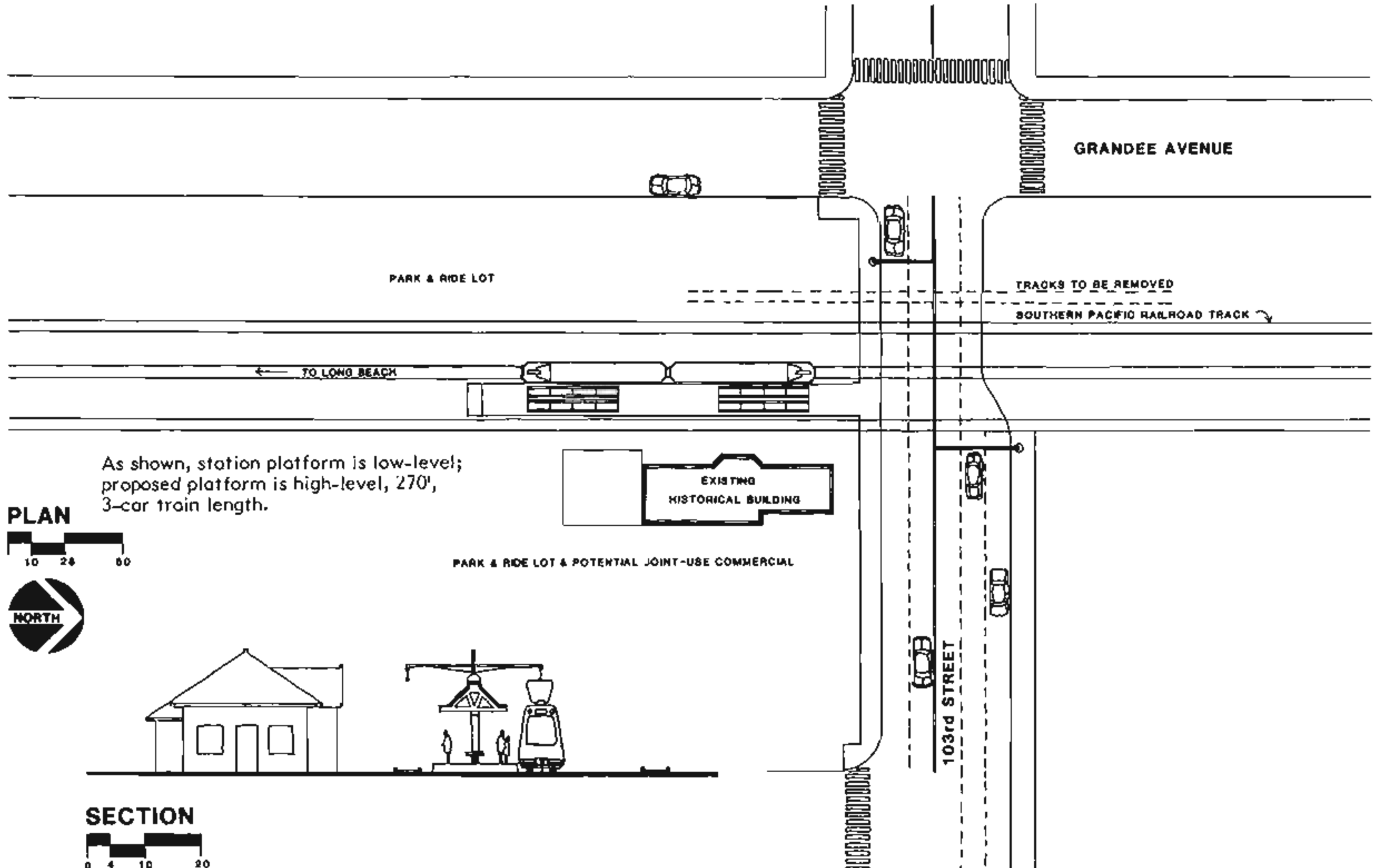
Figure I-25D

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Station Concept

PARSONS BRINCKERHOFF / KAISER ENGINEERS



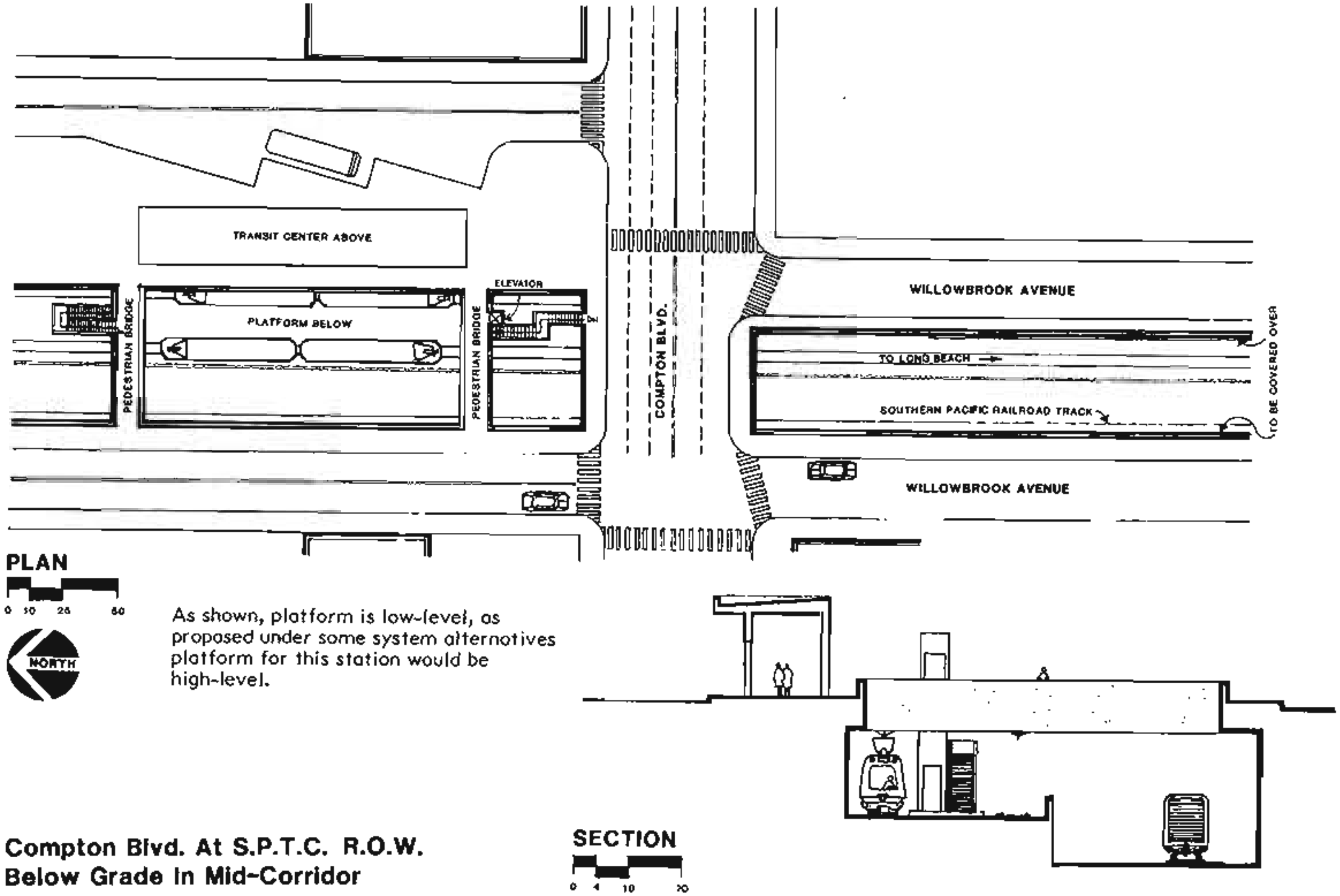
103rd Street at S.P.T.C. R.O.W.
At Grade In Mid-Corridor

Station Concept Subject To Change In Final Design

Figure I-25E

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

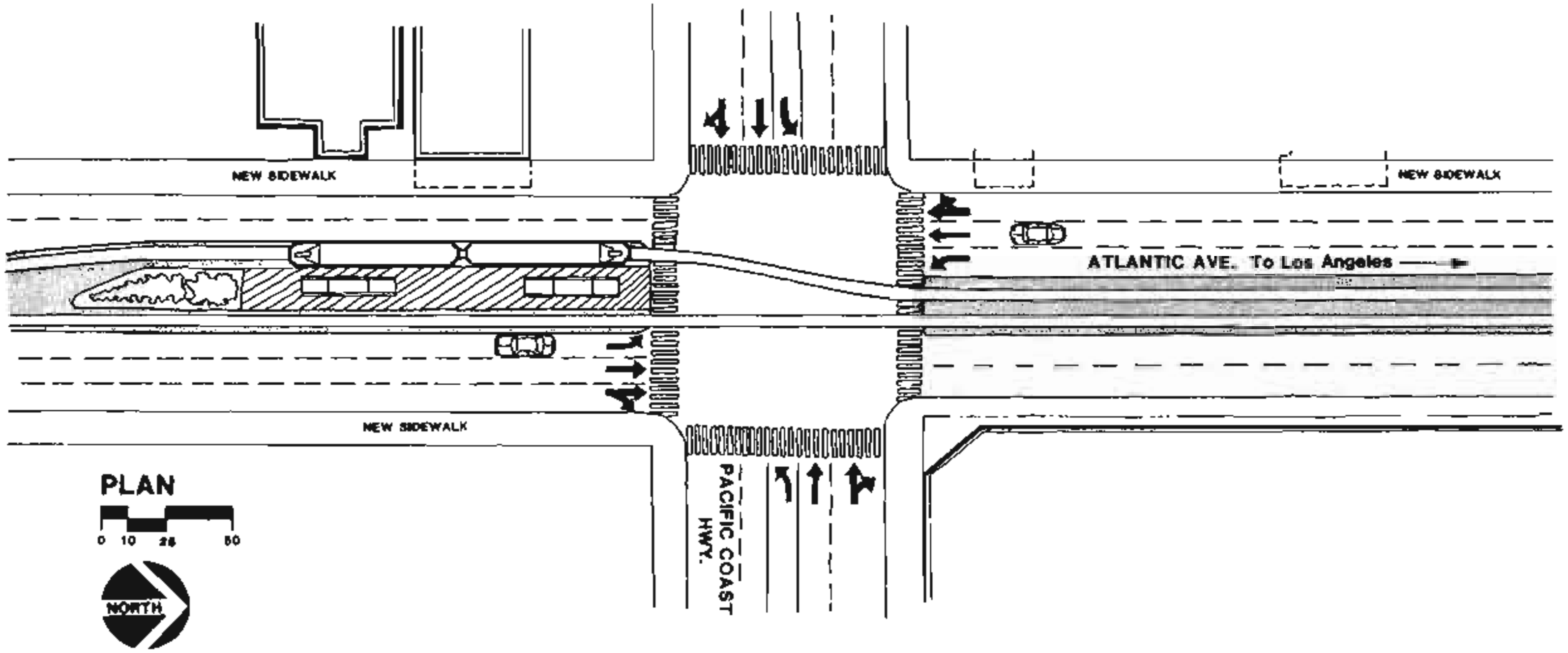
Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS



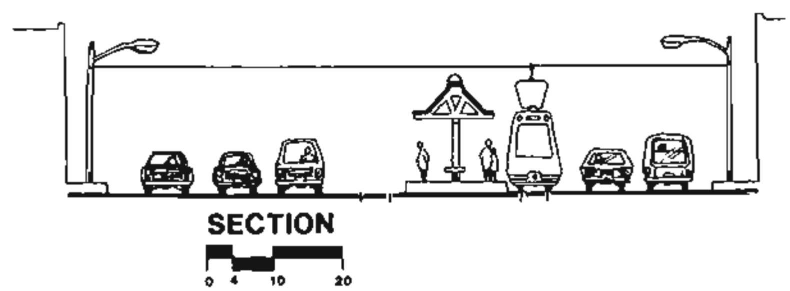
Compton Blvd. At S.P.T.C. R.O.W.
Below Grade In Mid-Corridor

Station Concept Subject To Change In Final Design

Figure I-25F



As shown, station platform is low-level, 180', 2-car train length, correponding to baseline system alternative. Under other system alternatives, platform is proposed as high-level (but also 180', 2-car train length).



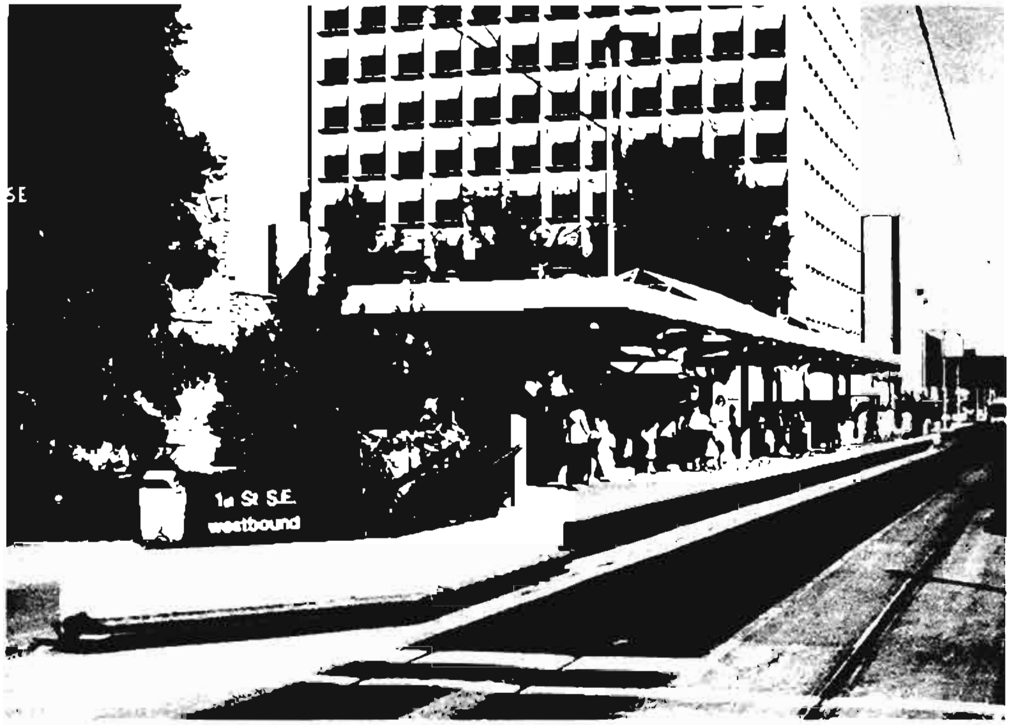
Atlantic Avenue at Pacific Coast Hwy
At-Grade In Downtown Long Beach
(LB-1 and 4)

Station Concept Subject To Change In Final Design

Figure I-25G

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS



High Platform

Low Platform

Figure I-25H

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Examples of Rail Transit
High & Low Platforms
PARSONS BRINCKERHOFF / KAISER ENGINEERS

the system alternative selected for construction in determining of platform heights.

- The typical length of station platforms will be 270 feet (3 light rail vehicle lengths). Exceptions to this typical length would be all stations on Main, Spring, and Broadway Streets for downtown Los Angeles alternative LA-1 and all stations south of Willow Street for Long Beach alternatives LB-1, LB-2, and LB-4; such stations would be 180 feet long (2 light rail vehicle lengths). However, if the system alternative selected for construction includes the Broadway/Spring Couplet in downtown Los Angeles (LA-1), then station platforms on Washington Boulevard along the mid-corridor and for Long Beach alternative LB-3, if constructed at-grade (low-level platorms), might initially be built at 180 feet in length, with expandability to 270 feet.

- Parking lots and access ways to stations would be planned with full provisions for elderly and handicapped patrons.

- Parking spaces for the handicapped would be integrated into the overall development of parking lots.

- Stations and their equipment would be designed to function without a station agent on duty at any station; control of the station or essential contact with a patron would be accomplished using video, public address, and other electronic communication and monitoring systems.

- In all aerial or below-grade stations, vertical transportation would be by escalators, elevators, stairs, ramps, and walks, as appropriate.

- Public restrooms would not be provided at stations.

- Because of the good weather conditions in the Los Angeles-Long Beach area, passenger waiting facilities would not be fully enclosed or air-conditioned. Where practicable, waiting areas would protect waiting passengers from driven rain and would be shaded against the sun.

- Landscape buffers would be provided between parking areas and abutting residential properties.

I-300 SYSTEM OPERATIONS

I-310 PRELIMINARY SYSTEM OPERATING CHARACTERISTICS

I-311 Frequency of Service

In order to provide a high quality of service as well as accommodate the projected ridership demand, trains would run approximately every 12 to 15 minutes during normal service hours. With a peak hour patronage estimate of 12 percent of the daily total (6,534 riders), 6-minute interval service is proposed during the AM and PM commuting periods. It is anticipated that reduced service (15- to 20-minute intervals) would be offered at night and on holidays and weekends. At full operation the system would provide service 20 hours a day (5:30 AM until 1:30 AM), 365 days a year.

I-312 Number of Cars Per Train

Year 2000 patronage estimates indicate that 2-car-train lengths would adequately carry the peak period demand for all system alternatives except those which include the Olympic/9th Aerial (LA-3) alternative. Due to higher peak period patronage estimates, route combinations using LA-3 would require 3-car operations, and system design features would need to accommodate 3-car-train lengths. Three-car trains, however, could not be used in Long Beach because short block lengths would cause trains stopped at stations to extend into intersections and interfere with traffic. The third car would therefore be dropped off (southbound) or added (northbound) at a location in the mid-corridor, such as Willow Street or, in the case of LB-3, at Del Amo Boulevard.

Although year 2000 peak hour patronage estimates for system alternatives using the Flower Street Subway (LA-2) alignment do not indicate a need for 3-car trains, the system would be designed to accommodate 3-car-train lengths in case the demand were to develop.

For the same reason that 3-car operations are not viable in downtown Long Beach, 3-car trains are not proposed for those system alternatives which include the Broadway/Spring Couplet, At-Grade (LA-1) alternative.

I-313 Average Operating Speeds

Average peak hour operating speeds for each of the alignment alternatives are listed in Table I-31A. These speeds assume 20-second station dwell times with an additional 5 percent added to running times to provide for uncertain factors.

Based on patronage estimates and the physical characteristics of the proposed system, a conceptual operations plan has been developed which includes such items as peak and off-peak headways (length of

TABLE I-31A

AVERAGE PEAK HOUR OPERATING SPEEDS[1]

Corridor Segment	Southbound (mph)	Northbound (mph)
Downtown Los Angeles		
Broadway/Spring Couplet (LA-1)	12.2	11.7
Flower Street Subway (LA-2)	18.9	18.3
Olympic/9th Aerial (LA-3)	21.9	20.1
Mid-Corridor[2]		
Compton At-Grade (MC-1)	32.6	32.5
Compton Grade Separation (MC-2)	34.4	34.3
SPTC Railroad Relocation (MC-3)	32.6	32.5
Long Beach		
Atlantic Avenue Two-Way (LB-1)	19.7	19.0
Atlantic/Long Beach Couplet (LB-2)	18.1	18.1
LA River Route (LB-3)[3]	32.0	33.0
Atlantic with Pacific Avenue Loop (LB-4)	16.5	17.6

1 Includes 20-second station and traffic light dwell times and 5 percent added to travel times for uncertain factors.

2 Assumes 5 stops at nonpreempted grade crossings and no interference from SPTC operations.

3 From Del Amo Boulevard station.

Source: PB/KE, 1983.

time between trains); car capacities and loading standards; number of cars per train; night, holiday, and weekend service; running speeds; crew requirements; operating hours; fleet sizes; and annual vehicle-miles and vehicle-hours.

I-320 COMPLEMENTARY BUS NETWORK

The development of a complementary bus network supporting each of the rail alternatives for the project would play a key role in the effectiveness and success of the new rail facility. One intent in providing a new rail transit operation would be to increase the operating efficiency of the total bus and rail transit system by re-orienting existing bus lines to serve rail stations and eliminating those bus routes which parallel the rail transit alignment. Overall bus miles per passenger would decrease, while more riders would be served due to the attractiveness of the rail facility.

A key concern in bus route modifications would be to avoid inconveniencing bus riders who would continue to use the bus routes for purposes other than getting to or from the new rail system.

I-321 Existing Route Modifications

Few modifications would be necessary for bus routes operating in the rail transit corridor. The distribution of existing local bus services operating in downtown Long Beach and Los Angeles is such that most local lines would either provide direct access to a rail transit station or operate within close proximity of a station. In the mid-corridor segment, major east-west lines would intersect the rail transit right-of-way providing potential transfer points at the proposed rail transit stations. A feeder bus system completely separate from the areawide network of local and express buses is not proposed.

Proposed bus route and frequency modifications for local and express services are summarized below for each of the rail transit alternatives in the downtown Los Angeles, mid-corridor, and Long Beach segments. Detailed information regarding the proposed changes can be obtained in a memorandum titled "Design of Complementary Bus Network" (PB/KE Task 7.7), dated August 24, 1983.

I-321.1 Downtown Los Angeles

o Broadway/Spring, At-Grade, alternative (LA-1):

  - RTD Lines 55 and 56 - reduce service frequencies during peak periods.

o Flower Street Subway and Olympic/9th Aerial alternatives (LA-2, LA-3):

No bus route modifications for local and express services are proposed for these alternatives.

I-321.2 Mid-Corridor

- All alternatives (MC-1, MC-2, MC-3):

  - RTD Lines 55, 56, 105, 115, and 117 and LBTC Line 15 - change service frequencies during peak periods.

  - RTD Lines 107, 110, 119, 125, and 457 - reroute to or terminate at nearest rail project station.

  - RTD Lines 358, 360, and 456 - eliminate service.

I-321.3 Long Beach

- Atlantic Avenue Two-Way, Atlantic/Long Beach Couplet, and Atlantic with Pacific Avenue Loop alternatives (LB-1, LB-2, LB-4):

  - LBTC Lines 5, 8, 15 and 16 - change service frequencies during peak periods.

  - LBTC Line 16 and RTD Line 457 - terminate service at Del Amo station.

  - RTD Lines 360 and 456 - eliminate service.

- Los Angeles River Route alternative (LB-3):

  - LBTC Lines 8, 9, 15, 16, and 17 - change service frequencies during peak periods.

  - LBTC Line 16 and RTD Line 457 - terminate service at Del Amo station.

  - RTD Lines 360 and 456 - eliminate service.

I-400 SYSTEM DESIGN CONSIDERATIONS

I-410 YARD AND SHOP FACILITIES

I-411 Description of Facilities

Operation of the rail transit system would require a major facility for performance of scheduled and unscheduled maintenance on transit vehicles and for storage of trains when not in service. In addition to the primary facility, a "satellite" yard would be highly desirable to provide a secondary storage area to reduce vehicle movement during intervals between peak service. The satellite yard would also provide facilities for light maintenance at the opposite end of the rail line from the primary facility, thus reducing operating costs.

The main yard facilities would be designed to provide complete maintenance and repair of all transit vehicles and to serve as a base of operations for maintenance-of-way activities. Design of the primary and satellite facilities would be guided by general considerations of system operations and maintenance efficiency and site access geometry and topography.

In particular, the following functions would be needed at the primary yard and maintenance shop and would be housed in separate areas: service and inspection, heavy repair and component repair, vehicle cleaning, wheel truing, support shops, and maintenance-of-way facilities.

Both facility locations would have extensive security features, including high fencing and clear areas, closed-circuit television monitoring, and various intruder alarms. This would be particularly necessary for the satellite yard, which would not be staffed at all times.

I-412 Candidate Sites

In selecting a set of candidate sites for primary and satellite facilities, consideration was given only to those sites of adequate size which are undeveloped or available for sale, located near the rail transit alignment, and sufficiently removed from residential land uses. Five sites in the mid-corridor area were considered for location of a primary yard and shop facility. Three sites in the southern end of downtown Los Angeles were considered for location of the possible satellite yard. In addition, one of these downtown sites was considered as a possible main yard.

During the course of the investigation, it was determined that one of the satellite sites and two of the main sites were either under development or had been removed from the real estate market. Another downtown site which had been considered for either a main yard or a satellite facility was too expensive to develop for a satellite and inadequate in size for a main yard. A third main yard site was ruled out due to conflicts concerning development plans of the City of Long Beach. Finally, the southernmost site was found to be potentially too costly to purchase (due to the presence of oil on the property) and would require extensive mitigation of noise and lighting due to its proximity to a residential area.

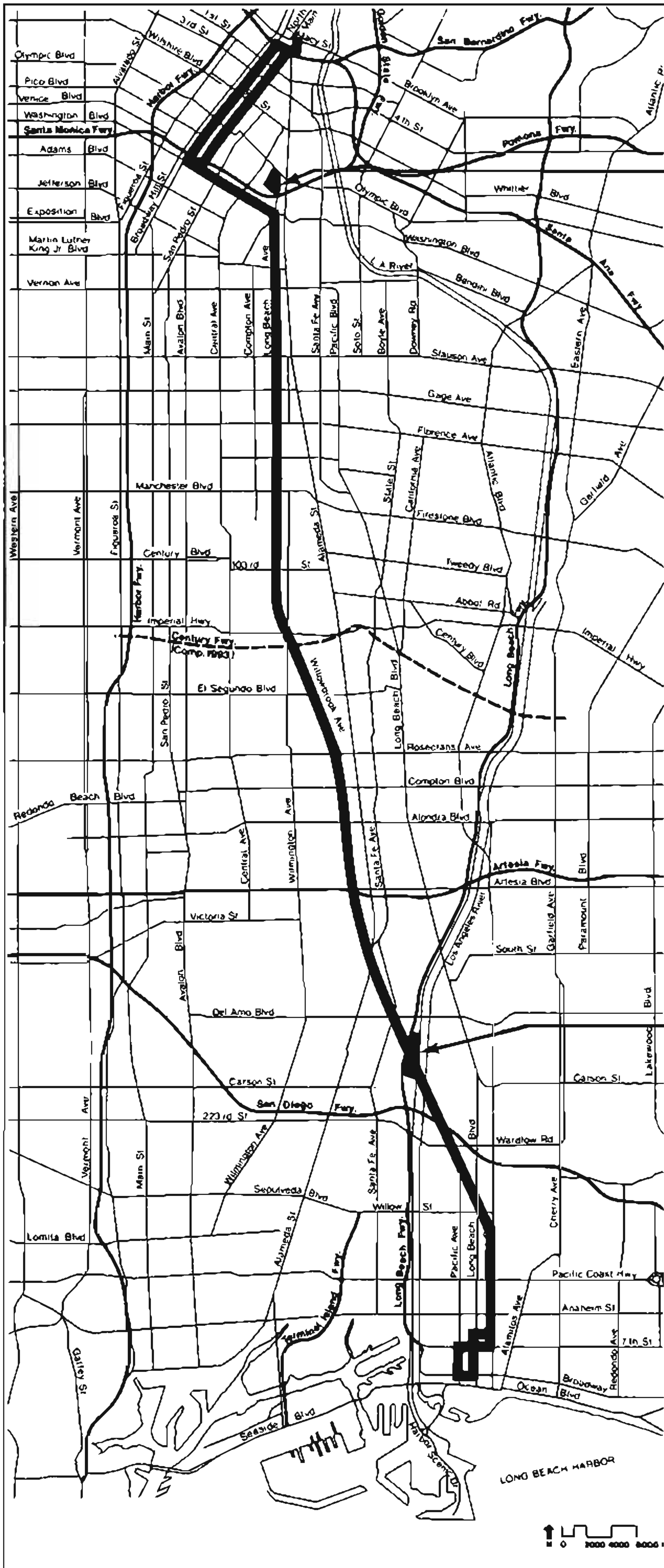
1-413 Proposed Yard and Shop Sites

Two sites, one for a primary yard and one for a satellite yard, have been identified as viable locations and suitable for further investigation (see Figure 1-41A). The site for the main yard and shop is located east of the Long Beach Freeway, west of the Los Angeles River, south of Compton Creek, and north of Carson Street. The site is currently for sale and can accommodate full vehicle and maintenance-of-way facilities as well as storage for 60 vehicles (see conceptual layout in Figure 1-41B). The SPTC is expected to abandon its East Long Beach Branch south of Cota Crossing, which would permit removal of the existing SPTC embankment dividing the southerly two sections of the site by placing the rail transit project on an aerial structure from Cota Crossing through the proposed site.

There are several apparent advantages of this site as the location for primary maintenance and storage facilities:

- o The proposed use is compatible with the Long Beach general plan. The site is totally buffered on all sides by freeways, rail lines, and flood channels.
- o The site is large enough to support the ultimate fleet size at one location.
- o The site has the best security of all candidates. Outside access is through one control point for all 29 acres.
- o Development costs are reasonable when compared with other candidates. Present physical constraints on the site limit the market value of the land.
- o Location at the intersection of the Long Beach and San Diego Freeways would give excellent visual presence to freeway users in south Los Angeles County, encouraging park-and-ride interest at the Del Amo station.
- o The entire site is available for purchase.

Effective use of the site would require the construction of a roadway under the Union Pacific railroad embankment, to provide access to the proposed Plant Facilities Maintenance site, and the enlargement of a road access tunnel under the Long Beach Freeway. Both of these actions are technically feasible.



SATELLITE YARD

Hooper Street, 16th Street & Long Beach Avenue

MAIN YARD

Long Beach Freeway, Los Angeles River & S.P.T.C. ROW.

Figure I-41A

Yard & Shop Facility Locations

Long Beach-Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

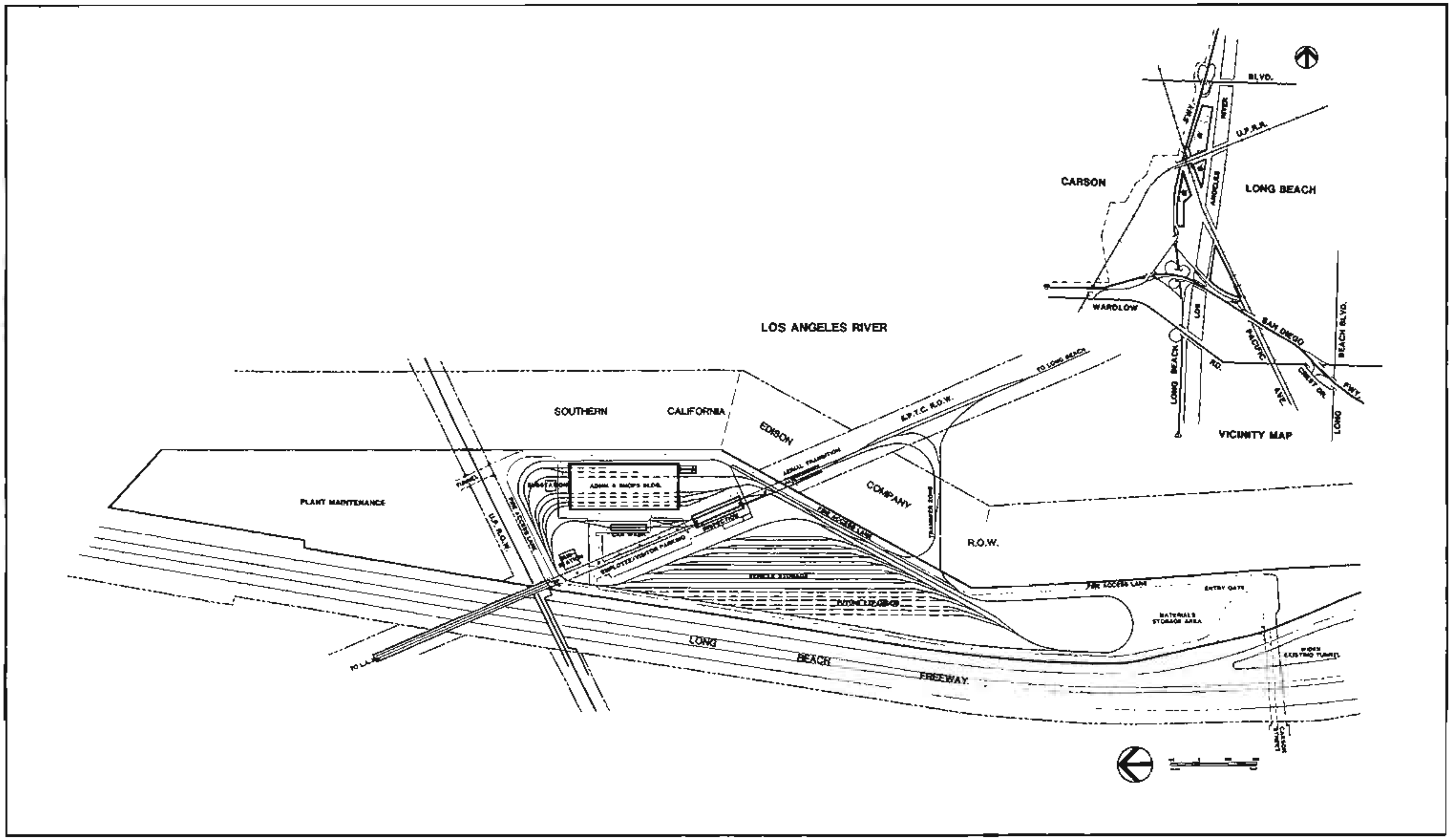


Figure I-41B

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Main Yard and Shops Plan

PARSONS BRINCKERHOFF/KAISER ENGINEERS

The satellite yard is located directly adjacent to Long Beach Avenue between 12th Street and 14th Street in downtown Los Angeles. The property, owned by the Southern Pacific Transportation Company, is well located to function as a downtown satellite yard and could accommodate a relatively efficient layout for vehicle movement and storage (see conceptual layout in Figure I-41C). It has a storage capacity for at least 14 vehicles and could be expanded further. The parcel is zoned industrial and is compatible with adjacent land uses. The site is readily accessible by service and emergency vehicles and is available for purchase.

I-420 OPERATING SYSTEMS

Successful operation of the rail transit system would require design of efficient, flexible, and cost-effective systems for various functions. Design considerations, preliminary concepts, and criteria have been prepared for electrification, signaling and communications, safety, security, and fare collection.

I-421 Electrification

The electrical system would supply the power to provide safe, efficient, and continuous operation of the transit system. It would provide power for two major types of electrical usage: vehicle propulsion and auxiliary systems, and the operation of passenger stations and maintenance facilities. Power would be supplied directly by the City of Los Angeles Department of Water and Power and the Southern California Edison Company. Equipment housed in traction power substations along the route would transform and convert the high-voltage AC power provided by the utility companies into power suitable for operation of the system. An overhead wire distribution system would collect power from the traction power substations and deliver it to the vehicles.

In the downtown Los Angeles and Long Beach segments, a contact-wire system would be used. The feeder cables would be underground, concealed inside the hollow galvanized steel poles that support the contact wire.

In the mid-corridor section a simple catenary system would be used. It consists of a contact wire suspended from a messenger wire by means of hangers spaced about 30 feet apart. The feeder cables would be carried on top of the poles, permitting the use of wide-flange poles, which are stronger and easier to maintain than the hollow poles used in downtown areas. Aesthetic appearance of the catenary system elements will be a prime consideration during the final design process.

I-422 Signaling and Communications

The control center will be the focal point of system operations and security functions. It would house controls and system operating

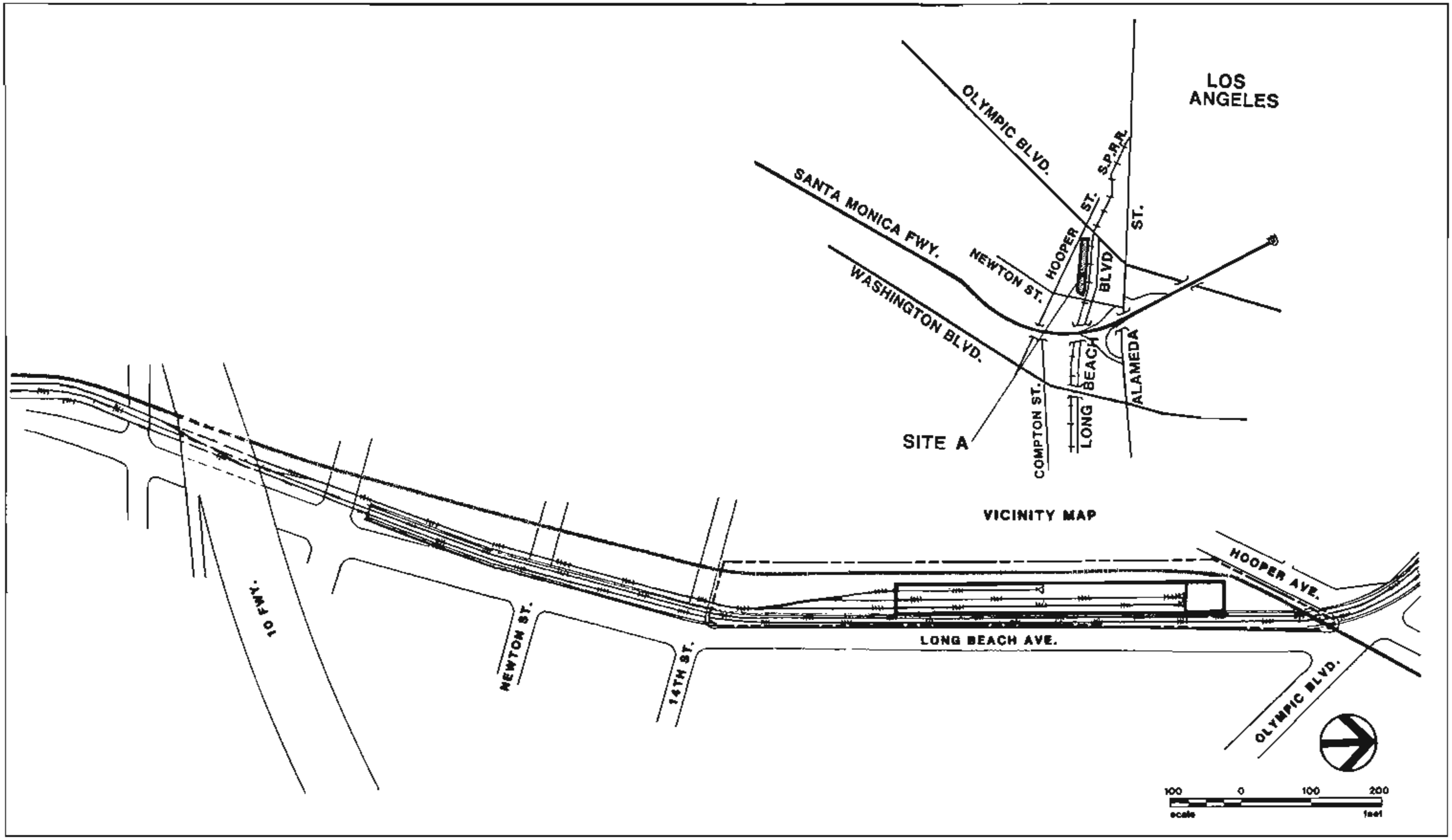


Figure I-41C

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Satellite Yard Plan

PARSONS BRINCKERHOFF/KAISER ENGINEERS

personnel, the computer, alarm monitoring system, emergency controls, and digital data transmission center.

In the mid-corridor (Washington Boulevard to Willow Street) a conventional rail transit signal system (similar to rail freight signal systems) will be installed within the railroad right-of-way to govern movements of the rail transit trains. It will enforce a safe distance between successive transit trains and will automatically bring a transit train to a stop in the event the operator passes a red signal. It will also have the capability to control the speed of the transit trains through use of appropriate signal indications and corresponding operator's rules.

The train operator would have the primary responsibility for train protection functions in mixed traffic areas. The detection of vehicles in mixed traffic, if provided, would be accomplished by presence detectors, which may preempt traffic signals. The presence detection circuits would be the only track circuits in downtown at-grade sections and would be used to convey train location to the control center.

All road crossings in the mid-corridor would have automatic gate protection. A fence and curb would be provided for the sections between road crossings, and major railroad crossing would be grade separated. Minor railroad crossings at-grade would be protected by fail-safe devices.

The rail transit signal system as proposed in the mid-corridor is to be coordinated with auto traffic signal systems at crossings of principal roadways in order to optimize movements of all vehicles from a traffic engineering perspective. It will be necessary to provide intervals of 30 to 33 seconds within cycle lengths of traffic signals at or near the rail transit line to accommodate crossings of such roadways by the rail transit trains. The speed of the transit trains between these roadway crossings will be regulated by the rail transit signal system to provide for the arrival of transit trains at such crossings at appropriate times so that the necessary 30- to 33-second interval is during the north-south "green" phase of the nearby traffic signals. If it is determined during detailed design of the project that there are locations where such coordination cannot be fully achieved, appropriate extension of phase lengths of traffic signals at or near the transit line will be needed to provide the 30- to 33-second crossing interval for the rail transit trains.

The communications system would provide the means for exchange of information between train operators and security, emergency, control center, administrative, and maintenance personnel. It would also allow transmission of information to passengers as necessary. The system would include radio, telephone, public address, closed circuit television, cable transmission, and digital data transmission.

1-423 Safety

Passenger and personnel safety will be of paramount importance in system design and operation. All dynamic system elements would be designed to be fail-safe -- that is, the system would revert to a safe condition (i.e., the system components are in such a state that risk to people and property is minimized) whenever a single failure or a reasonably likely combination of undesirable events could result in a critical hazard. Facilities and procedures would be provided to permit the safe, expedient, and unsupervised evacuation of passengers and personnel from all fixed structures. In general, when problem conditions do not pose an immediate threat to the health, safety, and security of the patrons or staff, vehicle evacuation would be accomplished under the supervision of emergency forces or system personnel. However, design features, equipment, and instructions would be provided to allow unsupervised vehicle evacuation in emergency conditions.

1-424 Security

The security of passengers, employees, and the general public will be a primary consideration in the design and operation of the system; high levels of perceived as well as actual security would be provided. Enforcement would be the responsibility of both the transit police of the SCRTD and the law enforcement organizations of the communities through which the system would operate. Although the security program would continue to evolve through future design stages, the following paragraphs present a conceptualization of the proposed security plan:

- Stations would feature as much open space as possible and would be well lighted, especially at fare machines and exit routes. All stations would have at least one closed circuit television camera (CCTV), which would be monitored at the control center.

- A building housing the field functions of the transit police, security guards, and fare inspectors is being considered as part of the project at the Imperial Highway station.

- Traction power substations would be equipped with intrusion detection alarms.

- The maintenance facilities would have intrusion detection alarms and a CCTV and would be enclosed in security fencing with a 20-foot clear zone on each side of the fence.

- Fencing would be provided along all at-grade sections of exclusive rights-of-way in order to speed train operations and prohibit pedestrian crossing except at designated intersections. To deter the dropping or throwing of objects at passing trains, all structures that pass over or are adjacent to and higher than the tracks would also be fenced.

o The vehicle windows would be made of impact-resistant, hard-surfaced material to afford protection to passengers without presenting unacceptable hazards in case of fire.

o Seating and interior finish materials would be vandal-resistant. Silent alarms would be provided between the vehicle operator and the control center. Windows at both ends of each vehicle would provide visibility between the cars of a train.

Inspectors and armed transit police would ride the trains, and transit police would be assigned to patrol stations. Monitor screens for the CCTV cameras would be staffed 24 hours a day, and security personnel would report any violations to appropriate local and transit police for rapid response.

1-425 Fare Collection

Alternative methods for setting and collecting fares on the proposed rail transit system were explored and evaluated using criteria measuring efficiency, cost, and convenience. In addition, the need to interface with the proposed Metro Rail fare collection system was given explicit consideration. The following generic options for fare collection were addressed:

o Full Barrier - entry and exit fully controlled.

o Entry Barrier - control at point of entry only.

o Vehicle Collection - all collections made on vehicles.

o Bus Barrier/No Rail Barrier - collection at bus boardings, but not at rail boardings.

o Barrier-Free - a self-service system, with fare inspectors.

As a result of this analysis, the "barrier-free" system was identified as the most viable approach to fare collection for the Long Beach-Los Angeles system. There were several design and operational considerations leading to this judgment:

o The at-grade rail transit stations would not be enclosed, as is necessary for barrier fare collection systems. It would not be possible to fit enclosed stations in the available street rights-of-way for any of the Long Beach alignments or surface portions of the downtown Los Angeles alignments.

o Fare collection via fareboxes onboard the light rail vehicles would require the presence of an operator on each car of a multiple-unit train (to operate the farebox), would result in the effective loss of floor area (passenger capacity) at both ends of the double-ended vehicles for placement of the farebox and stanchions, and would require boarding at all at-grade stations to be by the front door of each car only, potentially increasing station dwell times. The predominant use of on-board fareboxes in rail transit operations is on lower-volume lines, with side platform stations permitting orientation of the farebox to boarding on one side of the vehicle only, conserving vehicle floor area for passenger capacity. Civil design constraints for the Long Beach-Los Angeles rail project generally require a center-platform system, meaning the farebox would have to be centered, with stanchions on both sides of the vehicle. At aerial or below-grade stations, conventional turnstiles could be used to permit "rapid transit" style train boarding/exiting (all train doors on the platform side could be opened), but then such stations would probably need to be manned by station agents full-time.

- Design of the project with "rapid transit" performance characteristics calls for the operation of multiple-unit trains, with the intent of having all train doors open at a station to speed passenger boarding and exiting. This would require off-vehicle fare collection to prevent fare evasion through doors not supervised by the operator.

The barrier-free system would provide for self-service (vending machine) pre-purchase of fares at transit stations. A zoned fare system currently under study would probably be used, providing at least three zones in the corridor.

Details of alternative transfer procedures between the Long Beach-Los Angeles rail project and the Metro Rail system are under study. They include issuance of inter-line tickets by the fare machines of both systems, use of "transfer attendants" at interface stations, or a combination of the two.

Enforcement of the barrier-free system would be via "inspectors," consistent with practices currently in use worldwide. Inspector personnel would board trains at random and require that passengers produce proof of fare payment. An appropriate number of inspectors would be used to insure effective fare enforcement. These individuals are also intended to constitute a key component of the security system on the line.

In the event that a vehicle-barrier system is desired at a future time, it would be possible to retrofit the transit vehicles to accommodate this type of system. Vehicle design criteria will specify door and operator locations that would permit the placement of stanchions and fareboxes within supervision of the operator's seat. The system would permit access from either side of the vehicle, though boarding would be by front doors of the vehicles only.

1-425.1 Fare Structure, Pricing, and Project Revenue

Fare structure and pricing for the Long Beach-Los Angeles rail transit project is a policy matter to be determined by the project's operator, Southern California Rapid Transit District, in collaboration with the Los Angeles County Transportation Commission. A conceptual fare structure and pricing have been developed in order to estimate project revenue performance and to allow for initial policy level review and public comment.

Proposal of a fare structure for a fixed-guideway public mass transit operation considers the geography and orientation of communities along the transit line as well as social and economic relationships among the communities. When the transit line is relatively long and passes through a number of communities, with resultant diversity in travel patterns, a zone fare structure becomes desirable to obtain more revenue for longer trips, while charging a lower base fare for local trips. Use of a proof-of-payment fare collection system, as proposed for the Long Beach-Los Angeles rail transit project, permits the fare zones to overlap as appropriate due to fare structure considerations. This is because the tickets issued by vending machines at the stations will indicate at which station a passenger has boarded and how many zones of travel have been paid for, enabling fare enforcement by roving "Inspector" employees of the transit operation.

Setting a pricing level for the rail transit line considers that transit is a public service, a contributor to quality of life in and among communities. In providing people increased social and economic opportunities by making travel to such opportunities easier and less costly than without transit, some degree of subsidy support to transit operations is ususally considered desirable. Setting lower fares also helps more people avail themselves of the transit facility and its mobility benefits.

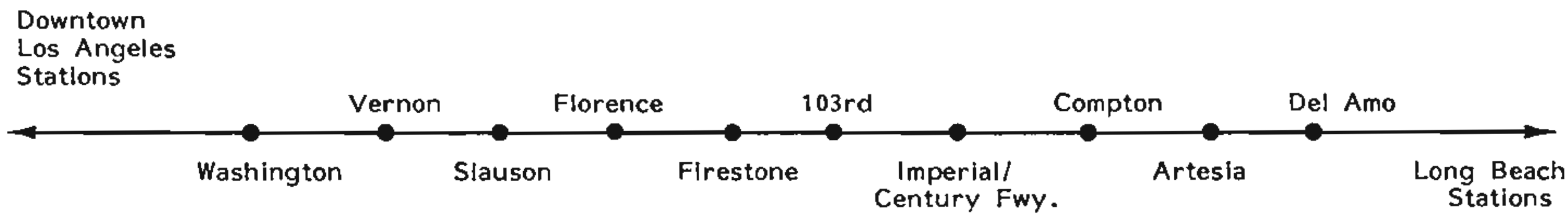
These fare structure and pricing considerations among the communities in the service area of the Long Beach-Los Angeles rail transit project suggest a fare structure, pricing, and characteristics as described in Figure 1-42A. The suggested fares are relatively low and are consistent with fare pricing assumptions used by SCAG in preparing the project's ridership estimates.

The prospective revenue performance of various system alternatives for the project is described in Table 1-42A, based on the suggested fare structure and pricing described in Figure 1-42A. Overall, a high percentage of operating costs recovery is indicated for the Long Beach-Los Angeles rail project relative to most rail transit operations in North America, notwithstanding the use of relatively low fare pricing for the project.

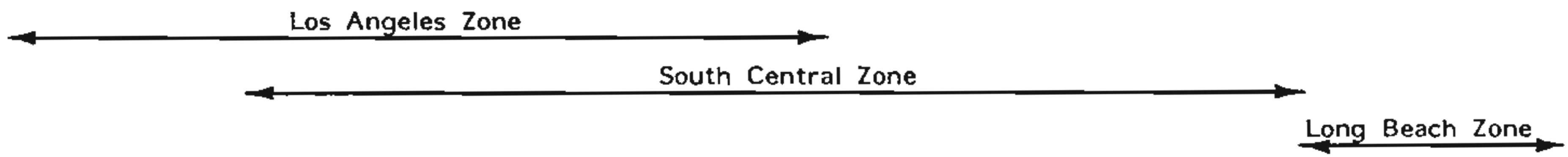
The revenue performance figures do not reflect adjustment due to proposed revisions in bus transit operations associated with the project. However, it appears that reduction in bus transit revenues

FIGURE 1-42A

SUGGESTED FARE STRUCTURE, PRICING AND CHARACTERISTICS



Fare Zone Structure:



Fare Pricing (1984 dollars):

Travel Within One Zone	$0.60	Base Fare
Travel Between Adjacent Zones	1.10	2nd Tier Fare
Travel Between End Zones	1.50	3rd Tier Fare

FIGURE 1-42A (Continued)

SUGGESTED FARE STRUCTURE, PRICING AND CHARACTERISTICS

FARE CHARACTERISTICS:

Base Fare	Travel within downtown Los Angeles.
Base Fare	Travel between downtown Los Angeles and north south-central communities, extending to Watts, due to orientation to downtown Los Angeles, and to facilitate access to economic opportunities.
Base Fare	Travel among south-central communities located between downtown Los Angeles and Long Beach, for social purposes and access to community services.
Base Fare	Travel between Century Freeway transitway and south-central communities (transfers will receive fare discount).
Base Fare	Travel within Long Beach, but extending to Del Amo to facilitate park-and-ride travel into Long Beach.
2nd Tier Fare	Travel between Century Freeway transitway and downtown Los Angeles or Long Beach (transfers will receive fare discount).
2nd Tier Fare	Travel between Compton (as principal south-central economic and civic center) and downtown Los Angeles or Long Beach.
3rd Tier Fare	Travel between downtown Los Angeles and Long Beach (as principal economic and civic centers at opposite ends of line).

TABLE 1-42A

REVENUE PERFORMANCE OF SYSTEM ALTERNATIVES[1]

System Alternative[2]	Total Weekday Ridership[3]	Percentage of Trips: Within One Zone	Percentage of Trips: Between Adjacent Zones	Percentage of Trips: Between End Zones	Average Fare[4,5]	Annual Revenue[4] (Millions)	Annual Operating Costs[4,6] (Millions)	Percentage of Costs Recovery	Average Subsidy per Passenger[4]
Broadway/ Spring, At-Grade	54,446	20.1	75.6	4.2	$1.02/.51	$ 8.33	$13.23	63	$0.30
Flower St. Subway	54,702	20.1	75.6	4.2	$1.02/.51	$ 8.37	$12.54	67	$0.25
Olympic/9th Aerial	76,303	20.2	76.7	3.1	$1.01/.51	$11.67	$13.54	86	$0.08
Olympic/9th Aerial w/ LA River Route	70,444	19.4	77.3	3.3	$1.02/.51	$10.78	$10.78	84	$0.10

[1] Based on zone fare structure and pricing as defined in Figure 1-42A and SCAG origin-destination analysis.

[2] System alternatives are representative of using any mid-corridor alternative, and any of Long Beach alternatives LB-1, LB-2, or LB-4, except as noted, with respect to patronage.

[3] Year 2000 estimates per SCAG, based on fare price of $0.07 per mile (current dollars) and including operational Century Freeway transitway.

[4] 1984 dollars.

[5] First figure is the undiscounted fare price for average trip; second figure is the average fare received per passenger after accounting for fare discounts for senior citizens, students, passholders, transfers, etc.; discount rate per SCRTD projections for 1988.

[6] Per PB/KE.

Source: Los Angeles County Transportation Commission, 1984.

are commensurate with reduction in bus transit operating costs resulting from reduction in bus miles traveled in the project area associated with the project.

The revenue performance figures indicate that existing transit subsidy sources, including Proposition A, will support the project's net costs of operation.

I-426 Streets and Utilities

Construction of any of the at-grade alternatives would require extensive modifications to and, in some cases, total reconstruction of city streets and the utility systems underneath them in all three corridor segments, but particularly in downtown Los Angeles and in Long Beach.

I-426.1 Streets

City streets are generally crowned (higher at the center than at the curbs) in order to provide effective drainage during storms; the streets in downtown Los Angeles have particularly steep center-to-curb slopes. This sloped street section is incompatible with the requirements of a rail transit line, which can tolerate only minimal side-to-side sloping and very modest forward grades (no more than 6 percent).

In most locations, city streets would be rebuilt to provide the flat section required by the rail transit line. Street intersections would be modified to allow transit vehicles to cross intersections and make turns at a relatively constant grade. In those cases where transit vehicles would be operated in the outside lane adjacent to the curb, drainage facilities would be required to keep the trackway free of runoff water that concentrates in the street gutter. Fewer modifications would be required where tracks go down the center of a street and only a small slope would be required to drain the track area. If the transit median is built on Atlantic Avenue in Long Beach, greater modifications to the street would be required in the form of different elevations for the transit median and traffic lanes. In all corridor locations, loop type traffic detectors for traffic signal systems would be modified to accommodate the rail transit system and its operation.

I-426.2 Utilities

Virtually all utility lines in major urban areas are located beneath city streets; outer traffic and parking lanes have been popular locations for all types of utilities. Placing rail transit tracks in the streets of Los Angeles and Long Beach would require some relocation of electric and telephone lines, gas mains, sewer lines, storm drains and, to a lesser extent, water mains. This would be necessary to prevent accidental damage during construction but, more importantly, to provide service access once the tracks are in place.

In the mid-corridor, utilities that cross the tracks perpendicularly would generally not require relocation or modification. However, major relocations would be required in the vicinity of Compton Avenue (particularly storm and sewer mains) in the event that alternative MC-2 (Compton Grade Separation) is implemented.

Utility relocation would be greatest in Los Angeles due to the density of utilities in that area. While the at-grade alternative (LA-1) would require the greatest amount of utility work, some relocation would be needed for the subway alternative and the aerial alternative (in the area of column footings).

Some overhead utility wires, street lights, and traffic signals would require modification and/or relocation at various points throughout the corridor.

I-430 RAIL FREIGHT OPERATIONS

All of the proposed rail transit system alternatives described in Section 230 of this chapter would share the right-of-way with freight operations of the Southern Pacific Transportation Company along its Wilmington Branch between downtown Los Angeles and Cota Crossing. South of Cota Crossing, it is assumed that SPTC would abandon its East Long Beach Branch, thus leaving exclusive use of the right-of-way to rail transit operations. If this should occur, the transit line would join the active SPTC right-of-way at Washington Boulevard in Los Angeles and leave it at Cota Crossing. While there is sufficient room at virtually all points along this route to accommodate the two-track rail transit system and SPTC tracks, several branch-line junctions and industrial spur turnouts would necessitate either the construction of structures to grade separate the lines or the crossing at-grade of the two operations, one passenger and one freight.

Three grade separations are planned over rail lines where there is considerable rail freight traffic (see Figure I-43A). These all would be needed for each of the three mid-corridor alternatives:

- At Slauson Junction, the rail transit tracks would cross over the SPTC Wilmington Branch track from the west side north of that point to the east side south of that point. In addition the transit project would cross over the Santa Fe railroad track, Slauson Avenue, and tracks of the SPTC Randolph Street "La Habra" Branch.

- The rail transit tracks would cross over the SPTC San Pedro Branch at Dominguez Junction, Alameda Street, and Santa Fe Avenue. The transit project would stay on the east side of the SPTC tracks.

- At Cota Crossing the rail transit tracks would cross over the Union Pacific railroad track and, assuming current SPTC plans

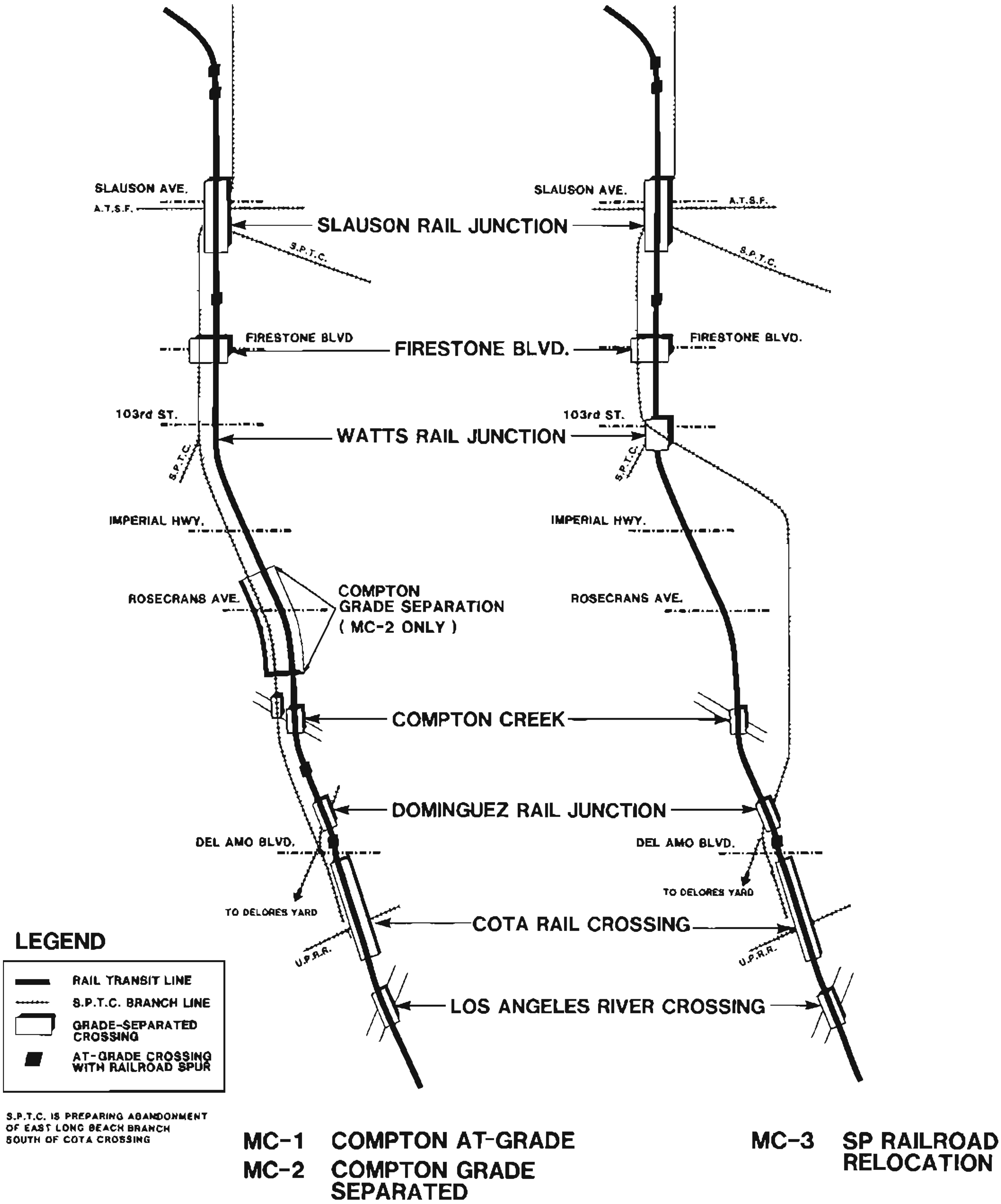


Figure I-43A

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Rail Transit / SPTC Track Configuration
PARSONS BRINCKERHOFF / KAISER ENGINEERS

for abandonment of the East Long Beach Branch, would continue in the vacated SPTC right-of-way.

A fourth grade separation would be built at Watts Junction if alternative MC-3 (SPTC Railroad Relocation) is implemented, in order to pass over the rerouted Wilmington Branch traffic.

In addition to mainline crossings in the mid-corridor area, there are 4 active spur lines which serve industries located along the SPTC Wilmington Branch and which would cross the rail transit tracks. Due to present and anticipated levels of freight rail traffic on these spurs, crossings with the rail transit tracks would be made at-grade. Figures from the Southern Pacific Transportation Company for 1983 show approximately 4 switcher trains a day on the Wilmington Branch, most less than 20 cars in length. Forecasts of future traffic indicate that the majority of traffic growth on the line would be unit (container) trains operating between classification yards in Los Angeles and the ports of Los Angeles and Long Beach. These unit trains would not use the industrial service spurs.

I-500 CONSTRUCTION SCENARIO

I-510 GENERAL

The following subsection generally discusses the overall construction process for the proposed project. Impacts are discussed in Chapters III and IV.

The project is scheduled to be constructed during a 36-month period. Construction on the project would begin simultaneously at several locations along the selected route to accommodate problem areas requiring lengthy construction times and to bring the various segments to completion at approximately the same time.

Existing rail rights-of-way, bridge structures, and embankments would be used wherever possible. The electrical power for the entire rail transit project would be supplied by a system of substations located about 1½ miles apart. The electrical power would be brought from the substations to the rail line by overhead wires. Overhead-wire support poles would be contained within proposed rights-of-way, generally constructed of concrete or steel and placed on the project centerline or within the existing sidewalk at approximately 80-foot intervals. They would be erected at about the same time the tracks are laid.

Many contractors specializing in various methods of construction would be working on the project for the overall length of the construction period. The physical construction would involve the method that is most suitable for each segment of the project. A typical sequence of construction activities for the entire rail transit project is shown in Table I-51A.

Construction of the project would follow all applicable local, state, and federal laws for building and safety. Equipment used on the project would be fitted with mufflers and spark arresters. Standard construction methods would be used for traffic, noise, vibration, and dust control, consistent with all applicable laws. Working hours would be varied to meet special circumstances.

Disposal sites for excess or contaminated materials coming from the proposed project are as follows (Table I-51B):

TABLE I-51A

TYPICAL SEQUENCE OF CONSTRUCTION ACTIVITIES*

Activity	Tasks	Average Time Required (Months)
1. Survey	Locate utilities, establish R/W and project control points and center lines, relocate survey monuments.	4-6
2. Site Preparation	Relocate utilities and railroad (both temporarily and permanently), clear and grub ROW (demolition), establish detours-haul routes, erect safety devices and special construction equipment, construct equipment yards, stockpile materials.	12-18
3. Heavy Construction	Construct maintenance yards, tunnels, bridges, aerial structures, street guideways, aerial and subway stations, trenches, piles, piers and columns, and dispose of excess material. Rebuild roadways and sidewalks.	24-36
4. Medium Construction	Lay ballast and track, construct surface stations, drainage, girders, backfill, build noise walls, pave streets. Construct at-grade stations and parking lots.	12-24
5. Light Construction	Finish work, install all system elements (electrical, signals, and communication) landscaping, signing and striping, close detours, clean-up and test system (debug).	6-12
6. Open Project	--	

* Some of these activities would overlap or be conducted simultaneously, which would decrease construction time.

Source: PB/KE, 1984.

TABLE I-51B

DISPOSAL SITES

Material	Class of Site	Location
Toxic (hazardous)	Class I	BKK site in West Covina
Unusable (organic mixed)	Class II	Monterey Park and/or Puente Hills
Asphalt, Concrete	Recycle	Irwindale
Usable backfill	Class III	Nearby landfill sites or ongoing construction projects

Source: PB/KE, 1983.

Haul routes to disposal sites would be predetermined by agreement with local authorities prior to construction. They would follow streets and highways forming the safest or shortest route with the least adverse effect on traffic, residences, and businesses.

Each of the proposed alternatives would require differing construction times, materials, and methods. See Table I-51C for estimated construction quantities for each alternative. Lengths of time required to construct each alternative are shown on Table I-51D.

I-520 TYPICAL CONSTRUCTION METHODS

I-521 Utility Relocation and Street Closures

Prior to beginning construction it would be necessary to relocate or modify all utilities and underground structures which would conflict with laying track and building subways, aerial guideways, station structures and yard facilities. The utilities would be modified and relocated away from underneath the proposed facilities. Generally, utility relocation would take approximately 12 to 14 months to complete. During this time it would be necessary to occupy at least two traffic lanes at one time. It is possible in some instances that block-long sections of both Long Beach and Los Angeles Streets would be closed temporarily. Pedestrian access (sidewalks) would remain open. Special facilities, such as handrails, fences, and walkways, would be provided for the safety of pedestrians.

For aerial guideways in downtown Los Angeles, it may be possible to intentionally locate foundation sites for support columns in areas where there are minimal or no utilities below. Where it is not

TABLE I-51C

ESTIMATED CONSTRUCTION QUANTITIES FOR EACH ALTERNATIVE (Includes Stations)[1]

Alternative	Excavation Material Excess	Backfill	Ballast-Subballast	Concrete	Concrete Beams Precast	Pavement Restoration Asphalt/Concrete	Walkway-Decking	Rebar	Steel Rails	Timber-Formwork Shoring	Timber Ties
	IN CUBIC YARDS							IN POUNDS		IN CUBIC FEET	
LA-1	70,000	38,000	N.A.[2]	8,000	87,000	13,000	2,000	1,375,000	3,868,000	66,000	N.A.[2]
LA-2 (w/o extension)	203,000	70,000	N.A.[2]	41,000	N.A.	12,000	6,000	6,090,000	2,989,000	462,000	N.A.[2]
LA-3 (w/o extension)	42,000	11,000	N.A.[2]	74,000	145,000	6,000	2,000	4,675,000	2,631,000	119,000	N.A.[2]
MC-1 (w/o modifying SPTC)	265,000	39,000	881,000	8,000	58,000	10,000	4,000	1,891,000	12,454,000	46,000	233,000
MC-2 (trench only)	961,000	266,000	157,000	172,000	N.A.	N.A.	16,000	31,693,000	2,687,000	1,529,000	77,000
MC-3	2,000	N.A.	42,000	1,000	3,000	N.A.	1,000	184,000	4,027,000	6,000	90,000
LB-1	56,000	37,000	N.A.[2]	5,000	N.A.	9,000	1,000	261,000	2,639,000	70,000	N.A.[2]
LB-2	30,000	18,000	N.A.[2]	4,000	N.A.	5,000	1,000	N.A.	2,548,000	N.A.	N.A.[2]
LB-3	13,000	15,000	49,000	3,000	N.A.	3,000	1,000	151,000	4,162,000	20,000	15,746
LB-4	60,000	40,000	N.A.[2]	5,000	N.A.	10,000	1,000	264,000	2,912,000	73,000	N.A.[2]
Yards & Shops	40,000	121,000	9,000	N.A.	N.A.	7,000	1,000	N.A.	804,000	N.A.	N.A.[2]

[1] Does not include materials for electrical equipment and miscellaneous fixtures made of glass, brick, stone, wire, plastic, fabric, and aluminum. These materials make up between 5 and 15 percent of all materials used on project.

[2] Data is not available to quantify the amount of material needed for ballast and ties for these alternatives.

Note: All figures rounded to nearest thousand.

Source: PB/KE, 1984.

TABLE I-51D

ESTIMATED LENGTHS OF TIME REQUIRED

TO CONSTRUCT EACH ALTERNATIVE[1]

Alternative	Length in Miles	Length of Time Required (Months)
LA-1	4.25	24-30
LA-2	2.64 (at-grade) 0.72 (cut-and-cover)	30-36
LA-3	2.84 (elevated) 0.35 (at-grade)	20-24
MC-1	15.30 (entire mid-corridor)	20-24
MC-2	2.20 (trench only)	30-36 (non-additive, would run concurrent with the construction of MC-1)
MC-3	5.96 (SPTC bypass)	6 (non-additive, included in construction time for MC-1)
LB-1	2.9[2]	24-30
LB-2	2.8[2]	24-30
LB-3	5.0[2]	20-24
LB-4	3.2[2]	24-30

[1] Construction activities in each corridor segment would need to occur simultaneously for the project to be completed within 36 months.

[2] Distance is measured from point where alternative leaves the existing SPTC right-of-way.

Source: PB/KE, 1984.

possible to avoid existing utilities, they would have to be modified or relocated. Utilities located above ground along Olympic Boulevard would be moved away from the aerial guideway. They could be moved from one side of the street to the other, placed underground, or relocated to another street, whichever is most appropriate.

The mid-corridor alternatives would not require extensive relocation of utilities or cause significant disruption to neighborhoods and traffic. Relocation of utilities would be limited to those that cross perpendicularly to the proposed alignment, a few overhead power and communication lines, and minor underground drains and pipelines existing parallel to the SPTC track in the ROW. Most of these utilities could be relocated during the actual construction phase.

Construction of alternative MC-2 (Compton Grade Separation) would require that all existing utilities crossing perpendicular to the proposed trench be relocated. Generally the utilities would be rerouted to cross with the new bridge structures. The existing drainage culvert on the east side of the SPTC ROW would be modified and possibly connected to a larger capacity system that would be constructed on the west side of the proposed trench.

Temporary rerouting of SPTC freight trains will be necessary during construction of the light rail tracks. Temporary tracks would be built on one side of the existing ROW and used during construction.

Minor streets and alleyways would be temporarily closed. Major cross streets would require partial closure, half of the street at a time, while relocating utilities and constructing the light rail trackbed. Two-way access would be allowed on the other half of the street. After the trackbed is constructed across a local street and the roadway is restored to its permanent condition, vehicles could resume original traffic patterns.

The rail transit project would either cross over or pass under major freeways, including the Hollywood Freeway (101), Santa Monica Freeway (I-10), Artesia Freeway (91), San Diego Freeway (I-405), and Long Beach Freeway (7). In the case of Routes I-10, 91, and I-405, construction would be within existing structures and would not interfere with normal traffic patterns.

During construction of LA-1 (Broadway/Spring Couplet), some of the Hollywood Freeway travel lanes would need to be closed temporarily. Temporary lane closures would generally occur during non-peak traffic hours (late night, weekends, and possibly middays) due to the large volumes of commuters using the Hollywood Freeway in the early morning and evening hours. A total shutdown and redirection of traffic in one direction may be required during late night and early morning hours to set long spans of aerial guideway in place.

The Cota Crossing involves an aerial guideway above the Long Beach Freeway. Similar freeway lane closures, as described above for the

Hollywood Freeway, would most likely be necessary. The Century Freeway would, in all probability, be constructed after the rail transit project and thus not be affected by construction activities. In any event, construction on both projects can be phased so as to minimize potential conflicts.

Equipment used for the utility relocation phase of work would include: diamond saws, pavement breakers, jackhammers, compressors, backhoes, small cranes, front-end loaders, compactors, dumptrucks, and welding machines.

I-522 Trackwork - Downtown Los Angeles and Long Beach

It is estimated that it would generally take 60 days to construct a one-block section of the line at-grade, an average block being 300 to 600 feet in length. Clearing and utility relocation would occur first, proceeding one block ahead of guideway construction, with a 30-day overlap of construction work between any two adjacent blocks.

The actual construction of the track bed and installation of the tracks for streets with single roadbeds (e.g., within the Broadway/Spring (LA-1) and Atlantic/Long Beach (LB-2) alternatives) would consist of digging out a section of the existing street for both the northbound and southbound routes along the full at-grade alignment. A paved track section would be used for downtown city streets and areas where mixed traffic (both light rail transit and autos) would occur. For at-grade alternatives where reserved medians are used (e.g., Washington Boulevard and possibly Atlantic Avenue) open ties and ballast would be used unless it is determined during final design that width restrictions or tuning movements require a "mountable" median, which would be paved.

I-523 Trackwork - Mid-Corridor

At-grade sections with little or no pavement to remove would be primarily located in the mid-corridor area. Typical construction methods would involve the temporary relocation of the SPTC tracks to allow for the clearing and grading of a new roadbed for the new rail transit and relocated and rebuilt SPTC tracks. After rough grading is completed, a foundation would be dug and subballast, ballast, and ties would be put in place for the rail transit. Cross streets would be improved and repaired after installation of the tracks. A fence would be erected on both sides of the rail transit tracks, except at street intersections where automatic crossing gates would be installed.

Generally, construction would move rapidly because there would be no major relocation of utilities, creation of detours, removal and replacement of pavement, or construction of structures. It is estimated that it would generally take 90 days to construct 1½ miles of transit guideway and/or modification of SPTC tracks. The most intense construction activities would take place at the at-grade crossings for local streets.

Equipment used for construction of the tracks and stations would be similar to what is required for relocation of the utilities with the addition of track-laying equipment, paving machines, concrete mixers, and finishers.

I-524 Aerial Guideway

Aerial structures are required for the northern portion of alternative LA-1 (Broadway/Spring Couplet), alternative LA-3 (Olympic/9th Aerial) and at several locations in the mid-corridor. Generally, foundations for aerial guideway columns would be spaced approximately 80 feet apart, although actual distances may vary considerably. Major construction activities would take place at these locations. A one-mile segment of aerial guideway could require as little as 6 months to complete. Three or more columns could be erected simultaneously with work occurring in more than one block at a time.

Typical construction methods for the aerial segments would involve four phases of work: foundation construction, installation of guideway columns, attachment of interlinking concrete girders, and station construction.

Construction on the column foundations could begin at the same time that the utilities are being relocated. Depending upon the subsurface geology at a particular site, individual decisions would be made to use either drilled caissons or deep-set piles to support the column foundations. The minimum working area required for installation of the caissons would be at least 12 feet, one traffic lane width, with an additional 24 feet (two lanes) required for ingress and egress during working hours. This method of constructing the foundation is the least disruptive.

Where soil conditions are poor (too much groundwater or unstable materials), deep-set piles which must be impact driven or drilled into place are necessary. Attached to these piles would be wide-spread column footings (20 feet by 20 feet) that would require a minimum of 36 feet (3 traffic lanes) of working space at all times during installation. Closure of two additional lanes of traffic during working hours may be necessary for equipment access. The deep-set pile method is one of the most disruptive techniques available for constructing foundations. The Los Angeles Basin is potentially subject to strong groundshaking and liquefaction during a major seismic event. It may be necessary to establish all aerial segments on wide-spread footings and deep-set piles wherever possible.

Once the foundations are in place, the columns would be attached. The columns would be cast-in-place reinforced concrete or pre-cast concrete. Pre-cast columns would be formed off-site and brought to the foundations by truck, hoisted into place with cranes, and bolted down. Cast-in-place columns would be erected by attaching steel reinforcing to the foundations and framing a wooden falsework into which the concrete could be poured.

As soon as the columns are set, "T" heads would be attached atop each one, and two concrete box girders would be placed linking the individual columns. The concrete box girders would be transported to the site by truck and put into place by cranes. It may be possible to conduct most of the column construction and girder placement during late night hours to minimize disruption on local streets.

Fitting the aerial structure of LA-1 in and around Union Station and along the Hollywood Freeway would require special construction methods. Staged construction would undoubtedly have to be used to ease the access and detour problems on the Hollywood Freeway. It is likely that 4-foot-square guideway support columns would be used within the shoulder and median areas of the freeway to minimize potential conflict with automobiles.

Equipment used for construction of the aerial guideway would include drill rigs/augers, cranes, pile drivers, jackhammers, compressors, pumps, dump trucks, front-end loaders, paving machines, and large tractor-trailer rigs to carry girders and miscellaneous tools.

1-525 Subway

In the downtown Los Angeles area, mining or tunneling is not possible due to the shallow depth of the proposed facility. Instead, cut-and-cover construction methods would have to be used. This construction technique would generally consist of cutting open Flower Street to an adequate depth to permit support of existing utility lines and to set piles or other means of retaining the excavation. After the street opening (cut) was covered with a temporary decking so traffic and pedestrian movement could continue, excavation could proceed to the required depth. The appropriate concrete structure (station or tunnel) would then be built and backfilled. Cut-and-cover subway construction would require very intense activities within the street section to be used. LA-2 (Flower Street Subway) would require approximately 36 months to complete, with major activities occurring throughout the entire period.

The construction of the 7th Street station and half-mile tunnel section would involve two separate operations, excavating and concreting. Both operations would be carried out through openings in the temporary street decking. The excavating and concreting would progress from one end of the station and/or tunnel to the other, with concreting taking place immediately after excavation, reducing construction time. Construction activities would be coordinated with Metro Rail as much as possible to minimize disruption.

Excavation would be done by cranes with clamshell buckets; blasting would not be used. The excavated material would be removed at an average rate of between 800 and 900 cubic yards (cy) per day and hauled away by trucks along predesignated disposal routes. The excess material could be disposed of at either an approved landfill site or a concurrent construction project where a large amount of fill would be needed.

The cut-and-cover excavation and temporary decking would need to be fully supported. Adjacent building foundations could also require special support structures.

The excavated cut could require dewatering during the construction period, in which case excess water would be pumped out of sump pits as the excavation proceeds downward. Gravity flow would be used to force the water into the low lying sumps. Then it would be passed into a settling basin to remove solids before being pumped into the local drainage system. The disposal of this underground wastewater may also require treatment to eliminate sediments impregnated with oil and tar. This could be done by an oil/water separator and the oil removed by truck to a Class I or II disposal site.

Portland cement concrete (PCC) mix would be used for concreting the station and tunnel. When the concrete structures were completed they would be water-proofed and backfilled, and the tracks, overhead wire supports, and other fixtures would be installed inside. It would be necessary to permanently shore up the sides of the excavation to provide support for adjacent buildings.

When the underground work was complete, one-half of the street would be restored at a time to maintain city street traffic flow. The backfill material would be trucked in over the same haul route used to remove excess material, dumped in place and compacted. Due to soil characteristics, it may not be possible to use excavated material for backfill. A local source of borrow material would have to be located.

For alternative LB-3 in Long Beach (Los Angeles River Route), a double concrete box 33 feet wide would be constructed beneath Willow Street as a new underpass. The hole for the concrete box would be excavated by tunneling under the existing street. The sides of the excavation would be shored up while the structure is erected. Local traffic would continue to use Willow Street during the construction period. There would be other minor modifications and relocations of existing structures on and adjacent to the LB-3 alignment.

Additional equipment required for cut-and-cover subway construction not used on other segments would include large cranes, clamshell buckets, drive underbins, concrete tremie pipes, shoring, and dewatering apparatus.

I-526 Trench, Retaining Wall, and Fill Construction

Generally, digging trenches, filling depressions, and building retaining walls would require a very intense effort over the entire construction period. Therefore, it is assumed that construction activities would cause disruption for a 36-month period over the entire 2.2-mile length of the Compton Grade Separation (MC-2).

Construction of the retained fill at Firestone Boulevard in the mid-corridor and at San Francisco Avenue on LB-3 would require approximately 9 months.

The trench would be constructed to separate the rail transit and freight traffic from local vehicular traffic. Five bridges would be constructed across the trench.

Approximately one million cubic yards of material would be excavated from the proposed trench. This material would be excavated using large bulldozers, earthmovers, front-end loaders, drive under bins, and tractor-trailer rigs. Excess material would be transported to approved disposal sites, possibly to the Century Freeway Project approximately one mile north of the proposed trench.

The SPTC track would be approximately 30 feet below-grade. Additional space for an access road would be allowed for between the SPTC track and a 10-foot retaining wall built to support the embankment for the rail transit tracks. The two rail transit tracks would be approximately 10 feet above the SPTC track (20 feet below existing street grade) on a 26-foot-wide embankment.

The three retaining walls which would support the sides of the trench and the embankment for the rail transit tracks would be erected either on a continuous-spread footing or pile footing, depending on soil conditions. If poor soil conditions existed in the area of the proposed trench, the pile footing would be selected. In addition, the walls of the trench may be supported by sheet piles on both sides, which would be driven in during construction. The side walls would be constructed in segments beginning at one end of the trench and continuing to the other. After the walls were completed, backfill would be placed on the retained side and compacted. The track foundation, subballast, ballast, ties, steel rails, and overhead wire system would be placed in the trench when the retaining walls are completed.

Five bridges for Rosecrans Avenue, Elm Street, Compton Boulevard, Myrrh Street, and Alondra Boulevard would be constructed. Rosecrans Avenue, Compton Boulevard, and Alondra Boulevard must be temporarily rerouted during the construction of their permanent structures. Myrrh and Elm Streets would be closed throughout the construction period. Traffic from these streets would be rerouted to either Rosecrans Avenue, Compton Boulevard, or Alondra Boulevard. The new abutments for all the bridges would be built during construction of the trench retaining walls. After the bridges were complete, they would be opened to east-west through traffic while construction on the remainder of the trench continued. These bridges alone could take between 18 and 24 months to complete.

A reinforced concrete deck, with intermittent openings for ventilation of the train exhaust below, would be placed over the trench between Compton Boulevard and Myrrh Street (1400 feet). The proposed deck might become the floor of an open mall in front of the Compton City Hall. The concrete deck would be put in place after the retaining walls for the trench were completed.

The LB-3 (Los Angeles River Route) alignment is grade separated as a depression along San Francisco Avenue (easterly side of the Long Beach Freeway) between 6th and 4th Streets. This depression would require filling before the rail transit tracks could be put in place. Retaining walls would be constructed to hold the fill. Fill material could be obtained from elsewhere on the project or from local commercial sources. A portion of San Francisco Avenue and the Long Beach Freeway (Route 7) would need to be realigned approximately 20 feet to the west to accommodate the retained fill. This realignment would take place prior to construction of the retained fill in order to maintain traffic flow through the work area. San Francisco Avenue is adjacent to the southerly terminus of the Long Beach Freeway. The north and southbound lanes of the Long Beach Freeway are divided by a wide, landscaped median between 6th Street and Ocean Boulevard. Realigning San Francisco Avenue and a portion of the northbound lanes of the Long Beach Freeway 20 feet westerly into this median should have no effect on the surrounding area.

The existing embankment on which the SPTC tracks are located at Firestone Boulevard would require reconstruction and widening to accommodate the two rail transit tracks. There would be a single-track expansion of the Firestone Boulevard Bridge with the rail transit tracks located on the easterly side. New retaining walls would, be constructed to hold the fill needed to widen the embankment.

Retaining wall construction for both San Francisco Avenue and Firestone Boulevard would be similar to that described for the Compton Grade Separation (MC-2).

1-527 Stations

All stations would be constructed simultaneously with the various segments of the system. At-grade stations in downtown Los Angeles and Long Beach would be constructed approximately 1/2 to 1 mile apart. These stations would be constructed from standard building materials, such as brick, concrete, steel, and heavy plastic, which are durable and resistant to vandalism. The stations would be similar to existing bus shelters in downtown Long Beach but larger in size.

At-grade stations in the mid-corridor would generally be located at the intersections of main highways and streets. These stations would typically be larger than downtown stations and some would include park-and-ride lots (see Section 252 for map). Park-and-ride lots require paving and installation of lighting and fences. Subway (LA-2 - Flower Street) and below-grade stations (MC-2 - Compton Boulevard) would be constructed as part of the concrete structures built to retain the light rail guideway.

Aerial guideway station construction would require additional foundation columns to support the platform.

I-528 Yards and Shops (Maintenance Facilities)

Construction activities associated with the maintenance facilities would be confined to the proposed site and would not spill over into adjacent areas. The foundations of the proposed structures and rail transit trackbeds would be constructed first with the associated buildings and track to follow. The entrance and exit tracks for the yards would be erected at the same time as the tracks passing the yard site are constructed. The entrance and exit tracks may be at-grade or be elevated crossovers, whichever is appropriate. Construction of the yards and shops would take between 24 and 36 months to complete. Yard and shop construction could begin early in the overall construction process and should run concurrent with that of the various segments.

I-529 Safety and Security During Construction

Safety and security during construction would basically consist of providing for the safe passage of vehicles and pedestrians through the construction area and protecting construction sites and equipment/material storage areas from vandalism and theft.

All standard construction procedures would be implemented to ensure the safety of the public. Detours and existing roadways through and around construction zones would be well lighted and signed. Barriers (e.g., Jersey barriers) would be used to separate the public from work areas where necessary. Pedestrian pathways would be cordoned off and protected from traffic and flying objects. Standard traffic control procedures would be used, including flaggers, cones, and flashing lights.

Construction areas would be fenced and lighted wherever appropriate. Some areas, such as material and equipment storage sites, would require perimeter patrols and night time security personnel.

I-600 COSTS

I-610 CAPITAL

All capital costs associated with implementing the Long Beach-Los Angeles Rail Transit Project have been estimated based on the most current conceptual designs and operations plans. The cost estimates are fully documented in Working Paper 7.9, "Cost Estimates of Alternatives" (PB/KE, January 1984) and are summarized here in Tables I-61A and I-61B. Design information is provided in the Concept Design Report, Volumes I and II (PB/KE, September 1983), while vehicle and maintenance yard requirements are presented in the Operations and Maintenance Plan (PB/KE, January 1984).

The figures presented in Table I-61A are summaries by major corridor segment (e.g., LA-1, LB-3, etc.). All figures reflect 1983 prices and do not include allowances for inflation.

The cost for the two yard facilities is estimated at $51.7 million, which should vary only slightly with the final choice of alignment. Estimated requirements range from 44 to 73 vehicles, depending which alternative is selected. The acquisition cost for vehicles, therefore, ranges from $49.5 million to $80.8 million.

Estimated total costs for selected system alternatives (combinations of segments) are shown in Table I-61B. These costs reflect the sum of segment costs, yard and shop costs, and vehicle costs. It should be noted that the alternatives including segment LA-3 (Olympic/9th Aerial) are more expensive due to the need to provide 3-car trains to accommodate much higher anticipated ridership levels.

I-620 OPERATIONS AND MAINTENANCE

Annual costs for operating and maintaining the rail transit system were estimated for four of the system alternatives. These costs were calculated using preexisting 1984 unit costs for labor, materials, and energy and are summarized in Table I-62A.

TABLE 1-61A

SUMMARY OF CAPITAL COST ESTIMATES BY CORRIDOR SEGMENT

(Millions of 1983 Dollars)

Corridor Segment	Construction or Procurement	E/M/A/C[1]	Total[2]
LA-1 Broadway/Spring Couplet	$ 48.4	$ 22.4	$ 70.8
LA-2 Flower Street Subway	53.5	24.8	78.3
LA-3 Olympic/9th Aerial	52.2	24.2	76.4
MC-1 Compton At-Grade	108.9	50.5	159.4
MC-2 Compton Grade Separation	201.3	93.5	294.8
MC-3 SPTC RR Relocation	117.0	54.2	171.2
LB-1 Atlantic Avenue Two-Way	16.5	7.7	24.2
LB-2 Atlantic/Long Beach Couplet	20.8	9.6	30.4
LB-3 LA River Route	24.2	11.2	35.4
LB-4 Atlantic/Pacific Avenue Loop	20.9	9.7	30.6
Yards and Shops	35.3	16.4	51.7
Vehicles (44-73)	49.5 - 80.8	23.0 - 37.5	72.5 - 118.3

[1] Engineering and Management - 15%
Agency Cost - 7%
Contingency - 20% of total

[2] The total does not include right-of-way.

Source: PB/KE, 1983.

TABLE I-61B

SUMMARY OF CAPITAL COST ESTIMATES BY SYSTEM ALTERNATIVE

(Millions of 1983 Dollars)

System Alternative	Construction	E/M/A/C[1]	Total[5]
LA-1/MC-1/LB-4[2]	$278.2	$129.0	$407.2
LA-1/MC-2/LB-4	370.6	171.9	542.5
LA-2/MC-1/LB-4	272.8	126.6	399.4
LA-2/MC-2/LB-4	365.2	169.5	534.7
LA-3/MC-1/LB-4	294.4	136.6	431.0
LA-3/MC-1/LB-3	283.7	131.6	415.3
LA-3/MC-2/LB-4[4]	383.3	177.7	561.0
LA-2/MC-1/LB-3[3]	268.4	124.7	393.1

[1] Engineering and Management - 15%;
Agency Cost - 7%;
Contingency - 20% of total

[2] Baseline alternative

[3] Low cost alternative

[4] High cost alternative

[5] The total does not include right-of-way.

Source: PB/KE, 1984.

TABLE I-62A

SUMMARY OF ANNUAL OPERATION AND MAINTENANCE COST ESTIMATES

BY SYSTEM ALTERNATIVE

(Millions of Dollars)

System Alternative	Operation	Maintenance	Total
LA-1/MC-1/LB-4 (Baseline)	$ 8.8	$ 4.4	$13.2
LA-2/MC-1/LB-4	8.4	4.2	12.5
LA-3/MC-1/LB-4	8.9	4.6	13.5
LA-3/MC-2/LB-3	8.5	4.3	12.9

Source: PB/KE, 1984.

I-700 POSSIBLE FUTURE EXTENSIONS IN DOWNTOWN LOS ANGELES

As noted in Section I-220, an extensive screening and review process was conducted by LACTC in early 1983 with regional and local transportation and planning agencies to develop alternative alignments for the Long Beach-Los Angeles rail transit project in the context of the Proposition A rail network. For downtown Los Angeles, three alignments were determined as most appropriate and promising for the project's environmental impact and alternatives analysis studies. Initial definition of each of these three alignments included routings extending through the Civic Center area and terminating at Union Station; for two of these alignments, using Figueroa or Flower Streets on the west side of downtown Los Angeles, such routings were defined more or less along the formerly-proposed route of the City of Los Angeles' Downtown People Mover. However, because these two westside routings called for costly subway or aerial sections, the LACTC shortened the two routings to correspond to available funds for the Long Beach-Los Angeles rail project. The Commission determined that under the Long Beach-Los Angeles Rail Transit Project the LA-2 (Flower Street Subway) alternative would be defined as extending only to the Metro Rail 7th and Flower Street station, and that the LA-3 (Olympic/9th aerial) alternative would be defined as extending only to 4th Street. The Commission did decide, however, to assess environmental impacts of possible future extensions of these two alignments to Union Station. It is important to note that in further definition of the Commission's Proposition A rail transit implementation strategy, consideration is being given to possible future extensions of these alignments via Chinatown and Lincoln Heights (on to Pasadena), with the Metro Rail project serving Union Station.

I-710 ALIGNMENTS

I-711 LA-2 Extension: Flower Street Subway

From 7th Street the tracks would continue in a subway north on Flower Street to 1st Street and then turn easterly on 1st to Main Street. There the tracks would turn north, then east along and under the Hollywood Freeway, and finally north to Union Station. The routing of this extension is shown in Figure I-71A.

I-712 LA-3 Extension: Olympic/9th Aerial

At Third Street the line would turn east and go underground through the Bunker Hill area. It would then portal on 1st Street to an aerial line east of Hill Street. The line would continue on 1st Street to Los Angeles Street where it would turn north and proceed to the Hollywood Freeway. After swinging northeast along and over the Hollywood Freeway, it would terminate at Union Station. The routing of this extension is shown in Figure I-71B.

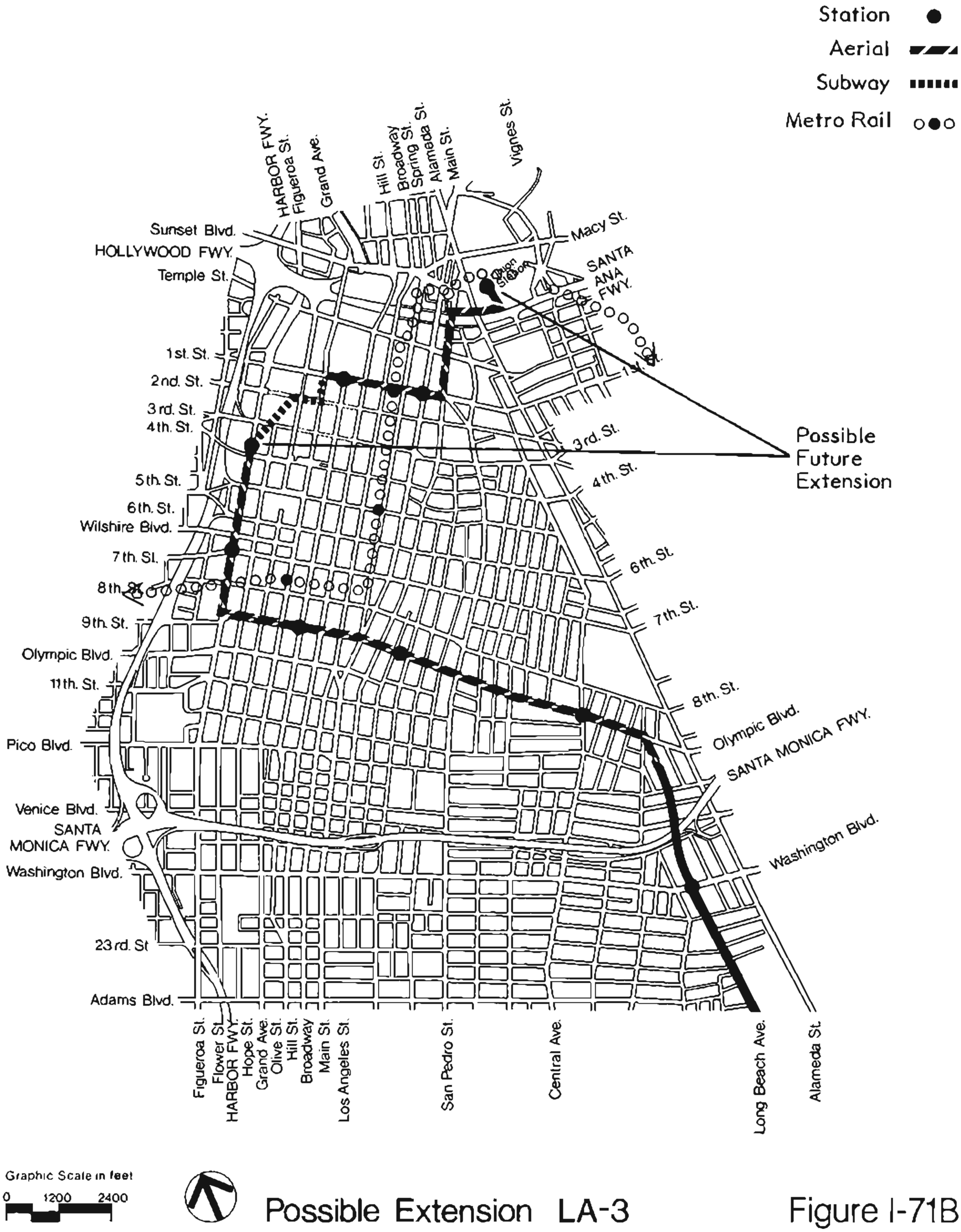
Graphic Scale in feet 0 1200 2400

Possible Extension LA-2

Figure I-71A

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS



Possible Extension LA-3

Figure I-71B

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS

I-720 PATRONAGE

Patronage for the two extended system alternatives was estimated in the same manner as that for the four project alternatives described in Section II-240. Mode split and total ridership are shown in Table I-72A, while total station boardings are shown in Table I-72B.

I-730 STATIONS

Stations for the extended subway and aerial alternatives are described in Table I-73A. All of the subway stations would use side platforms, while the aerial stations would include center platforms. No additional parking is contemplated for these stations.

I-740 CONSTRUCTION SCENARIO OF POSSIBLE EXTENSIONS

The extension of the Flower Street Subway (LA-2) in downtown Los Angeles from 7th and Flower Streets northerly to Union Station would be a considerably more complex construction process and could take up to 24 months longer to complete than the initial phase of LA-2.

Four additional underground stations and 1.7 miles of tunnel would be required. The stations and areas of minimal depth (less than 30 feet) would be constructed using cut-and-cover methods as described for the initial phase of LA-2; however, the majority of the tunnel operation could be conducted by using tunneling machines. Tunneling has less effect on surrounding areas than the cut-and-cover method since the street surface and utilities are not significantly disturbed and there is less dust, noise, and traffic disruption.

Assuming a tunneling rate of between 40 and 60 feet per day in soft ground (as the soil below the downtown Los Angeles area is expected to be), the tunneling operation would take between 6 and 12 months to complete. The amount of excess material to be hauled away (imported backfill, concrete, and steel required for the LA-2 extension) could be as much as four times the amount required for the initial phase (7th Street southerly to 12th Street).

The LA-3 (Olympic/9th Aerial) extension would be 1.5 miles long from 4th and Figueroa Streets (with a short subway section through Bunker Hill) to Union Station. The construction methods and equipment used for the 1.5 miles of guideway extension and three additional stations would be identical to those used for the initial stage. The construction period could be extended an additional 12 to 18 months. Cut-and-cover methods as described for alternative LA-2 (initial phase) would be used to construct the 1350 feet of subway required through Bunker Hill.

TABLE I-72A

MODAL SPLIT AND RIDERSHIP OF SELECTED SYSTEM ALTERNATIVES*

POSSIBLE FUTURE EXTENSIONS

Trip Type	1980 Base Year	Yr. 2000 w/o Project	Flower St. Subway to Union Station	Olympic/9th Aerial to Union Station
Project Boardings	-	-		
Home-work			37,172	44,665
All Other			31,665	38,048
TOTAL DAILY	-	-	68,837	82,713
Corridor Mode Split (Home-Work Trips)				
Via Transit	53,200	78,778	80,169	80,633
Auto Drivers	250,824	271,318	270,288	269,930
Auto Passengers	49,845	61,414	61,053	60,947
TOTAL TRIPS	353,869	411,510	411,510	411,510
Countywide Mode Split (Home-Work Trips)				
Via Transit	394,478	645,581	647,385	647,952
Auto Drivers	3,709,710	4,132,554	4,131,229	4,130,786
Auto Passengers	496,901	644,092	643,613	643,489
TOTAL TRIPS	4,601,089	5,422,227	5,422,227	5,422,227

* Both modeled project alternatives are representative of using any mid-corridor alternative and any of Long Beach alternatives LB-1, LB-2 and LB-4, with respect to patronage.

Source: Southern California Association of Governments, 1983.

TABLE I-72B

PASSENGER LOADINGS BY STATION

EXTENSIONS TO UNION STATION

LA-2 Ext./MC-1/LB-4

Station	Total Boardings
Union Station	2,343
Main Street	2,319
Olive Street	1,335
4th Street	3,433
7th Street	3,898
Pico Boulevard	4,659
18th Street	1,358
Broadway	2,426
San Pedro Street	2,529
Washington Boulevard	1,689
Vernon Avenue	3,301
Slauson Avenue	1,794
Florence Avenue	2,575
Firestone Boulevard	2,786
103rd Street	686
Imperial Highway	7,896
Compton Boulevard	2,373
Artesia Boulevard	2,827
Del Amo Boulevard	3,597
Wardlow Road	3,171
Willow Street	1,287
Hill Street	656
Pacific Coast Highway	3,198
Anaheim Street	1,862
6th Street	1,800
3rd Street[2]	0
1st Street	3,039
TOTAL	68,837

LA-3 Ext./MC-1/LB-4

Station	Total Boardings
Union Station	4,285
Main Street	1,635
Olive Street	1,418
4th Street	1,675
7th Street	7,366
Olive Street	5,416
Maple Avenue	3,233
Central Avenue	3,189
Washington Boulevard	1,580
Vernon Avenue	4,149
Slauson Avenue	2,459
Florence Avenue	5,029
Firestone Boulevard	3,904
103rd Street	1,050
Imperial Highway	9,748
Compton Boulevard	2,709
Artesia Boulevard	3,755
Del Amo Boulevard	3,904
Wardlow Road	3,483
Willow Street	1,380
Hill Street	676
Pacific Coast Highway	3,622
Anaheim Street	1,951
6th Street	1,879
3rd Street[2]	0
1st Street	3,217
TOTAL	82,712

[1] Combines boardings of both northbound and southbound stations of loop.

[2] Proximity of this station to terminal station does not permit data isolation from LARTS model.

Source: Southern California Association of Governments, 1983.

TABLE I-73A

DOWNTOWN LOS ANGELES

STATION LOCATIONS AND CHARACTERISTICS

FOR ALIGNMENT EXTENSIONS

	Profile	Placement in ROW	Platform Location	Additional Parking
Possible Extension of LA-2				
Union Station	subway	-	side	none
Main Street	subway	-	side	none
Olive Street	subway	-	side	none
4th Street	subway	-	side	none
Possible Extension of LA-3				
Union Station	aerial	-	center	none
Main Street	aerial	curbside	center	none
Olive Street	aerial	curbside	center	none

Source: PB/KE, 1983.

I-750 COSTS

I-751 Capital

Full documentation of capital cost estimates for the possible LA-2 and LA-3 extension segments can be found in Working Paper 7.9 "Cost Estimates of Alternatives" (PB/KE, January 1984). Table I-75A summarizes these estimates.

The difference in capital costs between the LA-2 and LA-3 extensions is attributable to the relative expense of subway versus aerial guideway construction.

I-752 Operations and Maintenance

Extending either the subway or aerial alignments to Union Station would require some additional outlay for system operations and maintenance. These additional annual costs summarized in Table I-75B.

TABLE I-75A

SUMMARY OF CAPITAL COST ESTIMATES

FOR POSSIBLE EXTENSION SEGMENTS

(Millions of Dollars)

	Construction	E/M/A/C*	Total
LA-2 Extension Segment	$ 130.1	$ 60.4	$190.5
LA-3 Extension Segment	$ 83.3	$ 38.6	$121.9

* Engineering and Management - 15%
  Agency Cost - 7%
  Contingency - 20% of total

Source: PB/KE, 1984.

TABLE I-75B

ADDITIONAL ANNUAL OPERATION AND MAINTENANCE COSTS

FOR PROJECT EXTENSIONS

(Thousands of 1984 Dollars)

	Operation	Maintenance	Total
LA-2 Extension w/Pacific Loop	$ 480	$ 228	$ 708
LA-3 Extension w/Pacific Loop	442	201	643

Source: PB/KE, 1984.

I-800 RELATED PROJECTS

For purposes of this impact assessment, related projects include those major development activities scheduled for completion before the projected year of operation (2000) which, when combined with the Long Beach-Los Angeles Rail Transit Project, could produce significant adverse cumulative impacts. Appendix 1 includes a description and the present status of each of these projects and Figure I-80A shows their locations. A discussion of the expected cumulative adverse impacts can be found in Section 140 of Chapter III and in the other impacts chapters.

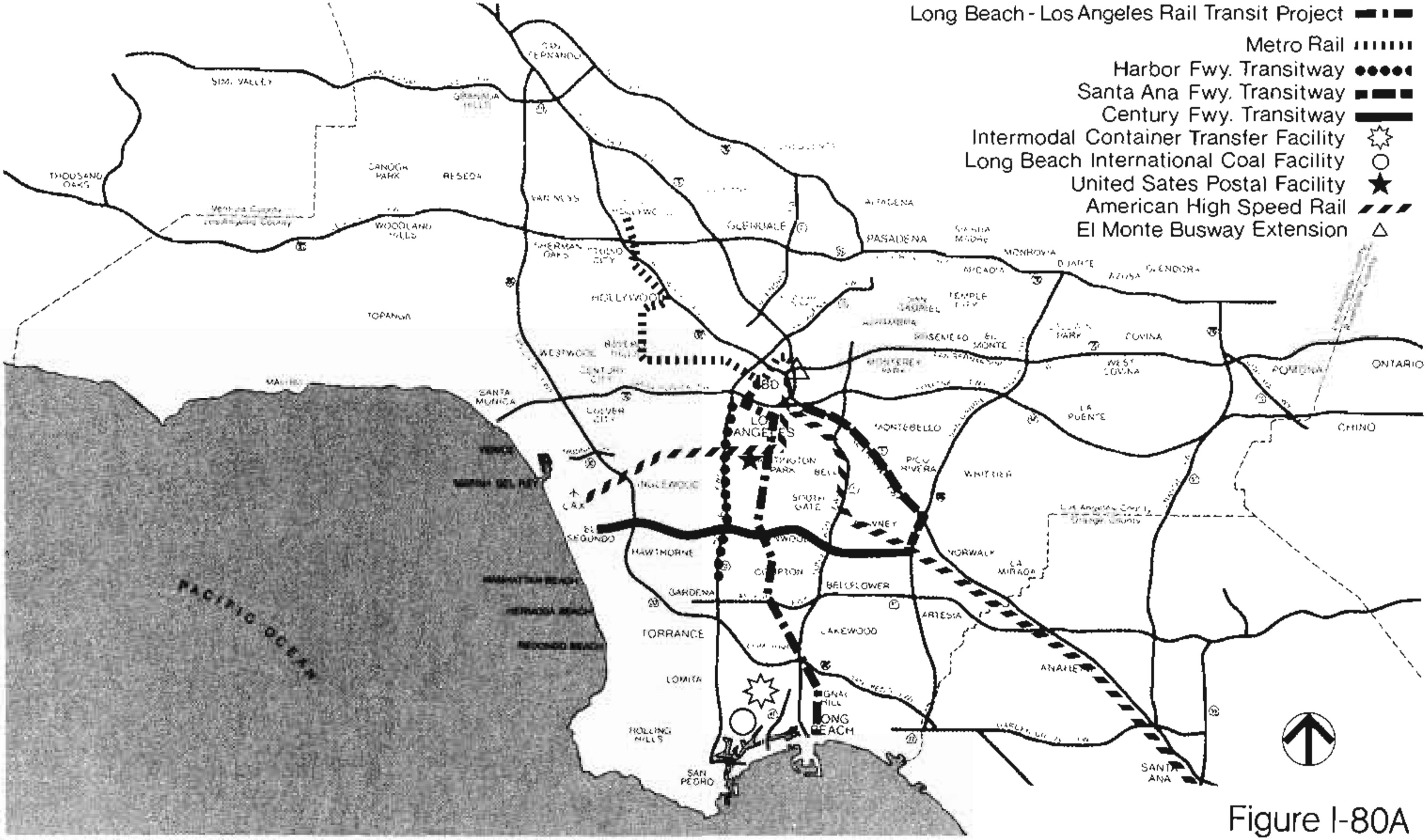


Figure I-80A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

RELATED PROJECTS

PARSONS BRINCKERHOFF / KAISER ENGINEERS

I-900 INTENDED USE OF EIR

I-910 LISTING OF AGENCIES USING EIR

The Environmental Impact Report (EIR) will be used by the Los Angeles County Transportation Commission in deciding whether to approve the project. If local funds other than those generated by Proposition A are used to fund the project, agencies such as the State of California Transportation Commission could also use the EIR as part of the funding approval process.

I-920 LIST OF APPROVALS FOR WHICH THE EIR WILL BE USED

Depending on the alternative selected for implementation, the following agencies could use the EIR as part of the process of issuing permits or approvals necessary to construct the project (Table I-92A):

TABLE I-92A

REQUIRED PERMITS AND APPROVALS

Agency	Type of Approval
California Department of Transportation	Right-of-way acquisition, possible encroachment of state funded highways
Public Utilities Commission	Operating/safety approvals
Regional Water Quality Control Board	Discharge permit for maintenance facilities
Southern California Rapid Transit District	Operating authority over completed project
County of Los Angeles	Right-of-way acquisition, possible zone changes for specialized facilities
County Flood Control District	Overcrossing approvals, possible need for modifications to district facilities
County Sanitation District	Possible acquisition of easements

TABLE I-92A (continued)

REQUIRED PERMITS AND APPROVALS

Agency	Type of Approval
City of Los Angeles	Right-of-way acquisition, possible zone changes for specialized facilities
Community Redevelopment Agency of the City of Los Angeles	Reviews and approvals of possible impacts on redevelopment projects
City of Long Beach	Right-of-way acquisition, possible zone changes for specialized facilities
Long Beach Redevelopment Agency	Reviews and approvals of possible impacts on redevelopment projects
Port of Long Beach	Possible development permit depending on alternative selected
City of Compton	Right-of-way acquisition, possible zone changes for specialized facilities

Source: M. L. Frank & Associates, 1984.

Chapter

II

II ENVIRONMENTAL SETTING

II-10 INTRODUCTION

This chapter provides an overview of existing and projected environmental conditions in the Long Beach-Los Angeles project corridor. Future conditions are defined in the absence of the proposed rail transit project but do reflect other projects scheduled for implementation. All significant physical, biological, and socioeconomic characteristics of the project corridor are described generally for the years 1980, 1983, and 2000 to provide a baseline for determining and evaluating the probable environmental impacts of the project alternatives.

The material in this chapter is first organized by geographic area. Environmental characteristics common to the entire Los Angeles region or the entire project corridor are presented first. Following this are discussions of the three main corridor subareas: Los Angeles, the mid-corridor, and Long Beach. The location of the project corridor is shown in Figure II-10A.

The discussions of probable environmental impacts in Chapters III and IV focus on local impacts. These chapters are organized by corridor subarea. Regional impacts are discussed in Chapter V.

In addition to this geographic organization, setting descriptions and impact discussions are generally grouped into three categories: natural environment, socioeconomic environment, and traffic and transportation. The final area is separated from the socioeconomic discussion due to the nature of the proposed project and the importance of its impact on traffic and other transportation issues.

Throughout this chapter and the remaining chapters in the Environmental Impact Report (EIR), treatments of existing conditions and probable impacts will refer to a wide range of geographic study areas, with each area chosen for its appropriateness to a particular characteristic or impact. Thus, material will be presented for areas ranging from the six-county Southern California Association of Governments (SCAG) region to the transit station and alignment local impact corridor, with boundaries generally located 1,000 feet on either side of the proposed alignment (one-quarter-mile radius around each station).

The project corridor delineated in Figure II-10A represents the probable service area of the project and is used for organizing much of the socioeconomic data presented herein. The boundaries are generalized, however, as data availability has necessitated the use of different boundaries for different items (e.g., zipcode zones and census tracts). Finally, some information is presented on a county, city or neighborhood level. These study areas, as well as special air quality or water management districts, are defined as they are presented.

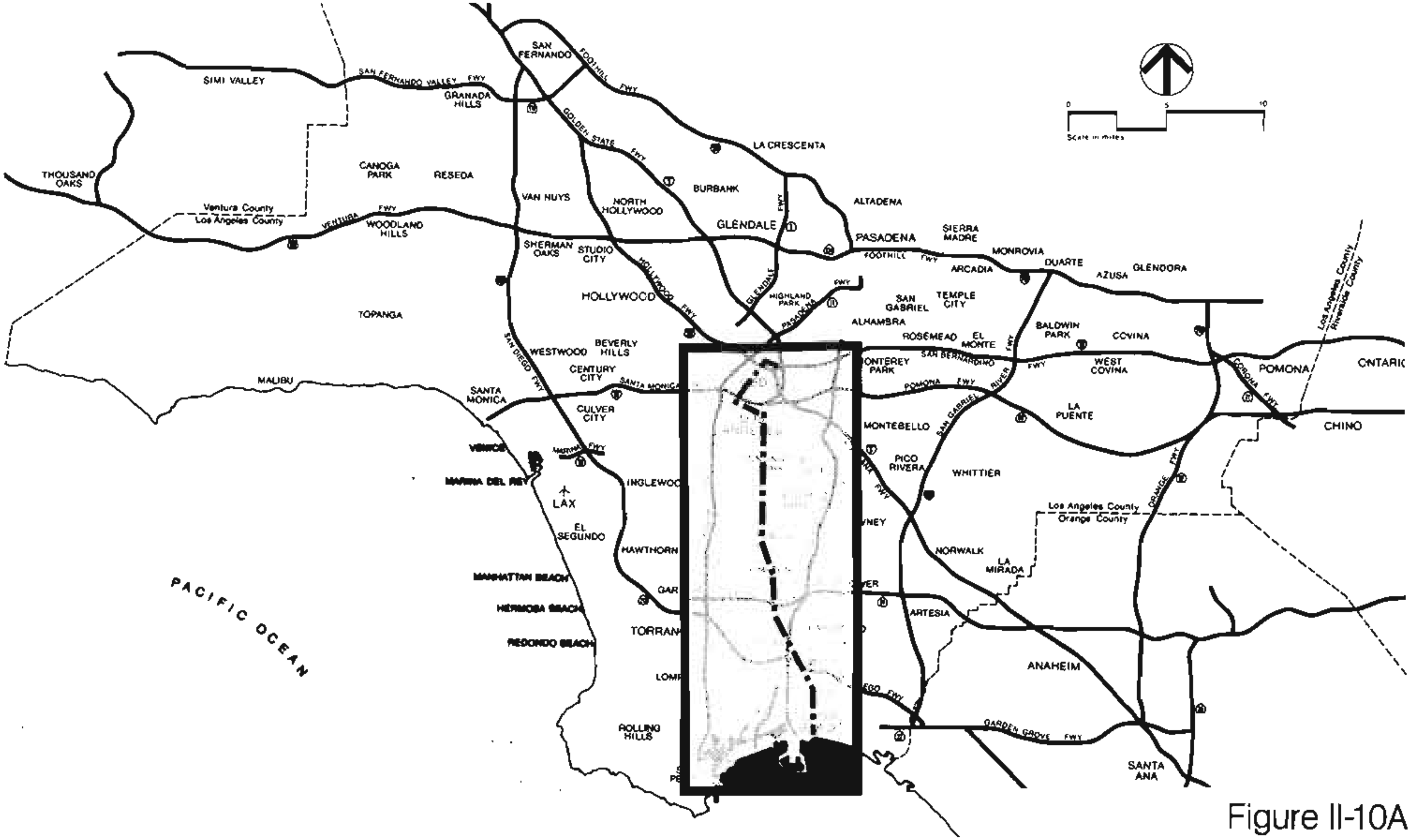


Figure II-10A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

STUDY CORRIDOR
PARSONS BRINCKERHOFF / KAISER ENGINEERS

II-100 THE REGION

II-110 TOPOGRAPHY, SOILS, GEOLOGY, AND SEISMICITY

II-111 Topography and Soils

The project corridor is located on a coastal plain which has a gently sloping terrain with only minor changes in relief. The coastal plain, known also as the Los Angeles Basin, is located in the southwestern part of Los Angeles County. The Los Angeles Basin slopes from north to south with an elevation ranging from nearly 400 feet above sea level north of downtown Los Angeles to approximately 20 feet above sea level at the south end of the proposed project in Long Beach. Places of higher and lower relief are scattered throughout the project area (see Figure II-11A).

The dominant topographic feature of the basin is the San Gabriel Mountain range which rises on the northern edge of the basin and extends westerly to the Santa Monica Mountains. On the northwest, the basin is separated from the San Fernando Valley by the Santa Monica Mountains.

On the northeast, the San Jose and Puente Hills separate the basin from the San Gabriel Valley. The Los Angeles Basin meets the Pacific Ocean on the west along 75 miles of coastline, which is indented by two crescent-shaped bays, Santa Monica and San Pedro. The Palos Verdes Hills and San Pedro Bay form the southwestern and southern edges of the basin and the Santa Ana Mountains shape the eastern and southeastern boundaries.

Many streams flow from the San Gabriel and Santa Monica mountains into the Los Angeles Basin. The Los Angeles River and its tributaries are the principal drainage courses. These streams are usually dry during summer months. The average slope is sufficient to give good surface drainage over most of the basin area except for sloughs and several small tidal marches near the seashore.

There are four general soil types found within the project area. These are the Hanford, Chino, Tujunga-Soboba, and Ramona-Placential soil associations as determined by the U.S. Soil Conservation Service. Each of these soil types will be discussed for individual corridor segments in the local environmental setting sections (Sections II-211, II-311, and II-411).

II-112 Geology and Seismicity

The Los Angeles Basin was formerly a marine embayment that subsided and has been successively accumulating sediments eroded from the surrounding highlands, eventually forming the present coastal plain. It contains many oil fields, generally located in close proximity to the shoreline; however, some of the oil fields, including

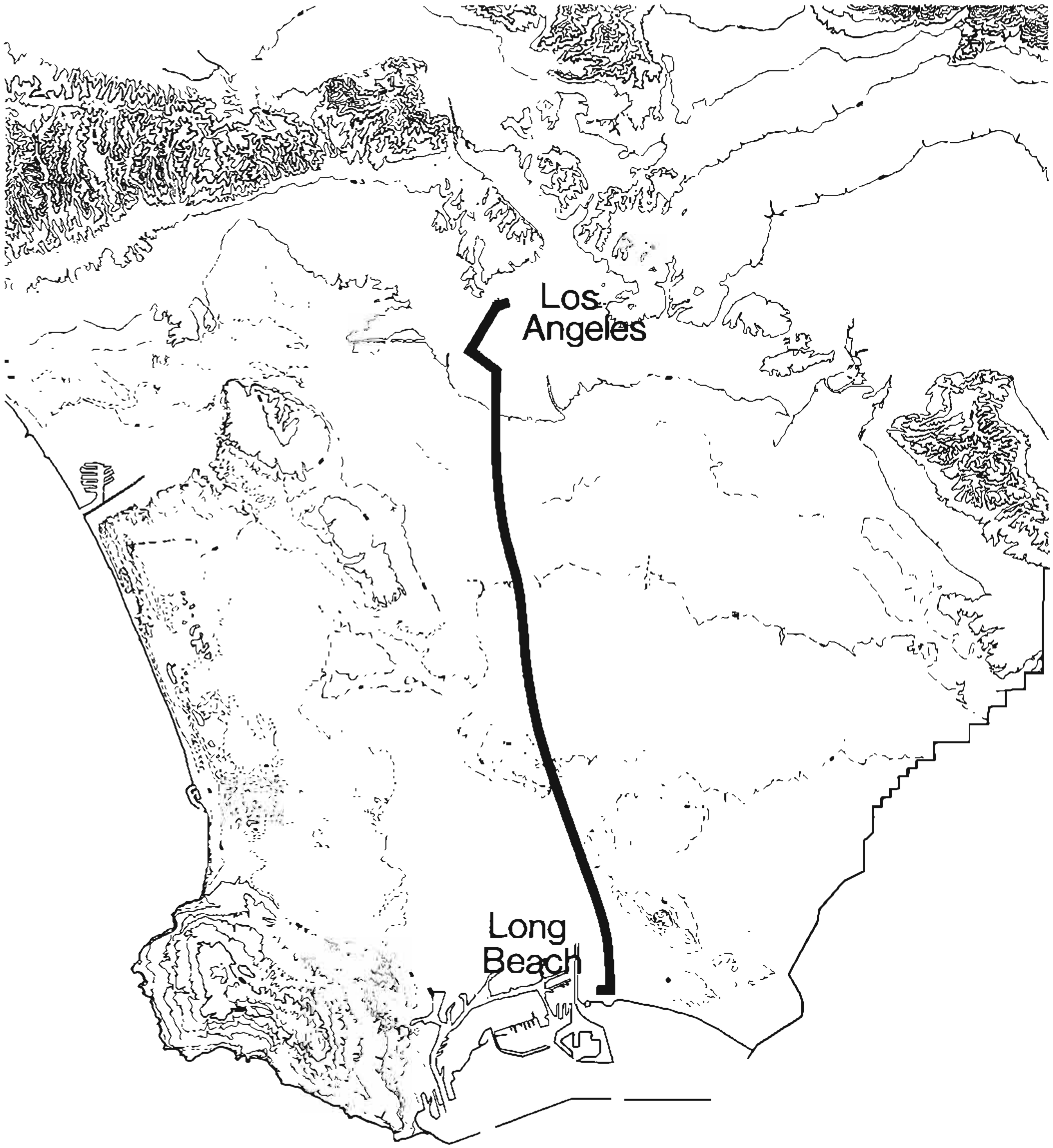


Figure II-11A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Los Angeles Basin
Topography Map
PARSONS BRINCKERHOFF / KAISER ENGINEERS

the Los Angeles City Oil Field, Dominguez Oil Field, and Signal Hill Oil Field, are near the proposed project alignment.

Zones of faulting and flexure divide the Los Angeles Basin into four structural blocks: the northeastern, central, southwestern, and northwestern. The proposed project would cross the central and the southwestern structural blocks.

The Los Angeles region is a seismically active area. The basin continues to be folded and faulted, as evidenced by numerous earthquakes recorded during historic time. A high level of earthquake activity is considered to be normal for the Southern California region. The last major earthquake to affect Los Angeles was the 1971 San Fernando/Sylmar quake, which registered a magnitude of 6.5 on Richter Scale.

Major faults which may affect the project are the Newport-Inglewood/ Cherry Hill, Raymond Hill-Santa Monica, Whittier-Elsinore, and San Andreas (see Table II-11A and Figure II-11B).

TABLE II-11A

MAJOR FAULTS IN OR NEAR PROJECT CORRIDOR

Fault Zone Name	Maximum Possible Earthquake Magnitude (Richter Scale)	Proximity to Project Corridor (Miles)
Newport-Inglewood/Cherry Hill	7.0	traverses
Raymond Hill-Santa Monica	7.5	4
Whittier-Elsinore	7.5	12
San Andreas	8.3	42

Source: California Division of Mines & Geology, Map Sheet 23, R.W. Greensfelder, 1976.

Potential for liquefaction exists throughout the proposed rail corridor, though this is somewhat less probable in downtown Los Angeles. This occurs where saturated, loosely compacted, granular soil occurs within 30 feet of the ground surface, and saturation of soils develops from perched groundwater and percolation of winter storm run-off.

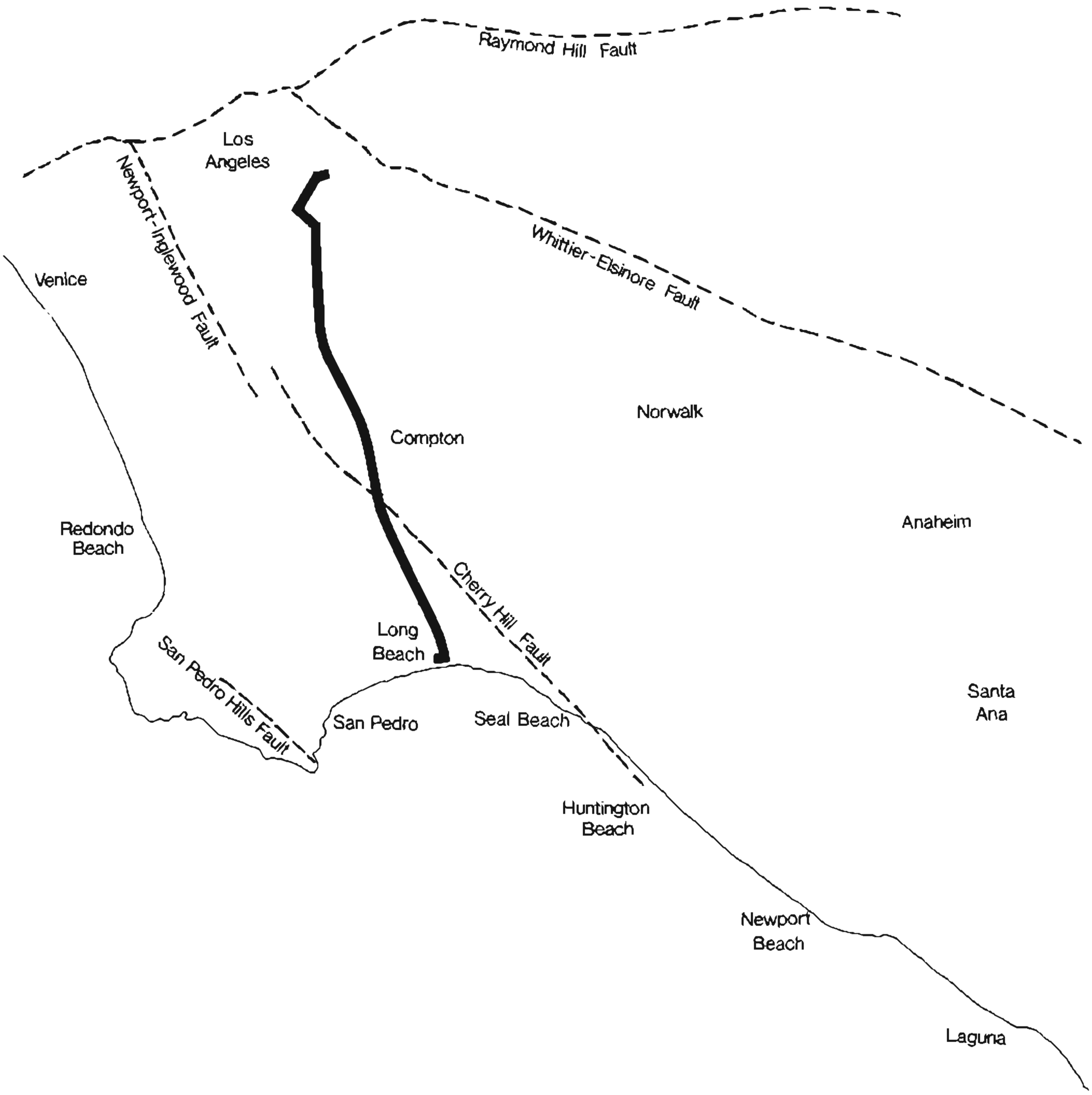


Figure II-11B

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Active Earthquake Faults

PARSONS BRINCKERHOFF / KAISER ENGINEERS

II-120 FLOODPLAINS, HYDROLOGY, WATER QUALITY, AND COASTAL ZONE

II-121 Floodplains, Hydrology (Drainage)

Due to the high level of urbanization in the Los Angeles Basin, the majority of the surface hydrology is a function of precipitation and storm run-off into drainage channels. Most of the existing streams and rivers have been channelized, including the Los Angeles River and Compton Creek, which cross the rail corridor. The channelization of the existing streams and rivers provides adequate protection for potential flooding hazards.

None of the proposed alternatives would be subject to inundation by coastal flooding from seasonal wave action or a tsunami caused by an earthquake.

II-122 Water Quality, Coastal Zone

Water bodies which might be affected by the project alternatives are the Los Angeles River and tidal prisms, Compton Creek, San Pedro Bay/outer Los Angeles-Long Beach Harbor, and the West Coast and Central Groundwater basins.

The Los Angeles River and its tributaries provide the major drainage system in the basin. The Los Angeles River travels southerly through the Los Angeles Basin flowing into the Pacific Ocean at San Pedro Bay. Compton Creek is a minor tributary of the Los Angeles River which joins the river just south of Del Amo Boulevard. Most of the Los Angeles River is concrete-lined and serves an extremely limited freshwater and wildlife habitat.

Surface waters in the project corridor are primarily limited to run-off from storms and commercial/domestic use. In the rail corridor the majority of surface flow is directed toward the Los Angeles River flood control channel via storm drains. Large volumes of water and debris, litter and sediment are carried by the Los Angeles River during major storms. However, surface flow during dry weather consists mainly of run-off of excess irrigation water applied in urban areas, outflow from the San Fernando and San Gabriel Valleys, and some municipal and industrial wastewater.

The Central and West Coast Groundwater basins underlie the Los Angeles Coastal Plain and contain a large amount of groundwater which is primarily used for municipal and industrial purposes. Both confined and unconfined groundwaters occur within the basins and are generally replenished by subsurface inflow at the Los Angeles and Whittier narrows, as urbanization and impervious subsurface strata preclude much direct percolation and recharge of the basins. Groundwater levels have been gradually rising in recent years due to limits set on extraction and heavier than usual rainfall.

The average depth to ground water is relatively shallow (less than 100 feet). Groundwater is of poor quality nearer the surface, according to existing state and federal standards, with a high total dissolved solids (TDS) content and hardness. Water for potable use is extracted from lower aquifers due to their higher yields and better quality water.

The rail transit project would not be located within any portion of the California Coastal Zone and is therefore not subject to the 1976 Coastal Zone Act. The nearest area governed by the act is one city block southerly of the project boundary at 1st Street between Ocean Boulevard and the shoreline in the city of Long Beach.

II-130 VEGETATION AND WILDLIFE

Originally, the Los Angeles Basin was predominantly a coastal sage scrub habitat and/or native southern California grassland, now long removed by several decades of agricultural and urban activities. Existing vegetation in undeveloped areas of the Los Angeles Basin consists of native and naturalized species adapted to constant disturbance (ruderal species): mustard (Brassica sp.), vinegar weed (Trichostema lanceolatum), telegraph weed (Heterotheca grandiflora), tumbleweed (Salsola iberica), horehound (Marrubium vulgare), matchweed (Guterrezia brachteata), goldbush (Haplopappus spp.), buckwheat (Eriogonum fasciculatum), coyote bush (Bacharis pilularis var. consaguinea), and sunflower (Helianthus annus). Washes and ditches have willow (salix spp.) and mulefat (Baccharis glutinosa). The majority of flora existing in developed areas consists of introduced species used for landscaping and ornamentation. No rare or endangered species of plants are known to exist within the overall project area.

Wildlife known to exist in the regional area includes urban-adapted rodents such as ground squirrels, gophers, rabbits, and skunks. Many urban-adapted bird species and occasional migratory birds have also been observed. No rare or endangered species of wildlife are known to exist within the overall project area.

II-140 AIR QUALITY

The South Coast Air Basin (SCAB) consists of Los Angeles County south of the crest of the San Gabriel Mountains, all of Orange County, and Riverside and San Bernardino counties west of Banning Pass.

Although significant progress has been made in reducing high concentrations of pollutants in the SCAB, air pollution still remains a serious problem. Federal and state air quality standards, established to protect public health and welfare, are frequently exceeded in many areas of the basin.

Historical trends in ambient air quality measurements made throughout the basin are shown in Table II-14A. Federal and state standards most frequently violated are those controlling oxidants (ozone) and carbon monoxide. While the annual average nitrogen dioxide standard continues to be violated, the number of violations of the one-hour standard has decreased in the 1970s. Sulfur dioxide standards have been violated only infrequently in recent years.

II-141 Air Quality Planning in the South Coast Air Basin

The entire basin is a designated Air Quality Maintenance Area (AQMA) for the 5 federally regulated pollutants: oxidants (reactive organic gases, or ROG, measured as ozone) (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and particulates (TSP). The air basin is currently a nonattainment area for all pollutants except sulfur dioxide. (A nonattainment area is one that exceeds any national ambient air quality standard for any pollutant.) Photochemical oxidants are the most serious air pollution problem in the basin, with maximum ozone readings regularly exceeding the federal air quality standard of 12 parts per million (ppm) by a significant factor. In the western and central portions of the basin, ozone readings may be as much as four times the federal standard. These areas experience higher readings because they are generally downwind of the many emission sources in the western and central portions of the basin. As the hydrocarbon and nitrogen oxide emissions are transported across the basin, they combine in the presence of sunlight to form the heavy concentrations of photochemical oxidants experienced in the eastern portion of the basin.

The 1982 Air Quality Management Plan (AQMP - a mandated plan for achieving state and federal air quality standards) used an updated emission inventory, the most recent ambient air quality data, and projected industrial, commercial, and vehicle activities to estimate future pollutant levels. The plan includes a group of short-term and long-term control strategies designed to reduce emissions and to provide for attainment of air quality standards.

II-142 Existing Air Quality in the Long Beach-Los Angeles Rail Transit Project Study Area

The distribution of emissions by pollutant type is listed in Table II-14B. Los Angeles County itself produces about 67 percent of total air pollutants generated in the entire SCAB.

Sources of man-made air pollution are categorized as either mobile or stationary sources. Mobile sources (which include motor vehicles, aircraft, trains, ships, and any off-road vehicles) predominantly emit reactive organic gases, nitrogen oxides, and carbon monoxide. Passenger cars produce about 69 percent of the total pollutants from mobile sources.

TABLE II-14A

ANNUAL SUMMARY OF DAYS NOT MEETING THE STATE STANDARD FOR VARIOUS POLLUTANTS IN SOUTH COAST AIR BASIN

Year	SO_2 (1 hr avg)	SO_2 (24 hr avg)	NO_2 (1 hr avg)	CO (12 hr avg)	Oxidant (1 hr avg)
1955	1	96	-	-	-
1956	9	284	71	195	-
1957	15	323	99	359	305
1958	2	287	96	343	322
1959	6	109	113	340	316
1960	0	60	112	354	286
1961	1	63	101	360	283
1962	2	60	85	363	267
1963	2	35	78	365	258
1964	1	28	78	366	232
1965	0	86	100	365	236
1966	2	124	89	365	271
1967	1	100	113	363*	259
1968	2	114	132	185	252
1969	1	68	102	171	246
1970	1	95	115	203	241
1971	2	68	125	146	218
1972	1	115	96	137	211
1973	0	84	59	116	185
1974	0	51	69	128	215
1975	0	62	78	123	201
1976	0	22	93	116	220
1977	0	16	65	55	193
1978	0	0	38	44	185
1979	0	4	27	38	197
1980	0	0	23	43	181

* In April 1968, the instrumentation used to measure carbon monoxide was modified. Data taken prior to that month cannot be related exactly to later data as previous standards were slightly different and resulting values were approximately 5 ppm higher, but varying with time.

Source: Southern California Association of Governments Air Quality Management Planning Program (AQMP), Description of Existing Air Quality in the South Coast Area, 208-20a, b, October 1977; South Coast Air Quality Management District, Summary of Air Quality in the South Coast Air Basin, May 1978, July 1979, June 1980, May 1981.

TABLE II-14B

1980 BASE YEAR EMISSIONS IN THE SOUTH COAST AIR BASIN

AND LOS ANGELES COUNTY

(Average Annual Day, Tons/Day)

Source Category	Emittant				
	ROG[2]	CO	NO_x[2]	SO_x[2]	TSP
Mobile Sources					
On-Road Vehicles					
Light-Duty Passenger	335.0	2,773	339	15.4	41.0
Light- and Medium-Duty Trucks	88.6	775	90.2	3.14	9.02
Heavy-Duty Gas Trucks	17.5	409	32.8	1.76	3.87
Heavy-Duty Diesel Trucks	12.5	33.6	140	18.4	11.4
Motorcycles	6.6	25.4	0.92	0.05	0.2
Total On-Road Vehicles	460.2	4,016.0	602.92	38.75	65.49
Total Other Mobile	39.5	266	63.10	20.2	4.07
Total Mobile Sources	499.7	4,282	666.02	58.95	69.56
Total Stationary Sources	460.	168	311	144	226
Total LA County	959.7	4,450	997.02	202.95	295.5
TOTAL SOUTH COAST AIR BASIN	1,423	6,781	1,362	273	619

[1] On-road mobile emissions are for 1980, as derived from the LARTS Travel Forecast Summary prepared by SCAG in March 1983. Other mobile emissions and stationary emissions are for 1979, as derived from the Final Air Quality Management Plan published jointly by SCAG and the South Coast Air Quality Maintenance Management District.

[2] ROG - Reactive Organic Gas
NO_x - Combination of NO and NO_2
SO_x - Sulfur oxides, primarily SO_2

Source: SCAG, "Air Quality: Long Beach-Los Angeles Rail Transit Project" (Table 3), February 2, 1984.

Stationary sources include industrial and commercial facilities; major stationary sources in the basin are power plants and refineries. The harbor area has a large concentration of the area's refineries and two large power plants are on the eastern boundary of Long Beach.

For this study on-road mobile emissions occurring in the geographical areas known as regional statistical areas (RSAs) have been calculated using the Direct Travel Impact Model (DTIM). The air quality study area consists of Regional Statistical Areas 20, 21, and 23 and is shown on Figure II-14A.

The DTIM results indicate that within the study area on-road vehicular traffic in 1980 generated the following level of emissions, as shown in Table II-14C below.

TABLE II-14C

1980 MOTOR VEHICLE EMISSIONS IN THE VICINITY OF

LONG BEACH-LOS ANGELES RAIL TRANSIT PROJECT

	Pollutant, Tons/Average Annual Day					
	ROG	NO_x	CO	SO_x	TSP	VMT
Light-Duty Vehicles	85.4	76.5	704	3.53	9.55	24,888,992
Heavy-Duty Vehicles*	5.7	32.8	84	3.83	2.90	1,431,117
TOTAL	91.1	109.3	788	7.36	12.5	26,320,109

*VMT (vehicle miles traveled) for heavy-duty vehicles is assumed to be 5.75 percent of the light-duty vehicle VMT. Emissions were calculated based upon emission factors (EMFAC 6C) provided by the California Air Resources Board.

Source: Southern California Association of Governments, 1984.

There are 28 air quality monitoring stations in the South Coast Air Basin, maintained by the South Coast Air Quality Management District (SCAQMD). Three of these stations are located near or within the project study area: Downtown Los Angeles, Lynwood, and Long Beach. Figure II-14A shows the monitoring stations and the Regional Statistical Areas in which they are located.

Table II-14D summarizes the 1980 violations of standards at the three air quality monitoring sites closest to the rail transit corridor.

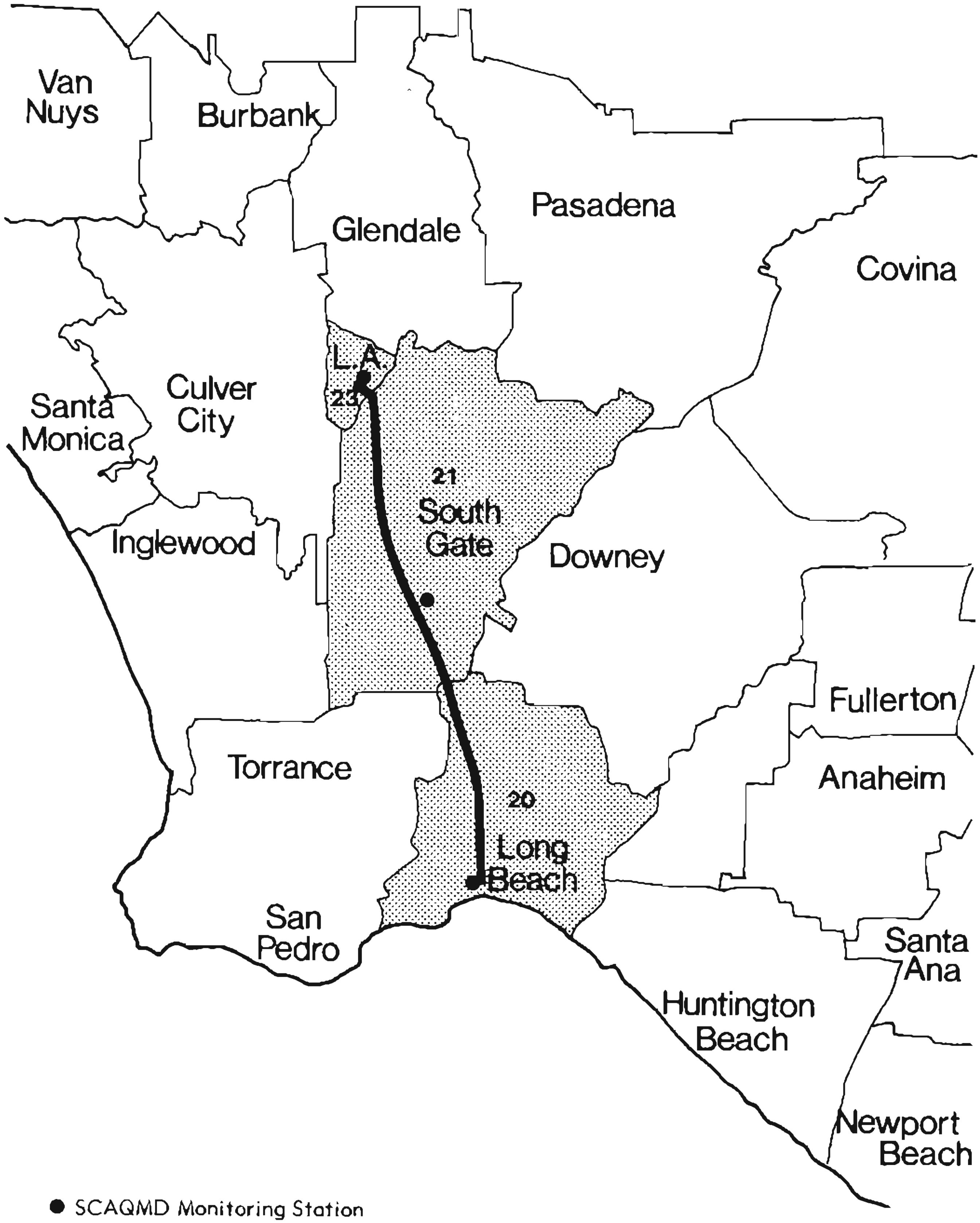


Figure II-14A

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Air Quality Analysis Area And Monitoring Stations
PARSONS BRINCKERHOFF / KAISER ENGINEERS

TABLE II-14D

1980 VIOLATIONS OF FEDERAL AND STATE AIR QUALITY STANDARDS IN SOUTH COAST AIR BASIN

Pollutant by Monitoring Site	Times Exceeding Standards: State	Times Exceeding Standards: Federal	Annual Max. Con.	State Standard	Federal Standard
Ozone					
Downtown Los Angeles	109	59	0.29 ppm	0.10 ppm	0.12 ppm
Lynwood	42	17	0.18 ppm	1 hr.	1 hr.
Long Beach	21	6	0.20 ppm		
Nitrogen Dioxide				0.25 ppm	0.05 ppm
Downtown Los Angeles	16	1	0.44 ppm	1 hr.	annual average
Lynwood	1	0	0.29 ppm		
Long Beach	4	0	0.31 ppm		
Carbon Monoxide				40* ppm	35.0 ppm
Downtown Los Angeles	7	18	19 ppm	1 hr.	1 hr.
Lynwood	43	67	31 ppm		
Long Beach	2	12	16 ppm		
Sulfur Dioxide				0.5* ppm	0.14 ppm
Downtown Los Angeles	0	0	0.037 ppm	24 hr.	24 hr.
Lynwood	0	0	0.055 ppm		
Long Beach	0	0	0.030 ppm		
Particulate Matter				100 ug/m^3	260 ug/m^3
Downtown Los Angeles	33	0	248 ug/m^3	24 hr.	24 hr.
Lynwood	35	1	290 ug/m^3		
Long Beach	21	1	282 ug/m^3		
Lead				1.5 ug/m^3	1.5 ug/m^3
Downtown Los Angeles	5	1	2.68 ug/m^3	30 day avg.	calendar quarte
Lynwood	5	1	3.02 ug/m^3		
Long Beach	1	1	2.01 ug/m^3		

* Standard in effect at the time. New state standards for carbon monoxide (20 ppm/1 hr.) were adopted by the California Air Resources Board in September 1982. The sulfur dioxide 1-hour California standard was changed to 0.25 ppm by the CARB in November 1983.

Note: ppm - parts per million
ug - micrograms
m^3 - cubic meters

Source: Southern California Association of Government, "Air Quality: Long Beach-Los Angeles Rail Transit Project" (Tables 1, 2, 6), February 2, 1984.

Regionwide trends in air quality can be seen in the study area as well. Maximum ozone readings during the past five years (1976-1980) have not changed significantly, and only in the downtown area has there been an appreciable drop in the number of days state standards were exceeded. Carbon monoxide maxima have remained nearly constant, although the number of standards violations has declined markedly. For nitrogen oxides, both the maximum readings and the number of violations have declined along the study area corridor. The levels of total suspended particulates at Lynwood and Downtown Los Angeles have varied considerably, but continually exceed state standards. Over the last five years violations of the lead standard at these two sites have dropped by 50 percent.

II-150 LAND USE, POPULATION, AND HOUSING

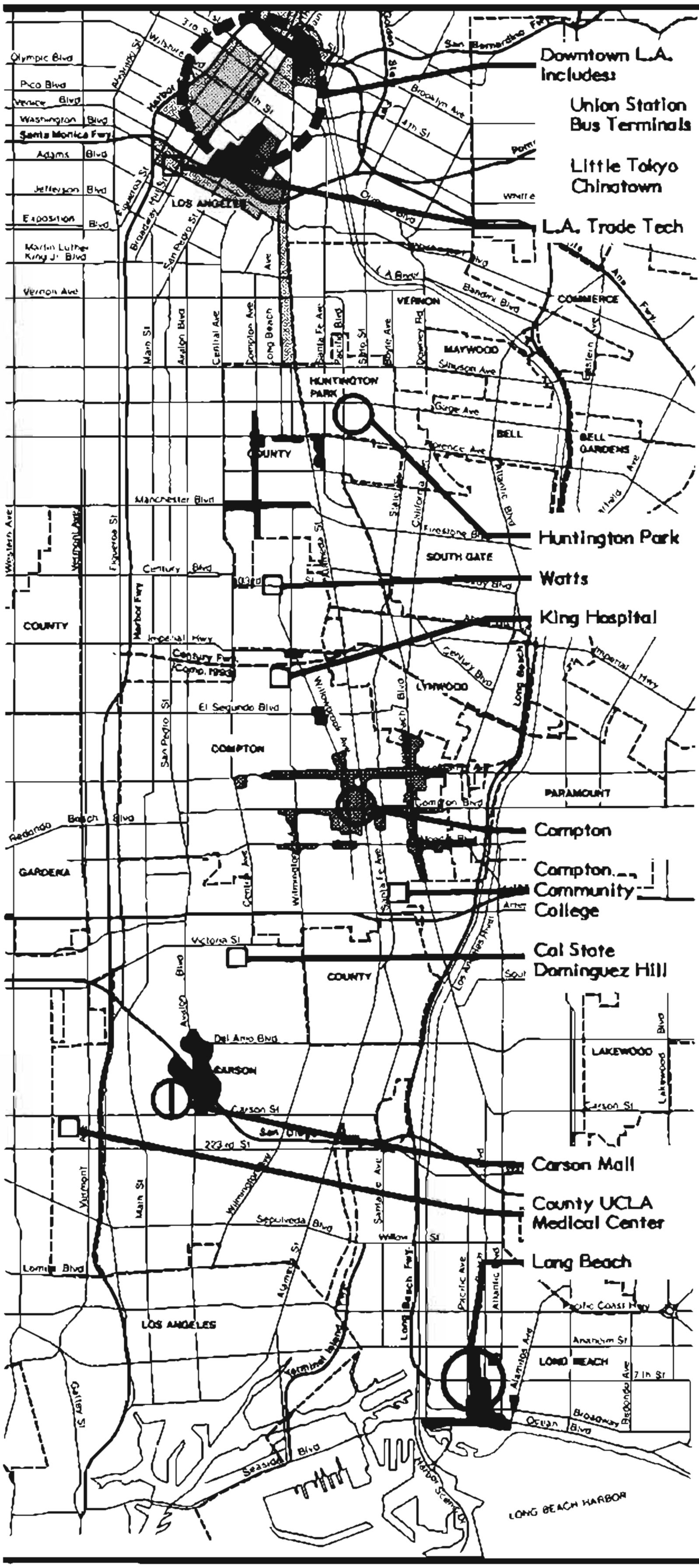
II-151 Land Use

Just over one-quarter of Los Angeles County (27.7 percent, or 1,133 square miles) is considered urbanized. In 1975 (the most recent date for which figures are available) 55 percent of this urban area was residential, 7 percent commercial, 10 percent industrial, 11 percent public or quasi-public, 9 percent vacant or agricultural, and 7 percent committed to long-term open space use.

The basic principle for the organization and planning of land use in the Los Angeles area is the Centers Concept. Developed during the late 1960s and early 1970s and adopted by the City of Los Angeles in 1974, 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 county's general plan identifies three growth centers within the Long Beach-Los Angeles corridor: downtown Los Angeles, downtown Long Beach, and downtown Compton. The SCAG-82 growth forecast identifies Watts as an additional growth center. Figure II-15A illustrates urban form policies, as derived from zoning codes, in the corridor.

Nonresidential development by the year 2000 is expected to increase by 18 percent in the corridor, compared to a growth rate of 19 percent for the county as a whole. Nonresidential development densities in the corridor in the year 2000 will be 7½ times the projected average for the county.

In addition to the two major concentrations of commercial and office development in downtown Los Angeles and downtown Long Beach, there is a slight concentration in the mid-corridor between Slauson Boulevard and Artesia Boulevard, centered along Long Beach Boulevard and Santa Fe Avenue, about 1/2 mile east of the proposed route. In 1980 the corridor contained 12 million commercial square feet (24 percent of all major commercial space in the county). In the year 2000 it is estimated that 31 to 42 million square feet of major commercial space will be located in the corridor served by the Long Beach-Los Angeles Rail Transit Project. Of that floor area, 24 to 35



Floor Area Ratio

10.1+

6.1 - 10.0

3.1 - 6.0

≤ 3.0

County General Plan Regional Focal Points

Level 1 Multipurpose Center- provides several major functions for all of the metropolitan area; contains a major concentration of high-rise buildings and jobs; and is the focus of the regional transportation network.

Level 2 Multipurpose Center- provides two or more major functions to a substantial part of the metropolitan area; contains a significant number of medium to high-rise buildings and jobs; is on or near the regional transportation network.

Level 3 Multipurpose Center- provides two or more major functions to a substantial part of the metropolitan area but does not necessarily contain a significant number of high-rise buildings or jobs and is not necessarily on the regional transportation network.

Level 2 Single Purpose Center- Shopping Centers containing one or two major department stores.

Institutional, Cultural or Recreational Centers.

Figure II-15A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Urban Form Policy

PARSONS BRINCKERHOFF / KAISER ENGINEERS

million square feet (77 to 83 percent of the corridor total) will be located in downtown Los Angeles.

II-152 Population

Population in the Long Beach-Los Angeles rail corridor totaled 731,500 persons in 1980. While the mid-corridor added the greatest number of residents during the 1970s, the greatest growth rate was experienced in downtown Los Angeles (see Table II-15A and Figure II-15B). All population figures in this section are drawn from the 1980 U.S. Census.

While the county's population increased 6.2 percent between 1970 and 1980, the corridor's population grew by 10.2 percent. However, between 1980 and 2000 the county's growth rate is expected to outpace that of the corridor. Nevertheless, the corridor will likely continue to grow, although more slowly than during the 1970s, reaching a population in excess of 800,000 by 2000.

II-152.1 Age Structure

When compared to the county as a whole, the age structure of the corridor reflects a relatively young population, with a larger proportion of its population less than 19 years old. This is especially noticeable in the southern part of downtown Los Angeles and in the mid-corridor, where more than two out of every five individuals fall into this age category.

The percentage of elderly in the corridor parallels that of the county as a whole. Recent construction of elderly housing in the two downtowns has greatly increased the proportion of elderly compared to the mid-corridor. The percentages of elderly in the Bixby Knolls, Wrigley, and downtown Long Beach areas are among the highest in the entire corridor and account for this segment's relatively large elderly population.

II-152.2 Household Size

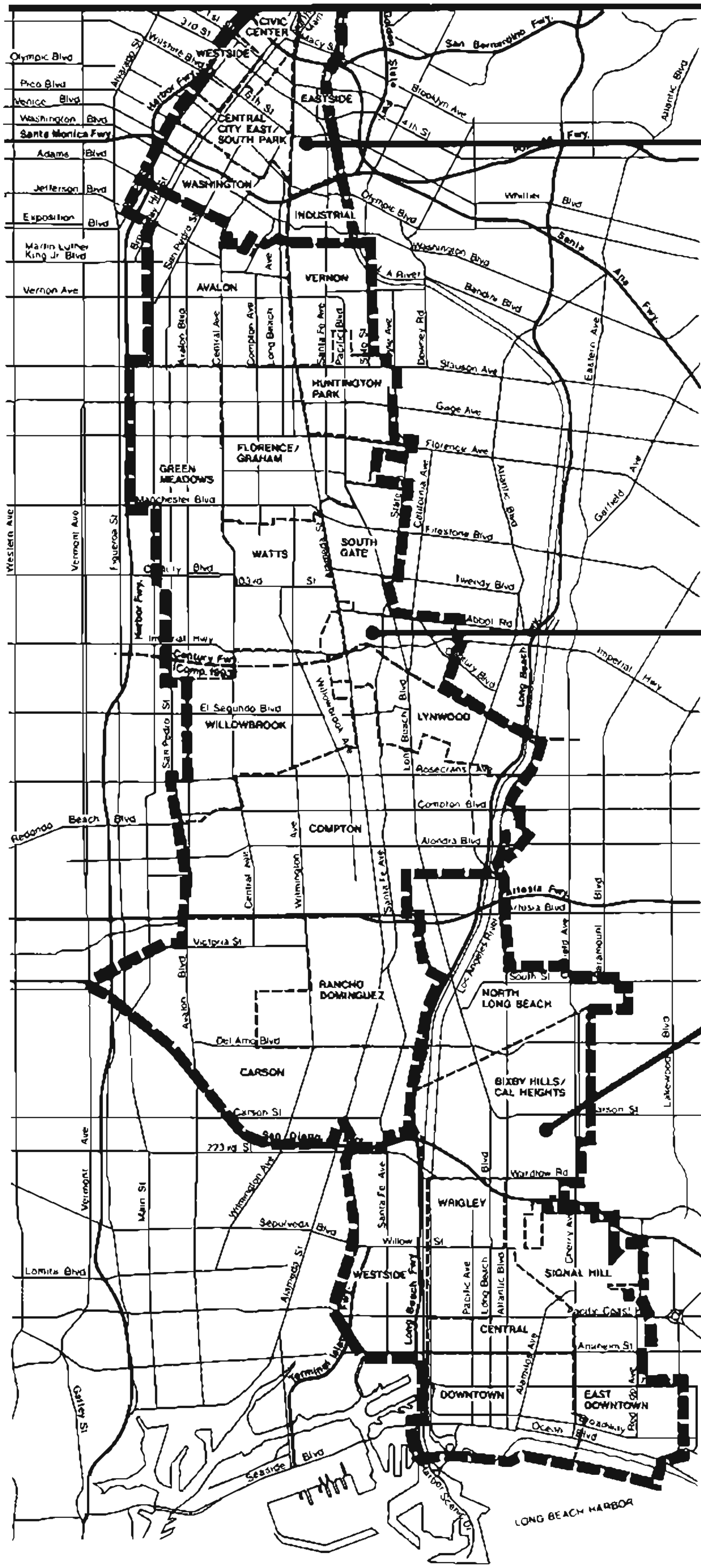
The average household size in the corridor is 2.96 persons per household. Like the county, the majority of households (about 55 percent) contain one or two members. However, over 11 percent of the corridor's households contain 6 or more members, compared to 6.6 percent for the entire county. The southern part of the downtown Los Angeles segment and all of the mid-corridor, characterized by a large proportion of ethnic minorities and youth, have the largest average household size and the largest proportion of large households (i.e., six or more members). Long Beach has an average household size of less than 2.0.

TABLE II-15A

POPULATION TRENDS

	Land Area (Square Miles)	1970 Popu-lation	1980 Popu-lation	Density (persons/ sq. mile)	1980 Change Per Year 1970-1980	Percent 2000 Popu-lation	2000 Density (persons/ sq.mile)	Percent Change Per Yea 1980-200
Long Beach-Los Angeles Corridor								
Los Angeles	8.7	47,763	65,848	7,570	3.8	79,440	9,130	1.0
Mid-Corridor	50.2	402,799	432,351	8,610	0.7	452,897	9,020	0.2
Long Beach	24.0	213,117	233,319	9,720	0.9	270,412	11,270	0.8
Corridor-wide	82.9	663,679	731,518	8,825	1.0	802,749	9,680	0.5
Los Angeles County	4,083	7,042,000	7,478,000	1,830	0.6	8,358,000	2,050	0.6
Southern California Region	38,500	10,100,000	11,500,000	300	1.4	14,643,000	380	1.4

Source: U.S. Bureau of the Census; Southern California Association of Governments, 1983.



Downtown Los Angeles

1980 Population	Population Change 1980-2000	1980 Percent Minority
57,698	**+21.6%**	**84.6%**

Mid-Corridor

1980 Population	Population Change 1980-2000	1980 Percent Minority
440,501	**+4.9%**	**93.1%**

Downtown Long Beach

1980 Population	Population Change 1980-2000	1980 Percent Minority
233,319	**+15.9%**	**43.0%**

The Avalon community lies in both the Downtown Los Angeles and the Mid-Corridor segments. In this figure, it has been included with the Mid-Corridor totals.

Figure II-15B

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Corridor Population Characteristics
PARSONS BRINCKERHOFF / KAISER ENGINEERS

II-152.3 Ethnic Communities

The corridor contains a number of ethnic communities. In fact, over three-fourths of the corridor's population are members of specific ethnic and cultural groups. The representation of these groups in the corridor is considerably greater than in the overall county. In particular there is a larger proportion of Hispanics and Blacks. While the 1980 U.S. Census counted the Hispanic population as 27.6 percent of the county total, it was 31.5 percent of the corridor total (although there is evidence that these percentages are too low). Similarly, while the 1980 Black population was 12.4 percent of the county total, it was nearly 40 percent of the corridor total. A sizeable Asian community (mostly Chinese, Vietnamese, and Japanese) resides in downtown Los Angeles. Whites, who account for more than half of the county's population, represent only 24 percent of the corridor's population. Virtually all of the communities comprising the downtown Los Angeles and the mid-corridor segments contain nonwhite majorities. Only in several of the Long Beach communities are non-whites in the minority.

II-152.4 Transit Dependents

Transit dependents are defined as segments of the population who, because of their particular circumstances, must rely predominantly or frequently on public transit to satisfy their travel needs. Guidelines prepared for the federal Urban Mass Transportation Administration UMTA (Voorhees, 1979) identify the following groups as transit dependent: elderly, youth, minorities, handicapped, economically disadvantaged (i.e., households earning less than 25 percent above the federally defined poverty level), and any other households lacking automobiles.

II-152.5 Youth and Elderly.

In both the county as a whole and in the Long Beach-Los Angeles rail corridor, the proportion of youth and of elderly to the total population is roughly the same: about 25 percent and 10 percent, respectively. This percentage of youth is matched or exceeded within the mid-corridor. Watts, with 50 percent of its population under the age of 19, has the highest percentage of youth. The elderly are concentrated in the two downtowns. In downtown Los Angeles they represent about 11 percent of the population, although in actual numbers this only amounts to 4,000. The downtown community of Long Beach has over 11,000 residents 65 years or older, 22 percent of the local population.

II-152.6 Minority Groups

Minority-group households are often larger in size than the overall average, with lower incomes and more limited access to automobiles. A relatively large proportion of nonwhite ethnic or racial groups ride transit. As stated in the section on ethnic communities, almost three-quarters of the corridor population are members of nonwhite ethnic groups. Hispanics and Blacks comprise the majority of the nonwhite population.

II-152.7 Handicapped

The U.S. Census defines two types of handicaps: transit disabilities and work disabilities. The term transit disabled is used to denote those persons over 16 years of age whose physical disabilities make the use of normal transit difficult. The proportion of transit disabled (at 3 to 4 percent) is evenly distributed across the segments of the overall corridor, which has a total of about 28,500 persons over 16 years with transit disabilities.

Work disabled, a broader indicator of the physically handicapped, refers to those of working age (16 to 64 years) who have had a disability that prevented them from working for the previous 6 months. Nearly 54,000 (7 percent) of the corridor's population reported work disabilities.

II-152.8 Low-Income

A 1981 Southern California Rapid Transit District survey shows a strong relationship between transit ridership and income. Those with less income, typically elderly and without access to an automobile, constitute a large proportion of the riders. Federal poverty levels vary according to household size, ranging from approximately $4,700 for one-person households to $15,500 for seven or more. The Urban Mass Transit Administration's guidelines define households as economically disadvantaged if they earn less than 25 percent above the poverty level.

While the median household income in the corridor suggests the majority of the population is not economically disadvantaged, there are several communities that would be considered transit dependent due to their low median incomes. These include the downtown Los Angeles communities, and Avalon, Green Meadows, Florence/Graham, and Watts in the mid-corridor. No communities in the Long Beach area fall below the defined low-income level.

II-153 <u>Housing</u>

In general, housing units in the corridor are older, smaller, more crowded, and of lower value than in the rest of the county. Over 50 percent of existing units were built prior to 1950 as compared to 36 percent of the cojnty's overall housing stock. Average unit size for the corridor is 3.9 rooms versus 4.5 rooms for the county as a whole. This is reflective of a higher proportion of multi-family units in the corridor (54 percent) than in the county (47 percent), and smaller than average single-family dwellings. Due to smaller unit sizes and the existence of large families, the incidence of overcrowding (more than 1.01 persons per room) is extremely high. Twenty percent of all units within the corridor are overcrowded while only 11 percent of the county's housing stock would be so classified.

Average housing costs in the corridor are substantially lower than elsewhere in the county. Values of owner-occupied units average 36 percent lower, while contract rents average 26 percent lower. The corridor contains a substantial number of publicly assisted housing units adjacent to the alignment, including some of the older projects in the mid-corridor (e.g., Nickerson, Jordan Downs, Imperial Courts, and Pueblo).

Since 1970 overall residential building activity in the corridor has been relatively stagnant (see Table II-15B). Between 1970 and 1980 the corridor had an average annual housing growth rate of 0.2 percent. In contrast, during the same period, the county's housing stock grew at a 1.2 percent annual rate. Such a low growth rate for the corridor may be explained in part by the public demolition activity in the Century Freeway project and the downtown Long Beach redevelopment projects.

SCAG-82 growth forecasts indicate that a substantial increase in the corridor's housing stock can be expected by the year 2000. Between 1980 and the year 2000, SCAG projects an average annual housing growth rate of 0.9 percent for the corridor with a considerably lower rate in the mid-corridor than in the two other segments. This is significantly higher than the 1970-1980 rate and is only slightly lower than the county's projected average annual rate of 1.0 percent. Housing densities in the year 2000, defined as dwelling units per acre of total land area, will range from 8.8 to 10.9 units per acre in the regional core to 1.3 units per acre in the county as a whole, compared with 5.8 units per acre in the corridor.

II-160 ECONOMIC ACTIVITY

Los Angeles is a region with a strong and diverse economic base, relying for its prosperity on traditional manufacturing activities and on a wide range of entertainment and service industries, retail trade, and real estate. The Long Beach-Los Angeles corridor contains many older, industrialized sections, with the result that manufacturing constitutes a significantly greater share of total economic activity in the corridor than it does in Los Angeles County as a whole.

The discussion of economic activity in the corridor addresses the types of employment (by place of work), retail sales, employment, and income characteristics of the resident population, and the assessed and market value of real property. For the purposes of the economic analysis the Long Beach-Los Angeles corridor has been defined using zip code boundaries or census tracts, depending on the type of data being addressed. In both cases the total corridor has been defined to closely match the general service area boundary shown in Figure II-15B.

TABLE II-15B

HOUSING TRENDS

	Land Area (Acres)	1970 Units	1980 Units	1980 Density (units/acre)	Percent Change Per Year 1970-1980	2000 Units	2000 Density (units/acre)	Percent Change Per Year 1980-2000
Long Beach-Los Angeles Corridor								
Los Angeles	5,568	19,543	20,706	3.7	0.6	27,098	4.9	1.5
Mid-Corridor	32,128	132,255	131,130	4.1	-0.1	147,823	4.6	0.6
Long Beach	15,360	103,814	108,648	7.1	0.5	132,208	8.6	1.1
Corridor-wide	53,056	255,612	260,484	4.9	0.2	307,129	5.8	0.9
Los Angeles County	2,613,120	2,538,000	2,846,000	1.2	1.2	3,389,000	1.3	1.0
Southern California Region	24,640,000	3,560,000	4,428,000	0.2	2.5	5,988,000	0.2	1.7

Source: U.S. Bureau of the Census; Southern California Association of Governments, 1983.

II-161 Employment

According to the Dun and Bradstreet Corporation, non-government employment in Los Angeles County in 1983 was an estimated 3.1 million persons. The highest concentrations of employment were found in the following sectors: services, 28.8 percent; manufacturing, 27.1 percent, and retail trade, 17.7 percent. As shown in Table II-16A, employment within the project corridor is estimated at 447,737 in 1983, or 14.3 percent of the county total.

Manufacturing activities account for 36.9 percent of the corridor employment, amounting to 165,119 jobs. The service and wholesale trade sectors within the corridor account for another 22.4 and 13.0 percent of the corridor workforce, respectively.

Total non-government employment in Los Angeles County is forecast to increase by 50 percent (approximately 1.7 million jobs) by the year 2000, assuming an average annual growth rate of 2.0 percent during the 1980 to 2000 period. Based upon projected growth rates of employment provided by the California Employment Development Department for Los Angeles County, county employment by industry for the year 2000 is estimated as shown in Table II-16B.

Mirroring trends expected elsewhere in the United States, the relative share of service employment is forecast to increase significantly, while manufacturing is predicted to decline in relative importance. Changes in the relative sizes of the other sectors are expected to be minor.

Employment forecasts for the project corridor are not available from state or regional agencies. It is likely, however, that similar shifts in the distribution of employment by sector will occur. The relative size of the manufacturing sector in the corridor suggests that the size of the shift may be relatively greater than that forecast for the county as a whole.

II-162 Retail Sales

In 1980 total taxable sales transactions in Los Angeles County were recorded at $45.6 billion by the California State Board of Equalization. Of this total 65 percent, or $29.7 billion, were in retail sales. The balance of the taxable transactions consisted of business and personal services and all other outlets. Using the 1980 relationship of taxable to nontaxable transactions estimated for the State of California by the Board of Equalization, total sales transactions (taxable and non-taxable) in the county in 1980 were estimated at $53.1 billion. On the basis of the historical growth in Los Angeles County retail sales during the period 1970 to 1980, taxable retail sales in Los Angeles County are projected to grow 3.0 percent annually between 1980 and 2000, increasing from $29.7 billion to $53.6 billion (in 1980 constant dollars) in the year 2000.

TABLE II-16A

1983 NON-GOVERNMENT EMPLOYMENT BY INDUSTRY

PLACE OF WORK

	Los Angeles County		Project Corridor		
Industry	Number	Percent	Number	Percent	As a % of County
Agriculture, Forestry, Fishing	12,000	0.4	1,399	0.3	11.7
Mining	14,400	0.5	2,179	0.5	15.1
Construction	98,000	3.1	12,218	2.7	12.5
Manufacturing	850,400	27.1	165,119	36.9	19.4
Transportation, Communication, Utilities	197,000	6.3	35,805	8.0	18.2
Wholesale Trade	264,000	8.4	58,321	13.0	22.1
Retail Trade	556,000	17.7	49,656	11.1	8.9
Finance, Insurance, Real Estate	240,000	7.7	22,683	5.1	9.5
Services	901,000	28.8	100,357	22.4	11.1
TOTAL	3,132,800	100.0%	447,737	100.0%	14.3%

Note: Percentage figures rounded to nearest 10th.

Source: California Employment Development Department; The Dun & Bradstreet Corporation and Donnelly Marketing Information Services, 1984.

TABLE II-16B

YEAR 2000 FORECAST OF LOS ANGELES COUNTY EMPLOYMENT

Industry	Number	Percent
Agriculture, Forestry, Fishing	17,000	0.4
Mining	14,400	0.3
Construction	142,000	3.0
Manufacturing	1,336,000	27.8
Transportation, Communication, Utilities	254,000	5.3
Wholesale Trade	370,000	7.7
Retail Trade	779,000	16.2
Financial, Insurance, Real Estate	397,000	8.3
Services	1,489,000	31.0
TOTAL	4,798,400	100.0

Source: California Employment Development Department; The Dun & Bradstreet Corporation and Donnelly Marketing Information Services, 1984.

II-163 Employment and Income Characteristics of Residents

The distribution of employment of residents in Los Angeles County and the project corridor generally resembles the distribution of jobs found in those two areas. As shown in Table II-16C, county residents are primarily employed in service industries, manufacturing, and retail trade. Corridor residents hold a greater share of jobs in manufacturing than do all county residents, but otherwise the distributions are similar.

Although the predominant occupations of both Los Angeles County and corridor residents are in the technical/sales category, the occupational distribution of corridor residents differs considerably from the county as a whole, with a much smaller proportion of corridor residents in managerial jobs and a larger proportion in service and operator/laborer/assembler jobs (see Table II-16D).

The large percentage of corridor residents found in lower-paying clerical and operator occupations is reflected in lower personal income levels found in the corridor. According to the 1980 U.S. Census, per capita and household income levels within the corridor are significantly below the overall county averages. The 1979 per capita income level for Los Angeles County residents was $6,424, and the median and mean household incomes were $17,563 and $22,518 respectively. By contrast, the 1979 per capita income level within the corridor was estimated at $3,826, and the average mean and median income of households were $14,862 and $11,345 respectively, approximately 65 percent of the county averages.

During the period 1970 to 1980 real household mean and median income in Los Angeles County, as measured by constant 1980 dollars, did not increase. In fact, real median household income dropped by 4.0 percent over that period. During the 1980 to 2000 period real income in Los Angeles County and the project corridor is projected to grow only slightly, if at all.

As of April 1980 unemployment among the available labor pool ranged from 7 percent in the Long Beach segment to 11 percent in the mid-corridor and 13 percent in the Los Angeles segments.

II-164 Assessed and Market Value of Real Property

According to the Los Angeles County Assessor's office, the total assessed value of secured and unsecured property in Los Angeles County in 1980 was $41.4 billion. The full market value of this property was $165.6 billion. Assuming an average annual growth rate of 4 percent to allow for the annual 2 percent increase in assessments as allowed by Proposition 13, reassessments due to property improvements and sales, and new construction (the actual increase during the 1980 to 1983 period was 4.06 percent), the market value for secured and unsecured property in Los Angeles County in the year 2000 is

TABLE II-16C

1980 EMPLOYMENT OF RESIDENTS BY INDUSTRY

Industry	Los Angeles County		Project Corridor	
	Number	Percent	Number	Percent
Agriculture	43,741	1.3	3,639	1.4
Construction	154,612	4.5	9,520	3.7
Manufacturing				
Nondurable	282,895	8.1	29,351	11.3
Durable	601,244	17.3	55,337	21.4
Transportation	155,685	4.5	14,337	5.5
Communication	92,731	2.7	5,460	2.1
Wholesale Trade	166,744	4.8	11,471	4.4
Retail Trade	533,364	15.4	35,179	13.6
Finance	249,271	7.2	11,154	4.3
Business/Repair	203,265	5.9	12,849	5.0
Personal	195,217	5.6	12,327	4.8
Professional				
Health	250,413	7.2	20,792	8.0
Education	250,293	7.2	17,308	6.7
Other	170,887	4.9	9,262	3.6
Government	121,402	3.4	10,654	4.2
TOTAL	3,471,764	100.0%	258,640	100.0%
Employment as a percent of County	100.0%		7.5%	

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

TABLE II-16D

1980 EMPLOYMENT OF RESIDENTS BY OCCUPATION

Occupation	Los Angeles County Number	Los Angeles County Percent	Project Corridor Number	Project Corridor Percent
Managerial				
Administrative	408,969	11.8	16,751	6.5
Specialty	445,857	12.8	18,985	7.3
Technical/Sales				
Technicians	107,502	3.1	6,572	2.5
Sales	347,100	10.0	17,246	6.7
Clerical	685,497	19.7	47,305	18.3
Service	410,560	11.9	41,350	16.0
Farming/Forestry	38,002	1.1	3,393	1.3
Craft/Repair	423,665	12.2	33,368	12.9
Operator/Laborer/ Assemblers	340,971	9.8	43,545	16.8
Transportation	120,412	3.5	13,124	5.1
Laborers	143,229	4.1	17,001	6.6
TOTAL	3,471,764	100.0%	258,640	100.0%
Employment as a percent of County	100%		7.4%	

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

projected to be $362.8 billion. Property values by corridor segment are discussed in Sections 223, 323, and 423 of this chapter.

II-170 TRANSPORTATION

II-171 Vehicular Traffic

Los Angeles County possesses an extensive street and highway system, with nearly 500 miles of freeway and over 18,000 miles of county roads and city streets (see Figure II-17A). The major freeway facilities which serve the Long Beach-Los Angeles corridor area are the Hollywood, Santa Ana, Long Beach, Harbor, Santa Monica, Artesia and San Diego Freeways.

The total number of person-trips is expected to increase by 18 percent between the years 1980 and 2000, while transit person-trips will increase by 64 percent. By the year 2000 there will be approximately 178 million total average daily vehicle miles of travel (VMT) and about 20 million total vehicular trips in Los Angeles County. An average trip length in Los Angeles will be approximately 9.0 miles, and travel times will have increased substantially as a result of increasing levels of congestion. Between 1980 and 2000 average daily traffic volumes are projected to increase by 11 percent. During the same time frame, as congestion levels increase, peak period traffic volumes will increase by some 20 percent, reflecting a lengthening of peak period traffic conditions.

Overall, regional travel demands will increase significantly from the existing condition to the forecast year of 2000. Transit improvements, including Metro Rail, will increase transit's share of the mode split somewhat, and greater use of high-occupancy vehicles is expected. These modal shifts, combined with peak-period lengthening, will result in a lower growth rate of peak period traffic; however, the absolute growth in peak hour traffic will result in a high level of congestion.

The year 2000 highway network employed in the regional transportation system represents the highway improvements to be implemented under the 1980 Regional Transportation Plan and includes:

- o Construction of the 8-lane Century Freeway (I-105) from Sepulveda Boulevard to the San Gabriel River Freeway (I-605) with a high occupancy vehicle/transit lane in the center median.
- o Addition of high occupancy vehicle/transit lanes on the Harbor (I-110) and Santa Ana (I-5) Freeways.
- o A gap closure on the Foothill Freeway (Route 210) in the Sunland-Tujunga area.

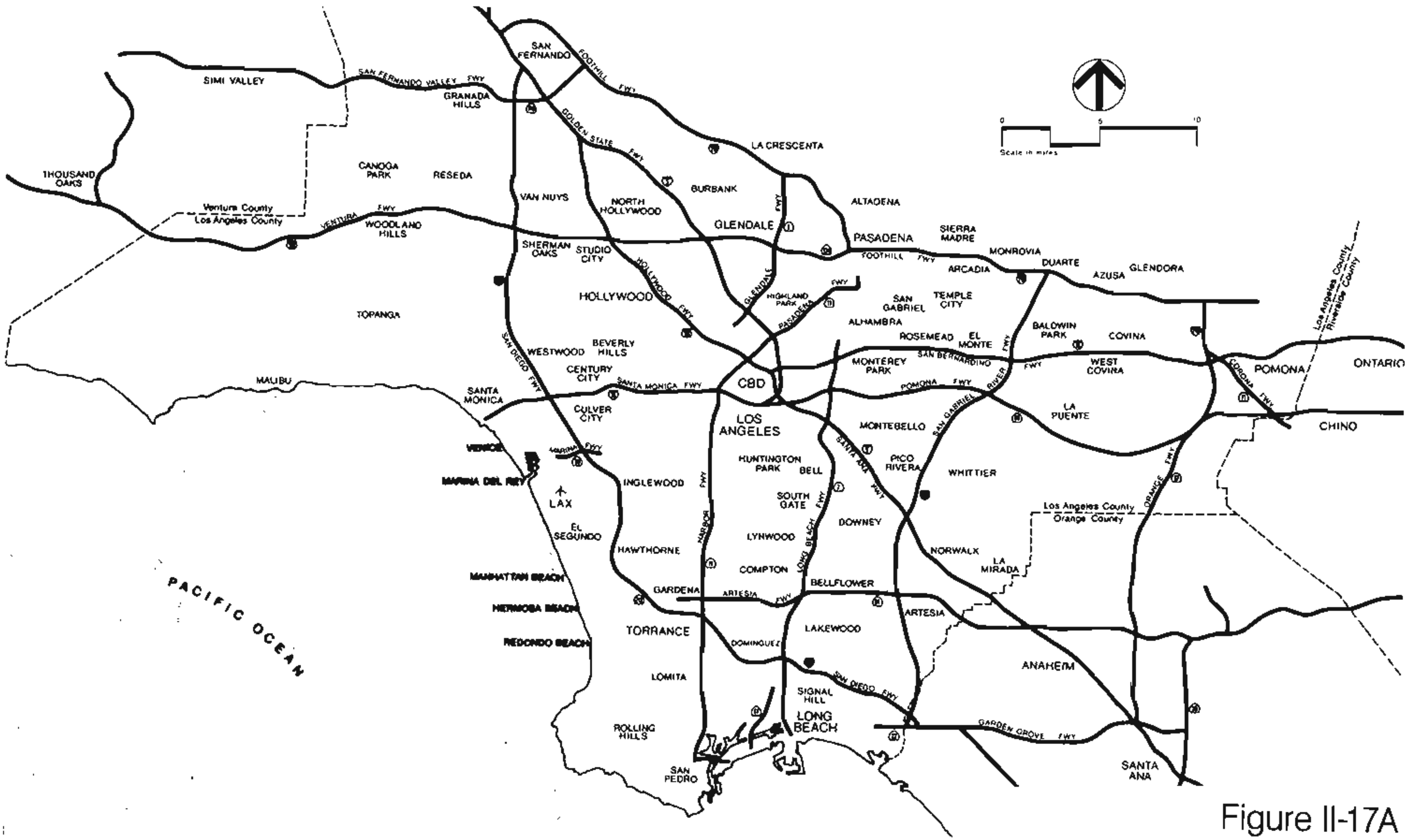


Figure II-17A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

REGIONAL FREEWAY NETWORK
PARSONS BRINCKERHOFF / KAISER ENGINEERS

- Extensions of the following freeways: Artesia Freeway (Route 91) extension to the Harbor Freeway (I-110), and the Simi Valley Freeway (Route 118) in the San Fernando Valley to the Thousand Oaks Freeway (Route 23).

- Upgrading of I-215 (Route 15E) freeway (from 6 lanes to 8 lanes) from the interchange with the Pomona Freeway (Route 60) to the Artesia Freeway (Route 91).

Total person-trips in the Long Beach-Los Angeles project corridor are approximately 8 percent of the total regional person-trips. Within the corridor the total number of person-trips between 1980 and 2000 is expected to increase by 16 percent, while transit person-trips will increase by 47 percent. Transit now accounts for 15 percent of the person-trips in the corridor, almost twice the county average. The percent of transit trips of the total person-trips is expected to increase from 15 percent to 19 percent by the year 2000.

II-172 Transit Operations

The Southern California Rapid Transit District (SCRTD) is the primary public transportation carrier in the Los Angeles region. SCRTD has the largest all-bus transit system in North America, with over 2,400 buses. Average weekday patronage on SCRTD's 226 lines is approximately 1.5 million. The Long Beach-Los Angeles project corridor accounts for 53,000 home-to-work transit trips, or 13 percent of the total for Los Angeles County. By the year 2000, without the project, this number is projected to increase to 79,000, or 12 percent of the projected home-to-work trips for LA County. Service is provided on local bus lines, limited stop lines on arterial streets, and express bus lines on freeways.

In the Long Beach area the Long Beach Transit Company (LBTC) is the primary public transportation carrier. This all-bus transit system, with approximately 180 buses on 19 bus lines, carries over 11,000 passengers on an average weekday.

Other bus transit systems operating within the project corridor include the Gardena Municipal Bus Lines and the Torrance Transit System.

II-180 ENERGY

II-181 Transportation Fuel Use in the SCAG Region

The SCAG region's consumption of gasoline (5.5 billion gallons) and diesel fuel (530 million gallons) in 1980 was about half that used for on-road transportation in all of California. The distribution of this consumption among various categories of vehicles is shown in Table II-18A, along with vehicle miles traveled (VMT) per year for each class of vehicle and average fuel economy. Effective average fuel economy was about 13.9 mpg for light-duty and medium-duty vehicles

TABLE II-18A

TOTAL 1980 ON-ROAD TRANSPORTATION VEHICLE FUEL CONSUMPTION

SCAG REGION

Economy	Gasoline Consumption (Billions of Gallons)	Gasoline Consumption (Percent)	Diesel Consumption (Millions of Gallons)	Annual VMT (Millions)	Annual VMT Percent	Fuel (MPG)
Auto	4,063	74.2	Negligible*	58,916	77.3	14.5
Light-duty truck	635	11.6	*	8,386	11.0	13.2
On-road motorcycle	14	0.3	*	719	1.0	51.6
Medium-duty truck	471	8.6	*	3,909	5.1	8.3
Heavy-duty truck						
Gasoline	290	5.3	-	1,509	2.0	5.2
Diesel	-	-	530	2,756	3.6	5.2
TOTAL	5,473	100.0	530	76,195	100.0	12.7

*Based on Air Resources Board (ARB) Report: "Light-duty diesel powered vehicles constitute a negligible amount of vehicular diesel emissions" (ARB, 1981).

Note: 1980 VMT is based on South Coast Air Basin, Ventura County Air Basin, and Southeast Desert Air Basin estimates. Fuel economy is based on California Energy Commission 1980 estimates (CEC, 1983).

Source: Southern California Association of Governments, "Energy Analysis for Long-Beach-Los Angeles Rail Transit Project," February 1984.

and 5.2 mpg for heavy-duty vehicles. Diesel fuel use was almost entirely by heavy-duty vehicles and was negligible for light-duty vehicles.

Within the South Coast Air Basin light-duty cars and trucks used 4.7 billion gallons of gasoline per year; heavy-duty vehicles required 253 million gallons of gasoline and 470 million gallons of diesel fuel. All vehicles traveling in the Long Beach and southern Los Angeles areas in the vicinity of the Long Beach-Los Angeles rail corridor were calculated to use 649 million gallons of gasoline and 64.5 million gallons of diesel fuel in 1980.

II-182 Transportation Energy Supply

Since 1973 supplies and costs of U.S. transportation fuels have fluctuated in response to events in the Middle East. These fluctuations have influenced fuel consumption patterns. By December 1982 the world oil market was in a state of oversupply and the price of gasoline had decreased by about $.10 per gallon over the previous year (Lundberg Letter, 1982). With the current world depression and long-term conservation trends likely to maintain downward pressure for several years into the future, the California Energy Commission (CEC) forecasts only a one percent annual average real price increase to 1987. With a serious supply disruption the real cost could increase more than that. Increased gasoline costs related to a major supply disruption would be expected to have a major influence on transportation energy consumption patterns.

Petroleum (crude oil) is the primary source of transportation fuels used in the SCAG region. The fuels are refined principally by large complexes located in the vicinity of the Los Angeles-Long Beach Harbor. Refineries in this region process about 300 million barrels of crude oil each year (California Energy Commission, 1983). Assuming the world oil market remains stable, ample resources exist to sustain petroleum requirements of the state during the next two decades (CEC, 1983).

II-183 Fuel Economy Trends

Since the automobile is the dominant form of transportation, its average fuel economy is a critical determinant of transportation energy consumption in the region. For new vehicles average fuel economy has increased during recent years, thus increasing the overall fleet average. One consequence of this trend is that total fuel consumption has declined slightly in recent years even though travel mileage has grown. The trend toward increased automobile fuel economy is expected to continue due to the federal standard of 27.5 mph for new automobiles starting in 1985 and as a response to probable long-term increases in costs for motor fuel.

II-200 DOWNTOWN LOS ANGELES

II-210 NATURAL ENVIRONMENT

II-211 Topography, Soils, Geology, and Seismicity

The downtown Los Angeles segment comprises approximately 2,240 acres with the lowest elevation (about 220 feet above sea level) occurring along Washington Boulevard. Proceeding northerly, elevation climbs to 400 feet above sea level in the Elysian Hills.

Extensive grading for development has occurred throughout downtown Los Angeles in the past. Consequently, imported fill of unknown extent and quality could be found almost anywhere along the proposed alignments.

Generally, however, there is only one naturally occurring soil type found -- the "Hanford association." Hanford soils are well drained, very deep, moderately dense, and have good available water holding capacities. Erosion hazards are moderate and water run-off slow over most of this soil association.

Geologic and seismic conditions for downtown Los Angeles are generally described in Section 110 of this chapter.

II-212 Floodplains, Hydrology, and Water Quality

The downtown Los Angeles alternatives would not encroach onto any established floodplain. The location and areal limits of floodplains are established by Flood Insurance Rate Maps (FIRM). These maps are published by the Federal Emergency Management Agency (FEMA) as part of an ongoing program to reduce potential flooding hazards. Contour elevations indicate a direction of flow for storm run-off parallel to the proposed project right-of-way. Drainage control for downtown Los Angeles alternatives would consist of using exisiting facilities.

Groundwater enters the downtown Los Angeles area through subsurface flow at the Los Angeles and Whittier narrows. Replenishment of groundwater occurs by percolation or precipitation, streamflow, and artificial spreading. Groundwater levels have been gradually rising in recent years due to limits set on extraction rates and heavier than usual rainfall during the past five years.

Depth to groundwater in downtown Los Angeles ranges from 20 feet to 150 feet below the surface. The higher levels of ground are probably "perched" (i.e., a small quantity held above the general groundwater table by an impervious stratum). Potable drinking water has been tapped by wells at lower levels, 100 to 150 feet below the surface.

II-213 Vegetation and Wildlife

The downtown Los Angeles area is a long-established urban area; virtually no native vegetation remains. Existing vegetation consists of shade trees, shrubs and ground cover (grasses) associated with surrounding development. Typically, there are eight types of trees that are used as landscaping along the proposed alignments in downtown Los Angeles. These trees include the following: Rustyleaf fig (Ficus rubiginosa), Southern Magnolia (Magnolia grandiflora), Indian Laurel fig (Ficus retusa nitida), Fern pine (Podocarpus gracilior), London Plane Tree (Platanus acerifolia), Evergreen Pear (Pyrus kawikami), Jacaranda (Jacaranda mimosifolia), and Crape Myrtle (Lagerstroemia indica).

These trees provide roosts and habitat for common city-dwelling birds such as house sparrows, finches, mockingbirds, starlings, scrub jays and pigeons. Other wildlife that could be expected to be found in downtown Los Angeles would generally be burrowing rodents including mice, rats, gophers, and ground squirrels.

A satellite maintenance yard would be located directly adjacent to Long Beach Avenue between 12th and 14th Streets in downtown Los Angeles. There is no vegetation or wildlife on the site.

II-214 Noise and Vibration

The major source of noise in downtown Los Angeles is automobile and bus traffic on city streets. Superimposed on this ambient level are the sounds of construction activities at numerous locations, plus the noise of traffic on the major freeways. While this base produces an average sound level that remains fairly constant with time, individual high noise level events occur from time to time due to horns, sirens, construction equipment, and passbys of noisy vehicles such as trucks and buses. Occasional aircraft and helicopter overflights contribute to the total, as does the noise of air conditioning and ventilating systems, particularly in the summer months.

In order to document the existing noise and vibration environment along the proposed downtown alignment alternatives, a field survey was conducted in November 1983. In addition, previous recent noise monitoring surveys from the Los Angeles Rail Rapid Transit Project (Metro Rail) and the Los Angeles Downtown People Mover Project were reviewed. During the November survey, conducted for the Long Beach-Los Angeles Rail Transit Project, noise levels were monitored for a continuous 24-hour period at two locations and for short-term (20-minute) periods at two additional locations. Vibration data also were collected at Locations 1 and 2. The sites for which data are available are shown on Figure II-21A.

Table II-21A describes the two measurement locations at which 24-hour monitoring and vibration measurements were obtained and lists the community noise equivalent levels (CNEL) measured; it also

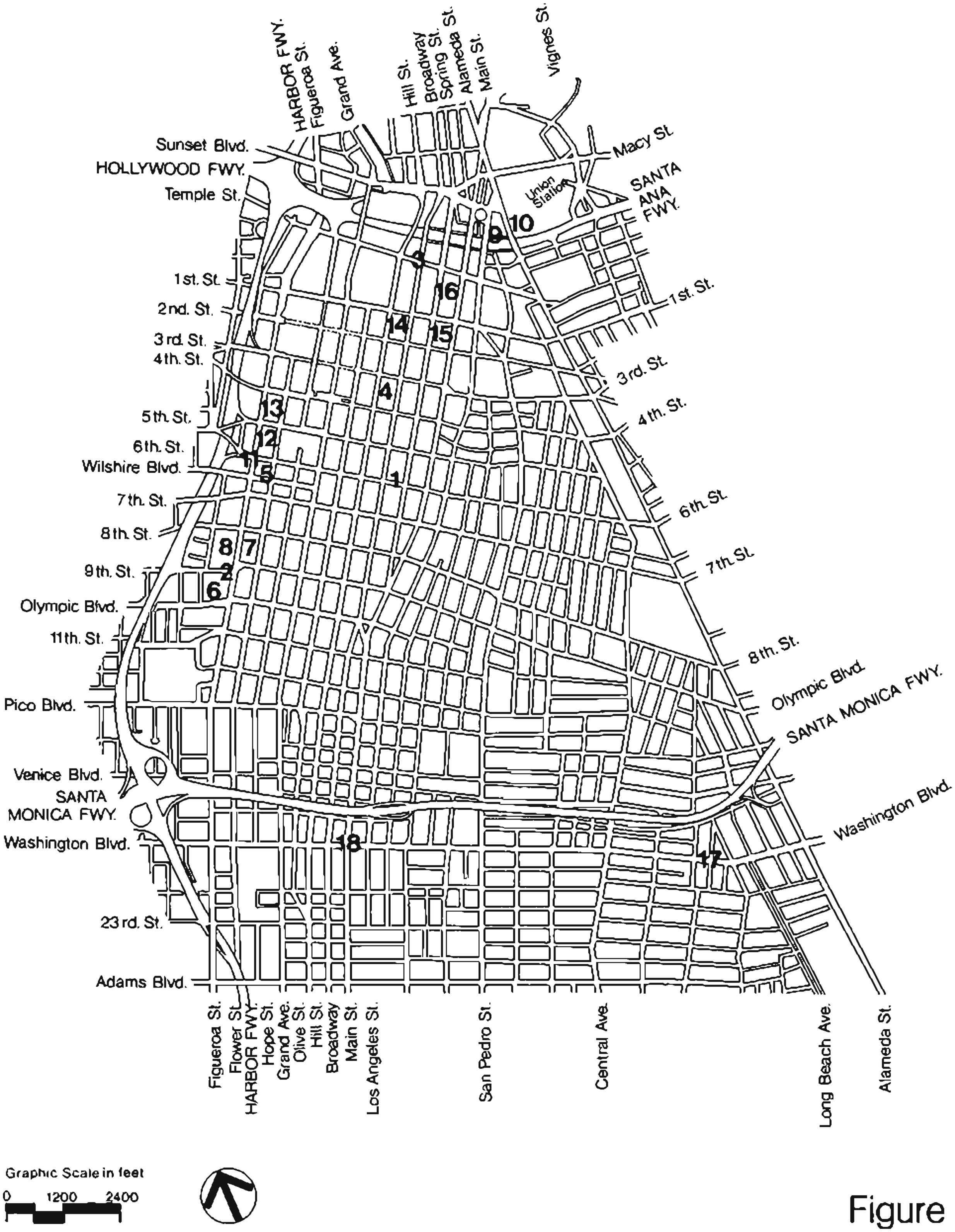


Figure II-21A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Los Angeles
Noise Measurement Sites
PARSONS BRINCKERHOFF / KAISER ENGINEERS

TABLE II-21A

NOISE DATA - LOS ANGELES

Map Key	Location	Measured Sound Levels (dBA) CNEL/L_{dn}	L_{eq} (Peak Hr.)	Comments
1	Hayward Hotel 6th/Spring Sts.	74 CNEL	75	Long-term (24 hr.) measurement November 1983
2	Best Western Kent 9th/Figueroa Sts.	72 CNEL	70	Long-term (24 hr.) measurement November 1983
3(1)	Broadway/Temple St.	70-72 L_{dn}(2)	72	Short-term (10-20 min.) 1982
4	Broadway between 3rd/4th Sts.	70-72 L_{dn}	73	Short-term (10-20 min.) 1982
5	Wells Fargo Bank Flower St./ Wilshire Blvd.	72-74 L_{dn}	74	Short-term (10-20 min.) 1982
6(3)	West side of Figueroa between 9th St. & 9th Place	-	72	Short-term (10-15 min.) 1978
7	East side of Figueroa between 8th/9th Sts.	-	71	Short-term (10-15 min.) 1978
8	West side of Figueroa between 8th St. & 8th Place	-	69	Short-term (10-15 min.) 1978
9	Northeast corner, Aliso/Los Angeles Sts.	-	74	Short-term (10-15 min.) 1978
10	North side of Arcadia St., 200 ft. east of Alameda St.	-	68	Short-term (10-15 min.) 1978
11	West side of Figueroa St. between Wilshire Blvd. & 6th St.	-	70	Short-term (10-15 min.) 1978

TABLE II-21A (Continued)

NOISE DATA - LOS ANGELES

Map Key	Location	Sound Levels (dBA) CNEL/L_{dn}	L_{eq} (Peak Hr.)	Comments
12	East side of Figueroa St. between 5th/6th Sts.	-	72	Short-term (10-15 min.) 1978
13	West side of Flower St. between 4th/5th Sts.	-	72	Short-term (10-15 min.) 1978
14	West side of Broadway between 1st/2nd Sts.	-	72	Short-term (10-15 min.) 1978
15	East side of Spring St. between 1st/2nd Sts.	-	71	Short-term (10-15 min.) 1978
16	East side of Spring St. between 1st/Temple	-	75	Short-term (10-15 min.) 1978
17	Washington Blvd. near Naomi Ave.	-	73(4)	Short-term (20 min.) November, 1983
18	Washington Blvd. near Main St.	-	76(4)	Short-term (20 min.) November, 1983

Note: (1) Sites 3, 4 and 5 are from information prepared for Southern California Rapid Transit District Metro Rail Project.
(2) As a rule, the difference between the CNEL and L_{dn} ratings for the same location is usually less than 1 dB and therefore not significant for purposes of comparison. The difference is that there is no evening adjustment in the L_{dn} measurement.
(3) Sites 6 through 16 are from information prepared for the Los Angeles Downtown People Mover Project.
(4) Non peak period L_{eq}.

Source: Bolt Beranek & Newman; M. L. Frank & Associates, 1984.

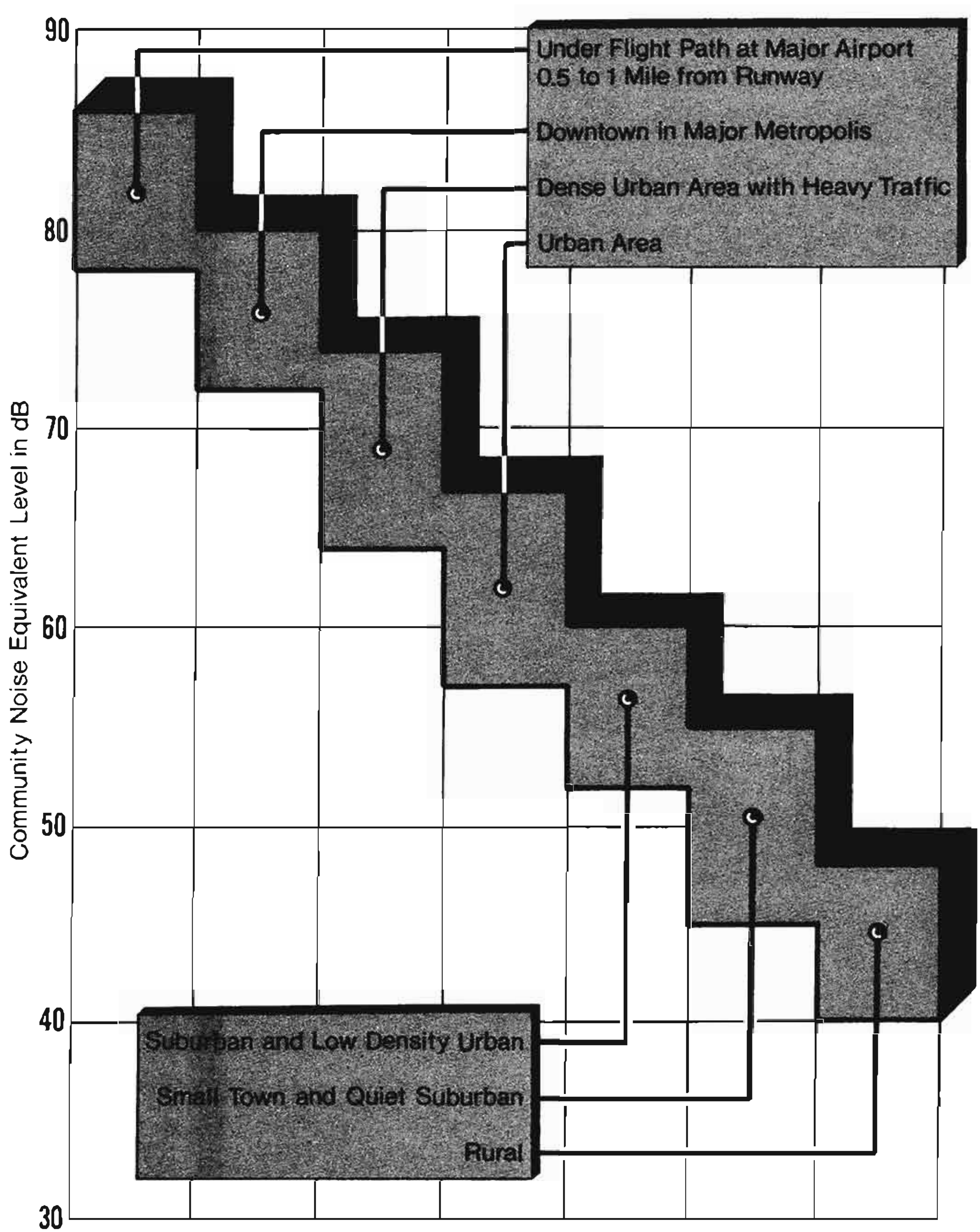


Figure II-21B

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

TYPICAL COMMUNITY
CNEL LEVELS
PARSONS BRINCKERHOFF / KAISER ENGINEERS

describes the short-term measurement locations and lists the maximum A-weighted noise level occurring during the measurement period. The CNEL represents an average of the A-weighted noise levels occurring over a full 24-hour period, with adjustments applied to those levels occurring during evening and nighttime hours in order to account for the greater sensitivity of people to noise and vibration levels during these hours. Specifically the noise level ocurring between 7:00 PM and 10:00 PM have an adjustment of 5 dBA, while noise levels ocuring from 10:00 PM to 7:00 AM have an adjustment of 10 dBA. These weighted evening and nighttime noise levels are then averaged together with the unweighted daytime noise levels to provide an equivalent hourly average.

The A-weighted sound level incorporates a frequency weighting of the sound signal which simulates the sensitivity of the human ear to sounds of different frequencies.

The results indicate short-term average sound levels and CNEL values of 70 to 75 dBA, which is representative of downtown major metropolitan areas (see Figure II-21B). Levels of similar magnitude were found in two earlier studies, Metro Rail Environmental Impact Statement (EIS) and the EIS for the Los Angeles Downtown People Mover.

CNEL values and average short-term sound levels in this range are high for typical residential uses, but acceptable for uses such as office buildings, retail, and commercial activities. The ambient vibration levels measured at Locations 1 and 2 were well below the threshold of perception.

II-220 SOCIOECONOMIC ENVIRONMENT

II-221 Land Use, Population, and Housing

II-221.1 Land Use

As illustrated in Figure II-22A, dominant land uses in the Los Angeles segment of the project corridor are public, office, retail, and industrial. The downtown area has been divided by the City Planning Department and Community Redevelopment Agency (CRA) into various subareas. The subareas through which the alternative alignments would pass are described briefly below.

- Central City North: The Chinatown community and redevelopment area is located north of Sunset, west of Alameda and east of the Harbor/Pasadena Freeway. It includes low-rise structures that contain ground-floor retail and services with housing or offices above. Southeast of Chinatown is the El Pueblo de Los Angeles State Historic Park which includes Olvera Street, a visitor attraction with many restored historic landmarks as well as restaurants and shops. East of Olvera Street is Union Station,

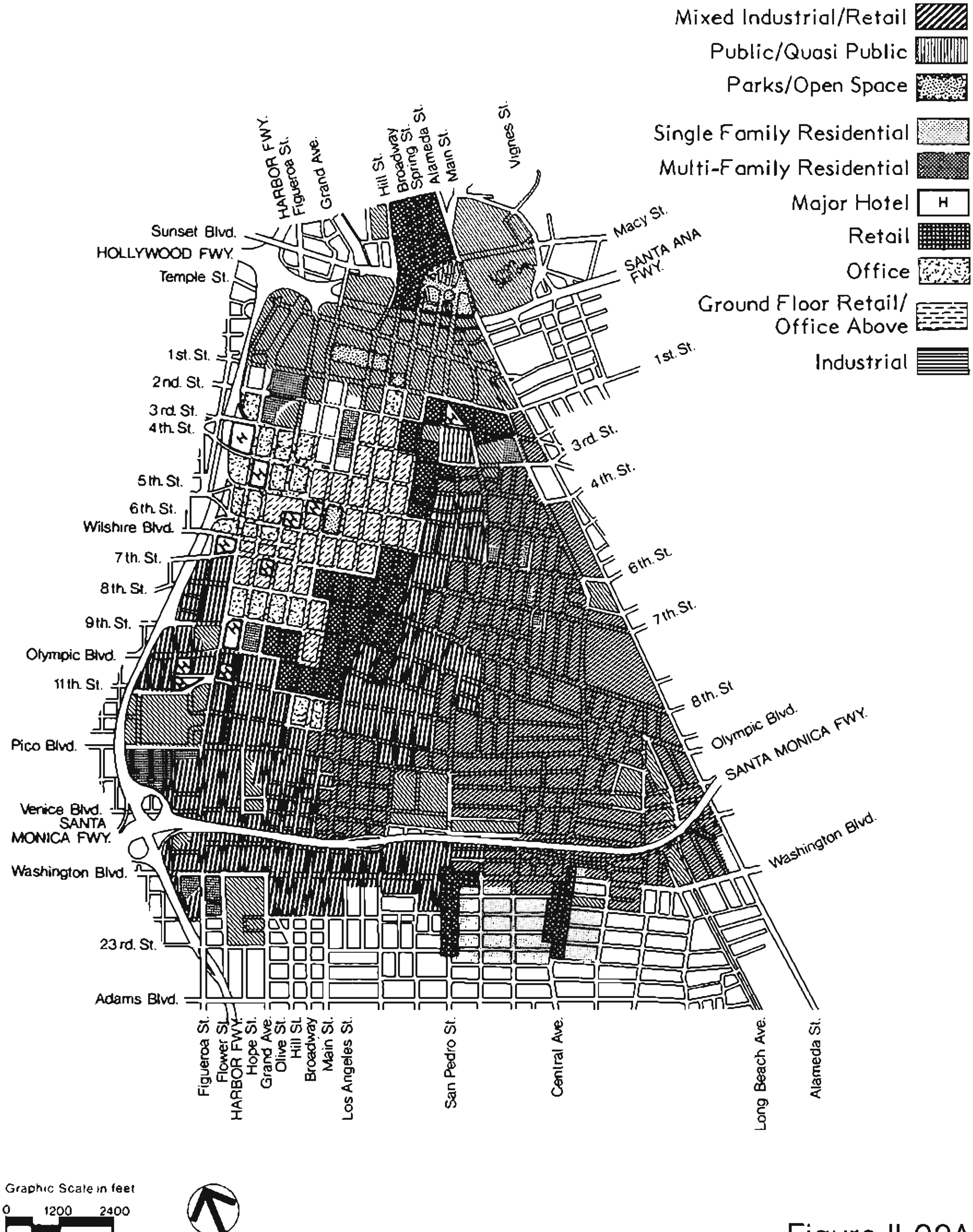


Figure II-22A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles
Generalized Land Use
PARSONS BRINCKERHOFF KAISER ENGINEERS

which is currently the terminal for Amtrak rail service and Trailways buses.

- o Civic Center: Bounded by 1st Street on the south, the Hollywood Freeway (Highway 101) on the north, Alameda Street on the east, and the Harbor Freeway on the west, the Civic Center contains city, county, and federal administrative and court buildings as well as the Music Center.

- o Little Tokyo: The Little Tokyo community and redevelopment area contains a mix of retail, service, housing, and cultural facilities. As in Chinatown, structures are predominantly low-rise with no setback and are subdivided into small shops and offices. Several off street pedestrian retail plazas have been constructed as part of the redevelopment project in conjunction with more intensive retail and office development. Redevelopment projects emphasizing retail, residential, and office uses are planned for the area.

- o Bunker Hill: Bunker Hill, the original downtown redevelopment project, is 65 percent complete with 30 acres still undeveloped. Current uses include over 6 million square feet of major office space, over 1,000 housing units for the elderly, approximately 1,000 market-rate, multi-family units and 1,000 hotel rooms with support retail. The remainder of the Bunker Hill project area, including the three-block California Center complex, will be completed by the year 2000.

- o Central Commercial Core: This portion of the Central Business District (CBD) Redevelopment Project contains a mix of new high-rise commercial buildings and well-maintained older mid-rise buildings west of Hill Street and less-well-maintained mid-rise buildings east of Hill Street. The Broadway and Spring Street historic districts comprise most of the area east of Hill Street. The majority of structures in these districts contain vacant upper stories, formerly occupied by offices. Along Broadway, lucrative retail activity supports ground floor leases, generally permitting the upper stories to remain vacant.

  A substantial amount of the upper story office space on Spring Street is similarly vacant and retail activity is much less intense than on Broadway. The CRA estimates that of the 3.7 million square feet on Spring Street, 2.5 million are potentially available for office use. Of that total, 1.4 million square feet of office space are available for immediate occupancy or are in the process of being renovated, and another 1.1 million square feet could be revitalized.

- o South Park: In addition to the Convention Center and secondary hotels, the South Park area is currently occupied by a mix of very low-intensity light manufacturing and retail uses. The recently completed skyline condominiums were the first major residential project planned for the area by the CRA. South Park is planned as a major pedestrian-oriented residential center with retail and commercial development located between 7th and 9th streets.

Projecting build-out by the year 2006, the CRA's plans for the area call for 6,000 to 7,500 dwelling units and 6 to 8 million square feet of new office and retail space organized around two pedestrian spines on Hope Street and 9th Street. To convert Hope Street into a pedestrian promenade, the CRA plans to retain the street's pedestrian scale and strong axial view of the Central Library. The curb-to-curb dimension of Hope Street will be narrowed to accommodate wider sidewalks, plazas and mini-parks; a three-acre park will be located south of 9th Street between Hope and Grand Streets.

- Central City East: This portion of the CBD Redevelopment Project is comprised of an extension of the apparel wholesaling and manufacturing district primarily to the west of San Pedro Street and industrial uses to the east. Distribution facilities line the railroad yards along Alameda.

- East Side Industrial Park: This Redevelopment Project subarea includes the existing produce market and the new produce market site near North Street and Central Avenue, the revitalized Flower Market and the apparel manufacturing and wholesaling district. The California Apparel Mart at Olympic Boulevard and Los Angeles Street provides a focus for garment wholesaling activities.

- Southeast Area (Outside of Redevelopment Project Areas): Land use in this area is almost completely industrial, including manufacturing, warehouses, and distribution.

- Washington Boulevard: Land use in the area adjacent to Washington Boulevard is predominantly industrial. Retail use is concentrated at Central Avenue and San Pedro Street and scattered along Washington Boulevard west of San Pedro. A mix of single-family and multi-family housing predominates south of 24th Street (one block south of Washington Boulevard).

The Land Use and Development Technical Report (Sedway Cooke Associates, April 1984) contains maps of land uses in 1980 as well as land uses permitted by the applicable community or redevelopment plan and by zoning. These plans call for mixed development in the downtown; however, the three predominating land uses will be office space, retail and hotels.

II-221.2 Development Trends

Building rates for major commercial office space in downtown Los Angeles have accelerated rapidly in recent years. Since the "renaissance" of the downtown area that began in 1972 with the construction of Arco Plaza, the average growth rate has been 1.1 million square feet of rentable space per year. The overall occupancy rate for the total 18 million rentable square feet available on January 1, 1984 (grown from 13 million square feet on January 1, 1980) is estimated at 86 percent, a level normally sufficient to guarantee a healthy economic return for most developments. The absorption rate averaged 716,000 square feet per year from 1977 to 1981. Between 1979 and 1981 it averaged 1.1 to 1.3 million square feet per year.

Nine development projects totaling 6.8 million square feet are scheduled for completion by 1990; an additional nine projects including 5.2 million square feet are in various stages of planning.

In 1980 there were an estimated 18 million square feet of retail space in the entire Los Angeles corridor segment. Of this, the 1.5-square-mile Los Angeles downtown area bounded by the Harbor Freeway, the Hollywood Freeway, Los Angeles Street, and Pico Boulevard contained approximately 14 million square feet of space; an additional 300,000 square feet was added between 1980 and 1983. By 1990 the existing base of retail space will increase by at least 750,000 square feet with the addition of the California Center and CitiCorp Plaza.

As of 1980 there were 8 competitive hotel facilities with 5,346 rooms. The majority of these facilities were constructed prior to 1970. However, a significant increase in hotel construction activity occurred in the late 1970s with an average of 277 rooms per year added from 1975 to 1981. The average annual occupancy rate has been about 77 percent.

Three additional hotels totaling 1,383 rooms have been completed or are scheduled for completion between 1980 and 1986. An additional 450+ rooms are in the planning stages. It is anticipated that the projected room demand will increase from 4,148 rooms in 1980 to 6,250 rooms in the early 1990s, which would increase the number of supportable rooms from 5,530 to 8,334 (assuming a 75 percent average annual occupancy rate).

II-221.3 Population

Areas within 1/4 mile of the stations for LA-1 (Broadway/ Spring Couplet) and LA-2 (Flower Street Subway) contain roughly the same population with similar ethnic and age characteristics (see Table II-22A). The population within the LA-3 (Olympic/9th Aerial) station areas is slightly more than half of the other two, and their residents tend to include a smaller proportion of nonwhites and a larger proportion of elderly. Each of the three downtown Los Angeles alternatives would pass through sections where the incidence of transit dependence is high.

In the more northerly section of Los Angeles, station areas would include a significant proportion of males living in group quarters.

TABLE II-22A

1980 STATION AREA SELECTED DEMOGRAPHIC CHARACTERISTICS

DOWNTOWN LOS ANGELES

Station Area	Population	Percent Nonwhite	Percent 0-19 Years	Percent 64+ Years	Median Household Income	Percent Classified as Low-Income[1]	Percent Households Without Automobiles	Percent Between 16-64 Years Classified as Work-Disabled	Percent 16+ Years Classified as Transit-Disabled
LA-1									
Union Station	709	84	24	8	$ 6,894	52	35	17	5
Temple Street	35	94	26	23	6,397	33	33	0	4
1st/2nd Streets	711	80	8	6	6,614	38	79	11	2
4th Street	1,472	50	4	16	5,095	55	84	23	0
7th Street	4,112	58	7	18	4,718	53	96	22	5
Olympic Boulevard	842	85	34	6	6,681	64	78	5	2
18th Street	1,087	97	44	3	7,177	63	52	6	2
San Pedro Street	1,971	99	40	6	14,219	37	29	5	5
TOTAL	10,939	73	20	12		54	81	15	5
LA-2									
Union Station[2]	702	84	24	8	$ 6,917	52	35	7	5
Main Street	1,368	66	5	9	5,652	50	82	18	5
Olive Street[2]	880	30	6	11	24,986	9	14	2	1
4th Street	1,055	29	5	17	22,054	13	17	2	1
7th Street	1,191	49	9	39	4,931	41	90	20	6
Pico Boulevard	2,034	88	29	7	7,257	44	74	10	3
18th Street	1,451	91	34	6	8,151	51	56	39	0
Broadway	1,107	98	44	3	7,229	62	51	6	2
San Pedro Street[2]	1,971	99	40	6	14,219	54	29	5	4
TOTAL	11,759	75	24	11		40	54	9	4

TABLE II-22A (Continued)

1980 STATION AREA SELECTED DEMOGRAPHIC CHARACTERISTICS

DOWNTOWN LOS ANGELES

Station Area	Population	Percent Nonwhite	Percent 0-19 Years	Percent 64+ Years	Median Household Income	Percent Classified as Low-Income[1]	Percent Households Without Automobiles	Percent Between 16-64 Years Classified as Work-Disabled	Percent 16+ Years Classified as Transit-Disabled
LA-3									
Union Station[2]	702	84	24	8	$ 917	52	35	7	5
Main Street	1,167	64	5	10	5,678	35	85	19	5
Olive Street[2]	877	30	6	11	24,986	9	14	2	1
4th Street	99	26	2	40	5,184	39	29	0	0
7th Street	771	80	23	12	6,590	49	69	10	4
Olive Street	1,871	57	12	41	4,938	39	97	18	6
Maple Avenue	421	72	16	12	5,053	54	94	0	5
Central Avenue	238	95	24	4	8,910	58	28	14	2
TOTAL	6,146	63	13	20		37	72	13	4

[1] Low-income is defined as below 125 percent of the federally defined poverty level.

[2] Indicates identical station areas. Where duplicate station names appear without asterisks, the geographic boundaries of the station areas actually differ; therefore, the characteristics of the station areas differ.

Source: Sedway Cooke Associates, "Land Use and Development Technical Report," 1984.

Those not living in group quarters in this section are family-oriented and have a broad ethnic distribution. In the southern portion of downtown Los Angeles the population consists almost entirely of Hispanics, with correspondingly larger households and larger proportions of youth. The number of disabled and elderly is low. Auto ownership is slightly higher than in the central downtown area; the relatively higher median income and the distance from the downtown core cause more people to drive to work, rather than walk. Many depend on mass transit, but in smaller proportions than in the downtown core.

Alternative LA-1 would traverse neighborhoods populated by many immigrants who have recently arrived in this country. Station area households of this alternative generally have low incomes ranging from $4,700 to $7,200. Consequently, LA-1's station areas include the greatest number of low-income and autoless households.

Alternative LA-2 would pass through station areas inhabited by many nonwhite, low-income families. The only exception is the 7th Street station area which contains a high proportion of elderly, white middle-income residents.

Residents along the LA-3 alternative, on the whole, are slightly older and tend to live in one- and two-person households. Although LA-3 would have a large proportion of transit dependents, with 6,100 residents it is the least-populated of the three Los Angeles alternative areas.

II-221.4 Housing

Since there is little residential land use in downtown Los Angeles, housing density is a low 3.7 units per acre. Consequently, only 8 percent of the corridor's housing stock is located in this section. Of the over 20,000 units in the downtown area, 85 percent are found in multi-family structures and 90 percent are rentals.

Most of the downtown housing stock consists of older, lower-value residential hotel units or high-occupancy apartments inhabited by a highly transient population. There are, however, pockets of recently built, market-rate housing constructed as part of the city's redevelopment efforts. There are several publicly subsidized housing projects in the downtown area with a combined total of nearly 1,500 units. The largest project is Angelus Plaza, which contains over 1,000 units for the elderly.

Between 1970 and 1980 the downtown area had an average annual housing growth rate of 0.6 percent. Although this rate was only half that of the overall county (1.2 percent), it exceeded the growth rates of the other corridor sections. This growth was due to housing projects constructed as part of the Bunker Hill and Little Tokyo redevelopment efforts. SCAG projects that, between 1980 and 2000, downtown Los Angeles will experience an average annual housing growth rate of 1.5 percent, which is significantly higher than the county's projected annual rate of 1.0 percent. This growth would occur as a result of continued redevelopment efforts in both the Bunker Hill and South Park areas.

II-222 Community Services

Although there are large numbers of community services in the downtown Los Angeles segment of the project corridor, the only significant impacts would be to those service facilities located within walking distance (approximately 1/4 to 1/2 mile) of the alignment and to those emergency services and public utilities serving each segment of the alignment. For the purposes of this analysis service facilities include schools, libraries, churches, parks and other public recreational facilities, medical facilities, and other social service outlets. Emergency services include police and fire protection. Public utilities include gas, water, electricity, telephone, solid waste disposal, and wastewater disposal. Figure II-22B shows the locations of schools, libraries, churches and medical facilities. Figure II-22C shows public and private social service outlets, and the response areas and locations of local fire and law enforcement facilities.

II-222.1 Schools, Libraries, and Churches

Because of the low residential population in downtown Los Angeles, there are few schools. The only significant concentrations of school-aged children near any of the downtown alignments are found in residential areas south of Washington Boulevard, and in the Skid Row area between Little Tokyo and the Garment District where newly arrived immigrant families live.

There are several regionally-based post-secondary schools in the downtown area. Los Angeles Trade-Technical College and the UCLA Extension downtown center, the two largest, enrolled 18,000 and 9,000 students respectively in 1982.

There are two libraries in downtown Los Angeles: the Los Angeles City Central Library and the County Law Library. Both are large, regionally-based facilities.

There are 26 churches in downtown Los Angeles. Those north of Washington Boulevard are mainly small, independent churches with regionally-based congregations representing specific ethnicities or lifestyles. The highest concentration of churches exists south of Washington Boulevard where local neighborhood churches serve the surrounding neighborhoods.

II-222.2 Medical Facilities

The largest medical facility in downtown Los Angeles, and the only one with emergency facilities, is the 325-bed California Hospital

Figure II-22B

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles Community Facilities

PARSONS BRINCKERHOFF/KAISER ENGINEERS

Figure II-22C

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles
Community Services
PARSONS BRINCKERHOFF / KAISER ENGINEERS

Medical Center at 1414 South Hope Street. In addition to the hospital, there are 13 public and private clinics spread throughout the downtown area.

II-222.3 Parks and Other Recreational Facilities

The largest park in the downtown area -- and the only significant open space -- is Pershing Square, which occupies an entire block bounded by 5th, 6th, Olive, and Hill Streets. Another downtown park, the Pueblo de Los Angeles State Historic Park, is located north of the Hollywood Freeway between Alameda and Main Streets. The south lawn of the Los Angeles City Hall, which fronts on 1st Street between Spring and Main Streets, has been formally designated as a public park by the City of Los Angeles. South of Washington Boulevard there are two local neighborhood parks which have recreation centers operated by the LA City Department of Recreation and Parks.

II-222.4 Other Social Service Outlets

This category of social services can be subdivided into two categories: government-supported services and independent, privately-supported services. In downtown Los Angeles there are many city, state and federal agencies which provide social services to the entire region. Most of these agencies are located in government office buildings in the Civic Center area.

Most of the privately supported services are provided to the residents and transients of the east side, especially the Skid Row area. In addition to rescue missions, a number of privately supported facilities have opened to provide medical, legal, housing and child care services to the Latin American families living on Skid Row.

II-222.5 Law Enforcement

Police protection in the downtown area is provided by both the Central and Newton divisions of the LAPD. Other divisions, however, are often called upon in emergency situations.

II-222.6 Fire Protection

The downtown Los Angeles alignment alternatives traverse the response areas of Los Angeles City Fire Department Stations 3, 4, 9, 10, 11, 14, and 17. All of theses are Task Force stations, meaning that they each house 2 engine companies, 1 truck company, and 10 on-duty fire fighters. Stations 3, 9, 10, 11, and 14 are also equipped with paramedic ambulances.

II-222.7 Public Utilities

Utilities in downtown Los Angeles are provided by the following entities:

- o Gas: Southern California Gas Company
- o Water: Los Angeles Department of Water and Power (DWP). Most supplies are obtained from the California Aqueduct, but some water is received from local groundwater sources and the Metropolitan Water District.
- o Electricity: Department of Water and Power
- o Telephone: Pacific Bell
- o Solid Waste Disposal: The Sanitation Bureau of the Los Angeles Department of Public Works. Although the city is responsible for residential refuse collection, commercial collection is handled by private companies.
- o Wastewater Disposal (Sewers): Sanitation is provided by the Los Angeles Department of Public Works. Treatment occurs at the city's Hyperion Treatment Plant in Playa Del Rey.

II-223 Economic Activity

The Los Angeles Central Business District (CBD) has the highest concentration of employment of the three corridor study areas. According to the Dun and Bradstreet Corporation, non-government employment in downtown Los Angeles totaled 192,700 persons in 1983. Employment in the services, wholesale and retail trade sectors constituted 46.6 percent of this total; employment in the manufacturing industry accounted for another 32.6 percent. Table II-22B presents the employment by industry for the Los Angeles CBD and project corridor.

Based upon a field survey of existing land uses in the corridor, 1980 employment has been estimated for each of the proposed station areas of the three alternative alignments in downtown Los Angeles. Year 2000 employment by place of work for these same station areas has been projected on the basis of assumptions regarding ongoing, planned, and proposed developments. The estimated 1980 and 2000 employment figures by station area for the LA-1 (Broadway/Spring), LA-2 (Flower Street Subway) and LA-3 (Olympic/9th Aerial) alternative alignments are presented in Tables II-22C through II-22E.

Of the three alternatives under consideration, the LA-1 alignment area with 83,700 persons had the highest number of employees in 1980. Should projected developments occur, the LA-1 station area employment would grow by 2.0 percent annually, increasing from

TABLE II-22B

1983 NON-GOVERNMENT EMPLOYMENT BY INDUSTRY

TOTAL CORRIDOR AND DOWNTOWN LOS ANGELES STUDY AREAS

	Total Corridor		Downtown Los Angeles		
Industry	Number	Percent	Number	Percent	As a % of Corridor
Agriculture, Forestry, Fishing	1,399	0.3	258	0.2	18.4
Mining	2,179	0.5	64	*	2.9
Construction	12,218	2.7	1,910	1.0	15.6
Manufacturing	165,119	36.9	62,695	32.6	38.0
Transportation, Communication, Utilities	35,805	8.0	22,195	11.5	62.0
Wholesale Trade	58,321	13.0	25,487	13.2	43.7
Retail Trade	49,656	11.1	27,575	14.3	55.5
Finance, Insurance, Real Estate	22,683	5.1	15,640	8.1	69.0
Services	100,357	22.4	36,850	19.1	36.7
TOTAL	477,737	100.0%	192,674	100.0%	40.3%

* Less than 0.1 percent.

Source: California Employment Development Department; the Dun and Bradstreet Corporation and Donnelly Marketing Information Services; Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE II-22C

STATION AREA EMPLOYMENT WITHOUT PROJECT

DOWNTOWN LOS ANGELES, LA-1 ALIGNMENT

Station	1980[1]	2000[2]	Total Change	
			Number	Percent
Union Station	510	510 - 2,445	0 - 1,935	0 - 379.4
Temple Street	15,135	15,135 - 17,070	0 - 1,935	0 - 12.8
1st/2nd Streets	10,520	18,370 - 22,370	7,850 - 11,850	74.6 - 112.6
4th Street	15,385	25,485 - 31,135	10,100 - 15,750	65.6 - 102.4
7th Street	28,200	32,165 - 32,235	3,965 - 4,035	14.1 - 14.3
Olympic Avenue	9,200	9,280	80	0.9
18th Street	3,615	3,655	40	1.1
San Pedro Street	1,165	1,165	--	--
TOTAL	83,730	105,765 - 119,355	22,035 - 35,625	26.3% - 42.5%

[1] 1980 employment estimated on the basis of existing development by type, as recorded by Sedway Cooke Associates' field survey 1983, and standard employment per square foot by type of development conversion factors.

[2] Total change in employment estimated on the basis of: (1) assumptions regarding ongoing, planned and proposed developments by the consultant team and City and County Planning Departments; and (2) standard employment per square foot by type of development conversion factors. A range of potential new employment has been indicated as a number of development proposals for these station areas appear tentative.

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE II-22D

STATION AREA EMPLOYMENT WITHOUT PROJECT

DOWNTOWN LOS ANGELES, LA-2 ALIGNMENT

Station	1980[1]	2000[2]	Total Change	
			Number	Percent
7th Street	39,975	61,335 - 64,045	21,360 - 24,070	53.4 - 60.2
Pico Boulevard	6,125	6,640	515	8.4
18th Street	2,300	2,330	30	1.3
Broadway	2,865	2,895	30	1.0
San Pedro Street	1,255	1,255	0	--
TOTAL	52,520	74,455 - 77,165	21,935 - 24,645	41.7% - 46.9%
Metro Rail to Union Station	52,000	81,000	29,000	36.5%
LA-2 and Metro Rail	104,520	155,455 - 158,165	50,935 - 53,645	48.7% - 51.3%

[1] 1980 employment on the basis of existing development by type, as recorded by Sedway Cooke Associates' field survey 1983, and standard employment per square foot by type of development conversion factors.

[2] Total change in employment estimated on the basis of: (1) assumptions regarding ongoing, planned and proposed developments by the consultant team and City and County Planning Departments; and (2) standard employment per square foot by type of development conversion factors. A range of potential new employment has been indicated as a number of development proposals for these station areas appear tentative.

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE II-22E

STATION AREA EMPLOYMENT WITHOUT PROJECT

DOWNTOWN LOS ANGELES, LA-3 ALIGNMENT

Station	1980[1]	2000[2]	Total Change	
			Number	Percent
4th Street	12,500	29,100 - 31,770	16,600-19,270	132.8 - 154.2
7th Street	31,000	50,935 - 54,110	19,935-23,110	64.3 -74.5
Olive Street	17,500	18,415 - 18,815	915 - 1,315	5.2 - 7.5
Maple Avenue	3,450	3,620	170	4.9
Central Avenue	3,470	3,480	10	0.2
TOTAL	67,920	105,550 -111,795	37,630-43,875	55.4% - 64.6%
Metro Rail to Union Station	42,200	63,200	21,000	49.8%
LA-3 and Metro Rail	110,120	168,750 - 174,995	58,630 - 64,875	53.2% - 58.9%

1 1980 employment estimated on the basis of existing development by type, as recorded by Sedway Cooke Associates' field survey 1983, and standard employment per square foot by type of development conversion factors.

2 Total change in employment estimated on the basis of: (1) assumptions regarding ongoing, planned and proposed developments by the consultant team and City and County Planning Departments; and (2) standard employment per square foot by type of development conversion factors. A range of potential new employment has been indicated as a number of development proposals for these station areas appear tentative.

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

106,000 to 119,000 persons in the year 2000. Station area employment along the LA-3 alignment is projected to grow at a slightly faster rate, resulting in a range similar to LA-1 by the year 2000 if all projected developments occur. At 52,500 persons the LA-2 alignment station area employment has the lowest total employment of the three alternative alignments under consideration. By the year 2000, total station area employment for this alternative is projected to reach 75,000 to 77,000, approximately 30 percent fewer employees than the projected station area employment for the LA-1 and LA-3 alignments.

II-223.1 Retail Sales

In 1980, total taxable sales transactions in the city of Los Angeles were recorded at $16.2 billion by the California State Board of Equalization. Of this total, 70 percent, or $11.3 billion, were in retail stores. The balance of the taxable transactions consisted of business and personal services and all other outlets. Total taxable and non-taxable sales transactions in the City of Los Angeles in 1980 are estimated at $19.1 billion. On the basis of the historic growth in the city of Los Angeles retail sales during the period of 1970 to 1980, taxable retail sales in the city are projected to grow 2.2 percent annually between 1980 and 2000 and reach $25.0 billion (1980 constant dollars) in the year 2000.

II-223.2 Employment and Income Characteristics of Residents

The U.S. Bureau of the Census reported 65,900 persons residing in downtown Los Angeles in 1980. Of these residents, 28,640 were available for employment: 34.7 percent (22,900 persons) were active labor force participants and 13 percent (3,400 persons) were unemployed as of April 1980. Tables II-22F and II-22G summarize the industrial and occupational characteristics of active labor force participants.

The 1980 per capita income for downtown Los Angeles was estimated at $2,117 by the U.S. Bureau of the Census. Median and mean household income estimated at $7,296 and $10,425 respectively, were well below the 1980 Los Angeles County and project corridor averages. According to the SCAG, no real growth in personal income of downtown Los Angeles residents is forecast to occur during the 1980 to 2000 period.

II-223.3 Assessed and Market Value of Real Property

According to the Los Angeles County Assessor's office, the total assessed value of secured and unsecured property in the City of Los Angeles in 1980 was $16.2 billion. The full market value of this property was $64.8 billion. Assuming an average annual growth rate of 4 percent (based on recent trends) to allow for the annual 2 percent increase in assessments as allowed by Proposition 13, reassessments due to property improvements and sales, and new construction, the market value for secured and unsecured property in

TABLE II-22F

1980 EMPLOYMENT OF RESIDENTS BY INDUSTRY

PROJECT CORRIDOR AND DOWNTOWN LOS ANGELES

Industry	Project Corridor Number	Project Corridor Percent	Downtown Los Angeles Number	Downtown Los Angeles Percent
Agriculture	3,639	1.4	361	1.5
Construction	9,520	3.7	695	3.1
Manufacturing				
Nondurable	29,351	11.3	5,853	25.9
Durable	55,337	21.4	3,370	14.9
Transportation	14,337	5.5	517	2.3
Communication	5,460	2.1	217	1.0
Wholesale Trade	11,471	4.4	882	3.9
Retail Trade	35,179	13.6	3,714	16.5
Finance	11,154	4.3	929	4.1
Business/Repair	12,849	5.0	1,262	5.6
Personal	12,327	4.8	1,567	6.9
Professional				
Health	20,792	8.0	1,236	5.5
Education	17,308	6.7	582	2.6
Other	9,262	3.6	851	3.8
Government	10,654	4.2	527	2.3
TOTAL	258,640	100.0%	22,563	100.0%

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

TABLE II-22G

1980 EMPLOYMENT OF RESIDENTS BY OCCUPATION

PROJECT CORRIDOR AND DOWNTOWN LOS ANGELES

Occupation	Project Corridor		Downtown Los Angeles	
	Number	Percent	Number	Percent
Managerial				
Administrative	16,751	6.5	1,127	4.9
Specialty	18,985	7.3	921	4.0
Technical/Sales				
Technicians	6,572	2.5	216	1.0
Sales	17,246	6.7	1,174	5.1
Clerical	47,305	18.3	2,586	11.3
Service	41,350	16.0	4,515	19.8
Farming/Forestry	3,393	1.3	457	2.0
Craft/Repair	33,368	12.9	2,644	11.5
Operator/Laborer/ Assemblers	43,545	16.8	6,345	27.7
Transportation	13,124	5.1	869	3.8
Laborers	17,001	6.6	2,039	8.9
TOTAL	258,640	100.0%	22,893	100.0%

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

the City of Los Angeles is projected to be $142.0 billion in the year 2000.

Data regarding the assessed and market value of real property within the LA-1, LA-2, and LA-3 alignments are not available.

II-224 Visual Quality

The downtown Los Angeles alternatives would traverse quite disparate areas of the downtown. Visual settings for each of the three alternative routings are described below. Figure II-22D shows a portion of the downtown Los Angeles segment.

II-224.1 Broadway/Spring (LA-1)

The Broadway/Spring alternative would terminate at the historic Los Angeles Union Passenger Terminal, also known as Union Station. Though the station is as high as a mid-rise structure, its great length, architectural features, and the landscaped parking lot fronting Alameda Street all work to create a comfortable scale. Views to and from the historic plaza and Olvera Street across Alameda Street are intermittently screened by landscaping on both sides of the street.

The Hollywood Freeway is depressed in this area, functionally separating the Union Station/plaza complex from the Civic Center to the south, although they are within each other's view area. The buildings of the Civic Center, with wide setbacks and extensive lawns, look inward to the Civic Center mall. The street space between the Hollywood Freeway and 2nd Street is weakly defined because of the setbacks and landscaping.

In contrast, Broadway from 3rd Street south to 9th Street, and Spring Street from 4th Street to 7th Street have strong spatial definition. Architecturally ornate mid-rise buildings enclose the street. Strong street level retail activity flourishes along Broadway, although the upper building stories are often vacant. Pedestrian activity is more sedate along Spring Street although the old financial district is being rehabilitated for office and residential uses.

Washington Boulevard from Long Beach Avenue to Broadway and Main Streets presents a wide undefined streetscape, cluttered with utility poles and overhead wires. The California Textile Apparel Mart anchors this area both visually and as a functional center to the surrounding garment district.

II-224.2 Flower Street Subway (LA-2)

The mix of low-rise industrial buildings, parking lots, and streets (90 to 100 feet wide) presents a low, flat, undefined appearance to the portions of Flower and Washington Streets where the rail project would be at-grade. On Flower Street the Santa Monica Freeway is

Figure II-22D

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Los Angeles
Aerial Photo
PARSONS BRINCKERHOFF / KAISER ENGINEERS

the most visually dominant element as it bridges the street between Washington and Olympic Boulevards. Along Washington Boulevard only Los Angeles Technical College, because of its bulk and form, presents a focal point between Flower Street on the west and Broadway and Main Streets on the east.

II-224.3 Olympic/9th Aerial (LA-3)

From 3rd Street to 9th Street, Figueroa forms the western edge of the new high-rise downtown. The development is more intense north of Seventh Street with high-rise buildings, individually stepped and set back on plazas, towering over the street. Second- and third--story pedways span the street with few or no pedestrian-oriented shops at street level. Arcades within the buildings and plazas at upper levels turn the focus of activity away from the street.

South of 7th Street, there are more open vistas, primarily parking lots interspersed with newer buildings and several developent sites. The high-rise corridor, already well-developed on the north is being extended south of 7th Street.

Parking lots characterize the area between Figueroa and Olive Streets along 9th. However, a new condominium between Flower and Hope Streets indicates development to come. Its deep setback establishes a new location for the street's building wall. From Hill Street east to Santee, 9th Street has strong spatial definition with older elaborate mid-rise structures serving to enclose the street.

Ninth Street angles south at Spring and Main Streets, terminating east-west views and making a transition to the low-rise manufacturing and warehouse buildings east of Santee Street. From Santee to Long Beach Avenue the mixed uses, vacant lots, parking lots, and overhead wires present little spatial definition. Long Beach Avenue south to Washington Boulevard is dominated by large-scale industrial uses. Storage yards and parking lots create large, open spaces cluttered with utility poles and overhead wires. The railroad siding between 13th Street and Olympic Boulevard is the site of the project's satellite rail vehicle maintenance yard.

II-225 Historic and Cultural Resources

The central business district of Los Angeles has been the center of the city since the establishment of El Pueblo de Los Angeles in 1781. There have been three major periods of growth in the downtown area: the first from the turn of the century through the late 1910s, the second during the 1920s and early 30s, and the third from the late 1960s through today. Even though there has been substantial redevelopment within the core area, there remain many recognized historical buildings, structures, and archeological resources.

Most of the downtown area has been surveyed according to National Register criteria by the Los Angeles Community Redevelopment

Agency. Numerous local surveys have been completed. In addition, surveys have been conducted recently for the Downtown People Mover project and the Metro Rail project. These studies have identified 115 properties in the downtown area which are either designated or eligible for designation to the federal, state, or local inventories of historic sites. Of these individual buildings, 33 are within the potential impact area of the three downtown Los Angeles alternatives.

In addition to individual properties, there are three National Register Historic Districts within the area:

- El Pueblo de Los Angeles - Placed on the Register in 1972, the boundaries were amended in 1982 to incorporate additional area. The Plaza District also includes six State Historical Landmarks and three City of Los Angeles historical/cultural monuments.

- Broadway Theater and Commercial District - This six-block complex of commercial and entertainment buildings was listed on the Register in 1979. There are 63 buildings dating from 1894 to 1931 which contribute to the character of the district. Two buildings, the Bradbury Building and the Million Dollar Theater, are also listed in the National Register on their individual merits.

- Spring Street Financial District - This three-block-long area along Spring Street, once known as the "Wall Street of the West", was listed on the National Register in 1979. Comprised of 26 buildings built between the turn of the century and the mid-1930s to house financial institutions, the district is homogenous in style and function. This district has recently been the focus of revitalization efforts.

The significant buildings and the National Register Districts are listed in Table II-22H and mapped in Figure II-22E.

The site proposed for the satellite vehicle maintenance yard is at the railroad property between 13th Street and Olympic Boulevard. The site and the surrounding area were surveyed by Caltrans environmental staff for historical and cultural resources in January 1984. This survey found no properties of historic significance. Due to the highly disturbed nature of the site, no evidence of cultural or archeological resources was found.

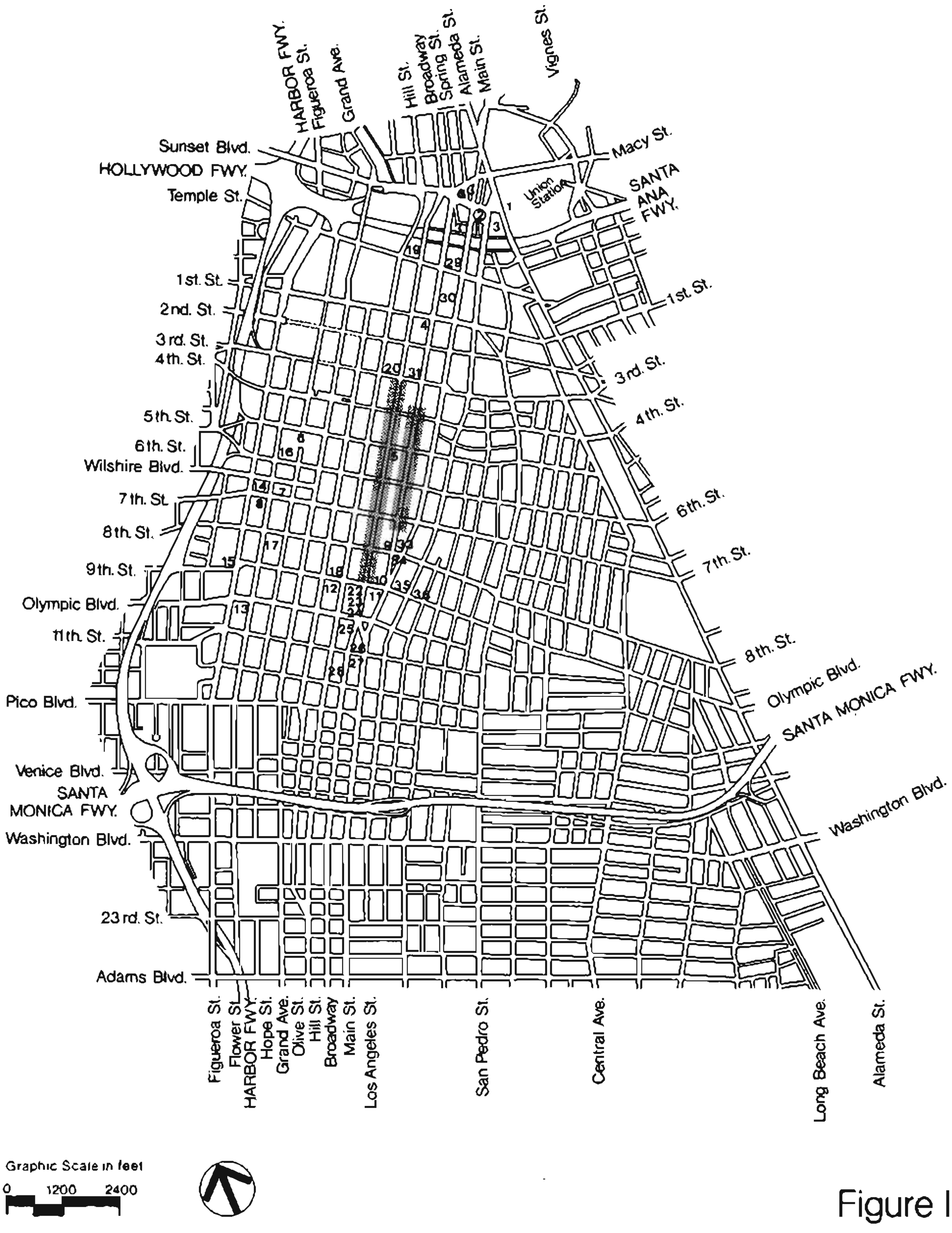


Figure II-22E

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Historic Resources in Downtown Los Angeles
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TABLE II-22H

HISTORIC AND CULTURAL RESOURCES FOR

DOWNTOWN LOS ANGELES ALTERNATIVES

(KEY TO FIGURE II-22E)

*	1.	Union Building 800 N. Alameda Ave.
*+o	2.	Plaza District Los Angeles & Main Sts.
ARCH.	3.	Parking Lots (adjacent to Plaza District)
*	4.	Los Angeles Times 202 W. 1st St.
o	5.	Alexandra - Palm Court 210 W. 5th St.
* o	6.	Central Library 630 W. 5th St.
*	7.	Roosevelt Building 727 W. 7th St.
*	8.	Barker Brothers 800 W. 7th St.
*	9.	Lane Mortgage Building 200-16 W. 8th St.
*	10.	William M. Garland Building 101-17 W. 9th St.
*	11.	Marsh & Strong Bldg. 102-10 W. 9th St.
*	12.	Insurance Exchange Building 318-42 W. 9th St.
*	13.	Petroleum Building 716 W. Olympic Blvd.
*	14.	Fire Station #28 644-46 S. Figueroa St.
	15.	Original Pantry 877 S. Figueroa St.
* o	16.	California Club 538 S. Flower St.
*	17.	LA Gas & Electric Co. 800-16 S. Flower St.
*	18.	Pacific National Bank 855-59 S. Hill St.
*	19.	Hall of Justice 300 N. Broadway
*	20.	Irvine Block 249-259 S. Broadway
* o	21.	Broadway Theater and Commercial District Broadway between 3rd and 8th Sts.
*	22.	Blackstone's 901-11 S. Broadway
*	23.	United Artists/Texas Co. 921-33 S. Broadway
*	24.	Western Costume Building 939-47 S. Broadway
*	25.	Western Pacific Company 1023-43 S. Broadway
*	26.	LA Transit Building 1050-90 S. Broadway
*	27.	Commercial Club Building 1100-06 S. Broadway
* o	28.	Herald Examiner Building 1101-33 S. Broadway

TABLE II-22H (Continued)

HISTORIC AND CULTURAL RESOURCES FOR

DOWNTOWN LOS ANGELES ALTERNATIVES

(KEY TO FIGURE II-22E)

	29.	Federal Courthouse 312 N. Spring St.	*	33.	Central Finance Building 756 S. Spring
* o	30.	City Hall 200 N. Spring St.	*	34.	National City Bank 800-10 S. Spring
*	31	Douglas Building 225-59 S. Spring St.	*	35.	Harris Newmark Building 849-63 S. Los Angeles
* o	32.	Spring St. Financial District 354-704 S. Spring	*	36.	Cooper Building 860 S. Los Angeles

* National Register Site or eligible for National Register

+ State of California Historic Site or Point of Interest

o Local Designation or Survey

ARCH. -- These areas are archeologically sensitive.

Source: California Department of Transportation, 1984;
M. L. Frank & Associates, 1984.

II-230 TRAFFIC AND TRANSPORTATION

II-231 Traffic

Freeways in the downtown Los Angeles segment of the corridor include the Hollywood, Harbor, and Santa Monica, which lie respectively on the north, west, and south sides of the Los Angeles Central Business District (CBD). According to the latest CBD cordon count (LADOT, 1980), there were a total of 1.4 million person-trips a day entering and leaving the CBD across a cordon defined by Figueroa Street, Los Angeles Street, Temple Street and Pico Boulevard. This level of activity has resulted in significant levels of congestion even though transit carries a significant percentage of CBD person-trips. Transit accounts for 41 percent of the morning (6:00 AM to 10:00 AM) person-trips to the CBD and 27 percent of all CBD person-trips between 6:00 AM and 10:00 AM (Schimpeler-Corradino Associates, December 1983).

The area's arterial street network is essentially a grid, though a number of discontinuities exist. East-west traffic flows are facilitated by four one-way couplets between 3rd and 12th Streets. Main and Spring Streets constitute the only one-way couplet with a north-south orientation. In terms of traffic volumes, the east-west arterials between 2nd and 9th Streets are the most heavily traveled, reflecting the current concentrations of development on the west side of the CBD and the access paths to the freeway system, particularly the Harbor Freeway. Average daily traffic volume on the most heavily congested arterials can exceed 20,000 vehicles. North-south arterials with significant volumes include Figueroa, Flower, Hill, Broadway and Spring Streets. Average travel speeds in both the AM and PM peaks can decline to less than 10 mph on many street segments in the CBD. Because traffic signals favor east-west movements, the north-south arterials generally have lower travel speeds in these periods. Broadway and Hill Streets exhibit significantly slow movement (Schimpeler-Corradino Associates, December 1983).

In the Los Angeles CBD, 134 key intersections were analyzed to evaluate existing and year 2000 base traffic conditions. The intersection volume-to-capacity (V/C) ratios were obtained from the City of Los Angeles Department of Transportation, or calculated from procedures outlined in the Signalization Optimization Analysis Program (SOAP) presented in Transportation Research Circular 212. (A V/C ratio represents the volume of vehicles passing through an intersection in a given time period compared to the theoretical traffic capacity of the intersection.)

Figure II-23A shows the intersections which operate at Level of Service (LOS) "D" or worse in the existing and year 2000 base conditions. The term LOS describes the quality of traffic flow based on the V/C ratio. LOS "D" (V/C ratio of 0.81 to 0.90) represents the maximum level acceptable for an urban street system and is characterized by relatively heavy traffic flow, without excessive back-up on

Existing Conditions ▼

Year 2000 Conditions ●

AM Peak

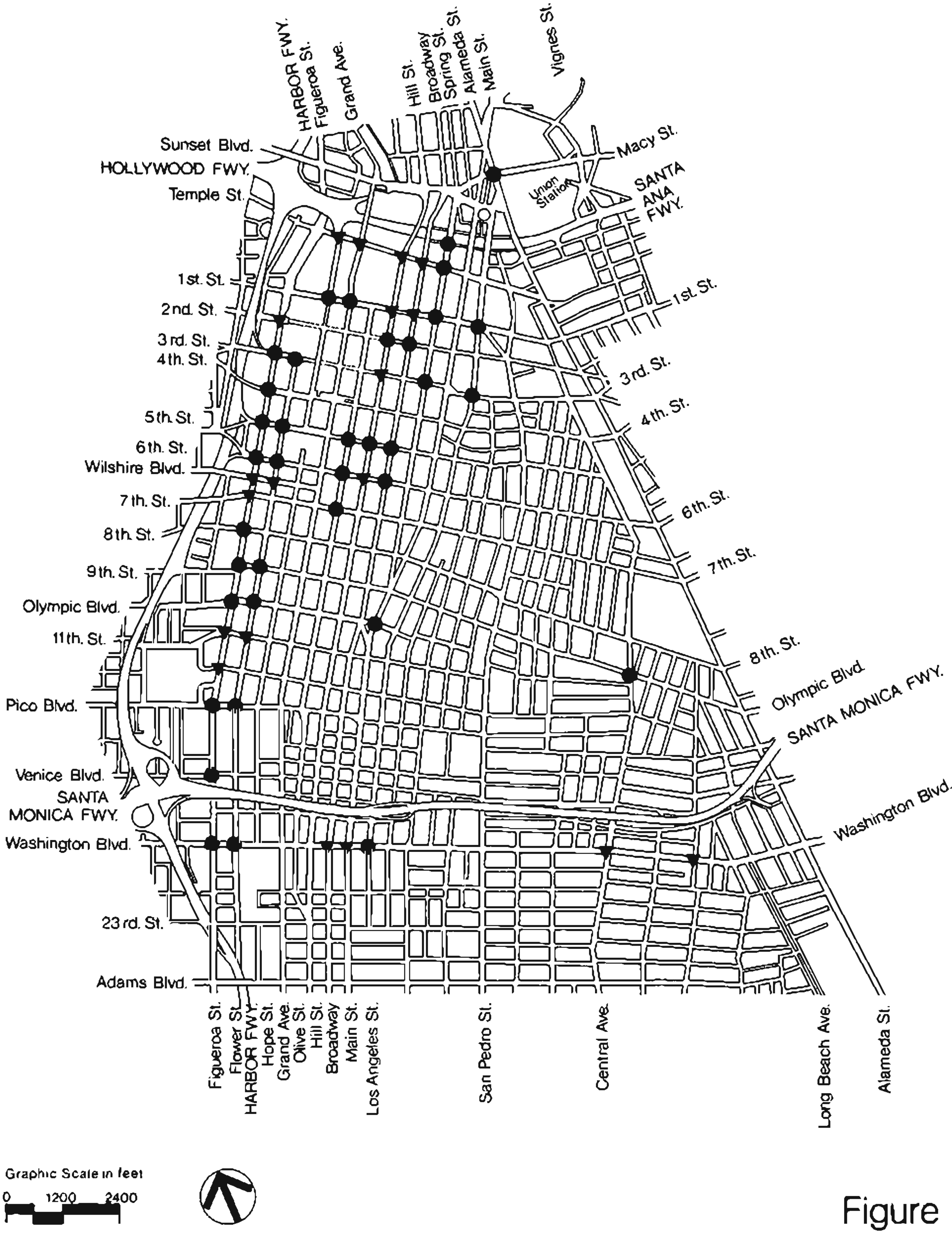

Figure II-23A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Los Angeles Level of Service D or Worse Intersections

PARSONS BRINCKERHOFF / KAISER ENGINEERS

intersection approaches. LOS "A" to "C" (V/C ratio of 0.80 or less) represent good traffic operations, whereas LOS "E" or"F" (V/C ratio of 0.91 and above) represent traffic volumes at or above the capacity of the intersection and are characterized by unstable or forced traffic flow and long vehicular queues and delays with routine stop-and-go traffic.

By the year 2000 a majority of the key intersections in downtown Los Angeles will carry the fully available traffic during the peak periods. A total of 19 intersections currently operate at LOS "D" or worse during AM or PM peak period. An additional 37 intersections will operate at LOS "D" or worse by the year 2000. Typical travel speeds on freeways and arterials are slow because of peak period congestion and will get worse by year 2000. Reduced speeds in the CBD area are caused by heavy vehicular traffic demand, close traffic signal spacing, on-street parking, and high pedestrian flows.

II-232 Transit

SCRTD is the principal public transportation carrier in the Los Angeles CBD proving both local and express bus services. There are also some small transit companies which provide service to the downtown area from adjacent communities, such as Santa Monica, Montebello, Torrance, and Gardena. There are several privately operated public carriers, including intercity bus service, airport buses and taxi companies. Although these private carriers provide important specialized service, the number of people served is insignificant when compared to the SCRTD.

Speeds on both local and express buses in the Los Angeles CBD are generally low, especially during AM and PM peak periods. Lines on Broadway average approximately 7 miles per hour between Washington Boulevard and Macy Street/Sunset Boulevard. Contra-flow buses on Spring Street provide higher operating speeds of approximately 10 miles per hour. Existing east-west bus line numbers 32 and 68 on Washington Boulevard and line numbers 10, 11, 25, 47, and 49 on Olympic Boulevard/9th Street operate at approximately 12 miles per hour during peak periods. Other north/south and east/west bus routes in the CBD area operate at speeds significantly below the SCRTD system average of 14.1 miles per hour.

The low operating speeds are a result of traffic congestion and long dwell time for passenger loading and unloading. The express bus services, including Line 457 from Long Beach, are significantly delayed during peak hour congestion, causing unreliable bus schedules during the peak periods.

II-233 Parking

A number of parking studies have been prepared in recent years, documenting a trend of increasing parking deficiencies in the CBD despite a significant increase in the number of parking spaces supplied. With continued development, this trend is expected to continue although some portions of the CBD will be less affected than others.

A 1979 parking study by Wilbur Smith and Associates identified a peak parking demand of 92,398 vehicles, compared to 110,272 spaces in the Central City that year. However, after adjusting for location and use restrictions (e.g., time limits or reserved parking), the parking deficit was estimated at 5,700 spaces. Major parking deficiencies were identified for the following areas: Olive-Hill Streets, the Civic Center, Broadway-Spring Streets, and the Garment District. A 1983 CBD Transportation Study prepared by Schimpeler-Corradino Associates for the Los Angeles Department of Transportation projects a 1990 parking deficit of approximately 43,000 spaces, assuming forecast development levels and continuation of present automobile usage patterns. Parking deficiencies are projected primarily in the Olive-Hill Streets area, north and south Broadway areas (roughly between 3rd and 9th Streets), and in the Garment District.

The findings of the Central City Parking Study were used to determine the existing and projected parking supply with the project's alternative alignment service areas. Table II-23A presents a summary of the existing and projected parking spaces within 1/4 mile of the proposed stations under each alternative rail alignment. Although parking data are not available for the areas outside the CBD, the Olympic/9th Aerial alternative is apparently served by the greatest number of parking facilities. The greatest projected growth in the parking supply will be along the Flower Street Subway alignment.

TABLE II-23A

DOWNTOWN LOS ANGELES PARKING SUPPLY

(Spaces Within One-Quarter Mile of Proposed Stations)

Alternative	Station	Existing Spaces (1979)	Future Spaces (1990)
Broadway/Spring At-Grade	Union Station	3,078	3,078
	Temple Street	3,716	3,716
	First Street	7,340	7,272
	4th Street	3,570	4,975
	7th Street	5,636	5,560
	Olympic Boulevard	7,419	7,449
	18th Street	444*	473*
	San Pedro Street	N.A.	N.A.
	TOTAL	31,203	32,523
Flower Street Subway	7th Street	13,280	15,014
	Pico Boulevard	3,811	4,294
	18th Street	799*	1,058*
	Broadway	444*	473*
	San Pedro Street	N.A.	N.A.
	TOTAL	18,334	20,839
Olympic/9th Aerial	4th Street	9,353	12,239
	7th Street	13,113	15,036
	Olive Street	7,881	7,881
	Maple Avenue	5,200	5,482
	Central Avenue	N.A.	N.A.
	TOTAL	35,547	40,638

*Includes only parking north of I-10.

Source: PB/KE from Los Angeles Central City Parking Study, 1983.

II-300 MID-CORRIDOR

II-310 NATURAL ENVIRONMENT

II-311 Topography, Soils, Geology, and Seismicity

The mid-corridor segment is situated on a gently sloping level plain with distinguishing topographic features only at its southerly end. This segment gradually slopes from approximately 220 feet above sea level at Washington Boulevard at its northern end to between 20 and 30 feet above sea level at Willow Avenue in Long Beach at its southern end. The Dominguez Hills (175 feet above sea level) and Bixby Knolls (100 feet above sea level) form the western and eastern boundaries, respectively, at the southern end of the mid-corridor segment. All three proposed alignment alternatives in the mid-corridor would cross both Compton Creek just south of Greenleaf Boulevard in the City of Compton and the Los Angeles River north of the San Diego Freeway.

The mid-corridor segment contains three soil types: the Hanford, the Chino, and the Tujunga-Soboba associations. The Hanford soils found in the mid-corridor are identical to those discussed above for the downtown Los Angeles area. Chino soils occur in the south Los Angeles, Watts and Compton areas proximate to the Los Angeles River and Compton Creek. This soil is somewhat poorly drained, variable in depth, and has a high water holding capacity. Erosion hazards are slight and water run-off slow for this soil association. Tujunga and Soboba soils occur in combination, making up one association. The soils of this association are excessively drained, with slow run-off potential, and are rapidly permeable, indicating only a minimal erosion hazard. These soils are also subject to occasional overflow.

Geology and seismic conditions for the mid-corridor are generally described in Section 110 of this chapter.

II-312 Floodplains, Hydrology, and Water Quality

The proposed project's mid-corridor segment begins at Washington Boulevard on the southerly edge of downtown Los Angeles. From Washington Boulevard to Slauson Avenue (approximately 2 miles), the proposed project would not encroach onto any existing floodplain or impede drainage flow patterns.

In the remainder of the mid-corridor from Slauson Avenue to the Los Angeles River in the City of Long Beach, FIRM maps are not published. This area is classified as Zone C (areas of minimal flooding). Contours indicate storm run-off flows parallel to the existing Southern Pacific (SPTC) Wilmington Branch. An area exists near the Dominguez Hills where drainage flow traverses the existing rail tracks in an easterly direction into Compton Creek.

Bridges for rail freight trains cross the Los Angeles River and Compton Creek. Both the river and the creek are channelized in this area; danger from a 100-year flood is considered minimal.

II-313 Vegetation and Wildlife

The mid-corridor alternatives would follow existing SPTC rights-of-way. The existing rail right-of-way is barren for much of its length due to treatment with herbicides, with the exceptions noted below.

From downtown Los Angeles to 60th Street, the existing rail right-of-way is heavily industrialized, used primarily for warehousing, and not landscaped. From 60th Street to Florence Avenue the backyards of the residential units abut the rail corridor. Some large trees extend a few feet into the right-of-way in this stretch, but are not large enough to interfere with rail operations. The right-of-way in this section is also not landscaped.

From Willowbrook Avenue and Imperial Highway to Oris Avenue at the Compton City boundary (approximately 2 miles), the right-of-way is landscaped with Canary Island pines (Pinus canariensis) and Canary Island date palms (Phoenix carnariensis). These trees do not interfere with rail operations. There is no undergrowth, except around the base of the trees. Two Blackwood acacias (Acacia melanoxylon), 40 to 60 feet tall, are growing in front of the Compton City Hall at Compton Boulevard and Willowbrook Avenue. The rest of the existing rail facility has little vegetation, except for scattered stands of ruderal species: foxtail brome (Bromus rubens), dandelion (Taraxcum ssp.), mustard (Brassica ssp.), cheeseweed (Malva parviflora), lamb's-quarters (Chenopodium album), and dock (Rumex ssp.).

The rail corridor crosses the Los Angeles River Flood Control District right-of-way between Carson Street and the San Diego Freeway (I-405) in the Bixby Knolls area of the City of Long Beach. There are two large groundwater recharge basins within the flood control right-of-way. The rail corridor passes between these two basins. Ruderal vegetation dominates the basin banks: mustard (Brassica rapa ssp. sylvestris), wild radish (Raphanus sativus), and wild-rhubarb (Rumex hymenosepalus). Mulefat (Baccharis glutinosa) is a dominant shrub in both basins. The basin on the west bank of the river closest to the rail right-of-way has no emergent vegetation and only 10 to 12 willows at one end. The basin on the east bank of the river is about 500 feet north from the rail corridor, and is thus outside the project's impact area. Neither basin falls within federal definitions of a "wetland" (Executive Order 11990 and U.S. DOT Order 5660.1A).

The affected environment for alternatives MC-1 (Compton At-Grade) and MC-2 (Compton Grade Separation) would be identical. Alternative MC-3 (SPTC Railroad Relocation) would differ only in the fact that the existing rail freight traffic would be diverted off of the SPTC

Wilmington Branch at Watts Junction (at the project alignment) onto the SPTC's West Santa Ana Branch and then onto the SPTC San Pedro Branch (at Alameda Street). The existing SPTC right-of-way between Watts Junction and Alameda Street is inhabited by ruderal, predominantly weedy, and ornamental species of vegetation and has no formal landscaping. Alameda Street is a major north/south arterial with existing SPTC tracks primarily within the median. This right-of-way has been treated with herbicides to discourage vegetative growth.

Wildlife occurring in the mid-corridor would be similar to what is found in the downtown Los Angeles area, typically urban adapted birds and various burrowing rodents.

The proposed main yard and shop site (maintenance facility) would be located between the Long Beach Freeway (Route 7) (west) and the Los Angeles River (east), and between Compton Creek (north) and Carson Street (south). This site is presently divided into several parcels. Parcel 1 is undeveloped; although it is used for trailer storage and various equestrian uses.

Parcel 2 is landlocked by railroad embankments and is accessible by pedestrians only. Parcel 2 has developed some grassland indicator species: foxtail (Hordeum jubatum), ripgut grass (Bromus diandrus), Soft Chess (B. Mollis), etc. There are also some coastal sage scrub species: black sage (Salvia mellifera), coastal sagebrush (Artemisia californica), Golden Bush (Haploppappus squarrosus, ssp. grindolio-ides), and Elderberry (Sambucus mexicana). Ruderal species dominate the drainage areas located on Parcel 2.

Parcel 3, located northwest of Parcel 2, is bounded on the west by the Long Beach Freeway, on the south by the Union Pacific right-of-way, and on the east by the Los Angeles River and the DWP Southern California Edison right-of-way. This parcel is heavily used by motorcyclists. Species composition is similar to that of Parcel 2.

No mammals were seen using Parcel 1. Mammals found on Parcels 2 and 3 include: gray fox (Urccyon cinereoargenteus), possibly coyote (Canis latrans), pocket gopher (Thomomys bottae), Beechey ground squirrel (Citellus beecheyi), and the Audubon cottontail (Sylvilagus audubonii).

Birds observed using Parcels 1, 2 and 3 include: northern barrier Marsh hawk (Circus cyaneus), red-tailed hawk (Buteo jamaicensis), American kestral (Falco sparverius), killdeer (Charadrius vociferus), mourning dove (Zenaida macroura), Anna's hummingbird (Calypte anna), black phoebe (Sayornis nigricans), Say's phoebe (S. saya), northern mockingbird (Mimus polyglottos), ruby-crowned ringlet (Regulus calendula), loggerhead shrike (Lanius ludovicianus), yellow-rumped warbler (Dendroica coronata), western meadowlark (Sturnella neglecta), Brewer's blackbird (Euphagus cyanocephalus), brown-headed cow bird (Molothrus ater), American goldfinch

(Carduelis tristis), house finch (Carpodacus mexicanus), and European starling (Sturnus vulgaris).

II-314 Noise and Vibration

There are a variety of noise environments along the mid-corridor area, but common to all of them is the existence of rail freight traffic. Along the northern portion of the mid-corridor, from just south of downtown Los Angeles to Watts Junction, existing rail traffic is the heaviest, with relatively frequent activity (both switcher and through freight) between Slauson and Watts Junctions. The level of rail freight activity is significantly less from Watts Junction south.

Traffic noise contributes to the ambient noise environment in varying degrees along the corridor. Along the northern portion it is secondary in importance to rail noise except in the immediate vicinity of major cross streets. South of Watts Junction traffic noise varies from being a major contributor to the noise environment throughout the more urbanized areas such as Compton, to being a low level contributor throughout such areas as Willowbrook. The various freeways intersecting the project alternatives also contribute significantly to the noise levels.

Along the mid-corridor, and particularly in the central part of the mid-corridor, the noise of aircraft flyovers contributes intermittently to the noise environment.

A field survey was conducted in 1983 along the mid-corridor to document existing noise and vibration levels. Table II-31A describes the four 24-hour measurement sites and lists their measured CNEL values, as well as the short-term measurement locations and the resulting measured and average sound levels. Measurement locations are shown in Figure II-31A.

The noise measurement presented for Location 1 is representative of the area between Slauson Avenue and Watts Junction where switcher activity is a significant contributor to the noise environment. At Location 2 rail operations decrease in number and the noise of traffic is low, resulting in the lowest CNEL measurements along the mid-corridor. Location 3 is in Compton, where the major factor is the high level of traffic noise in the area. Finally, the noise environment at Location 4 is dominated by heavy traffic on the nearby San Diego Freeway, and thus is representative of mid-corridor locations in the immediate vicinity of freeways.

The range of CNEL values measured, from 60 dBA at Location 2 to 70 dBA at Location 1, reflects the range of noise environments along the mid-corridor. These values are much lower than those measured in the downtown Los Angeles area. In an earlier noise measurement study for the proposed Inter-Modal Container Transfer Facility (ICTF) between 223rd Street and Sepulveda Boulevard, CNEL levels

TABLE II-31A

NOISE DATA - MID-CORRIDOR

Map Key	Location	Measured Sound Levels (dbA) CNEL/Leq	Comment
1	Residence 1700 Block of 68th St. Florence	70 CNEL	Long-term (24 hr) Measurement November, 1983
2	Church 12000 Block of Willowbrook Willowbrook	60 CNEL	Long-term (24 hr) Measurement November, 1983
3	Residence 700 Block of North Willowbrook Ave. Compton	67 CNEL	Long-term (24 hr) Measurement November, 1983
4	Residence 600 Block of Terry Lynn Circle Long Beach	66 CNEL	Long-term (24 hr) Measurement November, 1983
5	Cerritos Park Long Beach	61 L_{eq}	Short-term Non-peak period measurement
6	Northwest corner of Compton Blvd and Willowbrook Ave.	66 L_{eq}	Short-term Non-peak period measurement
7	Willowbrook Ave. near Caldwell St.	65 L_{eq}	Short-term Non-peak period measurement
8	LA County Library El Segundo Blvd. and Willowbrook Ave.	67 L_{eq}	Short-term Non-peak period measurement
9	Junior High School 104th St. and Grandee Ave. Watts	60 L_{eq}	Short-term Non-peak period measurement
10	Col. Leo H. Washington Park Graham Ave. and 92nd St. Los Angeles	58 L_{eq}	Short-term Non-peak period measurement
11	Fred Roberts Park Long Beach Blvd. and 48th Place	68 L_{eq}	Short-term Non-peak measurement

Source: Bolt Beranek & Newman, 1983.

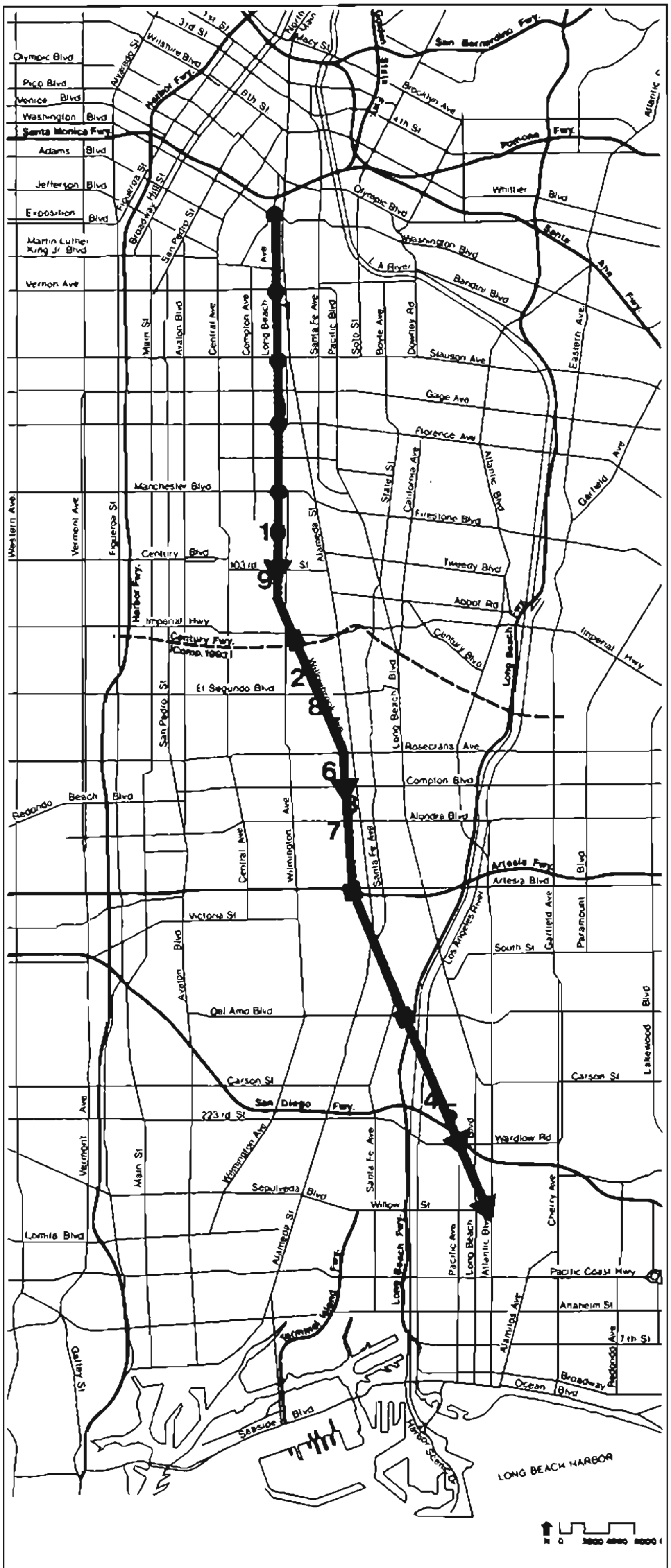

Figure II-31A

Mid - Corridor Noise Measurement Sites

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

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of 62 to 70 dBA were measured or estimated for similar locations along the corridor.

A CNEL of 65 dBA or above is generally considered to be an unacceptable noise environment for noise-sensitive land uses; thus, there are portions along the mid-corridor that are at present exposed to excessive noise levels. Figure II-32A (1) and (2) in the land use section of this chapter identifies residential areas; Figure II-32B (1) and (2) shows community facilities which are also considered noise sensitive. In addition, measurements indicate that vibration from switcher and freight train activities can be perceived by people in their homes.

II-320 SOCIOECONOMIC ENVIRONMENT

II-321 Land Use, Population, and Housing

II-321.1 Land Use

Land uses within 1,000 feet of the alignment and within one-quarter mile of stations are depicted on Figure II-32A (1) and (2), and are described briefly below by community area for mid-corridor alternatives MC-1 and MC-2. Land use adjacent to MC-3, SPTC Railroad Relocation, is described at the end of this subsection.

o Avalon. Land uses along the right-of-way in this portion of Los Angeles are split between industrial uses, primarily to the east, and housing, primarily to the west.

o Florence-Graham. The major land use along the rail corridor in this community is mixed multi-family and single-family housing with community commercial activity centers at Firestone Boulevard and Florence Avenue. Immediately adjacent to the right-of-way between Firestone Boulevard and Florence Avenue are industrial uses and a community park.

  The Florence-Graham Community Business Revitalization Area is located just west of the project alignment in the vicinity of Compton and Florence Avenues.

o Watts. Through Watts the right-of-way is bordered by single-family housing south of 103rd Street and a mix of multi-family and single-family housing to the north. A major park lies west of the right-of-way between 109th and 104th Streets. Two pockets of industrial use are located between Imperial Highway and 108th Street.

  The rail transit alignment would pass through the Watts Redevelopment Area (Los Angeles Community Redevelopment Agency) between Century Boulevard and 103rd Street.

o Willowbrook. Through Willowbrook the right-of-way is bounded by single-family and multi-family housing with a commercial node

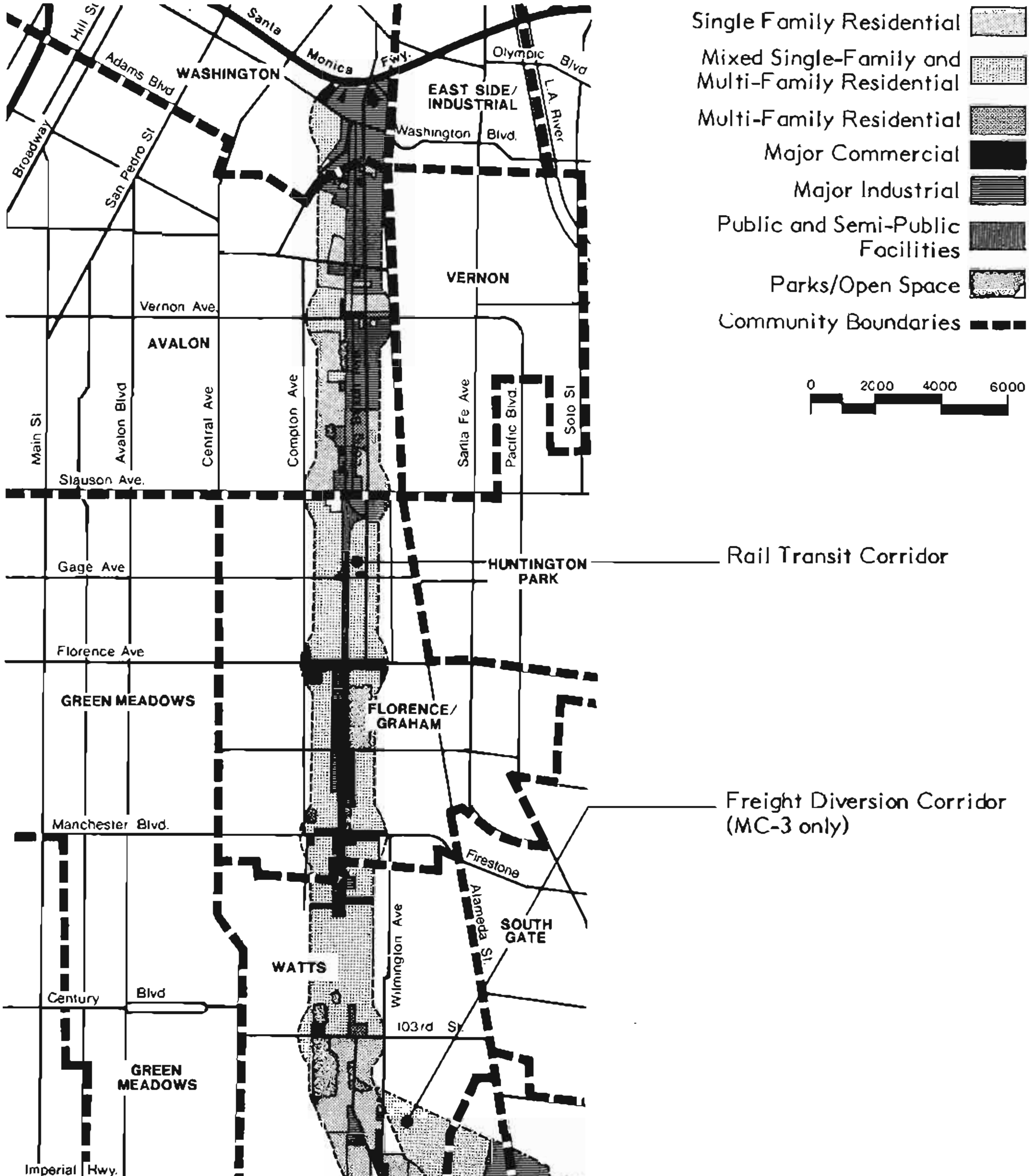

Figure II-32A(1)

Mid-Corridor Generalized Land Use

Long Beach-Los Angeles RAIL TRANSIT PROJECT

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Figure II-32A(2)

Mid-Corridor Generalized Land Use

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at El Segundo. The area just south of Imperial Highway is presently vacant because of clearance for Century Freeway construction.

The Willowbrook Neighborhood Redevelopment Area (Los Angeles County Community Development Commission) lies immediately west of the rail transit project between Imperial Highway and El Segundo Boulevard.

- Compton. Land use along the right-of-way in Compton is predominantly a mix of single-family and multi-family housing. The Compton downtown business district, a designated redevelopment area, is located in the vicinity of Compton Avenue and the right-of-way. A community shopping center is under construction southeast of Compton Avenue and the right-of-way, across from the Civic Center complex. The Compton Civic Center complex, including city government and criminal courts buildings, is located to the southwest. A substantial area of vacant and underutilized land (formerly the main shopping center site) is located to the northeast.

- Carson/Rancho Dominguez. With one exception, the entire right-of-way through Carson and Rancho Dominguez is industrial with a mix of light and heavy manufacturing. A seminary is located along the right-of-way at Victoria Street.

Alternative MC-3 would include the diversion of rail freight traffic from the SPTC Wilmington Branch (the project route) between 103rd Street (Watts Junction) and the intersection of the two lines halfway between Artesia and Del Amo Boulevards (Dominguez Junction). The diversion route would follow the SP Santa Ana Branch along Santa Ana Boulevard and the SPTC San Pedro Branch along Alameda Street. Land use along the freight diversion route is 60 percent industrial, 30 percent residential, and 10 percent commercial. Most of the industrial land area is designated for industrial revitalization. Half of the residential land area is low-density (largely single-family) and designated for preservation of existing structures through heavy maintenance. The other half, located along the Santa Ana Branch, is largely single-family and designated for comprehensive redevelopment at higher densities.

II-321.2 Development Trends

Virtually no high-rise commercial space is located in the mid-corridor segment of the Long Beach-Los Angeles corridor. The primary non-residential land use is industrial.

The only retail center in the corridor that contains major department stores is the Carson Mall, located approximately 3 miles west of the Del Amo station. There are 7 large community retail centers of more than 100,000 square feet scattered throughout the mid- corridor, 4 of which are located on the proposed transit route. A Boys Market and

Sav-on Drug Center are recently completed elements of a new community shopping center in the Compton Redevelopment Area adjacent to the proposed Compton Avenue station. Similar shopping centers are under construction in the Watts Redevelopment Area adjacent to the proposed 103rd Street station, and are being planned by the county in the area south of the intersection of the Century Freeway and the project. A substantial amount of new industrial development has occurred in the southern portion of the mid-corridor in the areas surrounding the Del Amo and Artesia stations.

II-321.3 Population

The entire mid-corridor segment contains significant numbers of non-whites, youth, and low-income residents; therefore, transit dependence is high. Table II-32A summarizes the demographic characteristics of the mid-corridor population.

In all station areas population is predominantly Hispanic, although at the Vernon, Firestone, and Compton station areas there are equal numbers of Blacks and Hispanics; and at 103rd and Imperial station areas Blacks make up the majority. The average proportion of Whites is only 2 percent.

Nearly half the residents are below the age of 19. The large number of youth and the large average household sizes (ranging from 3.5 to 4.2 persons) point to family-oriented communities. The elderly account for less than 10 percent of the population in most station areas.

Auto ownership in the mid-corridor is higher than in the two downtown areas. Household incomes, though higher on the average than for downtown Los Angeles, are still low. They range from $7,300 to $10,000 in all but one of the station areas, which is lower than the county average. At least half the households of the mid-corridor are considered low-income (within 125 percent of the federally defined poverty level.

Florence differs considerably from the other mid-corridor station areas. Median household income here is nearly $13,000 and only slightly more than a third are earning low incomes. This station area also combines the highest auto ownership level (over 80 percent) and the smallest number of disabled: 6 percent work disabled and 3 percent public transit disabled, compared to the mid-corridor average of 14 percent work disabled and 8 percent public transit disabled.

II-321.4 Housing

With 131,130 housing units, the mid-corridor contains over 50 percent of the project corridor's housing stock. The majority of dwellings are single-family (58 percent) and renter-occupied (66 percent). Due to the predominance of single-family homes and extensive industrial land usage, housing density is a low 3.8 units per acre. An aging housing stock (51 percent built before 1950) and insufficient

TABLE II-32A

1980 STATION AREA SELECTED DEMOGRAPHIC CHARACTERISTICS

MID-CORRIDOR

Station Area	Population	Percent Non-White	Percent 0-19 Years	Percent 64+ Years	Median Household Income	Percent Classified as Low-Income*	Percent Without Automobiles	Percent 16-64 Classified As Work-Disabled	Percent 16+ Years Classified As Transit-Disabled
Washington Boulevard	537	99	44	8	$10,359	50	31	13	8
Vernon Avenue	2,292	99	44	10	7,334	55	33	15	9
Slauson Avenue	1,585	96	48	6	8,033	53	39	13	8
Florence Avenue	2,959	96	48	5	12,978	36	19	6	3
Firestone Boulevard	2,877	98	47	6	9,888	39	20	18	10
103rd Street	1,466	100	48	9	7,666	59	33	17	9
Imperial Highway	1,943	100	50	7	8,267	49	44	18	10
Compton Boulevard	1,676	99	48	3	9,437	50	31	9	6
Del Amo Boulevard	0	-	-	-	-	-		-	-
Artesia Boulevard	0	-	-	-	-	-		-	-
TOTAL	15,335	98%	47%	7%		47%	30%	14%	8%

* Low-income is defined as below 125 percent of the federally defined poverty level.

Source: U.S. Bureau of the Census, 1980; Southern California Association of Government, 1983.

investment in housing rehabilitation has resulted in widespread structural deterioration.

The housing characteristics of the mid-corridor station areas north of, and including, the Compton Boulevard station are relatively homogeneous, and differ somewhat from those of the south mid-corridor area. Although these northern station areas have approximately the same proportion of single-family and multi-family dwellings as the rest of the mid-corridor, the housing is generally older, more crowded, and has a higher degree of renter occupancy. A number of publicly subsidized housing projects containing nearly 3,900 units are located in close proximity to the proposed alignment. The majority of these units are found in the four oldest housing projects: Pueblo Del Rio, Jordan Downs, Nickerson Gardens, and Imperial Courts.

Only one station area, 103rd Street, has experienced substantial recent residential development activity. As part of the Watts Redevelopment Project, over 400 units consisting of condominiums and subsidized rentals have been constructed in a five-block area surrounding the proposed station site. Over 100 additional units are currently under construction or are in the planning stages. Continued residential construction is also planned for the Compton Civic Center Redevelopment Area. Over 100 market-rate condominiums have been completed south of Civic Center.

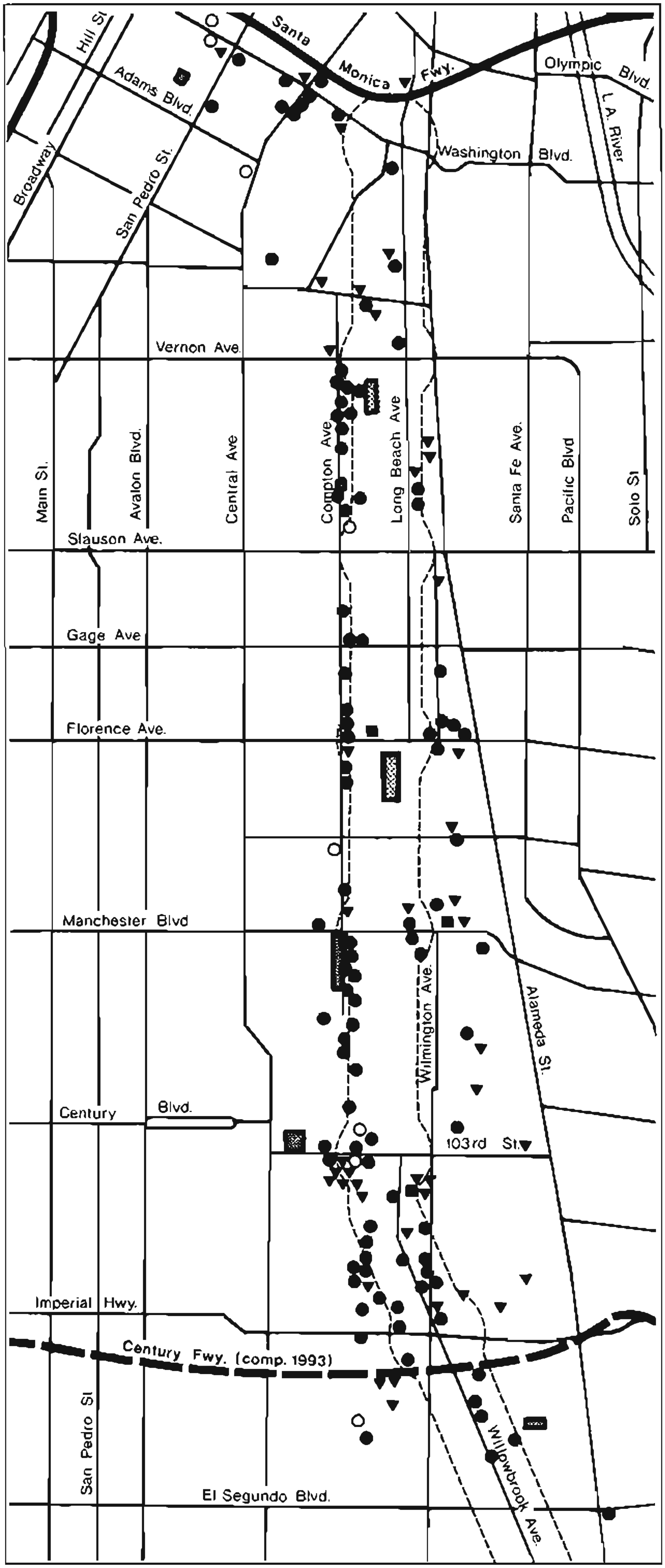
Between 1970 and 1980 the number of housing units in the mid-corridor dropped at an average annual rate of 0.1 percent. This decline was due to a depressed housing market and the demolition and relocation of housing for the Century Freeway Corridor. Between 1980 and 2000 SCAG projects housing stock increases at an average annual rate of 0.6 percent. Most of this increase will come from redevelopment projects and subsidized infill construction programs.

II-322 Community Services

II-322.1 Schools, Libraries, and Churches

There are approximately 60 schools in the vicinity of the proposed mid-corridor alignment with the highest concentrations occurring in Watts and Compton (see Figure II-32B (1) and (2)). The vast majority are either preschools or neighborhood elementary schools, reflecting the predominance of large family households. The four largest facilities are Jefferson High School at 1319 East 41st Street, Jordan High School at 2265 East 103rd Street, Compton High School located just west of the Compton Civic Center, and Compton College at 1111 East Artesia Boulevard.

There are 5 county libraries near the proposed alignment on the following cross streets: Florence Avenue, Firestone Boulevard, 103rd Street, El Segundo Boulevard, and Compton Boulevard (see Figure II-32B (1) and (2)).



School ▼
Library ■
Church ●
Hospital/Clinic ○
Park ▩

0 2000 4000 6000

Figure II-32B(1)

Mid-Corridor Community Facilities

Long Beach-Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

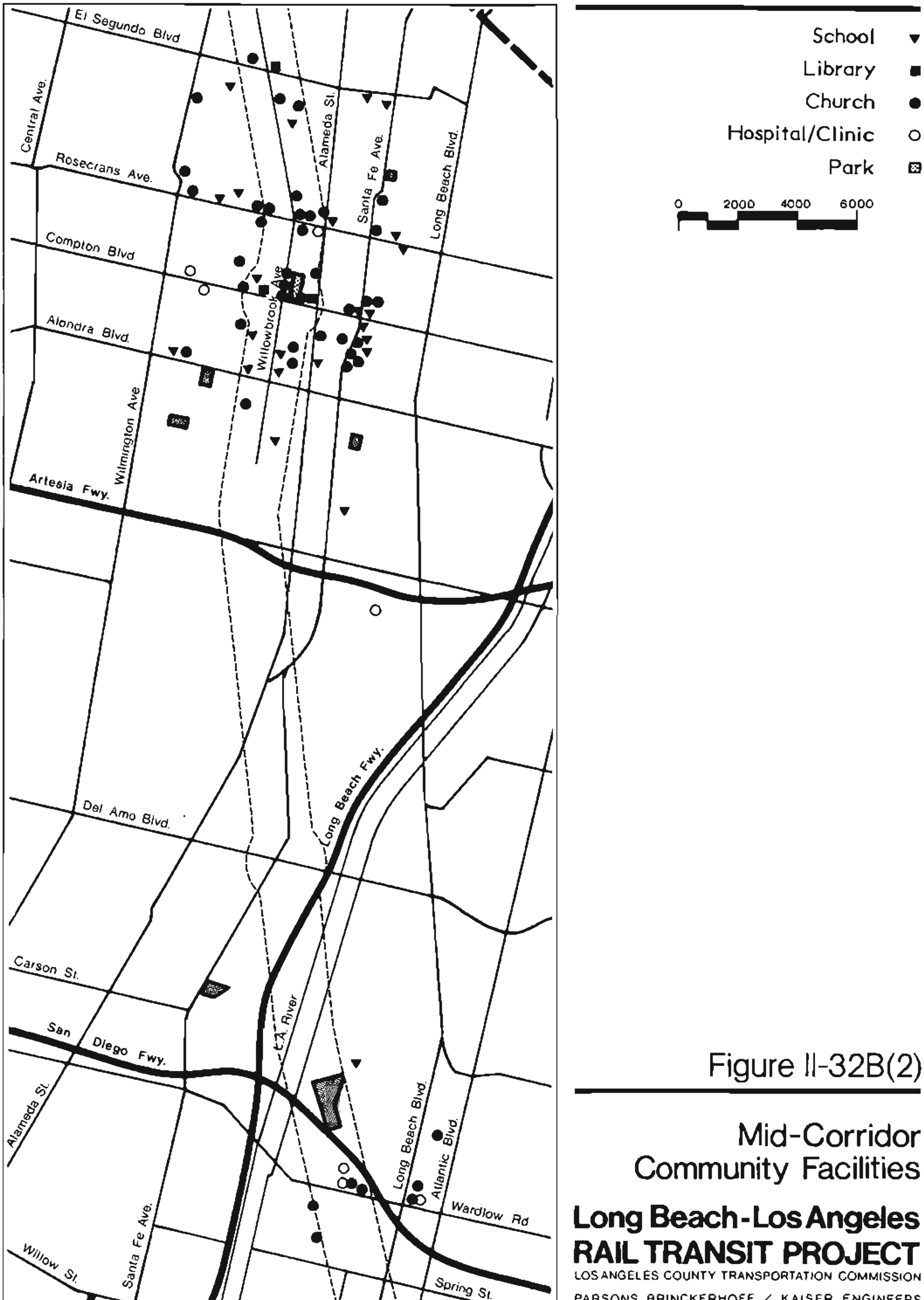


Figure II-32B(2)

Mid-Corridor Community Facilities

Long Beach-Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

Of the approximately 130 churches near the proposed alignment, most are concentrated in Watts and Compton. Churches in the mid-corridor range from small, independent, storefront churches to large, regionally-based churches representing nationally recognized denominations.

II-322.2 Medical Facilities

There are 2 hospitals in the vicinity of the proposed mid-corridor alignment: Martin Luther King Hospital at 12021 South Wilmington Avenue and Dominguez Valley Hospital at 3100 South Savannah Road. Both offer a full range of services, including emergency facilities.

In addition to the 2 hospitals, there are 7 public and private clinics. The clinic with the highest patronage and largest service area is the Watts Health Foundation at 10300 South Compton Avenue. Drew Medical School clinical facilities are located in Martin Luther King Hospital.

II-322.3 Parks and Other Recreation Facilities

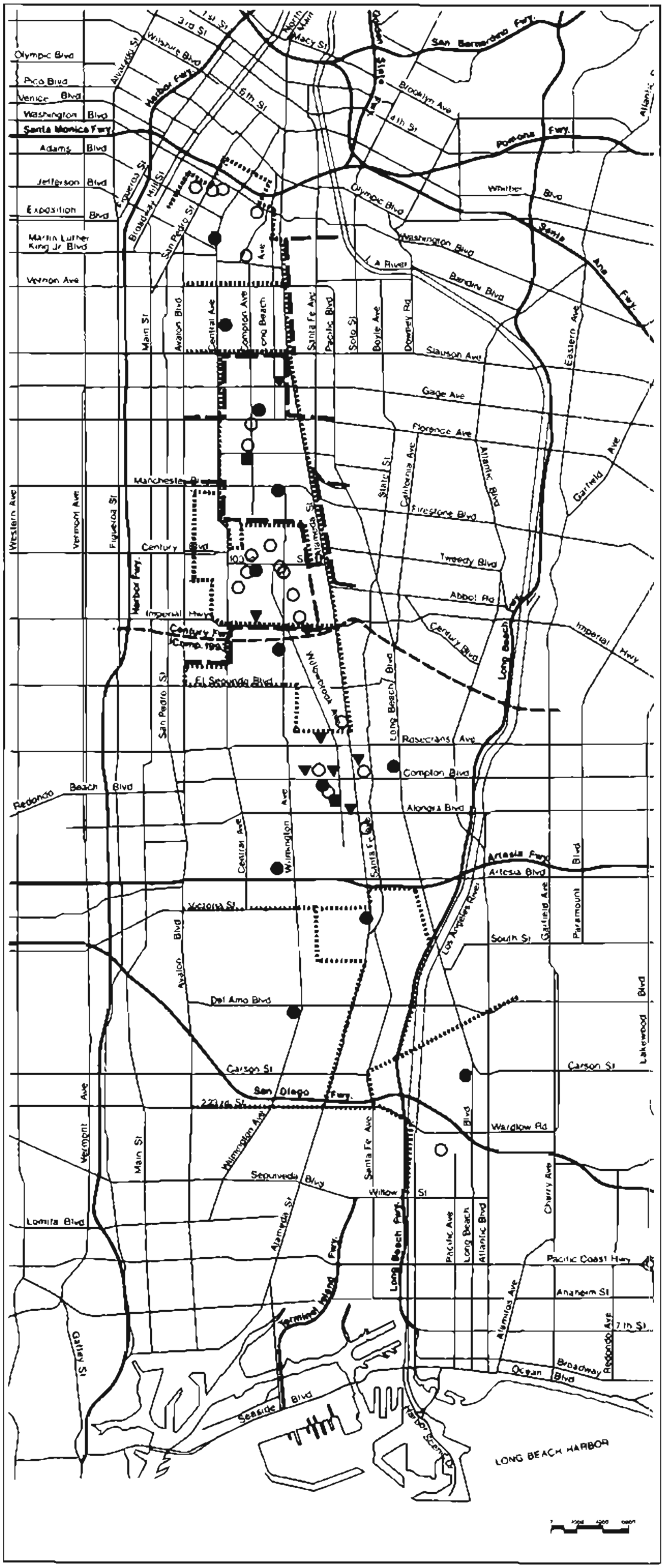
Thirteen public parks are located in the vicinity of the proposed alignment (see Figure II-32B (1) and (2)). Most of these have city or county recreation centers which serve local residents. Three of the largest parks are located immediately adjacent to the SPTC right-of-way. They are Fred Roberts Park, located between 46th Street and 48th Place; F.D. Roosevelt Park, located between Florence Avenue and Nadeau Street; and Colonel Leon H. Washington Park, located between Firestone Boulevard and 92nd Street.

II-322.4 Other Social Service Facilities

Most of the 22 public and private social service facilities near the proposed mid-corridor alignment offer programs which cater to local families and senior citizens. The largest facilities include two offices of the County Department of Social Services in the unincorporated area of Florence-Firestone and in Compton, the Florence-Firestone Multi-center at 7807 South Compton Avenue, and the Watts Neighborhood Center at 1825 East 103rd Street (see Figure II-32C).

II-322.5 Law Enforcement

From Washington Boulevard to Slauson Avenue the proposed alignments are within the response area of the LAPD's Newton Station. The unincorporated Florence-Firestone area between Slauson Avenue and 2nd Street is serviced by the Firestone Station of the LA County Sheriff's Department (LASD). Watts is served by the LAPD's Southeast Area Station, while the Willowbrook area between Watts and Compton is within the Lynwood Policing Area. The City of Compton has its own police department with its headquarters in the Compton Civic Center. The unincorporated county area between Compton and Long Beach is within the LASD's Carson Policing Area.



Police ■
Fire ●
Social Service ○
City/Government Office ▼
Police Response Boundary - — -
Fire Response Boundary ....

Figure II-32C

Mid-Corridor Community Services

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

II-322.6 Fire Protection

Table II-32B summarizes the agencies and equipment providing fire protection in the mid-corridor portions of the rail line.

II-322.7 Public Utilities

Utility services in the mid-corridor are provided by the following organizations:

- o Gas: Southern California Gas Company

- o Electricity: All areas within the City of Los Angeles are served by the Los Angeles Department of Water and Power (DWP) and all other areas are served by Southern California Edison.

- o Water: The following water purveyors serve the areas along the mid-corridor:

  - Los Angeles Department of Water and Power (from Washington Boulevard to Slauson Avenue, and the community of Watts)

  - Los Angeles County Waterworks District 16 (from Slauson Avenue to 92nd Street)

  - Los Angeles County Waterworks District 10 (from Imperial Highway to 130th Street)

  - Park Water Company (from 130th Street to Oris Street)

  - Compton Municipal Water Company (in the City of Compton)

  - Dominguez Water Company (in the unincorporated county area between Compton and Long Beach)

  Most supplies are obtained from the California Aqueduct, the Metropolitan Water District and local groundwater sources.

- o Telephone: Pacific Bell

- o Solid Waste Disposal: In the area surrounding the proposed alignment from Washington Boulevard to Slauson Avenue and in Watts, residential refuse collection is the responsibility of the Sanitation Bureau of the Los Angeles Department of Public Works. All commercial refuse collection is contracted to private companies.

  In the unincorporated county areas of Florence-Firestone and Willowbrook, both residential and commercial refuse collection is the responsibility of the Los Angeles County Health Services Department.

TABLE II-32B

FIRE DEPARTMENTS SERVING

THE MID-CORRIDOR

Area	Stations	Equipment	Comments
Washington Blvd. to Slauson Ave.	LAFD 14 LAFD 21	Task Force	Paramedics
Slauson Ave. to 92nd St.	LACFD 9	3-man Engine Company	
	LACFD 16	3-man Engine Company	Paramedics
Watts	LAFD 65	Task Force	Paramedics
Watts to Compton	LACFD 41	One Engine Company	Paramedics
Compton	CFD 1	One Engine Company, One Truck Company,	Paramedics
	CFD 4	3-man Engine Company	
Compton to Long Beach	LACFD 105	One Engine Company, Hazardous Materials, Response Unit,	
	LACFD 10	Foam Truck for Flammable Liquids	

Note: LAFD - Los Angeles Fire Department
LACFD - Los Angeles County Fire Department
CFD - Compton Fire Department

Source: M. L. Frank & Associates, 1983.

In Compton and in the unincorporated county area to the south, both residential and commercial service is contracted to private companies.

Most refuse from areas in the City of Los Angeles is dumped in the Lopez or Toyon landfills, while refuse from all other areas is dumped in either the BKK or Puente Hills landfills.

o Wastewater Disposal (Sewers): The proposed alignment from Washington Boulevard to Slauson Avenue is in the jurisdiction of the Sanitation Bureau of the Los Angeles Department of Public Works. Wastewater from this area is treated at the Hyperion Treatment Plant in Playa Del Rey. The rest of the mid-corridor alignment segment is within Los Angeles County Sanitation District No. 1. Wastewater from this district is treated at the Joint Water Pollution Control Plant in Carson.

II-323 Economic Activity

II-323.1 Employment

In 1983, there were 177,000 jobs in non-government industries in the mid-corridor. Employment in manufacturing activities comprised 50.7 percent of the total employment, and represented 54 percent of the total corridor manufacturing employment. Table II-32C presents the employment by industry for the mid-corridor in 1983.

Based upon a field survey of existing land uses in the corridor, 1980 employment has been estimated for each of the proposed station areas of the three project alternatives in the mid-corridor. Year 2000 employment for these same station areas has been projected on the basis of assumptions regarding ongoing, planned and proposed developments. The estimated 1980 and 2000 employment by station area for the mid-corridor route alignment is presented in Table II-32D.

In 1980 an estimated 11,700 persons worked in the mid-corridor station areas, concentrated primarily in the following station areas: Washington Boulevard, 15.1 percent; Compton Boulevard, 16.3 percent; Artesia Boulevard, 18.6 percent; and Del Amo Boulevard, 17.6 percent. There is very little development projected to occur in the mid-corridor station areas during the period 1980 to 2000. Only one large development project is proposed for the entire mid-corridor during this period. A new U.S. Postal Facility, which would employ over 4,700 persons, is proposed for the vacated Goodyear Tire site located just west of the Florence Avenue station area. It is anticipated that the 1980 station area employment would show only a 7.4 percent increase during these years and would reach a total employment of 12,600 persons by 2000.

TABLE II-32C

1983 NON-GOVERNMENT EMPLOYMENT BY INDUSTRY

TOTAL CORRIDOR AND MID-CORRIDOR STUDY AREAS

	Total Corridor		Mid-Corridor		
Industry	Number	Percent	Number	Percent	As a % of Corridor
Agriculture, Forestry, Fishing	1,399	0.3	958	0.5	68.5
Mining	2,179	0.5	92	*	4.2
Construction	12,218	2.7	4,894	2.7	40.1
Manufacturing	165,119	36.9	89,712	50.7	54.3
Transportation, Communication, Utilities	35,805	8.0	8,099	4.6	22.6
Wholesale Trade	58,321	13.0	27,004	15.3	46.3
Retail Trade	49,656	11.1	9,293	5.3	18.7
Finance, Insurance, Real Estate	22,683	5.1	1,563	0.9	6.9
Services	100,357	22.4	35,401	20.0	35.3
TOTAL	477,737	100.0%	177,016	100.0%	37.1%

*Less than 0.1 percent.

Source: California Employment Development Department; Dun and Bradstreet Corporation and Donnelly Marketing Information Services; Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE II-32D

MID-CORRIDOR STATION AREA EMPLOYMENT WITHOUT PROJECT

Station	1980[1]	2000[2]	Total Change	
			Number	Percent
Washington Boulevard	1,770	1,870	100	5.6
Vernon Avenue	970	970	0	-
Slauson Avenue	1,310	1,310	0	-
Florence Avenue	850	900	50	5.9
Firestone Boulevard	370	400	30	8.1
103rd Street	170	200	30	17.6
Imperial Highway	120	140	20	16.7
Compton Boulevard	1,900	1,900	0	-
Artesia Boulevard	2,170	2,350	180	8.3
Del Amo Boulevard	2,060	2,520	460	22.3
TOTAL EMPLOYMENT, MID-CORRIDOR STATIONS	11,690	12,560	870	7.4

[1] 1980 employment estimated on the basis of existing development by type, as recorded by Sedway Cooke Associates' field survey 1983, and standard employment per square foot by type of development conversion factors.

[2] Total change in employment estimated on the basis of: (1) assumptions regarding ongoing, planned and proposed developments by the consultant team and City and County Planning Departments; and (2) standard employment per square foot by type of development conversion factors.

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

II-323.2 Retail Sales

The mid-corridor study area includes three incorporated cities for which 1980 retail sales volume data are available from the California State Board of Equalization. (Data for the mid-corridor area only are not available.) These cities -- Los Angeles, Carson, and Compton -- had total taxable retail sales in 1980 of $11.3 billion, $398.1 million, and $136.7 million respectively. Assuming a continuation of historic growth trends in retail sales, the volume of taxable retail transactions in the year 2000 in these cities is estimated in constant 1984 dollars as follows (Table II-32E):

TABLE II-32E

TAXABLE RETAIL SALES

CITIES IN THE MID-CORRIDOR

City	1980	2000	Average Annual Growth
Los Angeles	$ 11.3 billion	$25.0 billion	4.0%
Carson	$398.1 million	$1,276.0 million	6.0%
Compton	$136.7 million	$166.8 million	1.0%

Source: State of California, Board of Equalization, 1983.

During the 1980 to 2000 period, total taxable retail sales in Los Angeles County are projected to grow from $45.6 billion to $53.6 billion, a 3.0 percent average annual growth rate.

II-323.3 Employment and Income Characteristics of Residents

In 1980 an estimated 432,400 persons resided in the mid-corridor, of whom 156,400 were available for work. Active labor force participants numbered 138,500; 11 percent (or 17,900 persons) were unemployed as of April 1980 (U.S. Bureau of the Census).

Of the mid-corridor residents employed in 1980, 36.6 percent were engaged in manufacturing activities. The second highest number of the resident labor force, 11.5 percent, were employed in the retail trade industry.

The occupational distribution of mid-corridor residents was found to be similar to that of the project corridor as a whole. Just over one-quarter (26.3 percent) performed technical/sales work and another one-fifth (20.7 percent) were operator/laborer/assemblers. Tables II-32F and 11-32G provide the employment by industry and occupation for the mid-corridor resident labor force.

TABLE II-32F

1980 EMPLOYMENT OF RESIDENTS BY INDUSTRY

PROJECT CORRIDOR AND MID-CORRIDOR

Industry	Project Corridor Number	Project Corridor Percent	Mid-Corridor Number	Mid-Corridor Percent
Agriculture	3,639	1.4	1,547	1.1
Construction	9,520	3.7	4,945	3.6
Manufacturing				
Nondurable	29,351	11.3	16,897	12.2
Durable	55,337	21.4	33,853	24.4
Transportation	14,337	5.5	7,835	5.7
Communication	5,460	2.1	2,981	2.2
Wholesale Trade	11,471	4.4	5,657	4.1
Retail Trade	35,179	13.6	15,871	11.5
Finance	11,154	4.3	5,066	3.7
Business/Repair	12,849	5.0	6,448	4.7
Personal	12,327	4.8	5,973	4.3
Professional				
Health	20,792	8.0	10,477	7.6
Education	17,308	6.7	10,263	7.4
Other	9,262	3.6	4,341	3.1
Government	10,654	4.2	6,340	4.4
TOTAL	258,640	100.0%	138,494	100.0%

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

TABLE II-32G

1980 EMPLOYMENT OF RESIDENTS BY OCCUPATION

PROJECT CORRIDOR AND MID-CORRIDOR

Occupation	Project Corridor Number	Project Corridor Percent	Mid-Corridor Number	Mid-Corridor Percent
Managerial				
Administrative	16,751	6.5	6,237	4.5
Specialty	18,985	7.3	7,226	5.2
Technical/Sales				
Technicians	6,572	2.5	3,060	2.2
Sales	17,246	6.7	7,665	5.5
Clerical	47,305	18.3	25,805	18.6
Service	41,350	16.0	22,217	16.0
Farming/Forestry	3,393	1.3	1,716	1.2
Craft/Repair	33,368	12.9	17,717	12.8
Operator/Laborer/ Assemblers	43,545	16.8	28,718	20.7
Transportation	13,124	5.1	7,847	5.7
Laborers	17,001	6.6	10,286	7.3
TOTAL	258,640	100.0%	138,494	100.0%

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

The 1980 per capita income for the mid-corridor was estimated at $3,255 by the U.S. Bureau of the Census. Median and mean household income were estimated at $11,171 and $14,517 respectively. These figures were considerably below the 1980 Los Angeles County averages, but were similar to the income profile for the project corridor as a whole. According to SCAG a 6 percent increase in the mid-corridor personal income is predicted from 1980 to 2000, raising the year 2000 mid-corridor per capita income to $3,450 in constant 1984 dollars; median and mean household incomes are estimated to rise to $11,840 and $15,400 respectively.

II-324 Visual Quality

II-324.1 Long Beach Avenue

Long Beach Avenue is the primary visual element from Washington Boulevard south to Slauson Junction. Its expansive right-of-way is divided into two one-way roads by a wide, barren median strip containing the SPTC rail right-of-way and poles and overhead wires serving adjacent industrial uses. The large scale, bulky one-story industrial buildings are inconsistently sited; some are built to the property line, while others are set back in material storage yards and parking lots. The result is discontinuous street facades and an undefined street space. Other uses along Long Beach Avenue include single-family and multi-family dwellings and commercial structures (many are abandoned). At Slauson Junction there is a connection to the SPTC La Habra Branch to the east. The additional right-of-way, in conjunction with signal lights, utility poles, and chain link fencing, results in a disorganized visual setting.

II-324.2 Slauson Junction to Imperial Highway

The residential area through which the SPTC Wilmington Branch passes establishes the visual character of this segment. South of Slauson Junction to Florence Avenue the SPTC alignment is an exclusive right-of-way defined by the landscaped sides of single-family home parcels (see Figure II-32D). South to 83rd Street, industrial uses at varying setbacks define the rail corridor. The large-scale, bulky one-story buildings contrast with the surrounding single-family detached residences. Other segments of the SPTC alignment are paralleled by streets creating a wider, visually less defined corridor. From Firestone Boulevard south to 92nd Street, a linear park parallels the western side of the alignment. At 103rd Street, there are SPTC's West Santa Ana and El Segundo Branches to the east and west, respectively, visually widening the corridor. Watts Station, built in 1904, is on the National Register of Historic Places. New multi-family apartment complexes, enclosed by walls, border this area.

Figure II-32D

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Mid-Corridor
Aerial Photo
PARSONS BRINCKERHOFF / KAISER ENGINEERS

II-324.3 Imperial Highway to Greenleaf Boulevard

Willowbrook Avenue is the dominant visual element from Imperial Highway south to Greenleaf Boulevard as it passes through a single-family detached residential community. Its wide right-of-way is divided into two two-way roads by a wide median strip containing the SPTC rail alignment and highly visible utility poles and overhead wires. Between Imperial Highway and Oris Street (Compton city boundary) mature pine trees create aesthetic relief in an otherwise barren median strip. The detached single-family residences bordering the street are insufficient in scale to define the street space. The continuity of the median strip is broken between Rosecrans Avenue and Compton Boulevard. At Compton Boulevard, there is the Compton Civic Center and a redevelopment area.

II-324.4 Greenleaf Boulevard to Willow Street

The image of this segment is defined by relatively open, expansive grasslands and developing industrial parks consisting of large-scale, bulky low-rise buildings (see Figure II-32E). Utility poles and overhead wires paralleling the SPTC rail alignment and the Artesia and San Diego Freeway aerial crossings dominate the landscape.

In the Wardlow Road area sensitive residential land uses are buffered from the SPTC rail alignment by a wide open right-of-way and a parallel road (Pacific Place). Occasional commercial uses interspersed with parking lots and undeveloped parcels present a discontinuous street facade. This area is primarily residential with some large apartment buildings.

II-325 Historic and Cultural Resources

The mid-corridor area was subject to extensive speculative activity during the real estate boom years of the 1880s. Some residential and commercial activity took place in the late 1880s, but more extensive development did not occur until after the turn of the century. The Long Beach line of the Pacific Electric Railway began service along the present-day Wilmington Branch of the SPTC in 1902 and contributed to growth in the area.

Much of the mid-corridor area is now industrial in nature, although there are residential areas dating back to the early 1900s. The majority of the housing, however, was constructed during the 1920s and later.

Several areas in the mid-corridor have been surveyed previously for historic resources. The SPTC Wilmington and West Santa Ana Branches were surveyed by Caltrans in conjunction with the Century Freeway Project. The Watts area was studied by the Historical and Cultural Resources Survey staff of the Los Angeles Bureau of Engineering in 1982. The remainder of the mid-corridor was surveyed for this project with staff from Caltrans and the State

Figure II-32E

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Mid-Corridor
Aerial Photo
PARSONS BRINCKERHOFF / KAISER ENGINEERS

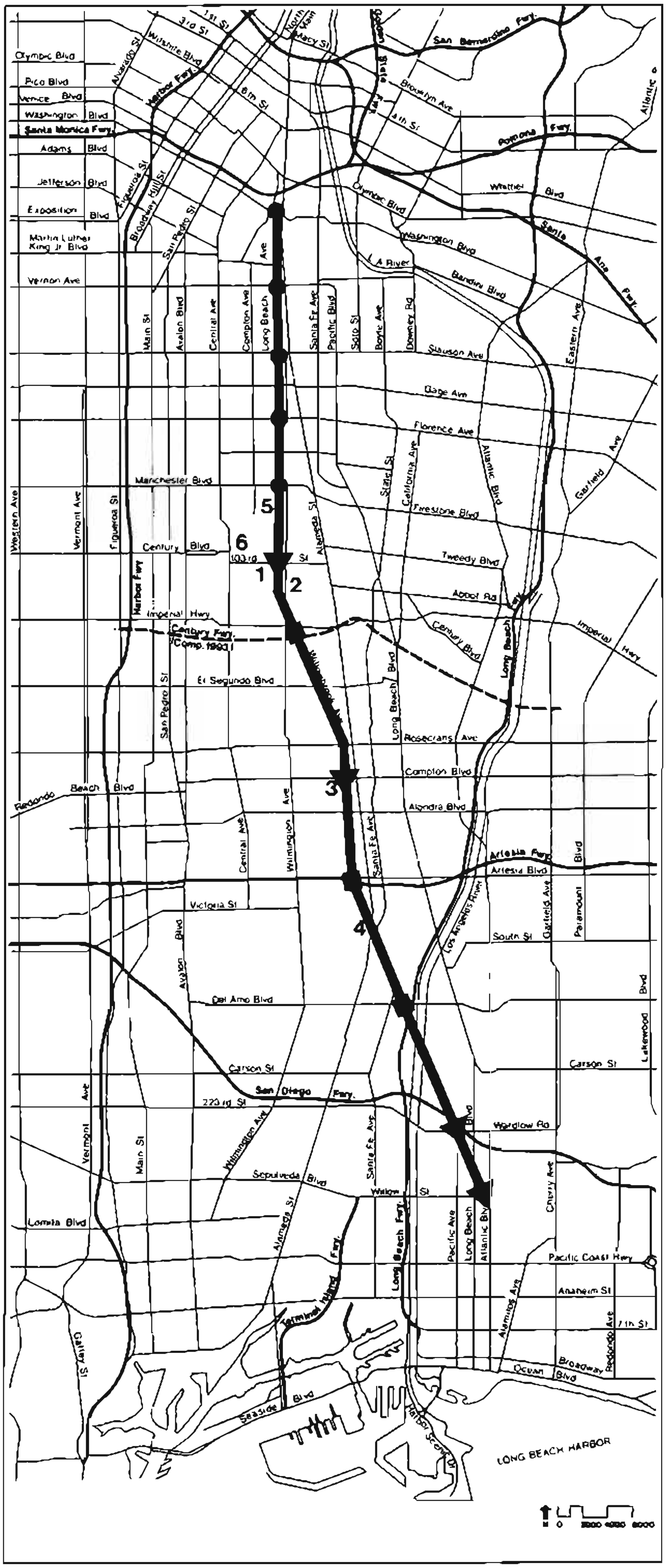


Figure II-32F

Mid-Corridor
Historic Resources

Long Beach-Los Angeles
RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

TABLE II-32H

HISTORIC AND CULTURAL RESOURCES FOR MID-CORRIDOR ALTERNATIVES

(Key to Figure II-32F)

* o	1.	Watts Station 1636 E. 103rd St.
* o	2.	Watts Towers 1765 E. 107th St.
+	3.	Heritage House 205 S. Willowbrook Ave. Compton
*+	4.	Dominguez Adobe 18127 S. Alameda St. Compton
o	5.	House 9502 Maie Ave.
o	6.	Watts City Hall 1515-17 S. 103rd St.
o	7.	Pacific Electric R.O.W. (From Olympic Blvd. southerly)

* National Register site or eligible for National Register.

+ State of California Historic Site or Point of Interest.

o Local designation or survey.

Source: California Department of Transportation, 1983; M. L. Frank & Associates, 1984.

Office of Historic Preservation in February 1983. Caltrans surveyed the maintenance site in January 1984. In addition, the UCLA Archeological Survey was contacted regarding archeological resources. Figure II-32F and Table II-32H summarize the findings of all archival and field research. No archeological resources have been identified in the mid-corridor.

At the proposed maintenance site the survey found no properties of historic significance. The surface of all three parcels has undergone some disturbance by grading and off-road vehicle use. No evidence of cultural or archeological resources was found on either the disturbed or undisturbed areas.

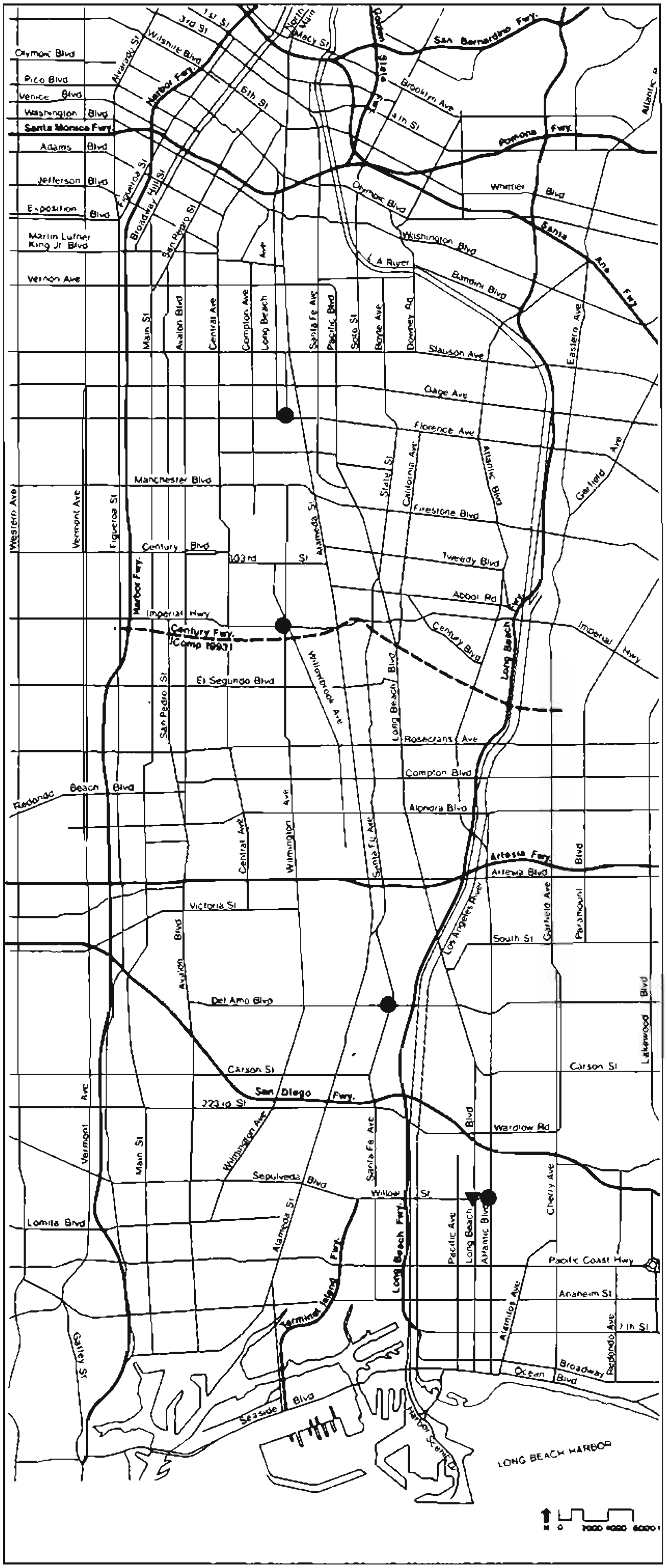
II-330 TRAFFIC AND TRANSPORTATION

II-331 Traffic

The mid-corridor segment of the study area incorporates five jurisdictions including the cities of Los Angeles, Compton, Carson and Long Beach and the County of Los Angeles. The street network is primarily structured in a grid pattern and consists of major arterials and local access streets. The two state freeways which currently intersect the corridor are the San Diego Freeway (I-405) and the Artesia Freeway (Route 91). The Century Freeway, presently under construction, includes a planned transitway and will connect the Los Angeles International Airport with Norwalk. Of the major east-west arterials, two are state facilities: Slauson Avenue (Route 90) and Firestone Boulevard (Route 42). Year 2000 traffic volumes for the mid-corridor major arterials were projected based on a one percent annual growth factor applied to existing traffic (provided by the involved agencies), with the exception of the following cross streets where specific related projects dictated the traffic growth in the area:

- Santa Fe Avenue - 2%
- Atlantic Avenue - 2%
- Willow Street - 1.5%
- Gage Avenue - 3%
- Florence Avenue - In addition to the 1 percent growth factor, the proposed major U.S. postal facility traffic projections were used to develop the year 2000 traffic movements at the intersection of Florence and Holmes Avenues.

In the mid-corridor 18 key signalized intersections closest to the project station locations and proposed park-and-ride facilities on each major arterial were analyzed to evaluate the existing and year 2000 base conditions. Results of the analysis are shown in Figure II-33A, which identifies intersections operating at level-of-service "D" or worse. Presently only the intersection at Willow Street and Long Beach Boulevard operates at LOS "D". By year 2000 four additional intersections, including Florence at Holmes, Imperial at Wilmington,



Existing Conditions ▼

Year 2000 Conditions ●

AM Peak

Figure II-33A

Mid-Corridor
Level of Service D
or Worse Intersections

Long Beach-Los Angeles
RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

Del Amo at Santa Fe, and Willow at Atlantic, would operate at LOS "D" or worse due to projected traffic growth. Typical travel speeds on major arterials in the mid-corridor are significantly higher than speeds in downtown Los Angeles due to lower traffic demand, increased signal spacing, and low pedestrian flows.

II-332 Transit

SCRTD is also the primary public transportation operator in the mid-corridor segment, providing mainly local bus services. The only other transit companies operating within the Del Amo Fashion Center in the mid-corridor are the Torrance Transit System and Gardena Bus Lines. The Torrance Transit System would connect Del Amo Fashion Center with the rail transit system.

The local and limited bus services in the mid-corridor operate at speeds in excess of the SCRTD's system average (14.1 mph). Primary north-south bus lines operate at an average of 15 miles per hour between Washington Boulevard and Slauson Avenue, 18 miles per hour between Slauson Avenue and 103rd Street, 31 miles per hour between 103rd Street and Artesia Boulevard, and 25 miles per hour between Artesia Boulevard and Willow Street. Service schedules are reasonably well maintained on the bus north-south bus lines and the intersecting east-west bus lines in the mid-corridor.

TABLE II-33A

PROPOSED PARK-AND-RIDE FACILITIES

IN THE MID-CORRIDOR

Station	Number of Parking Spaces
103rd Street	50
Compton Boulevard	50
Wardlow Road	50
Willow Street	100
Imperial Highway	500
Del Amo Boulevard	400
Artesia Boulevard	650
	1,800

Source: PB/KE; Southern California Association of Governments, 1983.

II-333 Parking

In the mid-corridor segment of the proposed project, parking is relatively more available than in the two downtown areas of Los Angeles and Long Beach; however, rail patrons parking at a station would create a demand for parking near stations. Presently there are no commercial parking facilities in the vicinity of proposed stations. Stations which include proposed park-and-ride facilities are listed below (Table II-33A):

Some curbside parking currently exists on neighborhood streets near proposed stations. However, the majority of this parking is used by residents and this is not expected to be a significant resource for riders.

II-334 Rail Freight Traffic

A San Pedro Bay Ports Access Study has been completed by SCAG which analyzes alternative routing scenarios for proposed future through freight movements to and from the ports area. Table II-33B presents a summary of the Ports Study scenarios and train movements under investigation. The 1983 SCAG study alternatives include three routing alternatives and two levels of projected train activity. The three routing alternatives include (1) the status quo (each of the railroads continues to operate on its own branches), (2) one-way loop (via the Atchison Topeka & Santa Fe and Union Pacific Branches), and (3) consolidation (ATSF, UPRR, SPTC operations all occur on the SPTC San Pedro Branch) (see Figure II-33B).

The two activity scenarios (low and high) refer to the number of train movements in the year 2000. The low scenario assumes moderate growth in rail traffic. The high scenario assumes that both the Los Angeles Inter-Modal Container Facility and the Long Beach Coal Facility are fully operational in the year 2000, and that each market for goods moved by rail is at maximum demand.

Future rail freight traffic growth at the levels of these forecasts would create significant traffic impacts on east-west arterials in the mid-corridor regardless of the project. Currently, if freight train operations occur during peak periods, significant queuing and delays to vehicular traffic result on some of the major east-west arterials. By the year 2000 increased frequency of freight train movements combined with the anticipated growth in vehicular traffic traffic on major east-west arterials in the mid-corridor, would result in even greater delay to vehicular traffic. Long queue lengths resulting from freight trains crossing major cross streets could also disrupt traffic movements on adjacent north-south streets. In consideration of these projections, SCAG has proposed that a task force composed of affected cities and government agencies, the Ports of Los Angeles and Long Beach, and the railroads develop plans to generate sources of funding for grade separations and/or consolidation of the projected

TABLE II-33B

SAN PEDRO BAY PORTS ACCESS STUDY

YEAR 2000 SCENARIOS AND TRAIN MOVEMENTS

Freight Routing Alternative	Projected Train Activity	Descriptions of Railroad Routings	SPTC Wilmington Br Freight Trains/Day	SPTC San Pedro Br Freight Trains/Day
Existing, 1983			6[2]	2
Status Quo	Low	All railroads continue to use existing routes	17[3]	4
One-Way Loop	Low	SP operations continue along present routes. UP and SF operate one-way on their tracks.	17[3]	4
Consolidation	Low	All trains bound for port operate on Southern Pacific San Pedro Branch.	4[4]	33
Status Quo	High	All railroads continue to use existing routes.	29[5]	10
One-Way Loop	High	SP operations continue along present routes. UP and SF operate one-way on their tracks.	29[5]	10
Consolidation	High	All trains bound for ports operate on Southern Pacific San Pedro Branch.	4[4]	67

[1] Projections of train movements are consistent with the economic planning of the ports, but is not known when this level of traffic will materialize.

[2] From Slauson to Watts Junctions, 3 South to Dominguez Junction.

[3] To Watts Junction, 13 from Watts Junction to Dominguez Junction.

[4] To Watts Junction, 0 from Watts Junction to Dominguez Junction.

[5] To Watts Junction, 25 from Watts Junction to Dominguez Junction.

Source: San Pedro Bay Ports Access Study, Southern California Association of Governments, 1983.

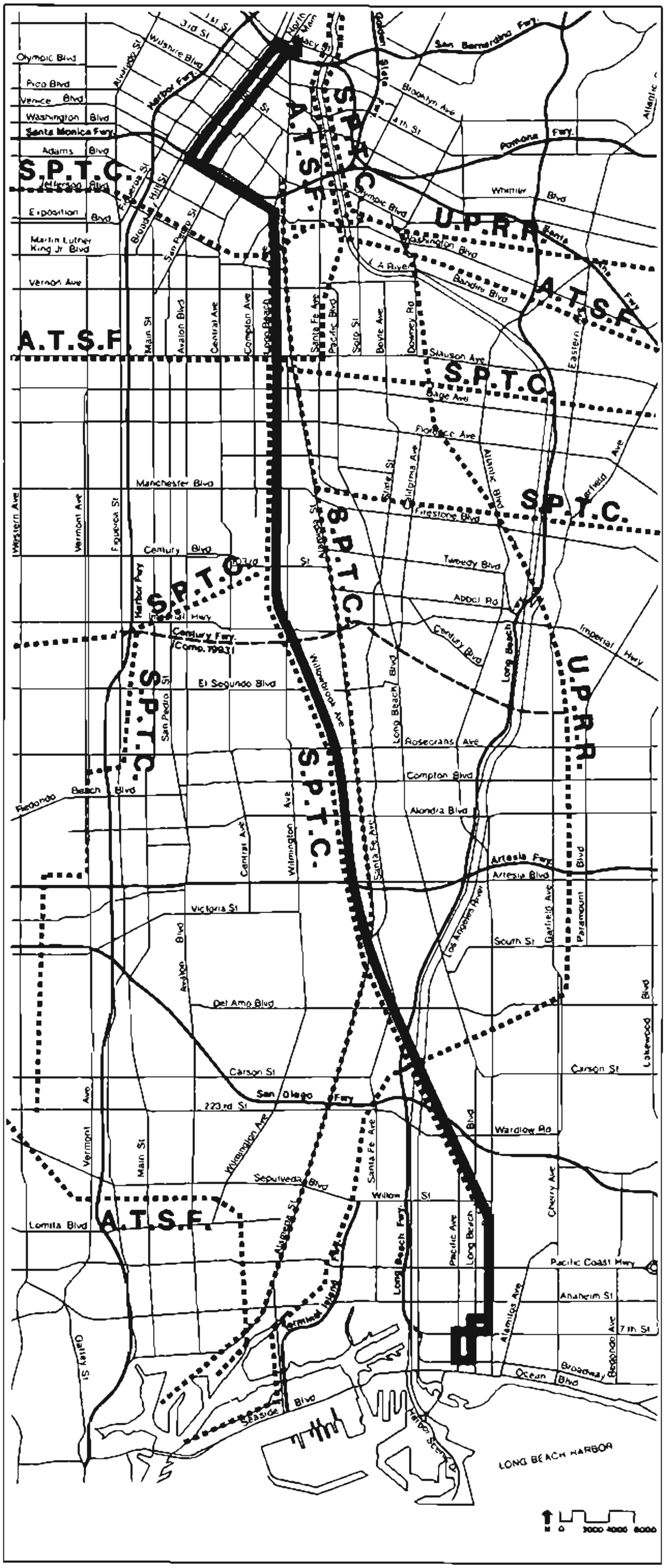


Figure II-33B

Active Rail Freight Lines

Long Beach-Los Angeles
RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

future levels of rail freight traffic from major crossing roadways. Funding and construction of such facilities is likely to depend on actual materialization of the increased rail freight traffic and, if developed in the future, are actions independent of the rail transit project.

II-400 LONG BEACH

II-410 NATURAL ENVIRONMENT

II-411 Topography, Soils, Geology, and Seismicity

The Long Beach segment of the project corridor begins south of the San Diego Freeway near Willow Street. The Los Angeles River and its tidal prism (i.e., the portion of an estuary influenced by tides) form the western edge of the Long Beach segment. The terrain is gently sloping from the northeast to the Los Angeles River and shoreline of San Pedro Bay on the west and south. Signal Hill represents a single point of high relief (355 feet above sea level) that abruptly rises from a surrounding area that averages only 25 feet above sea level. Signal Hill is located easterly of the proposed Long Beach alternatives.

The Long Beach segment encompasses three soil types, the Hanford, the Tujunga-Soboba, and the Ramona-Placentia associations. The Hanford and Tujunga-Soboba soils were previously discussed for the downtown Los Angeles and mid-corridor segments (Sections 211 and 311).

The Ramona and Placentia soils occur in combination, making up one association. The soils of this association are moderately drained with medium to rapid run-off potential, creating a moderate to high erosion hazard.

Geologic and seismic conditions for the Long Beach segment are generally described on Section 110 of this chapter.

II-412 Floodplains, Hydrology, and Water Quality

None of the alternative alignments in the city of Long Beach encroaches onto any established floodplain or significantly impedes drainage flows. As with the downtown Los Angeles alternatives, drainage control for the Long Beach alternatives would consist of using existing facilities.

There are three topographic depressions in the Long Beach area. One is located adjacent to the easterly side of the existing SPTC track between 32nd Street on the north and Canton Street on the south. This depression is not part of any floodplain and actually represents a localized sump when a 100-year flood occurs. Drainage patterns in this sump traverse westerly to the existing rail right-of-way.

A second depression is bounded by Willow Avenue (north) and Burnett Street (south), Long Beach Boulevard (west) and Linden Avenue (east).

The third and smallest depression is at the intersection of Hill Street and Atlantic Avenue. These depressions represent areas that could become flooded during a 100-year flood, but they are not parts of any established floodplain.

II-413 Vegetation and Wildlife

The project's Long Beach alternatives traverse a densely urbanized area. The LB-1 (Atlantic Avenue Two-Way) alternative would be located entirely on Atlantic Boulevard. The vegetation that presently occurs along this route is primarily non-native landscaping located on the fronts of businesses and residences, including several Mexican fan palms, King, and Queen palms.

Alternative LB-2 (Atlantic/Long Beach Couplet) would proceed northbound on Atlantic Boulevard and southbound on Long Beach Boulevard. The Long Beach Boulevard median has recently been landscaped with mature species of Moreton Bay fig (Ficus macrophylla), California fan palm (Washingtonia filifera), jacaranda (Jacaranda ovalifolia) and Fern pine (Podocarpus ssp). The areas between the trees have been planted with grasses and various shrubs.

Similar to the LB-1 alternative, the Long Beach Boulevard (LB-2 southbound) route also has non-native vegetation used for landscaping associated with adjacent businesses and residences.

Alternative LB-3 (Los Angeles River Route) would skirt the edges of the Los Angeles River Flood Control Channel and the Long Beach Freeway (Route 7). Vegetation found along this alternate is ruderal. The proposed alignment has been extensively disturbed by development and construction for the flood control channel and freeway.

Alternative LB-4 (Atlantic with Pacific Avenue Loop) is basically the same as LB-1 with the addition of the Pacific Avenue Loop. No significant vegetation exists along this alignment.

The Los Angeles River tidal prism extends from the mouth of the river upstream to a point slightly below Willow Street. The tidal prism is characterized by a sandy expanse with limited aquatic vegetation. Both a saline (brackish) and marine habitat exist within the tidal prism. Beneficial uses to be protected in this area include small boating, water skiing, sport fishing and propagation and sustenance of marine life (downstream of Ocean Boulevard).

The Los Angeles-Long Beach Harbor is a man-made harbor formed by the the San Pedro, Middle and Long Beach breakwaters. The harbor is a marine habitat, with localized brackish areas near the mouths of the Los Angeles River and Dominguez Channel. It is inhabited by many species of fish and birds.

Wildlife in the Long Beach segment of the project corridor is dominated by urban-adapted species. House sparrow (Passer domesticus), house finch (Carpodacus mexicanus), rock dove -- common pigeon (Columbia livia), Ringed Turtle dove (Streptopelia risoria), European starling (Sturna vulgaris), mockingbird (Mimus polyglottos), and Brewer's blackbird (Euphagus cyanocephalus) are all common in the corridor. Other birds seen in the area of the Los Angeles River include Pintail (Anas acuta), Mallard (A. platyrhynchos), American coot (Fulica americana), Killdeer (Charadrius vociferus), and green heron (Butorides striatus).

It is probable that some urban-adapted mammals exist within the Long Beach segment; however, no evidence of these mammals has been found, except in the vicinity of the Los Angeles River. Ground squirrels (Citellus beecheyi) have been seen in the vicinity of the river, as have cottontails (Sylviligus audubonii) and evidence of either stray dogs, foxes, or coyotes. There may also be stray cats in the area.

II-414 Noise and Vibration

Downtown Long Beach is an urbanized area with its major noise source being surface traffic, particularly along Atlantic and Long Beach Boulevards, major arterials representing a major portion of the LB-1 and LB-2 alignment alternatives. Compared to downtown Los Angeles, downtown Long Beach has lower building density, lower building heights, wider streets, and lower traffic volumes, resulting in significantly lower noise exposure.

In contrast to relatively heavy traffic on Atlantic Avenue and Long Beach Boulevard, there is virtually no traffic along the proposed corridor for LB-3, which is located along the east bank of the Los Angeles River. Although the Long Beach Freeway runs parallel to this route and is just across the Los Angeles River from the nearest residential areas, the large earth berm on the eastern side of the river between the freeway and these residences provides significant shielding so that the noise level along LB-3 is relatively low.

To document the existing noise and vibration environment along the proposed corridors, long-term measurements were taken at two locations supplemented by short-term measurements at selected additional locations (see Figure II-41A). Location 1, located near Atlantic Avenue, is representative of a location with significant traffic noise exposure. Location 2 is in the immediate vicinity of the Los Angeles River and is representative of the noise environment along the LB-3 corridor. Descriptions of the long-term measurement locations and the CNEL measurement results are provided in Table II-41A, which also lists the short-term measurement locations and the average sound levels at those locations.

Taking distance differences into account, noise measurements obtained at the various locations along the heavily traveled streets are fairly

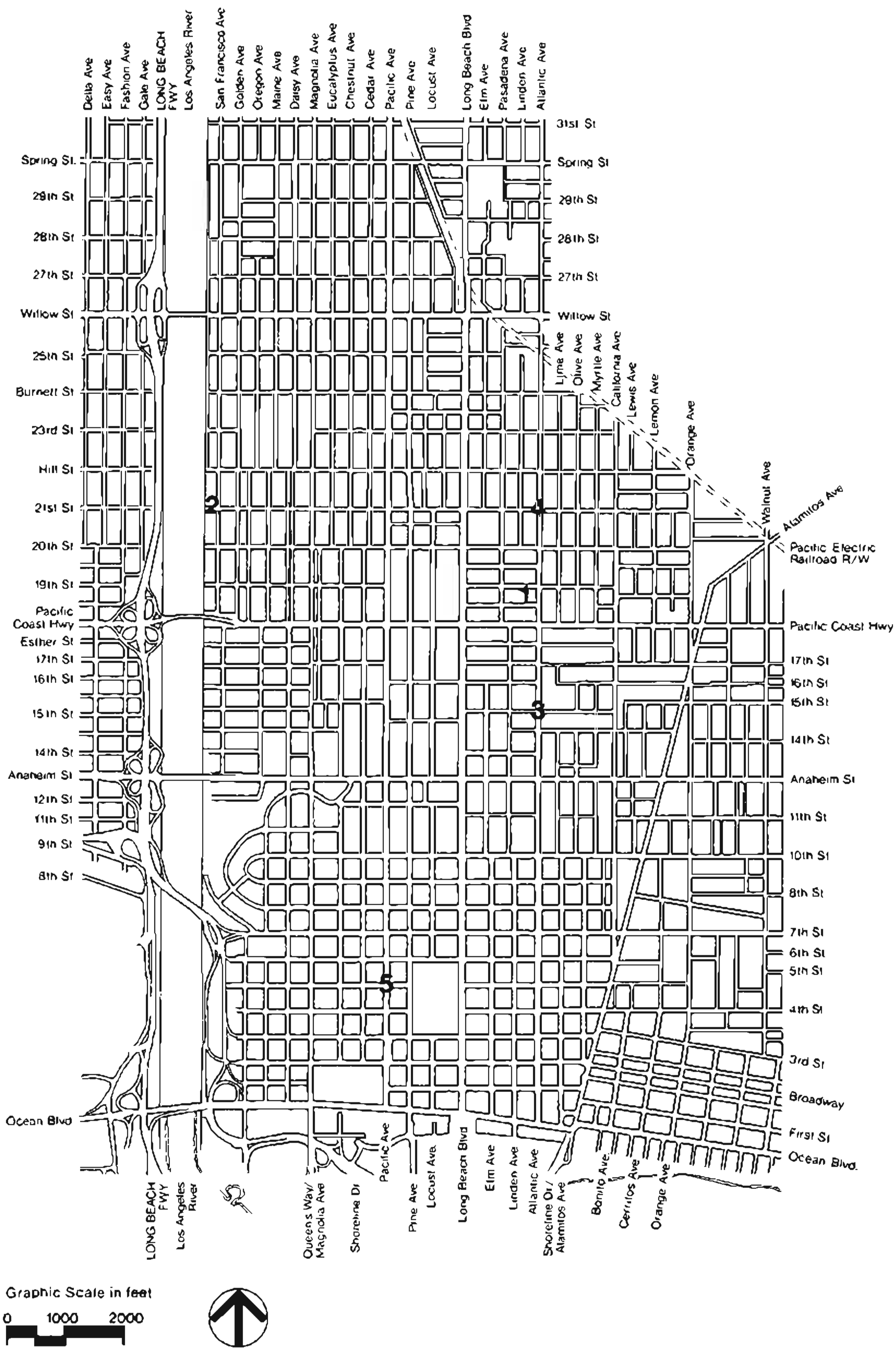


Figure II-41A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach
Noise Measurement Sites
PARSONS BRINCKERHOFF / KAISER ENGINEERS

TABLE II-41A

NOISE AND VIBRATION MEASUREMENT DATA - LONG BEACH

Map Key	Location	Measured Sound Levels in dB(A)	Comments
1.	Residence 500 block of Dayman Ave.	65 CNEL	Long-term (24 hour) measurement
2.	Residence 900 block of 21st St.	57 CNEL	Long-term (24 hour) measurement
3.	Gospel Memorial Church 5th and Atlantic Ave. (Vibration measurement below 50dB at all frequencies.)	70 L_{eq}	Short-term measurement
4.	Faith and Nettles Christian Center 21st St. and Atlantic Ave.	74 L_{eq}	Short-term measurement
5.	First United Methodist Church 5th St. and Pacific Ave. (Vibration measure below 50dB at all frequencies.)	68 L_{eq}	Short-term measurement

Source: Bolt Beranek & Newman, 1983.

comparable to measurements of traffic obtained along the Mid-corridor. Measurements obtained at Location 2 represent the quietest environment measured along any of the corridor locations monitored during the field survey, and they contrast with significantly higher noise levels throughout most of downtown Long Beach.

As with the vibration measurements in the downtown Los Angeles area, the ambient vibration data are at levels which are imperceptible to people in typical living environments.

II-420 SOCIOECONOMIC ENVIRONMENT

II-421 Land Use, Population, and Housing

II-421.1 Land Use

Land uses in the Long Beach area as of 1980 are depicted on Figure II-42A. As can be seen from this map, land uses along the Long Beach alternatives intensify as the civic center is approached.

- North of Wardlow Road. A mix of land uses borders the SPTC right-of-way (LB-1, LB-2, and LB-4) and the Los Angeles River channel (LB-3) north of Wardlow Road, including single-family and multi-family housing, a church facility, a park, a country club, and industrial uses along the right-of-way and along the Los Angeles River.

- Wardlow Road to Willow Street. Long Beach Boulevard is exclusively commercial south of Wardlow Road. Major institutional uses located directly north of Willow Street at Long Beach Boulevard are Memorial Hospital and related medical facilities, including convalescent homes to the east; and Pacific Hospital, and related medical facilities, and Long Beach Unified School District facilities to the west. Single-family housing is the predominant use in the remainder of this area.

- Willow Street to Pacific Coast Highway. Auto-oriented sales and service are the predominant uses along Long Beach Boulevard. Residential development is solidly single-family from the Los Angeles River to Magnolia Avenue, multi-family from Magnolia Avenue to Locust Avenue (one block west of Long Beach Boulevard), and a mix of multi-family and single-family east of Walnut Avenue.

- Pacific Coast Highway to Anaheim Street. Commercial uses along Long Beach Boulevard south of Pacific Coast Highway are dominated by automobile dealerships and auto-related sales and service. Commercial strip development extends east and west on both sides of the Pacific Coast Highway. Marginal commercial uses are mixed with predominantly single-family housing on Atlantic Avenue. The primary land uses outside of these

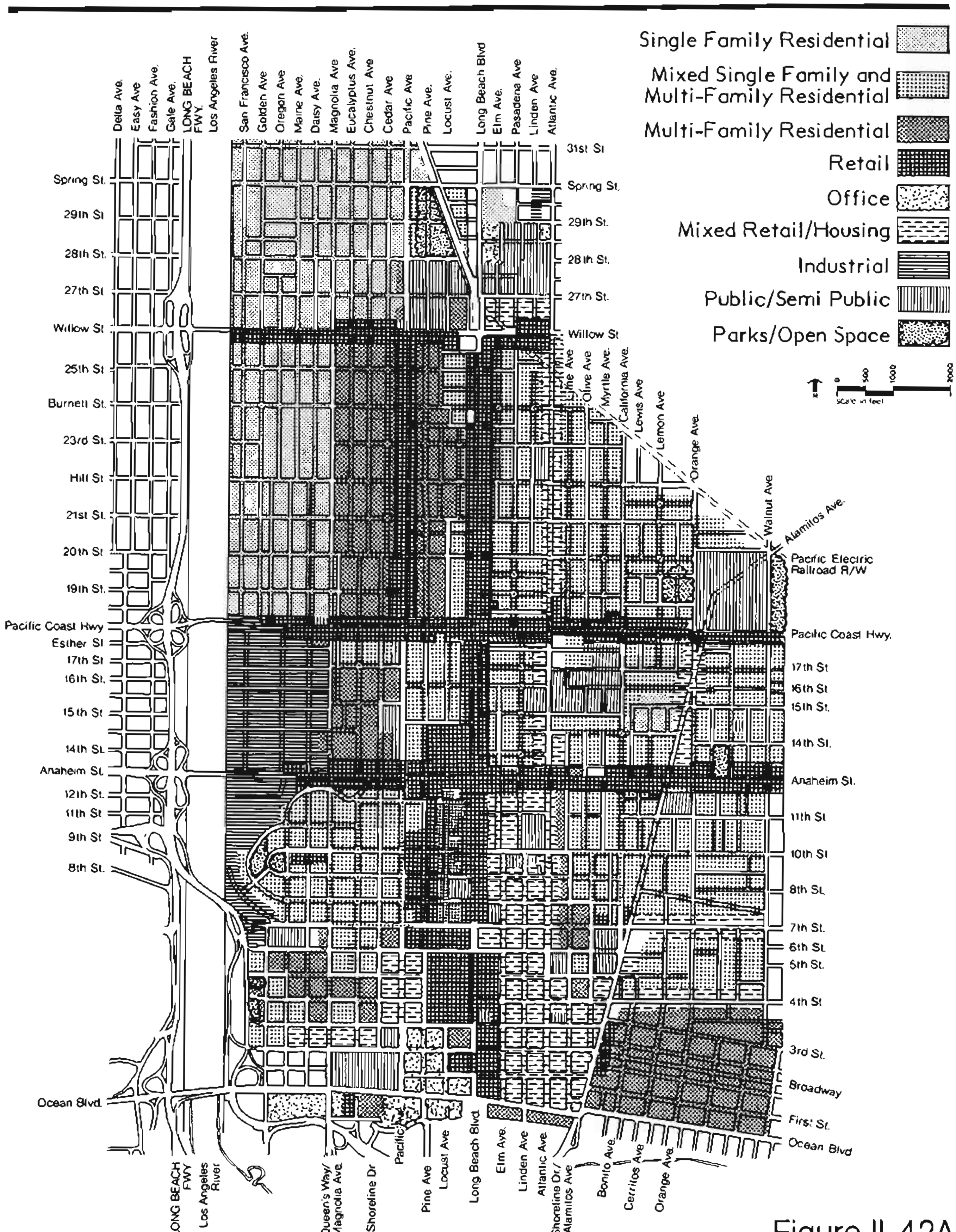


Figure II-42A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach
Generalized Land Use
PARSONS BRINCKERHOFF / KAISER ENGINEERS

corridors are a mix of multi-family and single-family housing and some industrial uses west of Magnolia Avenue.

o South of Anaheim Street. The area encompassing Long Beach Boulevard and Atlantic Avenue south of Anaheim Street contains a mix of residential and commercial uses at a greater intensity than the northern section of Long Beach. South of 4th Street there is a mix of high-rise housing, motels, and relatively well-maintained one-story commercial structures. The quality of commercial structures and the economic viability of the businesses they house decline progressively north of 4th Street. Housing from 4th Street north to Anaheim is a mix of two- to three-story multi-family structures and single-family homes, with the single-family homes increasing northward. South of 7th Street the predominant land use is multi-family housing with a mix of multi-family and single-family housing between 7th Street and Anaheim Street.

In the Long Beach downtown, commercial office space is concentrated in the Redevelopment Area south of 3rd Street between the Los Angeles River and Elm Avenue (one block east of Long Beach Boulevard). The Civic Center is included in this area. The Convention Center is located at the terminus of Long Beach Boulevard south of Ocean Avenue.

Long Beach Plaza, a regional shopping mall anchored by Sears, Buffums, and J.C. Penney's, is bounded by Long Beach Boulevard, Pine Avenue, 3rd Street, and 6th Street.

II-421.2 Development Trends

Prior to 1980 2 million rentable square feet of office space were developed in downtown and North Long Beach. Between 1980 and 1984 1.4 million square feet of commercial office space were added, almost doubling the supply. The occupancy rate is 68 percent for pre-1960 office space, 95 percent for the office space added between 1960 and 1980, and 56 percent for space added between 1980 and 1984. The rate of absorption has increased significantly in recent years: from 58,000 square feet per year for the period 1960 to 1983, to 72,000 square feet per year for the period 1970 to 1983, and 181,000 square feet per year for the period 1980 to 1983. In 1983 alone 386,000 square feet was absorbed during the first six months. While the absorption rate has not kept up with the supply, its recent increase suggests a long-term acceleration of demand for office space. An average absorption of approximately 250,000 to 300,000 square feet per year can be expected over the next decade.

In 1980 there were no competitive major hotels in downtown or North Long Beach. Between 1980 and 1984 two hotels were built near the Convention Center with a total of 762 rooms. Two additional facilities totaling 880 rooms are planned in the same area.

Of the estimated 7 million square feet of retail space available in the entire Long Beach segment in 1980, 1.9 million square feet were located in the 1.2-square-mile Long Beach downtown area bounded by the Los Angeles River, the Pacific Ocean, California Avenue, and 7th Street. An additional 700,000 square feet were constructed between 1980 and 1983. This distribution indicates that retail activity is less concentrated in downtown Long Beach than in downtown Los Angeles.

II-421.3 Population

Each of the four Long Beach alternatives would traverse roughly the same population areas, with the exception of the Los Angeles River Route (LB-3). The Atlantic/Long Beach Couplet (LB-2) is virtually identical to the Atlantic Avenue Two-Way (LB-1), except that the couplet would serve one more station in the southern portion of the city. Overall, LB-2 would serve a slightly higher concentration of nonwhites. The Atlantic with Pacific Avenue Loop alternative (LB-4) would lie further east than the Atlantic/Long Beach Couplet, encompassing more elderly, disabled Whites. The Los Angeles River Route (LB-3) would serve only two station areas, both in the southern section of the city. Table II-42A summarizes the demographic characteristics of the project alternatives in Long Beach.

Alternative LB-2, with its 9 stations, would serve the greatest population, over 27,000. In contrast, alternative LB-3 is at the other end of the range and its 2 station areas would include only 6,000 persons. The demographic characteristics for each alternative are similar, although alternatives LB-1 and LB-2 would tend to include more nonwhites and youth and alternatives LB-3 and LB-4 would tend to contain a greater proportion of low-income and autoless households.

The central section (Pacific Coast Highway and Anaheim stations) contain the highest concentrations of nonwhites in the Long Beach segment, 75 to 83 percent. These are mostly Blacks, with some Hispanics and a small proportion of Asians. Here households are larger and youth make up a greater proportion and elderly a smaller proportion than elsewhere in the segment. The proportion of family households earning low incomes is also higher here, and auto ownership is low.

In all respects the characteristics of Hill Street fall between those of the central station areas and those of the wealthier station areas in the north. The Wardlow and Willow station areas to the north contain more Whites than do the other station areas (with the remainder an equal proportion of Blacks and Hispanics), and about one-quarter of the residents are elderly. Wardlow represents the extreme of these conditions, with a median household income exceeding $22,000 and proportionately few disabled residents, although a major senior citizen's apartment residence is nearby. Auto ownership at these two station areas is the highest in the segment, exceeding 80 percent.

TABLE II-42A

1980 STATION AREA SELECTED DEMOGRAPHIC CHARACTERISTICS

DOWNTOWN LONG BEACH

Station Area	Population	Percent Nonwhite	Percent 0-19 Years	Percent 64+ Years	Median Household Income	Percent Classified as Low-Income[1]	Percent Households Without Automobiles	Percent Between 16-64 Years Classified as Work-Disabled	Percent 16+ Years Classified as Transit-Disabled
LB-1									
Wardlow Road[2]	2,700	24	18	27	$20,250	10	14	9	6
Willow Street	1,348	42	22	26	12,128	22	18	17	7
Hill Street[2]	3,371	9	33	11	10,015	33	28	17	6
Pacific Coast Hwy.	3,870	8	42	6	8,844	46	32	14	4
Anaheim Street	2,822	76	36	9	10,151	45	34	12	3
6th/7th Street	2,980	37	18	27	7,014	37	47	24	8
1st Street	1,964	12	4	48	6,801	31	68	31	14
TOTAL	19,055	52%	27%	19%		34%	37%	16%	7%
LB-2									
Wardlow Road[2]	2,700	24	18	27	$20,250	10	14	9	6
Willow Street	1,348	42	22	26	12,128	22	18	17	7
Hill Street	5,285	68	36	10	10,236	36	29	16	6
Pacific Coast Hwy.	6,618	77	39	7	9,233	42	31	15	5
Anaheim Street	3,990	72	35	9	9,056	45	37	13	4
6th/7th Street	3,737	38	15	28	7,024	38	47	24	8
3rd Street	697	15	5	41	5,890	39	73	38	11
1st Street	2,659	13	5	50	7,249	31	65	28	15
TOTAL	27,034	54%	28%	19%		30%	38%	17%	7%

TABLE II-42A (Continued)

1980 STATION AREA SELECTED DEMOGRAPHIC CHARACTERISTICS

DOWNTOWN LONG BEACH

Station Area	Population	Percent Nonwhite	Percent 0-19 Years	Percent 64+ Years	Median Household Income	Percent Classified as Low-Income[1]	Percent Households Without Automobiles	Percent Between 16-64 Years Classified as Work-Disabled	Percent 16+ Years Classified as Transit-Disabled
LB-3									
Daisy Avenue	4,405	51	30	15	$ 7,372	43	50	22	5
1st Street	1,582	13	6	49	6,110	34	62	34	12
TOTAL	5,987	41	24	24		41	54	24	7
LB-4									
Wardlow Road[2]	2,700	24	18	27	$ 20,250	10	14	9	6
Willow Street	1,348	42	22	26	12,128	22	18	17	7
Hill Street[2]	3,371	59	33	11	10,015	33	28	17	6
Pacific Coast Hwy.	3,870	83	42	6	8,844	46	32	14	4
Anaheim Street	2,822	76	36	9	10,151	45	34	12	3
6th Street	4,564	29	11	40	5,985	41	56	28	11
3rd Street	1,419	14	5	44	6,381	35	73	34	11
1st Street	1,202	13	7	52	5,652	34	63	33	14
TOTAL	21,296	48%	25%	23%		36%	42%	22%	8%

[1] Low-income is defined as below 125 percent of the federally defined poverty level.

[2] Indicates identical station areas. Where duplicate station names appear with asterisks, the geographic boundaries of the station areas actually differ, therefore, the characteristics of the station areas differ.

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

Below 7th Street the high concentration of elderly, white residents includes a significantly high proportion of disabled residents. This concentration is highest in the southernmost portion of the city. Here transit dependence is quite high. Auto ownership is even lower than in the central Long Beach segment, though the proportion of those earning low incomes remains roughly between 35 and 40 percent. There are very few Blacks and Asians in this area, though quite a few Hispanics reside here.

II-421.4 Housing

Housing in the Long Beach corridor section grew at a relatively low average annual growth rate of 0.5 percent (a total increase of 4834 units) between 1970 and 1980. Such a low rate probably reflects housing demolitions carried out as part of redevelopment projects in the downtown area. SCAG forecasts that, without the project, the Long Beach corridor section will experience an average annual housing growth rate of 1.1 percent (a total of over 23,500 units) between 1980 and 2000. This rate is higher than what is expected for the county and can be attributed to the city's housing objectives of increasing residential density in the central and downtown areas.

Housing in the Long Beach corridor section ranges from low-rent, single-room-occupancy apartments in the central and downtown areas to large, high-value, single-family homes in the Bixby Knolls/California Heights neighborhood. Overall, housing in this section, which contains 42 percent of the corridor's housing stock, is 64 percent multi-family and 67 percent renter-occupied. Residential density is the highest in the project corridor with an average 7.1 units per acre.

Average household size in this corridor section has been influenced by the large number of senior citizens living in Long Beach. The average number of persons per unit (2.2) is significantly lower than elsewhere in the corridor and only 10 percent of all dwellings are overcrowded. Sixty-eight percent of all residents moved into their current dwelling units between 1975 and 1980.

Near the Long Beach alignment alternatives, there are nearly 1,600 units contained in publicly assisted housing projects. The largest of these projects, Brethren Manor and American Gold Star Manor, contain a total of 644 units of elderly housing.

II-422 Community Services

II-422.1 Schools, Libraries, and Churches

There are 27 schools evenly dispersed in the residential areas adjacent to the Long Beach alignment alternatives. The largest is Polytechnic Senior High School at 1600 Atlantic Avenue which enrolls approximately 2,300 students (see Figure II-42B).

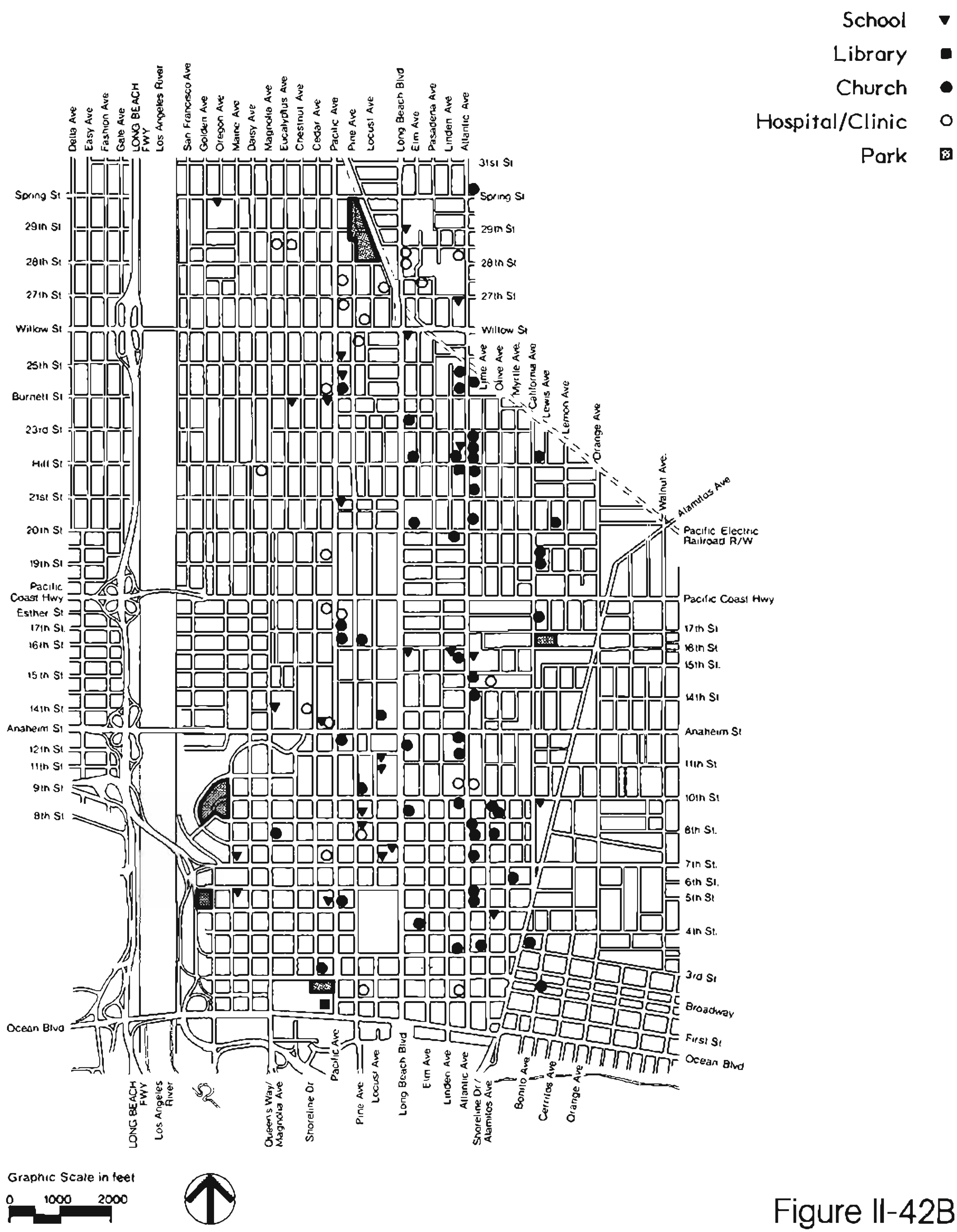


Figure II-42B

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach Community Facilities

PARSONS BRINCKERHOFF/KAISER ENGINEERS

The Long Beach City Library, in the Civic Center complex and its Burnett Branch at 560 East Hill Street are the only libraries located near the project's alternative alignments.

Of the 57 churches in the vicinity of the Long Beach alternatives, most are located along Long Beach Boulevard and Atlantic Avenue. These churches represent a wide variety of sizes and denominations.

II-422.2 Medical Facilities

Due to the sizeable senior citizen population, there are a large number of medical facilities in Long Beach. In the vicinity of the alternative alignments there are 8 hospitals (including convalescent hospitals) and 19 public and private clinics. The three largest facilities are Memorial Hospital Medical Center at 2801 Atlantic Avenue, Pacific Hospital at 2776 Pacific Avenue, and Saint Mary's Medical Center at 1050 Linden Avenue. All three offer a comprehensive range of medical services including emergency care. Figure II-42C shows medical and other community facilities.

II-422.3 Parks and Other Public Recreational Facilities

There are 5 parks the near Long Beach alignment alternatives. The largest, Veterans Memorial Park, abuts the SPTC right-of-way between Spring and 28th Streets (see Figure II-42B).

Although there are bikeways and equestrian trails located elsewhere in the project corridor, only in Long Beach is there a possibility that these facilities could conflict with the project. A bikeway located on top of the Los Angeles River levee would parallel the LB-3 alignment from the SPTC bridge crossing to where the alignment turns east on 4th Street. The bikeway has four access points along this segment at 34th Street, Willow Street, Pacific Coast Highway, and Chester Place. Also located along the LB-3 alignment is an equestrian trail which is located in or adjacent to the proposed right-of-way from the SPTC bridge crossing to Willow Street.

The City of Long Beach has proposed that an off-street bikeway be constructed in the abandoned SPTC right-of-way from the San Diego Freeway to just south of Anaheim Street. If the bikeway alternative is implemented the two facilities would share the SPTC right-of-way from the San Diego Freeway to Atlantic Avenue.

II-422.4 Other Social Service Facilities

There are approximately 60 social service facilities located near alignment alternatives in Long Beach. Most are privately supported and located in the downtown area. These facilities reflect the diversity of people and social issues found in Long Beach. Many are targeted to specific special interest groups such as seniors, Indochinese refugees, low-income families, or the homeless (see Figure II-42C).

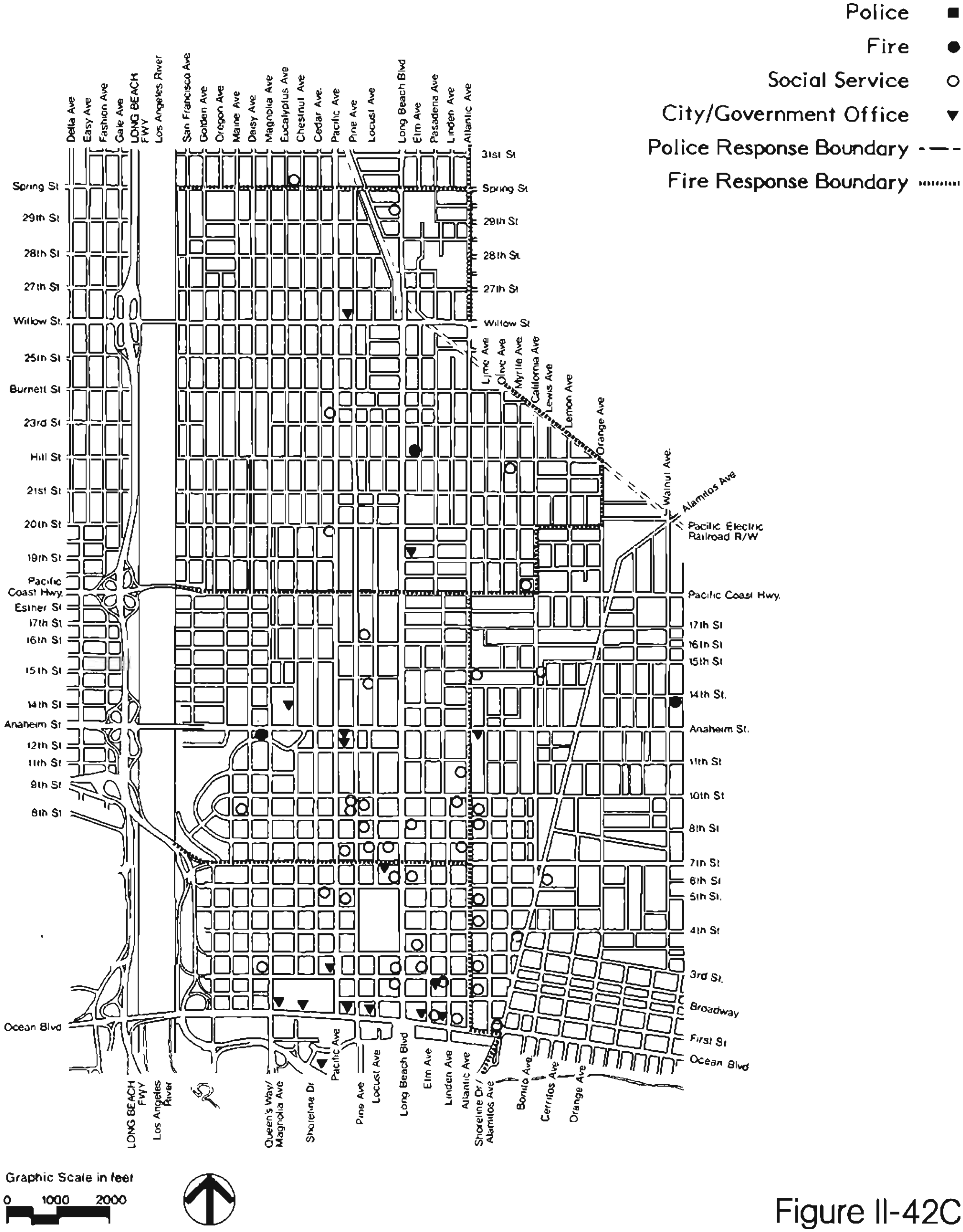


Figure II-42C

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach Community Services

PARSONS BRINCKERHOFF/KAISER ENGINEERS

II-422.5 Law Enforcement

The City of Long Beach maintains its own police department which is headquartered in one station located in the Civic Center complex.

II-422.6 Fire Protection

The area surrounding all four alignment alternatives from the SPTC bridge crossing to Willow Street is within the response area of Long Beach Fire Department (LBFD) Station 9 located near the corner of Roosevelt Road and Long Beach Boulevard. This station is equipped with one 4-man engine company and a 2-man paramedic squad. Figure II-42C shows community service locations in Long Beach.

From Willow Street to Pacific Coast Highway the proposed alignments would be served by LBFD Station 7, located at Hill Street and Elm Avenue, which houses one 4-man engine company and one 4-man truck company.

South from Pacific Coast Highway, the alternative alignments would pass through the response areas of LBFD Stations 1, 3, and 10. Station 1, the largest in Long Beach, is located in the Civic Center complex and houses one 4-man engine company, one 4-man squad company, one 5-man truck company and one 2-man rescue team. Station 3, located on Anaheim Street between Daisy and Magnolia Avenues, houses the battalion chief, one 4-man engine company, and one 2-man rescue squad. Station 10 is located at 14th Street and Walnut Avenue and is equipped with one 4-man engine company and a 2-man rescue squad.

II-422.7 Public Utilities

Utilities are provided by the following organizations:

- <u>Gas</u>: Long Beach Gas Department
- <u>Water</u>: Long Beach Water Department. Supplies are obtained from the Metropolitan Water District and local groundwater sources.
- <u>Electricity</u>: Southern California Edison
- <u>Telephone</u>: General Telephone
- <u>Solid Waste Disposal</u>: Residential refuse collection is the responsibility of the Long Beach Public Works Department while commercial collection is contracted to private companies. Nearly all solid waste is disposed of in the Puente Hills and BKK landfill sites.
- <u>Wastewater Disposal (Sewers)</u>: Los Angeles County Sanitation District No. 3. Treatment occurs at the Joint Water Pollution Control Plant in Carson.

II-423 Economic Activity

II-423.1 Employment

As shown in Table II-42B, total non-government employment in the Long Beach portion of the study corridor is estimated at 78,000 persons. With 28,100 employees, the service sector employs the largest number of persons, more than one-third of the total work force. Manufacturing and retail trade are next, with each accounting for slightly more than 16 percent of total employment.

Based upon a field survey of existing land uses in the corridor, 1980 employment by place of work has been estimated for each of the proposed station areas of the three alternative alignments in Long Beach. Year 2000 employment for these same station areas has been projected on the basis of assumptions regarding ongoing, planned, and proposed developments. The estimated 1980 and 2000 employment by station area for the LB-1, LB-2, LB-3, and LB-4 alternative alignments is presented in Tables II-42C through II-42F. The total estimated employment of the station areas in 1980 and 2000 is shown below by alternative alignment (Table II-42G):

TABLE II-42G

STATION AREA EMPLOYMENT

LONG BEACH

	LB-1	LB-2	LB-3	LB-4
1980	11,790	14,785	4,700	16,100
2000	19,965	24,510	14,224	32,715

Source: Williams-Kuebelbeck and Associates, Inc., 1983.

Of the four alternatives under consideration, the LB-4 alignment with 16,100 persons had the highest concentration of employment in 1980. Should projected developments occur, the LB-4 station area employment would grow by 5.2 percent annually, increasing to 32,700 persons in the year 2000. Station area employment along the LB-3 alignment is projected to grow at a faster rate, but would only increase to total employment of 14,200 persons by the year 2000, if all projected developments occur.

II-423.2 Retail Sales

In 1980 total taxable sales transactions in the City of Long Beach were recorded at $1.7 billion by the California State Board of Equalization. Of this total, 71 percent, or $1.2 billion, were in retail

TABLE II-42B

1983 NON-GOVERNMENT EMPLOYMENT BY INDUSTRY

TOTAL CORRIDOR AND LONG BEACH STUDY AREAS

Industry	Total Corridor Number	Total Corridor Percent	Long Beach Number	Long Beach Percent	Long Beach As a % of Corridor
Agriculture, Forestry, Fishing	1,399	0.3	183	0.2	13.1
Mining	2,179	0.5	2,023	2.6	92.8
Construction	12,218	2.7	5,414	6.9	44.3
Manufacturing	165,119	36.9	12,712	16.3	7.7
Transportation, Communication, Utilities	35,805	8.0	5,511	7.1	15.4
Wholesale Trade	58,321	13.0	5,830	7.5	10.0
Retail Trade	49,656	11.1	12,788	16.4	25.8
Finance, Insurance, Real Estate	22,683	5.1	5,480	7.0	24.2
Services	100,357	22.4	28,106	36.0	28.0
TOTAL	477,737	100.0%	78,047	100.0%	16.3%

Source: California Employment Development Department; Dun and Bradstreet Corporation and Donnelly Marketing Information Services; Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE 11-42C

STATION AREA EMPLOYMENT WITHOUT PROJECT

LONG BEACH, LB-1 ALIGNMENT

Station	1980[1]	2000[2]	Total Change	
			Number	Percent
Wardlow Road	45	45	0	-
27/28th Street	4,240	4,240	0	-
Hill Street	300	300	0	-
Pacific Coast Highway	710	710	0	-
Anaheim Street	2,400	2,400	0	-
6th/7th Street	785	1,105	320	40.8
1st Street	3,310	11,165	7,855	237.3
TOTAL	11,790	19,965	8,175	69.3%

[1] 1980 employment estimated on the basis of existing development by type, as recorded by Sedway Cooke Associates' field survey 1983, and standard employment per square foot by type of development conversion factors.

[2] Total change in employment estimated on the basis of: (1) assumptions regarding ongoing, planned and proposed developments by the consultant team and city and county planning departments; and (2) standard employment per square foot by type of development conversion factors. A range of potential new employment has been indiated as a number of development proposals for these stations areas appear tentative.

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE II-42D

STATION AREA EMPLOYMENT WITHOUT PROJECT

LONG BEACH, LB-2 ALIGNMENT

Station	1980[1]	2000[2]	Total Change Number	Total Change Percent
Wardlow Road	45	45	0	-
27/28th Hill Street	4,240	4,240	0	-
Hill Street	300	300	0	-
Pacific Coast Highway	940	940	0	-
Anaheim Street	3,350	3,350	0	-
6th/7th Streets	2,030	3,330	1,300	64.0
3rd Street	2,730	7,420	4,690	171.8
1st Street	1,150	4,885	3,735	324.8
TOTAL	14,785	24,510	9,725	65.8%

[1] 1980 employment estimated on the basis of existing development by type, as recorded by Sedway Cooke Associates' field survey 1983, and standard employment per square foot by type of development conversion factors.

[2] Total change in employment estimated on the basis of: (1) assumptions regarding ongoing, planned and proposed developments by the consultant team and city and county planning departments; and (2) standard employment per square foot by type of development conversion factors. A range of potential new employment has been indiated as a number of development proposals for these stations areas appear tentative.

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE II-42E

STATION AREA EMPLOYMENT WITHOUT PROJECT

LONG BEACH, LB-3 ALIGNMENT

Station	1980[1]	2000[2]	Total Change	
			Number	Percent
Daisy Avenue	130	3,945	3,815	293.5
1st Street	4,570	10,280	5,710	124.9
TOTAL	4,700	14,225	9,525	202.7%

[1] 1980 employment estimated on the basis of existing development by type, as recorded by Sedway Cooke Associates' field survey 1983, and standard employment per square foot by type of development conversion factors.

[2] Total change in employment estimated on the basis of: (1) assumptions regarding ongoing, planned and proposed developments by the consultant team and city and county planning departments; and (2) standard employment per square foot by type of development conversion factors. A range of potential new employment has been indiated as a number of development proposals for these stations areas appear tentative.

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE II-42F

STATION AREA EMPLOYMENT WITHOUT PROJECT

LONG BEACH, LB-4 ALIGNMENT

Station	1980[1]	2000[2]	Total Change	
			Number	Percent
Wardlow Road	45	45	0	-
27/28th Streets	4,340	4,340	0	-
Hill Street	300	300	0	-
Pacific Coast Highway	500	500	0	-
Anaheim Street	2,420	2,420	0	-
Long Beach/6th	915	1,525	610	66.7
Long Beach/3rd	2,730	13,030	10,300	377.3
First/Pacific	4,285	9,700	5,415	126.4
Pacific/6th	565	855	290	51.3
TOTAL	16,100	32,715	16,615	103.2%

[1] 1980 employment estimated on the basis of existing development by type, as recorded by Sedway Cooke Associates' field survey 1983, and standard employment per square foot by type of development conversion factors.

[2] Total change in employment estimated on the basis of: (1) assumptions regarding ongoing, planned and proposed developments by the consultant team and city and county planning departments; and (2) standard employment per square foot by type of development conversion factors. A range of potential new employment has been indiated as a number of development proposals for these stations areas appear tentative.

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

stores. The balance of the taxable transactions consisted of business and personal services and all other outlets. Total 1980 taxable and non-taxable sales transactions in the City of Long Beach in 1980 are estimated at $2.0 billion. On the basis of this historic growth in the city's retail sales during the period 1970 to 1980, taxable retail sales in Long Beach are projected to grow 1.0 percent annually between 1980 and 2000 and reach $1.4 billion (1980 constant dollars) in the year 2000.

II-423.3 Employment and Income Characteristics of Residents

The U.S. Bureau of the Census reported 233,100 persons residing in the Long Beach study area in 1980. Of these residents, 105,000 were available for employment. About 97,600 residents were active labor force participants and 7,500 (7 percent) were unemployed as of April 1980 (U.S. Bureau of the Census).

Of the total 97,600 study area residents who were employed in 1980, 25.4 percent were engaged in manufacturing activities. The second highest concentration of the resident labor force (20.1 percent) was employed in professional services industries.

The occupational distribution of residents of the Long Beach segment is similar to that of the corridor as a whole, although there is a relatively larger proportion of those in managerial positions and a smaller proportion in operator/laborer/assembler positions. Tables II-42H and II-42I provide the employment by industry and occupation for the Long Beach study area resident labor force.

The 1980 per capita income for Long Beach was estimated at $5,415 by the U.S. Bureau of the Census. Median and mean household incomes were estimated at $12,390 and $16,032, respectively. These figures were below the 1980 figures for Los Angeles County, but significantly higher than the corridor personal income averages. SCAG projects a 6.0 percent increase in real personal income for this area during the 1980 to 2000 period, thereby increasing the per capita income level to $5,740 and median and mean household incomes to $13,135 and $17,000, respectively.

II-423.4 Assessed and Market Value of Real Property

According to the Los Angeles County Assessor's office, the total assessed value of secured and unsecured property in the City of Long Beach in 1980 was $2.2 billion. The full market value of this property was $8.8 billion. Assuming an average annual growth rate of 8 percent (based on recent trends) to allow for the annual 2 percent increase in assessments as allowed by Proposition 13, reassessments due to property improvements and sales, and new construction, the market value for secured and unsecured property in the City of Long Beach in the year 2000 is projected to be $41.0 billion.

TABLE II-42H

1980 EMPLOYMENT OF RESIDENTS BY INDUSTRY

PROJECT CORRIDOR AND LONG BEACH

Industry	Project Corridor Number	Project Corridor Percent	Long Beach Number	Long Beach Percent
Agriculture	3,639	1.4	1,746	1.8
Construction	9,520	3.7	3,904	4.0
Manufacturing				
Nondurable	29,351	11.3	6,660	6.8
Durable	55,337	21.4	18,164	18.6
Transportation	14,337	5.5	5,700	5.8
Communication	5,460	2.1	2,262	2.3
Wholesale Trade	11,471	4.4	4,955	5.1
Retail Trade	35,179	13.6	15,605	16.0
Finance	11,154	4.3	5,159	5.3
Business/Repair	12,849	5.0	5,173	5.3
Personal	12,327	4.8	4,813	4.9
Professional				
Health	20,792	8.0	9,104	9.3
Education	17,308	6.7	6,483	6.6
Other	9,262	3.6	4,070	4.2
Government	10,654	4.2	3,787	4.0
TOTAL	258,640	100.0%	97,585	100.0%

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

TABLE II-421

1980 EMPLOYMENT OF RESIDENTS BY OCCUPATION

PROJECT CORRIDOR AND LONG BEACH

Occupation	Project Corridor Number	Project Corridor Percent	Long Beach Number	Long Beach Percent
Managerial				
Administrative	16,751	6.5	9,399	9.6
Specialty	18,985	7.3	10,853	11.1
Technical/Sales				
Technicians	6,572	2.5	3,303	3.4
Sales	17,246	6.7	8,438	8.6
Clerical	47,305	18.3	18,946	19.4
Service	41,350	16.0	14,687	15.1
Farming/Forestry	3,393	1.3	1,235	1.3
Craft/Repair	33,368	12.9	13,035	13.4
Operator/Laborer/ Assemblers	43,545	16.8	8,550	8.8
Transportation	13,124	5.1	4,408	4.5
Laborers	17,001	6.6	4,731	4.8
TOTAL	258,640	100.0%	97,585	100.0%

Source: U.S. Bureau of the Census, 1980; Southern California Association of Governments, 1983.

II-424 Visual Quality

In Long Beach three of the alternatives (LB-1, LB-2 and LB-4) would be located in an Atlantic Avenue/Long Beach Boulevard corridor, with various routings south of 9th Street. Figure II-42D is an aerial view of Long Beach looking north from the harbor. The Los Angeles River route (LB-3) would be substantially west of the other three alternatives and is discussed separately.

II-424.1 Atlantic Avenue/Long Beach Boulevard Corridor Alternatives (LB-1, LB-2 and LB-4)

o Atlantic Avenue: Atlantic Avenue from Willow Street south to Hill Street is characterized by the fine scale, articulated masses, and unadorned facades of the low-rise, commercial buildings lining the street. However, setbacks, parking lots, and abandoned buildings break this continuity. South of 21st Street the number of single-family residences interspersed among the commercial structures increases. Street space definition becomes weaker south of Pacific Coast Highway as the Polytechnic High School is set back from the street about 170 feet. Atlantic Avenue's right-of-way widens south of 11th Street from 80 feet to 100 feet, and the land uses and building forms become more varied. Institutional, office, and apartment structures add visual interest to the street facade, though not coherence or continuity. Mature palm trees add a positive visual quality and create defined pedestrian and vehicular street spaces.

o Long Beach Boulevard: A wide landscaped median strip with mature palm trees establishes the visual character of Long Beach Boulevard from 1st Street north to 6th Street. There is a continuous commercial street facade north to 3rd Street. However, the scale of these buildings in relation to the width of Long Beach Boulevard is insufficient to define the street space. The palm trees in the median strip visually divide the street into two channels. The view south along Long Beach Boulevard is terminated by the massive Long Beach Convention Center. The Long Beach Shopping Mall, set back on the west side of the Boulevard between 3rd and 6th Streets weakens the street space definition. North of 6th Street, Long Beach Boulevard changes to a strip commercial zone with automobile sales lots and service repair shops. The discontinuous street facade results in weaker street space definition and landscaping is intermittent.

o 1st Street: One-story and two-story buildings with articulated facades create a pedestrian-scaled street from Atlantic Avenue to Elm Street, though the buildings are too low to define the street space. West of Elm Street, high-rise office towers alter the scale of the street. First Street between Long Beach Boulevard and Pacific Avenue is designated as a transit mall, and streetscape improvements have been installed in association with the mall.

Figure II-42D

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach
Aerial Photo
PARSONS BRINCKERHOFF / KAISER ENGINEERS

- o Pacific Avenue: Pacific Avenue is wide but visually undefined. From 1st Street north to 5th Street the visual setting is characterized by parking lots, few buildings, and no street trees. North of 6th Street there are some mature street trees and buildings of inconsistent height, scale, and style.

- o 8th Street/9th Street: Mature street trees establish the visual image for the residential blocks between Atlantic Avenue and Long Beach Boulevard. They add scale and definition to the street and pedestrian spaces. On 8th Street between Pacific Avenue and Long Beach Boulevard land uses are mixed and there are no street trees, resulting in a weaker street space.

II-424.2 Los Angeles River Route Alternative (LB-3)

The wide expanse of the Los Angeles River establishes the visual character of the River Route. Its high landscaped embankment with a bicycle/jogging path along the top forms the western edge of the alignment south to 8th Street. A chain link fence parallels the berm at its base. A residential community of single-family homes parallels the Los Angeles River south of Wardlow Road to Pacific Coast Highway. South of Pacific Coast Highway vehicular service buildings, warehouses, and storage yards are sited along the river's berm. The visual character south of 5th Street is established by the adjoining residential community. Willmore Park sits above Ocean Park Boulevard and forms a visual open space system as a terminus to 4th Street. Fourth Street is a diverse residential street of single-family and multi-family dwellings. The varied height and setbacks of the buildings and intermittent street trees are insufficient to define the street space.

II-425 Historic and Cultural Resources

Long Beach was subdivided as an agricultural colony in 1882. Willmore City, as it was called then, was highly advertised but was not a successful development. In 1887 the area was taken over by the Long Beach Land and Water Company and promoted as a seaside resort. In 1902 the Pacific Electric Long Beach line was completed, connecting to Los Angeles. Four years later work began on the harbor which transformed Long Beach through the years into its present position as a major west coast port.

Unlike downtown Los Angeles, the downtown section of Long Beach has not been the subject of extensive surveys for structures which meet the criteria for nomination to the National Register. Currently there are only two structures which have been shown to be eligible for the National Register. They are the U.S. Post Office and Federal Offices at 3rd and Long Beach Boulevard and the Bank of American Building at 1st Street and Pine Avenue. Although the City Planning Department of Long Beach has compiled a list of potentially significant buildings in the area between Anaheim Street and the waterfront, these have not been officially designated in a historic inventory nor given recognized status. Further study of the buildings may be warranted.

As with the mid-corridor, a field survey was performed by Caltrans and state office of Historic Preservation staff for the four alternatives in the Long Beach area. The basic criterion for listing a structure during the field survey was the appearance of recognizable period architectural features which showed research potential. This potential was considered sufficient for listing when there appeared to be a possibility of historic or historic architectural value.

The results of the city's listing and the field survey are contained in Table II-42J and shown on Map Figure II-42E. Also shown are the two National Register eligible buildings.

TABLE II-42J

HISTORIC AND CULTURAL RESOURCES FOR

LONG BEACH ALTERNATIVES

- o 1. Storefronts
  433-45 E. 1st St.
- o 2. Brown House
  417 E. 1st St.
- o 3. Biltmore Apartments
  336 E. 1st St.
- o 4. Central Bldg.
  122 W. 1st St.
- o 5. Apartments
  234 W. 4th St.
- o 6. Apartments
  316-320 W. 4th St.
- o 7. Victor Court Apartments
  333 W. 4th St.
- o 8. Chestnut Apartments
  354 W. 4th St.
- o 9. Carter House
  416 W. 4th St.
- o 10. Ingersoll House
  424 W. 4th St.
- o 11. Arvilla Apartments
  425 W. 4th St.
- o 12. House
  430 W. 4th St.
- o 13. Apartments
  440-460 W. 4th St.
- o 14. Frost House
  445 W. 4th St.
- o 15. Jordan House
  465 W. 4th St.
- o 16. Dahlen House
  505 W. 4th St.

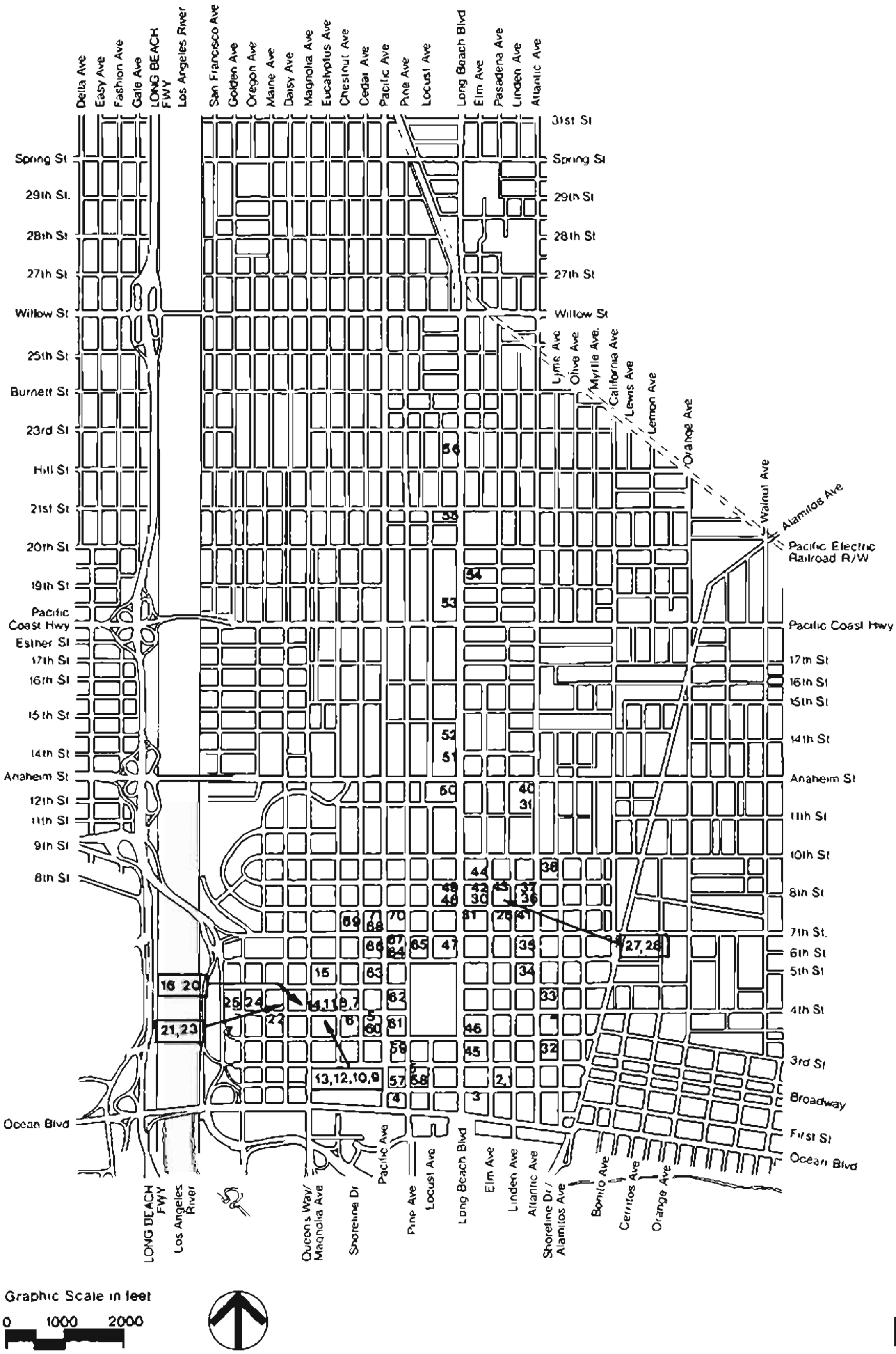


Figure II-42E

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Historic Resources in Long Beach

PARSONS BRINCKERHOFF / KAISER ENGINEERS

TABLE II-42J (Continued)

HISTORIC AND CULTURAL RESOURCES FOR

LONG BEACH ALTERNATIVES

o 17. Austin House
513 W. 4th St.

o 18. Dailey House
517 W. 4th St.

o 19. Thomas House
527 W. 4th St.

o 20. Stringer House
533 W. 4th St.

o 21. Cottages
611-27 W. 4th St.

o 22. Apartments
632-38 W. 4th St.

o 23. Apartments
641-47 W. 4th St.

o 24. Apartments
735 W. 4th St.

o 25. Apartments
831-33 W. 4th St.

o 26. Trinity Lutheran Church
E. 8th St.

o 27. Bogart House
421 E. 8th St.

o 28. House
N.E. Corner E.
& Elm Ave.

o 29. Duplex House
362-64 E. 8th St.

o 30. House
345 E. 8th St.

o 31. Apartments
312-16 E. 8th St.

o 32. Atlantic Studio
226 Atlantic Ave.

o 33. Little Brown Church
450 Atlantic Ave.

o 34. Beckman House
537 Atlantic Ave.

o 35. Williams House
629 Atlantic Ave.

o 36. Curtis House
835 Atlantic Ave.

o 37. Sternke House
847 Atlantic Ave.

o 38. Buffum House
940 Atlantic Ave.

o 39. House
1125 Atlantic Ave.

o 40. House
1215 Atlantic Ave.

o 41. Stannard House
752 Linden Ave.

o 42. Forster Apartments
751-57 Elm Ave.

o 43. House
754 Elm Ave.

o 44. Maloney House
801 Elm Ave.

o 45. Stores
240 Long Beach Blvd.

* o 46. U.S. P.O. & Federal Offices
300 Long Beach Blvd.

TABLE II-42J (Continued)

HISTORIC AND CULTURAL RESOURCES FOR

LONG BEACH ALTERNATIVES

o 47. Barr House
629 Long Beach Blvd.

o 48. School
835 Long Beach Blvd.

o 49. School
847 Long Beach Blvd.

o 50. Stores
1125 Long Beach Blvd.

o 51. House
1215 Long Beach Blvd.

o 52. Farmers & Merchants Bank
1401 Long Beach Blvd.

o 53. Garage
1817 Long Beach Blvd.

o 54. Garage
1910 Long Beach Blvd.

o 55. House
2069 Long Beach Blvd.

o 56. House
2247 Long Beach Blvd.

* o 57. Bank of America
101 Pine Ave.

o 58. Security Pacific Bank
110 Pine Ave.

o 59. Storefront
222 Pacific Ave.

o 60. Dolly Varden Hotel
335 Pacific Ave.

o 61. Florence Apartments
338 Pacific Ave.

o 62. Loring Apartments
430 Pacific Ave.

o 63. Apartments
555 Pacific Ave.

o 64. Keys House
622 Pacific Ave.

o 65. Storefronts
624-28 Pacific Ave.

o 66. Allen House
635 Pacific Ave.

o 67. House
642 Pacific Ave.

o 68. Apartments
702-23 Pacific Ave.

o 69. House
737 Pacific Ave.

o 70. "The Filling Station"
762 Pacific Ave.

o 71. Medical Building
757 Pacific Ave.

o 72. Caldwell House
351 Magnolia Ave.

* National Register site or eligible for the National Register.

o Local Designation or Survey.

Source: California Department of Transportation, 1983.

II-430 TRAFFIC AND TRANSPORTATION

II-431 Traffic

The traffic circulation system within the city of Long Beach consists of major and secondary highways as well as local and collector streets forming a grid pattern providing good access to the major freeways and activity centers. Within the corridor area major State highways include the San Diego Freeway (I-405), the Long Beach Freeway (Route 7), and Pacific Coast Highway (Route 1).

In Long Beach 33 key intersections near the alternative alignments were analyzed for existing and year 2000 conditions. The results of the capacity analysis for existing conditions show that most streets within the Long Beach CBD are presently operating at a good level of service (LOS), with the exception of some intersections on two boulevards where LOS "D" or worse conditions exist: along Long Beach Boulevard at the intersections with Pacific Coast Highway and 7th Street; and along Ocean Boulevard at the intersections with Long Beach Boulevard, Pine Avenue, Pacific Avenue, and Magnolia Avenue. The recently completed City of Long Beach CBD study indicated that both 7th Street and Ocean Boulevard in the eastern boundary of the CBD operate at or above their capacity. By the year 2000, 7 additional intersections in the CBD would operate at LOS "D" or worse. Figure II-43A shows the intersections which operate at LOS "D" or worse in the existing and year 2000 base conditions. Existing traffic data and growth factors for year 2000 analysis were obtained from the City of Long Beach and reflect planned downtown redevelopment projects.

II-432 Transit

The principal public transit operator in the Long Beach Area is the Long Beach Transit Company. SCRTD also operates 8 limited and express bus service routes in the Long Beach area. Other public transit companies serving the Long Beach area include the Orange County Transit District and the Torrance Transit System.

The transit system in the Long Beach area experiences no major difficulties and operating schedules are well maintained. The recent construction of the Transit Mall on 1st Street and the priority bus treatment along Pine Avenue and Long Beach Boulevard have dramatically changed the image and the importance of transit in downtown Long Beach. A total of 15 routes now serve the mall, making transfers between routes very convenient.

The Long Beach Circulation and Access Study (Barton-Aschmann Associates, 1983) estimated that the Transit Mall, along with just a portion of the redevelopment plan completion, would result in an additional 4,800 transit-trips per day boarding in the vicinity of the

Existing Conditions ▼

Year 2000 Conditions ●

AM Peak

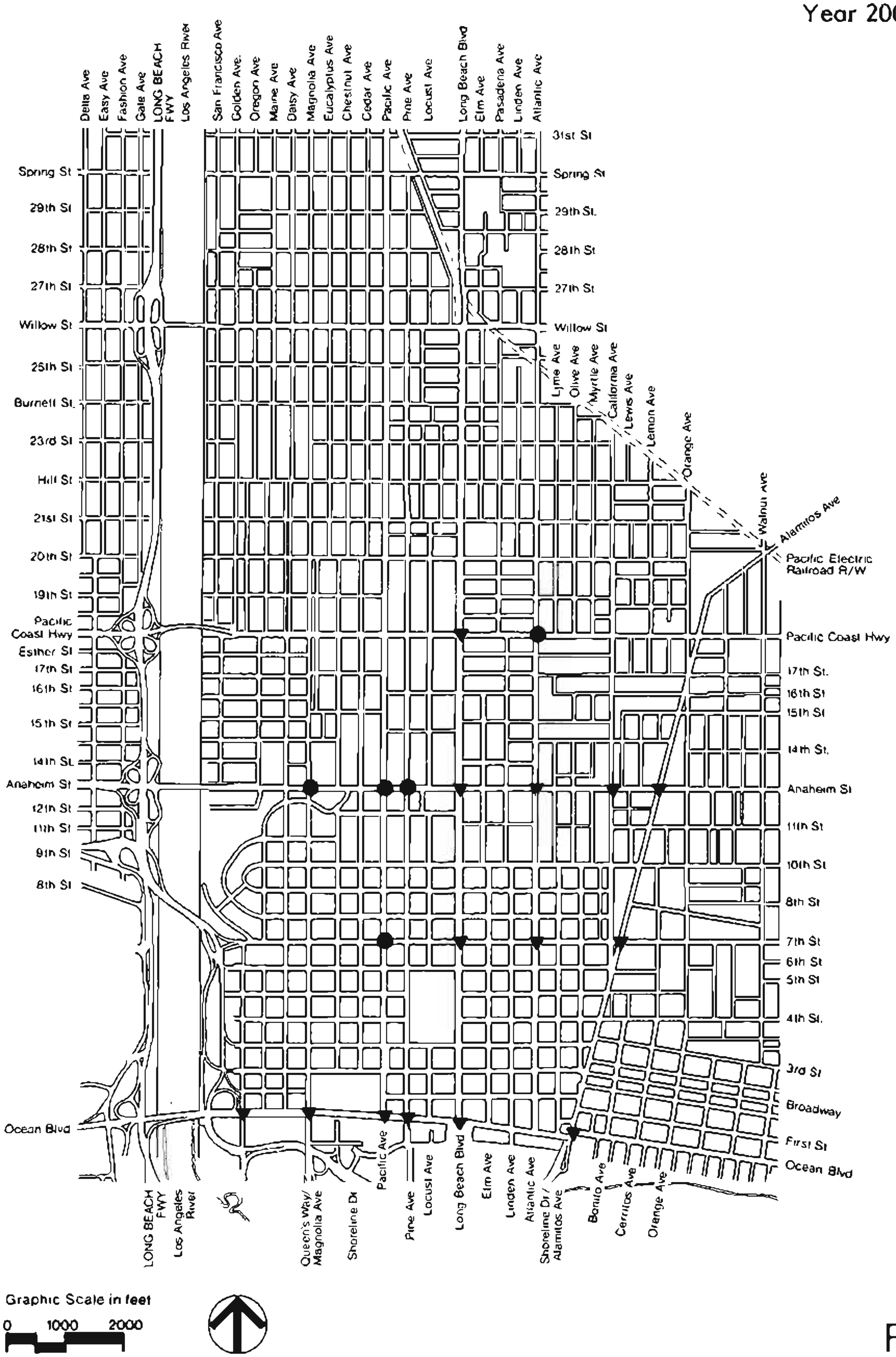


Figure II-43A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach Level of Service D or Worse Intersections

PARSONS BRINCKERHOFF / KAISER ENGINEERS

First Street facility. In addition, 4,500 transfers were projected to take place at this location. The citywide bus mode split is in the area of 4 percent of the total person-trips, the bus mode split to/ from downtown is approximately 8 percent of the total person-trips.

II-433 Parking

In 1978 a comprehensive parking study was conducted for the area of Long Beach south of Anaheim Street between the Long Beach Freeway and Alamitos Avenue. The study determined that 23,500 on-street and off-street parking spaces are available in this area, 26 percent of which are curb spaces. The parking study also suggested that the retail core area would experience a shortage of 550 short-term parking spaces, based on a very high level of parking activity. In addition to the parking in the downtown area (south of 7th Street), approximately the following number of parking spaces are available within 1/4 mile radius of the proposed project stations to the north (Table II-43A).

TABLE II-43A

PARKING AVAILABLE WITHIN ONE-QUARTER MILE

OF SELECTED STATIONS IN LONG BEACH

	Number of Parking Spaces		
Station	On-Street	Off-Street	Total
Hill Street	1,000	650	1,650
Pacific Coast Highway	800	800	1,600
Anaheim Street	800	2,000	2,800

Source: PB/KE, 1984.

Chapter III

III LOCAL IMPACTS AND MITIGATION MEASURES DURING CONSTRUCTION

Impacts of construction are compared to existing conditions or to those expected at the mid-point of the proposed construction period (1987), depending on data availability.

III-100 DOWNTOWN LOS ANGELES

A description of the activities required for the construction of the downtown Los Angeles alignment alternatives can be found in Section I-500 of the DEIR. Refer to Figures III-10A through III-10C during this discussion.

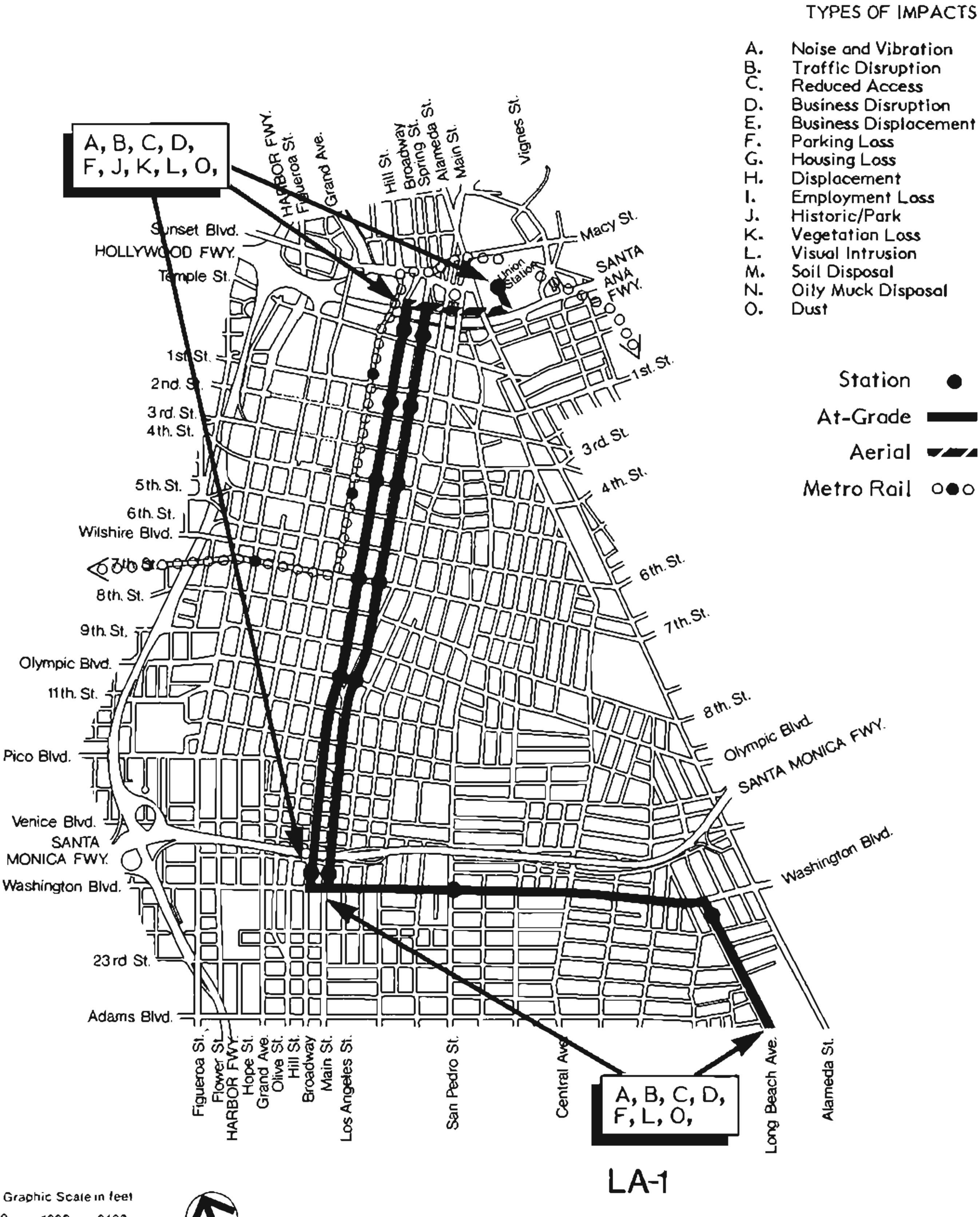
III-110 NATURAL ENVIRONMENT

III-111 Topography, Soils, Geology, and Seismicity

III-111.1 Topography and Soils

For the downtown Los Angeles alternatives, the above-ground stations, maintenance yards, and street level rail segments would be located where little or no land form alteration, such as cut-and-fill sections, would be necessary. Excavations for trackbeds, retaining walls, and structures would produce a minimal amount of material requiring disposal. Most of the excess material would, in all probability, be contaminated with chunks of asphalt, steel, concrete, wood, and other urban debris from previous developments and construction projects. This excess could be disposed of at Class II and III sanitary landfills, as appropriate.

Substantial volumes of saturated and unsaturated soil would be generated by the excavations for alternative LA-2 (Flower Street Subway). The aerial segments of LA-1 (Broadway/Spring Couplet, At-Grade) and LA-3 (Olympic/9th Aerial) would produce lesser amounts of excess material from the holes drilled for the foundation support columns. This material could possibly be used for backfill or deposited at the appropriate landfill site. See Table III-11A, below, for amounts of excavation and backfill required for each of the downtown Los Angeles segment alternatives.



Broadway/Spring At Grade

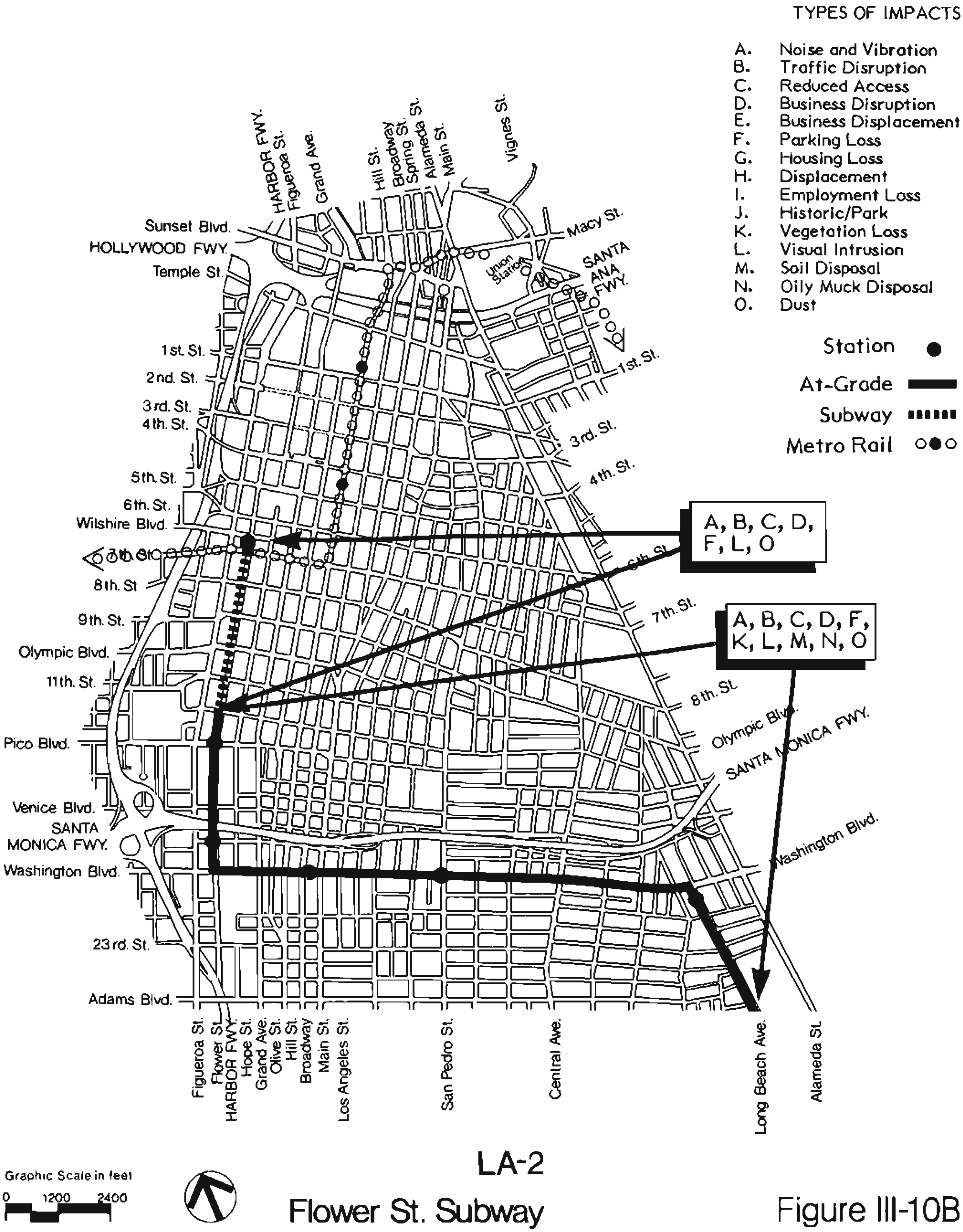
Figure III-10A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Impacts During Construction

PARSONS BRINCKERHOFF/KAISER ENGINEERS



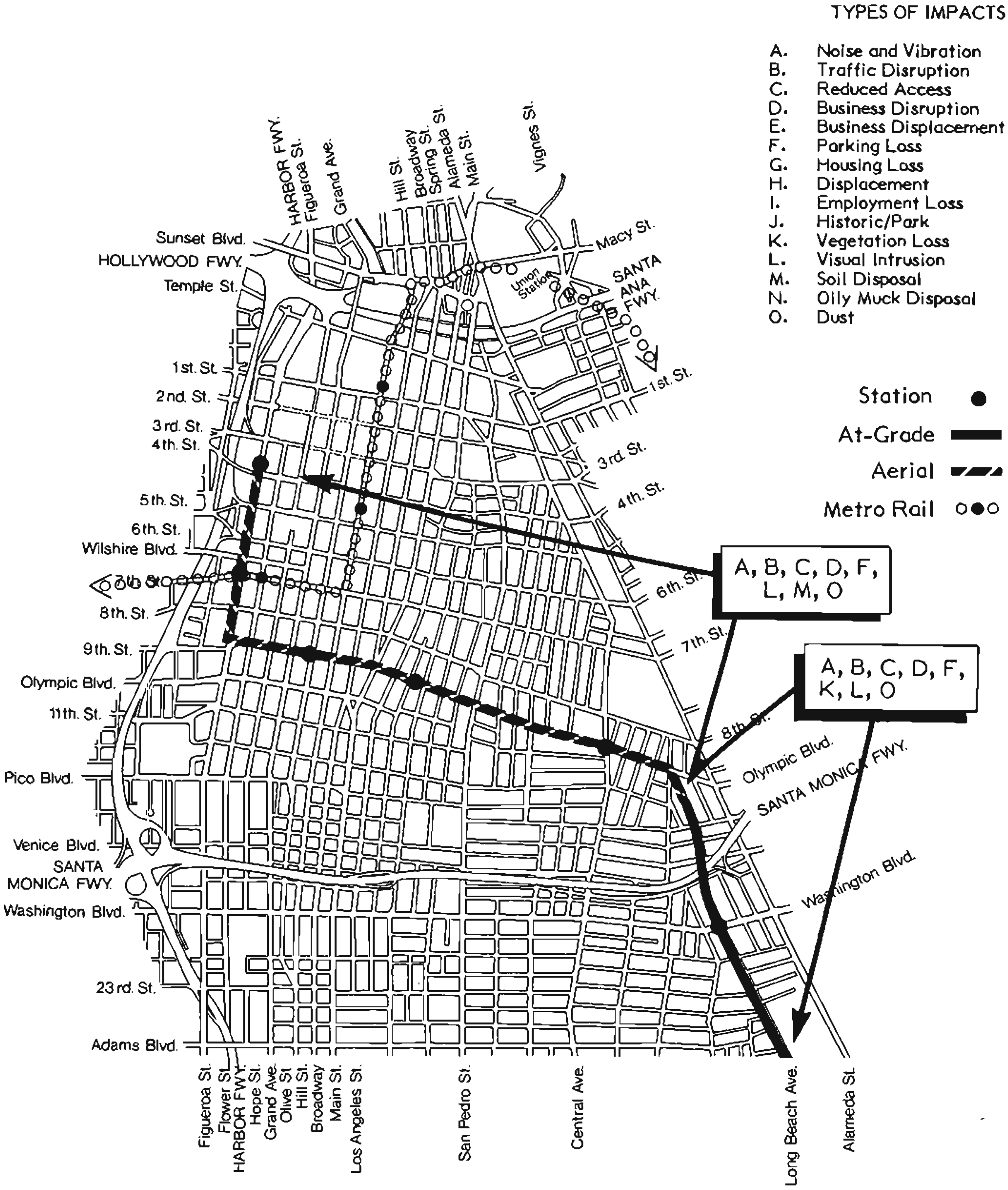
LA-2

Flower St. Subway

Figure III-10B

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Impacts During Construction
PARSONS BRINCKERHOFF/KAISER ENGINEERS



Graphic Scale in feet
0 1200 2400

LA-3

Olympic/Ninth Aerial

Figure III-10C

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Impacts During Construction
PARSONS BRINCKERHOFF/KAISER ENGINEERS

TABLE III-11A

EXCAVATION AND BACKFILL REQUIRED FOR

DOWNTOWN LOS ANGELES SEGMENT

Alternative	Excavation (Cubic Yards)	Backfill (Cubic Yards)
LA-1: Broadway/Spring Couplet, At-Grade	70,000	38,000
LA-2: Flower Street Subway	203,000	70,000
LA-3: Olympic/9th Aerial	42,000	11,000

Source: PB/KE, 1984.

Due to the proximity to the Los Angeles City Oil Field, all of the excess soil removed from the LA-2 alternative cut-and-cover section could potentially be impregnated with oil and gas (hydrocarbon accumulations) and therefore unusable on other segments of the project. Any soils with hydrocarbon accumulations would have to be disposed of at an acceptable sanitary landfill site either Class I or II.

III-111.2 Geology and Seismicity

The existing geological conditions in downtown Los Angeles would not present any unusual problems for the at-grade sections of LA-1, LA-2 and LA-3. The subway and elevated sections would involve special construction techniques.

The Flower Street Subway alternative's (LA-2) cut-and-cover box beneath Flower Street would be constructed in a recent alluvium of sand, gravel, and some boulders from the portal near 11th Street to between 6th and 7th Streets. From there to the end of the route, a few feet of poor quality rock may be encountered. The groundwater table in the alluvium would be well below the tunnel elevation. Where the bedrock is close to or in the excavation, a few feet of water should be expected to overlie the rock surface.

From the Flower Street station to the end of the initial phase of LA-2 there could be some groundwater inflow into the lower levels of the excavation. Quantity would be dependent on the depth of the water sheet over bedrock. Dewatering would be necessary during construction. The drilling of a few deep wells would solve the problem of groundwater inflow. Dewatering south of 7th Street would not be necessary.

The permeability of the soil indicates that the area of groundwater drawdown may be large; however, any underpinning allowance should be small. The major buildings in the area are deeply founded and should not experience any measurable settlement. Even if substantial drawdown is encountered, geological investigations by the United States Geological Survey (USGS) and the geotechnical report compiled for the 7th Street station for Metro Rail indicate generally less than 1/2 inch of stress-induced settlement would occur, which is considered to be negligible.

The aerial structures for alternative LA-3 would be founded on recent alluvial soils of sand, gravel, and cobbles with poor quality rock underlying them. Due to the potentially variable soil and seismic conditions, it is recommended that at least 25 piles support each of the foundations for the elevated guideway columns.

The probability of a major earthquake occurring during the construction phase is considered to be low. All available construction techniques for the safety of workers and passing pedestrians would be implemented. Shoring and falsework would be used extensively in supporting above- and below-ground structures. In the event of a major earthquake, damage to structures under construction could be extensive; however, the clean-up and repair of the project could be accomplished more quickly and easily than if the project were completed and in operation. No unusual methods would be used above what is specified in standard construction procedures.

III-112 Floodplains, Hydrology, and Water Quality

There would be no impacts to any established floodplain during the construction of any of the downtown Los Angeles alternatives.

Impacts on hydrology in downtown Los Angeles would be related to water run-off from the construction sites and erosion of barren rock and soil surfaces exposed during excavation. Placing straw or other temporary coverings over barren surfaces would reduce the severity of erosion. Temporary culverts, ditches, catch basins, and settling ponds would be installed on the construction site to maintain existing drainage flows and collect excess water and sediments coming from the project. Sediments collected from the settling ponds would be disposed of at a Class II or III disposal site.

Alternatives LA-1 and LA-3 would have no water quality impacts associated with them during construction.

Construction of the LA-2 subway alternative could have an impact on groundwater quality and solid waste disposal. Cut-and-cover construction would require dewatering of shallow groundwater deposits and muck disposal. The removed water and muck are expected to be contaminated with oil and tar, which would necessitate wastewater treatment and possible transport of muck to a Class I or Class II landfill.

The disposal of water removed from underground areas containing oil and tar is expected to require wastewater treatment to remove hydrocarbons before discharge. Treatment could be done by an oil/water separator, with the separated oil removed by truck to a Class I or II disposal site. This would require a National Pollutant Discharge Elimination System (NPDES) permit issued by the Regional Water Quality Control Board (RWQCB).

III-113 Vegetation and Wildlife

There would be no significant impacts to vegetation and wildlife due to the construction of any of the downtown Los Angeles alternatives. Alternative LA-1 would potentially cause 107 to 118 trees to be removed. Alternative LA-2 would potentially dislocate between 6 and 26 trees, depending on which side of the street is affected. Alternative LA-3 would potentially dislocate a total of 40 trees.

These trees would be replaced in locations near where they were removed, except in those areas with too limited space. Other permanent landscaping in the form of small trees, shrubs, and ground cover is proposed for the rail corridor, stations, and maintenance facilities where deemed desirable or appropriate. Displaced wildlife, such as birds and rodents, would return of its own accord after the construction phase.

III-114 Noise and Vibration

Noise from construction activities is of most concern near sensitive locations where sleep or speech interference is a consideration. Sensitive receptors include residences, motels, schools, hospitals, and religious facilities. Sustained high noise levels near such receptors may be disruptive to normal activity during daytime hours, while the same noise at night is considered to be objectionable. The actual number of people and dwelling units significantly affected by construction noise and vibration cannot be quantified because the impacts will be episodic. Chapter IV identifies the number of people and dwelling units affected by system operations.

Typical noise levels produced by construction equipment are listed in Table III-11B. These are indications of what the expected noise levels from project construction activities would be. Many cities and counties have provisions in their local noise ordinances which address construction noise levels and limit the time of operations. For example, in the City of Los Angeles noise ordinance, there is a limit of 75 dBA on the noise of construction equipment at 50 feet. Los Angeles County specifies maximum levels as a function of land use, time of day or night, and duration of activity.

TABLE III-11B

AVERAGE NOISE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Average A-Weighted Noise Level at 50 Feet, dB
Air Compressor	81
Backhoe	85
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	87
Generator	78
Grader	85
Jackhammer	88
Loader	84
Paver	89
Piledriver	101
Pneumatic Tool	85
Pump	76
Rock Driller	98
Roller	80
Saw	78
Scraper	88
Shovel	82
Truck	88

Source: Bolt Beranek & Newman, 1984.

The community noise equivalent level (CNEL) is a measure of the 24-hour noise exposure weighted to give additional penalty to noise during the evening and night hours (see Chapter II for more detailed explanation of CNEL). For typical noise-sensitive receptors, CNEL values of up to 65 dBA are generally considered acceptable. For other land uses often found in downtown areas (such as office buildings, commercial activities, etc.), a CNEL of up to 75 dBA is considered within the acceptable range. However, for construction activities, levels considerably higher may be acceptable because of the temporary nature of the activity. A CNEL of up to 90 dBA for noise-sensitive land uses, and up to 100 dBA for offices and commercial activities, would not be considered unacceptable.

In order to estimate the construction noise exposure in downtown Los Angeles, scenarios were developed describing the number, type, location, and operating cycle of the types of construction equipment that could be required for each of the Los Angeles alternatives. The number of trucks used during the construction would be a major factor in the expected noise and vibration levels during the construction of any of the alternatives.

Based upon these construction scenarios, which approximate the actual methods of construction to be used, CNEL values were estimated for at-grade construction, aerial guideway construction, and subway construction. Table III-11C presents these estimates. The daily estimates are all below 90 dBA and would be considered acceptable for noise-sensitive land uses if the construction activity were to last for a short period of time. However, the annual average CNEL values are high, indicative of the lengthy time frames during which the construction would be underway. These values indicate the need to consider noise mitigation measures during the long-term construction phases.

The aerial section of LA-1 would require that some activity occurs during the off-peak hours because of the proposed placement of support columns adjacent to the Hollywood Freeway. This would mean that some portion of the construction activities would take place during the late evening and early morning hours (i.e., 10 PM to 4 AM). As no sensitive receptors have been identified withih the area, no impact from these night activities would occur.

TABLE III-11C

CONSTRUCTION NOISE ESTIMATES FOR DOWNTOWN LOS ANGELES

Type of Construction	Alternative	Estimated CNEL at 50 Feet, dBA* Daily	Average Annual
At-Grade	LA-1, LA-2, LA-3	88	80
Aerial Guideway	LA-1	80	76
	LA-3	80	78
Subway	LA-2	85	83

* Assumes construction activity would occur between 7 AM and 7 PM. Activity at night would raise CNEL by up to 10 dBA.

Source: Bolt Beranek & Newman, 1984.

III-114.1 Mitigation Measures

Mitigation measures for lessening the noise and vibration impacts would fall into three categories:

- o Use of Alternative Methods and Modified Construction Equipment: In the last few years, more attention has been given to development and use of low-noise-generating construction equipment. Specifications for use of such equipment should be written into the criteria and provisions of construction contracts. Whenever possible, prefabricated structures would be used rather than performing assembly on-site.

- o Maximizing Physical Separation and Using Noise Barriers: In extreme cases or where particularly sensitive locations would be involved, acoustical barriers could be provided around stationary construction equipment and/or doors and windows of adjacent buildings. Special attention would be given to the selection of truck routes so that noise from heavy-duty trucks would have minimal impact on noise-sensitive receptors.

- o Proper Combination of Scheduling Techniques and Avoiding Noise-Sensitive Hours: Use of equipment would be scheduled to maintain the lowest possible overall noise levels. This could be helped by planning the higher noise level operations during the peak ambient periods and avoiding, as much as possible, peaks and impulse noise, as relatively uniform sound levels tend to be less obtrusive.

III-120 SOCIOECONOMIC ENVIRONMENT

III-121 Displacement

III-121.1 Residential Displacement

No land acquisitions requiring residential displacements have been identified; therefore, no mitigation measures would be necessary.

III-121.2 Non-Residential Displacement

No businesses would be expected to be displaced by any of the Los Angeles segment alternatives. Two or three parcels, at a minimum of 50 feet by 100 feet each, would have to be acquired as substation sites for each alternative; but because there are several vacant parcels and commercial parking lots in the vicinity of each site, no structures are expected to be affected.

III-122 Community Services

The most significant adverse impacts to downtown Los Angeles community services during the construction process are expected to be a decrease in public accessibility to service providers and obstruction of police, fire, and paramedic vehicles.

Auto access to downtown community service facilities may be impeded by temporary street closures, temporary elimination of on-street parking, and a general increase in traffic congestion caused by the spillover effects of closed streets. Pedestrian access to service facilities may also be impaired due to temporary closure of crosswalks and/or sidewalks. The facilities most severely affected by decreased accessibility would be those with high patronage located in close proximity to the chosen alignment. Such facilities might include the government buildings adjacent to Spring Street and Broadway in the Civic Center area, LA Trade-Technical College adjacent to Washington Boulevard, the University of California at Los Angeles Extension downtown center one block east of Flower Street, the Los Angeles Convention Center, and the Los Angeles Municipal Traffic Court one block south of Washington Boulevard. All community service facilities located near proposed project alignment alternatives are shown in Figures II-22C and II-22D in Chapter II.

Increased traffic congestion due to full or partial street closures may increase the response times of fire, police, and paramedic emergency vehicles passing through, or on the periphery of, construction areas. Also, direct access by the fire department to building faces adjacent to construction activities may be obstructed, especially when buildings are located on closed streets. Since the construction of the at-grade and subway segments would require more street closures than would aerial segments, emergency vehicles operating in the downtown area would encounter more interference if either the LA-1 or LA-2 alternative is constructed.

Because relocation of underground utility lines would be required (see Construction Scenario, Section I-500), temporary, localized shutoff of some utilities may occur. Uninterrupted provision of utilities to buildings housing life supporting machinery or vital communication systems would be ensured.

Construction of the project would result in a substantial quantity of excavated material. Much of this material would be used as backfill or for other local construction projects. Excess or contaminated materials would be disposed of at local Class I and Class II landfill sites. If a system alternative is selected which includes both the Flower Street Subway (LA-2) and the Compton Grade Separation (MC-2), the project could generate in excess of one million cubic yards of solid waste. Even if none of this waste is used for backfill, there would still be adequate capacity at local landfill sites to accommodate all excavated material from the project.

III-122.1 Mitigation Measures

For some downtown community service facilities, auto accessibility during the construction process would be unavoidably impaired. In some cases, however, impacts may be lessened by the installation of street signs, which would indicate alternate access points or alternate parking facilities. Continued pedestrian access to service facilities may be ensured by construction of walkways, protective canopies, and fences.

Obstruction of emergency vehicle operations could be partially mitigated by ensuring that providers of emergency services are kept informed of the location, nature, and duration of construction activities so alternative routes could be chosen. Also, scheduling construction activities for nights and weekends, if feasible, would lessen traffic congestion, thus facilitating emergency vehicle operations.

It is essential that fire department access is maintained to all buildings adjacent to construction activities. For this reason, a minimum of at least one curb lane for streets undergoing construction would be kept open at all times, and fire hydrants in construction areas would remain accessible.

If temporary interruption of utilities were to be required, occupants of affected buildings would be given advance notice of the time and duration of the shutoff.

III-123 Economic Activity

The significant economic impact resulting from the construction of the proposed project in downtown Los Angeles would be the potential disruption to local businesses located along its route. This disruption could occur when street access is partially or wholly restricted during construction, thereby obstructing pedestrian and vehicular access to the businesses served by these streets. In addition, business activity could be affected by noise and dirt from nearby construction activity. Given the preliminary construction scenario, it appears that all of the proposed alternative alignments would require partial or entire street closings at various times throughout their construction period, and all would create noisy conditions while construction is in progress.

Of the three alternatives under consideration, the LA-2 Flower Street Subway would cause disruption over the longest period of time, yet affect the least number of businesses (see Table III-12A). The LA-1 alignment is considered to be the most disruptive to local businesses, as it would affect street access on two primary streets for various lengths of time over a 30-month construction period. The LA-3 alignment has more businesses along its route, but many of these are associated with the apparel industry and do not rely on pedestrian traffic or retail patrons as their primary source of business. Construction in LA-3 would be more concentrated, due to footing construction and the installation of precast guideway members, thereby lessening the total impact.

III-123.1 Mitigation Measures

To mitigate the potential disruption to local businesses due to reduced pedestrian and vehicular access during construction, the duration of time when any one street block is closed would be minimized to the greatest extent possible. At a minimum, one lane would be kept open to permit some vehicular traffic flow in addition to construction and emergency vehicles. Special measures would be taken to encourage pedestrian access. In coordination with the local merchants, the visibility of the businesses through temporary signing and other measures would be maintained.

III-124 Visual Quality

The visual impacts resulting from the construction of the project would be short-term. They would affect the entire length of the rail alternatives in Los Angeles and would be associated with traffic control, site preparation, and construction activities.

The temporary closure of traffic lanes or streets would require traffic barriers and directional and detour signs that would negatively affect the visual environment. Streets would be opened for utility relocation during the site preparation phase. During construction, the at-grade segments of the Los Angeles alternatives would require, at minimum, that one lane of the street be cut to a depth of 28 inches. Possibly along Broadway and Spring Street, two lanes would require excavation to the same depth. LA-2 would require the opening of Flower Street by cut-and-cover construction methods and its temporary closure by metal framing and wood decking. The aerial segments of LA-1 and LA-3 would require foundation construction and additional heavy equipment to hoist precast segments of columns and guideways into place. Additional changes to the visual setting during the

TABLE III-12A

IMPACT ON BUSINESSES DURING CONSTRUCTION

DOWNTOWN LOS ANGELES

Construction Characteristic	Alternative Alignment		
	LA-1	LA-2	LA-3
Structure Type	At-grade	Subway; aerial	Aerial; at-grade
Time Required to Completion (months)	30	27-36	24
Number of Lanes Temporarily Closed[1]	2 lanes; or entire block	2 lanes; or entire street (subway)	1 lane to entire street (short periods only--when setting precast members)
Number of Businesses Along Alignment[2]	1,812	727	2,652
Primary Construction Activity Disruptive to Businesses	Utility relocation, trackway construction at-grade.	Utility relocation, cut-&-cover tunnel construction, trackway construction at-grade.	Installation of guideway columns, column footings.
Relative Magnitude of Disruption	Major	Moderate	Slight

[1] Temporary closure could range between several days to several months. An emergency access lane would remain open at all times.

[2] Estimated on the basis of businesses listed in the Polk Directory -- intended only to provide an indication of the potential impact relative to the other alternatives, as most likely not all businesses would be affected; rather, the impact would vary significantly throughout the construction period by number of businesses and duration of impact.

Source: PB/KE, 1984.

construction phase would result from the presence of heavy and construction equipment and barriers, the stockpiling of construction material, and the temporary storage of waste materials.

III-125 Historic and Cultural Resources

Construction of the rail transit project would have impacts on historic resources in the downtown area of Los Angeles. During the construction period for all alternatives, viewing of historic resources would be impaired. In some areas, streets may be closed for periods of time, making viewing impossible by auto. These impacts would be of a temporary nature. Sidewalks would remain open so that pedestrians could circulate through the downtown and its historic districts and view historic structures.

The Broadway/Spring alternative (LA-1) has 18 historic buildings and three historic districts along its route (see Figure II-22D, Section II-225). At Union Station the aerial segment of LA-1 would enter the grounds of the station to the rear of the main terminal building and behind the utility and baggage building. This baggage building, or portions of it, may have to be removed for construction of the project. The structure would not be removed if at all possible. If the aerial segment is part of the preferred alternative, the degree of impact would be determined with final engineering of the project. Impacts would be minimized as much as feasible consistent with sound engineering principals for construction and operation. However, space for and construction of trackage, the passenger station, and a traction power substation would be necessary at Union Station. In addition to construction on the terminal grounds for the station and traction power, guideway columns would be placed along the southern edge of the station site along the sidewalk adjacent to the row of trees bordering the parking lot. These mature trees would not be removed but would be pruned in order to be maintained during and after construction. During the construction of the project there would be adverse visual impacts to Union Station; however, they would be temporary in nature.

The construction of the aerial guideway would require the placement of a support column at the northwest corner of Alameda and Arcadia Streets. This parking lot is considered a part of Father Serra Park even though the main portion of the park is on the other side of a freeway on-ramp and a row of trees. It is planned to be incorporated eventually into the El Pueblo State Historic Park by the City of Los Angeles. This area is considered to be archeologically sensitive (Costello, 1981). Mitigation would be necessary before construction begins at this site. A testing program for the area of impact would be performed. If evidence of significant deposits is found, a research design would be written and resource recovery undertaken.

Broadway would be widened by 2 feet to accommodate the rail project on the west side of the street except between 8th and 9th Streets. Between these streets the widening would be on the east side only to avoid the stairs along the east facade of the May Company Building. This facade is an important element which contributes to the historic architecture of that structure.

Along Broadway, within the Historic District (from 9th to 3rd Streets), there are patterned and terrazzo sidewalks marking both existing and past commercial enterprises. The condition of the terrazzo ranges from fair to good. The terrazzo sidewalks in front of four buildings would lose 18 to 24 inches of depth. Only in front of the Los Angeles Theater between 6th and 7th Streets, where there is an intricate curvilinear pattern which extends to the curb, would there be a significant adverse impact. The other three sidewalks are located in front of Reed's (533 S. Broadway), the Norton Building (601 S. Broadway), and the Merrit Building (757 S. Broadway). These sidewalks are geometric in design and the reduction in size would not be as significant as the loss at the Los Angeles Theater site.

With the street widening, the first (streetside) row of bronze plaques commemorating Hispanic movie stars in front of the Million Dollar Theater would have to be removed. To mitigate this removal, the plaques would be replaced in the sidewalk closer to the structure.

There would be no effect to historic structures at station locations for the LA-1 alternative. There would also be no effect from overhead wire support poles to be placed at intervals along the route, because the photographic record shows that there were similar structures along the streets when the districts achieved significance.

Along the route of the Flower Street Subway alternative (LA-2), there are three historic buildings of merit. There would be temporary visual impacts to Barker Brothers (800 W. 7th Street), the Los Angeles Gas and Electric Company (800-16 South Flower), and the Petroleum Building (716 W. Olympic) due to the shoring of the subway trench and equipment usage during construction. The construction of the stations for the LA-2 alternative would not have any impacts of historic resources.

Along the route of LA-3, the Olympic/9th Aerial alternative, there are 12 identified historic buildings. The route also skirts the Broadway Theater and Commercial Historic District along the district's southern boundary on 9th Street. Construction of the aerial alignment along 9th and Figueroa Streets would cause major adverse visual effects to the following historic properties:

- Fire Station #28: 644-46 S. Figueroa Street
- Barker Brothers: 800 W. 7th Street
- Original Pantry: 877 S. Figueroa Street
- Insurance Exchange Building: 318-42 W. 9th Street
- Pacific National Bank: 855-59 S. Hill Street
- Blackstone's: 900-11 S. Broadway
- William M. Garland Building: 101-17 W. 9th Street

- Marsh & Strong Building: 102-10 W. 9th Street
- Harris Newmark Building: 849-63 S. Los Angeles Street
- Cooper Building: 850-66 S. Los Angeles Street
- Eastern Columbia Building: 849 S. Broadway
- Ninth and Broadway Building: northwest corner of 9th Street and Broadway

The latter two buildings are key buildings in the Broadway Theater and Commercial Historic District.

Mitigation in the form of photo documentation for the adverse visual impacts on the Fire Station #28 and Barker Brothers Furniture Store has already been accomplished as a part of the Downtown People Mover Project. For affected structures on 9th Street, mitigation would consist of photo documentation of the pre-construction conditions of the buildings.

III-130 TRAFFIC AND TRANSPORTATION

In the Los Angeles Central Business District area (CBD) the impacts due to construction would be the greatest on vehicular traffic, pedestrian movements, parking, and bus transit. There would be a slight decline in accessibility to certain CBD bus destinations and an increase in CBD travel time. LA-1, basically an at-grade alternative, would require a half-mile aerial structure from Union Station, over the Hollywood Freeway (Route 101), to at-grade tracks at Broadway and Spring Street. During construction, partial closure of the Hollywood Freeway would be necessary during placement of column foundations in the median. Temporary lane closures would occur during non-peak traffic hours, so that impact on the heavy commuter traffic is minimized. One lane on the freeway at times would be required to store the construction equipment during peak periods. Resulting traffic would detour via adjacent streets to bypass the construction area using, among others, Sunset Boulevard and Temple Street. Construction activity at Union Station would be conducted away from the street on vacant property and would cause minimal traffic impacts.

The at-grade construction on Broadway, Spring Street, Washington Boulevard, Main Street, and Flower Street would require the closure of a minimum of two traffic lanes. At any given time during construction, at least one traffic lane would remain open in each direction to accommodate local access and provide for emergency vehicles. Resulting traffic would be diverted to adjacent parallel streets in the CBD area creating increased congestion on the detour routes.

Spring Street is one-way southbound with a contra-flow bus lane on which the single rail transit track would be laid. During construction the existing RTD bus service would be modified by temporarily changing bus stops, rerouting buses, and instituting a revised bus schedule. Broadway, a two-way street, would suffer severe congestion between Temple Street and 6th Street during construction of the southbound rail transit track due to heavy vehicular traffic and pedestrian movements throughout most of the day. Curb parking would be prohibited during construction and bus service routes and schedules would be temporarily modified.

On Washington Boulevard the rail transit tracks would be constructed in a reserved median. With the elimination of curb parking, it would be feasible to maintain up to two traffic lanes in each direction. Traffic demand of 24,000 vehicles per day would be severely affected, with the worst congestion occurring between Los Angeles Street and Broadway. Existing bus service could be maintained during construction with modified bus stops and schedules.

Alternative LA-2 would have construction impacts similar to LA-1 on the at-grade sections on Washington Boulevard and Flower Street where a reserved median would be used for the rail transit tracks. The underground section of LA-2, between 6th Street and 12th Street (including stations), would involve cut-and-cover construction. During cut-and-cover construction, temporary decking will allow one traffic lane in each direction to be maintained, with the elimination of curb parking and modification of bus stops and schedules. Every effort will be made in the station areas to maintain at least one traffic lane at all times for local access and emergency vehicles. Rerouting of vehicular traffic around the construction area would cause congestion on adjacent parallel streets including Figueroa, Hope, and Grand. Impacts to pedestrian and vehicular movements would be greatest around Flower and 7th Street area due to heavy vehicular traffic, pedestrian circulation, and transit interface. This area would also be affected by the RTD Metro Rail construction, which has a schedule close to the project construction. Every effort will be made to coordinate the construction of both projects.

The aerial alternative (LA-3) guideway construction along Figueroa Street and Olympic/9th Street would create congestion because of heavy traffic and pedestrian movements. Traffic volumes of 25,000 vehicles per day on Figueroa Street between 7th Street and 9th Street would be disrupted. Construction of the supports and stations and placement of the elevated guideway would require the closure of one to three traffic lanes depending on the types of footing used. However, the duration of this action would be considerably less than that required for the at-grade or subway portal construction. Resulting traffic would be diverted on adjacent parallel streets, thereby increasing congestion on Flower Street, Hope Street, and Grand Avenue.

Construction of the aerial guideway between 3rd Street and 7th Street would affect vehicular access to and from the Harbor Freeway, where ramp access is available directly west of Figueroa Street. Traffic lane closures in this area would disrupt traffic circulation in the west side of the CBD, since Figueroa Street also acts as a prime diversion route when the Harbor Freeway is congested. Curb parking would be eliminated during construction and the existing bus service would be modified by changing bus routes, bus stops, and schedules.

The traffic impacts during construction along Olympic/9th would be greatest between Figueroa Street and Grand Avenue. East of Grand Avenue there would be less disruption of traffic during construction due to reduced travel demands and the availability of less congested diversion routes.

III-131 Mitigation Measures

There are several measures that would be adopted to mitigate the disruptions to vehicular traffic and pedestrian flows during construction of the project:

- o Construction activity on moving traffic lanes would be restricted to off-peak hours and to nights and weekends wherever feasible.

- o Construction would be phased so that all line sections and station areas are not affected at the same time.

- o All construction activities in the Los Angeles CBD would be coordinated with the RTD Metro Rail construction to minimize impacts. The LA-2 subway section (including the station at 7th Street), is proposed to be constructed simultaneously with the Metro Rail Project.

- o On-street curb parking would be temporarily eliminated to accommodate construction operations and traffic flow on streets where construction is ongoing, and on adjacent parallel streets where additional travel lanes would be required to accommodate the diverted traffic.

- o Contractors would be required to control traffic during construction by following the most recent edition of "Work Area Traffic Control Manual" prepared by the City of Los Angeles; Standard Plan S-610-12, "Notice to Contractors -- Comprehensive" prepared by the Bureau of Engineering, City of Los Angeles; and "Standard Specifications for Public Works Construction" prepared by the State of California.

- o During final design, traffic control plans, including detour plans, would be formulated in cooperation with all affected jurisdictions. Traffic signs would be developed to alert motorists to the location and duration of the project construction activities.

- o Unless unforeseen circumstances dictate, no designated major or secondary highway would be completely closed to vehicular or pedestrian traffic. No local street or alley would be completely closed, preventing vehicular or pedestrian access to residences, business, or other establishments.

- Where pedestrian activities are affected during construction, appropriate warning regulatory signs would be installed and pedestrians would be diverted. Pedestrian access to residences and business would be maintained during construction.

III-140 CUMULATIVE IMPACTS OF RELATED PROJECTS

There are several related projects (including Metro Rail, San Bernardino Freeway (El Monte) busway extension, Los Angeles-San Diego Bullet Train (American High Speed Rail), Harbor Freeway transitway, and the Santa Ana Freeway transitway (I-5 corridor), that could be constructed in downtown Los Angeles at approximately the same time. All of these projects would potentially interface with the LB-LA Rail Transit Project at Union Station if LA-1 is adopted. Appendix 1 summarizes the construction schedules for these projects.

The cumulative impact of related projects in downtown Los Angeles during construction would be most noticeable should two or more projects be underway at the same time, especially at Union Station. In addition to compounding the usual problems associated with one construction project (congestion, noise, dust, detours, loss of parking, access barriers and influx of heavy equipment), two or more projects would increase competition for available materials, labor, vacant staging area, and landfill/disposal sites among contractors.

Coordination of construction activities would allow two or more ongoing projects to make use of the same equipment, labor, staging areas, detours, haul routes, recycleable materials, and excess soil for backfill. Phasing construction schedules would minimize duplication of effort, lower costs, and reduce disruption.

Mitigation measures for construction impacts similar to those discussed for the light rail transit project would be incorporated into the construction processes for the related projects. The combination of mitigation measures and coordinated effort on all ongoing projects would be the best possible mitigation for cumulative construction impacts. Beneficial impacts during construction will be increases in employment, sales of equipment and supplies, and taxes collected by local governments.

III-200 MID-CORRIDOR

A discussion of the construction techniques to be used in the mid-corridor can be found in Section I-500 of the DEIR. Refer to Figures III-20A and III-20B during this discussion.

III-210 NATURAL ENVIRONMENT

III-211 Topography, Soils, Geology, and Seismicity

There would be substantial amounts of soil generated by and backfill required for the mid-corridor alternatives (MC-1, MC-2, and MC-3). Quantities of excess material and required backfill for the mid-corridor alternatives are shown on Table III-21A. If it is not contaminated with urban debris, some of the excess material coming from the mid-corridor alternatives would be used on other sections of the proposed project or be transferred to other large on-going projects such as the Century Freeway, where large amounts of backfill would be required.

Alternative MC-2 (Compton Grade Separation) would require the disposal of nearly one million cubic yards of material. The disposal of this much material would use up a relatively large amount of the available local landfill space. It is expected that the majority of this material would be transferred to other on-going projects, such as the Century Freeway, and would not be taken to landfill sites.

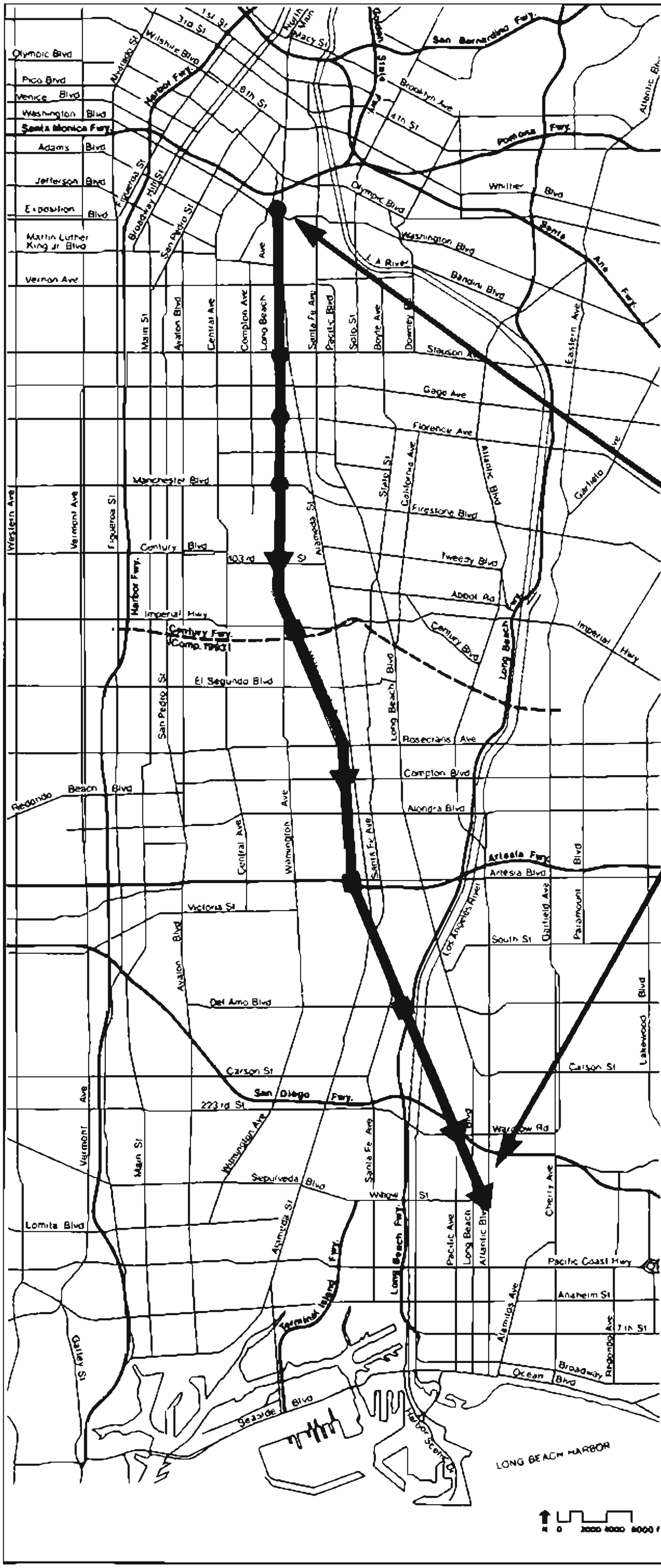
TABLE III-21A

EXCAVATION AND BACKFILL REQUIRED FOR

MID-CORRIDOR SEGMENT

Alternative	Excavation (Cubic Yards)	Backfill (Cubic Yards)
MC-1: Compton At-Grade	265,000 (15.3 miles at-grade)	39,000
MC-2: Compton Grade Separation	961,000 (2.2-mile trench)	266,000
MC-3: SPTC Railroad Relocation	2,000 (6.0-mile diversion only)	--

Source: PB/KE, 1984.



TYPES OF IMPACTS

A. Noise and Vibration
B. Traffic Disruption
C. Reduced Access
D. Business Disruption
E. Business Displacement
F. Parking Loss
G. Housing Loss
H. Displacement
I. Employment Loss
J. Historic/Park
K. Vegetation Loss
L. Visual Intrusion
M. Soil Disposal
N. Oily Muck Disposal
O. Dust

A, B, C,
K, L, M, O

MC-1

Figure III-20A

Impacts During Construction

Long Beach-Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

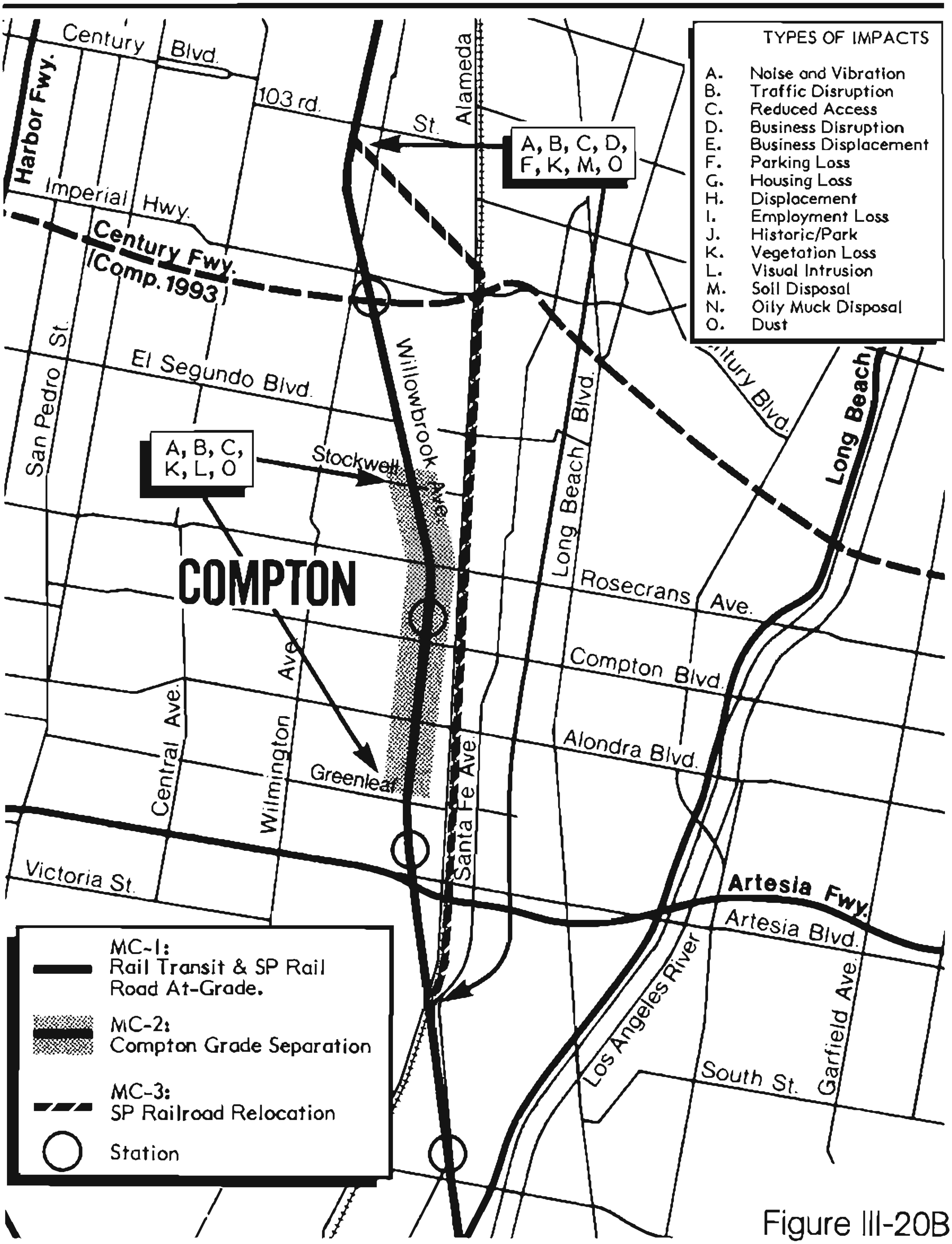


Figure III-20B

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Impacts During Construction
PARSONS BRINCKERHOFF / KAISER ENGINEERS

The mid-corridor alternatives lie mostly at-grade and would not require the special construction techniques used for aerial and subway sections. Safety devices, shoring, and falsework would be implemented where appropriate to minimize potential risks associated with seismic hazards (earthquakes) during construction.

III-212 Floodplains, Hydrology, and Water Quality

There would be no impacts to any established floodplain during the construction of any of the mid-corridor alternatives. U.S. Army Corps of Engineers and Los Angeles County Flood Control District permits would be required to conduct construction activities over and adjacent to flood control channels (Los Angeles River and Compton Creek).

Impacts on hydrology and proposed mitigation measures for the mid-corridor would be similar to those described for the downtown Los Angeles alternatives in Section 112 of this chapter.

Water resources which would potentially be affected are the Los Angeles River, Compton Creek, and the Central and West Coast Groundwater basins; however, impacts would be limited to small amounts of erosion and sediment-laden water run-off, which would be mitigated by using vegetative covering, catch basins, and settling ponds during construction.

III-213 Vegetation and Wildlife

There would be no significant impacts to vegetation and wildlife due to the construction of any of the mid-corridor alternatives. The amount of vegetation (landscaping), in the form of trees and shrubs, to be removed would be extremely small. Permanent landscaping is proposed for the rail corridor, stations, and maintenance facilities where deemed desirable or appropriate. Displaced wildlife, such as birds and rodents, would return of its own accord after the construction phase.

Construction activities would displace the wildlife from all three parcels (Parcels 1, 2, and 3) that make up the proposed main yards and shop sites in the mid-corridor. The wildlife may be able, during construction, to relocate into adjacent areas. The foxes living on the site may have previously been displaced from other vacant parcels or may have remained in the area after the construction of the Long Beach Freeway and the Los Angeles Flood Control Channel. The ground squirrels and other rodents (i.e., mice, rats, and gophers) are urban-adapted species. The cottontails, while not as urban-adapted as the rodents, would survive in vacant fields, golf courses, etc. It is probable that some of the birds only temporarily use this area during migration. Others, (e.g., hawks) appear to use the area as part of a larger foraging territory and, possibly, as a home range -- nesting on the transmission towers.

There are no endangered species on any of the parcels. None of the existing species is of great significance; all are common throughout Southern California. Loss of the habitat values on any of the parcels would not have significant accumulative adverse impacts on populations of any of the species present.

III-214 Noise and Vibration

Most of the mid-corridor alternatives would be constructed with an at-grade configuration. At selected locations there would be the need for cut, fill, and aerial guideway configurations, depending upon location and the alternative chosen. The worst case for construction noise impacts in the mid-corridor would be the below-grade section of MC-2 in Compton. The excavation and removal of material from the trench for this alternative would lengthen the time frame for construction and would use more diverse types of construction equipment. As with the Los Angeles and Long Beach segments, a major noise factor would be the trucks used to haul to and from the construction sites.

Table III-21B presents estimates of noise exposure based upon approximate scenarios describing the construction equipment that may be required along the mid-corridor alternatives. The table shows lower noise levels along most of the mid-corridor than are projected in the downtown Los Angeles area. For the at-grade construction, estimated noise exposure would be below 65 dBA at a distance of between 150 and 200 feet from the construction site; this distance depends upon terrain type and assumes no shielding by intervening structures or land forms. In the industrial areas noise would not be a problem; however, there are sensitive receptors where more care would be taken and mitigation measures may be needed during the construction. The sensitive receptors in the mid-corridor area (e.g., hospitals, schools, churches) are set forth in Figure II-32C. General development patterns can be found in Section II-321.

III-214.1 Mitigation Measures

In the mid-corridor area where there are sensitive noise receptors (e.g., single-family and multi-family residential units in the Watts area of Los Angeles and in Compton), mitigation measures may be necessary to ameliorate noise disturbances. Mitigation measures for these areas would include:

- Using low-noise-generating construction equipment.
- Scheduling high-noise activities to be least intrusive.
- Routing construction-related trucks away from sensitive areas as much as feasible.
- Following local ordinances concerning noise.

TABLE III-21B

CONSTRUCTION NOISE ESTIMATES FOR MID-CORRIDOR

Type of Construction	Alternative	Estimated CNEL at 50 Feet, dBA* Daily	Estimated CNEL at 50 Feet, dBA* Average Annual
At-Grade	MC-1, MC-2 (to Compton), MC-3	78	72
Trench, Retaining Wall and Fill	MC-1 (Firestone Boulevard)	83	80
	MC-2 (at Compton)	83	81
Aerial Guideway	MC-3 (Watts) MC-1, MC-2, MC-3, (Slauson Ave., Dominguez Junction, Cota Crossing and Compton Creek)	80	76

* Assumes construction activity would occur between 7 AM and 7 PM. Activity at night would raise CNEL by up to 10 dBA.

Source: Bolt Beranek & Newman, 1984.

III-220 SOCIOECONOMIC ENVIRONMENT

III-221 Displacement

III-221.1 Residential Displacement

No land acquisitions would be expected to require residential displacement in the mid-corridor; therefore, no mitigation measures would be required.

III-221.2 Non-Residential Displacement

No businesses would be displaced by the project in the mid-corridor.

III-222 Community Services

Increased traffic congestion at grade crossings where construction is occurring would result in diminished auto access to some community services. This would happen where gaining access to a facility involved crossing the alignment. Pedestrian access should not be significantly impaired if walkways through, or around, construction sites are built. Traffic congestion at grade crossings under construction may also result in prolonged response times for emergency vehicles having to cross the alignment. This would most likely occur at grade crossings where temporary detours are proposed. These grade crossings include Florence Avenue, Imperial Highway, Del Amo Boulevard, and Willow Street -- and Elm and Myrrh Streets if the Compton Grade Separation (MC-2) is constructed.

In general, utility relocation in the mid-corridor would be less involved than in downtown Los Angeles or Long Beach. As a result, there would be minimal disruption of utility service. The only exception would be in Compton, if the MC-2 alternative is implemented. In this case, underground utility lines crossing perpendicular to the proposed trench would be relocated to the new bridge structures. This process would undoubtedly necessitate temporary shutoff of some utilities.

III-222.1 Mitigation Measures

Diminished auto access to community service facilities in the vicinity of grade crossings under construction could only be alleviated by implementing the measures developed to mitigate traffic congestion (see Section III-131). Obstruction of emergency vehicles could also be alleviated by these same traffic congestion mitigation measures and by ensuring that construction management keeps local providers of emergency services abreast of the location and duration of construction activities.

Although pedestrian access to mid-corridor facilities would not be significantly obstructed, children using grade crossings under construction on their way to and from schools and parks would require particular attention. This potentially dangerous situation could be mitigated by constructing walkways and fencing around construction sites. Safety awareness programs offered in schools and employment of crossing guards would promote safer conditions.

Although temporary interruption of some utilities crossing the Compton trench would be unavoidable, inconvenience to utility customers could be lessened by giving advance notice of the shutoffs.

III-223 Economic Activity

The project would not result in any significant impacts on local economic activity in the mid-corridor during its construction. The MC-1 (Compton At-Grade) and MC-3 (SPTC Railroad Relocation) alternatives would require minor relocation of traffic flows at various intersections adjacent to the alignment, but these detours should not noticeably affect the level of local business activity. The MC-2 alternative (Compton Grade Separation), which would include the construction of 2.2 miles of trench between Stockwell Street and Greenleaf Boulevard in the City of Compton, would require the permanent closure of Stockwell and Indigo Streets and temporary closure of Elm and Myrrh Streets during construction of bridges across the trench. Neither of these actions is anticipated to affect significantly vehicular or pedestrian access to businesses served by these streets.

III-223.1 Mitigation Measures

During the temporary closure of Elm and Myrrh Streets, vehicular traffic would be rerouted to Rosecrans Avenue, thereby maintaining through traffic for these intersections.

III-224 Visual Quality

The visual impacts resulting from the construction of the mid-corridor alternatives would be moderate. All three alternatives would be constructed in the SPTC rail right-of-way and therefore would cause no major visual disruption to existing neighborhoods and traffic. Traffic control during construction would require the closure of half the streets crossing the alignment at any one time. The use of directional and detour signs and the placement of barriers would create a cluttered, disorganized appearance.

Site preparation would result in minimal visual impacts as utility relocation would be limited to those streets that cross the alignment. Construction activities that would affect the visual setting include the use of construction barriers, the presence of heavy construction material, the stockpiling of construction material, and creation of temporary waste disposal areas.

III-225 Historic and Cultural Resources

During construction of the mid-corridor alternatives, there would be short-term impacts by construction equipment. As much as possible, heavy-duty trucks and other equipment would be routed away from the 7 historic properties identified in the mid-corridor (see Figure II-32E, Section II-325). At the Watts Station particular care would be taken while the adjacent shelter is constructed.

For the MC-1 alternative, there would be no long-term effect to the historic properties by track or station construction, because the re-establishment of rail transit would restore the historic condition in effect at the time the buildings gained significance.

The MC-2 alternative would place the rail transit and freight railroad tracks below-grade in the City of Compton. The closest historic structure to the track depression would be the Heritage House, 205 South Willowbrook. There would be no effect to the Heritage House from the construction because the building is a relocated structure well beyond the railroad right-of-way.

In the case of the MC-3 alternative (SPTC Railroad Relocation), it would be necessary to construct an aerial structure and passenger station adjacent to the historic Watts Station. This would have severe impacts on the station. The setting of the station would be severely altered, the building would be in shadows for a portion of the day, and the opportunity to use the station for its original purpose would be foreclosed. The Watts Towers would not be adversely affected due to their distance from the proposed reconstruction. None of the other identified historic properties would be affected.

III-230 TRAFFIC AND TRANSPORTATION

III-231 Vehicular Traffic

Impacts on vehicular traffic and pedestrian movements in the mid-corridor segment during construction would be significantly less than in the at-grade portion of the LA-1 alternative. In most of the mid-corridor, there would be no pavement to break up or replace during or after construction. Committed improvements in this segment of the corridor for the MC-1 alternative include three grade separations, construction of the Century Freeway, and widening of the rail reservation along Long Beach Avenue between Washington Boulevard and Slauson Avenue.

During construction of the rail transit tracks on the east-west street crossings, one-half of the cross street would be closed at a time to vehicular traffic to allow continued traffic flow through the construction area. The cross streets affected the most would be the heavily travelled east-west arterials including Florence Avenue, Imperial Highway, Del Amo Boulevard, and Willow Street. Temporary detours for excess vehicular traffic onto parallel east-west streets would be required during construction of the track on these cross streets.

Construction impacts for alternative MC-2 would be identical to MC-1 with the exception of 2.2 miles of trench between Stockwell Street and Greenleaf Boulevard in the City of Compton. The trench would separate the rail traffic (both light rail transit and freight) from vehicular traffic. To construct the trench, through access across Stockwell and Indigo Streets would be permanently closed. Traffic using these streets would be diverted to the nearest through streets, such as Rosecrans Avenue and Alondra Boulevard, to gain access across the rail trench.

Detour routes for the streets requiring bridge structures, including Rosecrans Avenue, Elm Street, Compton Boulevard, Myrrh Street, and Alondra Boulevard, would be constructed prior to beginning work on the trench. The most probable scenario would require Elm and Myrrh Streets to be closed temporarily during construction of the bridge structures. Traffic currently using Elm and Myrrh Streets would be rerouted to use the detours for Rosecrans Avenue, Compton Boulevard, and Alondra Boulevard. The key element for retaining a reasonably smooth flow of east-west traffic through the construction zone is that the northbound and southbound lanes of Willowbrook Avenue be kept open during construction. The detour should be designed to provide adequate levels of service on cross streets and prevent wrong way moves on Willowbrook Avenue. After the bridges are completed, they would be opened to east-west through traffic while construction on the remainder of the trench continued.

The overall MC-2 alternative would take between 30 and 36 months to complete. Long periods of time would be required for construction of the trench due to the temporary addition of a shoo-fly track for the SPTC line and its subsequent removal when the trench is finished. Temporary detours for major cross streets could also add to the length of the construction period.

Construction impacts for the MC-3 alternative would be similar to the MC-1 alternative with the exception of the SPTC freight tracks being relocated to the San Pedro Branch from the existing Wilmington Branch, which would cause additional traffic delays on the major east-west cross streets along Alameda Street.

III-231.1 Mitigation Measures

Traffic mitigation measures would be similar to those outlined for downtown Los Angeles.

III-232 <u>Rail Freight Traffic</u>

In the mid-corridor the project would be constructed in the right-of-way (ROW) of the active SPTC Wilmington Branch freight line. It would also intersect the ATSF and UP Railways and the SPTC San Pedro Branch at Slauson Junction, Cota Crossing, and Dominguez Junction, respectively.

None of the rail freight activities would be interrupted during construction of the project. Wherever conflicts with the project occur, the freight operations would be relocated to new permanent or temporary (detour) locations prior to construction of the guideway. Temporary detour tracks could be built on one side or the other of the existing ROW.

A temporary shoo-fly track would be necessary for construction of the Compton Grade Separation (MC-2). This track would detour freight trains around the trench construction area and would be removed after the grade separation is completed.

III-240 CUMULATIVE IMPACTS OF RELATED PROJECTS

Several related projects could be constructed at approximately the same time as the Long Beach-Los Angeles project mid-corridor segment. These projects include the Century Freeway, Harbor Freeway transitway, United States Postal Facility on Florence and Central, Los Angeles-San Diego Bullet Train (American High Speed Rail), Intermodal Container Transfer Facility (ICTF), and the Long Beach International Coal Project. If the San Pedro Bay Ports Access (consolidation) Study recommendations were to be implemented with the construction of track and grade separations, it could be during this period also. The cumulative impacts of all these projects during construction would be similar to those described for downtown Los Angeles, essentially compounding the effects of noise, dust, detour, congestion, and competition for materials, labor, and disposal sites.

Specific impacts would occur where the rail transit project would interface with the Century Freeway and with the Los Angeles-San Diego Bullet Train. At these locations (Imperial Highway and Slauson Avenue respectively), preliminary facilities could be provided during construction of the rail transit project to accommodate the future construction of the other two projects. The Century Freeway may use excess material coming from the construction of the rail transit project.

Implementation of the ICTF and Long Beach International Coal Project, would increase rail freight traffic in the mid-corridor. Only the ICTF project would increase rail traffic on the SPTC Willowbrook line, which is adjacent to the proposed project alignment alternatives. Any increases of rail freight traffic on this line would directly affect construction activities for the Long Beach-Los Angeles Rail Transit Project. Detours of rail freight traffic and modification of tracks would need to be coordinated carefully with SPTC, ATSF and UP. Increases of freight traffic on the San Pedro Branch (with MC-3 only), combined with the construction traffic, would also affect east-west auto traffic crossing Alameda Street.

Development of the Harbor Freeway transitway and U.S. Postal Facility would also add to east-west traffic problems. It is expected that traffic congestion would be the major cumulative impact in the mid-corridor; maintaining a smooth east-west traffic flow during project construction would be a major goal. Mitigation measures would include proper signing, advanced warning to affected neighborhoods, and an appropriate number of detours.

III-300 LONG BEACH

Section I-500 of the DEIR contains a discussion of the construction techniques to be used for the Long Beach alignment alternatives. Refer to Figures III-30A through III-30D during this discussion.

III-310 NATURAL ENVIRONMENT

III-311 Topography, Soils, Geology, and Seismicity

Compared to the other segments of the proposed project, the Long Beach alternatives would produce only minor amounts of excess material requiring disposal (see Table III-31A, below). All of the Long Beach alternatives would be located in areas that have been largely disturbed by prior development, which indicates that the soil could be contaminated with urban debris (pieces of asphalt, concrete, steel, and wood). Contaminated soil is generally not suitable for use in major construction projects and would be disposed of at a local landfill site.

Table III-31A

EXCAVATION AND BACKFILL REQUIRED FOR LONG BEACH SEGMENT

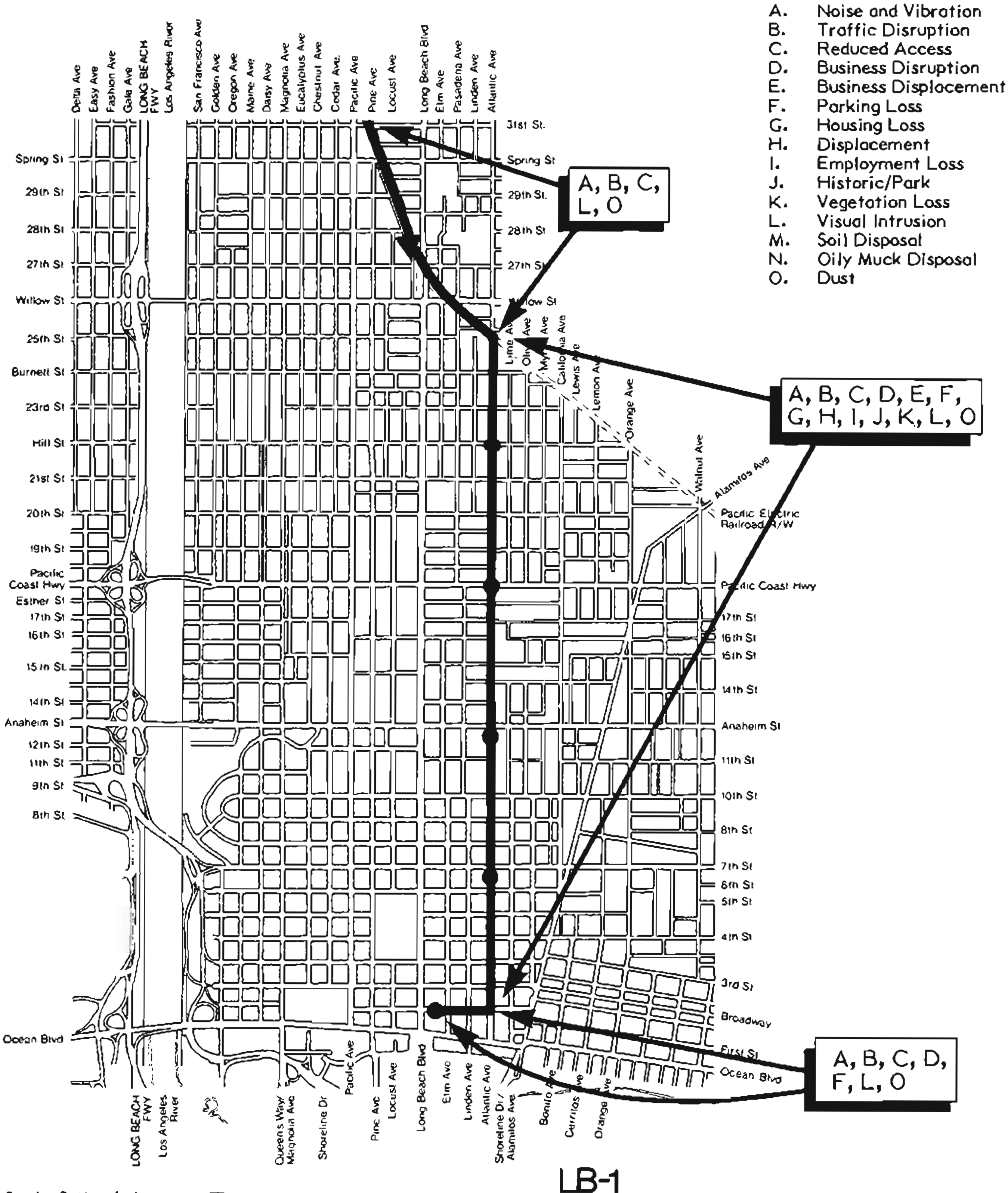
Alternative	Excavation (Cubic Yards)	Backfill (Cubic Yards)
LB-1: Atlantic Avenue Two-Way	56,000	37,000
LB-2: Atlantic/Long Beach Couplet	30,000	18,000
LB-3: Los Angeles River Route	13,000	15,000
LB-4: Atlantic with Pacific Pacific Avenue Loop	60,000	40,000

Source: PB/KE, 1984.

All of the Long Beach alternatives would be constructed at-grade and would not require the special construction techniques used for aerial and subway sections. Safety devices, shoring, and falsework would be implemented where appropriate to minimize potential risks associated with seismic hazards (earthquake) during construction.

TYPES OF IMPACTS

A. Noise and Vibration
B. Traffic Disruption
C. Reduced Access
D. Business Disruption
E. Business Displacement
F. Parking Loss
G. Housing Loss
H. Displacement
I. Employment Loss
J. Historic/Park
K. Vegetation Loss
L. Visual Intrusion
M. Soil Disposal
N. Oily Muck Disposal
O. Dust



Atlantic Ave. Two-Way

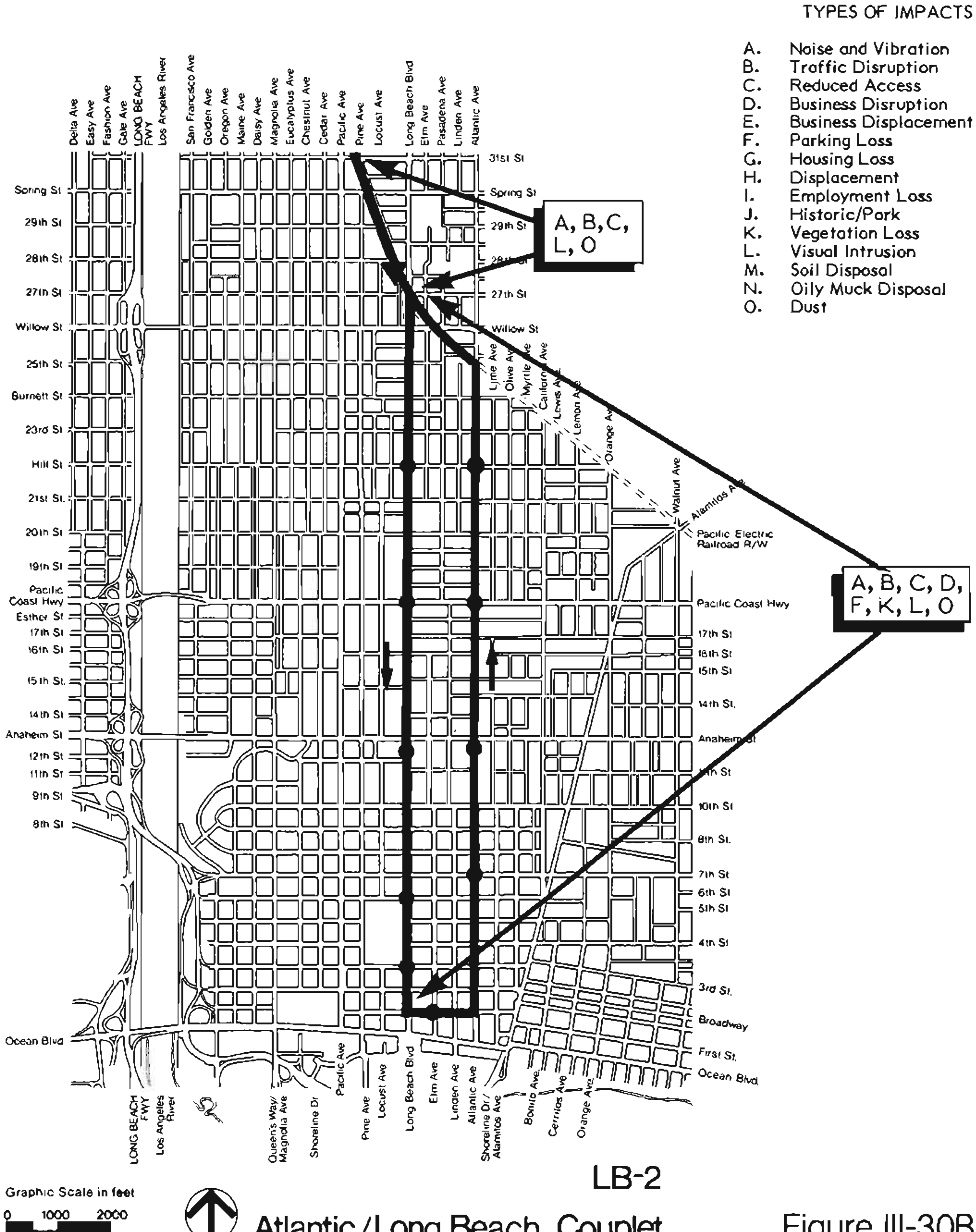
Figure III-30A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Impacts During Construction

PARSONS BRINCKERHOFF / KAISER ENGINEERS

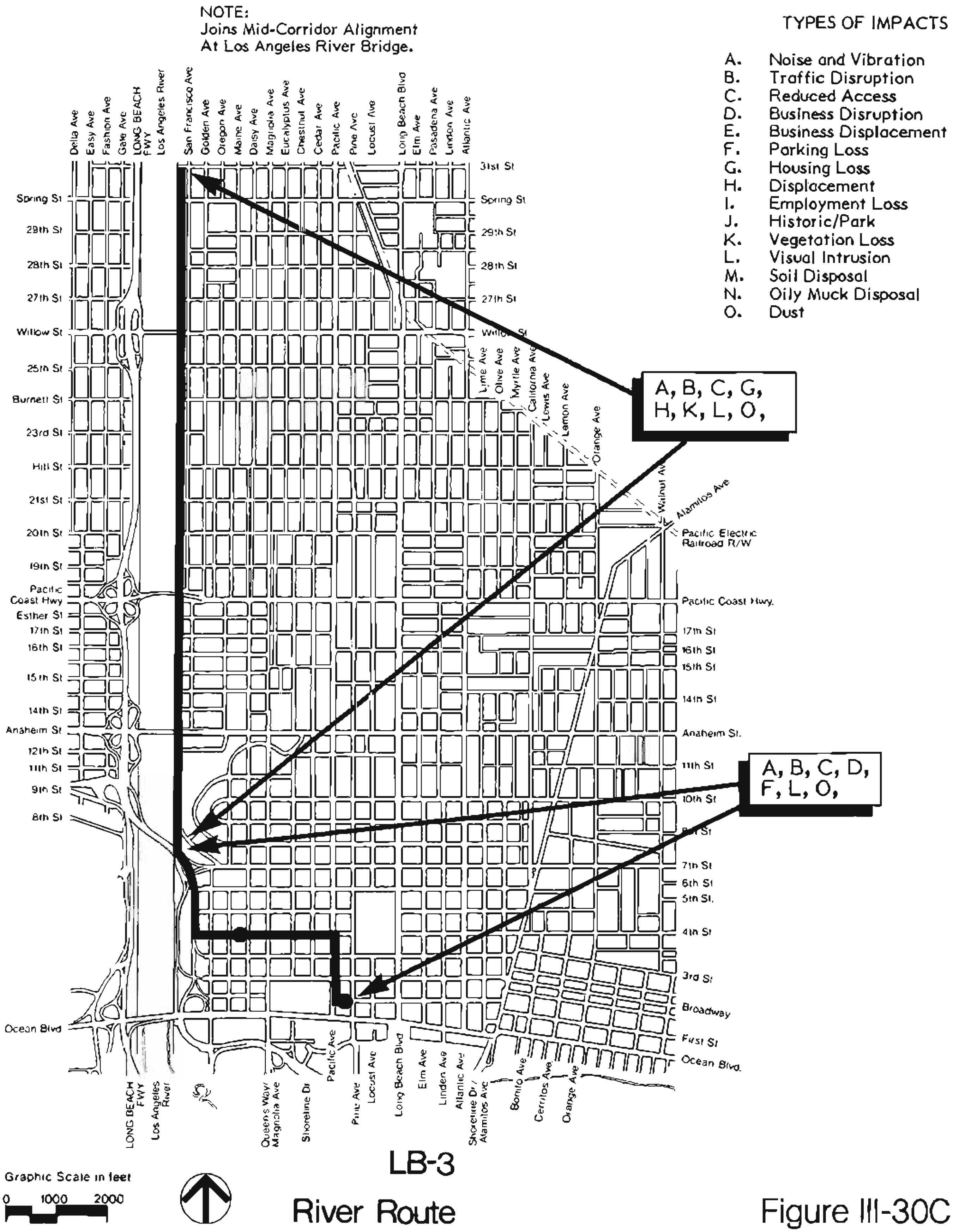


Atlantic/Long Beach Couplet

Figure III-30B

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Impacts During Construction
PARSONS BRINCKERHOFF/KAISER ENGINEERS



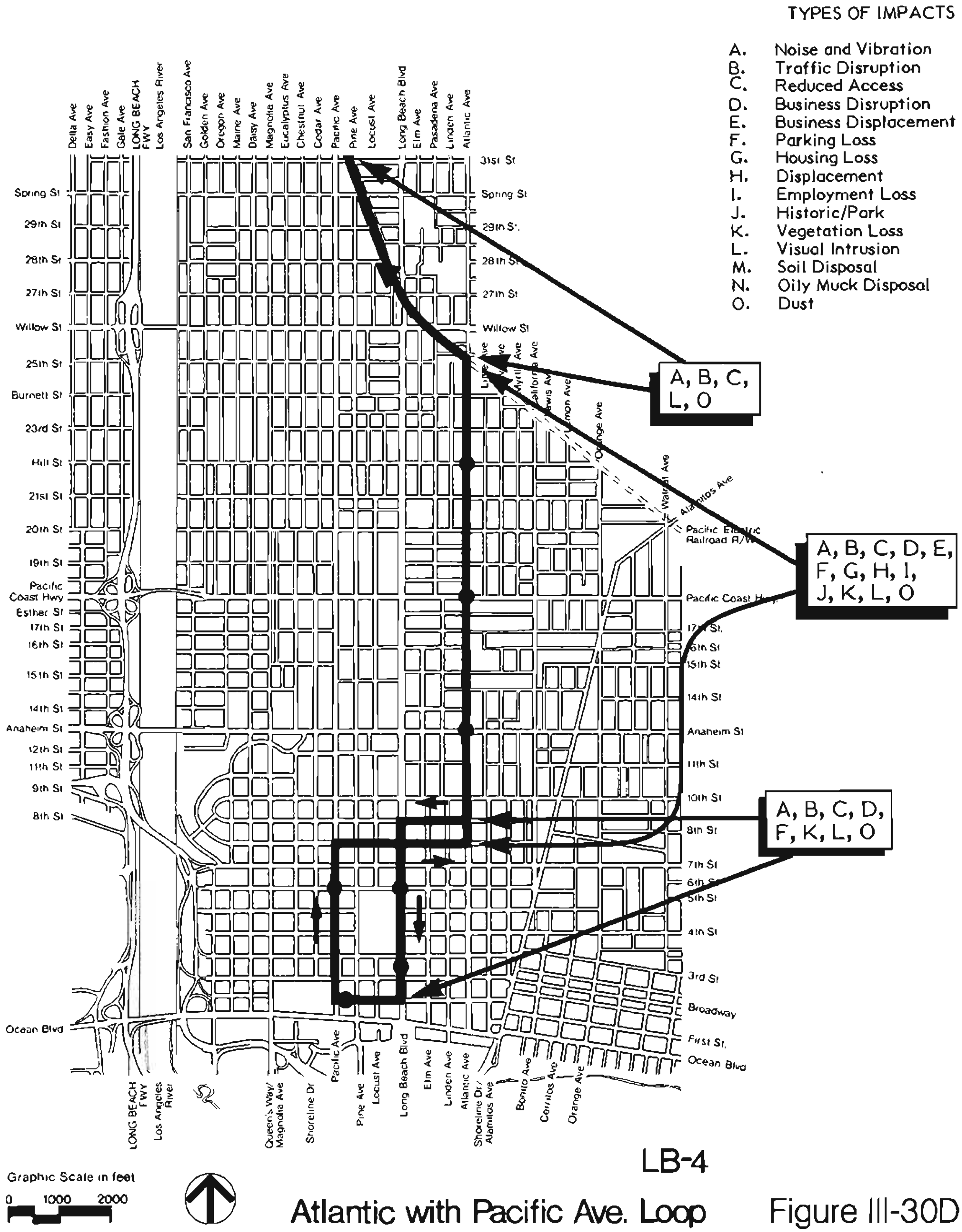
LB-3

River Route

Figure III-30C

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Impacts During Construction
PARSONS BRINCKERHOFF/KAISER ENGINEERS



Atlantic with Pacific Ave. Loop Figure III-30D

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Impacts During Construction
PARSONS BRINCKERHOFF/KAISER ENGINEERS

III-312 Floodplains, Hydrology, and Water Quality

There would be no impacts to any established floodplain during the construction of any of the Long Beach alternatives. Permits from the U.S. Army Corps of Engineers and the Los Angeles County Flood Control District would be required to conduct construction activities over and adjacent to the fully channelized Los Angeles River.

Impacts on hydrology and proposed mitigation measures would be similar to those described for the downtown Los Angeles alternatives. Erosion and sedimentation from construction sites on the Long Beach alternatives during clearing and grading operations could cause adverse impacts on water quality and impairment of beneficial uses of receiving waters. Sedimentation and erosion could affect the Los Angeles River Tidal Prism and Los Angeles-Long Beach Harbor area during the construction of the new rail tracks for alternative LB-3 (Los Angeles River Route). Every effort would be made to keep construction activities and equipment out of the Los Angeles River. Preventive measures, such as vegetative covering, catch basins, and settling ponds, would also reduce potential impact during construction.

III-313 Vegetation and Wildlife

There would be no significant impacts to vegetation and wildlife due to the construction of any of the Long Beach alternatives. Either alternative LB-1 (Atlantic Avenue Two-Way) or LB-4 (Atlantic with Pacific Avenue Loop) would require the removal of approximately 115 street trees (mostly palms) and various shrubs associated with residences and businesses. These trees and shrubs would be relocated and/or replaced within the project area wherever possible. Alternatives LB-2 (Atlantic/Long Beach Couplet) and LB-3 (Los Angeles River Route) would affect little or no vegetation. Permanent landscaping is proposed for the rail corridor and stations where deemed desirable or appropriate. Displaced wildlife, such as birds and rodents, would return of its own accord after the construction phase.

III-314 Noise and Vibration

For each of the Long Beach alternatives, the proposed routes would be at-grade with the exception of one crossing for LB-3, at San Francisco Avenue. While there are no federal or state guidelines or standards for limiting construction noise, the City of Long Beach has set forth standards which include a prohibition of nighttime construction activities.

Table III-31B presents noise exposure estimates for the different construction scenarios that may occur in the Long Beach area. On an annual average basis, the expected CNEL at 50 feet in the downtown Long Beach area for the alternatives would range from 72 to 80 dBA. As with the other segments of the project, a major factor in producing construction noise would be heavy-duty trucks hauling equipment, supplies, dirt, etc.

TABLE III-31B

CONSTRUCTION NOISE ESTIMATES FOR LONG BEACH

Type of Construction	Alternative	Estimated CNEL at 50 Feet, dBA* Daily	Estimated CNEL at 50 Feet, dBA* Average Annual
At-Grade	LB-1, LB-2, LB-3, LB-4	88	80
At-Grade	LB-3 (along river)	78	72
Trench, Retaining Wall and Fill	LB-3 (San Francisco Ave.)	83	80

* Assumes construction activity would occur between 7 AM and 7 PM. Activity at night would raise CNEL by up to 10 dBA.

Source: Bolt Beranek & Newman, 1984.

III-314.1 Mitigation Measures

There are more residences (both single-family and multi-family) in the more northern portions of the Long Beach alternatives, and more commercial and office activities in the southern portions. Residences are expected to be more sensitive to construction noise. Mitigation measures for Long Beach noise-sensitive areas would include:

- o Routing of trucks away from noise-sensitive receptors as much as is feasible.
- o Using low-noise-generating equipment during construction.
- o Scheduling high-noise-producing activities to be least intrusive.
- o Following local ordinances concerning noise.

III-320 SOCIOECONOMIC ENVIRONMENT

III-321 Displacement

III-321.1 Land Acquisition and Displacement

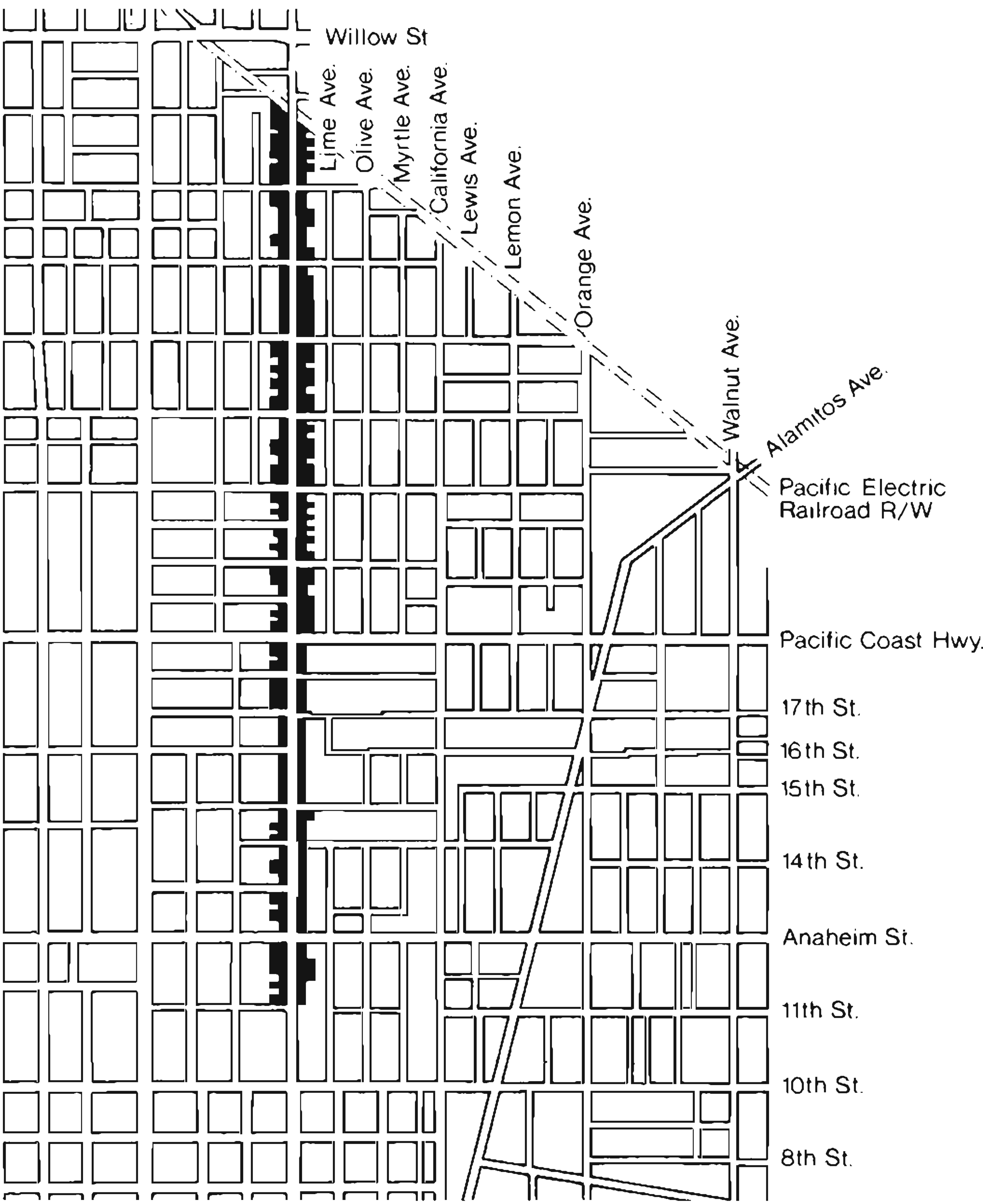
Major land acquisition and the resulting displacement of people and businesses would occur only along Atlantic Avenue as a result of alteratives LB-1 or LB-4. Planning efforts have been undertaken by LACTC and agencies in the City of Long Beach to reduce the right-of-way acquisition while preserving the viability of exclusive lanes in the street median for the separation of rail and auto traffic. At the time of the formulation of this draft EIR three options have been worked out. They are:

- o <u>Option A</u>: Rail transit provided in reserved median north of <u>Anaheim</u> Street; on-street parking is generally maintained (maximum impacts).
- o <u>Option B</u>: Rail transit provided in reserved median north of <u>Anaheim</u> Street; on-street parking is generally eliminated (reduced impacts).
- o <u>Option C</u>: Rail transit provided in mixed traffic with reserved <u>median</u> at station areas only; on-street parking is maintained except at station areas (minimum impacts).

A generalized illustration of potential property acquisition is shown in the Figure III-32A for Option A, the maximum case.

For purposes of comparison, the blocks along Atlantic Avenue will be grouped according to census tracts. While it is not possible to characterize the individual displaced residents, it is possible to create a demographic profile, assuming the residents are similar to others in their census tract. This profile, developed using 1980 census data, is offered to assist LACTC in its relocation efforts. This generalized and preliminary analysis can give indication as to whether the displaced residents would have difficulties in relocating. After an option is selected, the land acquisition requirements would be refined and it would be necessary to identify more precisely the characteristics of the displaced residents in order to suggest comparable relocation sites as required by state law.

Each of the four tables contained in this section shows the proposed property acquisitions, both residential and commercial. The number of residents who would be relocated has been calculated for the dwellings which would be acquired. Full takes of property would require the relocation of residents and businesses to other locations. Partial takes would generally not require relocation but would disrupt businesses and residences during the construction period.



Alternatives LB-1 & LB-4 **(Maximum Case)**

Figure III-32A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Potential Property Aquisition
Along Atlantic Avenue
PARSONS BRINCKERHOFF / KAISER ENGINEERS

An overall comparison of the options indicates that Option A would result in the loss of 229 dwelling units with 556 people displaced, while Option B would need acquisition of only 87 units and result in only 212 persons being relocated. Option C requires no loss of dwellings or relocation.

Looking at commercial (e.g., retail and office) property acquisition, Option A would necessitate the relocation of 80 businesses versus 35 businesses with Option B. Calculating the employees who would be displaced on the basis of one employee per 500 square feet of commercial floor space, there would be 340 employees displaced for Option A compared to 167 for Option B. Option C would need no commercial displacement but would require partial takings of vacant lots, front yards, and commercial properties (about 14,000 square feet), whether center or staggered side platforms are used. Study has shown that if left turns are eliminated at Hill Street station, then there are no displacements. For purposes of this environmental analysis, left turns at this intersection have been eliminated.

As with other projects which have required relocation, not all the businesses would relocate. Some would choose for various reasons to close rather than relocate; therefore an unknown number of these employees would lose their jobs and become unemployed.

III-321.11 Railroad ROW to Hill Street

According to U.S. Census information (this is within census tract 5732.0), most of the dwelling units are rentals. Median income for the census tract is $11,419, which would be considered low-income. The average household size for the census tract is 2.3 persons. The majority of the residents in this are are nonwhite, either Black or Hispanic. Table III-32A compares the displacement for this segment of Atlantic Avenue for the three options.

III-321.12 Hill Street to Pacific Coast Highway.

U. S. Census information, from which this profile is derived (census tract 5732.02), indicates an average household size of 2.7 persons. The average household income for this area of $7,943 is low compared to the City of Long Beach as a whole. The displaced residents are likely to be of nonwhite ethnicity. This is a youth-oriented community; almost half the residents may be younger than 19 years. Table III-32B sets forth the displacement likely with each option.

III-321.13 Pacific Coast Highway to Anaheim Street

The demographic profile for this area is derived from U.S. Census information for census tract 5753. Approximately 70 percent of the residential dwelling units are likely to be rentals. Based on the median income of $9,353, displaced residents are likely to be low-income. An average household size is 2.3 persons. The ethnicity of

TABLE III-32A

ATLANTIC AVENUE OPTIONS IMPACTS

RAILROAD ROW TO HILL STREET

Impact Characteristics	Option A	Option B	Option C
Residential Displacement			
Single-Family Units	32	9	0
Multi-Family Units			
No. of structures	11	3	0
No. of dwelling units	48	18	0
Persons	184	62	0
Non-Residential Displacement			
Commercial			
No. of structures	29	13	0
No. of businesses	28	11	0
No. of vacant businesses	14	6	0
Employees	81	36	0
Churches (Retail Space)	5	3	0
Community Service Agencies	1	0	0
Partial Takes			
No. of parcels	16	5	0
Square footage	12,800	9,600	0

Source: Sedway Cooke Associates; M. L. Frank & Associates, 1984.

TABLE III-32B

ATLANTIC AVENUE OPTIONS IMPACTS

HILL STREET TO PACIFIC COAST HIGHWAY

Impact Characteristics	Option A	Option B	Option C
Residential Displacement			
Single-Family Units	12	2	0
Multi-Family Units			
No. of structures	16	5	0
No. of dwelling units	82	35	0
Persons	254	100	0
Non-Residential Displacement			
Commercial			
No. of structures	47	21	0
No. of businesses	38	16	0
No. of vacant businesses	20	10	0
Employees	180	88	0
Churches (Retail Space)	3	3	0
Community Service Agencies	2	2	0
Partial Takes			
No. of parcels	31	14	4
Square footage	39,200	19,200	3,900

Source: Sedway Cooke Associates; M. L. Frank & Associates, 1984.

the displaced residents is likely to be nonwhite, again most likely Black or Hispanic.

Table III-32C shows the probable displacement for each option under considerstion.

III-321.14 Anaheim Street to Seventh Street

Only one block within this census tract would be affected by any of the three options. The demographic profile presented here is unlikely to be very accurate, given the small sample and small average household size of 1.6 persons. Median household income may be around $7,700. It is likely that the displaced residents would be White, as 40 percent of the population within the surrounding census tract is White.

Table III-32D shows the probable displacement for each option under consideration in this segment.

The implementation of alternative LB-3 would require the acquisition of three existing single-family units as well as preclude the construction of a housing project currently being planned through a joint venture between the Los Angeles County Community Development Commission and the Building Industry Association. This project would ultimately consist of 75 single-family detached units located in the proposed LB-3 right-of-way between 34th and Spring Streets. Construction is scheduled to begin sometime in 1984.

III-321.2 Mitigation Measures

The mitigation which would be necessary for the acquisition of property and the relocation of businesses and residents is set down in state law. California Government Code, Chapter 16, Section 7260 et seq. (Uniform Relocation Assistance and Real Property Acquisition Policies Act) mandates the relocation services and payments to be made to eligible residents, business concerns, and non-profit organizations displaced by the project. The law provides for uniform and equitable treatment of persons displaced from their homes, businesses, or farms and establishes the land acquisition policies which must be followed by public agencies. These services and payments are partial mitigation for the effects of acquisition of these properties by LACTC.

This mitigation would be further defined after the preferred alternative is selected and final engineering design completed. A Relocation Assistance Policy and Plan will be adopted by LACTC in accordance with the requirements of the state law.

TABLE III-32C

ATLANTIC AVENUE OPTIONS IMPACTS

PACIFIC COAST HIGHWAY TO ANAHEIM STREET

	Option		
Impact Characteristics	A	B	C
Residential Displacement			
Single-Family Units	12	2	0
Multi-Family Units			
No. of structures	6	3	0
No. of dwelling units	31	17	0
Persons	99	34	0
Non-Residential Displacement			
Commercial			
No. of structures	13	7	0
No. of Businesses	12	6	0
No. of Vacant Businesses	1	1	0
Employees	59	31	0
Churches (Retail Space)	1	0	0
Community Service Agencies	0	0	0
Partial Takes			
No. of parcels	20	14	8
Square footage	36,825	10,535	6,860

Source: Sedway Cooke Associates; M. L. Frank & Associates, 1984.

TABLE III-32D

ATLANTIC AVENUE OPTIONS IMPACTS

ANAHEIM STREET TO 7TH STREET

Impact Characteristics	Option A	Option B	Option C
Residential Displacement			
Single-Family Units	2	0	0
Multi-Family Units			
No. of structures	3	1	0
No. of dwelling units	10	4	0
Persons	19	6	0
Non-Residential Displacement			
Commercial			
No. of structures	3	2	0
No. of businesses	2	2	0
No. of vacant businesses	0	0	0
Employees	20	12	0
Churches (Retail Space)			
Community Service Agencies			
Partial Takes			
No. of parcels	7	7	7
Square Footage	13,200	4,500	2,760

Source: Sedway Cooke Associates; M. L. Frank & Associates, 1984.

Increased traffic congestion from full or partial street closures, temporary elimination of on-street parking, and construction activities in crosswalks and sidewalks would diminish vehicular and pedestrian access to Long Beach community service facilities during the construction period. These impacts would be most significant along Atlantic Avenue where there is a high concentration of churches, schools, and social service outlets.

Construction of alternatives LB-1 or LB-4 would create particularly severe impacts -- especially on on-street parking opportunities and school bus access -- due to the required street widening for two of the options, which would require a reserved median for the rail vehicle. This elimination of parking would be temporary during construction and permanent for one of the options under consideration. Construction of the LA River Route (LB-3) would have the least impact on access to community service facilities because most of the alignment would be located in a reserved right-of-way and would therefore not cause significant disruption to pedestrian and auto circulation.

Because there are a number of schools located along the Long Beach alignment alternatives, the safety of children who walk to school would be of particular concern due to construction activities occurring in streets and on sidewalks.

Increased response times for police, fire, and paramedic emergency vehicles operating in the vicinity of rail transit construction activities is expected to occur as a result of increased traffic congestion. The problem of emergency vehicle accessibility is particularly significant in Long Beach because three major hospitals with emergency wards are located immediately adjacent to alignment alternatives LB-1, LB-2, and LB-4. Another adverse impact may be obstructed access of fire department vehicles to buildings adjacent to construction activities.

Construction of the LA River Route (LB-3) alternative would necessitate the elimination of a 1½-mile end-segment of a county-maintained horse trail which follows the east bank of the Los Angeles River from the Ventura Freeway to Willow Street in Long Beach. The eliminated segment would be located in the proposed rail transit right-of-way from the SPTC bridge crossing to Willow Street. Also affected by the construction of the LB-3 alternative would be a bikeway which runs parallel to the proposed alignment on top of the east levee of the Los Angeles River. At present, access to the bikeway is provided at 34th Street, Willow Street, Pacific Coast Highway, and Chester Place. The access points may be temporarily obstructed during construction. Another impact associated with the construction of the LB-3 alternative would be the acquisition of the northeast corner of Willmore Park, which would result in the displacement of a basketball court.

Utility relocation should be less of an issue in Long Beach than in downtown Los Angeles because there are fewer underground utility lines. Temporary shutoffs in localized areas may still occur however.

III-322.1 Mitigation Measures

A certain degree of diminished accessibility to community service facilities because of increased traffic congestion in the vicinity of construction activities would be unavoidable. Traffic congestion could be partially alleviated, however, by implementing the mitigation measures discussed in Section III-131. School and church parking and school bus loading zones located on Atlantic Avenue may have to be temporarily, and in some cases permanently, relocated to side streets. If such relocation is not possible, it may be necessary to create off-street parking and bus loading areas.

Safety of school children walking near construction activities on their way to and from school could best be ensured by providing adequate barriers around construction sites, employing crossing guards, and offering safety awareness programs at school.

Because emergency medical facilities are located in the vicinity of the three alignments which would use Atlantic Avenue, measures would be taken to facilitate the operation of emergency vehicles. This could be done by implementing the traffic congestion mitigation measures discussed in Section III-131, by keeping providers of emergency services abreast of construction activities, and by developing alternative emergency access routes, if necessary, to Memorial Hospital Medical Center, Pacific Hospital, and Saint Mary's Medical Center.

Fire Department access to buildings adjacent to construction activities would be provided by leaving at least one road open through construction areas and by ensuring that fire hydrants are accessible at all times.

If the LA River Route (LA-3) is selected, every effort would be made to replace the eliminated end-segment of the county horse trail with another end-segment of equivalent length. Obstructed access to the Los Angeles River bike path could be mitigated by the placement of signs which indicate the location of the nearest open access point.

If shutoff of utilities is required during relocation activities, customers would be given advanced noticed of location and duration of shutoffs.

III-323 <u>Economic Activity</u>

The most significant economic impact resulting from the construction of the project in Long Beach would be the potential disruption to local businesses located along its route. This disruption could occur when street access is partially or wholly restricted during construction, thereby obstructing pedestrian and vehicular access to the businesses served by these streets. In addition, business activity could be affected by noise and dirt from nearby construction activity. It appears, given the preliminary construction scenario, that the LB-1, LB-2, and LB-4 alternative alignments would require partial or entire street closings in specific locations at various times throughout their construction period, and would create noisy conditions in commercial areas while construction is in progress. Of the four alternatives under consideration, LB-3 (Los Angeles River Route), would cause the least disruption, since it would only affect four businesses. LB-2 would have the most significant potential adverse effects both because of the number of adjacent businesses and because the track would run at curbside, inhibiting pedestrian and vehicular access more severely than if it were in the median. See Table III-32E for impacts on businesses during construction, by alignment alternative.

III-323.1 Mitigation Measures

To mitigate the potential disruption to local businesses due to reduced pedestrian and vehicular access during construction, every effort would be made to minimize the duration of time when any one street block is closed. At least one lane would remain open to permit some vehicular traffic flow and access by construction and emergency vehicles. Special measures would be taken to encourage pedestrian access. In coordination with the local merchants, visibility of the businesses through temporary signing and other measures would be maintained.

III-324 Visual Quality

The visual impacts resulting from the construction of the project alternatives would be short-term. They would affect the entire length of the project alternatives in Long Beach and would be associated with traffic control, site preparation, and construction. The nature of these visual impacts would be similar to those described for the Los Angeles segment.

III-325 Historic and Cultural Resources

The alternatives for location of the rail transit project in Long Beach each have potentially historic buildings along their proposed routes. These properties are shown on Figure II-42D, Section II-425.

For LB-1 (Atlantic Avenue Two-Way), there are 12 structures identified with historic potential. There would be impacts to 2 of these structures with the placement of the rail transit station in a reserved median in Atlantic Avenue, between Anaheim and 11th Streets. Depending on the final design for Atlantic Avenue, the structures may be acquired and removed along with other buildings which do not have historic potential. The LB-4 alternative would also require a station at this point; however, it would not require taking the structures.

TABLE III-32E

IMPACT ON BUSINESSES DURING CONSTRUCTION

LONG BEACH

Construction Characteristic	Alternative Alignment LB-1	LB-2	LB-3	LB-4
Structure Type	At-grade	At-grade	At-grade	At-grade
Time Required to Completion (months)	30	30	18-24	30
Number of Lanes Temporarily Closed[1]	2 lanes; or entire block	2 lanes; or entire block	2 lanes; or entire block	2 lanes; or entire block, downtown only
Number of Businesses Along Alignment[2]	90	270	4	90[3]
Primary Construction Activity Disruptive to Businesses	Utility relocation; track laying; station construction	Utility relocation; track laying; station construction	Utility relocation in downtown Long Beach	Utility relocation; track laying; station construction
Relative Magnitude of Disruption	Maximum	Moderate	Minimum	Maximum

[1] Temporary closure could range between several days to several months. An emergency access lane would remain open at all times.

[2] Estimated by PB/KE on the basis of businesses listed in the Polk Directory -- intended only to provide an indication of the potential impact relative to the other alternatives, as most likely not all businesses would be impacted but rather the impact would vary significantly throughout the construction period by number of businesses and duration of impact.

[3] Estimated on the basis of businesses located in the Atlantic Avenue Two-Way alignment (LB-1).

Source: PB/KE; Williams-Kuebelbeck and Associates, Inc., 1984.

Mitigation for the possible removal of the 2 buildings on the LB-1 alternative would include a study to evaluate their historic and architectural elements to determine whether the buildings meet the National Register criteria. If the properties were deemed eligible, two further steps of mitigation would follow: photographic recordation and/or, if feasible, physical relocation by a qualified private party to an area where the structure could enhance the historic character of the neighborhood. If the final design does not call for removal of the structures, there would be no long-term effects from the construction of the rail system, as such construction would be restoring the situation in effect when the buildings acquired their historic nature.

For the proposed LB-2 alternative (the Atlantic/Long Beach Couplet), there are 9 potentially historic buildings along Atlantic Avenue, 12 potentially historic buildings along Long Beach Boulevard, and 3 potentially historic buildings along 1st Avenue. These structures would be visually affected during construction.

The Los Angeles River Route (LB-3) has 21 potentially historic buildings along the 4th Street part of the route which would be visually affected during the construction phase of the project.

For the LB-4 alternative (Atlantic with Pacific Avenue Loop), there are 5 potentially historic buildings on Atlantic Avenue, 3 on 9th Street, 7 on 8th Street, 5 on Long Beach Boulevard, 13 on Pacific Avenue, and 3 on 1st Street which would be visually affected during construction.

Assuming mixed traffic circulation on all alternatives (except for Atlantic Avenue north of Anaheim Street), there would be no significant impacts due to track construction on any of the four alternatives being considered.

Except for the station proposed between 11th and Anaheim Streets, as described above, none of the other stations proposed for any of the alternatives should have any long-term effects other than visual intrusions into neighborhoods where rail or bus transit is not the historic condition. These visual impacts would not be adverse or significant.

III-330 TRAFFIC AND TRANSPORTATION

Impacts during construction of the Long Beach alternatives would be somewhat similar to the at-grade section of downtown Los Angeles alternative LA-1. Long Beach alternatives LB-1, LB-2, and LB-4 would all be located on major arterials in mid-city between just north of Willow Street and the 1st Street Transit Mall. Alternative LB-3 would parallel the Los Angeles River south to 4th Street and turn into the Transit Mall without significantly affecting the downtown Long Beach city streets.

Alternative LB-1 (Atlantic Avenue Two-Way) would require temporary closure of up to three traffic lanes during construction. At any given time at least one traffic lane would remain open in each direction to accommodate local access and emergency vehicles. Resulting through traffic would be diverted to adjacent parallel arterials including Long Beach Boulevard and California Avenue. During construction some of the minor cross streets would be temporarily closed. Major cross streets would need to be partially closed, half the street at a time, while relocating utilities and constructing the system trackbed. Two-way access would be allowed on the other half of the street. After the trackbed is constructed across a local street and the roadway is restored to its permanent condition, vehicles would resume original traffic patterns. All curb parking would be eliminated during construction. Bus routes, bus stops, and schedules would be temporarily modified.

Construction impacts to vehicular traffic and pedestrian movements under LB-2 (Atlantic/Long Beach Couplet) would be significantly less severe on Atlantic Avenue than elsewhere on that alternative because of single-track construction. Two traffic lanes could be maintained open in each direction throughout construction with the elimination of curb parking.

Impacts to vehicular traffic, transit service, and pedestrian movements would be significant on Long Beach Boulevard because of the already existing vehicular congestion and the high frequency of transit service. Two traffic lanes per direction could be maintained open at all times. All curb parking would be eliminated during construction. Transit service would be temporarily modified.

South of Pacific Coast Highway the traffic demand of just under 20,000 vehicles per day would be severely affected, with the worst conditions occurring at the intersections with Pacific Coast Highway, Anaheim Street, and 7th Street. Resulting through traffic during construction would be diverted to adjacent parallel streets, including Pacific and Pine Avenues.

Alternative LB-3, which would follow the Los Angeles River south to 7th Street, would require a new underpass beneath Willow Street. Local traffic would continue to use Willow Street during the construction period. Since the alignment would cross a depression along San Francisco Avenue south of 7th Street, a portion of the street (1400 feet) would need to be realigned approximately 20 feet to the west. This realignment would take place prior to construction so as to maintain traffic flow through the work area. Part of this realignment would result in realignment of the northbound lanes of the Long Beach Freeway (Route 7), using a portion of the wide median to the west.

Construction on 4th Street east to Pacific Avenue and on Pacific Avenue south to the Transit Mall on 1st Street would require partial closure of 4th Street and Pacific Avenue with resulting traffic diverted to adjacent parallel streets. A minimum of one traffic lane would remain open during construction to accommodate local traffic and emergency vehicles. Curb parking would be eliminated during construction. Bus stops and service frequencies on 4th Street and Pacific Avenue would be modified.

Alternative LB-4 (Atlantic with Pacific Avenue Loop) would have construction impacts similar to alternative LB-1 on Atlantic Avenue between Willow Street and 9th Street. Construction impacts on Long Beach Boulevard and Pacific Avenue between 9th Street and the Transit Mall would be similar to alternative LB-2 where a single track would be constructed. Impacts on 8th and 9th Streets would be minimal during construction due to low traffic and pedestrian demands. Resulting traffic would be diverted to adjacent parallel streets. In all cases at least one traffic lane would remain open to provide for local access and emergency vehicles.

III-331 Mitigation Measures

Traffic mitigation measures would be similar to those outlined for downtown Los Angeles.

340 CUMULATIVE IMPACTS OF RELATED PROJECTS

The cumulative impacts of related projects in Long Beach during construction of the rail transit project are expected to be minimal. None of the projects mentioned as having an effect on downtown Los Angeles and the mid-corridor would affect the Long Beach segment. This is because construction activities for all related projects would occur westerly (across the Los Angeles River) and northerly (beyond the San Diego Freeway) of where the rail transit guideway would be located in Long Beach.

Chapter IV

IV LOCAL IMPACTS AND MITIGATION MEASURES DURING OPERATION

Operations impacts are assessed against two no project conditions: year 2000 and existing (either 1980 or 1983, depending on data availability). The year 2000 was selected for analysis because (1) it represents a year when the system would be in full operation, (2) population and employment data are available on a regional basis for that year (SCAG '82), and (3) the other major transit improvement proposed in the region, Metro Rail, has also been assessed for year 2000 in the its EIR/EIS.

IV-100 DOWNTOWN LOS ANGELES

IV-110 NATURAL ENVIRONMENT

IV-111 Topography, Soils, Geology, and Seismicity

For the downtown Los Angeles alternatives, the at-grade stations, maintenance yard, and rail sections would be located where little or no land form alteration, such as cut-and-fill sections, would be necessary. The aerial sections of alternatives LA-1 (Broadway/Spring At-Grade) and LA-3 (Olympic/9th Aerial) would also be designed to minimize land form alteration.

The cut-and-cover construction of the subway portion of LA-2 (Flower Street Subway) would permanently alter the existing conditions on Flower Street between 12th and 11th Streets where a retained cut-and-portal would be constructed for below-ground access. The 7th Street station and remainder of the subway tunnel would be underground and not visually evident from the surface. Flower Street would be restored to its original condition and use as much as possible.

None of the downtown Los Angeles alternatives would affect any soil used for agricultural development. Soils incorporated into the project for foundation and backfill would be tested for their suitability for construction purposes prior to use.

The LA-2 alternative alignment would pass near the Los Angeles City Oil Field. Since a part of this alignment would be excavated, oil and/or natural gas in sediments are of special concern as hydrocarbons may potentially affect soil strength and underground structure safety. Soil samplings in the Los Angeles CBD have revealed oil and gas in sediments near the Harbor Freeway and Union Station.

Long-term accumulations of oil and gas are not considered likely following the construction of LA-2; however, if gas build-ups appear possible, special structure linings would be installed to prevent gas from entering the subway tunnel or station. Also, a gas collection and ventilation system would be provided to dissipate any hazardous concentrations. Drains and sumps would be installed to collect water and sediments impregnated with oil and tar. This material would then be pumped above ground and disposed of in accordance with regional water quality discharge requirements.

Existing seismic conditions in the Los Angeles Basin would affect the project rather than the project's affecting the seismology of the area.

The proposed project would be located in a highly active seismic area under the influence of the four major fault zones previously mentioned in Section II-112, Regional Setting. The downtown Los Angeles alternatives would consist of various proposed modes of operation: elevated, at-grade, and subway. During moderate and major earthquakes, all downtown Los Angeles alternatives would be subject to strong groundshaking; structures could potentially crack and slip from joints and foundations. Careful testing of soil foundations and correction of weaknesses in soil strength, coupled with state-of-the-art seismic design, would lessen the severity of effect. Structures will be designed to withstand collapse from a maximum credible earthquake.

The downtown Los Angeles area may also have underlying soils subject to liquefaction. Liquefaction is a process whereby loose, water-saturated granular soils lose their shear strength and become liquefied during seismic events. Soil liquefaction could potentially cause overlying structures to fail through the loss of bearing capacity, lateral spreading, and settlement.

Should soils subject to liquefaction be found below any of the downtown Los Angeles alternatives, then site specific engineering techniques (e.g., importation of stable material, compaction of soils, permanent dewatering, and attachment of deep-set piles to bedrock or lower, denser soils), would be implemented as mitigation measures. However, Caltrans preliminary geological investigations for downtown Los Angeles indicate that liquefaction potential on any of the alternatives would be low. None of the downtown Los Angeles alternatives would cross an existing fault where it would be subject to fault rupture hazards.

IV-112 Floodplains, Hydrology, and Water Quality

None of the downtown Los Angeles alternatives would encroach upon an established floodplain. There would be no need for the construction of major flood control facilities. The downtown Los Angeles area is a highly urbanized region. The construction of the project would not create additional pressure for growth in areas subject to flooding. Impacts would be limited to the possibility that construction of the project could alter some drainage flow patterns. All downtown Los Angeles alternatives would be designed and constructed with intrinsic drainage facilities such as subdrains, sumps, gutters, culverts, and catch basins, as appropriate.

In downtown Los Angeles, alternatives LA-1 (at-grade) and LA-3 (aerial) would have no negative effect on drainage flow patterns. These alternatives would generally maintain existing flow patterns and would generate no more water than present vehicles and development. Existing and proposed surface streets and drainage facilities would be adequate to handle any run-off coming from the project. Supplemental catch basins could be constructed, if necessary, to collect any excess water.

The LA-2 alternative would consist of an underground station and tunnel that would require subdrains, collector systems, sumps, and pumps to get the water from below ground into the existing drainage facilities. Water coming into the subway section of LA-2 would be generated from potential groundwater intrusion and funnelled from above through vents, portals, and access openings.

In downtown Los Angeles, there is a diffused regionwide source of pollution which affects water quality. This pollution source is urban run-off primarily from paved surfaces consisting of such water pollutants as sediment, lead, oils, and grease that are eventually discharged into local water bodies, mainly during storm conditions. The proposed rail system in downtown Los Angeles would not add measurable amounts of pollutants to existing urban run-off.

All downtown Los Angeles alternatives would comply with all applicable federal, state, and local policies, and standards and land use strategies which address water resource impacts, including the Federal 208 Areawide Waste Treatment Management Plan. The project is not expected to have any significant adverse impacts upon water bodies or wastewater treatment facilities within the South Coast Planning Area (208 Plan Area).

IV-113 Vegetation and Wildlife

All existing landscaping, ruderal (predominantly weedy) vegetation and wildlife within the proposed right-of-way for the downtown Los Angeles alternatives would be either permanently removed or relocated. The amount of vegetation to be permanently removed is relatively small and would be considered insignificant.

The rail alignment stations and maintenance facilities for the selected Los Angeles alternative would be landscaped with aesthetically compatible vegetation where deemed desirable or appropriate. Vegetation used as project landscaping would require continual irrigation and trimming throughout its lifetime, or until it is removed. Displaced wildlife such as birds and rodents would return to the downtown corridor of its own accord after the construction phase. The operation of the rail line would have no additional impact on wildlife over existing automobile traffic.

IV-114 Air Quality

Localized air quality impacts relate primarily to the potential concentration of carbon monoxide emissions at intersections and at parking lots because of project induced automobile queues. There are no parking lots proposed for any of the project's downtown Los Angeles alternatives. This analysis will concentrate on the potential air quality impacts of traffic congestion at downtown intersections with the Long Beach-Los Angeles Rail Transit Project in operation.

Roadside concentrations of emissions which could cause localized "hot spot" air quality degradation were assessed using a computer model called CALINE 3, developed by the California Department of Transportation. This model estimates the build up of carbon monoxide concentrations at various distances from specified street segments. The results can be compared to established air quality standards for carbon monoxide. In addition, carbon monoxide is considered a general indicator of microscale violations of other primary pollutants (including nitrogen dioxide, sulfur dioxide, and particulates); thus it is representative of potential health effects near automotive sources.

IV-114.1 Methodology

Worst case meteorological and traffic conditions were assumed in running the model, including low wind speeds, high atmospheric stability, and peak hour traffic volumes and speeds. Prevailing wind direction was set at 245 degrees, clockwise from north, which is typical for the corridor during morning peak hours. Peak hour traffic volumes and speeds for the years 1980 and 2000 were derived from SCAG's regional transportation model, which was also used to generate auto and transit patronage for other portions of the analysis.

Street segments adjacent to the selected intersections were each specified by their length, width, orientation, peak hour volume, and emission rate derived from their average peak hour traffic speed. To simulate intersections, the CALINE 3 model also requires a specification of average queue lengths at traffic signals and average speeds and emission rates through the intersection from all directions.

Two intersections each in downtown Los Angeles, the mid-corridor, and Long Beach were selected for analysis. These intersections were selected from a list of 86 intersections throughout the rail corridor expected to experience significant congestion (Level of Service "D") by the year 2000. The selection was guided by the criteria of high total projected traffic volumes, low traffic speeds, and proximity to the proposed rail alignments. A limited number of calculations were performed because the worst case analysis -- the at-grade system at a severely congested intersection -- indicated that the project would have no adverse carbon monoxide concentrations at the microscale level.

IV-114.2 Impacts

The two intersections selected for analysis in downtown Los Angeles are shown below (Table IV-11A). Also shown are the average peak hour volumes (vehicles/hour) and speeds (miles/hour) for both north-south and east-west directions, for the year 2000 No Project alternative.

TABLE IV-11A

LOS ANGELES INTERSECTIONS CHOSEN FOR MICROSCALE ANALYSIS

Intersection	North/South Volume	North/South Speed	East/West Volume	East/West Speed
Broadway and Temple Street	5020	16	1610	19
Figueroa and 6th Streets	1240	20	5897	13

Source: Southern California Association of Governments, 1983.

Table IV-11B reports the carbon monoxide concentrations for both intersections for the Broadway/Spring alternative (LA-1) for 1980, year 2000 without the project, and year 2000 with the project. The no project values were obtained by factoring down the carbon monoxide concentrations at the Los Angeles air quality monitoring station to anticipated year 2000 levels without the project. Carbon monoxide concentrations are estimated at 10, 20, 40, and 80 meters from both the north-south and east-west approaches to the intersection. In downtown Los Angeles, measurements 40 and 80 meters from the center of the intersection are located where buildings now stand and would therefore not have any impact on people.

The results indicate that even under theoretical worst case conditions, the year 2000 35 ppm one-hour federal carbon monoxide standard would be met at both intersections. Compared to current (1980) carbon monoxide levels, there would be a substantial decrease with or without the project due to improved emissions controls on automobiles. The state one-hour 20 ppm standard would be violated at the Figueroa/6th intersection by 4.5 ppm with or without the light rail line in operation. This violation would occur within the intersection itself (the 10-meter measure); there would be no violations at any of the other measuring points.

In summary, it was found that none of the light rail alternatives would have a significant localized air quality impact compared to expected conditions without the project. Although local violations are typically experienced today, such violations are not expected by the year 2000, with or without the project. The analysis was not

TABLE IV-11B

PEAK PERIOD ONE-HOUR CARBON MONOXIDE CONCENTRATIONS AT VARIOUS DISTANCES FROM SELECTED INTERSECTIONS - LOS ANGELES

(Parts Per Million)[1]

Distance From Center of Intersection (Meters)	1980: Existing Conditions				2000: Without Project				2000: Baseline Alternative			
	10	20	40	80	10	20	40	80	10	20	40	80
Intersection												
Broadway/ Temple St.[2]	48.6	39.3	30.3	22.5	15.7	13.2	10.9	8.4	15.7	13.2	10.9	8.4
Figueroa St./ 6th St.[2]	60.3	47.2	31.2	21.3	24.5	19.9	14.7	9.6	24.5	19.9	14.7	9.6

[1] Federal standard = 35 ppm; state standard = 20 ppm.

[2] Ambient (background) concentration ≈ 17 ppm (1980), 6.4 ppm (2000).

Source: Southern California Association of Governments, "Air Quality Impacts Technical Working Paper," February 9, 1984.

expanded to assess 8-hour average impacts since the impacts of the alternatives would be even less pronounced over an 8-hour period compared to peak hour impacts.

IV-115 Noise and Vibration

IV-115.1 Noise

In evaluating the potential noise impact for the operation of a new transportation source, there are two major factors which should be considered. First, the expected noise of the system should be compared against existing criteria to insure compliance with local, state, or federal regulations or guidelines to minimize interference with sensitive activities; and second, expected project levels should be compared with levels already occurring in areas (i.e., the ambient noise) to insure that the environment is not degraded. In downtown Los Angeles, because of the high levels of noise already occurring, the application of regulatory or guideline levels is not a valid comparison measure. In this section, therefore, the focus will be upon comparisons of projected sound levels for the Los Angeles rail transit alternatives with levels from existing noise sources.

Table IV-11C compares the maximum passby noise level of a variety of transportation vehicles for two typical operating speeds. As can be seen from the table, the noise of a rail transit vehicle would be comparable to that of a bus. At lower speeds typical of the expected operating speeds in the downtown Los Angeles area, the noise level would be reduced even lower than that indicated for the 30 mph speed shown on the table.

Table IV-11D provides a comparison of the noise of the light rail system with other transportation sources. The measure used to compare the noise exposure of the various systems is the community noise equivalent level (CNEL). The CNEL is an average of the A-weighted noise levels occurring over a full 24-hour period, with adjustments applied to those levels occurring during evening and nighttime hours in order to account for the greater sensitivity of people to noise and vibration levels during these hours. Specifically the noise levels occurring between 7 PM and 10 PM have an adjustment of 5dB, while noise levels occurring from 10 PM to 7 AM have an adjustment of 10dB. These weighted evening and nighttime noise levels are then averaged together with the unweighted daytime noise levels to provide an equivalent hourly average. The table shows that on a typical downtown street with moderate traffic flow, at 25 feet from the street centerline, the existing CNEL is approximately 70 dBA. The decibel (dB) is a measurement of the relative loudness of sound. The A-weighted scale is used because it most closely approximates the perception of the human ear. In comparison, the CNEL due to a 3-car light rail transit system at 20 mph would be 57 dBA for an at-grade configuration and 60 dBA for a configuration on aerial guideway. The peak hour average sound level (L_{eq}) for downtown Los Angeles traffic is approximately 1 dBA below the

TABLE IV-11C

COMPARISON OF MAXIMUM NOISE LEVELS FOR VARIOUS VEHICLE PASSBYS

Type Vehicle	Maximum Level at 50 ft, dBA 30 mph	50 mph
Auto	62	69
Bus	72	79
Heavy-Duty Truck	84	86
Motorcycle	71	77
Light Rail Transit Train	72	79
Freight Train		
Locomotive	98	98
Cars	72	79

TABLE IV-11D

COMPARISON OF NOISE EXPOSURE FOR VARIOUS TRANSPORTATION SOURCES

Transportation Source	CNEL at 25 ft (dBA)
Downtown Los Angeles Traffic	
(20,000 ADT)	70
Major Freeway	
(120,000 ADT)	84
Rail Freight Traffic	
(6 trains/day on the SPTC Wilmington Branch)	71
3-Car Light Rail Transit	
20 mph at-grade	57
20 mph on aerial guideway	60
45 mph at-grade	64
45 mph on aerial guideway	67

Source: Bolt Beranek & Newman, 1984.

indicated CNEL and the peak hour average sound level for the light rail system is approximately 2 dBA below the indicated CNEL. Measured CNEL and L_{dn} values at downtown Los Angeles locations, as reported in the environmental setting section, ranged between 70 and 74 dBA. The L_{dn} is the day-night noise level, a 24-hour average with the night period (i.e., 10 PM to 7 AM) having an adjustment made to account for people's higher sensitivity to noise at that time.

With regard to specific sensitive receptors for the Los Angeles alternatives, Table IV-11E lists locations by alternative with the expected CNEL due to proposed project operations and the CNEL from existing sources. Where there are multiple receptors along route segments, only the receptors with the greatest exposure are listed. As can be seen from the table, the proposed light rail system would have no impact on any of these land uses, regardless of alternative.

IV-115.2 Vibration

Groundborne vibration is generated during light rail vehicle operations as the steel wheels of the rail vehicle roll along the rails. In the vicinity of freeways and roads where rubber-tired vehicles are used, groundborne vibration is generally low. Some vibration may be felt with the passing of heavy-duty trucks, but this is usually not perceptible except within the right-of-way. However, in the vicinity of a rail guideway, the potential for wheel/rail generated vibration transmitted to the ground via the connection through the truck structure is higher. It is possible for rail vibration to travel through the ground to nearby building foundations and to be transmitted through the structural members of the building to the occupants.

In order to assess the impact of potential vibration levels, criteria developed by the National Academy of Sciences' Committee on Hearing and Bioacoustics (CHABA) are used. These criteria are shown in graphic form in Figure IV-11A. The upper portion of the figure depicts vibration levels in dB at which there is a potential for structural damage to buildings. The middle portion of the figure depicts maximum vibration levels for daytime and nighttime periods appropriate for residences. At these levels, most people would not find the vibration levels objectionable. The curve labeled "no adverse impact-any condition" implies that there would be no objections to vibrations at or below the levels indicated by the curve.

Measurements conducted on the Edmonton (Alberta, Canada) Transit System provide some general information on vibration levels which may be used as an estimate for the proposed system. The Edmonton Transit System uses a DueWag RTE 1 light rail vehicle, which is a two-directional six-axle articulated vehicle, comparable to the type of vehicle under consideration for this project. The bottom portion of Figure IV-11A shows measured octave band vibration levels for 50-foot and 100-foot distances from the track for a 30 mph operating speed in Edmonton.

TABLE IV-11E

NOISE EXPOSURE ESTIMATES FOR NOISE-SENSITIVE RECEPTORS

IN DOWNTOWN LOS ANGELES

Type	Nearest Street Intersection	CNEL, dBA Future No Project	Transit Vehicle	Future with Project	Project Contribution
LA-1 - Broadway/Spring Couplet					
Medical	Broadway & 4th	67.7	54.5	67.9	0.2
Hotel	Spring & 4th	66.7	57.0	67.1	0.4
Library	Broadway & 1st	65.0	54.5	65.4	0.4
Theater	Spring & 5th	66.7	57.0	67.1	0.4
Hotel	Spring & 5th	64.6	51.0	64.8	0.2
Hotel	Spring & 6th	64.7	51.0	64.9	0.2
Medical	Spring & 6th	64.7	51.0	64.9	0.2
Medical	Broadway & 7th	65.6	51.0	65.8	0.2
Hotel	Spring & 8th	68.0	54.5	68.0	0
Hotel	Spring & 8th	68.0	54.5	68.0	0
Business College	Broadway & 7th	69.7	54.5	69.7	0
Theater	Broadway & 9th	66.7	53.2	66.9	0.2
Theater	Broadway & 9th	66.7	53.2	66.9	0.2
Hotel	Main & 11th	64.2	54.5	64.7	0.5
Hotel	Main & 16th	66.0	53.2	66.2	0.2
Theater	Broadway & 9th	66.7	57.0	67.1	0.4
LA-2 - Subway					
Chapel	Flower & 8th	68.5	53.2	68.6	0.1
Church	Flower & 18th	68.5	53.2	68.6	0.1
LA-1 and LA-2 - Washington Boulevard					
Medical	Main & Washington	66.8	54.0	67.0	0.2
Extension	Broadway & Washington	63.8	51.0	64.0	0.2
Church	Wall St. & Washington	65.2	51.0	65.2	0
Single-Family Residence (behind row commercial buildings)	Washington & San Pedro	56.4	41.9	56.4	0
LA-3 - Aerial					
Hotel	Figueroa & 9th	66.9	53.2	67.1	0.2
Theaters	Broadway & 9th	67.0	57.0	67.4	0.4
Church	Olympic & San Pedro	67.9	55.0	68.1	0.2

Source: Bolt Beranek & Newman, 1984.

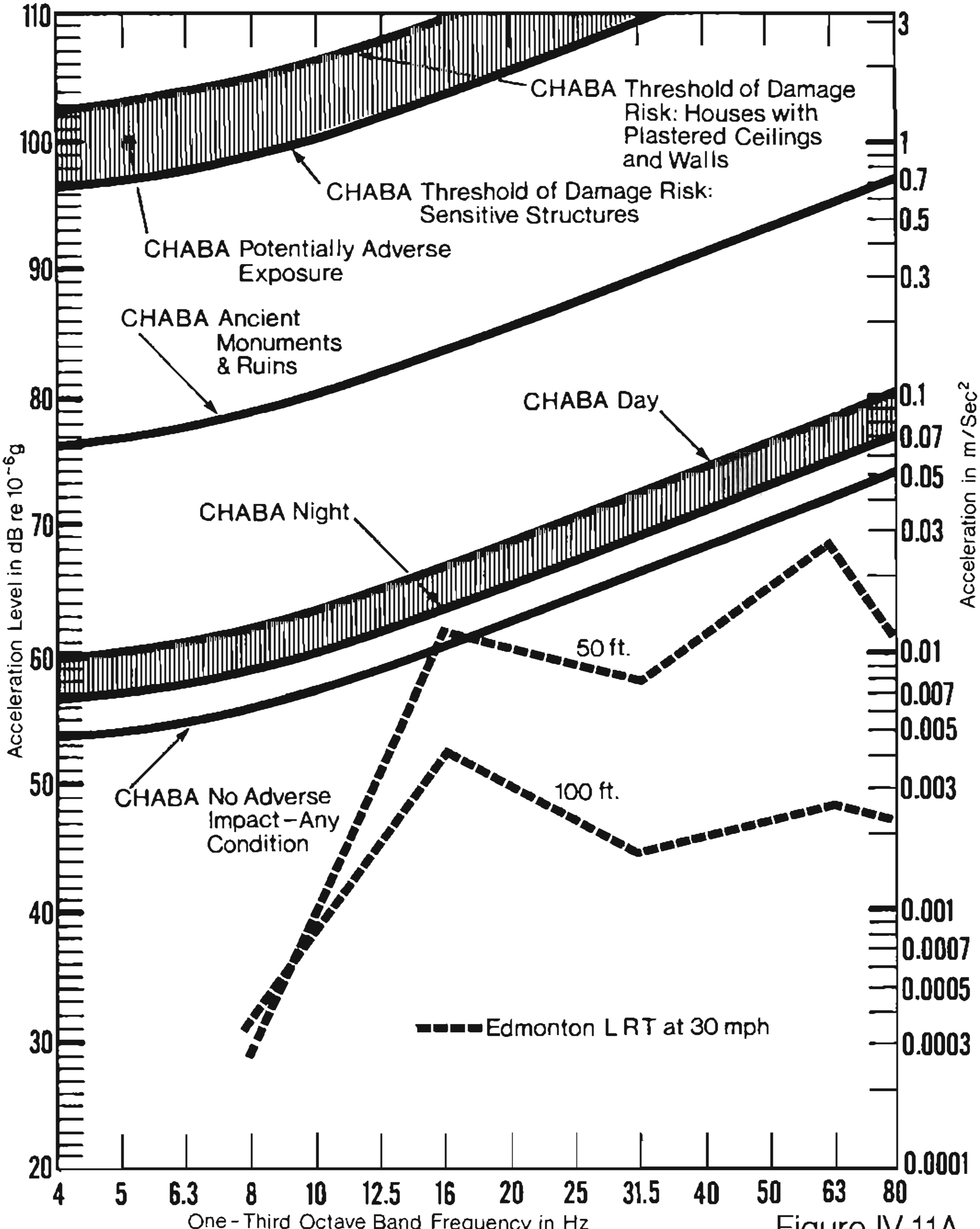


Figure IV-11A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Comparison of Measured Light Rail Train Vibration Levels Using CHABA Criteria

PARSONS BRINCKERHOFF / KAISER ENGINEERS

In downtown Los Angeles, operating speeds would vary depending upon location and alternatives selected; however, for most conditions, a lower speed than 30 mph would be used. This would result in lower vibration levels than indicated for the Edmonton example. For example, at 15 mph acceleration levels would decrease by 4 to 6 dBA. At locations closer than the 50-foot distance shown by the upper Edmonton LRT curve in Figure IV-11A, vibration levels would increase; for example, at 25 feet the levels would be increased by 3 to 5 dBA. Thus, for vibration-sensitive locations in downtown Los Angeles, comparison of expected vibration levels with the CHABA daytime and nighttime criteria curves indicate that no objectionable impact from vibration is expected.

For other than at-grade configurations in downtown Los Angeles, vibration levels are also not expected to create an adverse effect. Light rail operations on concrete aerial guideways or in subway structures typically produce vibration levels at or below levels generated by an at-grade guideway. Thus, there is no vibration impact expected for any of the downtown Los Angeles alternatives.

IV-115.3 Maintenance Sites

The satellite maintenance facility to be located at 14th Street and Olympic Boulevard would be well removed from any noise or vibration-sensitive receptors. No adverse noise or vibration impacts are anticipated with operation of this facility.

IV-120 SOCIOECONOMIC ENVIRONMENT

IV-121 Land Use, Population, and Housing

Implementation of the proposed project is not expected to induce any significant changes in land use, population, or housing either in downtown Los Angeles or throughout the project corridor. The possible changes brought about by the project were estimated by SCAG using a modified Delphi technique.

Since SCAG's employment and population forecast (SCAG-82) for the year 2000 does not assume construction of the project, SCAG distributed a questionnaire to members of its staff, representatives of local jurisdictions, and experts in the field of land use/transit. Respondents were given the SCAG housing and employment projections without construction of the project and were asked to estimate the growth rate with the project (as a percentage change from 1980) for downtown Los Angeles, Long Beach, and the mid-corridor. The average of their projections was tabulated and applied to the 1980 values to arrive at year 2000 employment and housing totals.

The overall effect of the project, as estimated by this technique, would be to increase employment and population growth in the project corridor by about 1 percent over the no project condition in the year 2000.

The extent to which new development could be attributed to the project remains speculative. Because a rail transit project such as Metro Rail, would concentrate users at stations, and because it would represent a fixed route and a significant capital investment, it has potential to influence development patterns. In cases where a transit project would move hundreds of thousands of users each day through a corridor with an already vital development market and draw new residents into its service area, the project might tend to attract new development from outside the service area as well as concentrate development already expected to occur in that service area.

In contrast, the Long Beach-Los Angeles Rail Transit Project is projected to attract 50,000 to 80,000 passengers per day. In this case the project's primary effect is likely to be one of concentrating development around key stations, increasing the occupancy rate in overbuilt areas (that is, areas with occupancy rates of less than 85 percent) and possibly reinforcing existing redevelopment plans.

IV-121.1 Land Use and Development

The following land use analysis is broken into two parts: (1) an assessment of where the project-induced development is likely to take place, and (2) an evaluation of how well the project meets transit-related goals and objectives as stipulated in local general, community, and redevelopment land use plans.

IV-121.11 Growth-Inducing Impacts

SCAG has estimated that the project would stimulate a 1 percent increase in employment within the project corridor over that which would occur without construction of the project, or possible induced development of an additional 100,000 square feet of retail floor space and 500,000 square feet of non-retail floor space in downtown Los Angeles.

Table IV-12A illustrates where the growth projected by SCAG could be expected to occur for each project alternative. In the Los Angeles segment the projected growth with alternative LA-1 would be expected to occur primarily as infill of existing vacant space on Spring Street and Broadway. Growth with alternative LA-2 would consist of infill retail and apparel manufacturing uses south of Pico Boulevard and on Washington Boulevard, with new office development in the service area of the 7th Street station. Similarly, with alternative LA-3 it would be likely to occur as infill industrial and retail uses on Olympic and 9th Streets and new office space near the 7th Street station. Residential growth is discussed in Section IV-121.

IV-121.12 Conformance with Land Use Plans

The project's conformance with local plans and policies has been assessed by translating basic land use-related transportation objectives into a series of land use goals. These goals express the need

TABLE IV-12A

DEVELOPMENT WITHIN ONE-QUARTER MILE OF STATIONS

DOWNTOWN LOS ANGELES

	Existing in 1980 (000s of gross square feet)				1980-2000: New Development without Project (000s of gross square feet)				Possible Additional Development by 2000 with Project (000s of gross square feet)			
	Office	Retail	Hotel	Housing Units	Office	Retail	Hotel	Housing Units	Office	Retail	Industrial	Housing Units
LA-1 (Broadway/Spring Couplet)												
Union Station[1]	138	14	25	0	400	50	0-500	750	0	0	0	0
Temple Street[1]	4,423	44	305	0	0	0	0	0	0	0	0	0
1st/2nd Streets[1]	2,913	83	431	266	2,200-3,400	260	0	580	0	0	0	0
4th Street[1]	4,089	454	741	991	2,900-4,600	210	0	250	200[2]	25[2]	0	0
7th Street[1]	6,791	2,477	407	2,730	1,150-1,130	100	0	620	200[2]	25[2]	0	500
Olympic Boulevard[1]	2,348	334	289	298	0	40	0	750	0	25[2]	0	950

[1] Office retail and hotel space data obtained from Los Angeles Department of Transportation, CBD Parking Study, 1981.

[2] Infill: Defined as occupancy of existing structures, in contrast to new construction.

TABLE IV-12A (Continued)

DEVELOPMENT WITHIN ONE-QUARTER MILE OF STATIONS

DOWNTOWN LOS ANGELES

	Existing in 1980 (000s of gross square feet)				1980-2000: New Development without Project (000s of gross square feet)				Possible Additional Development by 2000 with Project (000s of gross square feet)			
	Office	Retail	Hotel	Housing Units	Office	Retail	Hotel	Housing Units	Office	Retail	Industrial	Housing Units
LA-1 (Broadway/Spring Couplet) [Continued]												
18th Street	188	387	0	299	0	20	0	90	0	25[2]	50[2]	0
San Pedro Street	0	98	0	520	0	0	0	40	0	10[2]	50[2]	0
TOTAL	20,890	3,891	2,198	5,104	6,650-9,530	680	0-500	3,080	400[2]	110[2]	100[2]	1,450
LA-2 (Flower Street Subway)												
7th Street	10,622	1,330	1,907	1,236	6,000-6,800	430-450	0-500	200	350	25	0	250
Pico Boulevard	1,214	143	1,196	808	130	40	0	580	0	25	0	730
18th Street	243	382	0	558	0	15	0	160	0	25	50[2]	0

1 Office retail and hotel space data obtained from Los Angeles Department of Transportation, CBD Parking Study, 1981.

2 Infill: Defined as occupancy of existing structures, in contrast to new construction.

TABLE IV-12A (Continued)

DEVELOPMENT WITHIN ONE-QUARTER MILE OF STATIONS

DOWNTOWN LOS ANGELES

	Existing in 1980 (000s of gross square feet)				1980-2000: New Development without Project (000s of gross square feet)				Possible Additional Development by 2000 with Project (000s of gross square feet)			
	Office	Retail	Hotel	Housing Units	Office	Retail	Hotel	Housing Units	Office	Retail	Industrial	Housing Units
LA-2 (Flower Street Subway) [Continued]												
Broadway	185	304	0	302	0	15	0	90	0	15	50[2]	0
San Pedro Street	0	98	0	520	0	0	0	40	0	10	50[2]	0
TOTAL	12,264	2,257	3,103	3,424	6,130-6,930	500-520	0-500	1,070	350	100	150[2]	980
LA-3 (Olympic/9th Aerial)												
4th Street[1]	3,335	155	1,035	105	4,800-5,600	300	0	0	0	0	0	0
7th Street[1]	8,242	1,060	1,402	386	5,800-6,500	300-470	0-500	100	200	30[2]	0	130
Olive Street[1]	4,519	1,012	396	1,521	230-350	75	0	1,250	0	30[2]	100[2]	1,580

[1] Office retail and hotel space data obtained from Los Angeles Department of Transportation, CBD Parking Study, 1981.

[2] Infill: Defined as occupancy of existing structures, in contrast to new construction.

TABLE IV-12A (Continued)

DEVELOPMENT WITHIN ONE-QUARTER MILE OF STATIONS

DOWNTOWN LOS ANGELES

	Existing in 1980 (000s of gross square feet)				1980-2000: New Development without Project (000s of gross square feet)				Possible Additional Development by 2000 with Project (000s of gross square feet)			
	Office	Retail	Hotel	Housing Units	Office	Retail	Hotel	Housing Units	Office	Retail	Industrial	Housing Units
LA-3 (Olympic/9th Aerial) [Continued]												
Maple Avenue[1]	674	532	143	246	50	0	0	0	0	30[2]	100[2]	0
Central Avenue	0	0	0	53	0	5	0	0	0	10[2]	100[2]	0
TOTAL	16,770	2,759	2,976	2,311	10,880-12,500	680-850	0-500	1,350	200	100[2]	300[2]	1,710

[1] Office retail and hotel space data obtained from Los Angeles Department of Transportation, CBD Parking Study, 1981.

[2] Infill: Defined as occupancy of existing structures, in contrast to new construction.

Source: Sedway Cooke Associates for office, retail and hotel space, except for footnoted stations; M. L. Frank & Associates (from U.S. Census, 1980 and SCAG-82) for housing.

transit to function in concert with the land development pattern (i.e., for transit to support the existing and planned land use pattern, and conversely for development to support transit through ridership.) The analysis involved an evaluation of each alternative against the specific policies and programs in land use and revelopment plans, and the types and intensities of development permitted by the zoning. The Technical Report on Land Use and Development Impacts (Sedway Cooke Associates, 1984) lists the specific policies addressed in this analysis. The measures presented in this section summarize that analysis. In addition to assessing overall conformance with the relevant plans and policies, the following sections also analyze the differential effects of each alternative. Table IV-12B summarizes the relationship of land use goals to the conformance measures used to assess achievement of these goals.

o <u>Serve Population Concentrations</u>:

Table IV-12C reports population densities along the project's corridor and compares them with population densities along the Metro Rail and 7 other fixed-guideway corridors in the United States. This measure supports the conclusion that densities along this corridor are sufficient to achieve transit-related land use goals specified in local plans and policies. In the downtown Los Angeles segment, the Washington Boulevard corridor to be served by alternatives LA-1 and LA-2 has a substantially higher existing and potential population density than the LA-3 corridor, indicating that with respect to the size of the residential population to be served by the project, alternatives LA-1 and LA-2 would rank significantly higher than alternative LA-3.

The total population and population density for year 2000 within 1/4 mile of stations for each alternative alignment are compared with one another and with the entire segment in Table-IV-12D.

TABLE IV-12B

LAND USE GOALS AND CONFORMANCE MEASURES

Conformance Measures / Transit-Related Land Use Goals:	Permit/promote development of an auto-independent, pedestrian-oriented land use pattern - primarily by serving concentrations of population and employment.	Serve land uses and facilities used by transit-dependent populations. (See also Population Impact Measures.)	Support/reinforce the cities' and county's land use plans and related plans and programs.	Support revitalization of economically stagnant or declining areas.	Be compatible with adjacent land uses. Beneficially impact adjacent land uses and avoid adverse impacts.
1. Serve Population Concentrations	X	X	X		
2. Serve Commercial Development	X	X	X		
3. Serve Activity/Growth Centers	X	X	X		
4. Connect with Other Transit/ Transportation Systems	X	X	X		
5. Enhance Revitalization Efforts	X	X	X	X	
6. Increase Accessibility to Public Facilities	X	X	X		X
7. Compatibility of Yard and Shop Sites with Adjacent Uses with Adjacent Land					X
8. Other Measures of Compatibility with Adjacent Land Uses					X
9. Potential for Growth Inducement	X		X	X	X
10. Opportunity for Joint Development at Stations			X	X	
11. Displacement of Residents and Business (see Displacement)					X

Source: Sedway Cooke Associates, "Technical Report for Land Use and Development Impacts: Long Beach-Los Angeles Rail Transit Project," 1984.

TABLE IV-12C

POPULATION DENSITY

ALONG CORRIDORS AT GIVEN MILEAGE INCREMENTS FROM DOWNTOWNS

(Population per Square Mile, 000s)

	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20
Los Angeles										
Long Beach-Los Angeles[1] (1980)	7.6	9.2	11.2	12.7	9.8	8.4	4.8	5.5	7.8	14.3
Metro Rail[2] (1980)	6	26	15	15	10	10	--	4	9	not calculated
Maximum Density Corridors (45 - Degree Sectors) in Urban Areas with Fixed Guideway Systems (1975)										
Baltimore	41	35	20	9	5	3	1	2	1	1
Miami	28	18	12	12	8	6	4	5	4	1
Washington, D.C.	30	14	13	8	6	4	3	2	1	1
Pittsburgh	21	20	14	9	5	7	1	2	2	0.4
Buffalo	29	14	11	11	4	4	1	2	2	0.4
San Diego	12	12	10	7	6	3	1	1	1	0.3
Atlanta	14	8	6	4	3	3	2	2	1	0.74

[1] Comprises 55 percent of a 45-degree sector radiating for 20 miles from the Los Angeles Civic Center.

[2] Comprises approximately 60 percent of a 45-degree sector radiating for 18 miles from the Los Angeles Civic Center.

Source: Sedway Cooke Associates; Regional Plan Association, 1984.

TABLE IV-12D

YEAR 2000 STATION AREA POPULATION DENSITY

DOWNTOWN LOS ANGELES

	Total Population	Ranking	Population Density: Population/ Square Mile	Population Density: Impact[2]	Population Density: Ranking
Los Angeles Segment	79,440		9,131		
LA-1 Stations[1]	13,533	1	6,497	-	3
LA-2 Stations[1]	8,833	2	12,423	+	1
LA-3 Stations[1]	4,593	3	8,375	-	2

[1] Indicates population within 1/4 mile of station.

[2] + indicates potentially positive impact;
- indicates potentially negative impact.

Source: Sedway Cooke Associates, 1984.

Because alternative LA-1 would include 8 stations, compared with 4 for alternative LA-2 and 5 for alternative LA-3, the total population with pedestrian access to stations would be highest for alternative LA-1. Alternative LA-2 would rank second and alternative LA-3 third. With the inclusion of those areas in downtown Los Angeles that would be accessible to the project's users through a transfer to the Metro Rail system, alternative LA-2 would provide pedestrian access to about the same total population as alternative LA-1; with the Metro Rail connection, alternative LA-3 would provide access to 80 percent of that number.

The population density around stations in the year 2000 on both alternatives LA-1 and LA-3 will be less than that for the downtown Los Angeles corridor segment as a whole. The population density around stations on alternative LA-2 will be substantially higher than that of the downtown area as a whole. Alternative LA-2 would rank highest among the three alternatives in its ability to serve concentrations of residents; alternative LA-1 would rank second and alternative LA-2 third.

Housing development planned by the Los Angeles Community Redevelopment Agency (CRA) for the South Park area by the year 2006, not included in SCAG's growth projections, would substantially increase the number of residents served by alternatives LA-3 and LA-2 and would increase the number served by alternative LA-1 to a lesser extent. As a result, the population density for alternative LA-3 stations would exceed that of the downtown Los Angeles segment as a whole; alternative LA-2 would serve about the same number of residents as alternative LA-1, even without the Metro Rail connection.

- <u>Serve Commercial Centers</u>:

  The number and density of employees and daily shoppers who would be within 1/4 mile of stations on each alternative alignment are compared with one another and with the entire downtown Los Angeles segment in Table IV-12E.

  LA-1 would put the largest total number of employees and shoppers within walking distance of stations because it would include the most stations; LA-3 would rank second and LA-2 third. With a transfer to Metro Rail, LA-2 would serve 30 percent more and LA-3 50 percent more employees in downtown Los Angeles than would LA-1.

  All alternatives would achieve transit-related land use goals by locating stations in areas with higher than average employee and shopper densities. LA-3 would serve the greatest concentration, LA-2 the second greatest, and LA-1 would serve only a slightly higher than average density.

TABLE IV-12E

YEAR 2000 STATION AREA EMPLOYMENT/SHOPPING DENSITIES

DOWNTOWN LOS ANGELES[1]

			Employee and Daily Shopper Density		
	Total Employees and Daily Shoppers)	Ranking	Employees and Daily Shoppers/ Square Mile	Impact[2]	Ranking
Los Angeles Segment	1,016,700		116,900		
LA-1 Stations[3]	242,000	1	116,300	+	3
LA-2 Stations[3]	156,000	3	219,000	+	2
LA-3 Stations[3]	209,000	2	381,000	+	1

[1] Assumes 30 shoppers per day per 1,000 gross square feet and one employee per 300 gross square feet of office, one per 500 square feet of retail, one per hotel room, and 25 per acre of industrial use.

[2] + indicates potentially positive impact.

[3] Within 1/4 mile of stations.

Source: Sedway Cooke Associates, 1984.

o Serve Activity Centers:

The previous measure quantitatively evaluated the extent to which the alternative routes and stations would serve non-residential activity in the downtown Los Angeles segment. This measure addresses the extent to which alternatives would serve areas designated as regional focal points in the county's General Plan and activity centers in the city's Community Plan and Redevelopment Plans. The following downtown activity centers, listed in Table IV-12F, are within pedestrian access of stations on each alternative. All of the alternatives would serve a substantial number of downtown activity centers, especially with a connection to the Metro Rail system.

TABLE IV-12F

SERVICE TO ACTIVITY CENTERS

DOWNTOWN LOS ANGELES

	Service to Activity Centers		
Activity Centers	LA-1	LA-2	LA-3
Union Station	yes	with Metro Rail transfer	with Metro Rail transfer
Olvera Street	yes	with Metro Rail transfer	with Metro Rail transfer
Civic Center	yes	with Metro Rail transfer	with Metro Rail transfer
Little Tokyo	partially	no	no
Bunker Hill	partially	with Metro Rail transfer	yes
West Side Financial District	no	yes	yes
Broadway Shopping/ Historic District	yes	no	partially
Spring Street Historic District	yes	no	partially
Apparel District	yes	no	yes
Produce Center	no	no	yes
Convention Center	no	yes	no
LA Trade Tech College	partially	yes	no

Source: Sedway Cooke Associates, 1984.

o Connect with Other Transportation Systems:

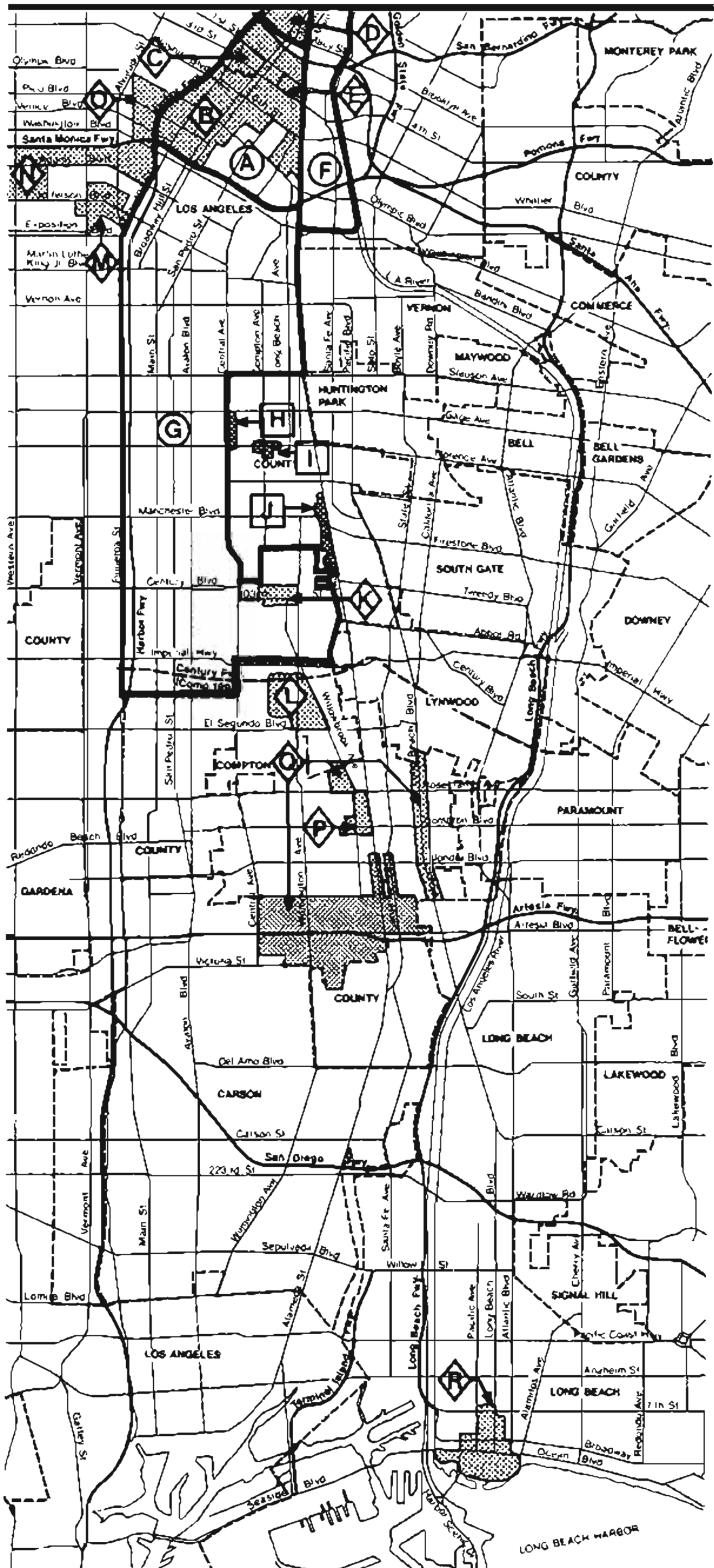
All three downtown Los Angeles segment alternatives would connect with the Metro Rail system. LA-1 would provide a direct transfer at Union Station, while the 1st Street station would be 1½ blocks from the Civic Center Metro Rail station entrance and 1 block from the 4th and Hill Metro Rail entrance. Both LA-2 and LA-3 would connect with the 7th/Flower Metro Rail station. LA-2 would make the most direct connection, since both systems would be underground with a direct transfer at a mezzanine level. The 7th Street station on LA-3 would be located about 1/2 block from the Metro Rail station entrance on an aerial structure. The transfer time between the two stations would be about 5 minutes longer for LA-3 than for LA-2.

LA-1 would connect directly with the other transportation systems proposed to terminate at Union Station: the El Monte Busway, Los Angeles-San Diego Bullet Train, Continental Trailways buses, and possibly a light rail line to Pasadena and Metro Rail line to Norwalk as parts of the future 150-mile Proposition A rail transit network. LA-2 and LA-3 would require a transfer to Metro Rail to connect with these systems at Union Station. LA-1 and LA-2 would have the potential to connect with parking lots on the periphery of the downtown along Washington Boulevard.

In summary, LA-1 and LA-2 would be relatively equal in their connection to other transportation systems, and would both rank higher than LA-3. If the connections available through a transfer to Metro Rail are included, LA-2 would rank first, followed by LA-1 and LA-3.

o Enhance Revitalization Efforts:

In the Los Angeles segment, designated and potential redevelopment areas, shown on Figure IV-12A, are within 1/4 mile of stations for each alternative. Table IV-12C summarizes this information.



- Planning Area
- Redevelopment Area
- Other Designation
- Jurisdictional Boundaries
- Ⓐ Central City Community Plan Area
- Ⓑ Central Business District Redevelopment Project
- Ⓒ Bunker Hill Redevelopment Project
- Ⓓ Chinatown Redevelopment Project
- Ⓔ Little Tokyo Redevelopment Project
- Ⓕ Central City North Community Plan Area
- Ⓖ Southeast Los Angeles District Plan Area
- H Central Avenue Target Area
- I Florence/Graham Community Business Revitalization Target Area
- J Alameda Street Corridor Target Area
- K Watts Redevelopment Project
- L Willowbrook Neighborhood Redevelopment Program Area
- M Hoover Redevelopment Project
- N Adams Normandie Redevelopment Project
- O Pico Union Redevelopment Project
- P Compton CBD Redevelopment Area
- Q Walnut Industrial Park Redevelopment Area
- R Downtown-Tidelands Redevelopment Project

Figure IV-12A

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Planning in Redevelopment Areas

PARSONS BRINCKERHOFF / KAISER ENGINEERS

TABLE IV-12G

RELATIONSHIP TO REVITALIZATION AREAS

DOWNTOWN LOS ANGELES

Redevelopment Areas	LA-1	LA-2	LA-3
Union Station (potential)	yes	with Metro Rail transfer	with Metro Rail transfer
Central Business District Subareas:			
Civic Center	yes	with Metro Rail transfer	with Metro Rail transfer
Central Commercial Core	partially	no	partially
Eastside Industrial	no	no	partially
Little Tokyo	partially	no	no
Bunker Hill	partially	with Metro Rail transfer	yes
South Park	partially	partially	yes

Source: Sedway Cooke Associates, 1984.

- Increase Accessibility to Public Facilities:

  All of the alternatives would improve accessibility to downtown community and social services. Community and public services within a 1/4-mile radius of stations total 57 for LA-1, 17 for LA-2, and 21 for LA-3. (A more detailed discussion of this analysis can be found in Section IV-122.) A transfer to Metro Rail would increase the number of public facilities accessible to users of LA-2 or LA-3 to about 40. LA-1 would provide direct access to the approximately 6 million square feet of city, county, state, and federal offices in the Civic Center area.

- Compatibility of Project Facilities with Adjacent Land Uses:

  In addition to the tracks and stations, project facilities in downtown Los Angeles would include a satellite yard and shop site near Washington Boulevard and Long Beach Avenue and substation sites along the various alternatives. The proposed yard and shop site would have no significant adverse land use impacts. It is located in an area currently in industrial use and designated for such use by the Southeast Los Angeles District Plan. Specific substation sites have not been selected. In those areas zoned for industrial and commercial uses, substations would be permitted without the need for a zoning variance. In redevelopment areas (e.g., at 4th and Figueroa Streets) CRA would have to approve the site plan.

Rail track and stations would follow or be in public rights-of-way already dedicated to transportation uses. The only possible exception to this would be at Union Station (for LA-1) where the ownership of the project's station location and approach right-of-way is currently held privately. However, existing and proposed land use in the Union Station area is dedicated to transportation uses.

o Other Measures of Compatibility:

In addition to having a positive direct or indirect impact on adjacent land uses, another way of measuring conformance to plans is to determine whether there will be adverse impacts on existing or proposed adjacent uses.

Two of the most common concerns with new transit systems are potential adverse impacts on traffic patterns and on parking. Impacts on traffic and parking are discussed in Section IV-130. Generally, there would be no impact on residential neighborhoods due to automobile access to stations, because the areas around downtown Los Angeles stations are almost exclusively non-residential.

Because the project would be either grade separated (aerial or subway) or in the flow of traffic on street level, it would not create safety hazards or a barrier to neighborhood circulation patterns. Light rail vehicles on the street would be perceived to be like buses and would not create any greater safety hazard than buses.

o Joint Development Opportunities:

For this analysis, joint development is defined in two ways: first, as the potential for additional development within 1/4 mile of stations; and second, as development in which the LACTC or other operating agency could participate directly.

By the year 2000 it is expected that 70 million gross square feet of commercial floor space will be available in downtown Los Angeles. Table IV-12A in Section IV-121.11 presents a comparison of commercial floor space by alternative. With 34 million gross square feet, LA-3 would contain the most commercial development (excluding governmental, industrial, and residential uses) within 1/4 mile of stations. LA-1 would contain about 27 million, and LA-2 25 million gross square feet of commercial floor space.

Development projected to occur by the year 2000 is included in the above floor area estimate. The opportunity for additional development beyond 2000 can be evaluated by the availability of vacant or underutilized land zoned for high intensity use near the stations and a general assessment of the type and level of development that could occur there. The amounts of vacant land or commercial surface parking on sites larger than one acre (within 1/4 mile of stations) which would potentially be available for development in the year 2000 are shown in Table IV-12H.

TABLE IV-12H

YEAR 2000 STATION AREA VACANT LAND AVAILABLE FOR DEVELOPMENT

DOWNTOWN LOS ANGELES

Station Area (within ¼ mile)	Acreage	Major Commercial Development Sites	Designated for Potential Development (gross square feet in millions)
LA-1	84	60	13.7
LA-2	78	50	13.1
LA-3	61	55	14.4

Source: Sedway Cooke Associates, 1984.

While other sites with limited amounts of existing development may also be available for development, these are the sites that could be most easily developed. In summary, all of the alternatives would have about the same amount of land available for development. However, the market demand for development is expected to be much stronger in the station areas served by LA-2 and LA-3 than in those served by LA-1.

The sites most likely to be available for development with LACTC participation would be parcels acquired as substation sites. Sites approximately 50 feet by 100 feet would have to be acquired at the substation locations indicated on Table IV-12I; the availability of undeveloped parcels for acquisition and their development potential is also indicated.

Generally, even where there is a market for development, a 50-foot by 100-foot parcel would be too small for a major development project. A mid-rise to high-rise commercial office structure typically requires at least a 200-foot by 150-foot site. Thus, in order to take advantage of joint development opportunities at a site such as the 4th Street station of LA-1, it would probably be necessary to acquire more than the minimum land needed to accommodate the substation. At the substation locations with low development potential, the market would be for wholesale/manufacturing or retail uses, which are typically one story. Generally, it would not be feasible to locate such uses on the same site with a substation. Thus, there appears to be only a limited opportunity for joint development on sites such as Central Avenue that would be acquired for project power substations in the Los Angeles segment.

TABLE IV-121

TRACTION POWER SUBSTATION SITES

DOWNTOWN LOS ANGELES

	Availability	Development Potential
LA-1		
Union Station	on station grounds	none
4th St. - Broadway/Spring St.	yes	moderate
Washington Blvd. - Broadway/Main St.	yes	low
LA-2		
7th St. - Flower St.	with Metro Rail substation	high
18th St. and Flower St.	yes	low
San Pedro St. - Washington Blvd.	yes	low
LA-3		
4th St. - Figueroa St.	not readily available	not known
Olive St. - 9th St.	yes	high
Central Ave. - 9th St.	yes	low

Source: Sedway Cooke Associates, 1984.

IV-121.13 Comparison of Alternatives

Table IV-12J compares the three downtown Los Angeles segment alternatives with respect to land use impacts. When the connection to the Metro Rail system permitting LA-2 and LA-3 to extend service (like LA-1) to Union Station is taken into account, they would be superior to LA-1. LA-2 and LA-3 differ principally in that LA-2 would serve more residential development while LA-3 would serve more non-residential development and employment. LA-2 would provide a better connection to the Metro Rail system than would LA-3.

IV-121.2 Population

IV-121.21 Impact Measures

Two measures were used to evaluate the population impacts of the proposed project: the growth-inducing consequences of implementing a rail transit line and the change in mobility and accessibility potentially available to residents and employees in the corridor.

SCAG has estimated that population growth induced by the project would be about 1 percent greater than growth without the project. Population increases of this magnitude would be insignificant.

IV-121.22 Changes in Mobility and Accessibility

To measure the project's potential effect on mobility and accessibility, each alternative is reviewed in terms of the population, transit dependents, and activity centers served.

Alternatives in the downtown Los Angeles segment would vary greatly in their potential to enhance mobility and accessibility. LA-1 would include 8 station stops, with projected year 2000 population of 13,500. LA-2 would potentially serve 8,830 people with its 5 stations, and LA-3 would potentially serve 4,590 people with its 5 stations. Station areas along LA-1 are projected to grow by 24 percent between 1980 and 2000, along LA-2 by 14 percent, and along LA-3 by 35 percent. These growth rates, projected by SCAG, include only a third of the growth planned by the CRA for South Park by 2006. The additional two-thirds, or 5,000 housing units, which would be served centrally by both LA-2 and LA-3 and peripherally by LA-1, would substantially reduce the difference in population served by the three alternatives. The number of transit dependents served by each alternative is indicated in Table IV-12K. Because of the greater number of stations, LA-1 would serve the transit-dependent population better.

TABLE IV-12J

SUMMARY COMPARISON OF ALTERNATIVES:

LAND USE IMPACTS

Measures	Alternative[1] LA-1	LA-2	LA-3
1. Residential Development Patterns:			
Total population with pedestrian access[2]	1	1	2
Population concentrations with pedestrian access	3	1	2
2. Non-residential Development Patterns:			
Total employees/shoppers with pedestrian access[2]	3	2	1
Employee/shopper concentrations with pedestrian access	3	2	1
3. Activity/Growth Centers Served[2]	1	1	1
4. Transportation Systems Connected[2]	1	1	2
5. Revitalization Areas Served[2]	3	2	1
6. Public Facilities Served[2]	1	2	2
7. Neighborhoods Affected by Traffic	1	1	1
8. Neighborhoods Affected by Parking	1	1	1
9. Safety and Pedestrian Patterns Affected	1	1	1
10. Opportunities for Joint Development Available	3	2	1

[1] A "1" identifies the alternative with the most positive or least negative impact. A "2" identifies the alternative with the second most positive or least negative impact, and a "3" the third. If two or more alternatives have comparable impacts, they are given the same rank.

[2] Includes areas in downtown Los Angeles served through a transfer to the Metro Rail System.

Source: Sedway Cooke Associates, 1984.

As currently designed, only LA-1 would directly connect Long Beach and the mid-corridor with the downtown Los Angeles Civic Center; LA-2 and LA-3 would serve the Civic Center indirectly via transfer to Metro Rail. LA-1's route along Washington Boulevard and Broadway/ Spring would provide access to prime retail/industrial/governmental employment areas. LA-2 would also serve the retail/industrial areas along Washington Boulevard, but would continue farther west to provide access to the Convention Center, South Park, and the recent office development on the west side of downtown Los Angeles. In contrast to LA-1 and LA-2, LA-3 would continue north to 9th Street and then west to Figueroa Street, providing access to the city's apparel, produce, and wholesaling jobs. The 4th Street and 7th Street stations would serve the westside office development, including the Bunker Hill Redevelopment Project. LA-1 would serve more activity centers and employees than LA-2 or LA-3; however, if a transfer to the Metro Rail system at 7th/Flower is included in the comparison, LA-3 and LA-2 would serve more employees than LA-1.

TABLE IV-12K

NUMBER OF TRANSIT DEPENDENTS

POTENTIALLY SERVED BY PROJECT ALTERNATIVES

DOWNTOWN LOS ANGELES[1]

	LA-1		LA-2		LA-3	
	1980	2000	1980	2000	1980	2000
Ethnic/Racial Minorities	8,055	9,879	6,740	7,685	2,239	3,031
Youth	2,152	2,707	2,467	2,827	529	735
Elderly	1,295	1,624	852	972	962	1,286
Low-Income	5,907[2]	7,308	3,567[2]	4,063	1,530[2]	2,067

[1] Because the demographic profile of downtown Los Angeles could change between 1980 and 2000, projections of the future number of transit dependents are speculative. To arrive at a rough approximation of their number in 2000, the proportion these groups representative of the 1980 population has been applied to the year 2000 station area population.

[2] Derived from population total.

Source: Sedway Cooke Associates, 1984.

Mobility/accessibility can also be evaluated in terms of potential connections with other transit modes. LA-1 would be intercepted by a greater number of bus trips because its alignment would be the longest, continuing to Union Station; however, with the transfer to the Metro Rail system included, all alternatives would provide access to an equal number of intersecting bus trips. Furthermore, LA-2 and LA-3 would offer a more convenient link to the Wilshire corridor.

IV-121.23 Mitigation Measures

There are no significant adverse population effects expected from operation of any of the rail alternatives. Therefore, no mitigation measures would be necessary.

IV-121.3 Housing

IV-121.31 Impact Assessment

If the operation of the project could affect housing in the project corridor, it would be by intensifying residential development activity in station areas. In downtown Los Angeles, however, SCAG's projections do not indicate any housing growth directly attributable to operations of the project. It is possible that the project would directly stimulate residential development in the South Park area by acting as a catalyst for CRA's redevelopment activities. Each of the three downtown Los Angeles alignment alternatives would have two stations within walking distance of portions of South Park. The 7th Street and Pico Boulevard station areas of LA-2 and the 7th Street and Olive Street station areas of LA-3 would include nearly all of the potential residential development sites in South Park.

The existence of the project in South Park would support CRA's residential development efforts by increasing the area's attractiveness as a place to live. In this way, the project operations would directly contribute to South Park's housing growth rate. SCAG-82 projections indicate that, without the project, South Park's housing stock would increase by approximately 2,000 units between 1980 and 2000. According to CRA, the residential development potential for the area would allow for an increase of over 7,000 units during the same period. It is estimated that, by improving the climate for residential development in South Park, the project system could promote the construction of 2,500 units above the SCAG-82 projected increase of 2,000 units, for a total of 4,500 units. A potential distribution of South Park housing growth directly induced by the project can be found in Table II-12A.

IV-121.32 <u>Mitigation Measures</u>

Since the operation of the project would not impose any significant adverse impacts on housing in downtown Los Angeles, mitigation measures would not be required.

IV-122 Community Services

The project is expected to have both beneficial and adverse effects on downtown Los Angeles community services. Benefits in the form of improved access would be realized by those community service facilities within station walking areas or within areas served by the complementary bus network. Table IV-12L lists the number of service facilities, by type, located within walking distance (1/4 mile) of the stations along each of the downtown Los Angeles alignment alternatives.

Depending on the type of service provided, improved access to a facility may result in increased convenience for users and/or increased patronage. Facilities offering services with inelastic demand (i.e., there is little choice in using a service) may experience more convenient access but not necessarily greater patronage. On the other hand, facilities with elastic demand (i.e., there is a high degree of choice in using a service) may experience an increase in patronage.

TABLE IV-12L

COMMUNITY FACILITIES WITHIN ONE-QUARTER MILE

OF DOWNTOWN LOS ANGELES STATIONS

Facilities By Type	Alternative		
	LA-1	LA-2	LA-3
Schools	5	3	0
Libraries	2	1	1
Churches	7	6	5
Parks	2	0	0
Medical Facilities	7	3	4
Government Office Buildings	14	2	3
Local Social Services	21	2	8
TOTAL	57	17	21

Source: M. L. Frank & Associates, 1984.

Implementation of the project may put additional strain on the LAPD's law enforcement efforts. Although security and law enforcement aboard the project would be the responsibility of specially trained SCRTD transit police, the LAPD may be called upon to lend support in emergency situations.

Operations of emergency services (police, fire, and paramedic) in downtown Los Angeles could be adversely affected by implementation of the project. The response times of emergency vehicles may be lengthened by increased traffic congestion at grade crossings. This impact would be significant only along at-grade segments. Throughout the corridor, fire department access to all elements of the rail transit system and to all structures immediately adjacent to the alignment would be ensured by strict adherence to the requirements of fire protection authorities.

Providers of utilities in the rail corridor have indicated that the project would have no significant adverse impacts on the provision of gas, water, or electricity. Also, with procurement of the required permits, the disposal of solid and liquid wastes generated from the project could be accommodated at local disposal sites.

IV-122.1 Mitigation Measures

Since there would be no significant adverse impacts, no mitigation measures would be necessary.

IV-123 Economic Activity

IV-123.1 Property Tax Revenue

None of the proposed alternative alignments in the downtown Los Angeles would require significant property takings at Union Station for the track and stations. Alternative LA-1 would require minor property takings at Union Station for its proposed track alignment and station locations. It is anticipated that the LA-2 alternative may require acquisition of subsurface easements for accommodation of stairwells and utilities. The LA-3 alternative would require aerial easements to accommodate stations and curves in the alignment.

Each of the alternative alignments in the Los Angeles CBD would require permanent property takings for the location of three substations along their route. It is estimated that each substation would require 5,000 square feet of land area. Based on a sample of properties in areas where the substations would be located, it is estimated that the three substations would remove approximately $450,000 in assessed property value from the tax rolls. This would translate to an annual revenue loss of about $4,500.

The satellite maintenance year proposed for location at the intersection of Hooper and Long Beach Avenues in the LACBD would require the permanent acquisition of 2.7± acres of property along Long Beach Avenue, where the yard is proposed for location. This property is currently owned by Southern Pacific Railroad and is tax-exempt. The location of the maintenance yard at this location would therefore not have an impact on the Los Angeles County property tax base.

New office, industrial, and housing development in conjunction with the proposed project would increase the property tax base in the Los Angeles CBD and generate new property taxes to the County, City of Los Angeles, Special Districts, and other taxing agencies. Based on the projections of new development presented in Section IV-121.3 and Table IV-12A, the potential new annual property tax revenue generated by the project is shown in Table IV-12M in constant 1983 dollars.

TABLE IV-12M

ANNUAL PROPERTY TAX REVENUE

DOWNTOWN LOS ANGELES ALTERNATIVES

Indirectly Induced New Land Use	LA-1	LA-2	LA-3
Office	$ -	$ 875,000	$ 550,000
Industrial	-	-	-
Housing	890,000	1,000,000	1,800,000
TOTAL Property Tax Benefit	$890,000	$1,875,000	$1,800,000

Source: Williams-Kuebelbeck and Associates, 1984.

IV-123.2 Local Business Activity

All of the downtown Los Angeles alignment alternatives would pass through what are predominantly highly developed areas on Washington Boulevard, Spring and Main Streets, Broadway, Flower and 9th Streets, and Figueroa Street. The predominantly commercial character of these streets would not be significantly affected by implementation of the light rail system.

In general, the direct impact of the system on business activity along the proposed alignments could be expected to be only modest at best. Some increases in sales of convenience goods as well as personal services and restaurants might result in immediate station areas. However, only minimal changes in office employment, shoppers' goods sales, and other commercial activities would be likely to result directly from implementation of the project.

The proposed project could indirectly result in increased retail sales and sales tax revenues in the Los Angeles CBD through the enhanced potential for 100,000 square feet of new and infill retail uses. Based on the projections of new development presented in Table IV-12A and assuming an average annual taxable sales volume ranging between $100 and $125 per square foot in 1983 constant dollars, the proposed project could indirectly generate annual retail sales and sales tax revenue to the state, City of Los Angeles, and the LACTC by alternative alignment as shown in Table IV-12N.

TABLE IV-12N

ANNUAL SALES TAX REVENUE

DOWNTOWN LOS ANGELES ALTERNATIVES

Annual Impact	LA-1	LA-2	LA-3
Retail Sales	$10,000,000	$15,000,000	$8,800,000
Sales Tax Revenue	650,000	975,000	572,000

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

IV-123.3 Net Fiscal Impact

All of the proposed alternative alignments in the Los Angeles CBD would have a positive net fiscal impact through the direct inducement of new development and retail activity at locations immediately adjacent to each alignment. The net annual fiscal impact from each source and alternative alignment is shown in Table IV-12O.

TABLE IV-120

NET FISCAL IMPACT

DOWNTOWN LOS ANGELES ALTERNATIVES

Cost/Benefit Source	LA-1	LA-2	LA-3
Property Tax Loss - Substations	$ (4,500)	$ (4,500)	$ (4,500)
Property Tax Gain - New Development	90,000	1,875,000	2,350,000
Retail Sales Tax	650,000	975,000	572,000
TOTAL BENEFIT	$1,535,500	$2,845,500	$2,917,500

Source: Williams-Kuebelbeck and Asociates, Inc., 1984.

IV-124 Visual Quality

IV-124.1 Impact Measures

A new visual element will be perceived differently by different observers. The assessment of visual impacts addresses direct changes in the visual setting introduced by the rail transit line. The impact measures used to document a range of significant visual changes are summarized in Table IV-12P.

IV-124.2 Impact Assessment and Mitigation Measures

The most significant visual impacts in the downtown Los Angeles segment would be caused by the aerial portions of LA-1 and LA-3. The aerial structure with its overhead wires and support poles would be a dominant visual element whose impact would vary according to its context. Visual impacts of the at-grade segments would be limited primarily to the effects of required street widenings rather than to the characteristics of the system itself. The following discussion will first identify the changes in the visual setting affected by each alternative and then compare the relative impacts of the three alternatives. The discussion will address the impact from the perspective of both viewers of the project at street level and of users of the project riding in the rail vehicles.

TABLE IV-12P

MEASURES OF COMPATIBILITY OF THE TRANSIT ALTERNATIVES WITH THE VISUAL SETTING

Impact Measure	Negative	Positive
View alteration	Blocks or obscures views.	Opens up views or focuses existing views.
Change in visual setting	Removes positive elements or Adds negative elements that discourage upgrading of surroundings or that lower the quality of the surroundings.	Adds positive elements that enhance or encourage upgrading of surroundings. Removes negative elements.
Appearance of street facade	Removes or disrupts features that contribute to scale, continuity, etc., of street facade.	Removes or disrupts features that detract from or adds features that contribute to scale, continuity, etc.
Appearance of street space	Does not promote definition of pedestrian space as separate from vehicular space or a continuous enclosure in scale with the street.	Promotes definition of pedestrian space as separate from vehicular space and a continuous enclosures in scale with the street.
Compatibility of scale	Does not conform to prevailing scale.	Conforms to the prevailing scale.
Visual Proximity	Intrusion: Very serious (within 60' of facades); Serious (within 61' - 120' of facades).	Negligible intrusion: (greater than 120' from facades).

Source: Sedway Cooke Associates, 1984.

IV-124.21 LA-1 (Broadway/Spring Couplet)

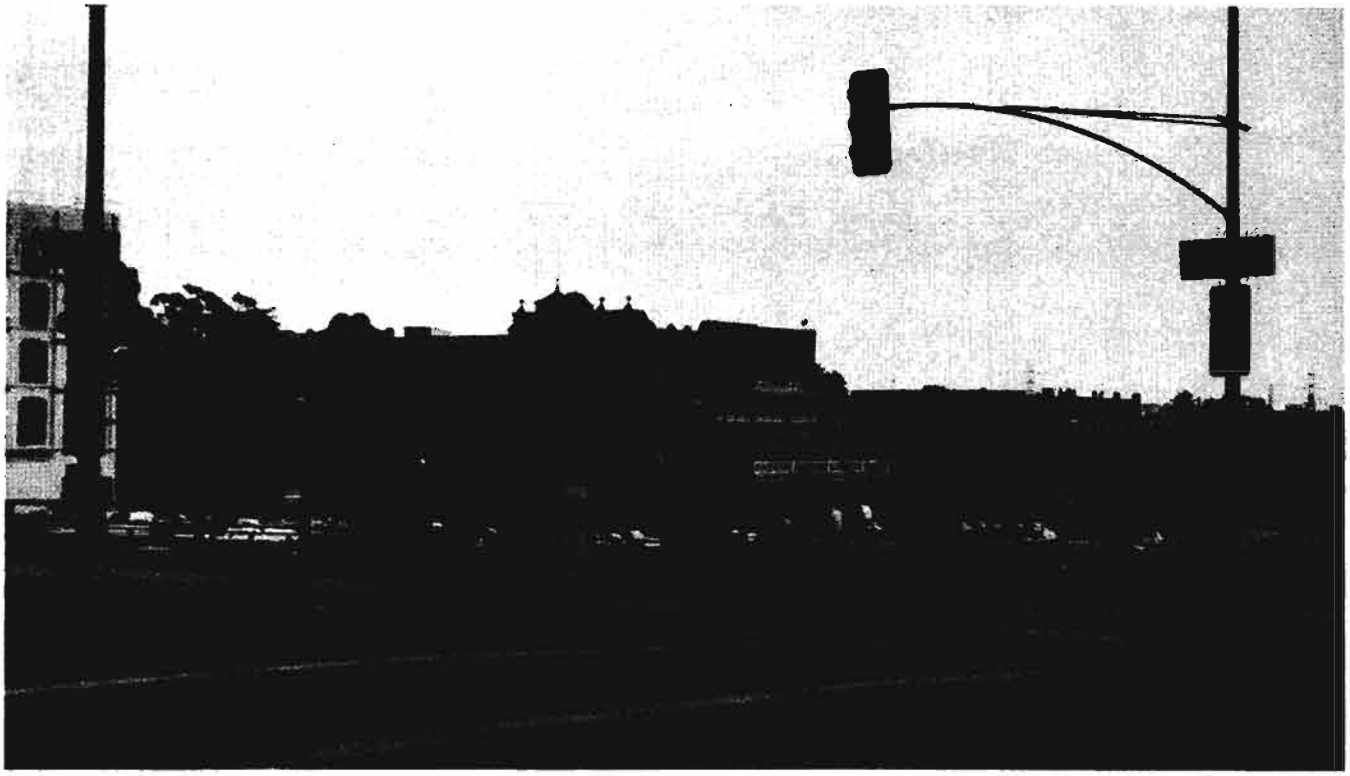
The elevated portion of LA-1 from Union Station to Broadway and Spring Streets along the Hollywood Freeway would consist of a guideway structure 16½ to 30 feet above cross streets and 20 to 40 feet above the depressed freeway. It would be approximately 24 to 26 feet wide, supported by 7-foot-wide columns at 80-foot intervals. Electrical overhead wires above the structure would be supported either by single 18-foot-high support poles located between the two tracks at 100-foot to 130-foot intervals or by double support poles on the outside edge of the tracks. Between Los Angeles Street and the points at which the tracks meet the street elevation on Spring Street (northbound) and Broadway (southbound), there would be two separate structures, each about 14 feet wide and each with single support poles, as shown in Figure IV-12B.

The guideway would intermittently block views of the El Pueblo de Los Angeles State Historic Park for viewers at street level south of the freeway as shown in Figure IV-12B. The support poles and electrical overhead wires would be visible as intermittent vertical elements above the guideway against the sky.

On the positive side, for project patrons, there would be increased exposure to the cultural and historic properties at Union Station (see Figure IV-12C), The El Pueblo de Los Angeles State Historic Park, and the Civic Center. The guideway within the wide, 150-foot freeway right-of-way and over the depressed Hollywood Freeway could have a positive impact on the scale and visual appearance of the area. It would, to some extent, define a northern boundary for the Civic Center area with its diverse architectural forms and scale, as illustrated in Figure IV-12D.

Visual impacts of the at-grade portions of LA-1 along Broadway and Spring Street from the Hollywood Freeway to Washington Boulevard would be associated primarily with the required widening of Broadway. The west side of Broadway would be widened by 2 feet along the entire alignment except between Aliso and Temple Streets, 8th and 9th Streets, and 9th Street/Olympic Boulevard, where it would only be tapered. The street widening would result in the removal of trees and historic sidewalk paving, and in the relocation of historic light standards (see Figure IV-12E). The trees that would have to be removed on Broadway include 7 Rustyleaf figs, 12 Southern Magnolias, 7 Fern pines, 6 London Plane Trees, 28 Evergreen Pears, 21 Jacarandas, 24 Indian Laurel figs, and 2 other broadleaf evergreens.

The catenary support poles and electrical overhead wires added on both Broadway and Spring Street would be the only overhead utilities on those streets as existing electrical and telephone wires are underground. However, views of these added elements would be obscured and screened to some extent by the existing mid-rise buildings and by landscaping. The wires would be less obvious against the



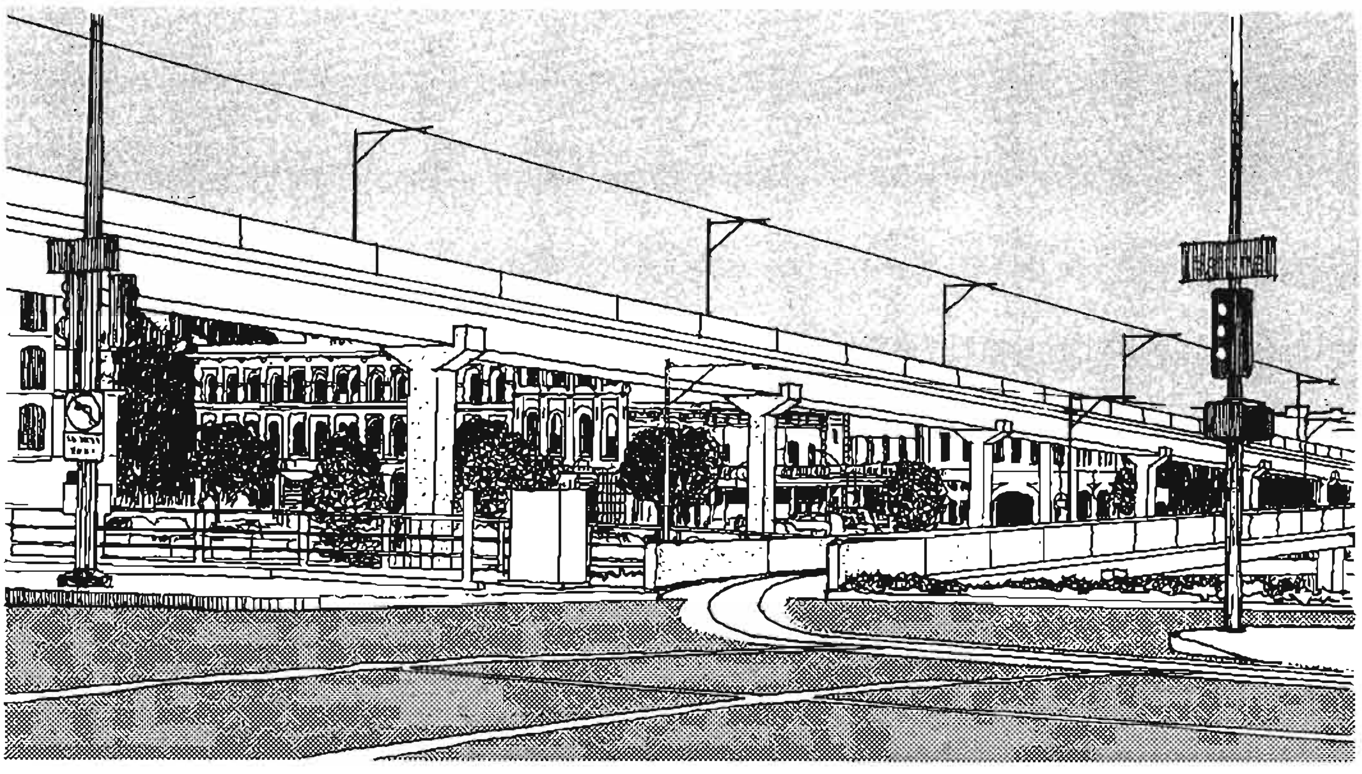


Figure IV-12B

Looking northeast toward Olvera Street from the intersection of Spring Street and the 101 Freeway in 1984 (above) and after construction of Alternative LA-1 (below).

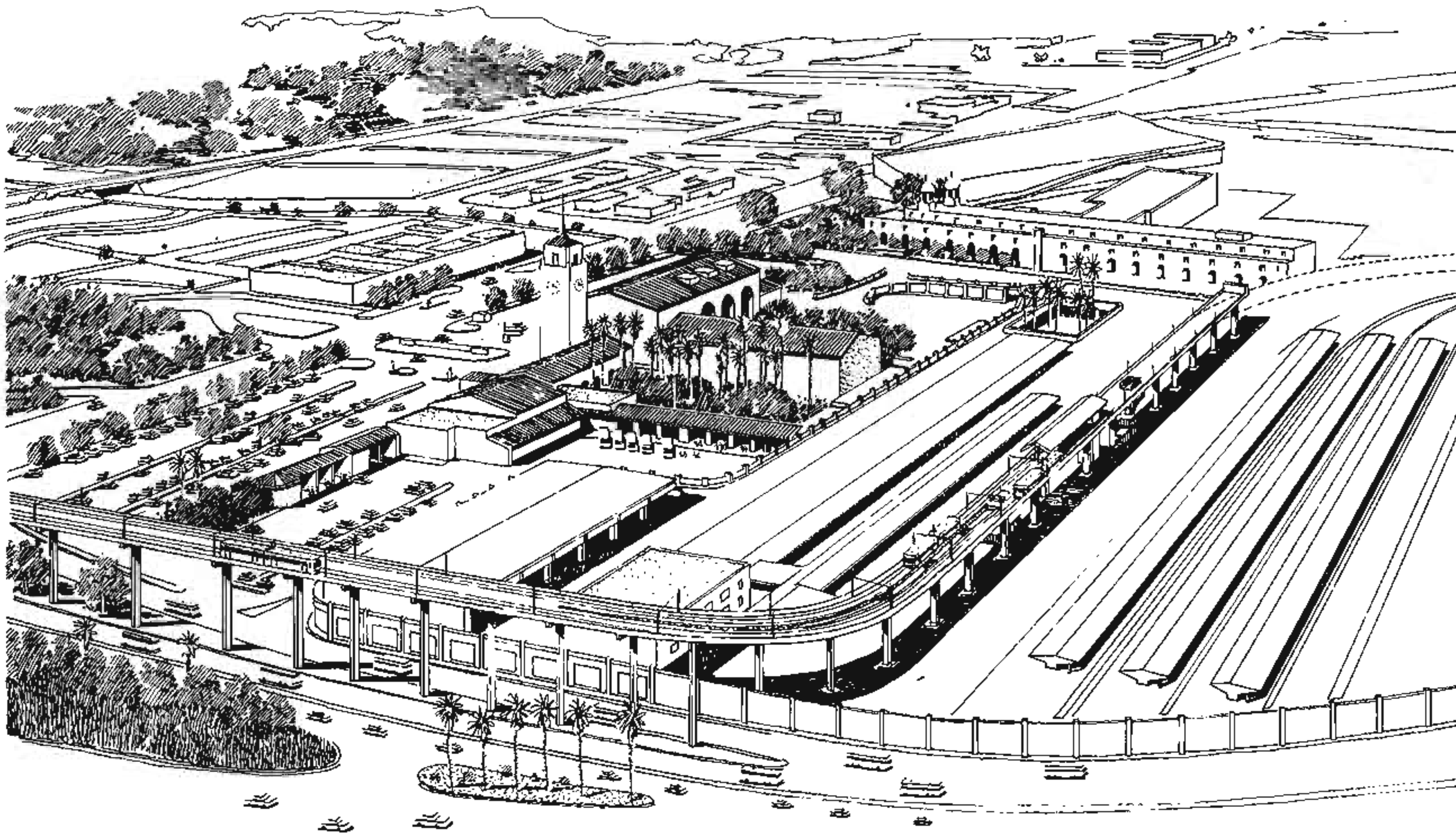


Figure IV-12C

Bird's eye view of Union Station looking north after construction of either LA-1 or the extension of LA-3. Approaching Union Station from the west, the aerial structure would parallel the Hollywood Freeway directly above the El Monte busway. At Union Station, the station platform would be located just east of the existing baggage facilities. Escalators, stairs, and an elevator would connect the platform with the subterranean Metro Rail station and Amtrak facilities.

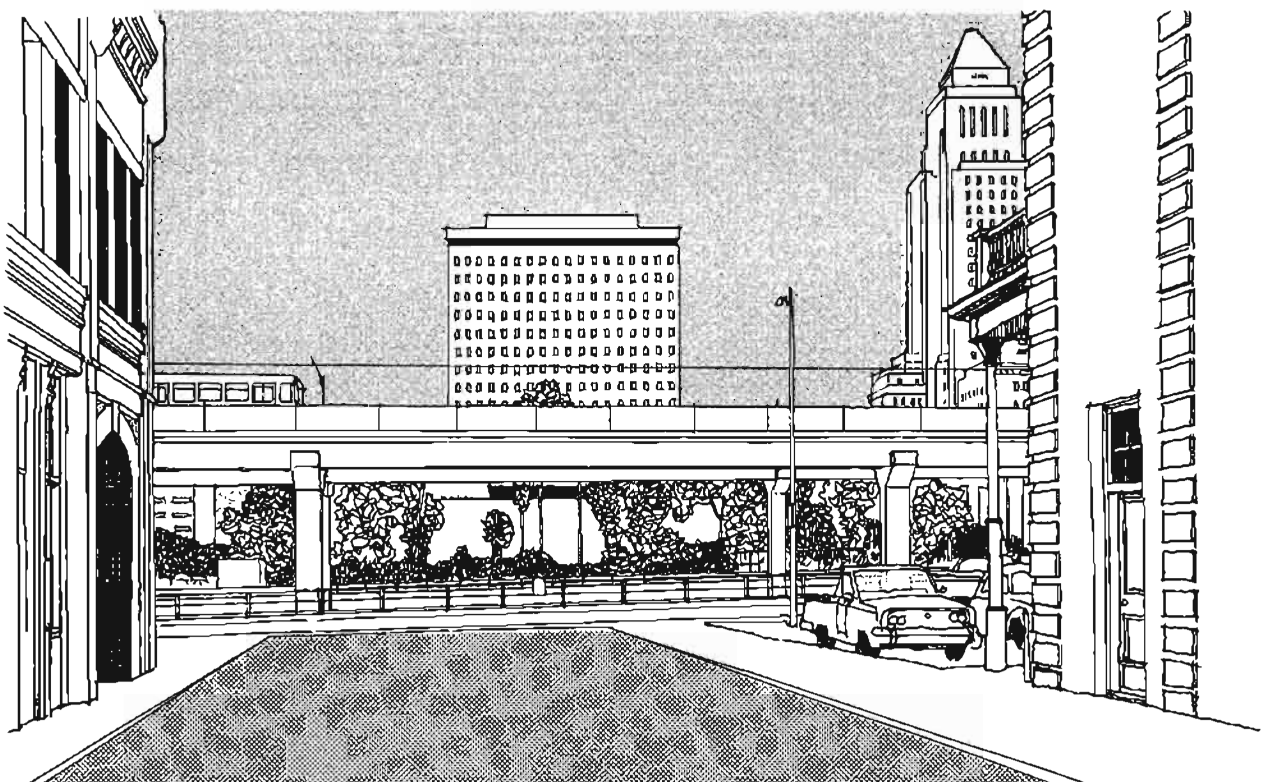


Figure IV-12D

Looking south from Olvera Street toward Civic Center across the 101 Freeway in 1984 (above) and after construction of Alternative LA-1 (below).

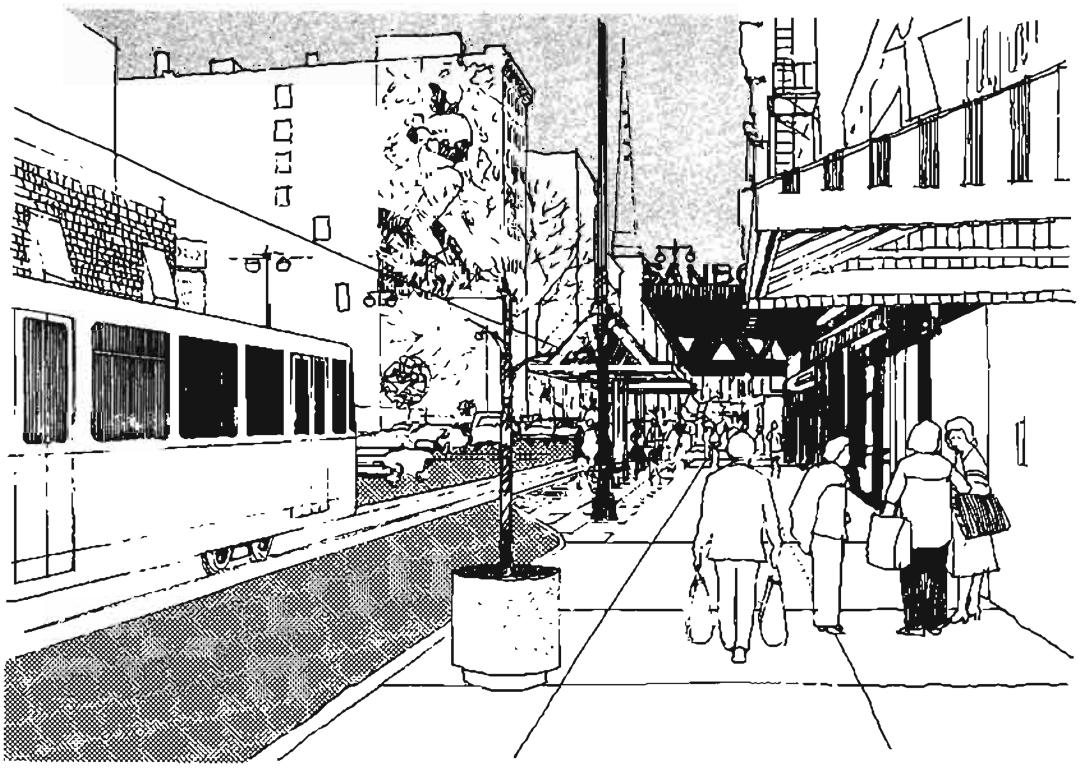


Figure IV-12E

Looking south on Broadway from its intersection with Fourth Street in 1984 (above) and after construction of Alternative LA-1 (below). The southbound rail line would be in the righthand traffic lane of Broadway with station stops extending into the parking/peak-hour traffic lane.

backdrop of a mid-tone building facade than against the bright, otherwise unobscured sky.

Along Washington Boulevard where utilities are overhead and buildings are primarily low-rise, the addition of support poles and overhead wires would add to the existing collection of utility lines. At the station areas along Washington Boulevard, the street would be widened by 2 feet, which would require the relocation of utility poles.

The substations on both Broadway at 4th Street and on Main Street at Washington Boulevard would affect the visual setting. Half of each 50-foot by 100-foot substation would be a structure and the other half an open, fenced yard. The substations would negatively alter the visual setting where they could not be incorporated into the design of a large-scale development (see Section 121.12 of this chapter). In such cases the obviously non-commercial use and the exposed equipment in the yard area would be incompatible with surrounding uses.

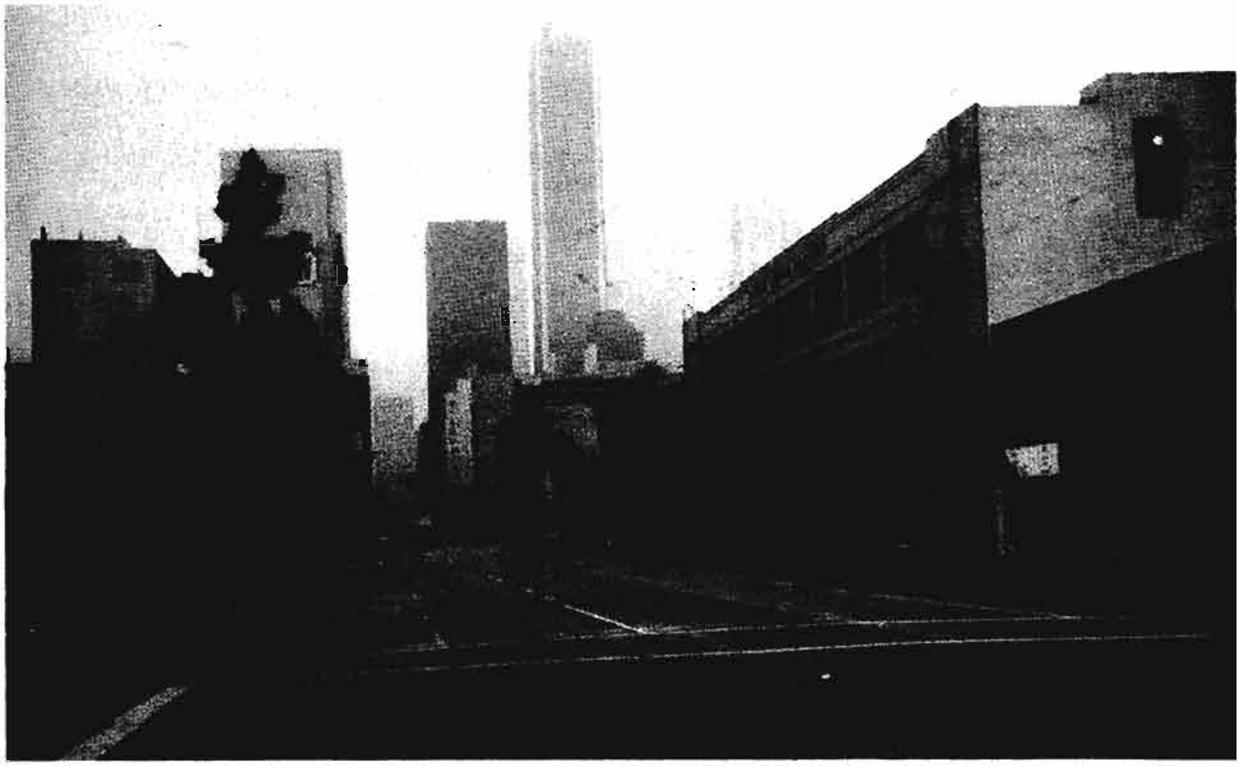
The added visual element of the overhead wires and support poles on the aerial structures could be eliminated by the use of a third rail in the aerial portion of the line. However, this would require that vehicles be equipped for both overhead and third-rail electrical connections at an additional cost to the project and a small increase in travel time.

The removal of street trees along Broadway could be mitigated by replacing them. In fact, the streetscape could be enhanced by replacing the trees with a single species appropriate to the character of the street. The removal of historic paving, however, would be an unavoidable impact.

Integration of the substations into larger development projects to mitigate their visual impact would require the acquisition of larger parcels and/or coordination with private developers. The Los Angeles Zoning Ordinances require that facilities such as this be enclosed by a solid wall when located in commercial zones. Fencing and facades could be designed to complement surrounding structures and to minimize visual incompatibilities.

IV-124.22 LA-2 (Flower Street Subway)

Since LA-2 would include no aerial portions, its visual impacts would be limited to the addition of support poles, overhead wires, and stations where the alignment would be at-grade along Flower Street from the portal at 12th Street south to Washington Boulevard and along Washington Boulevard; the portal at 12th Street; and the subway station entrances at 7th Street. The support poles and overhead wires would be the only overhead utilities on Flower Street and would add to the existing collection of utilities on Washington Boulevard. At station locations along Washington Boulevard, the street would be widened by 2 feet, which would require the relocation of utility poles.



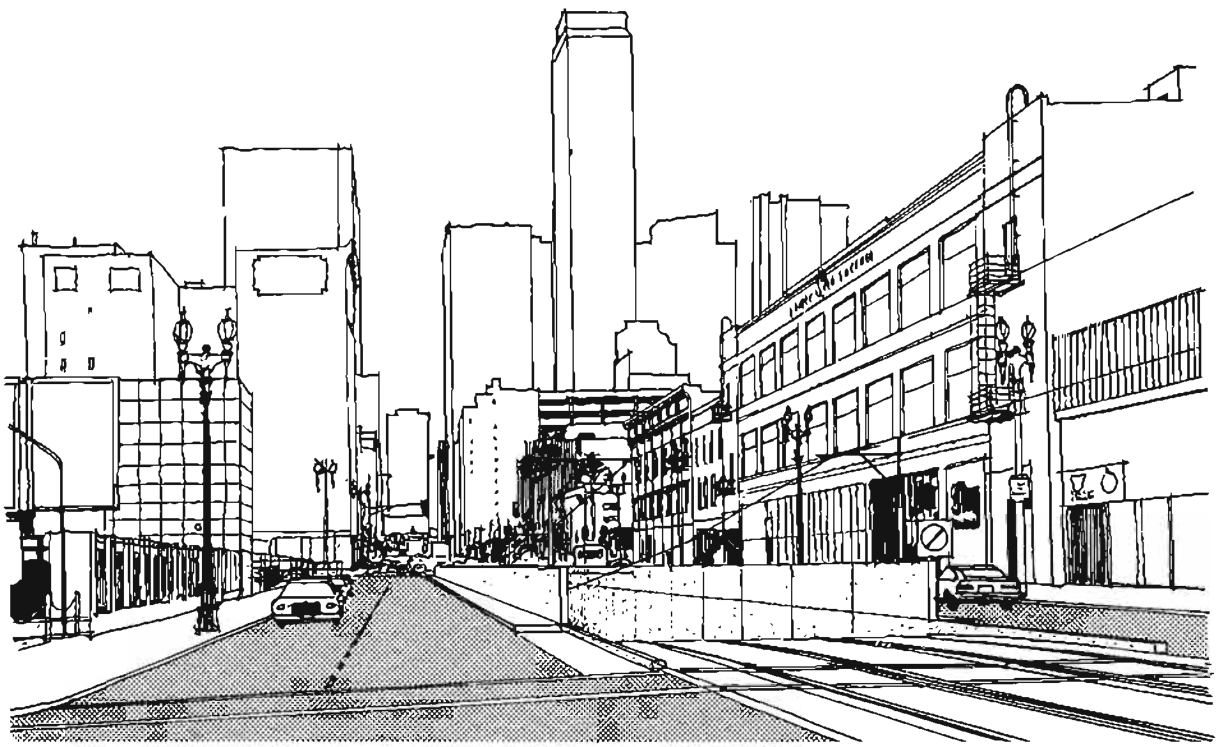


Figure IV-12F

Looking north on Flower Street from its intersection with 12th Street in 1984 (above) and after construction of Alternative LA-2 (below). The portal from surface to subway would be located in the center median and would require widening of Flower Street on both sides.

The visual effect of the portal from subway to surface in the center median of Flower Street between 11th and 12th Streets is depicted in Figure IV-12F. The portal structure for the subway, located in the street right-of-way and including a chain-link barrier fence, would displace existing parking spaces and street trees. It would also require the relocation of historic light standards. The trees that would have to be removed on Flower Street include 15 Canary Island pines and 3 Indian Laurel figs.

Two of the three proposed substations for LA-2 (i.e., 18th Street and San Pedro stations) would adversely affect the visual setting as described under LA-1. The substation at 7th and Flower Streets, however, is planned to be combined with the Metro Rail substation and integrated into a larger development project. Consequently, it would not produce adverse visual impacts. At the other two locations, the visual impact for a free-standing substation would be less significant because surrounding uses are largely industrial.

The replacement of street trees along the portal would mitigate the impact of their removal and could improve the character of the street by selecting species which are more appropriate visually and functionally. The proposed chain-link fence could be replaced by a low concrete wall or decorative metal fence (see Figure IV-12F).

Impacts of substations could be mitigated by integrating them into larger development projects where possible. The substation at Flower and 18th Streets (Santa Monica Freeway) could be located under or near the freeway structure to minimize visual impacts.

IV-124.23 LA-3 (Olympic/9th Aerial)

Because LA-3 would consist of an elevated guideway for most of its length, it would produce the most significant impacts on the overall character, scale and form of the visual setting. Like the aerial portion of LA-1, the guideway would be 16½ to 40 feet above the ground and 24 to 26 feet wide, supported by 7-foot-wide columns at roughly 80-foot intervals. Single or double catenary support poles at 100-foot to 130-foot intervals and overhead wires would extend 18 feet above the guideway. The aerial stations at Figueroa and 7th Streets and Figueroa and 4th Streets would stand approximately 33 to 40 feet above ground, be 53 feet wide at the platform level, and extend about 250 feet in length, as shown in Figure IV-12G.

Although the aerial guideway above the center median of Figueroa Street from 3rd Street to 6th Street could be considered an adverse affect on the visual setting, it is not deemed to be a significant adverse affect. Located in the 80-foot to 110-foot right-of-way with variable building setbacks, the guideway would become an organizational element in the streetscape. It would provide a focal point and would be consistent with scale of the street and the buildings on it. It would reinforce the organization and separation of vehicular and pedestrian circulation by providing a connection to the second-level

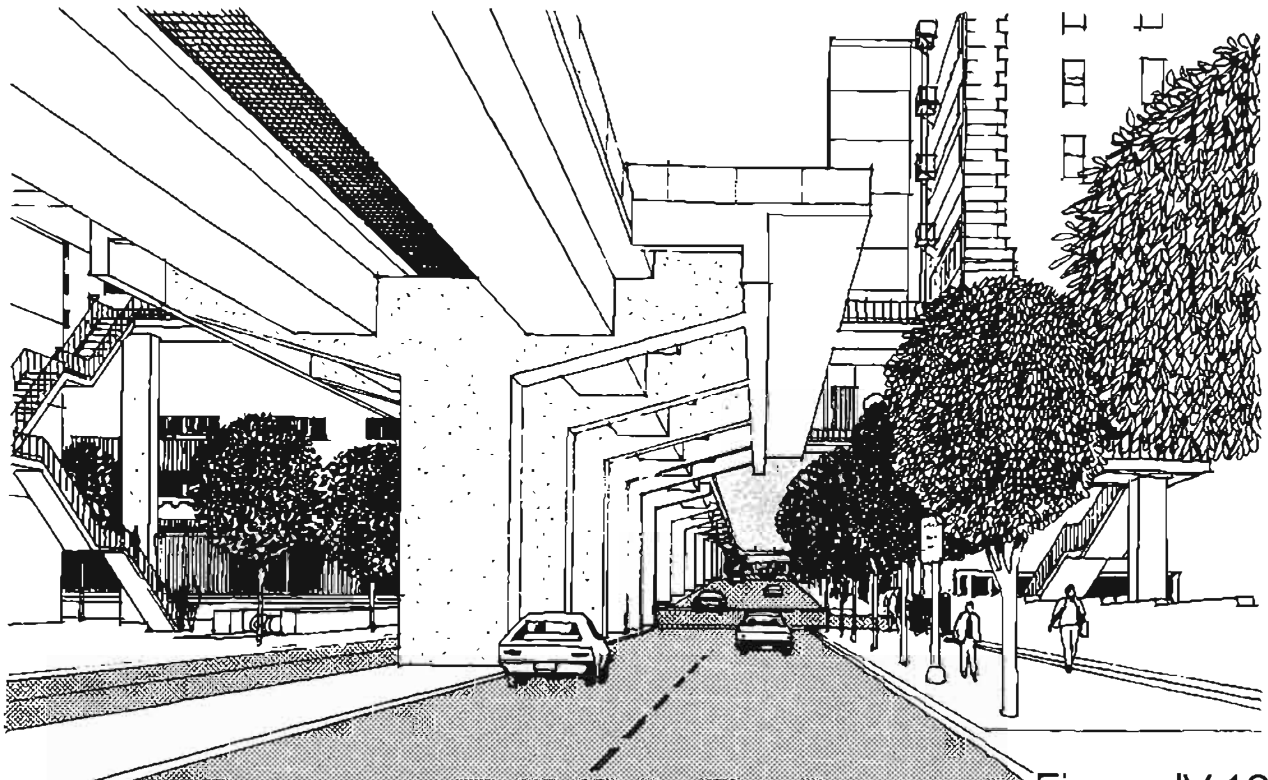


Figure IV-12G

Looking north on Figueroa Street at the intersection of Figueroa and Seventh Streets in 1984 (above) and after construction of Alternative LA-3 (below). An escalator and stairway to the aerial station would be located adjacent to the proposed Metro Rail station entrance near the Citicorp development on the southwest corner of the intersection.

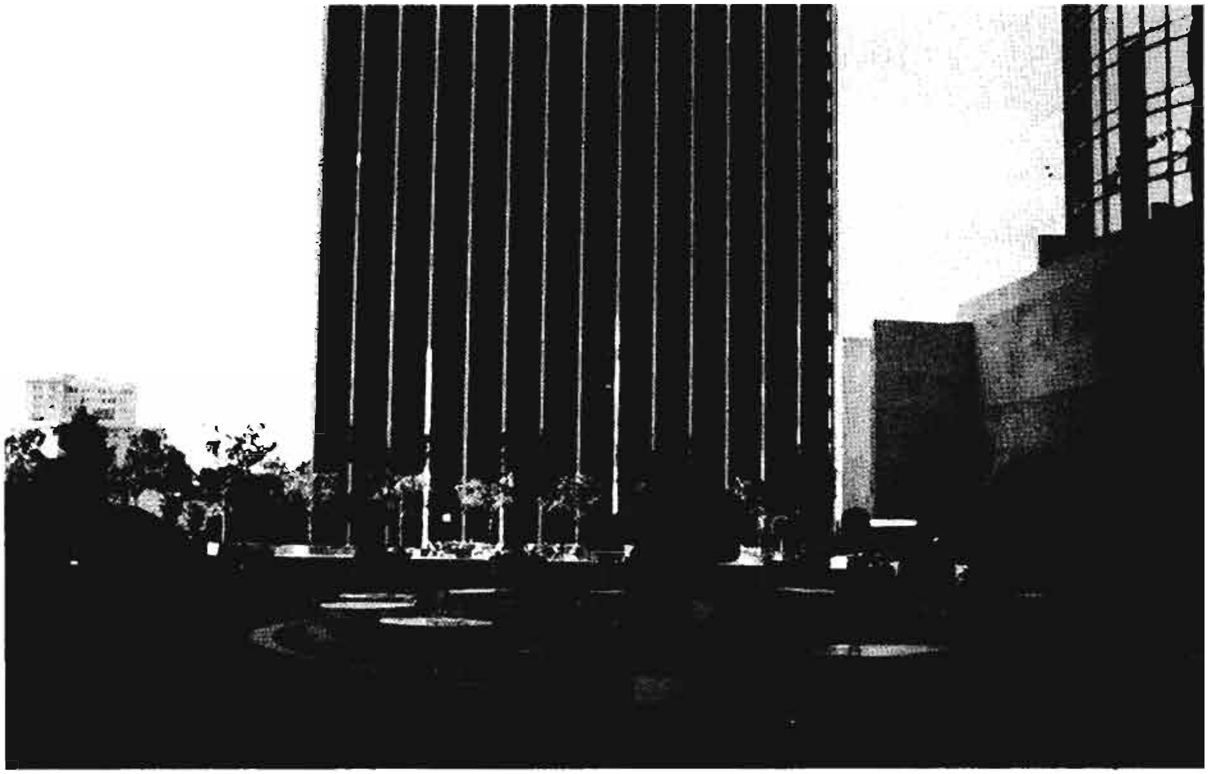
pedway and plaza system along Figueroa and Flower Streets. Furthermore, for project users, it would increase the visibility of those second-level plazas. Conversely, it would be a strong visual element for pedestrians on the plazas as shown in Figure IV-12H. Because of the wide right-of-way and additional building setbacks, encroachment on the visual privacy of the adjacent office uses would not be as serious. Figure IV-12I illustrates the view of the guideway from the sidewalk in front of the Jonathan Club at Figueroa and 6th Streets.

The shadow cast by the guideway structure onto the sidewalk and plaza areas of Figueroa Street would vary seasonally and diurnally. As a worst case, at mid-morning on a winter day a continuous shadow paralleling the guideway about 80 feet west of it and up to about 16 feet wide would be cast on the ground plane. The columns would cast shadows 80 feet long and about 7 feet wide at 88-foot intervals. A shadow about 8 feet wide would be cast along the facades of buildings at varying heights above the ground, depending on their distance from the guideway. For example, the mid-morning winter shadow across the facade of the Hilton Hotel would be about 20 feet above the ground. At noon the shadow band would be about 10 feet wide and would be located about 60 feet west of the guideway. At mid-afternoon in the winter, the shadow would be located almost directly under the guideway and would not affect sidewalks or buildings facades. During the spring and fall the shadow band would be narrower and would fall across the sidewalks and buildings facades less frequently. During the summer the shadow would fall in the street rather than on the sidewalks for most of the day.

On Figueroa Street from 6th to 9th Streets where the street narrows, the added central median strip and guideway would displace a parking lane. Because the street is narrower and setbacks are smaller, the guideway would become a more dominant visual element.

At Figueroa and 7th Streets views of the plaza area and commercial development within the CitiCorp Center, under construction, would be intermittently screened by the columns supporting the aerial station. If the aerial stations along Figueroa Street at 4th and 7th Streets must be supported by structural bents because of poor soil conditions, visual tunnels would be created along Figueroa Street for the 250-foot length of the stations and would significantly alter the street space.

As the guideway curves onto Figueroa Street, it would cross over the proposed public plaza of the International Tower, now under construction, and would create negative visual impacts. In particular, a major piece of sculpture is planned for the public plaza on the northeast corner of 9th and Figueroa Streets, adjacent to the new International Tower building. The sculpture is meant to define the gateway to South Park and the downtown area. The aerial guideway



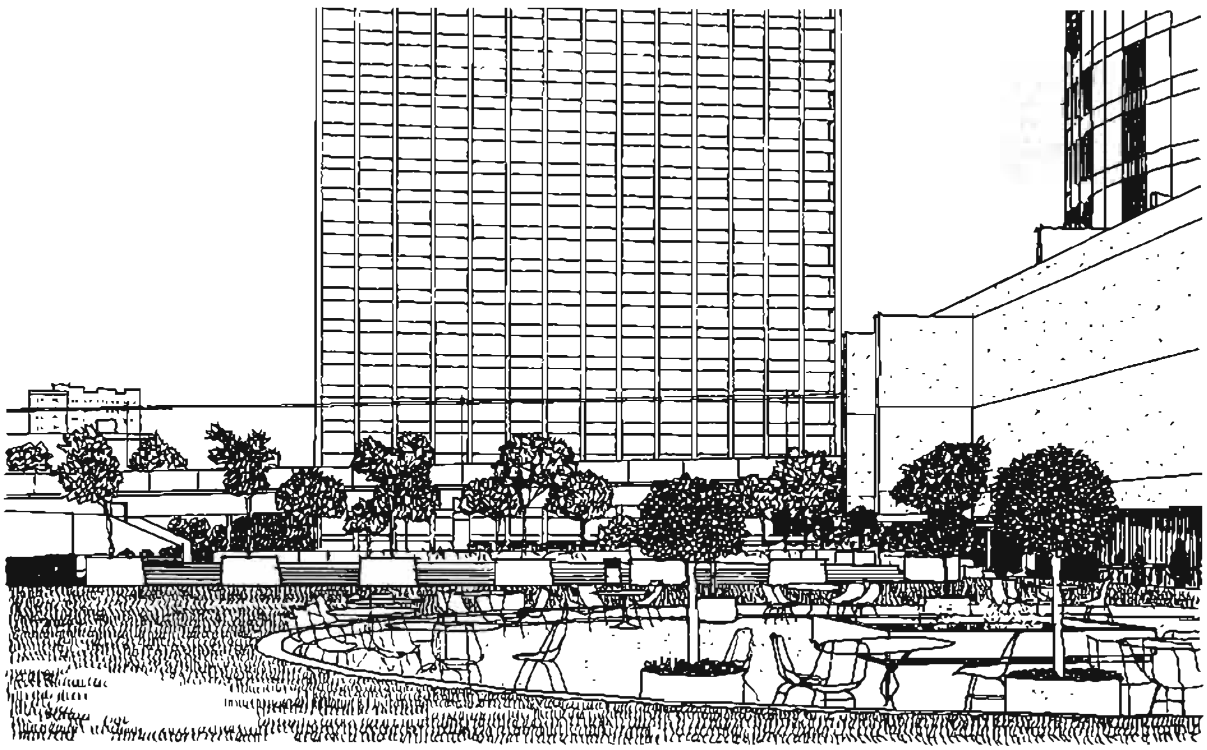


Figure IV-12H

Looking east from the second-story pedestrian plaza at the Bonaventure Hotel (located between Fourth and Fifth Streets on the west side of Figueroa Street) in 1984 (above) and after construction of Alternative LA-3 (below).

Figure IV-121

Looking north on Figueroa Street from its intersection with Sixth Street in 1984 (above) and after construction of Alternative LA-3 (below). The aerial structure would be from 35 to 40 feet high, crossing over the Fourth Street aerial roadway and over several pedway structures.

would pass directly over this public plaza, dramatically altering its spatial definition and affecting the basic concept of this public art work.

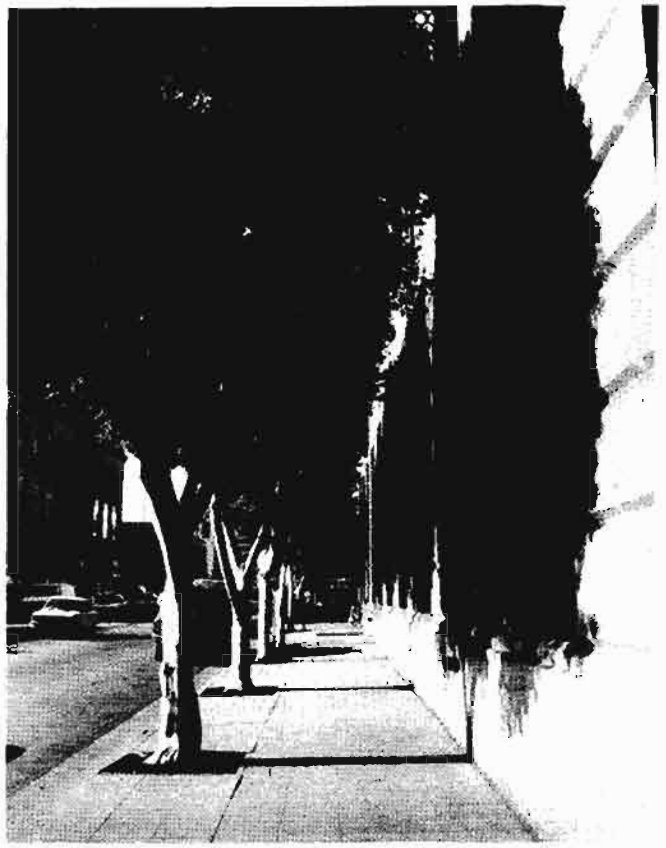
The elevated guideway would alter the visual setting of the 9th Street/ Olympic Boulevard corridor. The guideway would be located along the south side of the street from Figueroa Street to Hope Street and along the north side from Hope Street to Santee Street. Nineteen Indian Laurel figs and 5 London Plane Trees would most likely be removed for the alignment, and an additional 8 Evergreen Pears and 8 Crape Myrtles might have to be removed, for a total of 40 trees. A parking lane could be accommodated between the 80-foot on-center guideway columns athough the columns would displace existing parking spaces. For pedestrians, views of historic mid-rise buildings would be altered and obscured by the aerial guideway along 9th Street as illustrated in Figure IV-12J. The view of the Central Library from the South Park Redevelopment Area along Hope Street would be cut by the aerial structure. For project patrons, views along 9th Street from Santee Street to Figueroa Street would be restricted to the facades of adjacent structures except at intersections.

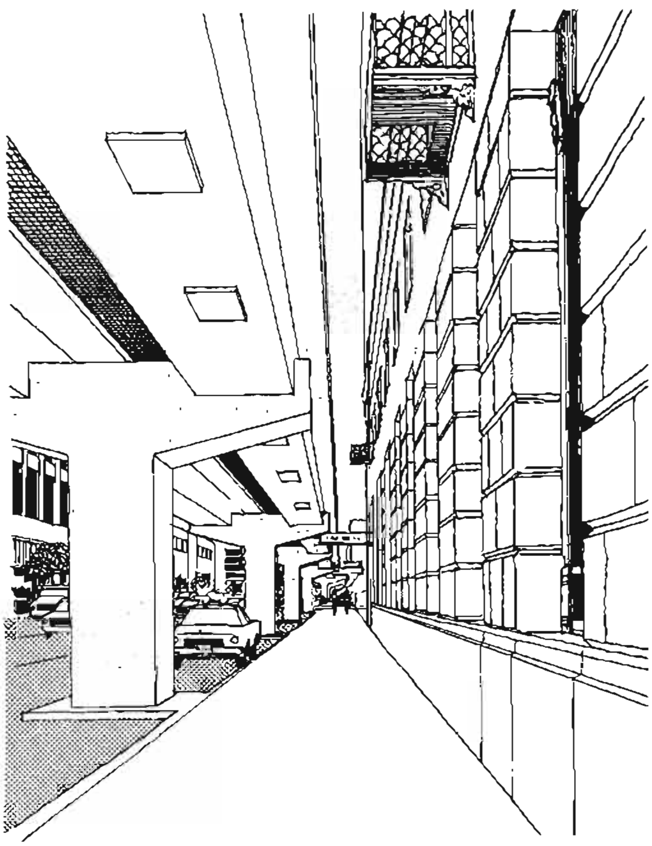
The aerial structure on the north side of the street between Hope and Santee Streets would visually restrict the street space for pedestrians and would screen the view of the street for building occupants. The guideway would shade the street directly beneath it and/or the facades of adjacent buildings throughout the year. The mid-morning shadows would be restricted to the area directly under the guideway, while midday and afternoon shadows would affect building facades. During the heat of the summer months, this arcade effect could be considered a positive impact.

Where the aerial structure is located on the south side of 9th Street between Figueroa and Hope Streets (see Figure IV-12K), it would be between 10 and 68 feet from the Skyline Condominiums. This would adversely affect those residential units facing 9th Street, primarily those in the western half of the building. The guideway and rail vehicles would be visible to all of the approximately 200 units with windows on 9th Street and would affect the visual privacy of those in second-story and third-story residents. Rail vehicle passengers would have a clear view onto the balconies and into the windows of approximately 70 affected units.

The elevated structure along 9th Street from Hope Street to Santee Street would be within 5 feet of the mid-rise buildings along the north side of the street. At this distance, the visual privacy of about 920 linear feet of commercial/office frontage would be adversely affected. Several of these buildings are currently being used as retail centers, and the windows have been covered with display merchandise.

The aerial segment from Santee Street to Long Beach Avenue would alter the visual setting of this area. Parking lanes would be removed





Looking west on the north side of Ninth Street from its intersection with Hill Street in 1984 (above) and after construction of Alternative LA-3 (below). Support columns for the structure would be located in the parking lane and the structure itself would be five feet from the facade of the Coast Federal Building.

Figure IV-12J

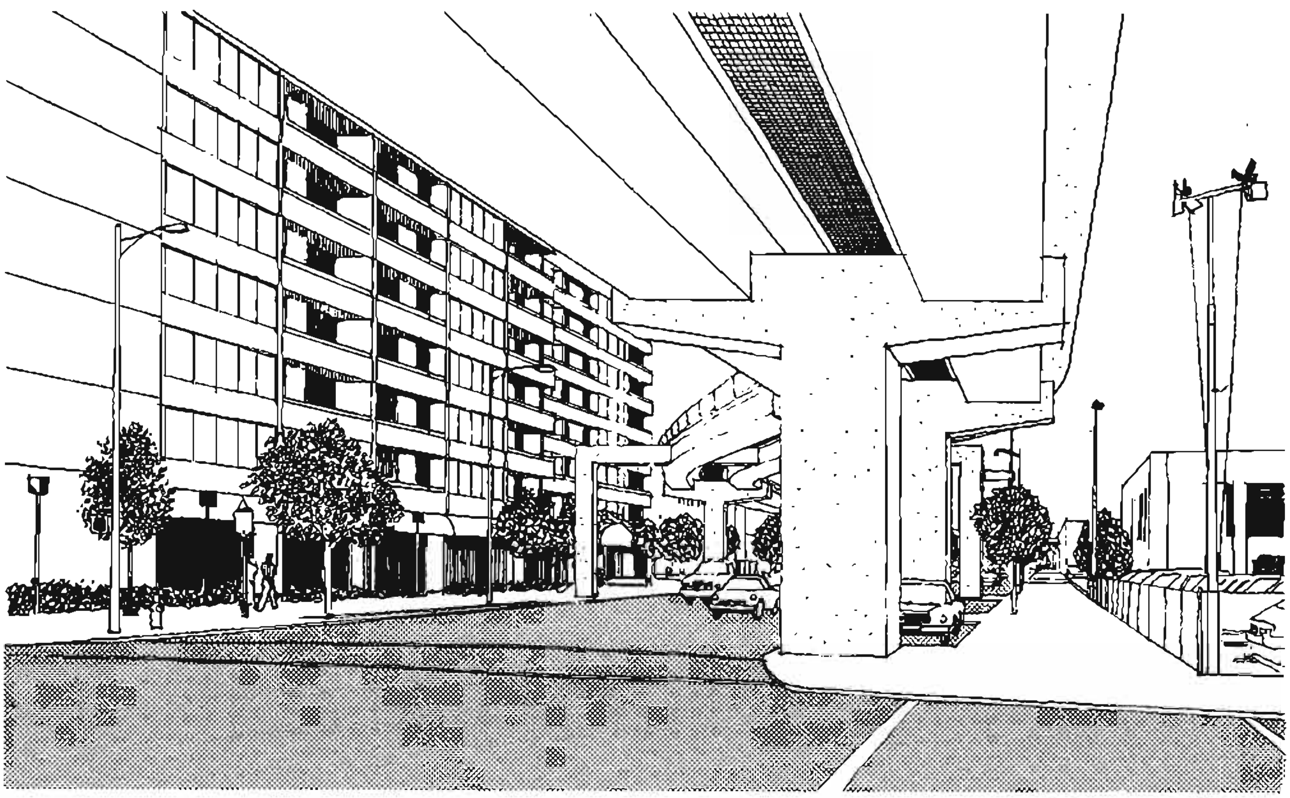


Figure IV-12K

Looking west on Ninth Street from the intersection of Hope Street in 1984 (above) and with Alternative LA-3 (below). The aerial structure would cross from the north to the south side of the street in front of the Skyline Condominiums.

to accommodate the central median strip and guideway as shown in Figure IV-12L. The aerial structure would tower above and be incompatible in scale with the adjacent low-rise buildings. It would also shade portions of the street and/or building facades on the north side of the street throughout the year.

The overhead wires and support poles above the aerial structure would be an additional visual element along the entire alignment.

The proposed substations at 4th and Figueroa, Olive and 9th and Central and 9th would adversely affect the visual setting as described in the discussion of LA-1's impacts.

The impact of overhead wires and support poles above the guideway could be mitigated by replacing the overhead system with a third rail. As indicated in the LA-1 discussion, this mitigation measure would require that vehicles be equipped for dual power collection, thereby increasing the cost of the project and lowering travel speeds slightly.

There is no vacant parcel at which the 4th and Figueroa substation could be located; however, it could be sited on unused public right-of-way and screened by landscaping. The impact of the other two substations could be mitigated through integration with larger development projects, as indicated earlier.

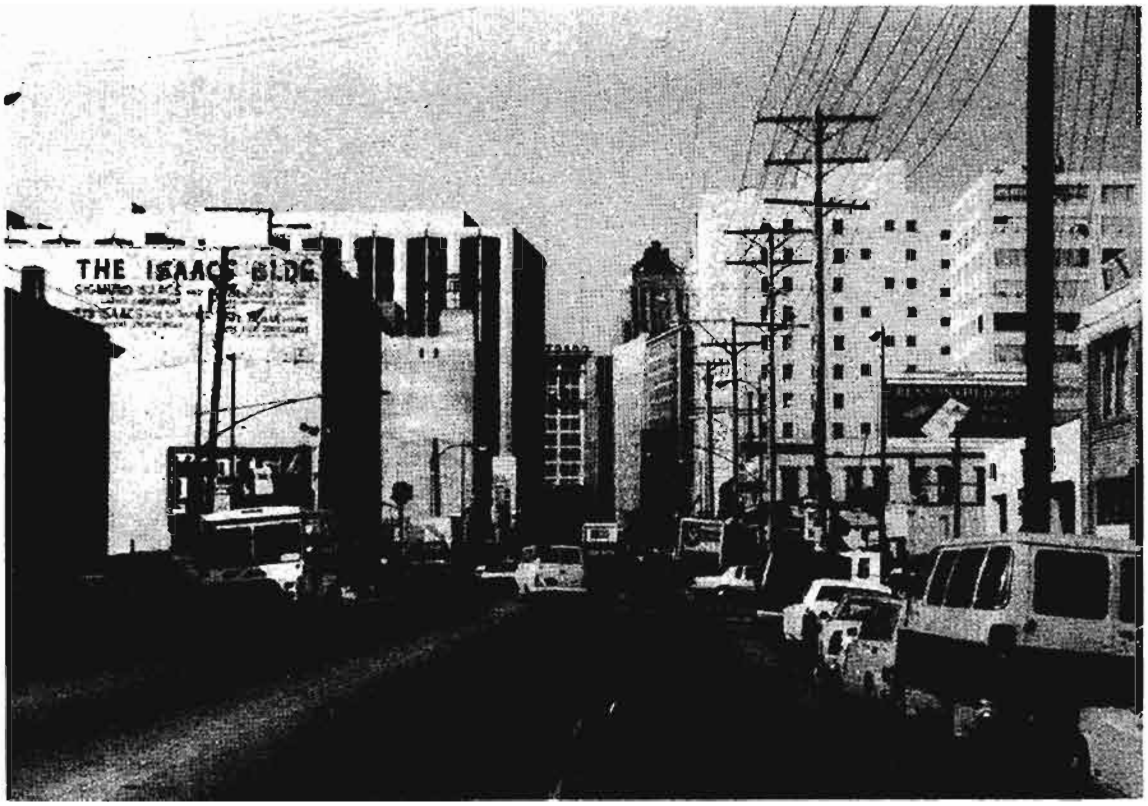
The major adverse impacts of the guideway on the visual setting and visual privacy along 9th Street/Olympic Boulevard could be mitigated by selecting a less sensitive corridor and by not locating the guideway directly in front of a series of mid-rise buildings. The street trees could not be replaced, although the mature Indian Laurel figs could possibly be transplanted. However, the cost and time requirements for such relocations would be significant. Minor cosmetic measures, such as decorative lighting on the shaded underside of stations, could be employed to soften the effect of the guideway. Such measures would not significantly mitigate the adverse visual impacts.

IV-124.24 Satellite Yard

There would be no negative visual impacts associated with the satellite yard, located in an industrial area between Long Beach and Compton Avenues off Washington Boulevard.

IV-124.25 Comparison of Alternatives

In summary, LA-3 would have the most significant adverse visual impacts of the three downtown Los Angeles segment alternatives. LA-1, with its aerial segment and impact on Broadway due to street widening, would rank second, while LA-2, with its subway portion and at-grade alignment (requiring only a small amount of street widening), would have the least adverse impact.



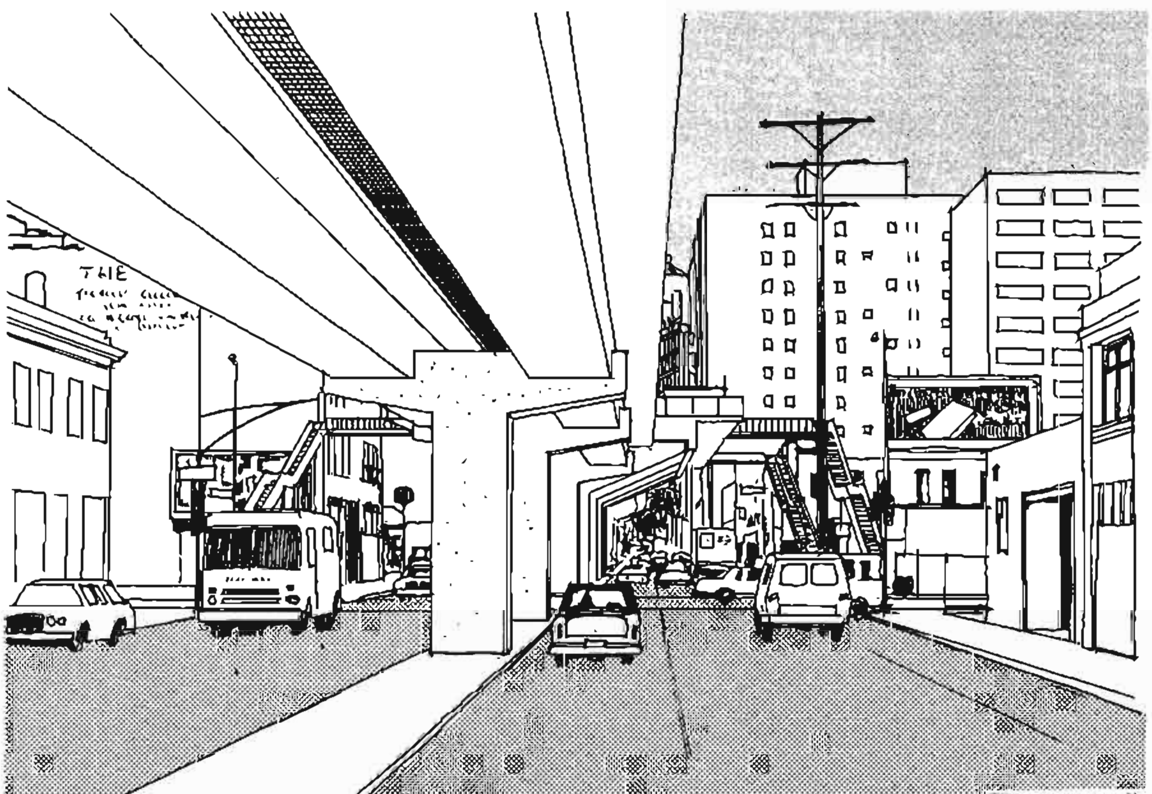


Figure IV-12L

Looking west on Ninth Street at its intersection with Wall Street in 1984 (above) and after construction of Alternative LA-3 (below). The aerial structure would be located on a center median strip from Santee Street to Long Beach Avenue.

IV-125 Historic and Cultural Resources

The impacts of the operations of the Long Beach-Los Angeles Rail Project on historic and cultural resources in downtown Los Angeles would vary depending on which alternative is chosen for implementation. Figure II-22D, in Section II-225, shows those buildings which have been found to be eligible or potentially eligible for the National Register of Historic Places or are of recognized local significance.

The Flower Street Subway alternative, LA-2, would have no effects (visual, noise, or vibration) on the historic resources along the route because the system would be underground in the historic areas.

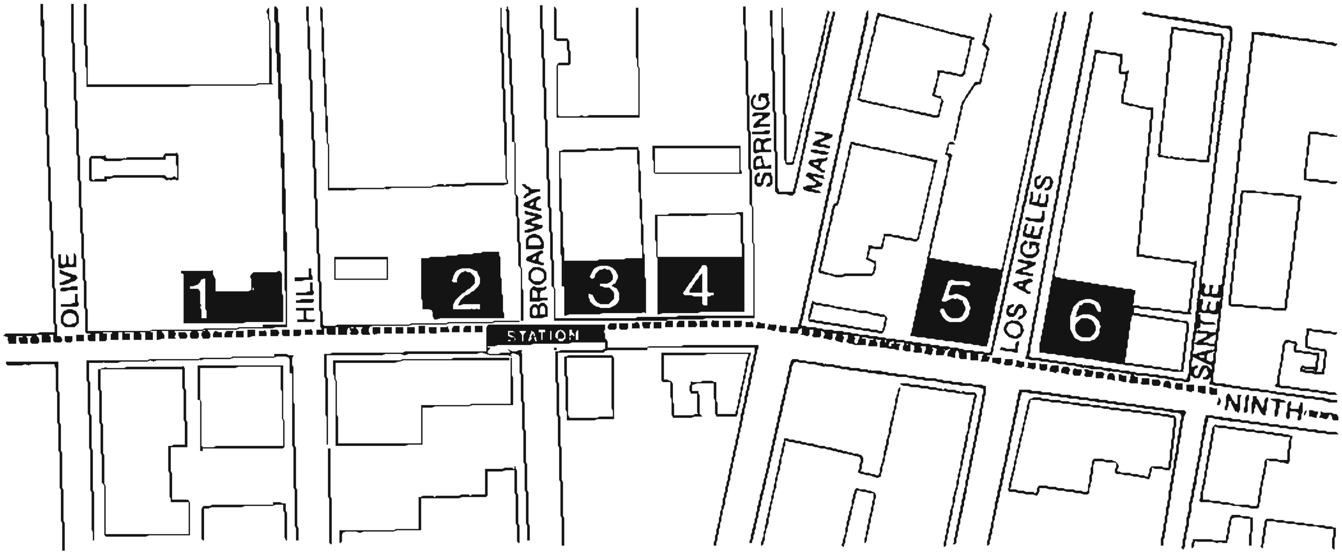
The Olympic/9th Aerial alternative, LA-3, would create visual intrusions to two National Register properties and one local historical landmark on Figueroa Street: Fire Station #28, Barker Brothers Furniture Store, and the Original Pantry restaurant. Impacts on these structures would be similar to those studied for the Downtown People Mover Project (DPM) in 1978. That project would also have used an aerial guideway, approximately 20 feet above the street surface. Mitigation (i.e., a photographic record) was accomplished for the visual impacts to Fire Station #28 and Barker Brothers Furniture Store by the City of Los Angeles in November of 1980 as a part of the DPM Project. Therefore no further mitigation would be necessary as a part of the rail transit project. The Original Pantry restaurant is not a National Register property and mitigation was not performed.

Along 9th Street there are additional properties of historic interest which would be subjected to visual intrusion by the operation of trains on the aerial guideway. These properties are listed below (and those numbered are shown on Figure IV-12M):

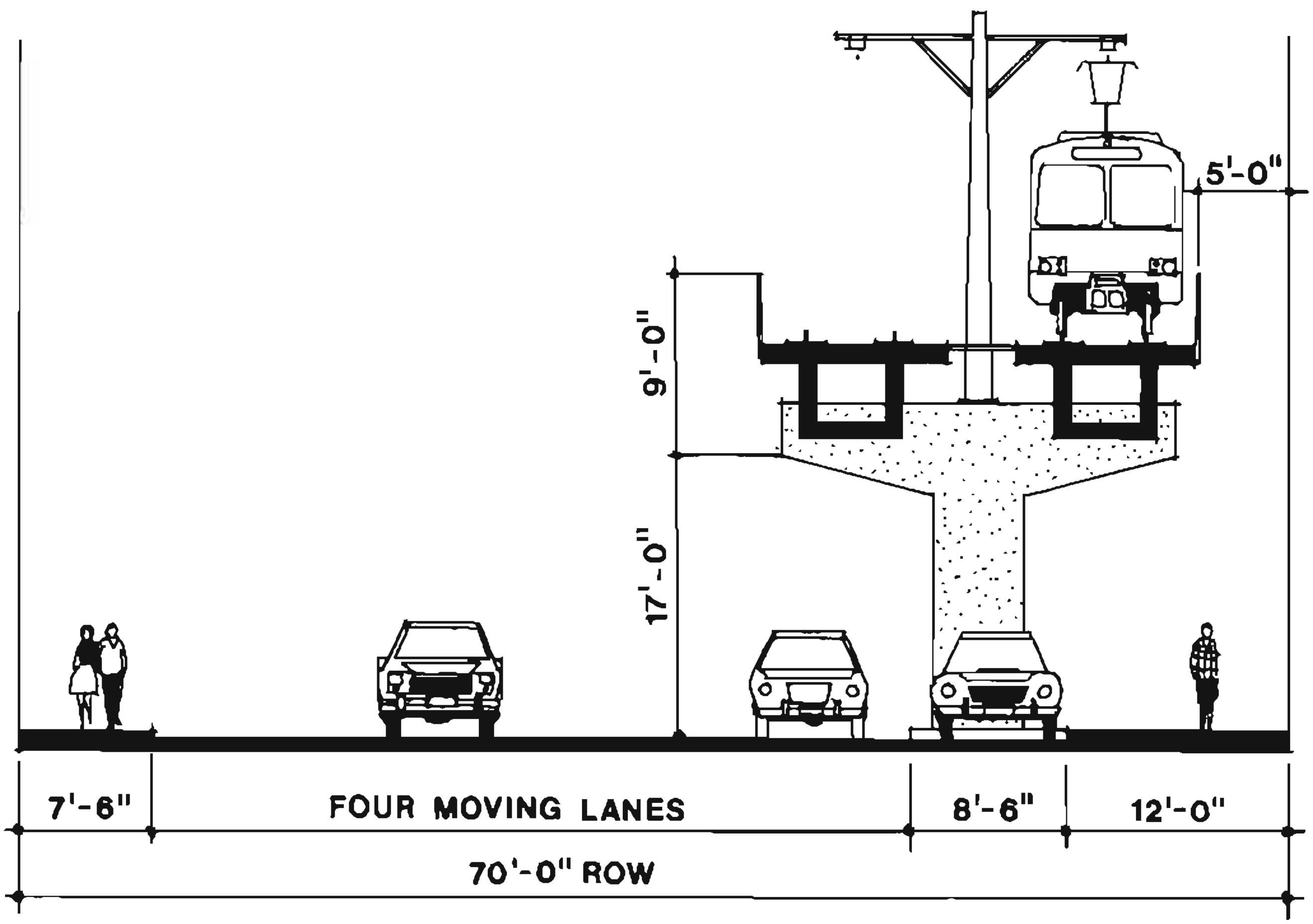
- *Insurance Exchange Building
- Pacific National Bank (Coast Federal) (1)
- *Blackstone's
- Eastern Columbia Building (2)
- 9th and Broadway Building (3)
- William M. Garland Building (4)
- *Marsh and Strong Building
- Harris Newmark Building (5)
- Cooper Building (6)

Three of the listed buildings (i.e., the Insurance Exchange, Blackstone's and Marsh and Strong) are separated by the width of the street and would not be affected as significantly as those structures on the same side of the street as the guideway (see Figures IV-12N and IV-12O).

There would not be any significant noise or vibration impacts on historic structures, even with an aerial system. Section IV-115 identifies noise and vibration effects on Figueroa Street as a result of the



Location of Building in Figure IV-12N and IV-12O

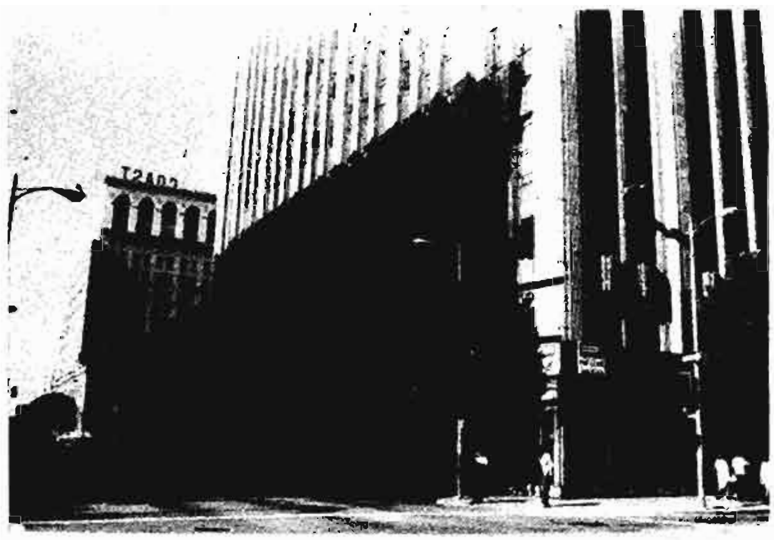


Typical section of aerial structure looking west on Ninth Street between Hope and Santee Street (Alternative LA-3). The base of the horizontal structure would be approximately 17 feet above the street. The distance from the base of the structure to the top of the sound wall would be 9 feet. The light rail vehicle would extend another 8 feet above the sound wall.

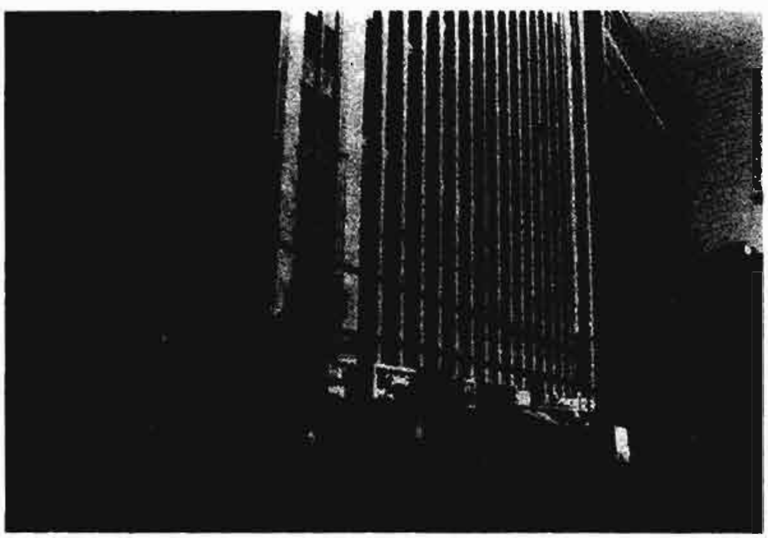
Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Figure IV-12M
VISUAL ANALYSIS
PREPARED BY SEDWAY COOKE ASSOCIATES
PARSONS BRINCKERHOFF / KAISER ENGINEERS

1 The aerial structure and sound wall would be located between the first- and second-story windows of the Coast Federal Savings Bank building at 315 West Ninth Street, as indicated by the two horizontal lines on the photo to the left. The light rail vehicles would pass directly in front of the second-story windows. (Orientation of photo: looking northwest from the south side of Ninth Street.)



2 The aerial structure and sound wall would be located in front of the second-story windows of the Eastern Columbia Building at 849 South Broadway, as indicated in this photo. The light rail vehicles would pass directly in front of the third-story windows. (Orientation of photo: looking northwest from the south side of Ninth Street.)



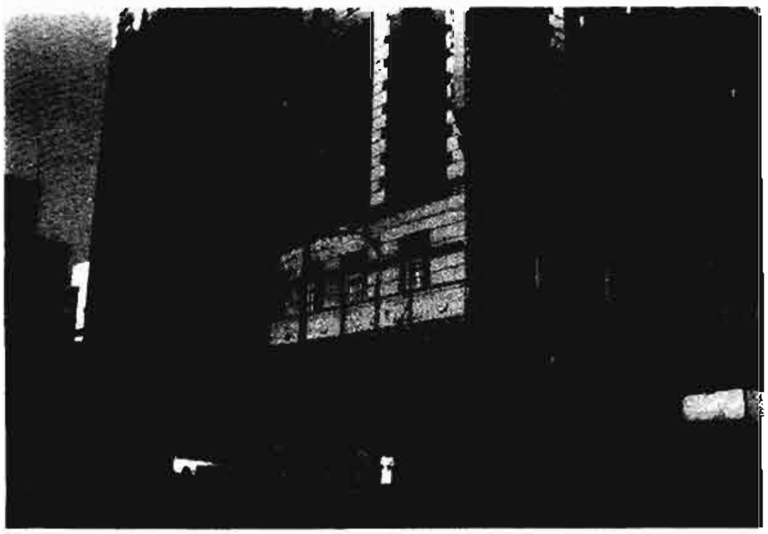
3 The aerial structure and sound wall would be located in front of the second-story windows of the building at 850 South Broadway, as indicated in this photo. The light rail vehicles would pass in front of the third-story windows. (Orientation of photo: looking northeast from the south side of Ninth Street.)

Figure IV-12N

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Relationship of Aerial Structure to Historic Buildings

4 The aerial structure and sound wall would be located in front of the second-story windows of the Fashion Design Center building at 117 Ninth Street, as indicated in this photo. The light rail vehicles would pass in front of the third-story windows. (Orientation of photo: looking northwest from the south side of Ninth Street.)



5 The aerial structure and sound wall would be located in front of the second-story windows of the Harris New Mark Building at 127 Ninth Street, as indicated in this photo. The light rail vehicles would pass in front of the third-story windows. (Orientation of photo: looking northwest from the south side of Ninth Street.)

6 The aerial structure and sound wall would be located just below the second-story windows of the Cooper Building at 860 Los Angeles Street, as indicated in this photo. The light rail vehicles would pass directly in front of the second-story windows. (Orientation of photo: looking northeast from the south side of Ninth Street.)

Figure IV-120

Relationship of Aerial Structure to Historic Buildings

PARSONS BRINCKERHOFF/KAISER ENGINEERS

project. The increase in noise levels is estimated to be 0.2 to 0.4 dBA CNEL with the system in operation. The peak hour average sound level for a 3-car light rail transit train would be approximately 58 dBA at 20 mph for the aerial configuration. Existing measured noise levels range between 70 and 74 dBA. The increase to the ambient noise levels attributable to the project would not be significant.

The Broadway/Spring, At-Grade, alternative (LA-1) would traverse two National Register Historic Districts and skirt the edge of a third. The northbound trains would use the existing contra-flow bus transit lane (on the eastern side of the street) passing through the Spring Street Financial District. The southbound tracks would be located on the western side of Broadway, the spine of the Historic Theater and Commercial District. Pacific Electric rail cars ran on both Broadway and Spring Street during the period for which these buildings have been found historically significant. Placing the rail track closer to the curb would be at variance with the historic placement in the center of the roadway. However, this displacement would be only 10 to 15 feet and is not considered a significant effect. The only significant effect is on the terrazzo sidewalks as previously discussed.

At El Pueblo de Los Angeles State Historic Park the view from the southern boundary of the park would be changed by the aerial guideway to Union Station, as would the view of this boundary. A guideway column would be placed at the northwest corner of Arcadia and Alameda Streets in that portion of Father Serra Park which is currently used as a parking lot. The aerial section would be located on the median and south side of the Hollywood Freeway to mitigate visual impacts and to reduce the intrusion on the park itself.

At Union Station the aerial guideway would require column footings on the southern boundary of the parking lot and on the platform area behind the station. Specific column locations for the guideway and station would not be determined until final design. However, coordination with Caltrans regarding the El Monte Busway extension and with SCRTD regarding the Metro Rail station is already underway.

There is also a possibility that the placement of the aerial guideway would alter pedestrian views of Union Station, particularly from Alameda and Aliso Streets. Final determination of the height of the guideway would not be made until the completion of engineering studies. This potential visual impact would be mitigated by designing the guideway as close to ground level as possible, consistent with the physical constraints of the system, site, and other projects such as the El Monte Busway.

Operations at Union Station would increase pedestrian traffic in the vicinity. Increases in pedestrian traffic would occur primarily as people transferred from one mode of mass transportation to another. There would also be an increase in accessibility to Union Station and

El Pueblo State Park with the location of a transit station at Union Station. Increased use of the station by a variety of transit passengers could be considered a positive impact, renewing its historic function as an important transportation center in the region.

As discussed in Section IV-115 the passby noise levels for a rail transit vehicle are about the same as for a bus (72 dBA for 30 mph at 50 feet). The noise exposure estimates for sensitive receptors on Broadway/Spring Street show project contribution of between 0.2 to 0.5 dBA CNEL. This is not considered to be a significant effect. As with the other alternatives there would be no vibrational effects to historic properties.

IV-125.1 Mitigation Measures

Historic structures whose visual environment would be altered by the project would be recorded photographically according to recognized standards. At Union Station, where the visual environment would be altered and some land would be acquired for column footings, this project would coordinate mitigation with the other agencies' (Caltrans and SCRTD) building projects in the station area. The California State Historic Preservation Office has been contacted and would be consulted regarding appropriate mitigation measures if this is the preferred alternative.

IV-130 TRAFFIC AND TRANSPORTATION

IV-131 Traffic

In downtown Los Angeles, operation of the proposed rail transit system would result in impacts to vehicular traffic arising from: (1) reduction in street capacity due to placement of tracks and/or guideway footings in existing vehicular travel lanes, (2) increase in vehicular/pedestrian conflicts in the vicinity of transit stations, and 3) reduction in overall traffic volumes on downtown Los Angeles streets as a result of travel diverted to the rail transit system.

In the analysis of potential traffic impacts and identification of possible mitigation measures, primary attention was focused on: (1) year 2000 peak hour and ADT (average daily traffic) volumes on key streets, and (2) volume to capacity ratios (V/C) at key intersections (also for the year 2000), including those located in the vicinity of proposed transit stations. In addition, the general measure of VMT (vehicle-miles traveled) was calculated to determine the overall change in auto travel resulting from operation of the rail transit system. In all cases the net effect of the project was determined by comparing year 2000 conditions with and without the project.

Projections of "no project" traffic volumes and intersection V/C ratios were generated by the Los Angeles City Department of Transportation. All projects associated with the city's Capital Improvement

Program, Community Redevelopment Agency projects, and private development projects were assumed to exist. (Critical intersections in downtown Los Angeles for the year 2000 were identified and described in Section II-231 of this document and shown in Figure II-23A.) Calculations of traffic volumes and V/C ratios with the various project alternatives were provided by the Southern California Association of Governments (SCAG). Daily VMT and vehicle hours were also provided by SCAG.

Three "system alternatives" (combinations of alignments in each of the three corridor subareas) were analyzed for their potential impact on traffic in downtown Los Angeles. The alternatives, all of which assumed the baseline mid-corridor alignment, are:

- LA-2/MC-1/LB-4 — Broadway/Spring Couplet and Atlantic with Pacific Avenue Loop
- LA-2/MC-1/LB-4 — Flower Street Subway and Atlantic with Pacific Avenue Loop
- LA-3/MC-1/LB-3 — Olympic/9th Aerial and Los Angeles River Route

These alternatives were chosen to "bracket" the full range of patronage levels forecast for the system alternatives, and to address each of the different grade options under consideration for downtown Los Angeles. All alternatives assumed the full implementation of the Regional Transportation Plan (see II-171).

A summary of the general findings of impact on traffic volumes and levels of service at intersections is presented below. This is followed by more specific discussions of the potential localized impacts of each alternative alignment and possible mitigation measures. From this point, the discussions will refer only to the downtown Los Angeles portions of the alternatives -- the alignments in the mid-corridor and Long Beach will be assumed implicitly.

For analysis purposes, two traffic screenlines were used within the downtown area. The impact on east-west traffic was examined between Grand and Olive Streets in order to see differences in the traffic arising from the transit alternatives on Figueroa, Flower, and Broadway/Spring. North-south traffic movements were recorded using a screenline between 5th and 6th Streets. Both of the screenlines cross several major arterials.

The results of the analysis are presented in Table IV-13A. They show that none of the "build" alternatives would result in more than a 0.1 percent change in AM peak hour traffic volumes. This holds true for both north-south and east-west traffic. The findings are well within the level of precision implicit in the model used for estimating traffic impacts, and thus it is apparent that none of the alternatives should have a measurably significant effect on traffic flows within the Los Angeles downtown area.

TABLE IV-13A

YEAR 2000 DOWNTOWN LOS ANGELES TRAFFIC VOLUMES

AM PEAK PERIOD*

	No Project	LA-3/MC-2/LB-3	LA-1/MC-1/LB-4
Screenline 1: LA CBD Between Grand Avenue and Olive Street			
Eastbound	13,242	13,254	13,259
Westbound	15,067	15,076	15,062
TOTAL	28,309	23,330	28,321
Screenline 2: LA CBD Between 5th and 6th Streets			
Southbound	7,321	7,317	7,367
Northbound	9,375	9,365	9,366
TOTAL	16,696	16,682	16,733

*For modeling purposes the AM peak period is defined as 6:30 AM to 8:30 AM.

Source: Southern California Association of Governments, 1984.

To measure the effect of the project on traffic coming into the downtown area from the south, a third screenline was constructed along Washington Boulevard from the Harbor Freeway to Santa Fe Avenue, and then along the Los Angeles River from Washington Boulevard to Macy Street. In addition to traffic volumes in the AM peak hour, this screenline was used to account for possible changes in daily traffic volumes, vehicle-miles traveled, and vehicle-hours traveled.

The results of this analysis are presented in Table IV-13B. In all cases, the relative change from the no project condition would be similar to that forecast for movement within the downtown area for all alternatives. Traffic volumes would decrease by a maximum of 0.15 percent, while daily VMT would decline by less than 0.1 percent. Total vehicle-hours would decrease by 0.6 percent.

In addition to the screenline analysis, the level of service prevailing at key intersections throughout the downtown was estimated for conditions with and without the project. In Table IV-13C, the volume

TABLE IV-13B

SUMMARY YEAR 2000 OF TRAFFIC IMPACTS

DOWNTOWN LOS ANGELES CBD

	No Project Condition (Volume)	Change From No Project Condition		
		LA-1/MC-1/LB-4	LA-2/MC-1/LB-4	LA-3/MC-1/LB-3
Screenline Daily Traffic Volumes* Crossing Washington Blvd/ LA River	1,759,927	-2768	-2362	-771
Peak Hour Traffic Volumes Crossing Washington Blvd/LA River				
Inbound AM Peak Hour	275,414	- 433	- 369	-120
Outbound PM Peak Hour	189,883	- 298	- 254	- 83
Daily Vehicle Miles Traveled (VMT) in downtown Los Angeles	3,588,763	-1276	- 488	-355
Daily Vehicle Hours Traveled in downtown Los Angeles	139,444	- 864	- 832	-660

*Average daily travel 2-way

Source: Southern California Association of Governments, 1984.

TABLE IV-13C

YEAR 2000 V/C RATIOS AT KEY INTERSECTIONS NEAR PROJECT STATIONS

AM PEAK HOUR

DOWNTOWN LOS ANGELES CBD

Location	No Project		LA-1 with LB-4		LA-2 with LB-4		LA-3 with LB-3	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Figueroa St./4th St.	0.84	D	0.84	D	0.84	D	0.85	D
Figueroa St./7th St.	0.82	D	0.82	D	0.82	D	0.83	D
Flower St./7th St.	0.70	B	0.70	B	0.70	B	0.69	B
Flower St./Pico Blvd.	1.09	F	1.09	F	1.09	F	1.10	F
Flower St./Washington Blvd.	0.82	D	0.82	D	0.90	D	0.82	D
Broadway/Temple St.	1.07	F	1.07	F	1.07	F	1.08	F
Broadway/1st St.	1.00	E	1.00	E	1.00	E	1.01	F
Broadway/7th St.	0.61	B	0.61	B	0.61	B	0.62	B
Broadway/Olympic Blvd.	0.60	A	0.60	A	0.60	A	0.61	B
Broadway/Washington Blvd.	1.04	F	1.09	F	1.04	F	1.04	F
Spring St./Temple St.	0.78	C	0.78	C	0.78	C	0.79	C
Spring St./1st St.	0.89	D	0.89	D	0.89	D	0.90	D
Spring St./4th St.	0.66	B	0.66	B	0.67	B	0.67	B
Spring St./7th St.	0.69	B	0.69	B	0.69	B	0.70	B
Main St./Olympic Blvd.	0.85	D	0.85	D	0.85	D	0.86	D
Main St./Washington Blvd.	0.92	E	0.96	E	0.92	E	0.92	E
9th St./Olive St.	0.75	C	0.75	C	0.75	C	0.76	C
Olympic Blvd./Los Angeles St.	0.62	B	0.62	B	0.62	B	0.63	B
Washington Blvd./San Pedro St.	1.09	F	1.09	F	1.09	F	1.09	F
Olympic Blvd./Central Ave.	0.80	C	0.80	C	0.80	C	0.81	D
Washington Blvd./Long Beach Ave.	0.74	C	0.78	C	0.78	C	0.75	C

Note: v/c = Volume/Capacity Ratio
LOS = Level of Service

Source: City of Los Angeles Department of Transporation; Southern California Association of Governments, 1984.

to capacity ratio (V/C) and equivalent level of service (LOS) is provided for each intersection for the no project condition and the three build alternatives. LOS "A" signifies a totally free-flow condition with no restrictions of any kind, while LOS "F" represents a total breakdown in traffic flow, with heavy stop-and-go activity. LOS "D" is considered the maximum design capacity, with traffic heavy but flowing in an orderly manner.

From this analysis, none of the alternatives would be expected to produce significant changes in the level of service at any of the intersections analyzed. The maximum projected change in V/C would be approximately 5 percent, while the majority of the intersections would experience a change of 1 percent or less. In some cases, the qualitative LOS designation would change, but this would be due to a small change in V/C crossing a LOS threshold level (e.g., from 0.70--B to 0.71--C).

IV-131.1 Localized Impacts -- Broadway/Spring Couplet (LA-1)

The Broadway/Spring Couplet, At-Grade alternative (LA-1) at the Washington Boulevard section of the Los Angeles CBD area would use an at-grade dedicated median to facilitate the rail transit operation. Two parallel tracks would serve the east and west bound rail transit operations.

Morning peak hour traffic volumes on Washington Boulevard, between Long Beach Avenue and Flower Street, in the year 2000 would show a decrease over the no project condition by about 0.6 percent, for the three alternatives analyzed. At one intersection (Washington Boulevard and Broadway), the year 2000 V/C ratio would increase from 1.04 (LOS "F") for the base condition to V/C ratio of 1.09 (LOS "F") under the Broadway/Spring alternative. Although the intersection would realize a slight decrease in traffic volumes, the increase in V/C ratio would result due to the modified signal phasing that would be required to allow for a separate left turn phasing for the light rail vehicles turning left from the right curb lane on Broadway to the center reserved median on Washington Boulevard. A similar increase in V/C ratio would also occur at the intersection of Washington Boulevard and Main Street, where special signal phasing would be required for the light rail vehicles turning right from the reserved median on Washington Boulevard to the right curb lane on Main Street.

With the elimination of curb parking at intersections and station areas on Washington Boulevard on both sides of the street, two or three traffic lanes could be maintained at intersection approaches in each direction in addition to the reserved median for the rail alignment. Normal signal operations with minor adjustment in relocating some signal fixtures could satisfactorily facilitate the rail transit, pedestrian and vehicular movements along this section of the downtown area. Some impacts, however, would still occur at intersections with left turning traffic because of conflicts with the light rail vehicles, and also at station locations where conflicts between vehicular traffic and pedestrians would exist. Also, in order to provide for station platforms, the intersection approaches near stations would be restricted to two through traffic lanes and a protected left turn lane.

The Broadway segment of the Broadway/Spring Couplet would serve the southbound rail transit operations in the downtown area, using a curbside vehicular lane at the passenger loading and unloading stations. This narrowed street width within the station block areas would require normal vehicular traffic to share the right-of-way with the rail transit operations. This might increase the potential of rail transit/auto conflicts and cause delay to both train and vehicular movement. North-south bus traffic on Broadway Street would be greater than 45 buses per hour during the peak traffic periods. There would be potential for light rail/bus conflicts in the vicinity of bus stops and light rail stations. The buses pulling out from the curb lane onto the path of the light rail would create temporary blockages of light rail vehicles and also affect vehicular traffic during peak period congestion on Broadway. Illegally stopped or parked vehicles might also block light rail operations if such vehicles protrude into the path of the light rail trains. Strict measures would be provided for immediate removal of the vehicles in event of blockage.

Broadway at Temple Street and 1st Street would operate at or over capacity by year 2000 without the project. The traffic projections with the rail project show an increase in traffic volumes on Broadway of about 1.0 percent for all three alternatives. The change in V/C ratios under each alternative is indicated in Table IV-13C.

There is a proposal by the City of Los Angeles to convert Broadway and Hill Street to a one-way couplet (Broadway northbound) in downtown Los Angeles, which could relieve some congestion on Broadway. The present number of through travel lanes would be maintained with the project.

On Spring Street, the northbound segment of the Broadway/Spring Couplet, the light rail vehicles would travel within the existing transit contra-flow lane along the east curb line. Although no additional conflicts between auto and rail transit would be expected (over and above any existing transit/auto conflicts), the major impacts would surface in the form of backups or "bunching" and increased delays to both existing bus transit and the new rail operations at common and separated bus and rail transit stops.

Pedestrian impacts from the light rail operations would basically be centered around the station areas. With the Broadway/Spring Couplet alignment the greatest impacts would occur at the 7th Street station, where about 550 northbound passengers would alight during the AM peak hours. With 10 rail transit operations during the peak hour, an average of 56 persons would use the platform area between subsequent rail transit arrivals. With a two-car train (4 exits/car), an average of only 7 passengers would alight the train per exit. This activity would not significantly affect the pedestrian circulation in the station area.

Along Washington Boulevard, the San Pedro station boarding platforms would be located in the reserved median. During the AM peak hour, 196 passengers would alight and 26 passengers would board the rail line at this station in the peak westbound direction. This would amount to an average of 22 passengers using the platform area between subsequent train arrivals. With proper signal operations for pedestrian movements, the impacts from pedestrian circulation would be minimal.

IV-131.2 Local Impacts -- Flower Street Subway (LA-2)

The Flower Street Subway alternative (LA-2) would use a double-track system at-grade on Flower Street between 11th Street and Washington Boulevard. The subway portal on Flower Street would be located between 11th and 12th Streets (See Figure IV-12F).

Along Flower Street between 9th Street and Pico Boulevard, the intersections (with the exception of 12th Street) would operate at or over capacity in the year 2000 without the rail transit project. The two through lanes in each direction of Flower Street between 11th Street and Washington Boulevard would be maintained.

The AM peak hour traffic volumes on Flower Street between 11th Street and Washington Boulevard in the year 2000 would show virtually no change over the no project condition for the Broadway/Spring and Flower Street Subway alternatives. The Olympic/9th Aerial alternative would produce a reduction in traffic volumes of about 1.0 percent.

At the intersection of Washington Boulevard and Flower Street the year 2000 V/C ratio would increase from 0.82 (LOS "D") for the no project condition to 0.90 (LOS "D") with the Flower Subway with Pacific Loop system alternative. This increase in V/C ratio would be due to the modified signal phasing that would be required to allow for the light rail vehicles turning from Washington Boulevard to Flower Street and vice versa.

The pedestrian impacts along Washington Boulevard from the Flower Street Subway alignment would be greater than with the Broadway/Spring Couplet alignment. At the Broadway station and at the San Pedro station approximately 440 passengers would alight, and between 17 and 47 would board, during the AM peak hour. This would represent an average of 48 passengers using the platform area between subsequent rail transit arrivals. Adequate pedestrian crossing signal time would need to be provided at the adjacent intersections to accommodate the pedestrian activity.

Passengers using the rail transit station at 7th Street during the AM peak hours would include both those terminating their trips within walking distance of the station and those transferring to Metro Rail for continued travel. Current modeling indicates that approximately 100 passengers would use the station area between subsequent rail transit arrivals of every 6 minutes. These passengers, when added to the Metro Rail passengers, would only slightly increase pedestrian congestion in the station area.

IV-131.3 Localized Impacts -- Olympic/9th Aerial (LA-3)

With the LA-3 (Olympic/9th Aerial) alternative, the width of Figueroa Street between 3rd Street and 9th Street would be reduced 14 to 18 feet by construction of the aerial guideway footings in the street median. Figueroa Street would be widened by 2 feet on each side.

All Figueroa intersections with east-west cross streets would be unaffected. Accessibility to the Harbor Freeway ramps between 3rd and 9th Streets would be maintained.

The AM peak hour traffic volumes on Figueroa Street between 3rd and 9th Streets in the year 2000 would show virtually no change over the no project condition for the Broadway/Spring and the Flower Street Subway alternatives. However, the Olympic/9th Aerial alternative would cause a reduction in traffic volume of about 1.7 percent, which would be the highest reduction among all the project alternatives.

On Figueroa Street and Olympic/9th Street the through-lane configuration would be maintained. The pavement width on Figueroa Street between 3rd and 9th Streets will accommodate two through lanes, left turn pockets, and a parking lane in each direction.

On Olympic and 9th Streets the guideway columns would be located in the north curb lane from Hope Street to Santee Street, which in this area is presently being used for restricted parking. With the aerial guideway in place, the right turn lane at intersections along Olympic, west of Santee Street, would be eliminated, but turns would still be permitted from the travel lanes. The impact to vehicular traffic would be minimal since the existing four through traffic lanes would be maintained. However, loading and unloading of pedestrians at station areas could create circulation problems. East of Santee Street where the aerial guideway would be in the center of Olympic/9th four through traffic lanes would be maintained. Existing restricted parking would be eliminated and no parking would be permitted.

The Olympic/9th Aerial alignment, with maximum patronage, would also have the highest boardings and alightings at stations. There would be in excess of 1,200 northbound alighting passengers at the 7th Street station during the AM peak hour. This would represent approximately 65 passengers using the platform area between subsequent train arrivals. With adequate vertical pedestrian circulation elements provided at this and the other heavily used stations, the impacts to pedestrian circulation would be minimal.

IV-131.4 Mitigation Measures

Traffic mitigation measures in the form of Transportation System Management (TSM) improvements would be used as appropriate along project alternative alignments in downtown Los Angeles in addition to the major improvements proposed by the City of Los Angeles Department of Transportation. Project-related traffic would have only a small impact at key intersections. Mitigation measures to be considered for the downtown Los Angeles alternatives include:

- o Eliminate auto parking at (1) intersections and station locations along Washington Boulevard, (2) on Flower Street between 11th Street and Washington Boulevard, (3) on the north side of Olympic/9th Street between Hope Street and Santee Street, and (4) on the south side of Olympic/9th Street between Hope and Figueroa Streets.
- o Add or revise traffic signal phases to accommodate the projected traffic pattern including light rail operations.

IV-132 <u>Transit</u>

The bus transit system in downtown Los Angeles under the year 2000 base condition will consist of the existing bus system as modified by SCRTD's Sector Improvements Plan whose implementation began in 1980 and is scheduled for completion in 1985. If the light rail project is not implemented, an increase in bus service would be necessary to provide for the anticipated growth of employment in downtown Los Angeles. In conjunction with significant increases in vehicular traffic projected by the year 2000, the bus service would encounter reduced travel speeds, more delays, and unreliable service during the peak traffic periods.

The complementary bus network proposed for the Long Beach-Los Angeles rail transit project comprises minimal modifications for bus routes operating in the downtown Los Angeles segment of the project corridor. The distribution of existing local bus services operating in downtown Los Angeles is such that most local lines would either provide direct access to a rail transit station or operate within close proximity of a station. Under the LA-1 alternative, peak period service frequencies would be reduced on RTD Lines 55 and 56. No modifications would be recommended under alternatives LA-2 and LA-3.

The project's impact on local transit patronage in downtown Los Angeles was examined for each of the project alignment alternatives. Findings of the screenline analysis, concerning change in local transit total daily trips, are presented in Table IV-13D. A comparison of the year 2000 total daily transit trips on the background bus network crossing the screenline without the project with the trips for each of the project alternatives show that the Olympic/9th Aerial routing through downtown Los Angeles would have a significantly greater

TABLE IV-13D

YEAR 2000 CHANGE IN LOCAL BACKGROUND BUS TRANSIT TRIPS

DOWNTOWN LOS ANGELES

Future Condition Year 2000	Screenline South of Washington Boulevard Daily Trips	Screenline South of Washington Boulevard Percent Change From No Project
No Project	36,152	-
LA-1/MC-1/LB-4	32,395	-11
LA-2/MC-1/LB-4	23,652	-35
LA-3/MC-1/LB-4	15,943	-56
LA-3/MC-1/LA-3	20,470	-43

Source: Southern California Association of Governments, 1984.

impact on local transit in the northern part of the corridor than would the other alternatives. This impact would range from a reduction of 56 percent for the Olympic/9th Aerial alternative to a reduction of 11 percent for the Broadway/Spring Couplet. This finding reflects the faster and more direct routing of the Olympic/9th alternative in reading the LACBD. By comparison, the Broadway/Spring alternative shows the lowest impact on local transit of the northern screenline.

IV-133 Parking

The demand for parking in downtown Los Angeles will increase at a faster rate than the parking supply between now and 1990 (the last year for which projections are available). A review of Table II-23A, Section II-233 shows that the parking supply is projected to increase in a majority of the proposed light rail station areas. However, the Broadway/Spring Couplet alternative (LA-1) shows the least amount (4.8 percent) of overall parking space increase at proposed station areas, as compared to 13.7 and 14.3 percent increases for the Flower Street Subway alternative (LA-2) and the Olympic/9th Aerial alternative (LA-3), respectively.

Curbside parking, which amounts to about 5 percent of the total downtown Los Angeles parking spaces, exists as both unrestricted and restricted parking spaces. Table IV-13E summarizes the reduction in the number of curbside parking spaces in downtown Los Angeles under each of the project alternatives. All of the spaces to be eliminated are restricted during the peak hour. The reduction in the number of spaces would be due to the elimination of parking on curbside lanes in order to provide for the traffic lanes lost on streets where the light rail tracks and stations would be constructed.

TABLE IV-13E

REDUCTION IN CURBSIDE PARKING SPACES

DOWNTOWN LOS ANGELES CBD

	Approximate Number of Curbside Spaces Lost	
Alternative	Unresricted Parking	Restricted Parking
Broadway/Spring (LA-1)	-	260
Flower Street Subway (LA-2)	-	300
Olympic/9th Aerial (LA-3)	-	105

Source: PB/KE, 1984.

Alternative LA-1 would eliminate approximately 96 curbside parking spaces on Washington Boulevard between Long Beach Avenue and Broadway Street at intersections and station locations; approximately 8 parking spaces on Broadway Street between Temple Street and Washington Boulevard at station locations; and about 8 curbside parking spaces on Main Street between 9th Street and Washington Boulevard.

Alternative LA-2 would eliminate approximately 128 curbside parking spaces on Washington Boulevard between Long Beach Avenue and Flower Street at intersections and station locations; and about 132 spaces on Flower Street between 11th Street and Washington Boulevard.

Alternative LA-3 would eliminate approximately 68 spaces on Olympic/9th Street (northside) between Los Angeles Street and Long Beach Avenue, and about 6 spaces on 9th Street (southside) between Hope and Figueroa Streets. Curb parking would be available to some extent between the aerial guideway columns on Olympic/9th. The net spaces lost on Olympic/9th Streets were estimated taking this parking into consideration.

The rail transit project could potentially reduce the peak parking demand in downtown Los Angeles. Comparison of the total daily traffic volumes entering the Central Business District from the south in year 2000 with and without the project shows a reduction of 2,768 vehicles for the Broadway/Spring Couplet with Atlantic with Pacific Loop Alternative and a reduction of 711 vehicles for the Olympic/9th Aerial with Los Angeles River Route alternative. The reduction in traffic entering the CBD for the Flower Subway with Atlantic with Pacific Avenue Loop alternative would be similar to the Broadway/Spring Couplet with Atlantic with Pacific Avenue Loop alternative. Therefore, all project alternatives would reduce the overall demand for parking in the CBD to the extent that they could compensate for the parking spaces lost due to the implementation of the project.

Further, all of the alignments would traverse areas identified as having parking supply deficits in the year 1990, including Spring Street, the Garment Center, and some portions of Figueroa Street. The rail transit systems would offer travelers bound for those areas the option of parking in more remote locations and riding the system to their final destinations.

IV-133.1 Mitigation Measures

Year 2000 parking conditions, at the light rail station areas in downtown Los Angeles will be crowded even without the project. Mitigation measures for those areas could involve, with proper coordination and cooperation of the public and private sector, the following:

- Transit-incentive and ride-share programs to reduce potential parking usage.

- The City of Los Angeles' "Parking Management Plan" which allows developers significant reduction in the provision of new parking spaces, if either an effective ride sharing program is implemented, or a remote parking lot is provided with an effective means of transporting employees to and from the remote lot.

- Increased parking fees to reduce parking demand.

The Long Beach-Los Angeles Rail Transit Project would be in itself an important parking mitigation measure, since it would provide an alternative to the automobile for access to and circulation within downtown Los Angeles.

IV-140 CUMULATIVE IMPACTS OF RELATED PROJECTS

The only potentially significant cumulative impact of the project in downtown Los Angeles is in the area of transportation. The Long Beach-Los Angeles Rail Transit Project would connect with or support other existing transit-related projects such as the El Monte busway extension; Metro Rail; the Harbor, Century, and Santa Ana Freeway transitways (see Appendix 1 for a discussion of related projects). Where transit lines cross, they would complement each other, giving the rider a choice of destinations and transit modes.

The freeway transit lines, such as the proposed Harbor Freeway transitway, the existing El Monte busway and the Santa Ana Freeway transitway, are through-routed and would not have a significant impact on circulation patterns in downtown Los Angeles. Amtrak and the proposed Los Angeles-San Diego Bullet Train (American High Speed Rail) also basically would provide services to areas outside of downtown Los Angeles and would have no cumulative effect.

Metro Rail will serve areas in Los Angeles and affect downtown traffic patterns. Metro Rail will also complement the Long Beach-Los Angeles Rail Transit Project very well by providing transit service to areas westerly and northerly of the light rail line. With expected transfer arrangements, total travel time on both systems will be quite acceptable.

The cumulative impacts of existing and proposed mass transportation projects could be substantial at Union Station. With all the potential transit lines coming into the station, it could again become a major center of activity as it was in the late 1940s and early 1950s when an average of 66 trains (33 departures and 33 arrivals) per day passed through the Union Station terminal.

Increased activity at Union Station could cause some minor economic development to occur to serve passengers (e.g., restaurants, candy-magazine counters, etc.). However, the overall cumulative economic benefits would not be significant since most of downtown Los Angeles is already densely urbanized, having substantial existing and proposed commercial development with well-established market areas. Generally, the LB-LA Rail Transit Project in combination with existing and proposed transit projects, would tend to support and supplement this development rather than stimulate new economic growth.

There would be small cumulative reductions in traffic congestion due to lower vehicle miles traveled (VMT) from increased transit ridership. Concurrent with decreased VMT would be minor reductions in energy consumption and slight improvements in overall air quality.

IV-200 MID-CORRIDOR

IV-210 NATURAL ENVIRONMENT

IV-211 Topography, Soils, Geology, and Seismicity

Alternatives MC-1 (Compton At-Grade) and MC-3 (SPTC Railroad Relocation) would have little or no impact on topography and soils. Alternative MC-2 (Compton Grade Separation) would cause the most significant change in landform. A 2.2-mile-long variable-width (40 feet to 100 feet) trench would be permanently constructed between the northbound and southbound lanes of Willowbrook Avenue from Stockwell Street to Greenleaf Boulevard in the City of Compton. Permanent bridge structures and partial decking are proposed to maintain vehicle and pedestrian access across the trench. No other mitigation is being considered.

The mid-corridor alternatives would be subject to strong groundshaking and liquefaction. Caltrans' preliminary geological investigations indicate that liquefaction potential is high in the mid-corridor and Long Beach. Mitigation measures used for groundshaking and liquefaction would be similar to those previously described for the downtown Los Angeles alternatives. No geological features, mineral resources, or agricultural soils would be affected in the mid-corridor.

IV-212 Floodplains, Hydrology, and Water Quality

In the mid-corridor there are no established floodplains and only two areas of potential drainage problems. One of these areas, near the Dominguez Hills, has been identified as having transverse drainage flow that could potentially be impeded by the proposed rail transit facility. Mitigation for this area would be the construction of culverts beneath the rail tracks to accommodate drainage patterns.

The other potential problem area is the MC-2 alternative (Compton Grade Separation). The construction of such a trench in Compton would require the improvement and/or relocation of an existing drainage system. This system is presently located on the easterly side of Willowbrook Avenue and collects surface flow from both the west and east sides of the corridor. A new drainage system would be constructed on the westerly side of Willowbrook Avenue with the existing westside facilities feeding into it. The drainage water would be channeled into Compton Creek just south of Greenleaf Boulevard. A system of sumps and pumps would be necessary to collect and eliminate water flowing into the trench. This water would be pumped into the local drainage system.

Crossing the Los Angeles River on the existing bridge and Compton Creek on a new bridge would not represent a significant encroachment on floodplains and have no effect on drainage patterns. The Los Angeles River and Compton Creek channels are designed to contain all water from the regional area generated by a 100-year flood. None of the potential modifications of existing bridges or new bridges would reduce the capacity of the channels or impede water flow in any way. Permits from the U.S. Army Corps of Engineers (404) and the Los Angeles County Flood Control District would be required for construction over the Los Angeles River and Compton Creek channels.

The proposed main yard site is located between the Long Beach Freeway (Route 7), San Diego Freeway (I-405), Compton Creek, and the Los Angeles River. The river is fully channelized in this area and does not represent a flooding hazard to adjacent areas.

Substantial run-off or pollution potential would probably not result from the rail transit line in itself in the mid-corridor, since the amount of impermeable surface associated with tracks is relatively minor. In addition, the implementation of design features which would reduce run-off, such as minimization of impervious surface areas and utilization of porous pavement, retention ponds, and vegetation, could lower the overall impact.

Increase in run-off of rain water from station construction could be anticipated. Facilities such as park-and-ride lots generally cause increases in impermeable surface area, which would result in additional local surface run-off during storms and reduced infiltration of water into the soil. This effect would cause added flows to storm drain and flood control systems and may reduce groundwater replenishment. No mitigation for increased water flow is anticipated; however, improvements to or new storm sewers would be constructed if needed. Pickup of litter and pavement sweeping would reduce levels of contaminants coming from park-and-ride lots. In any event, park-and-ride lot sources of water flow and contamination would not represent a significant impact because the amount of water involved would be very small.

There would be some increase in run-off at the selected main yard and shop site, although most of the yard would be covered with ballast. The run-off from the paved areas would be similar to any commercial development. The yard would have an underground drain system which would prevent water flows from concentrating, eliminate erosion, and reduce contamination of ballast in the track structure.

The main yard site would be constructed near a groundwater recharge basin located between the San Diego Freeway (I-405) and the existing SPTC tracks (proposed alignment). No impacts are anticipated because water flows from the yard would be routed away from the recharge basin.

Some minor water quality impacts would be associated with both the yard and shop sites (main and satellite). The act of washing and servicing the light rail vehicles (LRV) would require using various detergents, solvents, oil, grease, and other liquid chemicals. The washing and servicing areas would be constructed to drain into a collection system where all effluents would be contained for treatment before discharge. The treatment applied to this effluent would be primary in nature (sedimentation and clarification). After the effluent is skimmed, the oils separated, and the heavy particles settled out, the wash water would be recycled. The waste material cleaned from the water would be disposed of at the appropriate sanitary landfill. The majority of washing and servicing of the light rail vehicles would take place at the main yard. Only storage and running repairs would take place at the satellite yard.

Additional mitigation measures implemented at the yard sites would include the containment, cleanup, and management of other hazardous materials used or accidentally spilled. This would include a properly designed and maintained area for storage of any hazardous materials used in maintenance activities. Design features, such as impermeable floors to prevent chemical absorption from spills, protection of drains to prevent conveyance of chemicals to sewers, and walls or dikes to prevent horizontal migration of hazardous chemicals, would be employed as necessary. Materials used would be comparable to those used in a truck stop or bus garage maintenance facility. A permit from the Regional Water Quality Control Board (RWQCB) would be necessary to operate the maintenance yard facilities.

IV-213 Vegetation and Wildlife

Existing landscaping, ruderal (predominantly weedy) vegetation, and wildlife within the construction area of the mid-corridor alternatives would be either permanently removed or relocated. The amount of vegetation and wildlife within the existing mid-corridor right-of-way is relatively small and considered insignificant. The trees between Imperial Highway and the Compton city line will not be disturbed although some may have to be trimmed.

The rail alignment, stations, and maintenance facilities for the selected mid-corridor alternative would be landscaped with aesthetically compatible vegetation where deemed desirable or appropriate. Vegetation used as landscaping, especially at stations and maintenance yards, would require continual watering and trimming throughout its lifetime, or until it is removed. Displaced wildlife, such as birds and rodents, would return to the corridor of its own accord after the construction phase. The selected mid-corridor alternative would be fenced along most of its length, except at street intersections where automatic gates are to be installed. The fencing would reduce incidental contact with wildlife, such as larger rodents, and with cats and dogs.

The operation of the yard and shop facility would have permanent effects on the vegetation and wildlife presently at the proposed site. Impacts on birds would not appear to be severe since similar abandoned-field grasslands exist in the Southern California Edison transmission line corridor adjacent to the site. The red-tailed hawk densities in the corridor appear to be low. Therefore impacts on hawk populations would appear to be insignificant. Long-range impacts on the mammals would be the loss of most of the existing species using the site. However, the loss of the individuals would not endanger any of the species. Therefore, the long-range impacts are not deemed significant.

IV-214 Air Quality

Localized air quality impacts for the mid-corridor were calculated for both street intersections and at parking lots to determine whether the rail transit project would produce adverse carbon monoxide concentrations. The intersection analysis in the mid-corridor was conducted in the same manner as for the downtown Los Angeles segment, using the CALINE 3 model developed by the California Department of Transportation. (Section IV-114 describes the methodology in some detail.) The parking lot analysis draws upon the intersection analysis and is discussed in more detail in Section 214.2 below.

IV-214.1 Air Quality Impacts at Intersections

Two high-volume intersections with a projected traffic level of service of "D" or worse were chosen for analysis in the mid-corridor. The intersections are Imperial Boulevard at Wilmington and Del Amo Boulevard at Santa Fe. As with the downtown Los Angeles analysis, three conditions -- 1980, year 2000 without the project, and year 2000 with the project -- were compared for project-induced impacts. In the mid-corridor the analysis assumed the "baseline" at-grade light rail system (i.e., no grade separation in Compton for the light rail project and no diversion of Southern Pacific rail freight traffic from the Wilmington Branch to the San Pedro line).

Results of this analysis are shown in Table IV-21A. Ambient conditions reflect second highest hourly readings for the Lynwood sampling station in 1980. The background concentration was factored down from 1980 concentrations to projected year 2000 levels without the project based upon carbon monoxide emission reductions anticipated from implementation of the region's Air Quality Management Plan (AQMP).

Table IV-21A indicates that carbon monoxide concentrations would decline in the year 2000 to roughly one-quarter of what they were in 1980, with or without the light rail line in operation. The proposed rail transit system would have no effect on the carbon monoxide concentrations at these intersections in the year 2000.

IV-214.2 Air Quality Impacts at Parking Lots

In addition to the possibility of carbon monoxide concentrations at intersections along the light rail alignment, automobiles queuing to enter and leave parking lots could produce carbon monoxide concentrations potentially dangerous to health. In order to determine whether such concentrations would occur with the project in operation, a microscale dispersion analysis at the largest parking lots was performed.

TABLE IV-21A

PEAK PERIOD ONE-HOUR CARBON MONOXIDE CONCENTRATIONS

AT VARIOUS DISTANCES FROM SELECTED INTERSECTIONS - MID-CORRIDOR

(Parts Per Million)[1]

	1980: Existing Conditions				2000: Without Project				2000: Alternative LA-1			
Distance From Center of Intersection (meters)	10	20	40	80	10	20	40	80	10	20	40	80
Intersection												
Imperial Hwy./ Wilmington Ave.[2]	51.1	47.4	39.6	33.2	14.0	13.5	12.6	11.9	14.0	13.5	12.6	11.9
Del Amo Blvd./ Santa Fe Ave.[2]	68.6	54.9	42.0	33.5	15.7	14.2	12.9	11.9	15.7	14.2	12.8	11.9

[1] Federal standard = 35 ppm; state standard = 20 ppm.

[2] Ambient (background) concentration = 30 ppm (1980), 11.3 ppm (2000).

Source: Southern California Association of Governments, "Air Quality Impacts Technical Working Paper," February 9, 1984.

IV-214.21 Methodology

Carbon monoxide concentrations at parking lots were calculated by adding three components: (1) ambient carbon monoxide levels as determined by local monitoring data collected by the South Coast Air Quality Management District, in this case the Lynwood station, (2) the contribution of local streets and freeways adjacent to the parking lot as calculated with the CALINE 3 line source model, and (3) the local contribution of the parking lot itself using a methodology developed by the Environmental Protection Agency (Guideline for Air Quality Analysis, Volume 9, 1978). The combined results of these three components yield the carbon monoxide levels to be expected at each of the three largest parking facilities.

The analysis has assumed worst case meteorological conditions (e.g., low wind speed, high atmospheric stability, and peak hour traffic volumes and speeds). Prevailing wind direction was set at 245 degrees, clockwise from north, which is typical for the corridor during morning peak hours. The analysis also assumed that the highest monthly one-hour concentration of carbon monoxide represents the ambient condition. Emission factors were taken from EMFAC 6C for the existing 1980 condition and EMFAC 6D for the year 2000.

IV-214.22 Impacts

Seven parking lots are proposed in the mid-corridor to serve rail transit riders. The locations and projected number of spaces in each are shown in Table IV-21B.

TABLE IV-21B

PARKING LOTS IN THE MID-CORRIDOR

Stations	Parking Spaces
103rd Street	50
Compton Boulevard	50
Wardlow Road	50
Willow Street	100
Imperial Highway	500
Del Amo Boulevard	400
Artesia Boulevard	650

Source: PB/KE, 1984.

Of these parking facilities, experience indicates that all but the latter three could be ignored, in terms of carbon monoxide concentrations, on the basis of size.

Figures IV-21A to IV-21C show the conceptual designs for the Del Amo, Artesia, and Imperial station parking lots, including entrances/exits, line sources, and receptor locations. Only one receptor location was selected at each parking lot because analysis of adjacent land uses indicate that there would be no sensitive receptors, such as schools or hospitals, in the immediate vicinity of any of the stations. The receptor locations on referenced figures are the rail transit stations at each parking lot, points at which people could be expected to congregate.

Table IV-21C summarizes the results of this analysis and indicates that there would be no significant increase in carbon monoxide emissions at any of the parking lots with the project in operation. Again, because of stricter emission controls on automobiles and light duty trucks and because of implementation of the Air Quality Management Plan, carbon monoxide concentrations are projected to decline significantly in any case. With the project in operation, carbon monoxide concentrations would increase less than 0.5 ppm at any of the parking lots. In any case they would be well below both federal (35 ppm) and state (20 ppm) standards.

IV-215 Noise and Vibration

IV-215.1 Noise

Along the mid-corridor, the major source of current and future noise is rail freight traffic along the SPTC Wilmington Branch. Freight train noise levels at 50 feet for a single event passby could range as high as 98 dBA at 30 mph, in comparison with the much lower noise levels, approximately 72 dBA, of rail transit vehicles at the same speed and distance.

Current freight traffic traveling at 20 miles per hour on the Wilmington Branch produces a CNEL at 25 feet of 71 dBA, in comparison to a CNEL of 64 dBA for a light rail system at 25 feet traveling at 45 mph at-grade (see Table IV-11D, Section IV-115). As a further means of comparison, Table IV-21D lists estimated distances to different CNEL values for the light rail transit system and for three freight train traffic levels along the Wilmington Branch. The three levels of traffic include existing levels of traffic and two future levels, including the low scenario and high scenario options, currently being considered in the San Pedro Bay Ports Access Study. The significantly higher noise exposures generated by the existing and future rail traffic are apparent in the much greater distances shown to the various CNEL values.

Along the route, however, rail noises do not dominate everywhere. Measured CNEL values at four locations along the mid-corridor ranged

TABLE IV-21C

AM PEAK HOUR CARBON MONOXIDE CONCENTRATIONS

AT MAJOR PARKING LOTS

(ppm)

	1980	Year 2000 Without Project	Year 2000 With Project
Del Amo Station (400 parking spaces)			
Parking Lot	--	--	0.12
Street Traffic	15.9	1.8*	1.8*
Ambient	30.0	11.3	11.3
TOTAL	45.9	13.1	13.22
Artesia Station (650 parking spaces)			
Parking Lot	--	--	0.56
Street Traffic	0.4	0.1	0.1
Ambient	30.0	11.3	11.3
TOTAL	30.4	11.4	11.96
Imperial Station (500 parking spaces)			
Parking Lot	--	--	0.32
Street Traffic	0.5	0.2	0.2
Ambient	30.0	11.3	11.3
TOTAL	30.5	11.5	11.82

* The reasons for this significant decline are as follows: (1) existing (1980) queues at this intersection are at saturation levels, producing very low speeds; (2) there is a ten-fold decrease in emission rates from 1980 to 2000; and (3) consultants have recommended that signal cycle lengths at this intersection be increased from 60 seconds to 90 seconds. This change significantly improves the queuing situation.

Source: Southern California Association of Governments, "Carbon Monoxide Concentrations At Parking Lots: Long Beach-Los Angeles Rail Transit Project," January, 1984.

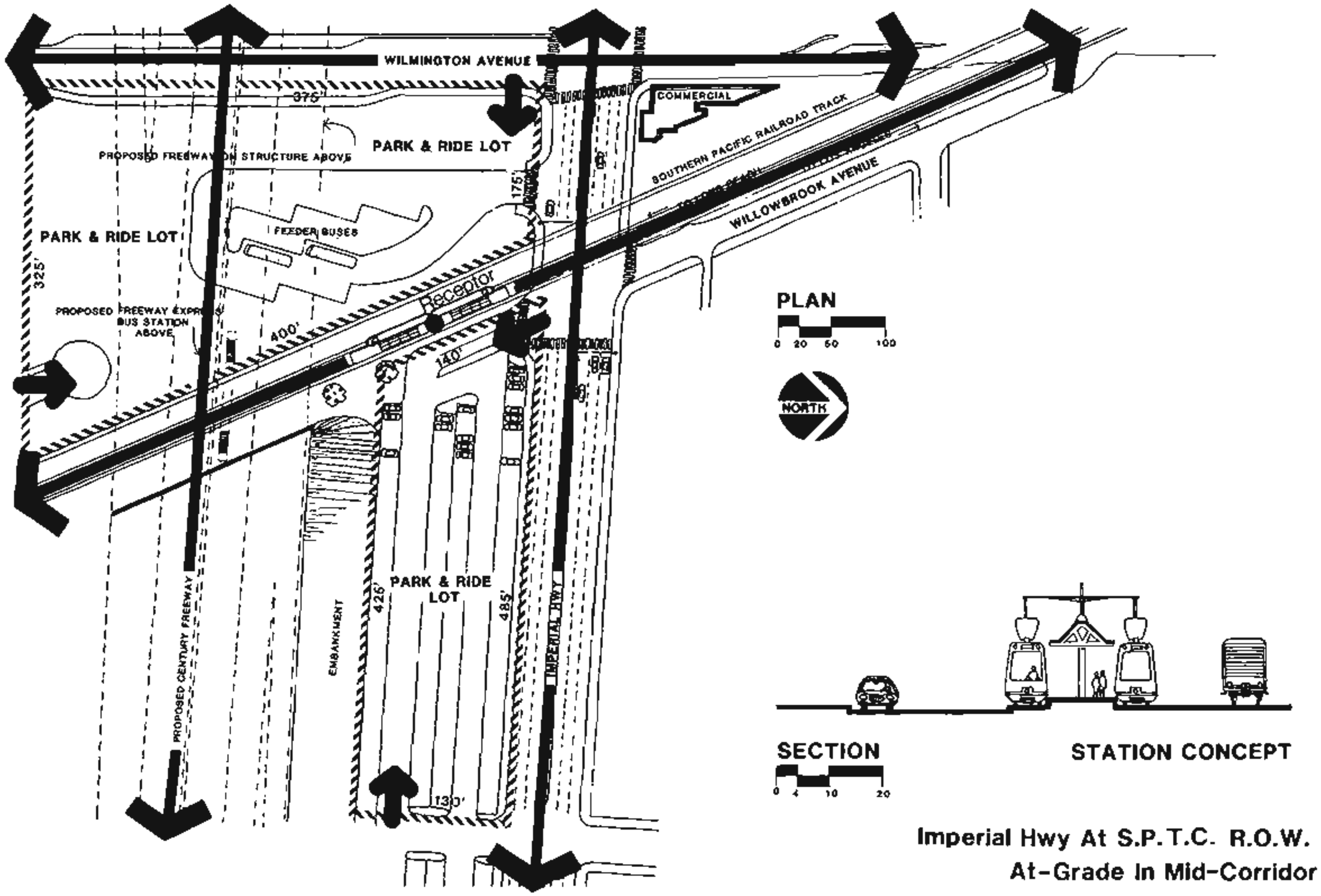


Figure IV-21A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Park & Ride Lot
At Imperial Hwy.
PARSONS BRINCKERHOFF / KAISER ENGINEERS

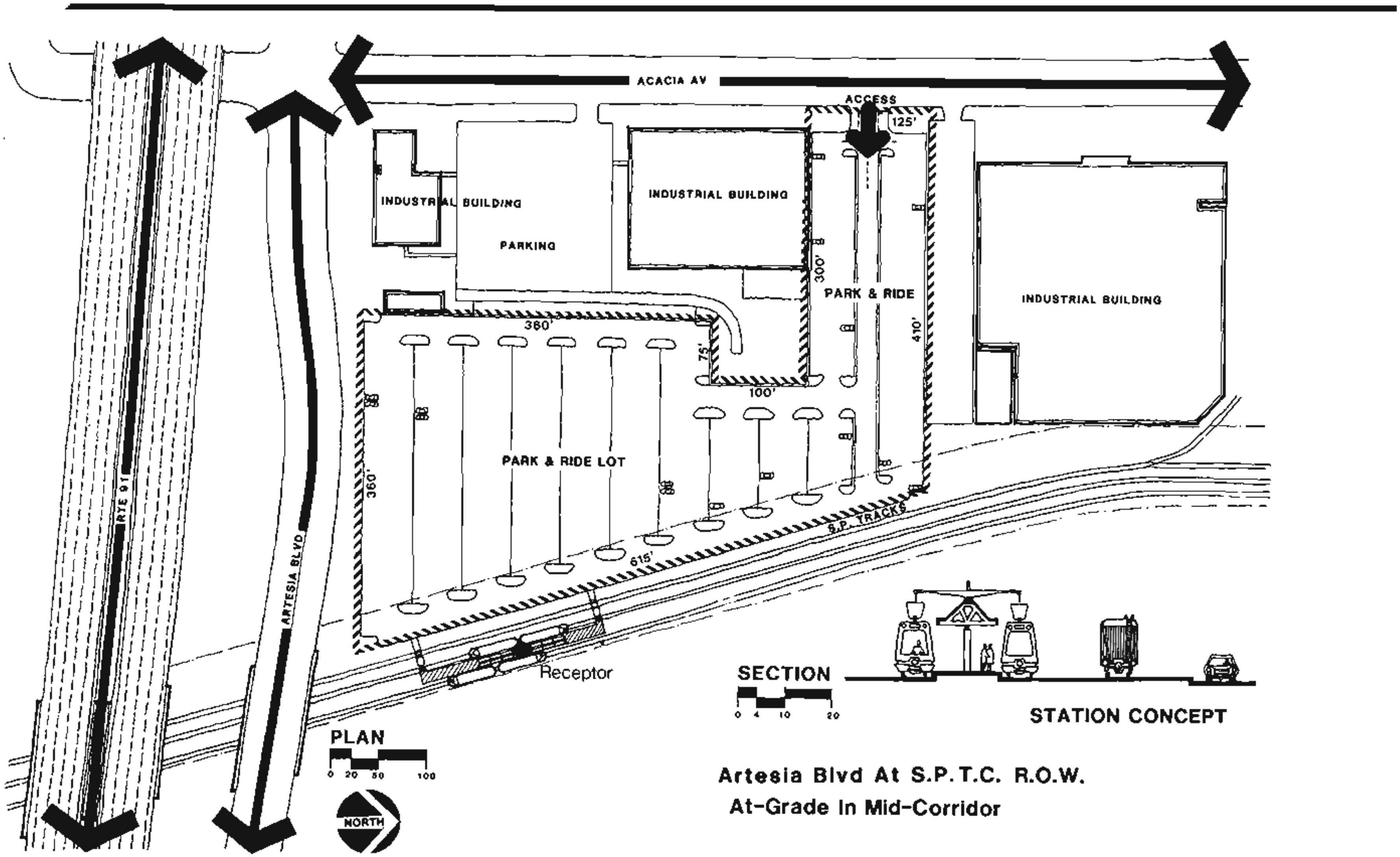
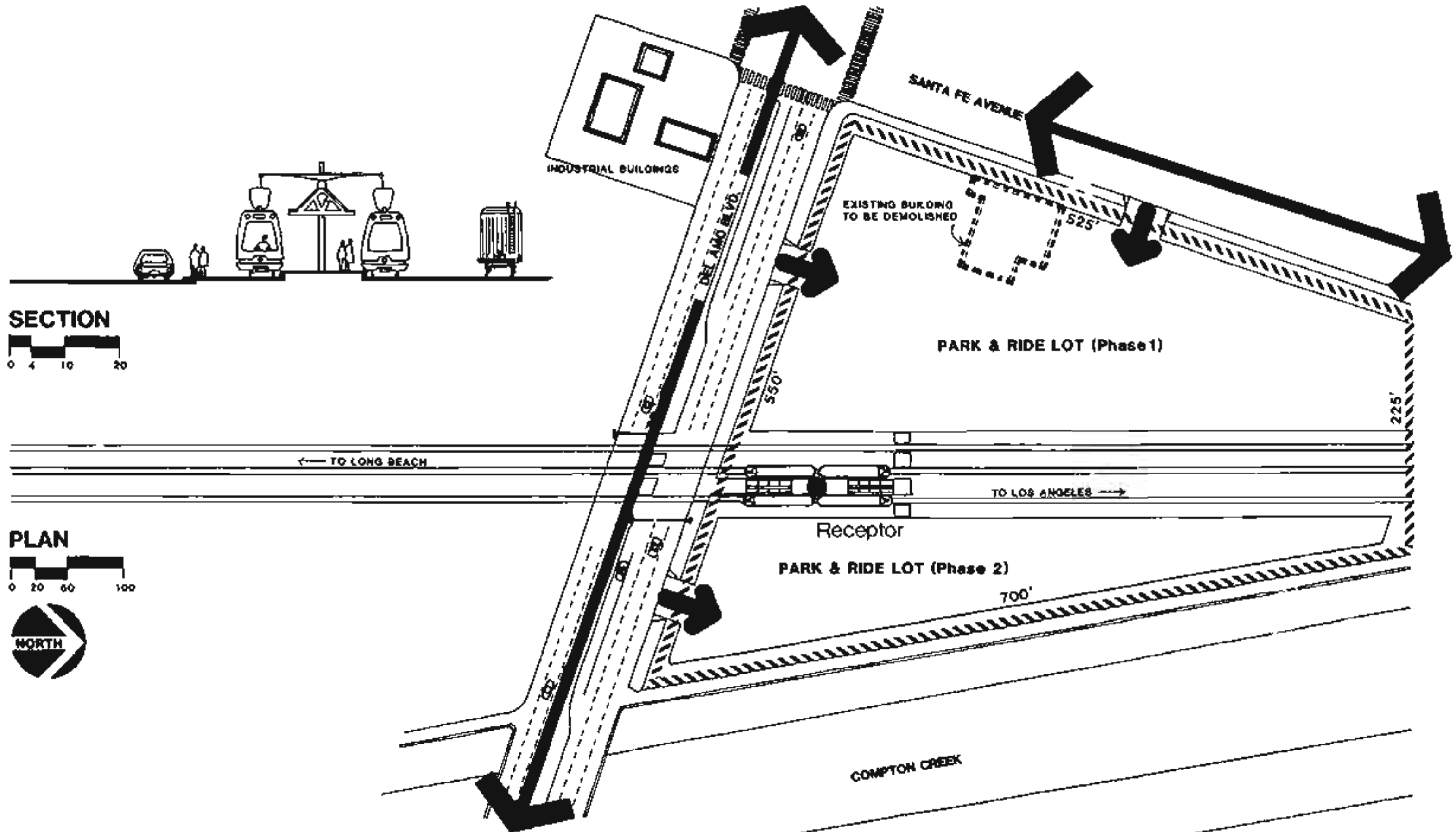


Figure IV-21B

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Park & Ride Lot
At Artesia Blvd.
PARSONS BRINCKERHOFF / KAISER ENGINEERS



Del Amo Blvd. At S.P.T.C. R.O.W.
At-Grade In Mid-Corridor

STATION CONCEPT

Figure IV-21C

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Park & Ride Lot
At Del Amo Blvd.
PARSONS BRINCKERHOFF/KAISER ENGINEERS

TABLE IV-21D

COMPARISON OF LIGHT RAIL TRANSIT AND

FREIGHT TRAIN CNELs ON SPTC WILMINGTON BRANCH

	Distance in Feet to Indicated CNEL				
	75 dBA	70 dBA	65 dBA	60 dBA	55 dBA
Light Rail Transit - 3-Car Train At-Grade at 45 mph	--	--	20	63	200
S.P. Wilmington Branch - Existing Freight Traffic (2 trains/day at 20 mph)	--	32	100	316	1,000
Future Rail Freight Traffic - Low Scenario (17 trains/day)	50	158	500	1,585	5000
High Scenario (29 trains/day)	100	316	1,000	3,160	10,000

[1] Assumes flat, open terrain with no shielding elements (atmospheric absorption not taken into account).

[2] The rail freight traffic levels shown for year 2000 are for the SPTC Wilmington Branch. Projected low and high scenarios represent a range of possible future rail freight traffic levels that might happen if all potential growth ocurs. It is not possible to predict whether all of this growth would occur before year 2000, although port planning in both Los Angeles and Long Beach assumes such growth.

Source: Bolt Beranek & Newman, 1984.

from 60 dBA to 70 dBA as reported in Section II-315 (Environmental Setting). In order to evaluate potential impact from the proposed light rail operations, a fractional impact analysis was performed.

The fractional impact methodology is a means of taking into account the absolute level of the future noise environment, the level of the existing noise environment, and the distribution of people exposed to various noise levels. In simple terms, the level weighted population (LWP) is a compilation of all the population affected by noise within 500 feet of a source. This number is not an absolute number of people but has weighting factors applied to reflect differing sound levels as related to distance and intensity. This method of counting the number of affected people allows not only a comparison among the alternatives but, in addition, a comparison from existing conditions to future conditions.

Table IV-21E presents the results of the impact analysis. The table first lists by alternative the total number of people in each community who live within 500 feet of the proposed light rail route. Under the column labeled "existing," the table lists the number of people with existing CNEL in excess of 65 dBA. This value is considered to be the dividing line between an acceptable and an unacceptable noise environment for residential land use. The next column lists one LWP, followed by the noise impact index NII. The NII is the ratio of the level weighted population (LWP) to the total number of people. For example, under alternative MC-1 the table shows that there are 4,129 people living in the corridor in Compton. Of these, 66 have an existing noise exposure in excess of 65 dBA. The level weighted population in Compton is 705, or 17 percent of the total number of people living in that portion of the corridor.

The next two columns on the table provide the same noise exposure information for the future conditions. One set of numbers shows conditions if the light rail system is not built; the other set shows conditions for the project in place. As indicated on the table, the future condition analysis includes the 29 trains/day scenario for freight rail operations along the Southern Pacific Wilmington Branch. (Additional analyses were performed for both the "4 trains/day" and an artificial scenario in which there were no freight operations along the Wilmington Branch. The results of these analyses, reported in the technical working paper on noise and vibration, showed the same trends and conclusions that are illustrated in this table: i.e., that the light rail system would have no impact on the noise environment of noise-sensitive residential land uses in the vicinity of the corridor.

Examination of the noise impact index and the level weighted population indicates that there would be a sharp increase in the noise environment from existing conditions to future conditions for most communities and most alternatives, even without the light rail transit project. Addition of the light rail transit project to the future scenario would change the impact numbers insignificantly.

TABLE IV-21E

NOISE IMPACT ANALYSIS RESULTS FOR THE MID-CORRIDOR

		Year 2000: 29 Freight Trains/Day								
		Existing			No Build			Project		
Alternative	Total No. People[1]	65+[2]	LWP[3]	NII	65+[2]	LWP[3]	NII[4]	65+[2]	LWP[3]	NII[4]
MC-1										
Compton	4129	668	705	.17	2020	2094	.51	2020	2117	.51
Los Angeles	13126	1335	2023	.15	6002	5157	.39	6002	5258	.40
Unincorporated Areas	8582	1361	1450	.17	3882	4061	.47	3882	4073	.47
Long Beach	1598	998	774	.48	1069	814	.51	1090	843	.53
MC-2[5]										
Compton	4129	668	705	.17	2020	2094	.51	948	1071	.26
MC-3										
Wilmington Branch										
Compton	4129	668	705	.17	2020	2094	.51	164	364	.09
Los Angeles	13126	1335	2023	.15	6002	5157	.39	5468	4732	.36
Unincorporated Areas	8582	1361	1450	.17	3882	4061	.47	2111	2551	.30
Long Beach	1598	998	774	.48	1069	814	.51	1090	843	.53
San Pedro Branch										
Compton	1191	414	378	.32	669	510	.43	1011	804	.68
Los Angeles	1865	70	175	.09	70	175	.09	1055	1044	.56
Unincorporated Areas	1803	189	309	.17	366	498	.28	867	888	.49
TOTALS										
MC-1	27435	4362	4952	.18	12973	12126	.44	12994	12291	.45
MC-2	27435	4362	4952	.18	12973	12126	.44	11922	11245	.41
MC-3	32294	5035	5814	.18	14078	13309	.41	11766	11226	.35

1 People living within 500 feet of route
2 65+ - No. people with CNEL greater than 65 dBA
3 LWP - Level Weighted Population
4 NII - Noise Impact Index = LWP ÷ Total No. People
5 Values for City of Los Angeles and unincorporated areas same as MC-1

Source: Bolt Beranek & Newman, 1984.

With regard to the various alternatives, the table shows that under MC-1 the noise impact index would rise from 18 percent to 44 percent for the future scenario, and to 45 percent with the addition of the light rail project. MC-2, which would involve depressing a portion of the Southern Pacific and light rail tracks through Compton, would result in a small but observable decrease in noise impact as evidenced by the decrease in the noise impact index shown on the table from 44 percent to 41 percent for MC-2 (note the larger reduction in impact for Compton itself).

The diversion of rail freight traffic, alternative MC-3, from the Wilmington Branch onto the San Pedro Branch via the West Santa Ana Branch at Watts Junction would result in a shift of the noise environment. There would be a noticeable decrease in noise impact in those communities south of Watts Junction along the Wilmington Branch and a significant increase in noise exposure and impacts along the communities that border the San Pedro Branch. These would tend to balance each other out such that the Noise Impact Index (NII) along the entire corridor would change from 45 percent without the project to 42 percent with the project for MC-3. However, although the NII percentage would show an overall decrease with the project over future conditions without the project, there would be still a significant increase in noise impacts to the residents along the West Santa Ana and San Pedro Branches of the railroad.

Table IV-21F lists CNEL estimates for future conditions with and without the project for non-residential noise-sensitive land uses along the mid-corridor. Again, along the Wilmington Branch the rail transit project would not significantly increase noise exposure, but increased freight traffic on the West Santa Ana and San Pedro Branches under alternative MC-3 would increase exposure significantly.

In summary, the light rail project would have insignificant impact on the noise environment in the mid-corridor corridor in future years. There would be slight reductions in impact for MC-2 and MC-3 relative to MC-1; however the MC-2 reductions would be developed without causing any additional impact, while the MC-3 reductions would occur only at the expense of an increase in impact of a significant nature along the West Santa Ana and San Pedro Branches of the railroad.

Noise produced by typical activities at maintenance facilities could be disturbing to people if such facilities were located close to noise-sensitive land uses. The main yard and shop site would be located south of Del Amo Boulevard between the Los Angeles River and the Long Beach Freeway. This is an industrial area impacted by noise from the freeway and railroad; there are no noise- or vibration-sensitive receptors in the vicinity of the site which could be adversely affected by maintenance facility operations.

TABLE IV-21F

NOISE EXPOSURE ESTIMATES FOR NONRESIDENTIAL NOISE-SENSITIVE RECEPTORS - MID-CORRIDOR

Type	Nearest Street Intersection	CNEL, dBA Future No Project	Project Level	Future with Project	Project Contribution
MC-1, MC-2, MC-3					
Church	Long Beach Ave. & Vernon Ave.	65.6	54.8	66.0	0.4
Church	Long Beach Ave. & 55th St.	68.7	57.0	69.0	0.3
Pre-School	Long Beach Ave. & 55th St.	68.7	57.0	69.0	0.3
Church	Long Beach Ave. & 55th St.	68.7	57.0	69.0	0.3
Park	Graham Ave. & Nadeau St.	74.6	55.7	74.7	0.1
Park	Long Beach Ave. & 48th St.	67.7	55.3	67.9	0.2
Pre-School	Graham Ave. & Firestone Blvd.	74.9	53.9	74.9	0
Park	Firestone Blvd. & Maie Ave.	72.5	53.9	72.6	0.1
Church	99th St. & Grandee Ave.	75.9	57.4	76.0	0.1
Church	Willowbrook Ave. & 104th St.	72.5	52.7	72.6	0.1
MC-1 & MC-2					
Watts Towers	Santa Ana Blvd. & 108th St.	70.2	50.4	70.3	0.1
Church	Willowbrook Ave. & 121st St.	75.7	57.7	75.8	0.1
Church	Willowbrook Ave. & 124th St.	75.3	57.3	75.4	0.1
Library	Willowbrook Ave. & El Segundo Blvd.	75.7	56.8	75.8	0.1
School	Willowbrook Ave. & 130th St.	72.7	54.8	72.8	0.1
Church	Willowbrook Ave. & 130th St.	75.7	56.8	75.8	0.1
MC-1					
Church	Willowbrook Ave. & Rosecrans Ave.	78.2	59.0	78.3	0.1
Church	Willowbrook Ave. & Rosecrans Ave.	78.2	59.0	78.3	0.1
Church	Willowbrook Ave. & Maple St.	73.8	56.0	73.9	0.1
Church	" & Elm St. - Compton Blvd.	73.7	55.2	73.8	0.1
Church	" & Elm St. - Compton Blvd.	73.7	55.2	73.8	0.1
Church	" & Elm St. - Compton Blvd.	73.7	55.2	73.8	0.1
School	Willowbrook Ave. & Alondra Blvd.	76.3	56.6	76.4	0.1
MC-1, MC-2, MC-3					
Seminary	South of Artesia Fwy.	66.3	56.9	66.8	0.5
Park	ROW & San Diego Fwy.	71.9	57.2	72.0	0.1
Church	Pacific Ave. & Wardlow Rd.	73.8	59.5	74.0	0.2
Medical Facility	Pacific Ave. & Wardlow Rd.	73.8	59.5	74.0	0.2
Park	Pacific Ave. & Spring St.	66.5	59.9	67.4	0.9
MC-2					
Church	Willowbrook Ave. & Rosecrans Blvd.	78.2	47.0	74.3	-3.9
Church	Willowbrook Ave. & Rosecrans Blvd.	78.2	47.0	74.3	-3.9
Church	Willowbrook Ave. & Maple St.	73.8	44.0	66.2	-7.6

TABLE IV-21F (Continued)

NOISE EXPOSURE ESTIMATES FOR NONRESIDENTIAL

NOISE-SENSITIVE RECEPTORS - MID-CORRIDOR

Type	Nearest Street Intersection	CNEL, dBA Future No Project	Project Level	Future with Project	Project Contribution
MC-2 (Continued)					
Church	Willowbrook Ave. & Elm St. - Compton Blvd.	73.7	43.2	64.6	-9.1
Church	" & Elm St. - Compton Blvd.	73.7	43.2	64.6	-9.1
Church	" & Elm St. - Compton Blvd.	73.7	43.2	64.6	-9.1
School	Willowbrook Ave. & Alondra Blvd.	76.3	56.6	68.7	-7.6
MC-3					
Church	Willowbrook Ave. & 121st St.	75.7	57.7	62.7	-13.0
Church	Willowbrook Ave. & 124th St.	75.3	57.3	62.6	-12.7
Library	Willowbrook Ave. & El Segundo Blvd.	75.7	56.8	69.6	-6.1
Church	Willowbrook Ave. & 130th St.	75.7	56.8	69.6	-6.1
School	Willowbrook Ave. & 130th St.	74.7	54.8	59.8	-12.9
Church	Willowbrook Ave. & Rosecrans Ave.	78.2	59.0	73.1	-5.1
Church	Willowbrook Ave. & Rosecrans Ave.	78.2	59.0	73.1	-5.1
Church	Willowbrook Ave. & Maple St.	73.8	56.0	59.4	-14.4
Church	" & Elm St. - Compton Blvd.	73.7	55.2	63.9	-9.8
Church	" & Elm St. - Compton Blvd.	73.7	55.2	63.9	-9.8
Church	" & Elm St. - Compton Blvd.	73.7	55.2	63.9	-9.8
School	Willowbrook Ave. & Alondra Blvd.	76.3	56.6	63.5	-12.8
MC-3 - West Santa Ana Branch					
Watts Towers	Santa Ana Blvd. & 108 St.	70.2	50.4	74.2	4.0
Church	Santa Ana Blvd. & Juniper St.	63.4	-	75.8	12.4
School	Santa Ana Blvd. & 111th St.	63.4	-	75.8	12.4
MC-3 - San Pedro Branch					
Church	Alameda St. & Rosecrans Ave.	73.3	-	79.4	6.1
School	Alameda St. & Rosecrans Ave.	73.4	-	77.1	3.7
Church	Alameda St. & Palmer Ave.	72.8	-	79.8	7.0
Library	Alameda St. & Compton Blvd.	74.3	-	81.1	6.8
Church	Alameda St. & Almond St.	72.8	-	79.8	7.0
Childrens Center	Alameda St. & Indigo St.	73.4	-	77.9	4.5
Medical Facility	Alameda St. & Rosecrans Ave.	73.4	-	77.1	3.7

Note: Assumes freight train traffic is at 29 trains/day from Slauson to Watts Junctions and 25 trains/day from Watts to Dominguez Junctions on SPTC Wilmington Branch. With MC-3, SPTC West Santa Ana Branch would carry 25 trains/day to junction with SPTC San Pedro Branch, and 35 trains/day from there south on San Pedro Branch to Dominguez Junction (SCAG, San Pedro Bay Ports Access Study, 1984).

Source: Bolt Beranek & Newman, 1984.

IV-215.11 Mitigation Measures

Situated along the West Santa Ana Branch of the railroad there are approximately 280 dwellings which would experience a noise exposure in excess of 65 dBA on the CNEL scale. Of these, approximately 115 would experience a significant impact, with exposure of 11 to 14 dBA above the 65 dBA level. The remaining 165 dwellings would experience a much lesser impact, with noise exposure of 1 to 4 dBA over the 65 dBA level.

Mitigation of the impacts to these homes caused by MC-3 could take the form of a noise barrier wall to shield the homes from the rail noise. Because of the high noise source associated with conventional rail vehicles (the exhaust stack of the locomotive), the use of noise barriers may not be appropriate as they would have to be 12 to 15 feet high. This may not be acceptable to the residents of the area on aesthetic grounds or to the railroads on safety grounds. The length of the wall which would have to be constructed is slightly over a mile. Assuming 6,000 feet at a cost of $70 per foot, the noise barrier would cost approximately $850,000.

A second method of mitigation would be to modify the homes to reduce interior noise levels. One disadvantage of this approach is that the outdoor noise environment is not affected. While it is difficult to estimate the exact types of mitigation that would be required without a detailed study of the structures to be modified, it is technically feasible to obtain a reduction of 10 to 15 dBA by appropriate modification to windows, doors, and walls; and the addition of mechanical ventilation systems. Typical costs of such modifications would be approximately $22,000 per unit. If the modifications were applied to the 115 units which are projected to be affected significantly, the cost would be about $2.5 million.

IV-215.2 Vibration

Groundborne vibration generated by the light rail system is not expected to create an impact on vibration-sensitive structures along the mid-corridor, for two reasons. First, vibration levels for light rail vehicles would be below the Committee on Hearing and Bioacoustics (CHABA) criteria for daytime and nighttime periods. Figure IV-11D shows measured vibration levels for DueWag RTE vehicles in service in Edmonton (Alberta), Canada. However, at the average 40 mph planned for the mid-corridor, vibration levels would only increase by 2 to 4 dB over one 30 mph measurement in the figure. Such speeds would be attained in areas where the closest structures would be 50 feet from the track centerline. Consequently, no vibration impacts on adjacent structures are anticipated from operation of the light rail vehicles.

Second, comparison of expected light rail vehicle vibration levels with existing (measured) levels for freight train and switcher activities indicates that current vibration levels are higher than those expected with light rail vehicles.

Under alternative MC-3, one additional area of impact must be considered. With diversion of rail traffic from the Wilmington Branch to the West Santa Ana and San Pedro Branches, there would be a significant increase in the number of freight trains passing by vibration-sensitive locations along these rail lines. Just as the noise analysis indicated a significant increase in the noise exposure for these locations, there would be a significant increase in vibration exposure as well. Of greatest concern, however, would be the vibration impact on vibration-sensitive receptors along the West Santa Ana Branch, where there are now no rail vehicles operating. For residences along this line, vibration levels comparable to those measured at mid-corridor locations would be expected. These vibration levels are in excess of the CHABA criteria.

A recent California Department of Transportation (Caltrans) study simulated vibration levels of operating freight trains on a single track of the West Santa Ana Branch (Caltrans, Vibration and Noise Study at Watts Towers, April 1981). The results indicated vibration levels very close to the CHABA limits for "ancient monuments and ruins," a category established for structures particularly susceptible to damage because of age or condition. Without detailed vibration measurements on the towers themselves, if is not possible to determine whether they are particularly susceptible to damage. However, since they were not designed to the same standards as conventional structures, a potential for significant damage exists if freight operations were resumed on the West Santa Ana Branch for the MC-3 alternative.

IV-215.21 Mitigation Measures

MC-3 is the only alternative which would require mitigation for vibration. In that case, tests would be conducted on the Watts Towers to determine the extent of the potential impact. If test results indicate potential damage from vibration, a vibration barrier would be incorporated into the project design. There is existing technology to reduce vibration to an insignificant level. Vibration barriers could consist of a ballast mat, a trench filled with vibration dampening material, or a combination of the two. Costs would be between $75,000 and $100,000 depending on methods used. Depending on test results, the final design would incorporate whatever elements were necessary to bring vibration levels at the towers to levels at or below those experienced today.

IV-220 SOCIOECONOMIC ENVIRONMENT

IV-221 Land Use, Population, and Housing

The methodology by which year 2000 growth forecasts were adjusted to estimate potential project-induced changes is discussed in Section IV-121.

IV-221.1 Land Use and Development

The following discussion is broken into two parts: 1) an assessment of the amount of project-induced development and its likely location, and 2) an evaluation of how well the project would meet transit-related goals and objectives as stipulated in the local general, community, and redevelopment land use plans.

IV-221.11 Growth-Inducing Impacts

Table IV-22A illustrates where growth projected by SCAG could be expected to occur. As in the rest of the corridor, the overall growth rate induced by the project is expected to be modest, approximately 100,000 square feet of retail and 300,000 square feet of office development. In addition, the project could provide additional support for the development of planned shopping centers at the 103rd Street and Imperial Highway stations, as well as additional development in the Florence Avenue business district and downtown Compton.

IV-221.12 Conformance With Land Use Plans

Conformance is evaluated in terms of the measures described in Section 121.11 of this chapter.

o <u>Serve Population Concentrations</u>:

Total population and population density within 1/4 mile of all stations in the mid-corridor are compared with the entire segment below in Table IV-22B.

TABLE IV-22B

YEAR 2000 STATION AREA POPULATION DENSITY

MID-CORRIDOR

	Total Population	Population Density: Population/ Square Mile	Population Density: Impact
Mid-Corridor Segment	42,188	9,022	
Mid-Corridor Stations	16,078*	10,290*	not significant

* Within 1/4 mile of stations

Source: Sedway Cooke Associates, 1984.

TABLE IV-22A

DEVELOPMENT WITHIN ONE QUARTER MILE OF STATIONS

MID-CORRIDOR

	Existing in 1980 (000s of Gross Sq. Ft.)			1980-2000: New Development with No Project (000s of Gross Sq. Ft.)			Possible Additional Development with the Project (000s of Gross Sq. Ft.)		
	Office	Retail	Housing Units	Office	Retail	Housing Units	Office	Retail	Housing Units
Washington Boulevard	0	17	145	0	4	140	0	0	110
Vernon Avenue	0	25	692	0	2	80	0	0	220
Slauson Avenue	0	30	434	0	0	90	0	0	260
Florence Avenue	0	300	725	9	0	80	10	30	240
Firestone Boulevard	10	150	712	5	0	60	0	0	180
103rd Street	15	60	452	3	100	100	30	100	310
Imperial Highway	0	24	612	6	100	100	30	140	310
Compton Boulevard	536	380	487	7	5	190	30	30	550
Artesia Boulevard	0	60	0	0	17	0	0	0	0
Del Amo Boulevard	0	0	0	0	3	0	0	0	0
TOTAL	561	1,047	4,259	30	231	740	100	300	2,180

Source: Sedway Cooke Associates, 1984.

The existing and projected population density around stations is only slightly greater than that of the mid-corridor segment as a whole, indicating that the selected route and stations would not provide access to significant concentrations of population.

o Serve Commercial Centers:

Compared with the two downtowns, employment densities in the mid-corridor are low. The principal non-residential land use in the mid-corridor is industrial, which supports low employment levels relative to office use. Specifically, 25 to 40 employees per net acre are generated by industry, compared with 500 to 1,000 per net acre for office use at a floor area ratio (FAR) of 3 to 6. In the mid-corridor, where the is little demand for office development, the most advantageous route would be close to retail centers. Although retail centers have employment densities about equal to industrial uses, they generate 20 to 30 times as many visitors as employees. If the transit-served retail centers are located near housing, especially high-density housing, shopping trips could be combined with work trips to the two downtowns to increase the attractiveness of the transit system for potential users. Thus, in the mid-corridor, it would be most effective to locate the transit line in predominantly residential areas with as many retail centers as possible.

Of all the railroad rights-of-way in the south central area, the Wilmington Branch passes through the most residential areas and connects the most retail centers.

The proposed stations in the mid-corridor segment of the project are located at roughly 2-mile intervals at major intersections. Most of these locations were stations on the old Pacific Electric Interurban Line between Long Beach and Los Angeles and consequently include at least a small concentration of retail development; several contain community retail centers of more than 100,000 square feet. The Florence Avenue and Compton Boulevard stations include large community shopping centers. Similar centers are planned for 103rd Street and the Century Freeway (Imperial Highway). The Firestone Boulevard and Vernon Avenue station areas contain a small amount of retail development.

The number and density of employees and shoppers who would be within 1/4 mile of a station in the mid-corridor are compared with the segment as a whole in Table IV-22C. The average concentration of non-residential activity in mid-corridor station areas would be double that of the segment as whole in the year 2000.

TABLE IV-22C

YEAR 2000 EMPLOYMENT/SHOPPING DENSITIES - MID-CORRIDOR[1]

	Total Employees and Daily Shoppers	Employees and Daily Shoppers/ Per Square Mile	Impact[2]
Mid-Corridor Segment	718,000	14,000	
Mid-Corridor Stations[3]	44,000	28,000	+

[1] Assumes 30 shoppers per day per 1,000 gross square feet and one employee per 300 gross square feet of office, one per 500 gross square feet of retail, and one per acre of industrial use.

[2] + indicates potentially positive impact.

[3] Within 1/4 mile of station.

Source: Sedway Cooke Associates, 1984.

- Serve Activity/Growth Centers:

  The following regional focal points designated in the County General Plan and depicted on Figure II-15A (In Chapter II) would be served by the project in the mid-corridor. The Compton Level 3 Multipurpose Center would be within walking distance of the Compton Boulevard station. The area around 103rd Street station is designated as a cultural center in the County General Plan and as a growth center by SCAG. Martin Luther King Hospital would be about a 1/2 mile from the Imperial Highway station, and Compton City College is about the same distance from the Artesia Boulevard station. Also served would be the Century Freeway (Imperial Highway) shopping center proposed by the County.

- Connect with Other Transit/Transportation Systems:

  The project would connect with three transportation systems the mid-corridor: the Century Freeway transitway, the Artesia Freeway, and the Long Beach Freeway. A direct passenger connection between the project and the Century Freeway transitway is planned. Park-and-ride lots are planned for both the Artesia Boulevard and Del Amo Boulevard stations, which would be accessible to the Artesia and Long Beach Freeways respectively.

- Enhance Revitalization Efforts:

  The following redevelopment and revitalization projects within the mid-corridor, shown on Figure IV-12A, would be served by the project: Florence/Graham Community Business Revitalization Target Area, Watts Redevelopment Project, Willowbrook Neighborhood Redevelopment Project and the Compton CBD Redevelopment Project. Revitalization projects in the mid-corridor which would not be served by the project include the Central Avenue Target Area, Alameda Corridor Target Area, and Walnut Industrial Park Redevelopment Areas.

- Increase Accessibility to Public Facilities:

  There are 84 public and community facilities within 1/4 mile of the proposed stations in the mid-corridor (see Section IV-122).

- Compatibility of Project Facilities with Adjacent Land Uses:

  As one of the oldest rail transit corridors in the Los Angeles area, use of the project's right-of-way would be within existing and proposed use plans and zones for the area. Station locations and parking lots have been carefully chosen to be in conformance with land use plans for the area.

  There are 3 major park-and-ride and 2 neighborhood park-and-ride lots proposed in the mid-corridor. The neighborhood park-and-ride lot at the 103rd Street station would be located in part on the SPTC right-of-way and in part on land in the Watts Redevelopment Project Area. This land is zoned for industrial use, which permits commercial or public parking facilities, and is designated for public use by the redevelopment plan.

  While the CRA has recently considered commercial uses for the proposed parcels, the redevelopment plan indicates a landscaped area or public park for site. According to the CRA, however, these were intended as temporary uses until the site could be developed. Since no specific plans have been made for the site by the CRA, development as a neighborhood park-and-ride lot, possibly in conjunction with retail development, would not be inconsistent with CRA plans.

  At the Imperial Highway station, there are three areas designated for parking lots. One would be in the Century Freeway right-of-way. The other two would be located adjacent to and north of the right-of-way on land zoned C3 (unlimited commercial) by the county. This zone would permit a public parking lot.

  The proposed neighborhood park-and-ride lot at the Compton Boulevard station would be located in the CBD Redevelopment Area on land zoned for light manufacturing use. According to the Compton CRA, use of the site as a parking lot would be consistent with plans for the area.

Alternative MC-3 would divert freight traffic between Watts and Dominguez Junctions onto the SPTC West Santa Ana Branch, which is adjacent to Santa Ana Boulevard, and the SPTC San Pedro Branch, adjacent to Alameda Street. Land uses adjacent to these two branch lines are predominantly industrial (60 percent of total frontage). A total of 30 percent of the frontage which is residential and 10 percent which is commercial would be adversely affected by the increased freight volumes. On the other hand, land uses along the Wilmington Branch -- 67 percent residential, 13 percent commercial or institutional, 4 percent vacant, and 16 percent industrial would benefit from the shift of freight traffic away from the Wilmington Branch. The principal impacts would be altered noise and traffic, discussed elsewhere in this chapter, and pedestrian safety. Access to the 103rd Street, Imperial Highway, Compton Boulevard, and Artesia Boulevard stations would be less hazardous and more convenient for passengers who would not have to wait for passing freight trains in order to cross the tracks to board a light rail vehicle. Conversely, safety hazards would increase and pedestrian access across the tracks would be constrained by the additional freight traffic on the West Santa Ana and San Pedro Branches.

- Other Measures of Compatibility:

There would be no significantly adverse impacts on residential neighborhoods from increased traffic congestion because the project is expected to have very little effect on traffic volumes near stations in the mid-corridor. Section IV-230 discusses traffic impacts in detail. The other transportation-related indirect impact, the potential for spillover parking into residential areas, is also considered to be negligible in the mid-corridor. At stations where parking demand may exceed supply, such as Artesia and Del Amo Boulevard, there are no significant residential land uses. Projected parking impaets are discussed in Section IV-233.

Safety hazards to pedestrians in the mid-corridor would be mitigated to some extent by fencing the tracks. Such hazards could occur primarily where high-use community facilities are located near intersections where the rail tracks would be accessible. Two parks, four churches, and two schools are adjacent to the right-of-way at intersections.

The fenced rail line could restrict pedestrian access to public facilities and local circulation patterns where it would create a barrier between residential neighborhoods. Residents who are accustomed to crossing the right-of-way between dead-end streets to use public facilities or to visit neighbors would have to walk to the nearest through street. A detour of less than

1/4 mile would not greatly inconvenience people, but a detour of more than that would begin to restrict neighborhood pedestrian circulation patterns. To mitigate this potential impact, pedestrian overpasses should be considered where fencing would cause pedestrian diversions of 1/4 mile or more. A discussion of potential pedestrian crossing locations could be found in Section IV-222.1.

The "Compton Cut" proposed in MC-2 would reinforce the barrier between neighborhood created by fencing the right-of-way from just south of El Segundo Boulevard to just north of Greenleaf Boulevard.

o <u>Joint Development Opportunities</u>:

There would be approximately 1.7 million square feet of commercial development and about 100 acres of vacant land, most of which is zoned for commercial use, within 1/4 mile of the proposed mid-corridor stations. Most of that vacant land is located near the Artesia Boulevard, Compton Boulevard, Del Amo Boulevard, and 103rd Street stations. There is a significant amount of additional land near these and other stations which is underused and could be developed.

The park-and-ride lots at the Century Freeway, Artesia Freeway, and Del Amo Boulevard, and the neighborhood park-and-ride lots 103rd Street, Compton Boulevard, and Wardlow Road could be developed in the future if the demand for development becomes sufficient to support structured parking in conjunction with that development; such demand is not expected in the next 20 years but could develop in the longer term.

While there is no strong market for commercial development in the mid-corridor, there are redevelopment plans to build community shopping centers near the 103rd Street and Imperial Highway stations. The project could bolster those plans by providing a strong pedestrian link between the stations and the shopping centers. The proposed shopping center at 103rd Street station would be located northwest of the intersection of the railroad right-of-way and 103rd Street. The rail transit station would be located south of the intersection, 400 to 500 feet from the shopping center site. This would be a convenient walk for transit users. The aerial station with MC-3 would lengthen the walk slightly.

At the Imperial Highway (Century Freeway) station the proposed shopping center would be located south of the freeway and west of the railroad right-of-way. The station is currently proposed to be located either directly under or just north of the freeway. A station located directly under the freeway would be about 1,000 feet from the middle of the shopping center, providing service to and support for the shopping center. With alternative

MC-3, there would be no rail freight traffic at this station, making pedestrian connections between the shopping center and the rail transit even more convenient.

IV-221.2 Population

IV-221.21 Impact Measures

The Long Beach-Los Angeles Rail Transit Project is expected to have little growth-inducing impact in the mid-corridor, since it would increase the population by only 1 percent over that forecast for the year 2000 without the project. SCAG's growth factors indicate an increase in corridor population from 497,800 in 2000 without the project to 502,600 with the project. Table IV-22A (Section IV-221) indicates the likely location of possible induced growth.

IV-221.22 Changes in Mobility and Accessibility

The rail transit line would improve mobility for the projected 16,100 residents in the 10 station areas along the mid-corridor alignment. Virtually all of these residents would be considered transit dependent. About 98 percent of the current residents are nonwhite and nearly half are youth. The rail transit line would also be expected to improve access to major employment areas in the two downtowns and in Carson and to retail centers in Florence/Graham, Watts, and Compton. Proposed transit stops would support redevelopment and revitalization efforts in the Florence/Graham Community Business Revitalization Target Area, the Watts Redevelopment Project Area, the Willowbrook Neighborhood Redevelopment Program Area, and the Compton CBD Redevelopment Area.

IV-221.23 Mitigation Measures

There are no significant adverse population effects expected from construction of the rail transit lines; therefore, no mitigation measures would be necessary.

IV-221.3 Housing

IV-221.31 Impact Assessment

A slight increase in the mid-corridor housing stock would be the only impact attributable to rail transit operations. According to SCAG's growth forecasts, approximately 2100 dwelling units would be constructed in the mid-corridor as a result of the rail transit project (see Table IV-22A). It is assumed that most of these additional units would be concentrated in station areas which are already experiencing a substantial degree of residential building activity. As a stimulus to residential development, the rail transit system could only be expected to encourage existing trends and not create significant new building activity in areas where the momentum for growth was not already initiated. Consequently, over half of the project-induced housing growth is expected to occur in the 103rd Street, Imperial Highway, and Compton Boulevard station areas where residential building activity has been encouraged by local redevelopment efforts.

IV-221.32 Mitigation Measures

Since there would be no significant adverse impacts associated with housing in the mid-corridor, mitigation measures would not be required.

IV-222 Community Services

Access to mid-corridor community service facilities located within walking distance of stations would be improved. In most cases, this would be to the benefit of users. Table IV-22D lists the number of service facilities, by type, which would be located within mid-corridor station areas.

TABLE IV-22D

COMMUNITY FACILITIES WITHIN ONE-QUARTER MILE OF STATIONS

MID-CORRIDOR

Facilities By Type	
Schools	14
Libraries	5
Churches	44
Parks	3
Medical Facilities	3
Government Offices	2
Local Social Services	9
TOTAL	80

Source: M. L. Frank & Associates, 1984.

One possible adverse impact on mid-corridor service facilities would be a decrease in local pedestrian accessibility due to a fence (6 to 8 feet high) that would enclose the northbound and southbound rail transit tracks between grade crossings. At present, many users travel to local service facilities by crossing the SPTC right-of-way on foot. Although fencing would serve to protect pedestrians from increased rail activity on the right-of-way, it would require them to reach cross-track destinations via the nearest grade crossing. This means a diversion of 1/4 to 1/2 mile in some locations. Only some mid-corridor schools, churches, and parks would be affected by impaired pedestrian access. Other service facilities are located near grade crossings and would therefore remain accessible to cross-alignment pedestrian traffic. The rail transit project would provide for maintenance or replacement of all legally authorized pedestrian crossings of the railroad rights-of-way.

Although SCRTD transit police would be responsible for law enforcement on the transit property, the existence of the rail transit system could place additional strain on local law enforcement authorities serving the mid-corridor. Local officials may be called upon to assist SCRTD police in emergency situations and may need to step up security in areas that are off the transit property but in close proximity to stations. Because of the potential increase in pedestrians walking to stations, patrons may become targets for criminal activity. Also, unattended cars parked by transit passengers on neighborhood streets in the vicinity of those stations with nonexistent or undersized parking facilities may lead to an increase in auto-related crimes.

Police, fire, and paramedic emergency vehicle operations may be impaired by increased traffic on the rail line. However, with the coordination planned for most street crossings in the mid-corridor, delays to emergency vehicles due to light rail operations would be minimal. Emergency vehicles would not be able to cross the rail tracks when a light rail train is crossing with a green light. However, rail transit crossings would only take 30 to 35 seconds; delay to emergency vehicles would be slight.

IV-222.1 Mitigation Measures

Pedestrian crossings should be considered where fencing would cause pedestrian diversions of 1/4 mile or more, and where a high volume of pedestrian activity presently exists. MC-1 alignment segments meeting these requirements are as follows:

- 48th Place to 55th Street (.4 mile)
- Gage Avenue to Florence Avenue (.5 mile)
- Firestone Boulevard to 92nd Street (.4 mile)
- 108th Street to Wilmington Avenue (.6 mile)
- Stockwell Street to Rosecrans Avenue (.6 mile)
- Elm Street to Compton Boulevard (.3 mile)
- Alondra Boulevard to Greenleaf Boulevard (.5 mile)

If the Compton Grade Separation (MC-2) alternative is selected, the grade crossing at Stockwell Street would be eliminated, thus necessitating an additional pedestrian crossing between 130th Street and Rosecrans Avenue. If the SPTC Railroad Relocation (MC-3) alternative is implemented, the rail transit tracks would be elevated between 97th and 103rd Streets to allow the SPTC tracks to proceed to the east. The elevation of the rail transit tracks would allow pedestrian access across the right-of-way, thus negating the need for a pedestrian crossing.

Auto-related criminal activity resulting from possible spillover parking in streets surrounding stations could be mitigated by discouraging all-day parking in residential neighborhoods and by encouraging parking in or adjacent to retail areas.

IV-223 Economic Activity

IV-223.1 Property Tax Revenue

No significant property takings are anticipated in the mid-corridor for any of the proposed alignments, as they could be accommodated within the existing SPTC right-of-way. Acquisition of private property would be limited to parcels at the Del Amo and Artesia park-and-ride facilities and to small strips of property at various points to accommodate the rail transit and SPTC track configurations, road crossing gates, substations, etc.

Two of the park-and-ride facilities proposed for location in the mid-corridor would require the permanent acquisition of private properties. The Artesia facility would result in the permanent acquisition of 5 private properties with a total assessed value of $1.5 million. The acquisition of these properties for the proposed project would result in the loss of $15,000 in annual property tax revenue to the county. Similarly, the Del Amo park-and-ride facility would require the acquisition of non-tax-exempt property held by Southern Pacific. The total 1983 assessed value of the properties under consideration is $199,500. The resulting tax loss to the county from the permanent acquisition of these properties for the proposed project would total $2,000 annually.

New office, retail, and housing development in conjunction with the proposed project would increase the property tax base in the mid-corridor and generate new property taxes to the county, City of Compton, Special Districts, and other taxing agencies. Based on development projections presented in Section VI-221.3 and Table IV-22A and current market values for new development in the mid-corridor and county, the potential new annual property tax revenue indirectly generated by the proposed project is estimated in constant 1983 dollars in Table IV-22E.

TABLE IV-22E

ANNUAL PROPERTY TAX REVENUE

MID-CORRIDOR

Indirectly Induced New Land Use	
Office	$ 60,000
Retail	180,000
Housing	1,300,000
TOTAL PROPERTY TAX BENEFIT	$1,540,000

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

IV-223.2 Local Business Activity

As described in the section on land use (IV-221), the character of the mid-corridor area traversed by the proposed rail transit alignment is largely industrial, with smaller sections of residential development and small clusters of retail activity. The majority of the east-west arterials at which stations would be located presently support small retail activity centers. Several of the stations would be sited near small community retail centers, while two of them -- Florence Avenue and Compton Boulevard -- would be constructed near larger community shopping centers. Two other community shopping centers are planned near proposed stations at Imperial Highway and 103rd Street.

Implementation of the rail transit project would provide some additional support to existing and proposed retail centers. Table IV-22A summarizes possible development with and without one rail transit project in operation. Sales would be directly influenced through an increase in journey-to-work traffic through the station areas; shopping trips conducted with the use of the transit system may be expected to augment sales as well. Further, long-term stability and growth potential for these retail nodes would be enhanced through the presence of the transit stations and their activity, though the actual character of development which might occur (ranging from convenience food stores to full shopping malls) would depend primarily on other market factors.

New retail sales and associated sales tax revenue could be indirectly generated by the project through its impact on the development potential of retail sites along the mid-corridor alignment. Assuming an average annual taxable sales volume of $100 per square foot in constant 1983 dollars, the proposed project could contribute $30.0 million in annual sales revenue to the total county retail sales volume if the new space is developed. Based on the 6.5 percent local retail sales tax rate, these new retail sales would generate $2.0 million in annual sales tax revenue to the state, City of Compton, and LACTC.

IV-223.3 Net Fiscal Impact

The proposed project would have a positive net fiscal impact on economic activity and revenue generation in the mid-corridor and the county through the indirect inducement of new development and retail activity at locations adjacent to the alignment. The net annual fiscal impact from each source is projected in Table IV-22F.

TABLE IV-22F

NET ANNUAL FISCAL IMPACT

MID-CORRIDOR

Cost/Benefit Source	
Property Tax Loss - Park-and-Ride Facilities	$ (17,000)
Property Tax Gain - New Development	1,540,000
Retail Sales Tax Gain	2,000,000
TOTAL BENEFIT	$3,523,000

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

IV-224 Visual Quality

IV-224.1 Impact Measures

Impacts are evaluated in terms of the impact measures described in Section 124.1 of this chapter.

IV-224.2 Impact Assessment

The mid-corridor alternatives would have relatively insignificant adverse impacts on the overall character, scale, and form of the visual setting of the communities through which they would pass. The alignment would follow the existing SPTC Railroad right-of-way from Long Beach Avenue and Washington Boulevard in Los Angeles, south through Vernon, Florence/Graham, Watts, and Compton, to Willow Street in Long Beach. The 24-foot-high power system support poles, spaced 100 to 300 feet on-center, would be the most visible impact of the project. Other impacts would be associated with:

- o the chain link fence (6 to 8 feet high), which would parallel the right-of-way throughout its length and increase its visibility to passersby;
- o traction power substations, as described earlier in the Los Angeles segment;
- o four grade separations with railroad mainlines at Slauson and Dominguez Junctions, Cota Crossing, and at Watts Junction (MC-3 only).

The magnitude of these impacts would be minor because the existing visual setting of the rail right-of-way does not include sensitive land uses, significant views, or well-defined street spaces.

Along Long Beach Avenue, an expansive right-of-way and a development pattern of large-scale and bulky one-story industrial buildings result in discontinuous street facades and undefined street spaces. Between Greenleaf Boulevard and Willow Street, the visual image is defined by open, expansive grasslands and industrial parks. The location of catenary support poles and electrical overhead, chain link fences, and power traction substations along the alignment in these segments would not adversely affect the visual setting, nor would the main yard facility between the Long Beach Freeway and the Los Angeles River.

More visually sensitive segments of the alignment would occur where residential uses border the SPTC right-of-way or where there are historic structures along the alignment. These segments would occur south of Slauson Junction to Florence Avenue under all alternatives, at 103rd Street under MC-3, and along Willowbrook Avenue between Imperial Highway and Greenleaf Boulevard under all alternatives.

South of Slauson Junction to 63rd Street, the required elevated grade crossing would impinge on the viewshed of the adjacent residential community for a distance of 1,250 feet and would expose the area to visual intrusion from passing trains. Between 63rd Street and Florence Avenue, the SPTC alignment would be in a corridor defined by the sides of single-family homes. The buildings' location (approximately 50 feet from the light rail transit system), orientation, and existing heavy mature landscaping would lessen the visual intrusion.

At 103rd Street, the elevated grade crossing and aerial station required by MC-3 would be visually prominent and would impinge on the viewshed of the adjacent community. Its scale would be incompatible with the historic Watts railroad station built in 1904, and it would obstruct views of the historic station from the east, as shown in Figure IV-22A.

The degree of visual impact along Willowbrook Avenue would vary with each alternative. Under all alternatives, between Imperial Highway and Oris Street, mature pine trees would break the silhouette of the electrical overhead, diminishing its adverse visual impacts, and would intermittently screen the catenary support poles and chain link fence (see Figure IV-22B). For MC-1 and MC-3, the median strip between Oris Street and Greenleaf Boulevard is devoid of landscaping; therefore, the catenary support poles, electrical overhead, and chain link fence would be more prominent, as shown in Figure IV-22C. Single-family homes in the vicinity are generally sited over 100 feet from the alignment along Willowbrook Avenue; therefore, the rail system would not be a visual obstruction in this area.

For MC-2, the grade separation of the light rail transit system and SPTC railroad within the median strip of Willowbrook Avenue would lessen the visual impact in this segment. Only the tops of the catenary support poles would be visible above the cut, while the electrical overhead would be located below street level. There would be an impact associated with the 6-foot-high chain link fence atop a 3-foot-high concrete wall which would border the cut alignment. It would visually separate the residential communities on either side of Willowbrook Avenue and become a prominent element in the streetscape. Figures IV-22D and IV-22E show this area before and after construction of MC-2.

Under alternative MC-3 the West Santa Ana Branch and the San Pedro Branch would be visually affected by the diversion of freight traffic from the Wilmington Branch. Without the freight diversion, 4 to 10 one-mile-long "unit trains" would travel the San Pedro Branch each day; the West Santa Ana Branch would remain unused. With MC-3 an additional 17 to 29 trains would be diverted onto the West Santa Ana and San Pedro Branches.

Currrently 60 percent of the land adjacent to the San Pedro Branch is industrial, 30 percent is residential, and 10 percent is commercial; occupants of buildings on these adjacent parcels are accustomed to seeing some freight traffic each day. The MC-3 diversion would increase the frequency of occurrence of that visual element.

Virtually all of the land adjacent to the West Santa Ana Branch is residential, and residents are accustomed to viewing the West Santa Ana Branch right-of-way as a vacant expanse of land, uninterrupted by trains. With the MC-3 diversion, that expanse would be bisected by 17 to 29 trains per day for about 5 minutes at a time.

Residents and employees adjacent to the Wilmington Branch between the Watts and Dominquez Junctions, where adjacent land use is

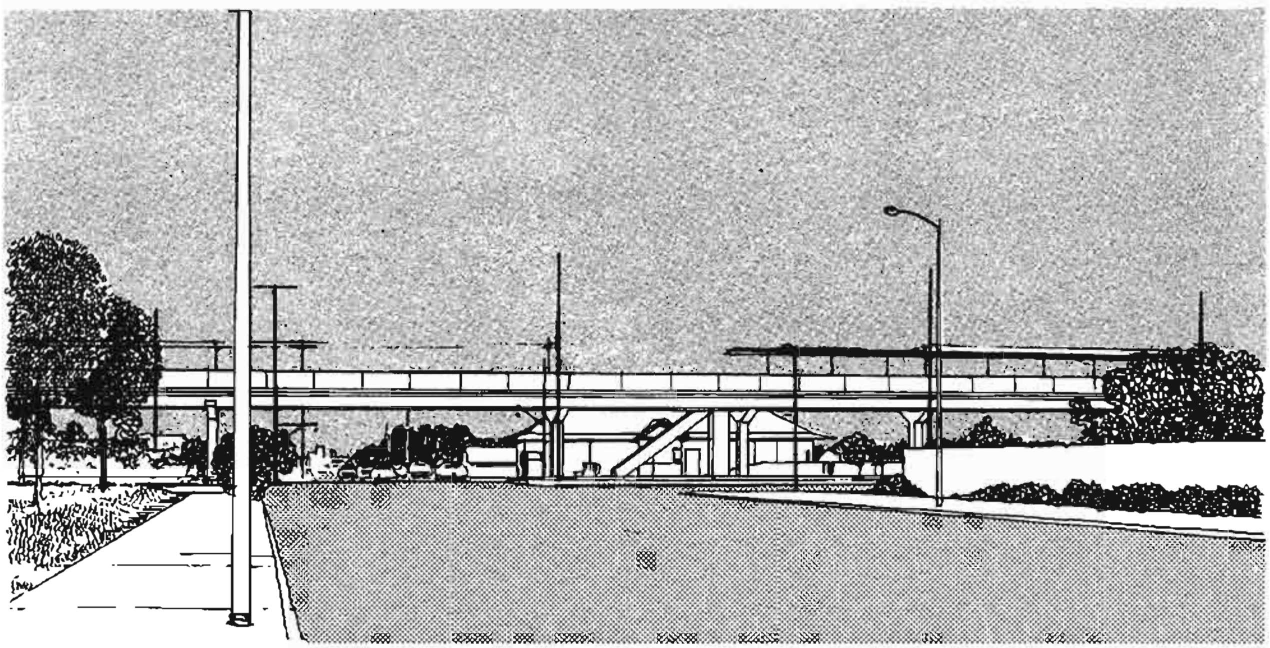


Figure IV-22A

Looking east on 103rd Street at the SPTC right-of-way in 1984 (above) and after construction of Alternative MC-3. The aerial structure and station would be located adjacent to and would obstruct views of the historic railroad station.

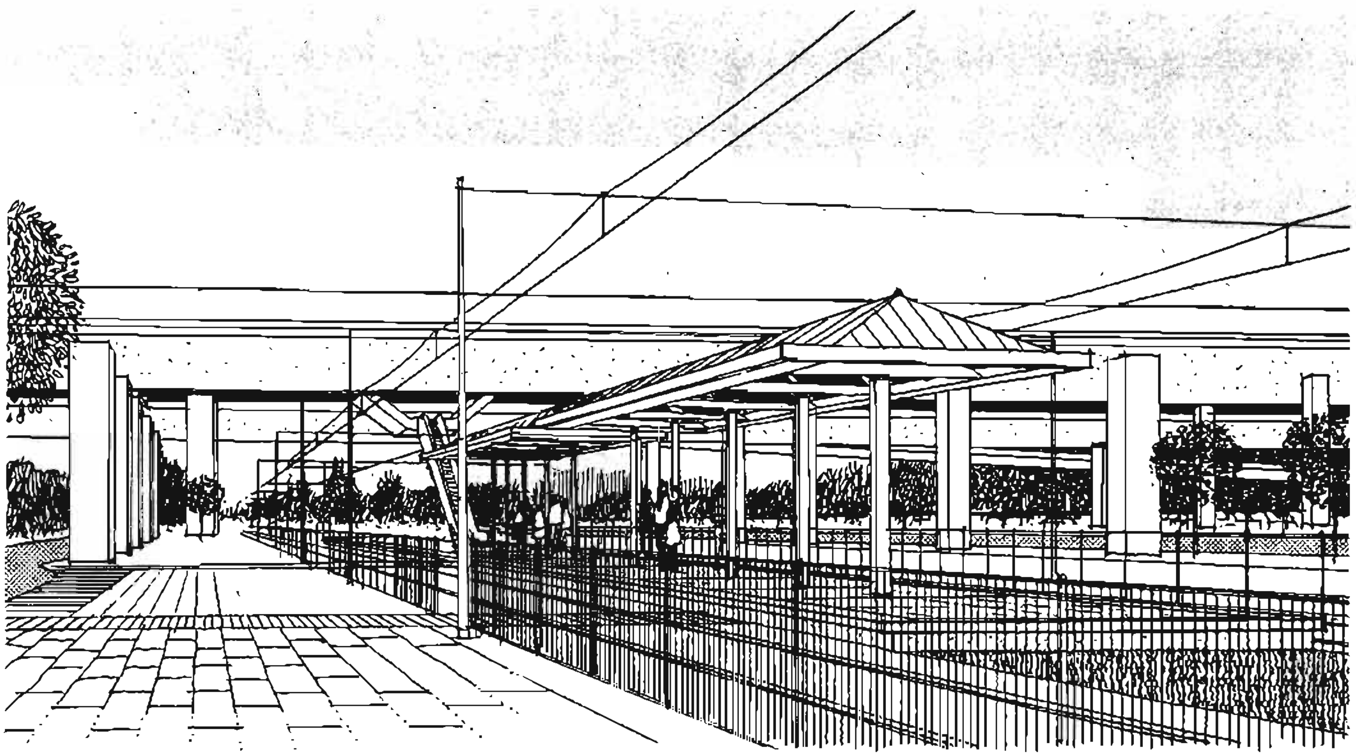


Figure IV-22B

Looking south on the SPTC right-of-way from its intersection with Imperial Highway in 1984 (above) and after construction of Alternative MC-1 and the Century Freeway. An elevator, escalators and stairways would connect the Project station with the elevated Century Freeway transit way station.

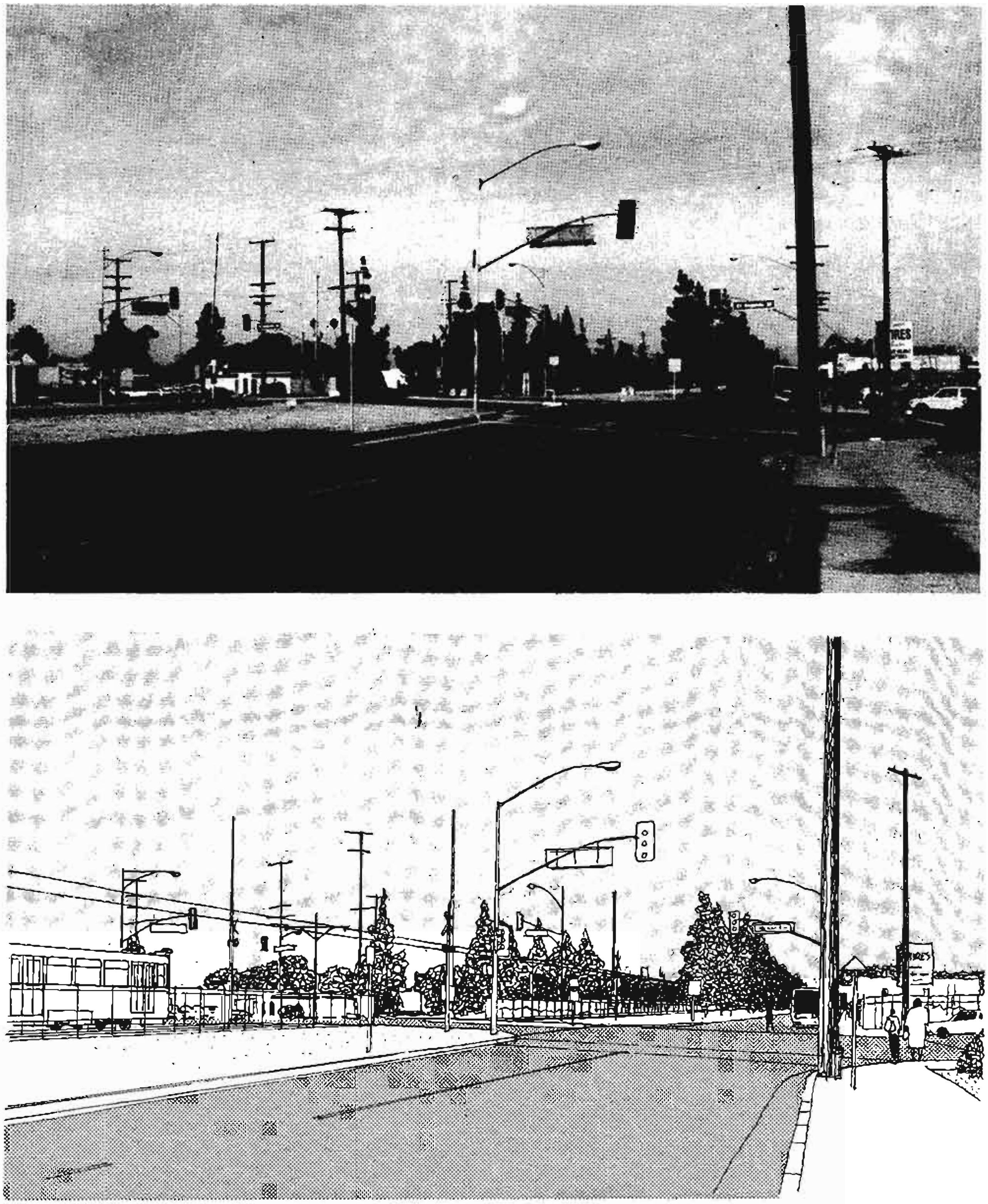


Figure IV-22C

Looking north on Willowbrook Avenue at its intersection with El Segundo Boulevard in 1984 (above) and after construction of Alternative MC-1 or MC-3.

Bird's eye view of the SPTC right-of-way looking north at downtown Compton in 1984.

Figure IV-22D

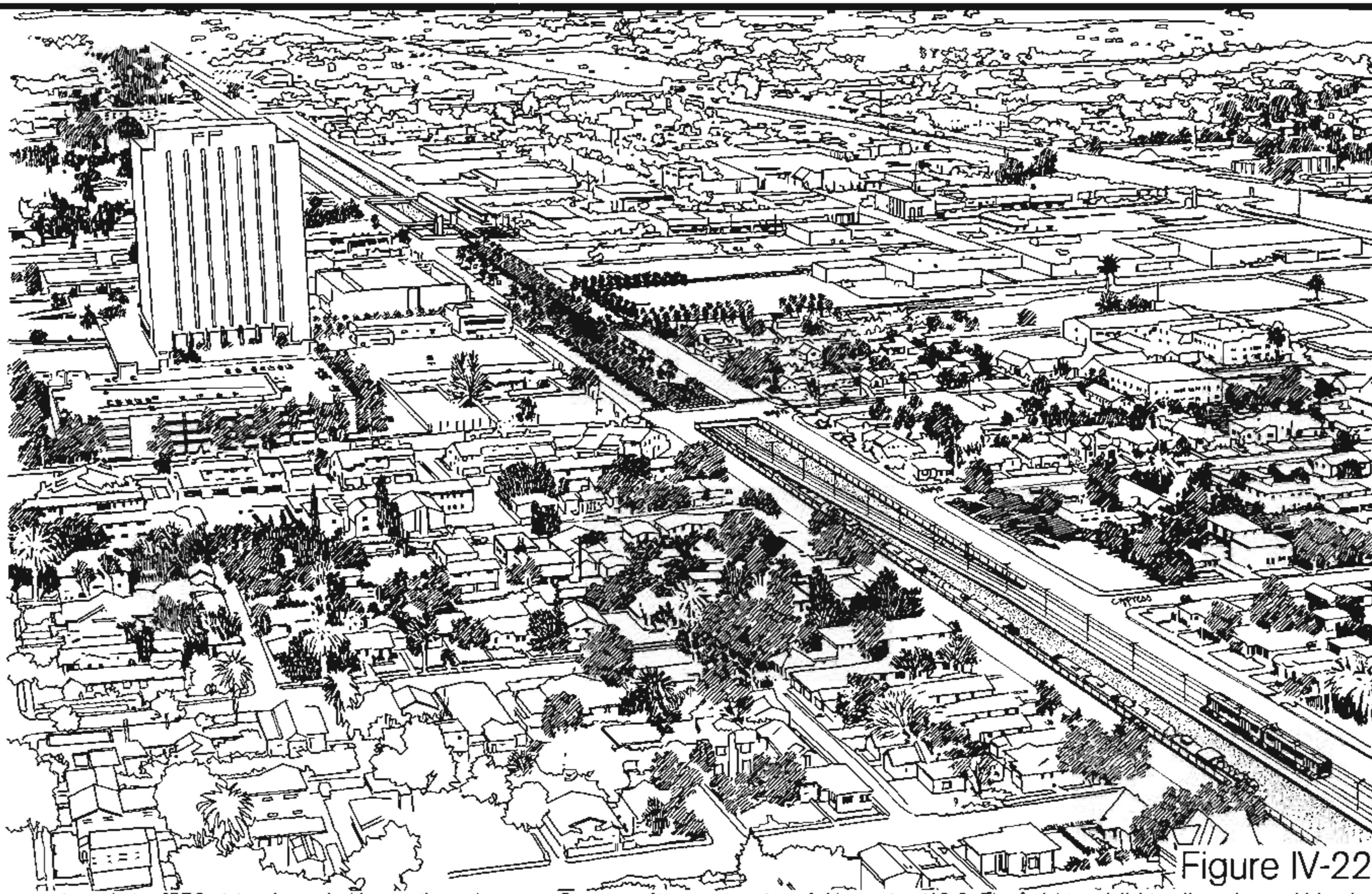


Figure IV-22E

Bird's eye view of the SPTC right-of-way looking north at downtown Compton after construction of Alternative MC-2. The freight and light rail tracks would be depressed and would be covered by a public plaza between Myrrh Street and Compton Boulevard.

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

VISUAL ANALYSIS
PREPARED BY SEDWAY COOKE ASSOCIATES
PARSONS BRINCKERHOFF / KAISER ENGINEERS

thirds residential, would not be exposed to intermittant appearance of 17 to 29 freight trains per day as a result of MC-3.

The impacts of the traction power substations would result from their size and site requirements. They would be incompatible in use and scale, and thus would negatively change the visual setting. The final location for substations would be determined during the final engineering phase of the project. The degree of potential impacts would depend on each substation's layout and design.

IV-224.3 Mitigation Measures

The visual impacts resulting from the grade separations between Slauson Junction and 63rd Street and at 103rd Street could not be mitigated. The view obstruction of the historic railroad station at 103rd Street by the aerial station could be mitigated by shifting the rail transit station to the south. However, such a southern shift would increase the distance between the rail transit station and commercial destinations in the Watts Redevelopment Project. The columns supporting the aerial guideway would still intermittently screen the historic railroad station. Moving the historic Watts railroad station would diminish its historic integrity while mitigating the visual impact of the aerial structure.

Along Willowbrook Avenue, the addition of mature street trees could be used to break the silhouette of the electrical overhead and to mask the catenary support poles. High landscaping could be planted alongside the chain link fence to mask it. The adverse visual impacts associated with the traction power substations could be reduced by fencing and facade treatments that would lessen visual incompatibilities with adjacent structures.

IV-225 Historic and Cultural Resources

Along the mid-corridor segment, the rail transit project would follow the historic route of the Pacific Electric Long Beach line. The MC-1 alternative would be entirely at-grade, except for three proposed grade separations with railroad mainlines (at Slauson, Dominguez and Cota). With the exception of Watts Station, the historic resources identified on Figure II-22D (Section II-235), would not be affected because the reestablishment of rail transit would restore the historical condition.

It has been suggested that the historic Watts Station at 103rd Street be rehabilitated for use as the light rail station. The requirements for safety and security on the system have dictated that the stations be designed with as much open space as possible, because they would not be attended by station agents. Therefore, reuse of the enclosed wooden structure would not be feasible for the rail transit project. However, increased access to, and pedestrian traffic in, the area may enhance the efforts of the Los Angeles Community Redevelopment Agency (owner of the station) in promoting the adaptive reuse of the structure for commercial and/or community purposes.

The MC-2 alternative calls for grade separating the rail transit and Southern Pacific railroad from the streets in the Compton area. The only identified historic structure in the area of the proposed grade separation section is the Heritage House. This building has been moved from its original location. The setting has been compromised and the building's site integrity lost; there would be no effect as a result of the project. As the remainder of the MC-2 alternative would be the same as MC-1, the effects would be the same as discussed above. There would be no impacts to historic structures by the reestablishment of rail transit with the exception to Watts Station, as discussed above.

The third of the mid-corridor alternatives, the railroad relocation (MC-3), would call for rerouting all Southern Pacific through freight operations from the Wilmington Branch at Watts Junction onto the West Santa Ana and San Pedro Branches. An additional grade separation would be required at Watts Junction to allow the passage of the rerouted freight traffic under the rail transit tracks. This would require an aerial rail transit station at 103rd Street. A station on the aerial guideway would have a negative impact on the historic Watts Station by cutting off views of the station from the south and introducing a new visual element into the historic station's environment. This negative impact could not be mitigated.

The relocation of freight traffic could also affect the Watts Towers located in Simon Rodia State Historic Park. Even though the West Santa Ana Branch was used for freight operations during the construction of the Watts Towers, there were many fewer trains and they were shorter than those proposed to be relocated. The intensity of freight operations contemplated would appear to be out of character with the historical noise environment surrounding the towers area. Depending on the number and speed of the relocated freight trains, vibration could also have an effect. If MC-3 is selected as the preferred alternative, additional noise and vibration testing would be necessary. Mitigation measures for noise and vibration are discussed in Section IV-215.

IV-230 TRAFFIC AND TRANSPORTATION

IV-231 Traffic

The mid-corridor segment of the project alignment would follow the SPTC Wilmington Branch Line and the East Long Beach Branch Line right-of-way between Washington Boulevard in the City of Los Angeles and Willow Street in the City of Long Beach. While in the mid-corridor, the alignment would also traverse the County of Los Angeles and the cities of Compton and Carson.

The MC-1 alignment would provide for a double track rail transit configuration entirely at-grade, with the exception of grade separations with the following major arterials:

- o Slauson Avenue
- o Firestone Boulevard (existing)
- o Artesia Boulevard (existing)
- o Alameda Street (at Dominguez Junction)
- o Santa Fe Avenue (at Dominguez Junction)

The MC-2 alignment would add grade separations at Rosecrans Avenue, Elm Street, Compton Boulevard, Myrrh Street, and Alondra Boulevard. The MC-3 alignment would also add a grade separation at 103rd Street to those proposed for MC-1.

IV-231.1 Peak Period Traffic Volumes

Because of the length of the mid-corridor segment of the project, two screenline checks were made to measure north-south traffic volumes (see Table IV-23A). Screenline 6, between Compton and Alondra Boulevards, would show a substantial reduction in traffic due to the rail transit project. This screenline is in the southern portion of the mid-corridor and would show major reductions in southbound traffic (7.6 percent), while northbound traffic would increase slightly. All alternatives would decrease total traffic (northbound and southbound) at this screenline as compared to the no project condition.

Traffic volumes at screenline 7 between Slauson and Florence would show almost no variation from the base case for any alternative. Northbound, southbound, and total traffic would all be approximately 0.3 percent over the "year 2000 without project" figures.

Screenline 8 was drawn between Wilmington and Central to measure east-west traffic volumes east of the project. The largest fluctuations in volumes would occur between the alternatives that included the project rather than between the alternatives with and without the project. However, total variation for either northbound, southbound, or total traffic would be less than 0.6 percent.

Screenline 9, west of the project between Alameda and Pacific Streets, would show significant reductions in east-west travel. The Olympic/9th Aerial with the LA River Route would show a 5.9 percent reduction in eastbound trips. Westbound traffic would show almost no variation among the alternatives.

A summary of traffic impacts for each alternative alignment, using the MC-1 alternative, is presented in Table IV-23B. The total vehicle miles traveled (VMT) in the mid-corridor would decrease by 0.11 percent for the Broadway/Spring with Atlantic with Pacific Avenue Loop alternative and 0.04 percent for the Olympic/9th Aerial with LA River Route alternative.

TABLE IV-23A

YEAR 2000 AM PEAK PERIOD* TRAFFIC VOLUMES

MID-CORRIDOR

	No Project	LA-1/MC-1/LB-4	LA-3/MC-1/LB-3
Screenline 6: Mid-Corridor Between Compton Boulevard and Alondra Boulevard			
Southbound	27,007	25,486	24,953
Northbound	36,049	36,787	36,822
TOTAL	63,056	62,273	61,775
Screenline 7: Mid-Corridor Between Slauson Avenue and Florence Avenue			
Southbound	11,106	11,106	11,130
Northbound	26,709	26,710	26,747
TOTAL	37,815	37,816	37,877
Screenline 8: Mid-Corridor Between Wilmington Avenue and Central Avenue			
Eastbound	16,127	16,113	16,071
Westbound	24,407	24,354	24,314
TOTAL	40,534	40,467	40,385
Screenline 9: Mid-Corridor Between Alameda Street and Pacific Avenue			
Eastbound	14,738	14,701	13,861
Westbound	27,381	27,264	27,254
TOTAL	42,119	41,965	41,115

Note: The LA-2/MC-1/LB-4 system alternative is essentially identical to the LA-1/MC-1/LB-4 system alternative.

* Peak period spans 6:30 AM to 8:30 AM.

Source: Southern California Association of Governments, 1984.

TABLE IV-23B

SUMMARY OF YEAR 2000 TRAFFIC IMPACTS

MID-CORRIDOR

		Change From No Project Condition		
	No Project	LA-1 MC-1/LB-4	LA-2 MC-2/LB-4	LA-3 MC-1/LB-3
Daily Vehicle Miles Traveled (VMT) in Mid-Corridor	18,157,120	-20,660	-16,478	-7776
Daily Vehicle Hours Traveled in Mid-Corridor	711,933	-9,420	-9,258	-6838

Source: Southern California Association of Governments, 1984.

In the analysis of the mid-corridor alternatives, traffic impacts from the introduction of the rail transit on major east-west cross streets and the signalized intersections nearest the rail transit track alignment were evaluated. The analysis was based on the following assumptions:

o The rail transit project operates during peak hours at a minimum of 6-minute headways per direction (passing each cross street at an average interval of 3 minutes). During off-peak hours headways of 12 to 20 minutes per direction would be used.

o At a typical crossing speed of 25 mph, a minimum 30-second "window" for a 2-car train is required for rail transit crossings of the east-west arterials at-grade. This crossing interval is determined as follows:

- Advance warning track clearance and lowering of gates	20 seconds
- Light rail train crossing and clearance	10 seconds
Total	30 seconds

Any of the alternatives involving the Olympic/9th Aerial alignment in downtown Los Angeles would necessitate the use of 3-car trains north of Willow Street in Long Beach. With a length of 270 feet, these trains would require an additional 3 seconds to clear the intersection, increasing the total required window by 10 percent to 33 seconds.

- o Additional traffic control equipment (including but not limited to fully actuated controllers, detection and telemetry equipment) will be provided by the project as needed to adequately accommodate the increasing demands of conflicting vehicular movements.

The existing signal operations and intersection geometry were analyzed to determine if light rail transit operations could be satisfactorily introduced without any modification to either the cycle length and current timing plans or the intersection geometry and still maintain an acceptable level of service and queuing impacts. Table IV-23C presents the acceptability of light rail operations for the PM peak period within the existing traffic conditions for each of the intersection locations. The PM peak hour was selected as it represented the worst case traffic conditions in the mid-corridor.

It is apparent that with the exception of 5 intersections (4 in the City of Compton and 1 in Long Beach) the existing cycle lengths would not be able to provide the 30-second minimum window required to accommodate the rail transit movements. In order to determine an appropriate cycle length that would accommodate rail transit operations, the functional demands of rail transit and auto operations were studied. Cycle lengths ranging from 60 to 120 seconds were analyzed in conjunction with critical movement analyses at various intersections. Based on this analysis, a 90-second signal cycle was selected for study purposes.

Table IV-23D summarizes V/C ratios and LOS values for mid-corridor intersections under a number of different conditions. The first two columns show intersection capacities in 1983 and year 2000 without the rail transit project in operation and with existing signal cycles and street geometrics. The last 3 columns of Table IV-23D (headed MC-1, MC-2, MC-3) show the effects of modifying signal cycles to accommodate the 30-second window required for rail transit operations. In this instance the signal cycle has been modified to 90 seconds for study purposes. Modifying the cycles slightly increases V/C ratios at some intersections; most of these would run at "good" levels of service (A or B) with or without the cycle modification. At several critical intersections, such as Imperial Highway and Del Amo Boulevard, signal modification is combined with improvements to the intersection in the study. The combined effect is to improve the V/C ratio and the LOS level significantly. Improving the intersection without modifying the signal cycle would not result in a significant improvement to V/C ratios or LOS levels.

TABLE IV-23C

ACCEPTABILITY OF EXISTING TRAFFIC SIGNAL OPERATIONS

PM PEAK PERIOD*

		Cycle Length (seconds)	Operating Green Time (seconds)		Acceptable Cycle Length	Acceptable Geometrics	Acceptable Queuing
			East-West Movement	North-South Movement			
1.	Washington Blvd./ Long Beach Ave.	60	29.4	21.6	N	Y	Y
2.	Vernon Ave./ Long Beach Ave.	60	26.4	24	N	Y	Y
3.	Gage Ave./ Holmes Ave.	60	29.4	22.2	N	Y	Y
4.	Florence Ave./ Holmes Ave.	80	46	27	N	Y	Y
5.	Nadeau St./ Maie Ave.	80	54	20	N	Y	Y
6.	92nd St./ Compton Ave.	60	27	27	N	Y	Y
7.	103rd St./ Wilmington Ave.	60	32.4	21	N	Y	Y
8.	Imperial Hwy./ Wilmington Ave.	60	30.6	23.4	N	N	N
9.	El Segundo Blvd./ Willowbrook Ave.	60	27	25	N	Y	Y
10.	Rosecrans Ave./ Willowbrook Ave.	90	51	33	Y	Y	Y
11.	Compton Blvd./ Willowbrook Ave.	90	51	33	Y	Y	Y
12.	Alondra Blvd./ Willowbrook Ave.	90	51	33	Y	Y	Y
13.	Greenleaf Ave./ Alameda St.	90	51	33	Y	Y	Y

TABLE IV-23C (Continued)

ACCEPTABILITY OF EXISTING TRAFFIC SIGNAL OPERATIONS

PM PEAK PERIOD*

			Operating Green Time (seconds)				
		Cycle Length (seconds)	East-West Movement	North-South Movement	Acceptable Cycle Length	Acceptable Geometrics	Acceptable Queuing
14.	Del Amo Blvd./ Santa Fe Ave.	60-100	26-46	27-47	Y	N	N
15.	Wardlow Rd./ Pacific Place	90	51	33	Y	Y	Y
16.	Spring St./ Pacific Ave.	60	27	27	N	Y	Y
17.	Willow St./ Long Beach Blvd.	60	27	27	N	N	N
18.	Willow St./ Atlantic Ave.	60	30	24	N	Y	Y

Note: The acceptability of light rail transit operation was defined as follows:

Acceptable Cycle Length: Existing intersection phasing should supply a 30-second minimum (2-car train) north-south parallel window for LRV.

Acceptable Geometrics: Existing intersections must have sufficient widths to accommodate geometric changes needed to satisfy demand (regardless of striping).

Acceptable Queuing: Two conditions must be satisfied:
(1) Queue length per/cycle must not be greater than available storage to adjacent signalized intersection or cause excessive congestion to intermediate non-signalized intersections.
(2) Vehicular queuing shall discharge to acceptable levels (may vary throughout the corridor) prior to the anticipated arrival of the next LRV.

* PM peak period spans 3:00 PM to 6:00 PM.

Source: PB/KE, 1984.

TABLE IV-23D

V/C RATIOS AT KEY INTERSECTIONS ALONG PROJECT ALIGNMENT

PM PEAK HOUR

MID-CORRIDOR

	Major Cross-Street	Intersection @	1983[1] V/C	1983[1] LOS	2000 No Project[1] V/C	2000 No Project[1] LOS	2000 MC-1[2] V/C	2000 MC-1[2] LOS	2000 MC-2[2] V/C	2000 MC-2[2] LOS	2000 MC-3[2] V/C	2000 MC-3[2] LOS
1.	Washington Blvd.	Long Beach Ave.	.58	A	.65	B	.69	B	.69	B	.69	B
2.	Vernon Ave.	Long Beach Ave.	.41	A	.45	A	.53	A	.53	A	.53	A
3.	Gage Ave.	Holmes Ave.	.59	A	.97	E	.84[3]	D	.84[3]	D	.84[3]	D
4.	Florence Ave.	Holmes Ave.	.72	C	.85	D	.78[3]	C	.78[3]	C	.78[3]	C
5.	Nadeau St.	Maie Ave.	.31	A	.37	A	.50	A	.50	A	.50	A
6.	92nd St.	Compton Ave.	.32	A	.40	A	.53	A	.53	A	.53	A
7.	103rd St.	Wilmington Ave.	.29	A	.36	A	.41	A	.41	A	.36	A
8.	Imperial Hwy.	Wilmington Ave.	.73	C	1.57	F	.88[3]	D	.88[3]	D	.88[3]	D
9.	El Segundo	Willowbrook Ave.	.53	A	.64	B	.58	A	.58	A	.58	A
10.	Rosecrans Ave.	Willowbrook Ave.	.51	A	.61	B	.64	B	.61	B	.61	B
11.	Compton Blvd.	Willowbrook Ave.	.47	A	.56	A	.60	A	.56	A	.56	A
12.	Alondra Blvd.	Willowbrook Ave.	.46	A	.54	A	.49	A	.54	A	.54	A
13.	Greenleaf Ave.	Alameda St.	.36	A	.43	A	.49	A	.43	A	.43	A
14.	Del Amo Blvd.	Santa Fe Ave.	.79	C	.98	E	.82[3]	D	.82[3]	D	.82[3]	D
15.	Wardlow Ave.	Pacific Pl.	.57	A	.72	C	.76	C	.76	C	.76	C
16.	Spring St.	Pacific Ave.	.31	A	.36	A	.38	A	.38	A	.38	A
17.	Long Beach Blvd.	Willow St.	.87	D	1.25	F	.83[3]	D	.83[3]	D	.83[3]	D
18.	Willow St.	Atlantic Ave.	.73	C	.88	D	.88	D	.88	D	.88	D

[1] Existing cycle length.

[2] The year 2000 alternatives represent all combinations of the light rail transit alignments in the Los Angeles CBD and Long Beach segments. A 90-second cycle was used for study purposes.

[3] Includes intersection geometry improvements.

Source: City of Los Angeles Department of Transportation; Los Angeles County Road Department; Southern California Association of Governments, 1984.

IV-231.2 Traffic Signal Program At Grade Crossings

Modern rail transit operations often incorporate preemption of traffic signals for the rail transit trains. However, analysis of queuing impacts of such preemption in the mid-corridor has indicated significant adverse impacts on cross street traffic at intersections of major boulevards. Excessive queuing would occur at Imperial Highway and Wilmington Avenue, Del Amo Boulevard and Santa Fe Avenue, and Willow Street and Long Beach Boulevard and Atlantic Avenue, where the queue clearance time would extend over three minutes, thereby not allowing for queue clearance before the arrival of the next transit vehicle.

Due to the potential for significant vehicle queuing and delays at several mid-corridor grade crossings, the feasibility of coordinating rail transit operations with optimized traffic signal cycles was investigated. The signal cycle used for analysis was 90 seconds. However, during final design each intersection will be studied in cooperation with the local jurisdictions, to determine the optimum traffic signal cycles for project implementation.

It was determined that a coordinated transit schedule would work at most intersections for both northbound and southbound operations, eliminating the need for signal preemption -- with accompanying vehicle queuing and delay. To minimize potential delays in rail transit operations in the mid-corridor, service in both directions would be governed to conform with regulated traffic signals by varying train speeds between grade crossings. The system would operate using two criteria for resolving potential rail transit/traffic signal conflicts arising from unscheduled variations in train headways or speeds and inadequate cycle lengths:

- At heavily traveled east-west arterials, rail transit trains will be controlled to arrive at grade crossings during north-south green phases of nearby traffic signals. Temporary elongation of north-south green phases might be required at certain grade crossings to accommodate trains traveling in grade crossing areas at the time of signal phase changes. Identification of these grade crossings would occur during subsequent system final design.

- Full preemption (interruption of east-west green phases) would be permitted at minor grade crossings in the mid-corridor, which typically have ADTs of less than 10,000.

IV-231.3 Impact of Rail Freight Activity

In order to place the potential impact of the rail transit system on vehicular traffic in proper context, the effect of rail freight operations on the Wilmington and San Pedro Branches of the SPTC on key east-west arterials was investigated. Worst case conditions for the year 2000 were defined based on a recently-completed study by SCAG exploring possible reorganization of rail freight lines serving the harbor area (San Pedro Bay Ports Access Study). Auto queue lengths, waiting times, and dissipation times for queues were calculated in a manner similar to that done for rail transit operations.

The impact on vehicular traffic from rail freight activity along the SPTC Wilmington Branch is greatest between Washington Boulevard and Dominguez Junction. South of Dominguez Junction to Willow Street in Long Beach the freight traffic drops significantly and the length of trains reduces from mile-long trains to those less than 1,000 feet in length, with a significant drop in frequency.

Eighteen railroad grade crossings with major east-west arterials showing potential for significant train-related traffic impacts were evaluated. Estimates of potential queue lengths and queue dissipation time were made for a 4,700-foot freight train traveling at 15 mph and using the SPTC Wilmington tracks during the heavier PM peak hour in year 2000. The queue length calculation was predicated on the assumption of the arrival of a single freight train during the peak and was not affected by the number of freight trains that might be crossing the streets on a given day. The time to dissipate the queues ranged from 1.0 to 16.5 minutes. Dissipation times of 3 minutes (arrival rate of rail transit during peak hour) or more were assumed to represent unacceptable queuing. The rail transit trains would have no impact when crossing a street during the concurrent passage of a freight train.

Results of the queuing analysis on the SPTC Wilmington Branch indicate that delays to vehicular traffic at grade crossings resulting from peak hour freight train operation on the Wilmington Branch in the year 2000 could be unacceptable at half the major cross streets in the mid-corridor. Assuming the system of rail transit/traffic signal coordination is implemented, any cumulative delays caused with the introduction of rail transit operations on top of the freight service would be minimal compared to delays caused by freight operations alone.

Under the rail transit mid-corridor alternative MC-2, the impacts upon vehicular traffic due to freight rail operations would be similar to mid-corridor alternative MC-1. The exception would be in the Compton area where the SPTC railroad track and the rail transit tracks would be grade separated from the east-west streets thereby eliminating all impacts to vehicular traffic on Rosecrans Avenue, Compton Boulevard, and Myrrh Street. Alondra Boulevard and Stockwell Street would also be grade separated, but for the freight railroad only.

The mid-corridor alternative MC-3 would reroute all SPTC rail operations from the Wilmington Branch to the SPTC San Pedro Branch between Watts Junction and Dominguez Junction. The rail transit tracks would remain at-grade on the Wilmington Branch alignment through Compton. The impacts to vehicular traffic on major streets crossing the rail tracks along Alameda Street on the San Pedro Branch were analyzed in the SCAG study. The study evaluated the effects of changes in the number of train operations based on the total vehicular-hours of delay per day that would be experienced by the vehicular traffic due to grade crossing blockages. This form of measure for impacts is sensitive to all key variables such as number of trains per day by length, train speed, highway traffic by time of day, number of traffic lanes, number of trucks in queue, etc.

Results of the analysis, under various rail scenarios between Watts and Dominguez Junctions are summarized in Table IV-23E. The impact of constructing the SPTC Railroad Relocation alternative (MC-3) would be to increase auto delay on 9 east-west arterials on the San Pedro and West Santa Ana Branches, while eliminating auto delays at 7 east-west arterials on the Wilmington Branch.

Detailed analysis of rail activity impacts on vehicular traffic, including total vehicle hours of delay under various threshold levels, grade separation requirements, railroad and grade separation costs, and other related impacts, are contained in the SCAG San Pedro Bay Ports Access Study. It should be noted that in consideration of the study projections, SCAG has proposed that a task force composed of affected cities and government agencies, the Port of Los Angeles and Long Beach, and the railroads develop plans to generate sources of funding for grade separations and/or consolidation of the projected futer levels of rail freight traffic from major crossing roadways. Funding and construction of such facilities is likely to depend on actual materialization of the increased rail freight traffic, and if developed in the future are actions independent of the rail transit project which could alter potential traffic impacts as assessed above.

IV-231.4 Traffic Impact At Station Areas

In general, the traffic impacts from the project in the mid-corridor would be insignificant. However, traffic circulation at station areas planned with park-and-ride facilities could worsen due to the peak hour commuter usage of the station facilities. The greatest impact would occur at the Imperial Highway station where the rail transit platform would be located adjacent to Willowbrook Avenue and would be partly under the Century Freeway to the south. The freeway/ transitway platform would be accessible to the rail transit platform. RTD buses serving the station would have a platform on Willowbrook Avenue near the rail transit station to maximize use of transfer. The critical intersections of Imperial Highway at Wilmington Avenue and Willowbrook Avenue, along with the Century Freeway ramp access, would be affected from commuter traffic access to the park-and-ride facility.

TABLE IV-23E

YEAR 2000 GRADE CROSSING VEHICLE DELAY TIME

FROM FREIGHT RAIL OPERATION

(Hours per Day)

Cross Street	Status Quo (High Scenario)		Compton Diversion (MC-3) (High Scenario)	
	Wilmington Br.	San Pedro Br.	Wilmington Br.	San Pedro Br.
1. Wilmington Ave.	91	N.A.	(98)+	N.A.
2. W. Alameda Street	N.A.	N.A.	N.A.	(114)+
3. Imperial Highway	199	95	--	197
4. Lynwood Avenue	N.A.	*	N.A.	62
5. El Segundo Boulevard	88	71	--	138
6. Rosecrans Avenue	108	105	--	204
7. Compton Boulevard	64	68	--	129
8. Alondra Boulevard	61	75	--	122
9. Greenleaf Boulevard	*	*	--	65

Note: + - Grade crossing with West Santa Ana Branch
* - Less than 50 hours of delay per day
N.A. - Not applicable

Source: Southern California Association of Governments, 1983.

There would be virtually no change in the peak hour traffic or the average speeds on Imperial Highway at the rail transit project alignment between the year 2000 no project condition and each of the project alternatives. However, depending on the chosen alternative, the arrival rate during the AM peak hour would vary between 181 and 380 vehicles when the home-to-work transit trips are more concentrated. The lowest park-and-ride arrival rate would be realized with the Flower Street Subway with Atlantic with Pacific Avenue Loop alternative and the highest with the Olympic/9th Aerial with Atlantic with Pacific Avenue Loop alternative. These arrivals would represent both park-and-ride and kiss-and-ride vehicles.

The volume/capacity ratio at the signalized intersection of Imperial Highway and Wilmington Avenue during the much heavier PM peak traffic in the year 2000 would be 1.57 (LOS "F") without the project, if no improvements were made at the intersection (see Table IV-23D). With the recommended widening of both Imperial Highway and Wilmington Avenue by one lane as each approaches the intersection and with modification of the signal cycle, the volume/ capacity ratio would decrease to an acceptable level of 0.88 (LOS "D"). Since the traffic volumes with the rail transit alternatives would be similar to the no project condition, and the concentrated arrival of park-and-ride vehicles would be during the AM peak hour when traffic volumes are much lower, there should be no significant change in the level of service at the intersection with the implementation of the rail transit project.

The access to the major park-and-ride facility at the Artesia Boulevard station would be via Acacia Avenue within the adjacent industrial complex to the west. Depending on the rail transit alternative, between 304 and 536 vehicles would be expected to arrive at the park-and-ride facility during the AM peak hour. Here also the lowest arrival rate would be realized by the Flower Street Subway with Atlantic with Pacific Avenue Loop alternative and the highest rate would come from the Olympic/9th Aerial with Atlantic with Pacific Avenue Loop alternative. The overall traffic volumes on Artesia Boulevard in the vicinity of the project alignment would show no change between the year 2000 no project condition and any of the project alternatives. The volume/capacity ratio on Artesia Boulevard in year 2000 would be 0.65 (LOS "B"). No significant impact on Artesia Boulevard is anticipated. However, the intersection of Artesia Boulevard with Acacia Avenue would warrant signalization.

The major park-and-ride facility at Del Amo station would have access via Del Amo Boulevard and Santa Fe Avenue. A range of between 311 and 387 vehicles would to use this facility during the AM peak hour, with the lowest arrival with the Broadway/Spring with Atlantic with Pacific Avenue Loop Alternative and the highest with the Olympic/9th Aerial with Atlantic with Pacific Avenue Loop alternative. The critical intersection of Del Amo Boulevard and Santa Fe Avenue would operate at full capacity in the year 2000 without the project (V/C=0.98).

Although there would be a slight reduction in traffic volumes in Del Amo Boulevard with the implementation of the project, the level of service would not show any improvement. Local circulation would be affected by the commuter usage of the park-and-ride facility. However, with proposed improvements to the intersection of Del Amo Boulevard and Santa Fe Avenue, and by restriping the northbound approach lane to provide an exclusive right turn lane and the westbound approach to provide dual left turn lanes, the volume/ capacity ratio during the heavier PM peak hour would be reduced to an acceptable level of 0.82 (LOS "D") with the project.

IV-231.5 Pedestrian Activity

In the mid-corridor, pedestrian activities would be the heaviest at the Imperial Highway station, where a major park-and-ride facility is proposed. The Broadway/Spring with Atlantic with Pacific Avenue Loop alternative would produce total northbound boardings and alightings during the AM peak hour of over 1,500 passengers and total southbound boardings and alightings of 470 passengers. In comparison, the Olympic/9th Aerial with Atlantic with Pacific Avenue Loop alternative would produce approximately 1,400 northbound and 860 southbound, and the Flower Street Subway Atlantic with Pacific Avenue Loop would produce 1,300 northbound and 440 southbound boarding and alighting combinations. A significant portion of the boardings, between 24 and 33 percent, would arrive via auto. The remaining represents transfers from a bus mode of arrival, both from local street buses and the Century Freeway transitway. The vertical and horizontal pedestrian transfer and circulation facilities proposed at the Imperial Highway station would adequately handle the 100 or so passengers using the station area between the subsequent rail transit arrivals.

IV-231.6 Mitigation Measures

Traffic mitigation measures in the mid-corridor segment of the project would require significant improvements at major east-west cross streets, due to the anticipated traffic growth in the year 2000. The improvements in the form of street widening would be needed if acceptable levels of service is to be maintained at key intersections, with or without the project. The following mitigation measures will be evaluated during final design of the project in coordination with local traffic agencies:

- At the intersections of Gage and Holmes Avenues, restripe the east and west approaches to accommodate two through and one left turn lane.

- At Florence and Holmes Avenues, restripe the east and west approaches to add an extra through lane.

- At Imperial Highway and Wilmington Avenue, widen all approaches by one lane.

- At Del Amo Boulevard and Sante Fe Avenue, restripe the northbound approach to provide an exclusive right turn lane and the westbound approach to provide dual left turn lanes.

- At Willow Street and Long Beach Boulevard, provide dual left turn lanes at the northbound and southbound approaches and add a through lane at all approaches.

- To the extent feasible, provide a coordinated north-south traffic control/light rail train control system under the project.

IV-232 Transit

The bus transit system under the year 2000 no project condition would be the existing bus system plus the Sector Improvements Plan which was approved in 1980 and is scheduled for completion in 1985.

In order to optimize overall transit operations while minimizing operating costs in the mid-corridor, a complementary bus network supporting the rail alternatives was developed. Existing bus lines were reoriented to collect and distribute riders to and from rail stations, while eliminating bus routes which parallel the rail transit alignment. A key concern was to avoid disruption of large numbers of bus riders whose travel requirements would not be conveniently served by the new rail system.

In the mid-corridor section, major east-west lines would intersect the rail transit right-of-way providing potential transfer points at the proposed rail transit stations. To accommodate feeder bus requirements, the supporting bus plan would entail a few route modifications to the basic bus route network in order to achieve convenient bus-rail transfer points. Supplemental bus service would be operated over bus routes which would directly connect to rail stations or would be rerouted to connect to rail stations, with services scheduled on a demand basis to handle projected feeder bus ridership passenger loads. A feeder bus system completely separate from the areawide network of local and express buses is not proposed.

Proposed bus route and frequency modifications for local and express services are summarized below for the rail transit alternatives in the mid-corridor. Detailed information regarding the proposed changes could be obtained in the PB/KE memorandum titled "Design of Complementary Bus Network" (Task 7.7), dated August 24, 1983.

- RTD Lines 55 and 56 - reduce service frequencies during peak periods.

- RTD Lines 55,56,105,115, and 117 and LBTC Line 15 - increase service frequencies during peak periods.

- RTD Lines 107, 110, 119, 125, and 457 - reroute to or terminate at nearest rail transit station during peak periods.

- RTD Line 119 - extend route during peak hours south on Atlantic Avenue to terminate at Alondra.

- RTD Lines 358, 360, and 456 - eliminate service on Lynwood-Paramount Limited, Long Beach Boulevard, and Long Beach Freeway Express buses.

The rail transit project impact on local transit patronage in the mid-corridor for each of the project alignment alternatives was examined (see Table IV-23F).

In the mid-corridor, the impacts would be substantial but would be much more uniform among the project alternatives than expected since, in that area, all the alternatives would be the same. The impacts would range from -51 percent with the Olympic/9th Aerial alternative to -26 percent for the Broadway/Spring Couplet, both with the Atlantic with Pacific Avenue Loop in Long Beach.

IV-233 Parking

Park-and-ride and neighborhood parking facilities would be provided near project station areas at 7 locations in the mid-corridor. Major park-and-ride facilities are proposed at Imperial Highway, Artesia Boulevard, and Del Amo Boulevard.

Based on an unconstrained analysis of arrival mode, estimated arrivals at the 3 park-and-ride stations by auto during the AM peak hour are shown in Table IV-23G. The total arrivals by auto reflect rail transit boarding passengers and include both park-and-ride and kiss-and-ride passengers, as well as arrivals by carpools. The number of vehicles which would park and ride at the parking lots during the peak hour has been determined by factoring the total arrivals, and is also shown in Table IV-23G.

The total parking demand at the park-and-ride and neighborhood parking facilities throughout the day would probably exceed the number of parking spaces supplied at the rail transit stations, and the potential for spillover parking to the surrounding neighborhood streets would exist. At station locations in the mid-corridor where no new parking would be provided, the access to the station would be almost all via feeder buses or walk trips. Therefore, the parking impacts on neighborhood local streets would be insignificant.

IV-233.1 Mitigation Measures

For rail transit stations in the mid-corridor that have a significant park-and-ride demand, the following mitigation measures could be implemented:

- Provide maximum park-and-ride facilities with provision for adequate circulation, as proposed at Imperial Highway, Artesia Boulevard, and Del Amo Boulevard.

TABLE IV-23F

YEAR 2000 CHANGE IN LOCAL BACKGROUND BUS TRANSIT TRIPS

MID-CORRIDOR

	Mid-Corridor Screenline North of Century Boulevard	
	Daily Trips	Percent Change From No Project
No Project	9,918	--
LA-1/MC-1/LB-4	5,975	-40
LA-2/MC-1/LB-4	5,427	-45
LA-3/MC-1/LB-4	4,839	-51
LA-3/MC-1/LB-3	5,777	-42

Source: Southern California Association of Governments, 1984.

TABLE IV-23G

PARKING SUPPLY AND USAGE BY SYSTEM ALTERNATIVES

AT PARK-AND-RIDE FACILITIES

Location of Park-and-Ride Facility (by stations)	Proposed Number of Parking Spaces	AM Peak Hour Arrivals By Alternatives			
		LA-1/MC-1/LB-4	LA-2/MC-1/LB-4	LA-3/MC-1/LB-3	LA-3/MC-1/LB-3
Imperial Highway	500	228 (217) [158]	190 (181) [139]	400 (380) [292]	388 (369) [283]
Artesia Boulevard	650	413 (392) [301]	320 (304) [234]	564 (536) [412]	455 (432) [322]
Del Amo Boulevard	400	387 (368) [283]	382 (363) [279]	406 (387) [296]	334 (317) [244]

Note: 000 Passenger arrivals by auto.
(000) Auto arrivals (includes carpools).
[000] Park-and-ride vehicles (excludes kiss-and-ride).

Source: The percent breakdown was obtained from the total observations taken by Cambridge Systematic, Inc. in June, 1981 in the RTD on-board, OCTD on-board, and RTD Park and Ride mail-out surveys.

- o Increase the feeder bus service to the rail transit stations to provide an alternative mode of access to the automobile. The complementary bus network designed for the rail transit would provide such service. With the exception of the rail transit stations with park-and-ride facilities, almost all access to the rail transit stations would be via feeder buses or would be walk trips.

- o Preferential parking for car pools and van pools at stations areas should be implemented.

- o Discourage spillover parking on neighborhood and residential streets by strict law enforcement.

IV-234 <u>Rail Freight Operations</u>

All of the mid-corridor alternatives would provide for full maintenance of SPTC rail freight operations at maximum levels of activity projected for the year 2000. Rail transit and freight rail branch line tracks would be fully segregated at all points throughout the corridor, and all crossings of the two systems would be grade separated. In a few cases, at-grade crossings of rail transit tracks and SPTC spur tracks would be required in order to maintain service to rail freight customers. No impact to either operation is anticipated from activity on these spur tracks.

IV-240 CUMULATIVE IMPACTS OF RELATED PROJECTS

Several related projects would potentially be in operation concurrently with the Long Beach-Los Angeles Rail Transit Project in the mid-corridor. These projects include the Century Freeway (including transitway), Harbor Freeway transitway, U.S. Postal Facility, Los Angeles-San Diego Bullet Train (American High Speed Rail), Intermodal Container Transfer Facility (ICTF), Long Beach International Coal Project, and the San Pedro Bay Ports Access (consolidation) Study.

The Los Angeles-San Diego Bullet Train (American High Speed Rail) does not stop within the mid-corridor and would have no cumulative operations impacts. The cumulative impacts of the other projects during operation would be somewhat different than those impacts generally described for downtown Los Angeles and are as follows:

- o The only transit available is the SCRTD buslines, which generally travel in a north-south direction. Bus lines in the mid-corridor would be rerouted, with more east-west orientation, promoting feeder service to the LB-LA Rail Transit Project and serving the surrounding community more effectively.

- o The LB-LA Rail Transit Project would compete with some of the north-south buslines and the parallel Harbor Freeway transitway (bus/HOV). The market areas for the LB-LA Rail Transit

Project and the Harbor Freeway transitway would overlap in the region located between the two lines north of the San Diego Freeway. These two competing lines could lose some patronage to one another, although it would not be significant.

- Specific cumulative impacts would occur where the LB-LA Rail Transit Project would interface with the Century Freeway transitway (Bus/HOV) project. At this location, a combined station for north-south rail transit passengers and east-west bus/HOV passengers would be constructed. The station would handle transfers from one line to the other and essentially become a focal point of transit activity, currently non-existent in the surrounding community.

- The LB-LA Rail Transit Project and Century Freeway transitway would not be responsible for expected development in the area; however, they would supplement and support the proposed plans by providing excellent public transit access, adequate parking, and high visibiity to the shopping center from passing transit vehicles.

- The Los Angeles County Redevelopment Agency has realized the economic potential of this area and is proposing to build a large shopping center immediately adjacent to the southern edge of the proposed station. The shopping center complex is to be part of the overall King Triangle Redevelopment project.

- The overall increase in rail traffic impacts from the LB-LA Rail Transit Project, in addition to those already caused by the ICTF and Long Beach International Coal Terminal projects, would be minimal.

IV-300 LONG BEACH

IV-310 NATURAL ENVIRONMENT

IV-311 Topography, Soils, Geology, and Seismicity

In addition to groundshaking and liquefaction hazards as discussed for the mid-corridor alternatives, a portion of the Long Beach segment may be subject to fault rupture (offset). Damage from fault rupture could occur where the proposed rail transit alignment would cross the Cherry Hill Fault (extension of Newport-Inglewood Fault) somewhere in the vicinity of Wardlow Road and the San Diego Freeway. The City of Long Beach has indicated that Alquist-Priolo studies for the Long Beach area show no evidence of surface displacement anywhere on Cherry Hill Fault for the last 12,000 years; thus, the fault rupture hazard for the portion of the rail transit alignment crossing the Cherry Hill Fault is considered very low during the proposed project life (50 years ±). In any case, there is no practical way to prevent severe localized damage in the event of a fault rupture occurring during a maximum credible earthquake. No specific mitigation is proposed for fault rupture, however, project design (see Section I-423) provides for system shut-down and evacuation measures should conditions occur that make vehicle operation hazardous.

None of the Long Beach alternatives would affect geological features, mineral resources, or agricultural soils.

Mitigation measures for ground shaking and liquefaction in Long Beach would be similar to those discussed for the downtown Los Angeles alternatives.

IV-312 Floodplains, Hydrology, and Water Quality

No established floodplains would be affected in Long Beach. Alternative LB-3 (Los Angeles River Route) would be adjacent the toe of the slope for the LA River levee; permits from the U.S. Army Corps of Engineers and the LA County Flood Control District would be required for operating the rail transit facility in this area.

The three low depressions that exist in downtown Long Beach would be crossed by the at-grade alignments for alternatives LB-1, LB-2 and LB-4 (Atlantic Avenue Two-Way, Atlantic/Long Beach Couplet, and Atlantic with Pacific Avenue Loop).

Only the low spot between 32nd Street and Canton Avenue adjacent the existing SPTC tracks would experience any impact. At this location, there could be an increase in the rail transit track roadbed elevation which would increase the areal extent of the depression adjacent to the proposed project. Culverts are proposed as mitigation to maintain transverse flow.

The other two depressions in Long Beach, located on the proposed alternatives, would not experience any significant change over existing conditions. The existing drainage systems would be generally adequate to handle any increased flow. Supplemental catch basins would be constructed as necessary to correct potential problems created by the rail facility.

Light rail facilities could affect patterns of surface water flow and infiltration, especially during storm or flood conditions. Surface and marine water resources in Long Beach may experience some minor localized impacts due to the effects of added run-off of polluted surface water. These effects would be most noticeable at discharge points and in estuaries and harbors.

Mitigation for impacts to drainage and water quality would include improvements to existing culverts, gutters, catch basins, and settling ponds.

IV-313 Vegetation and Wildlife

All existing landscaping, ruderal vegetation, and wildlife within the proposed right-of-way for the Long Beach alternatives would be either removed or relocated. The amount of vegetation and wildlife to be removed would be relatively small and considered insignificant.

Alternative LB-3 would be located along the toe of the slope of the east bank (levee) of the Los Angeles River. Operating the rail project below the top of bank outside of the channel would have no effect to wildlife in the Los Angeles River tidal prism or the harbor area.

The rail alignment and stations for the selected Long Beach alternative would be landscaped with aesthetically compatible vegetation where deemed desirable or appropriate. Vegetation used as project landscaping would require continual watering and trimming throughout its lifetime or until it is removed. Displaced wildlife such as birds and rodents would return to the corridor of its own accord after the construction phase.

IV-314 Air Quality

Localized air quality impacts in Long Beach were analyzed for two intersections in a manner similar to the Los Angeles analysis. Potential impacts from parking lots were not of concern in Long Beach, because the two proposed facilities at Wardlow Road and Willow Street would be so small. Analysis of much larger facilities in the mid-corridor determined that there would be extremely minor increases in carbon monoxide concentrations with the parking lots in operation (see Section IV-214.2).

The carbon monoxide concentration analysis in Long Beach used the same methodology as in Los Angeles to calculate carbon monoxide concentrations in 1980, year 2000 without the project, and year 2000 with the project. (See Section IV-114 for a discussion of the meteorological assumptions and the application of the CALINE 3 model.) In Long Beach, the intersections chosen for analysis were Long Beach Boulevard/7th Street and Long Beach Boulevard/Ocean Boulevard. Both of these intersections would have Level of Service "D" traffic in year 2000. Year 2000 peak hour traffic and vehicle speeds are summarized in Table IV-31A. Ambient (1980) carbon monoxide concentrations are taken from readings at the Long Beach air quality sampling station.

TABLE IV-31A

LONG BEACH INTERSECTIONS CHOSEN FOR MICROSCALE ANALYSIS

Intersection	North/South Volume	North/South Speed	East/West Volume	East/West Speed
Long Beach Blvd./7th St.	2210	28	3400	23
Long Beach Blvd./Ocean Blvd.	3300	30	3010	22

Source: Southern California Association of Governments, 1984.

The results of the carbon monoxide analysis are presented in Table IV-31B. Peak period one-hour carbon monoxide concentrations at distances ranging from 10 to 80 meters from the center of the intersection would decline substantially in the year 2000, both with and without the project in operation. The analysis projects no increase in carbon monoxide concentration at these intersections over the no project condition. As in Los Angeles and the mid-corridor analyses, reductions in carbon monoxide concentrations would occur by the year 2000 because of improved emission controls on vehicles and because of implementation of the Air Quality Maintenance Plan. The Long Beach-Los Angeles Rail Transit Project would have no effect on localized carbon monoxide concentrations in Long Beach.

IV-315 Noise and Vibration

IV-315.1 Noise

Except for a portion of the LB-3 alternative along the Los Angeles River, the alternatives in Long Beach would be located along major arterial streets. Noise measurements reported for Long Beach show average sound levels in the 68 to 74 dBA range along Atlantic and Pacific Avenues, with a CNEL on Atlantic Avenue of 65 dBA. The noise environment along the Los Angeles River is much quieter, however, with a CNEL of 57 dBA.

TABLE IV 31B

PEAK-PERIOD ONE-HOUR CARBON MONOXIDE CONCENTRATIONS

AT VARIOUS DISTANCES FROM SELECTED INTERSECTIONS - LONG BEACH

(Parts Per Million)[1]

	1980: Existing Conditions				2000: Without Project				2000: Baseline Alternative			
Distance from Center of Intersection (meters)	10	20	40	80	10	20	40	80	10	20	40	80
Intersection												
Long Beach Blvd/ 7th Street[2]	37.2	31.1	233.4	17.9	15.5	12.2	8.6	6.4	15.5	12.1	8.6	6.4
Long Beach Blvd/ Ocean Blvd[2]	36.0	30.2	23.5	18.2	15.0	12.5	9.7	7.3	15.0	12.5	9.7	7.3

[1] Federal standard = 35 ppm, state standard = 20 ppm

[2] Ambient (background) concentration = 15 ppm (1980), 5.7 ppm (2000)

Source: Southern California Association of Governments, "Air Quality Impacts Technical Working Paper", February 9, 1984.

As with the mid-corridor alternatives, a fractional impact analysis was conducted for residential areas in Long Beach. The results of this analysis are presented in Table IV-31C. The first column of the table shows the number of people within a 500-foot distance on either side of the centerline of the track. The next two sections of the table show the existing and future conditions both without the project and with the project in place. For each case, there are three measures given:

- o The number of people whose CNEL is greater than 65 dBA,
- o The Level Weighted Population (LWP) which is an aggregation of all the people affected by noise within the corridor with weighting factors applied to account for the differing levels of impact, and
- o The Noise Impact Index (NII), which is a ratio computed by dividing the LWP by the total number of people.

The comparison of the various measures on Table IV-31C shows a future increase in noise exposure over that which presently exists without the project's being built and a negligible change in noise impact over the future no project level with the addition of project alternatives LB-1, LB-2, and LB-4.

As far as nonresidential noise-sensitive receptors are concerned, the LB-1 alternative would have 14 churches, 4 medical facilities, a library, and 4 schools along the proposed route. On the Atlantic/ Long Beach Couplet (LB-2), there would be 19 churches, 5 schools, 4 medical facilities, and a library. The route proposed for LB-4 would include 10 churches, 3 schools, and 3 medical facilities. At all of the noise-sensitive receptor locations, the project's contribution to the CNEL in the future would be 0.1 dBA or less. These results indicate that the project would have an insignificant impact.

Because of the lower noise environment existing along the Los Angeles River, the LB-3 (LA River Route), noise exposure due to this alternative would increase by approximately 5 dBA, which would be considered a significant adverse impact. If this alternative is selected, a sound barrier will replace the fencing from Wardlow to Pacific Coast Highway. Assuming an approximate distance of 11,000 feet the mitigation would cost $660,000. Such a barrier would reduce the impact to an insignificant level.

IV-315.2 Vibration

Groundborne vibration along the various alternative routes in Long Beach is not expected to create an impact, based upon the results of prior measurements of light rail vehicles shown in Figure IV-11D. For the downtown Long Beach area, with reduced operating speeds, vibration-sensitive structures more than 25 feet from the tracks should experience no vibration impact. Along the river route, where

TABLE IV-31C

NOISE IMPACT ANALYSIS RESULTS FOR LONG BEACH

Alternative	Total No. People[1]	Existing 65+[2]	Existing LWP[3]	Existing NII[4]	Year 2000 No Project 65+[2]	Year 2000 No Project LWP[3]	Year 2000 No Project NII[4]	Year 2000 Project 65+[2]	Year 2000 Project LWP[3]	Year 2000 Project NII[4]
LB-1	9188	4368	3804	.41	4462	4499	.49	4480	4589	.50
LB-2	10250	4684	4279	.42	4584	5512	.54	4584	5567	.54
LB-3	4504	949	987	.22	956	1165	.26	960	1294	.29
LB-4	8464	3988	3533	.42	5114	5114	.60	5132	5204	.61

[1] Total No. people - those living within 500 feet of route.

[2] 65 - No. people with CNEL greater than 65 dBA.

[3] LWP - Level Weighted Population.

[4] NII - Noise Impact Index = LWP ÷ Total No. People.

Source: Bolt Beranek & Newman, 1984.

higher operating speeds are expected, residential structures located greater than 50 feet from the tracks should experience no vibration impact.

IV-320 SOCIOECONOMIC ENVIRONMENT

IV-321 Land Use, Population and Housing

The method by which year 2000 growth forecasts were adjusted to estimate potential project-induced impacts is discussed in Section IV-121.

IV-321.1 Land Use and Development

The following discussion is broken into two parts: 1) an assessment of the amount of project-induced development and its likely location, and 2) an evaluation of how well the project would meet the transit-related goals and objectives stipulated in the local general, community, and redevelopment land use plans.

IV-321.11 Growth-Inducing Impacts

Table IV-32A illustrates where growth projected by SCAG could be expected to occur. As in the rest of the corridor, the overall growth rate induced by the project in Long Beach is expected to be modest: approximately 400,000 square feet of office and 100,000 square feet of retail space. Additional office growth would be expected to occur as infill of recently built or renovated office space in the downtown portion of the redevelopment area, where the overall occupancy rate is currently 70 percent; the occupancy rate for office space built from 1980 through 1983 averages 55 percent, well below the expected 85 to 90 percent rate in a healthy office market. Additional retail development might occur at Hill Street and Pacific Coast Highway, where rail boardings are projected to be high.

In addition to the development shown in Table IV-32A, there may be an increased potential for redevelopment along Atlantic Avenue as a result of alternatives LB-1 or LB-4. Three options are proposed for the rail line on Atlantic under the alternatives:

o Option A would locate the rail tracks in a paved center median thereby providing on-street parking on both sides of the street (except in front of schools and churches), but it would require full fee acquisition of 20 acres of land.

o Option B would also locate the rail tracks in a paved center median, but it would generally eliminate on-street parking on both sides of the street and would require full fee acquisition of 9 acres of land.

TABLE IV-32A

DEVELOPMENT WITHIN ONE-QUARTER MILE OF STATIONS

LONG BEACH

	Existing in 1980 (000's of gross square feet)				1980-2000: New Development without Project (000's of gross square feet)				Possible Additional Development by 2000 with the Project (000's of gross square feet)			
	Office	Retail	Hotel	Housing Units	Office	Retail	Hotel	Housing Units	Office	Retail	Hotel	Housing Units
LB-1 (Atlantic Avenue Two-Way)												
Wardlow Road	13	0	0	1,196	0	0	0	230	0	0	0	60
Willow Street	91	115	0	609	0	0	0	150	0	0	0	40
Hill Street	0	160	0	1,444	0	0	0	120	0	20	0	30[2]
Pacific Coast Highway	33	326	0	1,438	0	30	0	300	0	40	0	80[2]
Anaheim Street	0	318	0	1,209	0	50	0	380	0	40	0	90[2]
6th/7th Street	77	302	0	1,855	30	160	0	720	0	0	0	180
1st Street	833	585	0	1,409	1,750	300	1,422	1,240	400[1]	0	0	310
TOTAL	1,047	1,806	0	9,160	1,780	540	1,422	3,140	400[1]	100	0	790
LB-2 (Atlantic/Long Beach Couplet)												
Wardlow Road	13	0	0	1,196	0	0	0	230	0	0	0	30
Willow Street	91	115	0	609	0	0	0	150	0	0	0	20
Hill Street	0	160	0	2,282	0	0	0	240	0	20	0	40
Pacific Coast Highway	53	410	0	2,640	0	30	0	550	0	40	0	90
Anaheim Street	118	624	0	1,746	0	50	0	790	0	40	0	120
6th/7th Streets	359	565	0	2,316	30	650	0	1,810	0	0	0	270
3rd Street	643	520	0	499	1,160	160	500	490	200[1]	0	0	80
1st Street	267	195	0	1,869	910	160	380	920	200[1]	0	0	140
TOTAL	1,544	2,589	0	13,157	2,100	1,050	880	5,180	400[1]	100	0	790

[1] Infill: Defined as occupancy of existing structures, in contrast to new construction.

[2] Does not include housing acquisitions or subsequent residential on vacated parcels.

TABLE IV-32A (Continued)

DEVELOPMENT WITHIN ONE-QUARTER MILE OF STATIONS

LONG BEACH

	Existing in 1980 (000's of gross square feet)				1980-2000: New Development without Project (000's of gross square feet)				Possible Additional Development by 2000 with the Project (000's of gross square feet)			
	Office	Retail	Hotel	Housing Units	Office	Retail	Hotel	Housing Units	Office	Retail	Hotel	Housing Units
LB-3 (River Route)												
Daisy Avenue	0	65	0	2,218	850	30	922	2,809	200[1]	0	0	380
1st Street	1,135	773	0	1,234	1,440	330	250	1,082	200[1]	0	0	150
TOTAL	1,135	838	0	3,452	2,290	360	1,172	3,891	400[1]	0	0	530
LB-4 (Atlantic Loop)												
Wardlow Road	13	0	0	1,196	0	0	0	230	0	0	0	30
Willow Street	91	115	0	609	0	0	0	150	0	0	0	20
Hill Street	0	160	0	1,444	0	0	0	120	0	20	0	20[2]
Pacific Coast Highway	33	224	0	1,438	0	30	0	300	0	40	0	50[2]
Anaheim Street	0	318	0	1,209	0	50	0	380	0	40	0	60[2]
6th Street	220	450	0	3,135	0	450	0	2,190	0	0	0	330
3rd Street	643	520	0	1,034	1,010	965	500	870	200[1]	0	0	130
1st Street	1,169	460	0	1,035	1,465	75	380	950	200[1]	0	0	140
TOTAL	2,169	2,247	0	11,100	2,475	1,570	880	5,190	400[1]	100	0	780

[1] Infill: Defined as occupancy of existing structures, in contrast to new construction.

[2] Does not include housing acquisitions or subsequent residential on vacated parcels.

Source: Sedway Cooke Associates for office, retail and hotel space, 1984; M. L. Frank & Associates (from U.S. Census, 1980 and SCAG-82) for housing, 1984.

- o Option C would locate the rail tracks in mixed traffic except at station areas and would require no displacement and only minor partial property acquisition.

Parcels acquired for the project could be redeveloped if Atlantic Avenue north of 11th Street is designated as a redevelopment area and development matrices are provided. The following table (see Table IV-32A) sets forth estimates of the additional development potential which would be available on parcels acquired for the project assumes that both displaced residential units and businesses would be relocated on Atlantic Avenue.

The possible additional development due to the project indicated in Table IV-32A, together with replacement housing and commercial floor space, would consume all of the acquired land available under Option B and all but 2.5 to 2.6 acres under Option A. The remaining land under Option A could accommodate up to 35,000 square feet of commercial floor space and up to 120 to 240 housing units, assuming an illustrative mix of 25 percent commercial use and 75 percent housing. This redevelopment could in turn, promote further redevelopment of privately-owned parcels along Atlantic Avenue.

IV-321.12 Conformance with Land Use Plans

Conformance is evaluated in terms of the measures described in Section 121.11 of this chapter.

- o <u>Serve Population Concentrations</u>:

  LB-1, LB-2, and LB-4 would serve roughly the same subcorridor within the Long Beach segment, while LB-3 would only serve the southernmost portion of the downtown. None of the alternatives would be located in the most densely populated portions of the Long Beach segment. Densities are higher to the west and to the east of the proposed routes. The highest residential densities in the Long Beach segment of the corridor are between Alamitos Avenue and Cherry Avenue, with nearly as high densities between Pacific Avenue and the Los Angeles River. Table IV-32B shows station area population densities in the year 2000.

TABLE IV-32B

YEAR 2000 STATION AREA POPULATION DENSITIES

LONG BEACH

	Total Population	Ranking	Population Density: Population/ Square Mile	Population Density: Impact	Population Density: Ranking
Long Beach Segment	247,101		11,267		
LB-1 Stations	26,183*	3	23,695*	+	4
LB-2 Stations	35,250*	1	28,155*	+	1
LB-3 Stations	12,810*	4	47,096*	+	2
LB-4 Stations	30,113*	2	25,199*	+	3

Note: * indicates within 1/4 mile of stations.
+ indicates potentially positive impact.

Source: Sedway Cooke Associates, 1984.

With respect to total population, LB-2 would put the largest number of people within walking distance of a station because of its couplet stations, with LB-4 and LB-1 providing access to 85 percent and 75 percent, respectively, of the number of people served by LB-2. LB-3 would provide access to only 36 percent of that number.

Stations on all of the Long Beach segment alternatives would serve areas with population densities at least twice that of the overall segment. LB-3 would serve the highest densities, but the fewest people due to a greater average walking distance and fewer stations along the route. With respect to density, the other alternatives would be ranked the same as they were for total population served, with LB-4 and LB-1 serving areas with 89 percent and 84 percent, respectively, of the density around LB-2 stations.

o Serve Commercial Centers:

With the exception of LB-3, all of the alternatives would serve the same subcorridor within the Long Beach segment of the corridor -- the area between Pacific and California Avenues. From the shoreline to Pacific Coast Highway, this area contains by far the densest employment and shopping activity in the Long Beach segment. Within this subcorridor, LB-1 and LB-4 would be located on Atlantic Avenue, which includes mixed commercial and residential activity at very low intensities north of Anaheim Street and somewhat high intensities south of Anaheim. LB-2 would directly serve Atlantic Avenue as well as Long Beach Boulevard, which is the major commercial corridor in Long Beach. All of the alternatives would terminate in and would, to some extent, serve the recently redeveloped downtown area.

The total number and density of employees and shoppers who would have pedestrian access to stations for each alternative, compared with the segment as a whole, are shown in Table IV-32C.

TABLE IV-32C

YEAR 2000 EMPLOYMENT/SHOPPING DENSITIES

LONG BEACH

			Employee and Shopper Density		
	Total Employees and Daily Shoppers	Ranking	Employees and Daily Shoppers/ Square Mile	Impact*	Ranking
Long Beach Segment	420,000		17,500		
LB-1 Stations	86,000	4	78,000	+	4
LB-2 Stations	129,000	2	103,000	+	3
LB-3 Stations	53,000	3	193,000	+	1
LB-4 Stations	135,000	1	113,000	+	2

* + indicates potentially positive impact.

Note: Assumes 30 shoppers per day per 1,000 gross square feet of retail space, one employee per 300 gross square feet of office, one per 500 gross square feet of retail, one per hotel room and 25 per acre of industrial use.

Source: Sedway Cooke Associates, 1984.

All alternatives would provide pedestrian access to areas having much greater concentrations of employees and shoppers than the segment as a whole. LB-2 and LB-4 would provide pedestrian access from transit stations to destinations for the greatest number of people; LB-1 and LB-3 would provide pedestrian access to 35 percent and 60 percent fewer employees and shoppers respectively.

- Serve Activity/Growth Centers:

  The centers of recent and planned growth in the Long Beach segment include: the major commercial development area bounded by 6th Street, Elm Avenue, Pacific Avenue, and the south frontage of Ocean Boulevard; the adjacent Civic Center to the west; the World Trade Center area farther west; and the visitor-serving facilities south of the Convention Center including the Hyatt Hotel, the Queen Mary, the Spruce Goose, and the Shoreline Village shopping center. All alternatives would serve the major commercial area. LB-3 and LB-4 would provide access to the Civic Center, and only LB-3 would serve the World Trade Center area. None of the alternatives would include stations within 1/4 mile of the visitor-serving facilities south of the Convention Center.

- Connect with Other Transit/Transportation Systems:

  The two transportation systems with which the project could connect in the Long Beach segment are the San Diego Freeway and the downtown Long Beach Transit Mall between Long Beach Boulevard and Locust Avenue on 1st Street.

  There is no park-and-ride lot at the Wardlow Boulevard station at the intersection of the San Diego Freeway and the project which would permit freeway users to transfer to the project. As the project is now designed, vehicles on the San Diego Freeway would have to travel 2 miles north on the Long Beach Freeway to use the Del Amo Boulevard station park-and-ride lot. All of the alternatives would include stations within 2 blocks of the Long Beach Transit Mall, where transfers to east-west feeder buses to the project would occur. LB-1 would make the closest connection at 1 block away; LB-2 and LB-3 would be 1-1/2 blocks away; and LB-4, 2 blocks away.

- Enhance Revitalization Efforts:

  The downtown portion of the Downtown-Tideland Redevelopment Project would be served by all four alternatives. It would be served most centrally by LB-4, somewhat less centrally by LB-2, and peripherally by LB-1 and LB-3. The tidelands portion of the redevelopment area would not be served by any of the alternatives.

- Increase Accessibility to Public Facilities:

  Each of the alternatives would improve access to public and community facilities within 1/4 mile of the station areas. LB-2 with 87 such facilities would provide the best service. LB-1 and LB-4, respectively serving 69 and 76 facilities, would improve accessibility to almost the same degree. LB-3 would serve the fewest, 17, because it would only have 2 stations. Section IV-322 discusses impacts on community facilities in some detail.

- <u>Compatibility of Project Facilities with Adjacent Land Uses</u>:

  With the exception of LB-3, all of the Long Beach alternatives would run in street rights-of-way. LB-3 would require using Los Angeles County Flood Control land for a portion of its route. The Los Angeles River Corridor, owned by the Los Angeles County Flood Control District, bears no zoning or general plan designated north of Anaheim Street. South of Anaheim Street it is zoned for "tourist commercial use." The City of Long Beach Planning Department has indicated that because this zoning classification does not specifically prohibit such a transportation route, the project would be in conformance with such zoning.

  However, LB-3 would be located adjacent to property from the San Diego Freeway south to Pacific Coast Highway which is zoned for single-family or multi-family housing and has been developed as single-family housing. North of Willow Street, the residential parcels are separated from the proposed line by 100 feet, which includes a street for most of its length. Between Willow and Hill Streets, residential parcels are 30 to 40 feet away, across the street. From Hill Street to Pacific Coast Highway, residential parcels are located 50 feet from the proposed rail line with the exception of 5 houses which would probably be removed. In addition to the above distances, all housing units are set back from their lot lines by at least 15 feet as required by zoning. From Pacific Coast Highway to 7th Street, the adjacent land is designated, zoned and used industrially. From 7th Street to 4th Street, the adjacent land is multi-family residential. The proposed rail line is across the street from residential parcels between 7th and 5th Streets; and it is less than 10 feet from an apartment complex between 5th and 4th Streets.

  Direct impacts of LB-3 on adjacent residential uses are discussed in the visual and noise impact sections of this chapter. In addition to visual intrusion and noise, the project would alter the character of the area to some extent. The east side of the Los Angeles River corridor is currently an undeveloped, landscaped area which includes a berm on which a bicycle path is located. The rail line would be located between the berm and the residential area to the east. The passage of rail vehicle would intermittently disrupt the relative passivity of the area. On the other hand, development of the project would insure that housing would not be developed on the landscaped area north of

Willow Street, thereby preserving the existing character of that area.

Stations would be located in street rights-of-way. Two small neighborhood parking lots have been proposed for the Wardlow and the Willow Street stations. Sites for the lots have not been precisely specified; however, as currently planned, the Wardlow Boulevard lot would be located on SPTC right-of-way and the Willow Street on SPTC-owned property zoned for industrial use. Parking lots are permitted by that zoning. As long as the proposed lots are not located on parcels zoned for residential use or restricted commercial use (CN), they would be permitted by zoning. Siting on a parcel zoned CL, CR, or CB would require a conditional use permit.

The main yard site would be located within the boundaries of the City of Long Beach on land that is zoned for industrial uses. It would be surrounded by other transportation uses and essentially land-locked. The Planning Commission of the City of Long Beach in an action on February 16, 1984 found the sale of this land for possible maintenance site use to be in conformance with the Long Beach General Plan.

o Other Measures of Compatibility:

The analysis of traffic impacts (Section IV-330) indictes increased congestion at several major cross streets. Increased congestion at the Daisy Avenue (LB-3) and 6th Street (LB-4) stations, which would be located in predominantly residential areas, could reduce vehicular mobility and increase pedestrian safety hazards. Substantial numbers of patrons boarding at these and other stations adjacent to the alignment (e.g., at Pacific Coast Highway on LB-1, LB-2, and LB-4; and at 1st Street on LB-1 or LB-2) could result in spillover parking into residential areas. If these impacts are significant, they could be mitigated by restricting parking in residential areas, providing off-street parking and/or improving feeder bus service.

Pedestrian detours of more than 1/4 mile to walk from residential areas on one side of the right-of-way to the other would be required at two points. The detour would be between 1/4 and 1/3 mile in one case and between 1/4 and 1/2 in the other. In the latter case, a pedestrian overpass should be considered between Wardlow Boulevard and Spring Street.

o Enhance Joint Development Opportunities:

In the year 2000, there would be 8.4 million gross square feet of commercial floor area within 1/4 mile of LB-4 stations. This is the greatest amount of commercial floor area among the four Long Beach segment alternatives. LB-2 would follow with 7.7 million square feet, LB-1 with 6.4 million square feet, and LB-3 with 5.9 million square feet.

Each of the four Long Beach alternatives would contain an estimated 5 to 10 acres of land within 1/4 mile of stations that would be vacant or used for commercial parking and, therefore, would be potentially available for development in the year 2000. There is, in addition, a substantial amount of land that would be underutilized relative to the intensity of development permitted by zoning and the General Plan. It is located primarily outside of the Downtown-Tidelands Redevelopment Area which would have been largely developed by the year 2000. With LB-1 and LB-4, approximately 17 acres of land along Atlantic Avenue acquired to accommodate the rail line in a rail exclusive center median and preserve curbside parking, would be vacant and available for redevelopment. Although no land would be acquired and cleared for LB-2, underutilized land between Pacific and California Avenues north to Burnett Street would be served by LB-2 and would potentially be available for redevelopment. LB-1 and LB-4 would serve a smaller amount of potentially developable land, extending between Long Beach Boulevard and California Avenue north to Burnett Street. LB-3 would serve the smallest amount of potentially developable land; it would be limited to the area bounded by Broadway, Magnolia Avenue, 7th Street, and the Los Angeles River.

The location, availability, and development potential of sites that would be acquired for substations by the LACTC for the project are shown in Table IV-32D.

Vacant or underutilized parcels on which substations could be sited are available near all proposed stations except 1st Street (LB-3 and LB-4). The blocks to the east of Pacific Avenue at that intersection are scheduled for specific redevelopment projects and those to the west are developed as the Civic Center complex. The substation could be incorporated into the development on either block to the east, through an agreement with the Redevelopment Agency; or it could be located somewhere in the existing Civic Center complex.

TABLE IV-32D

TRACTION POWER SUBSTATION SITES

LONG BEACH

	Availability	Development Potential
LB-1		
Pacific Coast Highway	yes	moderate
1st St. - Elm Ave.	maybe	high
LB-2		
Pacific Coast Hwy. - Atlantic Ave.	yes	moderate
1st St. - Elm Ave.	maybe	high
LB-3		
4th St. - Maine Ave.	yes	moderate
1st St. - Pacific Ave.	no	high
LB-4		
Pacific Coast Hwy	yes	moderate
6th St. - Long Beach	yes	high
1st St. - Pacific Ave	no	high

Source: Sedway Cooke Associates, 1984.

As was the case in downtown Los Angeles, at stations where underutilized sites are available, the 50-foot by 100-foot substation sites would not generally be large enough for a development project appropriate to the scale of the redevelopment area. At 1st Street (LB-1 and LB-2) and 6th Street (LB-4), larger sites would probably have to be acquired to take advantage of the area's development potential. Furthermore, three of the four blocks at the intersection of First and Elm are designated for specific redevelopment projects. The substation could be incorporated into one of these sites through an agreement with the Redevelopment Agency, but participation in the development by the LACTC would not be assured.

Near the Daisy Avenue station, redevelopment would be in the form of two- or three-story housing. There would be no additional development potential on the 50-foot by 100-foot substation site, but the substation could possibly be integrated into a larger (one-quarter to one-half block) development site.

Near the proposed Pacific Coast Highway station, there is a two-block frontage that would have been cleared for commercial development. The substation could be incorporated in the development planned for that site, or one of several nearby sites occupied by small commercial structures could be acquired. Since the market demand in this area is for one-story retail development with surface parking, there would not appear to be any potential for additional development on the substation site.

o Comparison of Alternatives:

Table IV-32E provides a summary comparison of the land use impacts of the Long Beach segment alternatives. LB-2 and LB-4 would appear to be more compatible with the land use pattern in the Long Beach segment than LB-1 or LB-2.

IV-321.2 Population

IV-321.21 Impact Measures

In the Long Beach segment, growth associated with the project is expected to be less than one percent over that forecast by SCAG for conditions without the project. Using SCAG's growth factor, year 2000 population with any of the project alternatives is estimated to be 297,715, compared to 296,315 without the project.

The growth factor was applied to the 1980 population estimate shown in Figure II-15B. The percentage population change shown in that figure differs from the one derived by SCAG primarily because of a difference in the boundaries of downtown Long Beach. SCAG used one that encompassed a smaller, faster growing area.

IV-321.22 Changes in Mobility and Accessibility

Significantly, the growth rate of the station areas will be much greater than the rate for the entire segment, indicating that the alternative alignments would traverse the fastest developing areas. In particular, LB-2 would potentially serve the greatest number of people, but of the alternatives with at least seven stations, LB-4 would serve the fastest growing areas.

o LB-1 would have 7 stations which currently would serve 19,050 residents and 26,180 in the year 2000.

o LB-2 would have 9 stations which currently would serve 27,030 residents and 35,250 in the year 2000.

o LB-3 would have 2 stations which currently would serve 5,990 residents and 12,810 in the year 2000.

TABLE IV-32E

SUMMARY COMPARISON OF ALTERNATIVES

LAND USE IMPACTS

Measures	Alternatives* LB-1	LB-2	LB-3	LB-4
1. Residential Development Patterns:				
Total population with pedestrian access	3	1	4	2
Population concentrations with pedestrian access	4	1	2	3
2. Nonresidential Development Patterns:				
Total employees/shoppers with pedestrian access	3	2	4	1
Employee/shopper concentrations with pedestrian access	4	3	1	2
3. Activity/Growth Centers Served	2	1	3	1
4. Transportation Systems Connected	1	1	1	1
5. Revitalization Areas Served	4	2	3	1
6. Public Facilities Served	2	1	3	2
7. Neighborhoods Affected by Traffic	1	1	1	1
8. Neighborhoods Affected by Parking	1	1	2	1
9. Safety and Pedestrian Patterns Affected	1	1	1	1
10. Opportunities for Joint Development Available	3	2	4	1

* A "1" identifies the alternative with the most positive or least negative impact. A "2" identifies the alternative with the second most positive or least negative impact, and so forth. If two or more alternatives have comparable impacts, they are given the same rank.

Source: Sedway Cook Associates, 1984.

- o LB-4 would have nine stations which currently would serve 21,300 residents and 30,110 in the year 2000.

The Table IV-32F shows that LB-2 would currently serve the greatest number of transit dependents, followed by LB-4, LB-1, and LB-3.

TABLE IV-32F

NUMBER OF LONG BEACH TRANSIT DEPENDENTS POTENTIALLY SERVED BY PROJECT ALTERNATIVES*

	LB-1		LB-2		LB-3		LB-4	
	1980	2000	1980	2000	1980	2000	1980	2000
Ethnic/Racial Minority	9,909	13,615	14,598	19,035	2,455	5,252	10,222	14,454
Youth	5,145	7,069	7,570	9,870	1,437	3,074	5,324	7,528
Elderly	3,620	4,975	5,136	6,698	1,437	3,074	4,898	6,926
Low-Income	6,479	8,902	8,110	10,575	2,455	5,252	7,667	10,841

* Although the demographic profile of downtown Long Beach will likely change between 1980 and 2000, the proportion these groups represent of the 1980 population have been applied to the year 2000 station area population to arrive at projections of the future number of transit dependents.

Source: Sedway Cooke Associates, 1984.

LB-1, LB-2, and LB-4 would generally traverse the same route in the Long Beach/Atlantic north-south corridor. LB-2 would directly serve the retail strip along Long Beach Boulevard and the major commercial job center in downtown Long Beach. LB-1, LB-2, and LB-4 would directly serve the mixed retail/housing development along Atlantic Boulevard, as well as the Long Beach Plaza regional shopping center. Only LB-4 would offer direct access to the Civic Center and the retail/office concentration surrounding the regional shopping center. The total number of employees potentially served by the alternatives is roughly the same, with LB-2 reaching the greatest number.

Enhanced mobility and accessibility can be further estimated by considering the number of daily bus trips intersecting the alternative alignments. LB-2, with 1,930 intersecting bus trips, would offer the greatest opportunity for bus-rail connections. LB-1 and LB-4 would follow with about 25 to 30 percent fewer intersecting trips.

In contrast to the above alignments, LB-3 would follow the Los Angeles River and then turn eastward to serve the downtown area. The alternative would include only two stations, thus limiting its potential as a local service. This route would result in reduced commute travel times between the downtowns, thus offering better regional mobility. However, this alternative would also intersect the fewest number of daily bus trips, thus reducing its ability to attract ridership.

IV-321.23 Mitigation Measures

There would be no significant adverse population effects; therefore, no mitigation measures would be necessary.

IV-321.3 Housing

IV-321.31 Impact Assessment

SCAG's projections indicate that by the year 2000, implementation of alternatives LB-1, LB-2, or LB-4 would have been responsible for inducing the construction of approximately 800 additional housing units. According to SCAG, there would be little difference among these three alternatives in terms of growth-inducing potential. alternative LB-3, on the other hand, with only two station areas, would induce less housing. If alternative LB-3 is selected, it is estimated that by the year 2000, housing in the two LB-3 station areas would have increased by approximately 500 units as a result of rail transit operations.

As in the other two corridor sections, the rail system would not promote new housing where a climate conducive to such development does not already exist. The project would stimulate housing growth only in those station areas where trends favoring residential development have already been established. In Long Beach, station areas located in the downtown area (i.e., south of Anaheim Street) would be the recipients of most of the project-induced housing growth. It is in this area that the City of Long Beach would be actively encouraging residential development as part of its redevelopment efforts.

SCAG's projections of project-induced housing growth in Long Beach only include residential development that could occur as a result of rail transit operations. Not included is residential development that could occur on those parcels along Atlantic Avenue that would be vacated by acquisition, demolition, and infill activities associated with the implementation of alternative LB-1 or LB-4. If either of these alternatives is implemented, approximately 15 acres of land currently zoned for residential use would be vacated. Given the housing densities allowed by current zoning, these parcels could support a maximum of 800 dwelling units. Although attainment of this maximum would be highly unlikely, it is probable that residential development of the vacated parcels would result in higher housing densities along Atlantic Avenue. The degree to which development along Atlantic

Avenue would favor residential use depends on the development objectives established by the City of Long Beach.

IV-321.32 Mitigation Measures

Since the operation of the rail transit system would not impose any significant adverse impacts on housing in Long Beach, mitigation measures would not be required.

IV-322 Community Services

The number of community service facilities by type that would be located within walking distance of proposed stations in Long Beach is shown in Table IV-32G.

TABLE IV-32G

COMMUNITY FACILITIES WITHIN ONE-QUARTER

MILE OF STATIONS

LONG BEACH

Facilities By Type	Alternative LB-1	LB-2	LB-3	LB-4
Schools	5	9	1	8
Libraries	0	0	1	1
Churches	29	30	1	22
Parks	1	1	2	2
Medical Facilities	10	11	1	14
Government Offices	5	9	6	8
Local Social Services	19	27	3	21
TOTAL	69	87	15	76

Source: M. L. Frank & Associates, 1983.

Long Beach community service facilities would experience impacts during the operation of the rail transit system that are similar to those associated with service facilities in other corridor sections. In general, facilities located in station areas would benefit from improved access.

If Long Beach alternative LB-1, LB-2, or LB-4 is selected, rail transit tracks running in the SPTC right-of-way from the LA River to 28th Street would require fencing. This would restrict cross-alignment access to some public facilities, especially to those located between Spring and 28th Streets.

The Long Beach Police Department may have to expand its law enforcement activities in response to crimes committed against transit passengers walking to and from stations and against the vehicles of transit passengers parked in neighborhood streets surrounding stations.

As in the other corridor sections, emergency vehicles operating in Long Beach may encounter some interference at grade crossings which could result in increased response times.

If either the LB-1 or LB-4 alternative is selected, additional adverse impacts may be experienced by schools and churches located on Atlantic Avenue. In widening Atlantic Avenue, some elimination of on-street parking and some narrowing of sidewalks would be required. This would not only reduce parking opportunities near schools and churches, but would also increase risks to pedestrians (especially school children) by bringing traffic closer to sidewalks. If the reserved median alternative is selected, there is the potential to negatively affect Long Beach Polytechnic High School at 1600 Atlantic Avenue, Burnett Elementary at 565 Hill Street, and Roosevelt Elementary School at 1574 Linden Avenue. These schools also would lose bus loading areas on Atlantic Avenue.

Adverse impacts may be imposed on a bikeway that is located on top of the east levee of the Los Angeles River paralleling the proposed LB-3 alignment from the SPTC bridge crossing to 4th Street. At present, this segment of the bikeway would have four access points: 34th Street, Willow Street, Pacific Coast Highway and Chester Place. With right-of-way fencing between grade crossings, access at 34th Street and Chester Place would be eliminated.

If the off-street bikeway currently under consideration for the SPTC right-of-way between the San Diego Freeway and Atlantic Avenue is constructed, implementation of a rail transit alternative using this alignment (LB-1, LB-2 or LB-4) would have to ensure adequate access and safe conditions for bikeway users.

IV-322.1 Mitigation Measures

Decreased pedestrian access to local community services as a result of fencing in the SPTC right-of-way may necessitate the construction of an at-grade or above-grade pedestrian crossing between Spring and 28th Streets. This crossing would maintain pedestrian access for local residents to Veterans Park on the west side of the alignment and to a number of commercial establishments on the east side.

Loss of school and church parking due to the widening of Atlantic Avenue (LB-1 and LB-4 alternatives) might be mitigated by the acquisition of land for off-street parking. If school children are exposed to increased hazards as a result of eliminating parking lanes and narrowed sidewalks, partial mitigation could be accomplished in the schools with safety awareness programs. Eliminated school bus loading zones on Atlantic Avenue would need to be relocated to side streets.

Elimination of access to the Los Angeles River bikeway at 34th Street and Chester Place could be mitigated by relocating the access point to the grade crossings at Wardlow Road and Anaheim Street respectively. This would involve the construction of ramps from both of these grade crossings to the bikeway.

IV-323 Economic Activity

IV-323.1 Property Tax Revenue

Of the four alternative routes under consideration for the proposed project in Long Beach, LB-2 and LB-3 would require moderate private property takings and public easements for the track alignments. LB-1 and LB-4 would require significant permanent property acquisition along Atlantic Avenue for the track alignment.

Several alternative alignment designs are under consideration for the LB-1 and LB-4 segment along Atlantic Avenue and it is possible for the project to be aligned so that no private property acquisition would be required. Should the proposed alternative alignments be constructed in a reserved transit median, a significant number of private properties might be impacted and require acquisition. Using information provided by PB/KE and the City of Long Beach a preliminary review of the potential property impacts along Atlantic Avenue was performed. Based upon this Right-of-Way Acquisition Report (M. L. Frank & Associates, 1984) and data from the Los Angles County assessor, it is estimated that permanent property takings could range between a minimum impact of no property acquisitions to a maximum worst case impact of 200 properties with a total assessed valuation of $7.5 million. The acquisition cost for these properties, should they all have to be acquired, would most likely be based on their current market value which could only be determined through an independent appraisal for each affected property. In the worst case, the LB-1 or LB-4 alternative would result in annual loss of approximately $75,000 in property tax revenue to Los Angeles County, the City of Long Beach, and other taxing agencies.

Each of the proposed alignments would require permanent property acquisition for the location of substatons along their route. Alignments LB-1, LB-2, and LB-3 would each require two substations, while the LB-4 alignment would require three substations. It is estimated that each substation would require 5,000 square feet of land area. As the exact locations for the substations is as yet undetermined, a review of the Los Angeles County Assessor's records was performed to identify an average assessed value per square foot of land area with improvements in the vicinity of each candidate substation location. Assessed values for the random sample of properties ranged from $0.01 to $0.25 per square foot in 1983 with most parcels ranging between $0.10 and $0.15 per square foot. Using an average assessed value of $0.12 per square foot, the assessed value of the property acquired for each of the substations is estimated at $600. Based on this estimated assessed valuation, the property acquisitions for each of the substations for any of the alignments would result in a $6.00 annual property tax revenue loss.

The main maintenance year proposed for location near the intersection of the Los Angeles River, and the Long Beach and San Diego Freeways would require the permanent acquisition of private properties. According to the Los Angeles County Office of the Assessor, the 1983 assessed value of these properties was approximately $184,600. Acquisition of these properties for the proposed rail transit project would have an insignificant impact on the County, City of Long Beach, Special Districts and other taxing agencies, resulting in the total loss of $1,800 in annual property tax revenues.

New retail and housing development in conjunction with the proposed project would increase the property tax base in the LBCBD and generate new property taxes to the county, City of Long Beach, Special Districts, and other taxing agencies. Based on projections of new development presented in Section 321.3 and Table IV-32A and current market values for new development in the City of Long Beach and the county, the potential new annual property tax revenue generated by the alternative alignments is estimated in constant 1983 dollars in Table IV-32H.

TABLE IV-32H

ANNUAL PROPERTY TAX REVENUE

LONG BEACH ALTERNATIVES

Indirectly Induced New Land Use	LB-1	LB-2	LB-3	LB-4
Retail	$ 70,000	$ 70,000	$ -0-	$ 70,000
Housing	665,000	665,000	530,000	655,000
TOTAL PROPERTY TAX BENEFIT	$735,000	$735,000	$530,000	$725,000

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

IV-323.2 Local Business Activity

The four Long Beach alternatives would provide direct service to the major commercial development area of the city, as well as to the Convention Center. Alternatives LB-3 and LB-4 would provide service to the Civic Center, while only LB-4 would provide direct connections with the World Trade Center. None of the alternatives would provide access directly to the various visitor facilities south of Ocean Boulevard.

Implementation of the project would provide very localized stimulus to retail establishments located in the immediate vicinity of the alignment and stations. The project would have the effect of concentrating some pedestrian movement in specific areas without noticeably reducing flows in other areas. These primarily would include convenience goods outlets and personal service concerns.

In a period of major redevelopment and economic growth, the project would provide additional support to the local economy in the forms of visible evidence of government interest and reinvestment in the downtown area. In general, however, the rail transit project would be expected to have little or no directly measurable effect on major retail, commercial, and office activites. The relatively modest size of the station volumes, the highly developed and intensely planned nature of the downtown Long Beach area, and relative importance of other market factors in influencing business activity and general economic growth would all contribute to minimizing potential direct impact of the project.

The proposed project could indirectly result in increased retail sales and sales tax revenues in the LBCBD through the enhanced potential for new retail uses. Based on projections presented in Table IV-32A and assuming an average annual taxable sales volume of $100 per square foot in 1983 constant dollars, the proposed LB-1, LB-2 and LB-4 alignments could indirectly generate annual retail sales and sales tax revenue of $12.5 million and $813,000 respectively. The retail sales tax revenue would be distributed to the state, the City of Long Beach and the LACTC.

IV-323.3 Net Fiscal Impact

All of the alternative alignments for the proposed project would have a positive net fiscal impact on economic activity and revenue generation in the Long Beach CBD and the county through the indirect inducement of new development and retail activity at locations immediate to the alignment. The net annual fiscal impact from each source and alternative alignment in Table IV-321 follows:

TABLE IV-321

NET FISCAL IMPACT

LONG BEACH ALTERNATIVES

Cost/Benefit/Source	LB-1	LB-2	LB-3	LB-4
Property Tax Loss (Alignment; Maintenance; Yard; Substations)	$ (76,812)	$ (1,812)	$ (1,812)	$ (76,818)
Property Tax Gain (New Development)	735,000	735,000	530,000	725,000
Retail Sales Tax Gain	813,000	813,000	-0-	813,000
TOTAL BENEFIT	$1,471,188	$1,546,188	$528,188	$1,461,182

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

IV-324 Visual Quality

IV-324.1 Impact Measures

Impacts are evaluated in terms of the impact measures described in Section 124.1 of this chapter.

IV-324.2 Impact Assessment

The Long Beach alternatives would have relatively insignificant adverse impacts on the overall character, scale, and form of the visual setting in Long Beach. All the alternative alignments would occur at-grade and therefore would only require catenary support poles, electrical overhead, and trackway on the city streets. The 24-foot-high poles, spaced 100 to 130 feet on-center, would be the most visible impact of the alternative alignments. Traction power substations, as described for Los Angeles, would be additional visual elements associated with the alternative alignments. The magnitude of these impacts would be considered minor, judging by the existing visual sensitivity of the proposed alignments.

Visually non-sensitive segments of the alignments would occur where low-rise structures, setbacks, parking lots, and automobile sales lots create non-continuous street facades and weak definition of the street space. The location of catenary support poles and electrical overhead in the street space would not adversely affect the visual setting.

These segments would occur along Atlantic Avenue between Willow and 11th Streets under LB-1, LB-2, and LB-4; 1st Street between Atlantic and Linden Avenues under LB-1 and LB-2; Pacific Avenue between 1st and 8th Streets under LB-3 and LB-4; and 8th Street between Pacific Avenue and Long Beach Boulevard under LB-4.

Visually sensitive segments of these alignments would be found where:

- o mature trees create a defined pedestrian and vehicular street space;
- o there are continuous commercial street facades or high-rise structures; or
- o there are streetscape improvements such as historic light standards.

These segments would occur along Atlantic Avenue between 11th and 1st Streets under LB-1 and LB-2 (between 11th and 8th Streets under LB-4) (see Figure IV-32A); 1st Street between Linden and Pacific Avenues under LB-2; Long Beach Boulevard between 1st and 7th Streets under LB-2 and LB-4 (see Figure IV-32B); 4th Street between Magnolia and Pacific Avenues under LB-3; 8th and 9th Streets between Long Beach Boulevard and Atlantic Avenues under LB-4; and the Los Angeles River Route (LB-3) between Spring Street and Pacific Coast Highway.

Adverse impacts to the visual setting would occur along Atlantic Avenue under LB-1 and LB-4, where the displacement of buildings one parcel deep along both sides of the street between the SPTC right-of-way (Burnett Street) and Anaheim Street would be required to accommodate two-way transit vehicle opertion and existing street trafic and parking. This change to the visual setting would displace a mix of commercial and residential uses, exposing the adjacent residential community to the street, as seen in Figure IV-32C. In addition, the widening of Atlantic Avenue would require removal of street trees and trees on adjacent parcels that would be acquired. A total of 115 trees would have to be removed for LB-1. For LB-4, 67 trees between the right-of-way and 9th Street would have to be removed.

The Los Angeles River Route (LB-3) along the base of the supporting berm of the Los Angeles River would alter the visual setting south of Pacific Coast Highway. Key impacts are identified below:

- o The alignment would cut into the base of the berm with a retaining wall.
- o The City of Long Beach Pump Station at Hill Street would be displaced or would require modification.

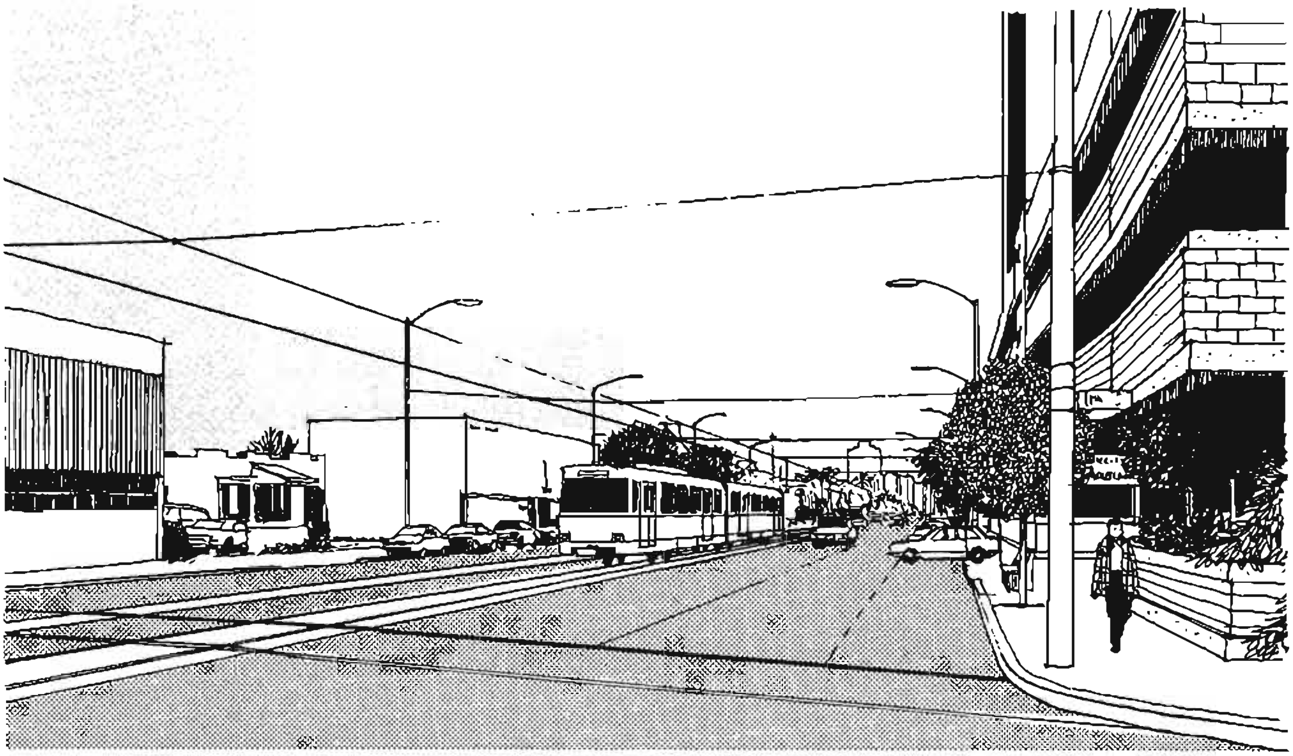
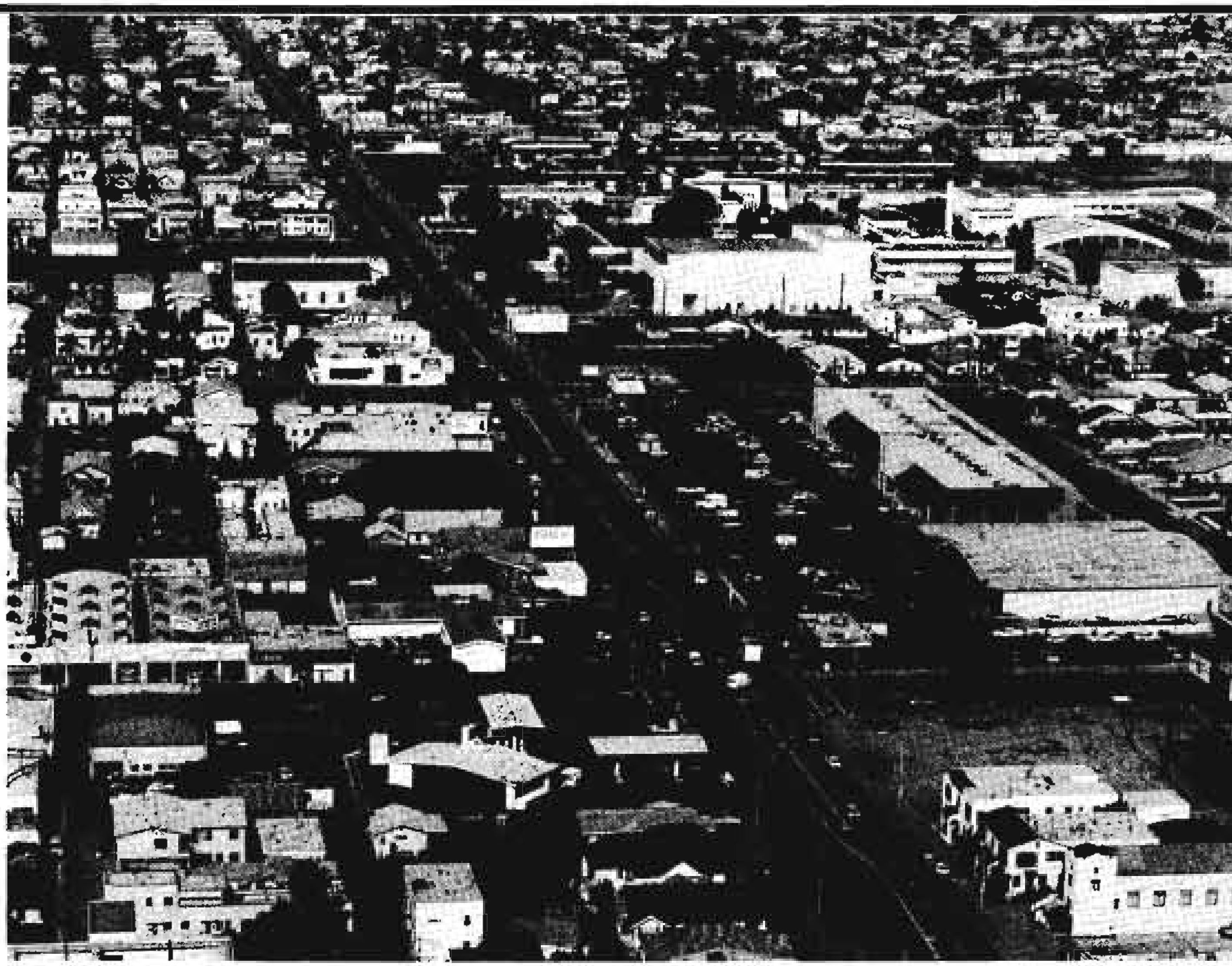


Figure IV-32A

Looking south on Atlantic Avenue from its intersection with 11th Street in 1984 (above) and after construction of Alternative LB-1 or LB-4 (below). The rail line would be located on a center median which would be paved to permit auto turning movements.



Bird's eye view of Atlantic Avenue looking north at its intersection with 11th Street in 1984.

Figure IV-32B

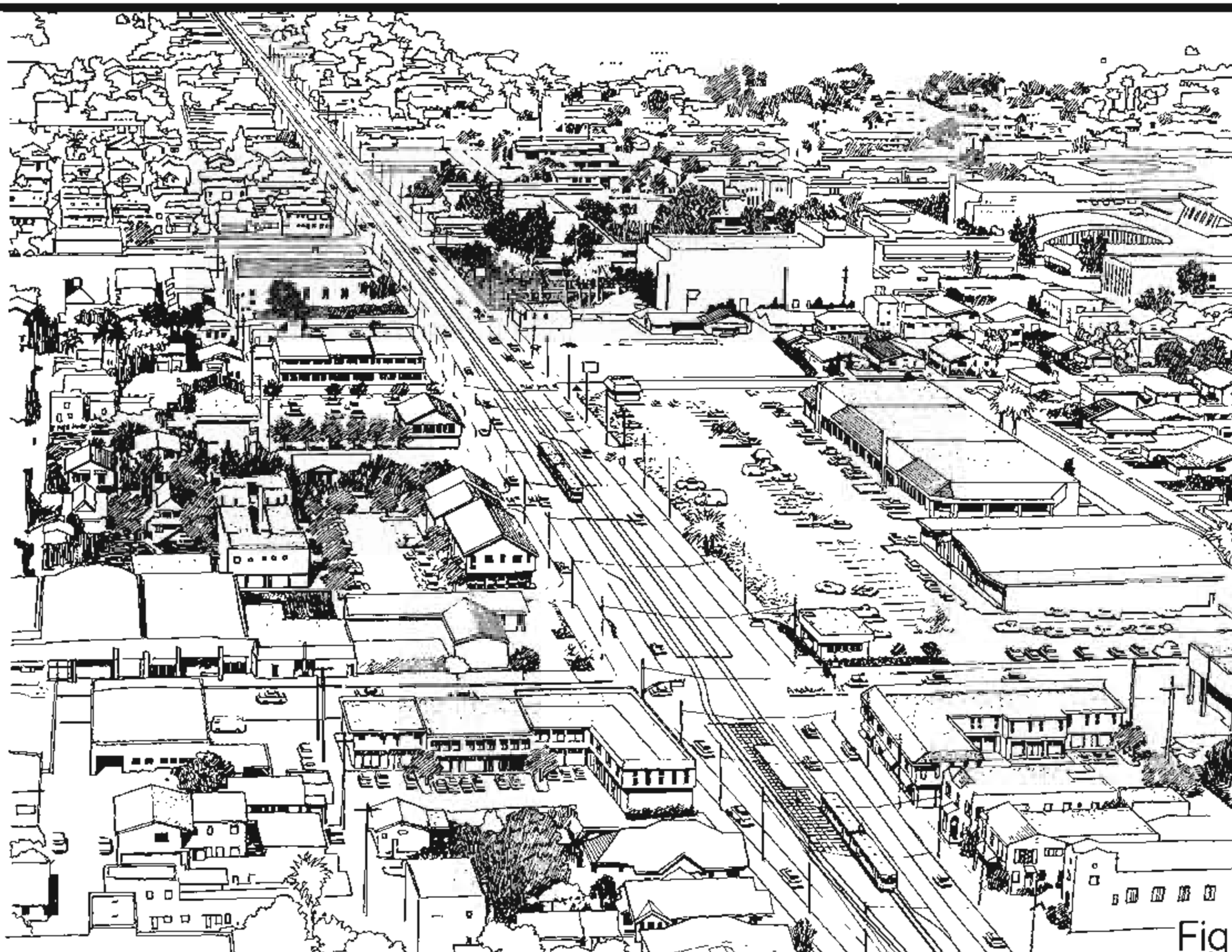


Figure IV-32C

Bird's eye view of Atlantic Avenue looking north at its intersection with 11th Street after construction of Alternative LB-1 or LB-4. Parcels acquired to permit both curbside parking on the west side of the street and the location of the rail line on a center median could be redeveloped as shown in this sketch.

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

VISUAL ANALYSIS
PREPARED BY SEDWAY COOKE ASSOCIATES
PARSONS BRINCKERHOFF / KAISER ENGINEERS

- o Single-family homes at 20th and 21st Streets would be displaced, as well as nearby stables and storage sheds between 20th and 19th Streets.

- o The relocation of Ocean Park Boulevard and San Francisco Avenue between 6th and 4th Streets would be required.

- o The transit line would be as close as nine feet from the face of the existing apartment buildings at 4th Street and San Francisco Avenue, a very serious visual intrusion.

- o Open space, trees, and a basketball court would be displaced at Willmore Park.

IV-324.3 Mitigation Measures

The disruption to the visual setting along Atlantic Avenue (LB-1 and LB-4) would be mitigated if the Long Beach Redevelopment Agency installed streetscape improvements and landscaping. Land acquisitions of sufficient depth would create the opportunity for mixed-use development.

Along the Los Angeles River Route (LB-3) there would be no mitigation measures available for the displacements caused by the alternative alignment, except for relocation to suitable adjacent areas. There are no feasible measures available for mitigating the visual intrusion at 4th Street and San Francisco Avenue other than relocating the transit line further away from the apartment building.

The adverse visual impacts associated with the traction power substations could be mitigated by landscaping and design and through their integration at station areas into the final station layouts.

IV-325 Historic and Cultural Resources

There are two buildings in downtown Long Beach which are eligible for the National Register (see Section II-425). All others listed and mapped in Section II-425 are buildings of interest compiled by either the Long Beach City Planning Department or a field survey of qualified professionals from the staff of the State Office of Historic Preservation and Caltrans Environmental Unit.

As a general rule, without any extenuating circumstances to the contrary, the reinstitution of rail service on a street where historically there had been such service in the past does not constitute an adverse effect to the potential historic resources which line that street. This is the case for the majority of the Long Beach alternatives. On LB-1 and LB-4 alternatives, Atlantic Avenue had Pacific Electric streetcars running just south of Willow at the Pacific Electric right-of-way to 6th Street. From that point south there were no streetcar routes on Atlantic Avenue. There are three potentially historic structures whose visual environment could be affected by placing a rail system at this location.

The Atlantic/Long Beach Couplet, LB-2, would have the same effects along Atlantic Avenue as alternative LB-1, because it would follow the same route along that street. There would be no effect to properties along Long Beach Boulevard, since the Pacific Electric railway ran down this street to the ocean.

The only potential historic resources on of LB-3, the Los Angeles River Route, are on 4th Avenue. Because this was not a historic street car route, 27 potentially historic buildings could have altered visual environments.

On alternative LB-4 (the Atlantic with Pacific Avenue Loop), 9th Street between Long Beach Boulevard and Atlantic Avenue and 8th Street between Pacific and Atlantic Avenues were not historic streetcar routes. Therefore, there could be a potential for visual effects to historic resources located on those streets. There are four potentially historic buildings on 9th Street, and seven structures with historic potential on 8th Street.

Mitigating visual impacts to potential historic structures would be the same for all alternatives. Mitigation would consist of further study to ascertain whether the structure meets the criteria for placement on the National Register of Historic Places. Buildings which meet those criteria would be photographically documented. This recordation would document the environment of the building prior to the start-up of rail activities. Such documentation would be available to the public at libraries in Long Beach.

IV-330 TRAFFIC AND TRANSPORTATION

IV-331 Traffic

In Long Beach, the impacts to vehicular traffic and pedestrian flows on major arterials with the rail operations would result in some differences in congestion over and above that presented in the "Long Beach Downtown Circulation and Access Study" (Barton-Aschmann, 1983) with the proposed Development Plan for Greater Downtown Long Beach. Traffic projections for the year 2000 base condition and V/C ratios and LOS for street segments were made by the City of Long Beach, and included all projects associated with the city's Capital Improvement Programs and private development projects.

IV-331.1 General Findings

Traffic volumes in the year 2000 with the implementation of the project would differ slightly from the year 2000 base conditions due to the vehicular trips that would be diverted to the rail system. Traffic figures for Screenline 3 in Long Beach, drawn east-west between the Pacific Coast Highway and Anaheim Street indicate that during the AM peak hour southbound traffic would be slightly higher with all alternatives than without the project. However, all alternatives would show a decrease in northbound traffic from the base case. The alternative including the LA River Route would show the greatest decrease in traffic at Screenline 3.

Screenline 4 was drawn east of the project between Atlantic and Orange Avenues. Eastbound traffic would show up to a 28 percent reduction in trips with all alternatives over the no project condition. Westbound trips would show much less variation across this screenline, although total traffic would be reduced as much as 5 percent with the Olympic/9th Aerial -- LA River alternative.

East-west traffic was also measured west of the project between Route 7 (Long Beach Freeway) and Magnolia in Long Beach. Total trips across Screenline 5 would be reduced by about 2 percent with the project.

The resulting traffic volumes for the three Long Beach screenlines, each crossing an average of 8 major arterials, are presented in Table IV-33A for the rail transit alternatives examined.

A summary of impacts of the Long Beach rail alternative combinations with the downtown Los Angeles and mid-corridor alternatives is presented in Table IV-33B. Traffic impacts, including volume/capacity ratios and levels of service at key intersections in Long Beach, adjacent to rail stations, are presented in Table IV-33C. The difference in traffic impacts and related mitigation measures for each Long Beach rail alternative is discussed below.

An additional screenline was selected along the south of Carson Street from Long Beach Municipal Airport to Alameda Street to determine the changes in the traffic entering and leaving Long Beach from the north. There would be a reduction in the total volume crossing the screenline in north Long Beach of 2,612 daily trips with the Broadway/Spring-Atlantic with Pacific Avenue Loop alternative. Changes with the other two alternatives analyzed would be of a similar magnitude.

The total daily vehicle miles traveled (VMT) figures would show a small decrease of about 0.3 percent for all of the rail alternatives.

With the LB-1 (Atlantic 2-Way) alternative the rail tracks from south of Willow on Atlantic Avenue to Anaheim Street is planned to be in a reserved median, which could take either of two configurations -- Options A or B (see Section I-223). A third option -- C -- would have a reserved median at station areas only and result in reduced curbside parking, loading zones, and eliminate the left turns at Hill Street. The two through traffic lanes in each direction on Atlantic Avenue would be maintained. There would be minor impacts to vehicular traffic along Atlantic Avenue due to the elimination of left turn lanes at intersections with some of the minor east-west streets.

TABLE IV-33A

YEAR 2000 AM PEAK PERIOD* TRAFFIC VOLUMES

LONG BEACH

	No Project	LA-1/MC-1/LB-4	LA-3/MC-1/LB-3
Screenline 3: Between Pacific Coast Highway and Anaheim Street			
Southbound	21,985	22,490	22,423
Northbound	22,512	21,412	21,304
TOTAL	44,497	43,902	43,826
Screenline 4: Between Atlantic Avenue and Orange Avenue			
Eastbound	7,848	5,664	5,698
Westbound	24,221	24,016	23,973
TOTAL	31,335	29,680	29,671
Screenline 5: Between Long Beach Freeway and Magnolia Avenue			
Eastbound	8,903	8,749	8,686
Westbound	17,721	17,467	17,396
TOTAL	26,624	26,216	26,082

Note: The LA-2/MC-1/LB-4 system alternative would be essentially identical to the LA-1/MC-1/LB-4 system alternative.

* The peak period is defined as 6:30 AM to 8:30 AM on weekdays.

Source: Southern California Association of Governments, 1984.

TABLE IV-33B

YEAR 2000 SUMMARY OF TRAFFIC IMPACTS

LONG BEACH

	No Project	Change from No Project Condition: LA-1/MC-1/LB-4	LA-2/MC-1/LB-4	LA-3/MC-1/LB-3
Screenline Daily Traffic Volumes* Crossing south of Carson Street (2-way)	341,374	-2,612	-2,534	-2,370
Peak-Hour Traffic Volumes Crossing south of Carson Street				
Inbound AM peak	53,515	-408	-395	-370
Outbound PM peak	36,896	-281	-273	-225
Daily Vehicle Miles Traveled (VMT) in Long Beach	8,002,250	-24,602	-22,769	-21,815
Daily Vehicle Hours Traveled in Long Beach	284,803	-2,715	-2,650	-2,551

* Average daily travel two-way

Source: Southern California Association of Governments, 1984.

TABLE IV-33C

YEAR 2000 V/C RATIOS AT KEY INTERSECTIONS NEAR PROJECT STATIONS

AM PEAK HOUR

LONG BEACH

Location	No Project		LA-1/MC-1/LB-4		LA-2/MC-1/LB-4		LA-2/MC-1/LB-4	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Atlantic Ave./Hill St.	0.58	A	0.58	A	0.58	A	0.58	A
Atlantic Ave./Pacific Coast Hwy.	0.94	E	0.94	E	0.94	E	0.94	E
Atlantic Ave./Anaheim St.	0.84	D	0.84	D	0.84	D	0.84	D
Atlantic Ave./7th St.	0.95	E	0.95	E	0.95	E	0.95	E
Long Beach Blvd./Hill St.	0.74	C	0.72	C	0.72	C	0.72	C
Long Beach Blvd./Pacific Coast Hwy.	1.03	F	1.01	F	1.01	F	1.01	F
Long Beach Blvd./Anaheim St.	0.82	D	0.81	D	0.81	D	0.80	C
Long Beach Blvd./6th St.	0.54	A	0.53	A	0.53	A	0.51	A
Long Beach Blvd./3rd St.	0.65	B	0.64	A	0.64	A	0.62	A
Pacific Ave./1st St.	0.28	A	0.28	A	0.28	A	0.28	A
Pacific Ave./6th St.	0.56	A	0.56	A	0.56	A	0.56	A

Note: v/c = volume/capacity ratio
LOS = level of service

Source: City of Los Angeles Department of Transportation; Southern California Association of Governments, 1984.

Year 2000 AM peak hour traffic volumes on Atlantic Avenue north of Anaheim Street would show a minor decrease over the no project condition ranging from 0.2 percent for the Olympic/9th Aerial with Los Angeles River Route alternative to 0.8 percent decrease for the Broadway/Spring with Altantic with Pacific Avenue Loop alternative. South of Anaheim Street the decrease in peak hour traffic on Atlantic Avenue would be even smaller. The average speed between the alternatives would remain the same.

Atlantic Avenue at Pacific Coast Highway and at Anaheim Street are the critical intersections with adjacent rail station locations. The V/C ratios at these intersections for the base year 2000 would be 0.94 (LOS "E") and 0.84 (LOS "D"), respectively. With the rail project, the V/C ratios would remain virtually the same.

South of Anaheim Street the LB-1 alternative would flow in mixed traffic except at station locations and the turn at 1st Street, where special channelization would be provided for rail operations. At 1st Street the rail tracks would leave the reserved median on Atlantic Avenue and operate in traffic between Atlantic Avenue and Long Beach Boulevard where it would enter the Transit Mall. At Atlantic Avenue and 1st Street the signalization phasing would be modified to allow a separate phase for rail turn movement. The intersection V/C ratio would increase from 0.31 (LOS "A") to 0.35 (LOS "A").

IV-331.2 Localized Impacts -- Atlantic/Long Beach Couplet (LB-2)

The alternative LB-2 would provide for single-track operation southbound on Long Beach Boulevard to 1st Street, and Atlantic Avenue northbound between 1st Street and the SPTC right-of-way south of Willow Street. The rail transit project would operate on the outermost traffic lanes in mixed traffic.

Year 2000 AM peak hour traffic volumes on Long Beach Boulevard between Willow Street and 1st Street would show a reduction over the no project condition for the rail alternatives. The Broadway/Spring with Pacific Avenue Loop alternative would produce a reduction in traffic volumes on Long Beach Boulevard from about 2.0 percent south of Willow Street to 0.8 percent north of 3rd Street, and the Olympic/9th Aerial alternative with LA River Route would produce a reduction from about 2.1 percent south of Willow Street to virtually no change north of 3rd Street. The traffic at key intersections along Long Beach Boulevard and Atlantic Avenue between Hill Street and 7th Street would be affected. The change in volume/capacity ratios are identified in Table IV-33C. Conflicts between rail and vehicular movements would occur at both left turns on 1st Street. Separate signal phasing of the rail transit movements would be provided at the two locations.

IV-331.3 Localized Impacts -- Los Angeles River Route (LB-3)

Alternative LB-3 would have minimal impacts to both vehicular and pedestrian movements from north of Willow Street to 4th Street. Along 4th Street and Pacific Avenue the rail alignment would consist of a double-track system in the center of the street and would operate in mixed traffic. Both Pacific Avenue (with year 2000 average daily traffic of 14,000) and 4th Street (with year 2000 traffic of less than 5,000) would easily accommodate the double-track system. There would be no significant change in traffic volumes in the year 2000 between the no project condition and the project alternatives for the section of Pacific Avenue between 1st and 4th Streets and 4th Street between Pacific Avenue and the Long Beach Freeway.

Vehicular/rail conflicts would occur at the intersections of 4th Street and Pacific Avenue, and Pacific Avenue and 1st Street, with year 2000 no project V/C ratios of .32 and 0.28 respectively, both level of service "A". To mitigate the conflict, separate signal phasing would be provided at these two intersections without significantly affecting the V/C ratios. The changes in key intersection V/C ratios resulting from the project alternatives are presented in Table IV-33C.

IV-331.4 Localized Impacts -- Atlantic with Pacific Avenue Loop (LB-4)

The LB-4 alternative would have double-track alignment between south of Willow Street to 9th Street. The track alignment as well as impacts to traffic in this section would be similar to the LB-1 alternative. The Atlantic with Pacific Avenue Loop alternative would introduce conflicting movement between both rail transit and vehicular operations. The rail transit/vehicular conflicting left turn movements at 9th Street and Long Beach Boulevard and at 8th Street and Atlantic Avenue, would be mitigated with the provision of separate signal phasing at both locations for the rail transit turn movements, without significantly affecting the level of service at these intersections. A specific right-of-way assignment would be maintained at the rail transit to rail transit crossover location at 8th Street and Long Beach Boulevard by means of installation of specific traffic control equipment.

IV-331.5 Pedestrian Activity

Pedestrian activity resulting from the Long Beach alternative alignments LB-1, LB-2 and LB-4 would be the greatest at the Pacific Coast Highway stations. The total northbound boardings and alighting during the AM peak hour would range between 410 passengers for the Flower Street Subway with Atlantic with Pacific Avenue Loop alternative to 540 for the Olympic/9th with Pacific Avenue Loop alternative. These figures represent 21 and 27 passengers using the platform area between subsequent light rail transit arrivals. This activity would not significantly affect the pedestrian circulation in the station area.

The Olympic/9th with LA River Route alternative would generate total northbound boardings and alightings at the 4th Street and Pacific Avenue stations of 1,010 and 885 respectively, which represent an average of 51 and 44 passengers using the platform area between subsequent rail transit arrivals. Due to the location of the rail transit tracks and platform area in the center of the streets, adequate pedestrian crossing signal time would need to be provided at the adjacent intersections to accommodate the pedestrian activity.

IV-331.6 Mitigation Measures

In Long Beach, the traffic mitigation measures would include transportation systems management (TSM) improvements and some street widening in segments of the alternative rail alignments. These measures would be in addition to the significant improvements proposed by the City of Long Beach through year 2000, and are discussed in the "Long Beach Downtown Circulation and Access Study" report. Traffic mitigation measures considered for the Long Beach alternatives include:

- o Widen Atlantic Avenue between Willow Street and 1st Street to provide for reserved rail transit median. Additional right-of-way would be required between Willow Street and 11th Street.
- o Prohibit left turns from Atlantic Avenue to some of the minor east-west streets.
- o Eliminate curb parking on both sides of Atlantic Avenue between Willow Street and 7th Street.
- o Eliminate curb parking at all rail station locations.
- o Add or revise traffic signal phasing to accommodate the projected traffic pattern including rail transit operations.
- o Provide separate traffic signal phasing and control equipment, and a specific right-of-way assignment at the rail transit to rail transit crossover location at 8th Street and Long Beach Avenue.

IV-332 <u>Transit</u>

The bus transit system in Long Beach for year 2000 base condition would be the existing bus system plus the Sector Improvements Plan which was approved in 1980 and is scheduled for completion in 1985. If the rail transit project is not implemented, an increase in bus service would be necessary to provide for the anticipated employment growth in downtown Long Beach. With significant increases in vehicular traffic projected for year 2000, bus service would encounter reduced travel speeds, more delays and an unreliable service during the peak traffic periods.

In order to optimize overall rail transit operations while minimizing operating costs in Long Beach, a complementary bus network supporting each of the rail alternatives was developed. The intent in providing a new rail transit operation would be to increase the operating efficiency of the total system (bus and rail) by re-orienting existing bus lines to collect and distribute riders to and from rail stations, while eliminating bus routes which would parallel the rail transit alignment.

Few modifications would be necessary for bus routes operating in the rail transit corridor. The distribution of existing local bus services operating in downtown Long Beach is such that most local lines would either provide direct access to a rail transit station or operate within close proximity of a station.

To accommodate feeder bus requirements, the supporting bus plan would entail a few route modifications to the basic bus route network in order to achieve convenient bus-rail transfer points. Supplemental bus service would be operated over bus routes which directly connect to rail stations or rerouted to connect to rail stations, scheduled on a demand basis to handle projected feeder bus ridership passenger loads. A feeder bus system completely separate from the areawide network of local and express buses is not proposed.

Proposed bus route and frequency modifications for local and express services are summarized below for each of the rail transit alternatives in Long Beach. Detailed information regarding the proposed changes can be obtained in the PB/KE memorandum titled "Design of Complementary Bus Network" (Task 7.7), dated August 24, 1983.

IV-332.1 Atlantic Avenue/Long Beach Boulevard Corridor Alternatives (LB-1, LB-2, LB-4)

- LBTC Line 5 - reduce service frequencies during peak periods.
- LBTC Lines 8, 15 and 16 - increase service frequencies during peak periods.
- LBTC Lines 16 and RTD Line 457 - terminate service at Del Amo Station.
- RTD Lines 360 and 456 - eliminate service.

IV-332.2 Los Angeles River Route Alternative (LB-3)

- LBTC Lines 8, 9, 15, 16 and 17 - increase service frequencies during peak periods.

- LBTC Lines 16 and RTD Line 457 - terminate service at Del Amo Station

- RTD Lines 360 and 456 - eliminate service.

Rail transit impacts on local transit patronage in Long Beach for each of the alignment alternatives were examined. The southerly screen-line impacts would be very uniform and fall in the range from -20 percent to -30 percent for all the rail transit alternatives. There would not seem to be a very significant variation in effect among the alternative Long Beach CBD routings. The Olympic/9th-LA River Route (LA-3/MC-1/LB3) would cause the least decline in local transit patronage (-20 percent) while the Flower Street Subway would cause the greatest decline (-30 percent). The findings of the screenline analysis in Long Beach for each of the rail transit alternatives are presented in Table IV-33D.

TABLE IV-33D

YEAR 2000 CHANGE IN LOCAL BACKGROUND BUS TRANSIT TRIPS

LONG BEACH

FUTURE CONDITION Year 2000	South Corridor Screenline North of Pacific Coast Highway	
	Daily Trips	Percent Change from No Project
No Project	9,659	--
LA-1/MC-1/LB-4	6,914	-28
LA-2/MC-1/LB-4	6,793	-30
LA-3/MC-1/LB-4	7,193	-26
LA-3/MC-1/LB-3	7,695	-20

Source: Southern California Association of Governments, 1984.

IV-333 Parking

The demand for parking in the Long Beach CBD is expected to increase at a faster rate than the parking supply between now and year 2000. The 1978 Downtown Parking Study suggested that the retail core would experience a shortage of 550 short-term parking spaces. The parking study also found that approximately 26 percent of the total 23,500 parking spaces were curb spaces. This high proportion of curb parking spaces would be somewhat affected by construction of the Long Beach rail alternatives. Table IV-33E summarizes the reduction in the number of curbside parking spaces in Long Beach for each of the alternatives.

TABLE IV-33E

REDUCTION IN CURBSIDE PARKING SPACES

LONG BEACH

	Approximate Number of Curbside		
Long Beach Alternative	Option A	Option B	Option C
LB-1	80	390	150
LB-2	60	N.A.	N.A.
LB-3	30	N.A.	N.A.
LB-4	60	360	130

Note: N.A. - Not Applicable

Source: PB/KE, 1984.

Option B on Alternative LB-1 and LB-4 would eliminate curbside parking spaces on Atlantic Avenue to provide space for reserved transit operations. With the remaining three Long Beach alternatives and options, only parking spaces at station locations would be affected.

The Long Beach-Los Angeles Rail Transit Project could potentially reduce peak parking demand in the Long Beach CBD. Comparison of the daily traffic volumes entering Long Beach from the north would show a reduction of 2,612 vehicles for the Broadway/Spring with Atlantic with Pacific Avenue Loop alternative and a similar reduction for the Flower Street Subway with Atlantic with Pacific Avenue Loop and Olympic/9th Aerial with LA River Route alternatives. All rail alternatives would reduce the overall demand for parking in the CBD; to some extent that would compensate for the parking spaces lost due to implementation of the rail transit system. However, with Option B on LB-1 and LB-4, 360 to 390 curbside parking spaces would be eliminated along Atlantic Avenue, which is more than the expected reduction in demand.

IV-333.1 Mitigation Measures

The Long Beach-Los Angeles Rail Transit Project would be in itself an important parking mitigation measure, since it would make transit an attractive alternative to automobile travel for access to and circulation within Long Beach CBD.

Year 2000 parking conditions at the rail station areas in the Long Beach CBD would be crowded even without the project. Mitigation measures for those areas could involve, with proper coordination and cooperation of the public and private sector, the following:

- o Introduce transit incentive and ride-share programs to reduce potential parking usage.

- o Implement the City of Long Beach operational improvement program, which prohibits peak hour parking on major streets in the Long Beach CBD, as indicated in the "Long Beach Downtown Circulation and Access Study" (Barton-Aschman Associates, 1983).

- o Reduce parking demand by increasing parking fees for long-term parkers.

- o Provide remote parking from the downtown area with express/ shuttle bus service to the employment areas.

IV-340 CUMULATIVE IMPACTS OF RELATED PROJECTS

Several related projects could potentially exist near the LB-LA rail project in the Long Beach area. These projects include the Harbor Freeway transitway, the Intermodal Container Transfer Facility (ICTF), the Long Beach International Coal Project, and the San Pedro Bay Ports Access (consolidation) Study. None of these projects in combination with the LB-LA rail project would have a significant cumulative impact on Long Beach. This would be due to the fact that most of these other projects only indirectly affect the downtown area.

The rail transit project would have an effect on Long Beach Transit bus operations and vice versa. Existing bus lines following the route of the rail project would be competing for the same passengers. As with the Los Angeles and mid-corridor segments, these bus lines could be rerouted to serve different areas which would increase the effectiveness of the overall transit system.

In Long Beach, the rail transit project could, in combination with the proposed and ongoing city redevelopment projects, possibly create focal points for intensified future development in many areas along

Atlantic Avenue or Long Beach Boulevard. As a result, land use and zoning could change putting further pressure on adjacent areas and public service systems. These changes could be much more dramatic than in Los Angeles because Long Beach is much smaller, market areas are less well defined, and the city is in a state of transition due to redevelopment activities.

Other cumulative impacts such as minor reductions in vehicle miles traveled (VMT), lower energy consumption, and slight decreases in air pollution would be similar to what is described for downtown Los Angeles.

Chapter

V

The regional impacts of construction and operation of the rail transit alternatives are discussed in this chapter. The construction impacts are compared to existing conditions or those expected at the mid-point of the proposed construction period (1987). Operations impacts are assessed with regard to existing conditions (usually 1980 or 1983, depending on data availability) and to year 2000 without the project. The year 2000 has been selected for analysis purposes because the rail transit system would be in full operation, population and employment data are available for that year (SCAG '82), and the other major transit project proposed for the region, Metro Rail, used the same year for environmental analysis purposes.

V-100 IMPACTS DURING CONSTRUCTION

V-110 REGIONAL AIR QUALITY

V-111 Emissions

There are two basic emission sources of concern during the construction phase: the numerous pieces of construction equipment powered by diesel fuel or gasoline-burning engines and fugitive dust produced whenever soils are disturbed.

The area surrounding the selected route could be affected by increases in emissions of carbon monoxide, reactive organic gases, nitrogen oxides, sulfur oxides, and particulates as a result of construction activities. Sources of emissions directly related to the construction would include the operation of gasoline- and diesel-powered construction machinery (such as earth hauling equipment) and emissions generated by the construction work force traveling to and from job sites. Indirectly, construction activities could cause local traffic delays, detours, and congestion which would increase the rate at which motor vehicles emitted pollutants. In addition, some of the construction energy demand may be met by using power generated within the South Coast Air Basin, which would have associated air pollutant emissions.

Dust from construction projects, termed "fugitive dust", is produced by wind and construction machinery moving over disturbed soil. Thus, dust emissions are generally proportional to the volume of earth moved. Fugitive dust is generally less of a problem than other kinds of particulate matter generated during construction because the particle size tends to be larger, allowing much of the material to settle a short distance from the source. However, depending on the type of material excavated, considerable amounts of fine particles can be emitted and can contribute to the ambient suspended particulate concentrations over a larger area.

A recent study for a general concept light rail transportation system (Interplan Corporation/ANL 1981) has been used here to estimate the possible air pollutant emissions resulting from construction of route alternatives. The estimates shown in Table V-11A assume that the energy use requirements projected for the proposed system would be proportional to emissions. This is reasonable because a major source of the emissions would result from fuel combustion for energy production. Both total emissions and expected on-site emissions are listed in order to give them proper perspective. Because these emissions are averaged over a three-year construction period, specific locations might experience lower or higher levels, depending on the immediate nature and level of activity. The lower number is an estimate for the Broadway/ Spring alternative (LA-1), while the upper number assumes construction of an aerial or subway alternative (LA-2 or LA-3) in the downtown Los Angeles segment of the system. All numbers include a 2.2-mile segment of below-grade track in the Compton area (MC-2) and the longest route in downtown Long Beach (LB-4).

TABLE V-11A

POTENTIAL AIR EMISSIONS FROM PROJECT CONSTRUCTION

	Total Tons/Average Weekday	On-Site Tons/Average Weekday
Hydrocarbons	0.20 - 0.52	0.17 - 0.45
Nitrogen Oxides	1.2 - 3.0	0.51 - 1.3
Carbon Monoxide	1.7 - 4.4	1.3 - 3.4
Sulfur Oxides	0.13 - 0.49	0.03 - 0.09
Particulates	4.2 - 12.8	0.02 - 0.06

Source: Southern California Association of Governments, 1984.

Overall, the air pollutant emissions are expected to be insignificant on a regional basis.

V-112 Mitigation Measures

South Coast Air Quality Management District Rules and Regulations apply to the proposed project and would thus govern construction operations. Rule 402 states that no person shall discharge air contaminants which endanger the health and welfare of the public or create an annoyance or nuisance. Rule 403 gives specific criteria for limitations on fugitive dust emissions.

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 should be done particularly for materials handling associated with waste removal and disposal. The construction contractor, who must meet project construction specifications, is responsible for dust impacts. The South Coast Air Quality Management District has enforcement responsibility with respect to fugitive dust.

Combustion emissions generated by the construction equipment could be mitigated in two ways: by using electricity from the utility system rather than diesel-powered generators, and by minimizing the distance trucks must drive to dispose of excavated materials.

V-120 ENERGY

Energy would be required for all stages of project construction including rights-of-way, stations, vehicles, and ancillary facilities. Some of the energy necessary to build the system would be produced and consumed outside of Los Angeles and the southern California region. However, it is not possible to predict precisely how much energy would be used elsewhere; for the purposes of this analysis it is assumed that all the energy necessary for this project would be produced and consumed in the South Coast Air Basin.

In developing estimates of the construction energy use for the rail line, consideration has been given to the production, installation, and transportation of the following principal items: excavation and backfilling, shoring timbers, steel rail and rebar, ballast, concrete and precast beams, pavement, and walkways. Construction energy requirements were estimated from the materials list developed for the cost estimates using the process method. This method accounts for all phases of production for project components, including mining, refining, fabrication, and hauling to onsite installation. A detailed description of the methodology used and calculations performed can be found in the Construction Energy Technical Report (1984). Because process estimates for electrical components could not be obtained, the process construction energy estimate was adjusted upwards to include electrical components based on professional engineering judgment.

Energy use estimates were made for each segment of the proposed system alternatives including the 3 routing alternatives proposed in downtown Los Angeles and the 4 proposed for Long Beach. The total energy projected to be required to construct each segment, including electrical components, is shown in Table V-12A. Based upon these values, construction of the baseline system alternative would require 1,871 billion BTUs of energy over an approximate three-year period (the sum of BTUs for each of the baseline segment alternatives LA-1, MC-1, LB-4, and Yard). The least energy (1809 billion BTUs) would be expended if the Long Beach section is built as a couplet along Atlantic Avenue and Long Beach Boulevard (LA-1, MC-1, LB-2, and

TABLE V-12A

ENERGY CONSUMED DURING PROJECT CONSTRUCTION

	Energy Use During Project Construction (billions of BTUs)
Downtown Los Angeles	
LA-1 (Broadway/Spring)	594
LA-2 (Flower Street Subway)	599
LA-3 (Olympic/9th Aerial)	1065
Mid-Corridor*	
MC-1 (Compton At-Grade)	1069
MC-2 (Compton Grade Separation)	3180
MC-3 (SPTC Railroad Relocation)	1131
Downtown Long Beach	
LB-1 (Atlantic Avenue Two-way)	173
LB-2 (Atlantic/Long Beach Couplet)	125
LB-3 (Los Angeles River Route)	152
LB-4 (Atlantic with Pacific Avenue Loop)	187
Yards and Shops	
Main and Satellite	21

* All mid-corridor construction energy estimates include all the construction energy for the removal of the existing SPTC Rail in the corridor and its replacement in two parts: 1) A 15.3-mile, all-welded rail main freight track for SPTC and 2) an additional, new 4.96-mile SPTC drill track. These 2 tracks are separate from and additional to the basic double track for the rail transit project.

Source: M. L. Frank & Associates, "Construction Energy Technical Report"; PB/KE, 1984.

Yard). The most energy intensive option (4453 billion BTUs) would involve building the Olympic/9th Aerial with the mid-corridor Compton Grade Separation (LA-3, MC-2, LB-4, and Yard). The Compton Grade Separation would require that a 2.2-mile section of track be built in a trench, requiring substantially more excavation.

V-121 Construction Energy Mitigation Measures

Beyond selection of a less-energy-consuming alternative, mitigation of this possible level of energy use would rely principally on conservation and recycling efforts: planning excavation activities and dump sites to minimize the number of trucks and hauling distances, reusing existing rail steel and lumber wherever possible, and recycling asphalt if a large quantity has to be torn out temporarily.

V-130 ECONOMIC ACTIVITY

V-131 Regional Economic Impact

Construction of the proposed project would have a significant positive impact on the regional economy as a result of direct and indirect expenditures. As shown in Table V-13A, all of the proposed alternative alignments for the entire project route would involve significant capital outlay within the Los Angeles and Southern California region. For each of the alternative segments, the direct construction expenditures are estimated to range as follows: downtown Los Angeles, $70.8 to $78.3 million; mid-corridor, $159.4 to $294.8 million; and Long Beach, $24.2 to $35.4 million. Within each of the corridor sections the following alternatives would generate the highest regional expenditures: downtown Los Angeles, LA-2; mid-corridor, MC-2; and Long Beach, LB-3. These expenditures include outlay for all aspects of the systems construction with the exception of vehicular purchase, as this would be done outside the Los Angeles region.

In addition to the direct capital outlay, the project's construction would lead to significant indirect and induced expenditures within the region. Using a 2.8 expenditure multiplier based on studies by SCAG and the U.S. Bureau of Economic Analysis (Department of Commerce), these secondary economic impacts have been estimated and are presented in Table V-13B. These secondary economic impacts would increase the project's total capital outlay within the region to range within the following: downtown Los Angeles, $198.2 to $219.2 million; mid-corridor, $446.3 to $479.4 million; and Long Beach, $67.8 to $99.1 million.

Of five system alternatives considered, alternative 1 in Table V-13B is projected to cost the least and therefore generate the lowest total direct and indirect regional expenditures while alternative 5 is projected to be the high cost system alternative and would therefore have the most significant regional expenditure impact.

TABLE V-13A

TOTAL REGIONAL ECONOMIC IMPACT

(Millions of 1983 Dollars)

	Total Direct Expenditures	Indirect and Induced Output	Total Regional Impact*
Downtown Los Angeles			
LA-1	70.8	127.4	198.2
LA-2	78.3	140.9	219.2
LA-3	76.4	137.5	213.9
Mid-Corridor			
MC-1	159.4	286.9	446.3
MC-2	294.8	539.6	834.4
MC-3	171.2	308.2	479.4
Long Beach			
LB-1	24.2	43.6	67.8
LB-2	30.4	54.7	85.1
LB-3	35.4	63.7	99.1
LB-4	30.6	55.1	85.7
Yards and Shops			
Main and Satellite	51.7	93.1	255.8

* Based upon a 2.8 multiplier.

Source Southern California Association of Governments; U.S. Department of Commerce Bureau of Economic Analysis; PB/KE; Williams-Kuebelbeck and Associates, Inc., 1984.

TABLE V-13B

REGIONAL ECONOMIC IMPACT OF SYSTEM ALTERNATIVES

(Millions of 1983 Dollars)

System Alternative	Direct Expenditures*	Indirect and Induced Expenditures	Total Regional Impact
1. LA-1/MC-1/LB-4 (Baseline)	$312.5	$562.5	$ 875.0
2. LA-2/MC-1/LB-4	320.0	576.0	896.0
3. LA-3/MC-1/LB-4	318.1	572.6	890.7
4. LA-3/MC-1/LB-3	322.9	598.3	921.2
5. LA-3/MC-2/LB-4 (Maximum cost)	453.5	816.3	1,269.8

* Includes all aspects of system construction except vehicle procurement.

Source: PB/KE; Williams-Kuebelbeck and Associates, Inc., 1984.

V-132 Construction Employment

The proposed project would generate a significant positive impact to the regional employment base in the construction, manufacturing, and related services industries. Total direct and indirect employment for the project is presented in person-years by corridor section and alternative alignment in Table V-13C. Project employment has been forecast on the basis of estimates of direct and indirect construction employment on recent transportation and other major construction projects throughout the United States, and on data from the Construction Industry Research Board.

Combining the alternative segments with the minimum/maximum employment yields a total employment impact for the project ranging between 8,280 and 12,435 person-years, including the yard and shop facilities. Direct construction employment for these alternatives would range between 2,760 and 4,145 person-years. Assuming an even employment level over a three-year construction schedule, this would represent somewhat less than 1 percent of the 1980 Los Angeles County construction employment of 122,400 persons. Among the alternative routes under study, the maximum cost system alternative (LA-3, MC-2, LB-4) would generate total construction employment at 12,255 person-years. Total direct and secondary employment by system

TABLE V-13C

TOTAL DIRECT AND INDIRECT CONSTRUCTION EMPLOYMENT

(Person-Years of Effort)

	Direct Constuction Employment[1]	Related Employment[2]	Total
Downtown Los Angeles			
LA-1	640	1,280	1,920
LA-2	705	1,410	2,115
LA-3	690	1,380	2,070
Mid-Corridor			
MC-1	1,435	2,870	4,305
MC-2	2,655	5,310	7,965
MC-3	1,540	3,080	4,620
Long Beach			
LB-1	220	440	660
LB-2	275	550	825
LB-3	320	640	960
LB-4	275	550	825
Yards and Shops			
Main and Satellite	465	930	1,395

[1] Assumes 9.0 construction person-years per $1.0 million of construction expenditure.

[2] Assumes 2.0 indirect and induced project-related service jobs created for every 1.0 direct construction jobs.

Source: PB/KE; Williams-Kuebelbeck and Associates, Inc., 1983.

alternative, including years and shops, is shown in Table V-13D in person-years.

TABLE V-13D

TOTAL CONSTRUCTION EMPLOYMENT BY SYSTEM ALTERNATIVE

	System Alternative	Direct Construction Employment	Related Employment	Total Project-Related Employment
1.	LA-1/MC-1/LB-4 (Baseline)	2,815	5,630	8,445
2.	LA-2/MC-1/LB-4	2,880	5,760	8,640
3.	LA-3/MC-1/LB-4	2,865	5,730	8,595
4.	LA-3/MC-1/LB-3	2,910	5,820	8,730
5.	LA-3/MC-2/LB-4	4,085	8,170	12,225

Source: PB/KE; Williams-Kuebelbeck and Associates, Inc., 1984.

V-133 Direct Retail Sales and Personal Income Taxes

Direct construction employment for the proposed project would result in the generation of retail sales tax revenue for the State of California, the City of Los Angeles, and the LACTC; and personal income tax revenue for the federal and state governments. Based upon the projected low and high-construction employment and estimated average earning data for heavy construction workers ($35,000 in 1983), total wages to be paid to construction workers on this project are estimated to range between $98.5 million and $143.0 million in 1983 dollars (California Employment Development Department). Of this total, it is estimated that between $35.5 million and $51.4 million would be expended for the purchase of taxable retail goods and services, resulting in total sales tax revenue generation of $2.3 million to $3.4 million in 1983 dollars (based on the California taxable retail sales expenditures/personal income relation estimated at 36 percent).

Direct construction employment for the five alternative system routes would generate the following in state and local sales tax revenue (Table V-13E):

TABLE V-13E

SALES TAX REVENUE

(Millions of Dollars)

Tax Revenue		State	City of Los Angeles	LACTC	Total Sales
1.	LA-1/MC-1/LB-4 (Baseline)	$1.8	$0.4	$0.1	$2.3
2.	LA-2/MC-1/LB-4	1.9	0.4	0.1	2.4
3.	LA-3/MC-1/LB-4	1.9	0.4	0.1	2.4
4.	LA-3/MC-1/LB-3	1.9	0.4	0.1	2.4
5.	LA-3/MC-2/LB-4	2.6	0.6	0.2	3.4

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

In addition to sales tax revenue the earnings of the direct construction employees would be subject to state and federal income taxation. According to the 1981 U.S. Internal Revenue Service ("Statistic of Income - Individual Income Tax Returns", August 1983) and to the 1983 federal and state tax tables, persons earning an annual average income of $35,000 pay an average total of $7,500 and $1,750 in federal and state income taxes, respectively. Based upon the projected low and high construction employment and the estimated total income of the direct construction employees for this project, federal and state income taxes to be paid by direct project construction employees is estimated to range as follows (Table V-13F):

TABLE V-13F

PROJECT-GENERATED INCOME TAXES

	Personal Income Tax (millions)
Federal Income Taxes	$20.8 to $46.2
State Income Taxes	$ 4.8 to $10.7
TOTAL	$25.6 to $56.9

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

For all of the potential construction projects that could occur within the LB-LA project corridor, including transportation facilities and residential, commercial and industrial developments, there would be short-term impacts, including the economic gains from the influx of workers into the area (employment), increased sales tax, and the purchase of supplies.

Additionally, there would be short-term physical impacts, such as a temporary increase in truck and equipment traffic in the area during construction and increased dust, noise, and traffic conflicts. Mitigation measures would include the use of dust retardants, limited construction working hours, use of settling basins, and use of adequate detours with advance notice to the public and neighborhoods affected. None of the proposed projects in combination or alone is expected to cause significant adverse impact during construction to the regional area.

V-200 IMPACTS DURING OPERATION

V-210 TRANSPORTATION

V-211 Los Angeles County

The transportation system in the year 2000, without the rail transit project, is the system described in the Regional Transportation Plan adopted in 1980. The system includes the Metro Rail Line and busways on the I-10, I-110, I-5, and I-105 (Century) freeways. This section assesses the changes in transit and highway usage resulting from growth and planned transportation improvements, and the incremental improvements that the project alternatives might produce relative to the regional system.

Using the year "2000 without rail transit project with full RTP" as the base case, Los Angeles County would produce 4,132,554 home-work auto trips. The greatest reduction countywide of 0.05 percent would be achieved with the baseline system alternative. The other system alternatives would produce a reduction of between a 1,000 and 2,000 home-work auto trips, a variation of about 0.03 percent.

The countywide mode split for home-work trips (transit trips to total trips) was 11.9 percent for the year 2000 no project condition, and 11.95 percent for the baseline and Olympic/9th Aerial with Pacific Avenue Loop (LA-3, MC-1, LB-4) alternatives. A summary of the Los Angeles County and regional mode split and ridership impacts for the system alternatives, in the year 2000, is presented in Table V-21A.

The summary of Los Angeles County and regional traffic impacts for the system alternatives, in the year 2000, is presented in Table V-21B. All alternatives would produce a small reduction in total daily vehicle miles traveled (VMT). The greatest reduction in the Los Angeles County of 0.08 percent would be achieved with the baseline alternative.

Results of changes in other categories, including vehicle trips, average trip length, and vehicle hours traveled for the system alternatives under both Los Angeles County and region, would be of a similar nature to the change in VMT, whereby the baseline alternative would produce the greatest reductions.

V-212 Project Corridor

Within the Long Beach-Los Angeles corridor, the year 2000 no project condition would produce 271,318 home-work auto trips. All system alternatives would produce a reduction in auto trips within the corridor of up to 0.05 percent. Table V-21C presents the corridor level auto trip reduction by alternative.

TABLE V-21A

SUMMARY OF YEAR 2000 COUNTY AND REGIONAL MODE SPLIT AND RIDERSHIP IMPACTS OF SYSTEM ALTERNATIVES

Trip Type	No Project (with Full RTP)	LA-1/MC-1/LB-4 (Baseline)	LA-2/MC-1/LB-4	LA-3/MC-1/LB-4	LA-3/MC-1/LB-3
1. Los Angeles County Mode Split:					
Home-Work Transit Trips	645,581	648,436	647,034	648,059	647,188
Home-Work Vehicle Drivers	4,132,554	4,130,430	4,131,579	4,130,641	4,131,430
Home-Work Auto Passenger	644,092	643,361	643,614	643,527	643,609
TOTAL Home-Work Person Trips	5,422,227	5,422,227	5,422,227	5,422,227	5,422,227
2. Los Angeles County					
TOTAL Transit Trips	1,434,424	1,440,928	1,437,727	1,440,064	1,438,067
Increase Over No Project	0	6,504	3,303	5,640	3,643
3. Region					
TOTAL Transit Trips	1,818,536	1,827,080	1,822,554	1,824,760	1,822,684
Increase Over No Project	0	8,544	4,018	6,227	4,148

Source: Southern California Association of Governments, 1984.

TABLE V-21B

SUMMARY OF YEAR 2000 COUNTY AND REGIONAL TRAFFIC IMPACTS OF SYSTEM ALTERNATIVES

Trip Type	No Project (with Full RTP)	LA-1/MC-1/LB-4 (Baseline)	LA-2/MC-1/LB-4	LA-3/MC-1/LB-4
1. Daily Vehicle Miles Traveled (VMT)				
Los Angeles County	177,795,425	177,654,037	177,670,460	177,716,588
Change from No Project	0	-141,388	-124,965	-78,837
Region	305,198,343	305,028,154	305,056,340	305,123,398
Change from No Project	0	-170,189	-142,003	-74,945
2. Daily Vehicle Trips				
Los Angeles County	19,891,866	19,887,065	19,888,902	19,889,270
Change from No Project	0	-4,801	-2,964	-2,596
Region	35,091,382	35,084,889	35,088,128	35,088,352
Change from No Project	0	-6,493	-3,254	-3,030
3. Average Trip Length (miles/veh.)				
Los Angeles County	8.94	8.93	8.93	8.94
Change from No Project	0	-.01	-.01	0
Region	8.70	8.69	8.69	8.70
Change from No Project	0	-.01	-.01	0
4. Vehicle Hours Traveled				
Los Angeles County	6,422,411	6,386,792	6,387,382	6,393,554
Change from No Project	0	-35,619	-35,029	-28,857
Region	11,143,762	11,026,246	11,027,264	11,039,015
Change from No Project	0	-117,516	-116,498	-104,747

Source: Southern California Association of Governments, 1984.

TABLE V-13E

SALES TAX REVENUE

(Millions of Dollars)

Tax Revenue		State	City of Los Angeles	LACTC	Total Sales
1.	LA-1/MC-1/LB-4 (Baseline)	$1.8	$0.4	$0.1	$2.3
2.	LA-2/MC-1/LB-4	1.9	0.4	0.1	2.4
3.	LA-3/MC-1/LB-4	1.9	0.4	0.1	2.4
4.	LA-3/MC-1/LB-3	1.9	0.4	0.1	2.4
5.	LA-3/MC-2/LB-4	2.6	0.6	0.2	3.4

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

In addition to sales tax revenue the earnings of the direct construction employees would be subject to state and federal income taxation. According to the 1981 U.S. Internal Revenue Service ("Statistic of Income - Individual Income Tax Returns", August 1983) and to the 1983 federal and state tax tables, persons earning an annual average income of $35,000 pay an average total of $7,500 and $1,750 in federal and state income taxes, respectively. Based upon the projected low and high construction employment and the estimated total income of the direct construction employees for this project, federal and state income taxes to be paid by direct project construction employees is estimated to range as follows (Table V-13F):

TABLE V-13F

PROJECT-GENERATED INCOME TAXES

	Personal Income Tax (millions)
Federal Income Taxes	$20.8 to $46.2
State Income Taxes	$ 4.8 to $10.7
TOTAL	$25.6 to $56.9

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

alternative, including years and shops, is shown in Table V-13D in person-years.

TABLE V-13D

TOTAL CONSTRUCTION EMPLOYMENT BY SYSTEM ALTERNATIVE

	System Alternative	Direct Construction Employment	Related Employment	Total Project-Related Employment
1.	LA-1/MC-1/LB-4 (Baseline)	2,815	5,630	8,445
2.	LA-2/MC-1/LB-4	2,880	5,760	8,640
3.	LA-3/MC-1/LB-4	2,865	5,730	8,595
4.	LA-3/MC-1/LB-3	2,910	5,820	8,730
5.	LA-3/MC-2/LB-4	4,085	8,170	12,225

Source: PB/KE; Williams-Kuebelbeck and Associates, Inc., 1984.

V-133 Direct Retail Sales and Personal Income Taxes

Direct construction employment for the proposed project would result in the generation of retail sales tax revenue for the State of California, the City of Los Angeles, and the LACTC; and personal income tax revenue for the federal and state governments. Based upon the projected low and high-construction employment and estimated average earning data for heavy construction workers ($35,000 in 1983), total wages to be paid to construction workers on this project are estimated to range between $98.5 million and $143.0 million in 1983 dollars (California Employment Development Department). Of this total, it is estimated that between $35.5 million and $51.4 million would be expended for the purchase of taxable retail goods and services, resulting in total sales tax revenue generation of $2.3 million to $3.4 million in 1983 dollars (based on the California taxable retail sales expenditures/personal income relation estimated at 36 percent).

Direct construction employment for the five alternative system routes would generate the following in state and local sales tax revenue (Table V-13E):

V-213 Impact on Local Transit Patronage

The prime indicator of the local transit impacts examined was the change in the total daily work-trip boardings on 5 selected bus lines, which parallel the project alignment for much of its length between Long Beach and downtown Los Angeles. The selected bus lines were coded as follows: 4-34, 4-35, 4-36, 4-37 and 4-39.

The results of the evaluation are presented in Table V-21E. The impacts would vary considerably among the five selected routes and among the system alternatives. The most significant change would be produced on line 4-37 (RTD Line No. 56) where the reduction in total work-trip boardings per day would be reduced up to 62 percent for the Olympic/9th Aerial with Los Angeles River Route alternative (LA-3, MC-1, LB-3).

V-214 Impact on Major Transit Facilities

The impact of the rail transit project upon various other line haul transit systems in the region was evaluated. The variations in total passenger volumes, as well as passenger volumes at major stations, were examined and are summarized in Tables V-21F through V-21I.

V-214.1 Metro Rail

Generally, the LB-LA Rail Transit Project and the Metro Rail projects are perceived as complementary projects and not competing projects, except in the area between 7th and Flower and Union Station. Table V-21F summarizes the project's impact on Metro Rail.

TABLE V-21F

YEAR 2000 IMPACT ON METRO RAIL DAILY PATRONAGE

System Alternative	Union Station	7th St. Flower St.	Daily Patronage	Percent Change
No Project	119,522	55,598	381,889	--
LA-1/MC-1/LB-4 (Baseline)	130,625	59,237	398,366	+4.3
LA-2/MC-1/LB-4	113,931	54,198	381,127	-0.2
LA-3/MC-1/LB-4	112,975	59,846	381,038	-0.2
LA-3/MC-1/LB-3	112,576	59,507	380,625	-0.3

Source: Southern California Association of Governments, 1984.

TABLE V-21E

YEAR 2000 CHANGE IN TOTAL WORK-TRIP BOARDINGS/DAY

ON FIVE SELECTED PARALLEL LOCAL TRANSIT LINES

	4-34		4-35		4-36		4-37		4-39	
	Daily Boardings	Percent Change from No Project	Daily Boardings	Percent Change from No Project	Daily Boardings	Percent Change from No Project	Daily Boardings	Percent Change from No Project	Daily Boardings	Percent Change from No Project
1. No Project	2,585		12,758		2,834		3,599		3,899	
2. LA-1/MC-1/LB-4 (Baseline)	2,278	-12	13,054	+ 2	2,458	-13	1,537	-57	3,727	- 4
3. LA-2/MC-1/LB-4	2,119	-18	12,364	- 3	2,559	-10	1,749	-51	4,116	+ 6
4. LA-3/MC-1/LB-4	2,890	+12	13,016	+ 2	2,424	-14	1,371	-62	3,491	-10
5. LA-3/MC-1/LB-3	2,873	+11	13,053	+ 2	2,382	-16	1,363	-62	3,642	- 7

Note: Line 4-34 = RTD Line 51/320
Line 4-35 = RTD Line 53
Line 4-36 = RTD Line 55
Line 4-37 = RTD Line 56
Line 4-39 = RTD Line 60/360

Source: Southern California Association of Governments, 1984.

V-214.2 Interstate 5 Transitway

The I-5 transitway and the rail transit project would offer competing service to southeast Los Angeles County. Ridership would be reduced on the transitway from 4.7 percent to 7.4 percent depending on the system alternative selected. Table V-21G shows the variations in I-5 ridership.

TABLE V-21G

YEAR 2000 DAILY PATRONAGE INTERSTATE I-5 TRANSITWAY

System Alternative	Daily Patronage	Percent Change
No Project	176,662	
LA-1/MC-1/LB-4 (Baseline)	168,269	-4.7
LA-2/MC-1/LB-4	164,350	-6.9
LA-3/MC-1/LB-3	163,613	-7.3
LA-3/MC-1/LB-4	163,525	-7.4

Source: Southern California Association of Governments, 1984.

V-214.3 Harbor Freeway Transitway

The Harbor Freeway transitway and the rail transit project (like the I-5 transitway above) would offer competing service to some parts of South Bay area. All system alternatives, except the baseline alternative, would reduce ridership on the transitway from 2.2 percent to 7.1 percent. Table V-21H presents the impact on total patronage.

TABLE V-21H

YEAR 2000 DAILY PATRONAGE HARBOR TRANSITWAY

System Alternative	Daily Patronage	Percent Change
No Project	65,778	--
LA-1/MC-1/LB-4	66,043	+0.4
LA-2/MC-1/LB-4	64,297	-2.2
LA-3/MC-1/LB-4	61,490	-6.5
LA-3/MC-1/LB-3	61,076	-7.1

Source: Southern California Association of Governments, 1984.

V-214.4 Century Freeway Transitway

At the transfer station with the I-105 transitway, patrons boarding the transitway would not vary significantly for any alternative. The transitway would act as a feeder for the LB-LA Rail Transit Project but the light rail project would not make a difference in the loadings for the transitway at this station.

Loadings at either transitway terminus (LAX and Fullerton) would not vary with any of the alternatives. Table V-21I shows the overall patronage impacts on the Century Freeway transitway.

TABLE V-211

YEAR 2000 DAILY PATRONAGE CENTURY TRANSITWAY

System Alternative	Daily Patronage	Percent Change
No Project	145,729	--
LA-1/MC-1/LB-4 (Baseline)	144,954	-0.5
LA-2/MC-1/LB-4	148,628	+2.0
LA-3/MC-1/LB-4	137,951	-5.3
LA-3/MC-1/LB-3	137,346	-5.7

Source: Southern California Association of Governments, 1984.

V-220 AIR QUALITY

V-221 Comparison of Alternatives

Impacts on air quality have been analyzed from two perspectives: a project corridor study area scale and a microscale level (i.e., a specific intersection or station). The possible impacts of system alternatives were examined at the corridor study area level, previously defined as Regional Statistical Areas (RSAs) 20, 21, and 23 through the use of computer modeling. The output of these model simulations provided estimates of on-road motor vehicle emissions of reactive organic gases, nitrogen oxides, carbon monoxide, sulfur oxides, and particulates in the year 2000 for the amount of light-duty vehicular traffic -- mileages and speeds -- which would be expected to result from development of a range of alternatives.

The electrical requirements of the system and the change in freight train operations were also examined for potential impacts on air quality.

V-222 Corridor Study Area Results

The air quality expected to be encountered throughout the study area if no project is built has been described in the setting. The key conclusions are that in the year 2000 the ambient air concentrations of ozone and carbon monoxide in this area will still exceed the applicable federal and state air quality standards unless both the short- and long-range air pollution control strategies adopted in the 1982 Air Quality Management Plan are completely implemented.

The differences in VMT, motor vehicle emissions, and average speeds projected for various alternatives -- No Project, baseline and Olympic/9th Aerial with Los Angeles River Route (LA-3, MC-1, LB-3) -- are shown in Table V-22A on the following page.

Air quality for the Bus alternative is described in Chapter VIII, Section 200.

Only two selected project route alternatives were chosen for a detailed analysis of their effects on future ambient air quality. The criteria in choosing the baseline and Olympic/9th Aerial with Los Angeles River Route scenarios were first, examine the changes in regionwide transit usage which a light rail transit line could generate; second, show the possible range of variations in auto mileage and travel speeds; and third, highlight the impact of changes in the light rail routing.

The baseline alternative would represent the highest level of diversion to transit use, the lowest automotive VMT, and the highest average travel speeds. The baseline alternative would also represent the slowest travel time via the rail transit project between Long Beach and Los Angeles.

The Olympic/9th Aerial with Los Angeles River Route would be representative of all the other alternatives due to the fact that there would be no significant difference in the level of emissions among them and it would also have the quickest travel time between Long Beach and Los Angeles.

All of the "build" alternatives would have a slight overall decrease in the pollutant burden. Comparing the baseline and No Project alternatives show a decrease of only 43,000 VMT as a result of the project. The average speeds during the AM and PM peak periods would increase only marginally. Neither of these two factors would contribute to any significant change in the level of emissions or in the ambient air quality in the project study area. Likewise, the differences between the Olympic/9th Aerial with Los Angeles River Route and No Project alternatives would be minimal. A decrease of 27,000 VMT would produce only a minimal increase in average peak period travel speeds and an slight decrease in emission levels.

Minor increases in nitrogen oxides would occur with all alternatives. The effect of speed on the rate of nitrogen oxide emissions is opposite to the effect of speed on carbon monoxide and reactive organic gas emissions, and it is inherent in the way the automobile engine operates. Consequently, any transit improvement that increases automobile speeds (or reduces congestion) would increase the emission rates of nitrogen oxides, even if other pollutant emissions decline. Nitrogen oxide emission levels could be reduced through controls on stationary sources.

TABLE V-22A

COMPARISON OF YEAR 2000 MOTOR VEHICLE TRAVEL AND EMISSIONS AMONG SYSTEM ALTERNATIVES

Light-Duty Motor Vehicle Travel and Emmission Characteristics	No Project	LA-1/MC-1/LB-4 (Baseline)	LA-3/MC-1/LB-3	Bus
VMT, thousand miles/day	27,476	27,433	27,449	27,486
AM Peak Speed, avg. miles/hour	19.20	19.40	19.40	19.40
PM Peak Speed, avg. miles/hour	21.40	21.90	21.80	21.80
ROG, tons/day	33.15	33.00	33.04	33.05
NOX, tons/day	30.49	30.50	30.61	30.55
CO, tons/day	351.80	350.10	350.50	350.70
SOX, tons/day	2.19	2.18	2.19	2.19
TSP, tons/day	7.57	7.55	7.56	7.57

Note: All values presented are indicative of travel conditions in RSAs 20, 21, and 23 on an average annual day. Heavy-duty vehicular traffic is not included.

Source: Southern California Association of Governments, 1984.

The electrical requirements of the proposed system are such a small fraction of the area's total electrical demand -- less than 0.05 percent, even if all the annualized energy required were produced in the basin -- that the impact of this project on power-plant emissions is not considered here.

Finally, the additional emissions from the proposed diversion of Southern Pacific operations (MC-3) between Watts and Wilmington Junctions were calculated. Carbon monoxide and hydrocarbons would increase 0.01 tons per day and nitrogen oxide would increase 0.03 tons per day. Total suspended particulates and sulfur oxides would increase by nearly imperceptible amounts -- 4 pounds per day and 8 pounds a day, respectively. These values should be added to the motor vehicle emissions for each construction alternative to determine the full impact of the project.

V-223 Conformance with Air Quality Goals and Programs

The change in emissions levels due to changes in on-road motor vehicle traffic and Southern Pacific train traffic resulting from operation of any of the suggested alternatives is miniscule, with the baseline alternative providing the most emissions improvement and the Bus alternative resulting in slightly higher emission levels. The differences among the alternatives would be very small and could well be a consequence of the limits of precision of the model. Even though the reduction in emissions projected to result from building a light rail transit line from Long Beach to downtown Los Angeles would be very small, the action would conform to and support the goals and policies of the 1982 Adopted Air Quality Management Plan. However, the air quality in the project corridor study area would not achieve acceptable levels in the year 2000 with or without construction of a Los Angeles-Long Beach rail transit line unless all the short-range and long-range air pollution control strategies in the AQMP were completely implemented.

V-230 ENERGY

The energy impacts of the proposed rail transit project were assessed in comparison to transportation energy consumption in the year 2000 without the project. The analysis takes into account reduced requirements for gasoline because of more fuel efficient automobiles, the number and length of auto or bus trips diverted to the light rail project, and the energy expended in building the light rail transit system, annualized over a 30-year period. The analysis was performed by SCAG's using the DTIM regional model which in turn relies on outputs of the Los Angeles Regional Transportation System (LARTS) patronage model.

Any of the proposed alignment alternatives or system alternatives would reduce the number of automobile miles traveled in the year 2000 by diverting automobile riders onto transit. In addition, certain bus lines that parallel the rail transit route would be eliminated or shortened. Table V-23A summarizes the key model output values and highlights the differences in vehicle miles traveled (VMT), fuel used, and person-trips projected for the various alternatives -- No Project, baseline and Olympic/9th Aerial with Los Angeles River Route (LA-3, MC-1, LB-3). Other system alternatives have not been discussed because their energy requirements would be intermediate between the baseline and Olympic/9th Aerial with Los Angeles River Route scenarios. The baseline alternative would be the most energy efficient combination of the proposed route combinations, and the Olympic/9th Aerial with Los Angeles River Route would be the least energy efficient of the combinations modeled.

All of the rail transit combinations modeled would decrease transportation energy usage in comparison to the No Project alternative. Table V-23A indicates a weekday VMT reduction of 162,974 miles for the baseline alternative to 67,318 for Olympic/9th Aerial with Los Angeles River Route, or approximately .05 to .02 percent of year 2000 VMT. Reduction in gasoline demand with the project in operation would range from 33,750 gallons/day for the baseline alternative to 27,825 gallons/day for Olympic/9th Aerial with Los Angeles River Route. Diesel fuel reductions of 954 gallons each weekday would be the same for all system alternatives because the background bus system would be the same. The electrical energy required for vehicle propulsion, maintenance, and station operation would be less than .02 percent of the utilities' forecast weekday demand.

The impacts of the Long Beach-Los Angeles transit system on energy use in the region have been evaluated from the standpoint of total energy consumed. The total annualized energy demand for system alternatives is summarized in Table V-23B. Although the transportation energy demand for the entire region is shown, the impact of the project can be distinguished. Key assumptions used in preparing these tables can be found in SCAG's technical working paper on energy impacts. Annualized energy values are used to account for the initial high construction energy cost and to prorate those costs over the life of the project components, usually 30 years. A project with a life of 30 years could require three times as much energy, total, as a project with a 10-year lifetime, yet both would have the same annualized energy demand.

Results indicate that the energy necessary to build a light rail system between Los Angeles and Long Beach would be substantial. However, over the life of the project the annualized construction energy requirements would be fairly low. Likewise, the operating energy needs (direct electricity consumption) of such a system would be relatively low, and diminished auto travel would add enough energy savings to compensate fully for the light rail system. The baseline alternative is estimated to use 1338 billion BTUs less per year than the No Project alternative. This would be a 0.1 percent reduction in the region's transportation energy demand. The Olympic/9th Aerial with Los Angeles River Route, because it would divert fewer auto trips and require more construction energy for the aerial segment,

TABLE V-23A

YEAR 2000 VEHICULAR FUEL CONSUMPTION IN THE SOUTHERN CALIFORNIA REGION[1]

(Per Average Summer Weekday)

System Alternative	Vehicular Miles Traveled	Person-Trips	Passenger Miles Traveled	Fuel Used and Type
No Project				
Light-Duty Vehicles	305,198,343	48,997,583	426,143,970	12,779,689 gallons of gasoline
Buses	382,708	1,411,748	19,393,212	114,927 gallons of diesel fuel
Metro Rail	30,620(2)	406,788	2,101,740	177,400 kilowatt hours of electricity
Light Rail	0	0	0	
TOTAL	305,611,671	50,816,119	447,638,922	
Baseline (LA-1/MC-1/LB-4)				
Light-Duty Vehicles	305,028,154	48,989,039	425,910,880	12,745,939 gallons of gasoline
Buses	379,531	1,347,880	18,944,243	113,973 gallons of diesel fuel
Metro Rail	30,620(2)	424,754	2,130,601	177,400 kilowatt hours of electricity
Light Rail	10,376	54,446	601,743	56,511 kilowatt hours of electricity
Southern Pacific Diversion	16	N/A	N/A	147 gallons of diesel fuel
TOTAL	305,448,697	50,816,119	447,587,467	

TABLE V-23A (Continued)

YEAR VEHICULAR FUEL CONSUMPTION IN THE SOUTHERN CALIFORNIA REGION[1]

(Per Average Summer Weekday)

System Alternative	Vehicular Miles Traveled	Person-Trips	Passenger Miles Traveled	Fuel Used and Type
Olympic/9th Aerial w/LA River Route (LA-3/MC-1/LB-3)				
Light-Duty Vehicles	305,123,398	48,993,435	426,043,050	12,751,864 gallons of gasoline
Buses	379,531	1,345,793	18,660,279	113,973 gallons of diesel fuel
Metro Rail	30,620[2]	406,447	2,097,275	177,400 kilowatt hours of electricity[2]
Light Rail	10,788	70,444	787,282	56,511 kilowatt hours of electricity
Southern Pacific Diversion	16	N/A	N/A	147 gallons of diesel fuel
TOTAL	305,544,353	50,816,119	447,587,886	

[1] The Southern California modeling study area includes Los Angeles, Orange, Ventura, and the most highly urbanized portions of Riverside and San Bernardino counties. All data are quoted directly from the model output.

[2] Los Angeles Rail Rapid Transit Project: Metro Rail, Draft Environmental Impact Report, March 1983.

Source: SCAG, "Energy Impacts Technical Report," February 9, 1984.

TABLE V-23B

YEAR 2000 ANNUALIZED REGIONAL TRANSPORTATION ENERGY REQUIREMENTS

(in billions of BTUs)

Component	Year 1980	No Project	LA-1/MC-1/LB-4 (Baseline)	LA-3/MC-1/LB-3
Vehicle Propulsion				
Automobile	548,272	538,536	537,114	537,364
Bus	3,798	5,374	5,329	5,329
Light Rail	--	--	205	199
Metro Rail	--	642	642	642
Southern Pacific Diversion	--	--	6	6
Subtotal	552,070	544,552	543,296	543,540
Vehicle Maintenance				
Automobile	119,487	164,622	164,530	164,581
Bus	107	129	128	128
Light Rail	--	--	9	9
Metro Rail	--	102	102	102
Subtotal	119,594	164,853	164,769	164,820
Vehicle Manufacture				
Automobile	82,147	113,177	113,114	113,150
Bus	128	155	154	154
Light Rail	--	--	7	4
Metro Rail	--	18	18	18
Subtotal	82,275	113,350	113,293	113,326
Guideway Construction				
Light Rail	--	--	37	46
Metro Rail	--	218	218	218
Subtotal	--	218	255	264
Station Operation				
Light Rail	--	--	22	19
Metro Rail	--			
Subtotal	--	453	475	472
TOTAL ENERGY CONSUMPTION	753,939	823,426	822,088	822,422

Source: SCAG, "Energy Impacts Technical Report," February 9, 1984.

would use nearly as much energy as the No Project alternative; net annual savings for this alternative would be only 4 billion BTUs.

Another important energy consideration is the change in the amount of gasoline and diesel fuel used when bus and light rail line travel is able to reduce automobile VMT and relieve congestion, thereby speeding up remaining traffic. Table V-23C compares the baseline and No Project alternatives and shows that 5,842 gallons of gasoline, or 730 million BTUs, could be conserved per average annual day, just in the transit corridor. About 29 percent of this would be the result of reduced VMT and 71 percent would be the result of reduced congestion. The Olympic/9th Aerial with Los Angeles River Route could produce a similar benefit, with even more of the gain resulting from improved traffic flow.

V-231 Proposed Mitigation Measures for Energy

Although the rail transit system would result in a small net energy savings, the LACTC is continuing to evaluate numerous energy conservation options for construction and operation. Major proposed mitigation measures incorporated in the light rail design are listed below in three separate groups: propulsion energy, station energy, and yards and shops.

232 Propulsion Energy Conservation

Rail vehicles would be equipped with "chopper" (semiconductor) traction motor speed controls rather than the conventional "cam" (mechanical) controls. Although they weigh more and are somewhat larger, "chopper" controls are considered to offer significant energy savings for the project.

LACTC will consider equipping light rail vehicles to recapture some of the energy used to stop trains through regenerative electrical braking. Regenerative braking recaptures energy which would otherwise be dissipated as heat. Traditionally, the benefits of regenerative braking have depended on the ability of the electrical system to make use of the power pumped back into the traction power network. If another train is accelerating, the braking energy of a nearby train can be used by this other train. The traction system would also be designed so that it could be connected with any adjacent future electrical transit systems, such as trolley-buses or other light rail systems, facilitating more efficient utilization of braking energy.

Varying train length in proportion to demand would conserve significant propulsion energy. Light rail vehicles are generally designed to operate as single units or in trains. Employing single-car train lengths during low demand periods could save substantial amounts of energy.

TABLE V-23C

YEAR 2000 LIGHT-DUTY VEHICLE TRAFFIC IN THE LONG BEACH-

LOS ANGELES TRANSIT CORRIDOR

Alternative	Vehicular Miles Traveled	AM Peak Average Speed, mph	PM Peak Average Speed, mph	Fuel Consumption, gallons	Changes In Fuel Comsumption: Due To VMT Changes	Changes In Fuel Comsumption: Due To VMT Changes
No Project	27,475,865	19.20	21.36	1,172,014	Base	Base
Baseline (LA-1/MC-1/LB-4)	27,416,240	19.40	21.86	1,166,172	-1,669	-4,173
Olympic/9th w/ LA River Route (LA-3/MC-1/LB-3)	27,448,792	19.37	21.79	1,167,660	-990	-3,364

Note: - represents a reduction.

Source: SCAG, "Energy Impacts Technical Report," February 9, 1984.

Coordination of traffic and rail signal systems and reserved rights-of-way are promising means of propulsion energy conservation. These propulsion energy conservation techniques have been incorporated into the project design where appropriate. The energy conservation merits of these techniques must be balanced against the need to minimize impacts on automobile and truck traffic.

All major facilities of the project, including individual stations, would have separate electric meters to facilitate energy consumption analysis and conservation. All station electrical systems would be designed to be capable of being turned off when not in use.

Integrating station design with adjacent office buildings, shopping malls, stores, and apartments (joint development) would offer special opportunities for saving station energy. These joint developments would not only save construction and operating energy, but would also minimize travel distances that would otherwise require vehicular energy. During all stages of design, LACTC would cooperate with public agencies and individuals interested in constructing station area joint developments.

During final design every aspect of station energy use would be reviewed in order to minimize heating, lighting, ventilating, air-conditioning, and other energy loads. Passive solar lighting, heating, and solar hot water preheating would be considered wherever feasible.

V-233 Yards and Shops

Non-revenue yard movements of vehicles would be consolidated so that routine evening maintenance involving external carwash, interior cleaning, and routine maintenance would be accomplished in a single roundtrip around the yard. A satellite yard would be provided which, among other duties, would minimize vehicle deadheading. Wheel truing equipment would be used to optimize wheel condition, ensuring efficient vehicle operation.

V-240 LAND USE, POPULATION, AND HOUSING

At the regional level, land use changes as a result of the project are expected to be minimal. The potential employment and population growth induced by the project has been projected by SCAG to be about 1.0 percent above year 2000 growth estimates without the project. (Section IV-121 outlines the methodology used in reaching this conclusion.)

V-241 Land Use

Land use changes in each of the segments of the line (downtown Los Angeles, mid-corridor, and Long Beach) are most likely to occur in fairly close proximity to route alternatives. In downtown Los Angeles and Long Beach, much of the induced development would consist of infill of underused land and/or reinforcement of existing redevelopment plans. Project-induced development in the mid-corridor would likely occur in areas already slated for redevelopment or revitalization. There may be some concentration of development around the rail line that might otherwise have been more widely dispersed. The rail project is not anticipated to induce any significant amount of new regional growth nor to change growth patterns throughout the region.

V-242 Population

The project would increase population by about 1 percent. On a regional basis this increase would be insignificant. The project would, however, increase accessibility and mobility for those close to stations. Table V-24A compares several route combinations from the standpoint of year 2000 population within 1/4 mile of proposed stations. The selected combinations reflected the baseline alignment, a low population combination, and a high population combination.

TABLE V-24A

YEAR 2000 POPULATION WITHIN ONE-QUARTER

MILE OF STATIONS

System Alternative	Population
Baseline (LA-1/MC-1/LB-4): 25 Stations	50,000
Low Population (LA-3/MC-1/LB-3): 21 Stations	34,000
High Population (LA-2/MC-1/LB-2): 27 Stations	59,000

Source: Sedway Cooke Associates, 1984.

V-250 ECONOMIC ACTIVITY

V-251 Permanent Employment

The permanent workforce required for operation and maintenance of the proposed system is projected to range between 216 and 236 full-time equivalent employees. The permanent workforce required would not vary significantly by alternative alignment. The distribution of permanent employees by job function is shown on Table V-25A.

TABLE V-25A

PROJECT-RELATED INCREASES IN PERMANENT WORK FORCE

Job Function	Staffing
Operation	
Administration/Operation Support	25
Labor/Operations	81-94
Central Control	28
Maintenance	
Administration/Maintenance Support	18
Maintenance of Right-of-Way	26-28
Vehicle Maintenance	38-43
TOTAL PERMANENT WORKFORCE	216-236

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

V-252 Retail Sales and Sales Tax Revenue

The proposed project is not expected to directly affect the magnitude of retail sales within Los Angeles County and the project corridor. The project may indirectly affect regional retail sales volume through increased accessibility to existing retail locations and enhanced development potential for new retail space. Of these two potential impacts, the increase in retail sales due to enhanced accessibility is not easily quantified but the potential impact is not considered to be significant. The latter potential impact is more easily quantified.

The proposed project may enhance the development potential for approximately 300,000 square feet of new retail space within the project corridor. Assuming an average annual taxable sales volume of $55 per square foot in 1983 dollars, the proposed project could contribute to a $15.0 million increase in the total county retail sales volume if the new retail space is developed. Based on the 6.5 percent local retail sales tax rate, these new retail sales would generate $975,000 in annual recurring sales tax revenue (in constant 1983 dollars) to the state, City of Los Angeles, and the LACTC, distributed as shown in Table V-25B.

TABLE V-25B

INDIRECT ANNUAL SALES TAX REVENUE

Agency	Revenue
State	$750,000
Los Angeles City	$150,000
LACTC	$ 75,000
TOTAL ANNUAL TAX REVENUE	$975,000

Source: Williams-Kubelbeck and Associates, Inc., 1984.

V-260 CUMULATIVE IMPACTS OF RELATED PROJECTS

There are several related projects within the Los Angeles Metropolitan Region that individually may have little or no effect but cumulatively may have a substantial impact overall.

These related projects are generally discussed in Appendix 1. Of those described, there are four projects that in combination with the LB-LA Rail Transit Project would have important effects on travel patterns in the LA Metropolitan Region. These are the Century Freeway, the Harbor Freeway transitway, Metro Rail, and the Los Angeles-San Diego Bullet Train. These projects would allow people to live in areas farther from downtown Los Angeles and have a quicker and easier commute to and from work. The ability of people to live further from their chosen place of work contributes greatly to the expansion of urbanization beyond its current boundaries.

The proposed LB-LA Rail Transit Project would contribute to these changes in the Southern California landscape; however, transit projects do not so much induce growth or change as they accommodate planned development. One of the impacts of the LB-LA project is that it would be a mitigation measure for some of the surrounding development. The project also would contain mitigation for its impacts.

Chapter VI

VI IMPACTS OF FUTURE EXTENSIONS IN DOWNTOWN LOS ANGELES (Not Part of Current Project)

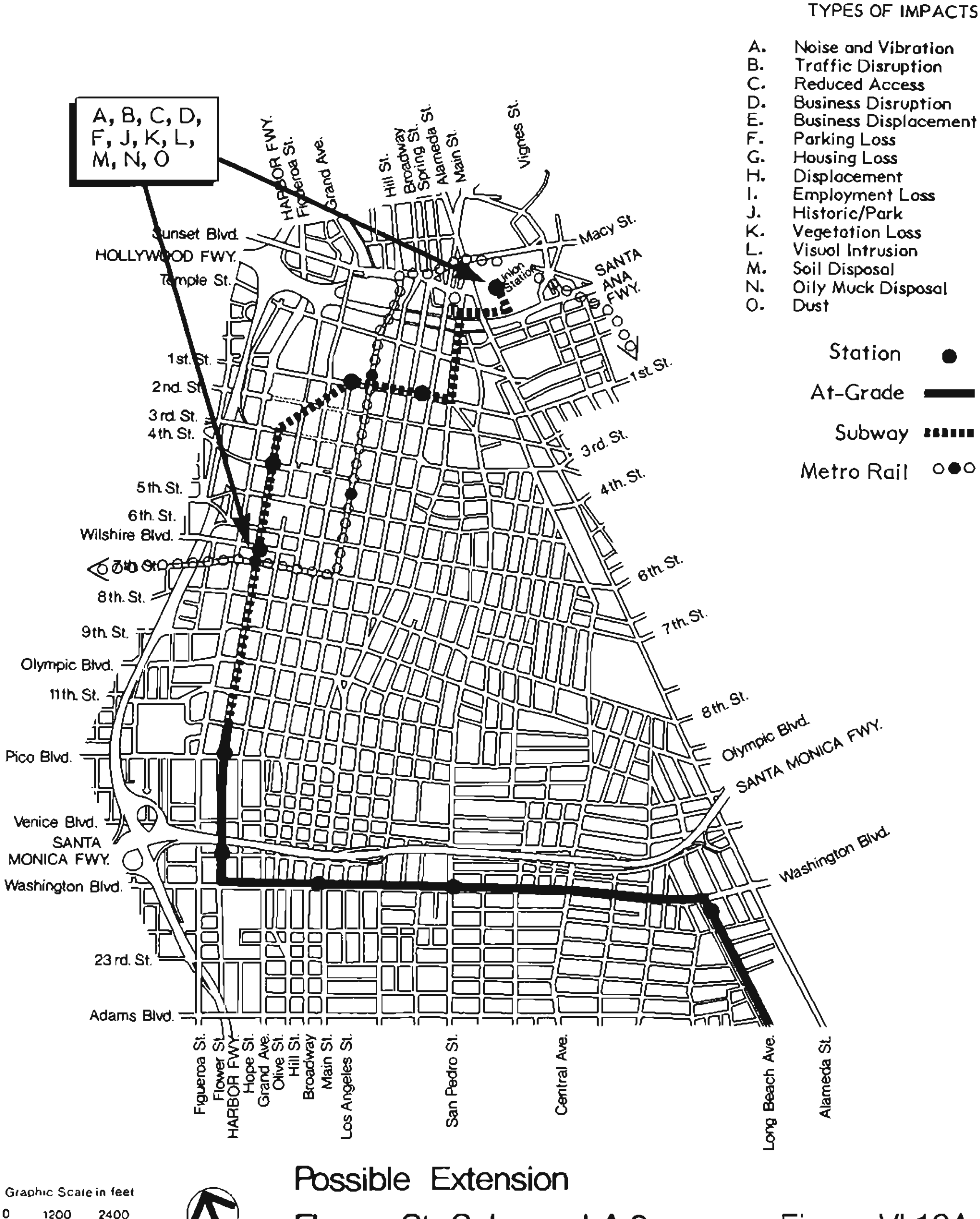
VI-100 <u>ALTERNATIVES CONSIDERED</u>

Two of the alternatives in downtown Los Angeles (LA-2, Flower Street Subway; and LA-3, Olympic/9th Aerial) are considered for possible future extensions (see Figures VI-10A and VI-10B).

The extension of the LA-2 subway from the 7th Street station northerly to Union Station would consist of 4 additional underground stations and 1.7 miles of tunnel. The stations would be constructed by using cut-and-cover methods. The 1.7 miles of tunnel would be built using both cut-and-cover and tunneling methods.

The LA-3 extension would be 1.5 miles long and include 3 stations. Beginning at a proposed aerial station behind Union Station (east side), the guideway would be constructed across the Hollywood Freeway (Route 101) to Los Angeles Street. It would then be constructed along the east curb lane of Los Angles Street southerly to 1st Street and take a turn westerly along the north curb lane of 1st Street to Grand Avenue. From Grand Avenue, the aerial guideway would be constructed in a south westerly direction through a subway tunnel cut into Bunker Hill. Cut-and-cover methods as described for alternative LA-2 (initial phase) would be used to construct the 1,350 feet of subway required through Bunker Hill. The guideway would eventually link up with the initial stage (Olympic Boulevard/9th Street) at the World Trade Center on Figueroa Street.

Both of these extensions would terminate at Union Station. However, it is important to note that in further definition of the Commission's Proposition A rail transit implementation strategy, consideration is being given to possible future extension of these alignments via Chinatown and Lincoln Heights (on to Pasadena), with the Metro Rail project serving Union Station.



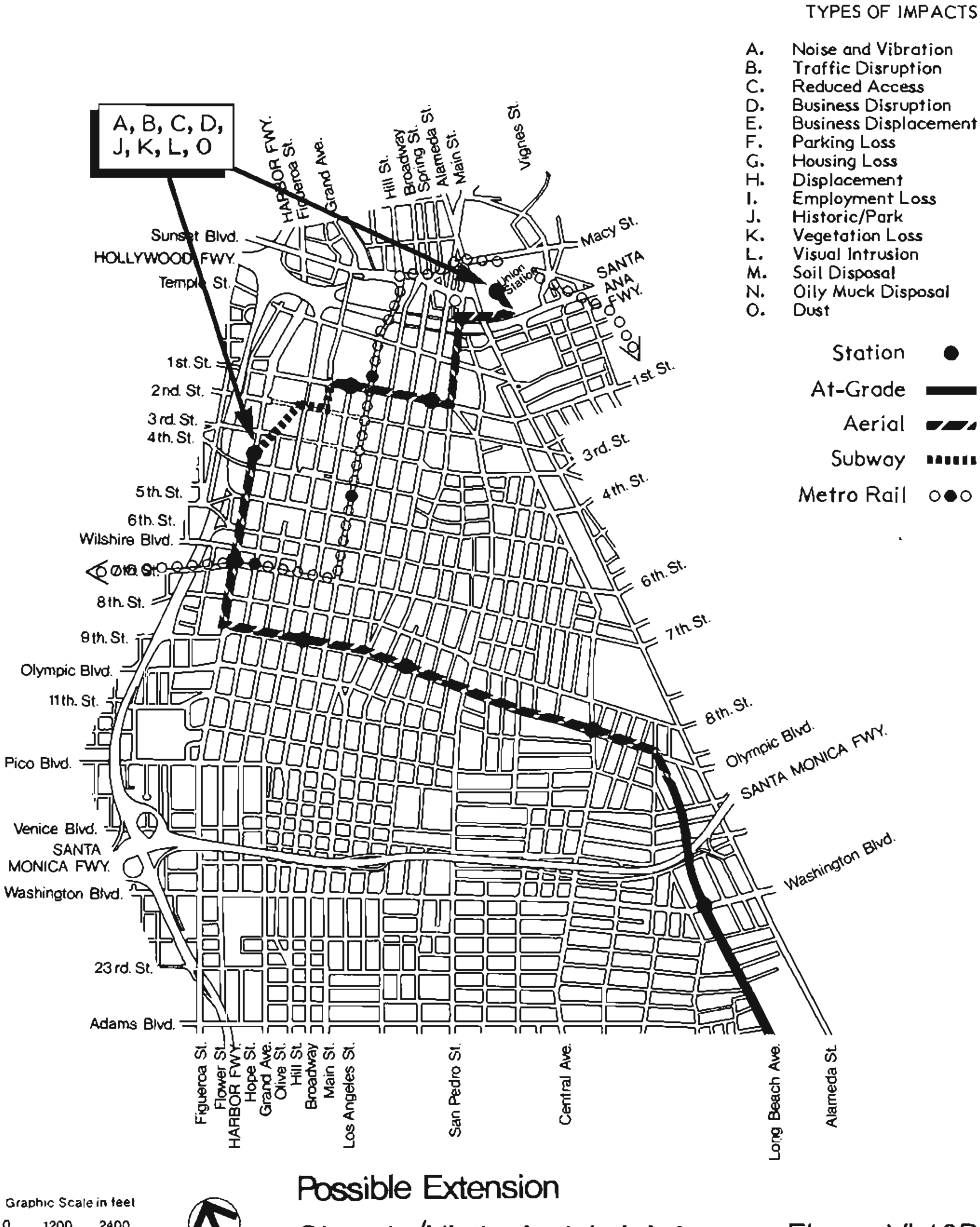
Possible Extension

Flower St. Subway LA-2

Figure VI-10A

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Construction Impacts
PARSONS BRINCKERHOFF/KAISER ENGINEERS



Possible Extension

Olympic/Ninth Aerial LA-3

Figure VI-10B

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Construction Impacts

PARSONS BRINCKERHOFF / KAISER ENGINEERS

VI-200 NATURAL ENVIRONMENT

VI-210 TOPOGRAPHY, SOILS, GEOLOGY, AND SEISMICITY

A majority of the LA-2 extension is proposed to be tunneled. The depth of the extension would be between 40 and 60 feet. Tunnel boring machines would be used except at underground station locations where cut-and-cover methods identical to those described for the 7th Street station would be used.

Underground conditions for the future extension of LA-2 would be different from those encountered during construction of the initial phase.

From just northerly of 6th Street, bedrock (a soft, massive sandstone) lies 15 to 25 feet below the surface, while the excavated tunnel would be from 40 feet below the surface at the end of the 7th Street station to 60 feet below at the southern end of the 4th Street station. At about this point, the formation changes to a poorly cemented, closely jointed, blocky siltstone and very fine-grained sandstone. This composition continues to the Civic Center where a short, deep-buried valley of the sandstone is anticipated. The statigraphy (underground formation) in that valley area is such that it may be a conglomerate instead of sandstone. The siltstone-sandstone formation then reoccurs to the Hollywood Freeway.

North of the Hollywood Freeway, some fill is likely over a thin, silty sand layer overlying gravelly sand, with the latter occurring in the lower 20 feet or so of the Union Station excavation. At Union Station, the raised fill is 15 feet or more deep and consists of rubble and silty clay/silty sand. The water table at the station will be 5 to 15 feet above the excavation for the tunnel. Dewatering would be necessary for most of the extension. Deep well installation would more than likely be used to dewater groundwater inflow.

Any underpinning allowance should be small. Where water is encountered, the depth of alluvium is not great. While the permeability of the soil indicates the area of drawdown would be large, the major buildings are deeply founded. Even for the substantial drawdowns potentially occurring at Union Station, geological reports indicate generally less than 1/2 inch of stress-induced settlement.

The extension of LA-3 (Olympic/9th Aerial), which would begin near 3rd and Flower Streets, would be constructed in anywhere from 0 to 35 feet of alluvium. Near and at Union Station, the ground conditions are as described for the extension of LA-2. Groundwater should not be a problem for column foundation construction. Other impacts for the aerial portion of the LA-3 extension would be similar to those described for the initial phase.

A cut-and-cover section would be constructed through Bunker Hill for the extension of LA-3 using similar methods as for the initial phase of alternative LA-2.

Bunker Hill represents an area of high relief in downtown Los Angeles where bedrock is near the surface. The granitic rock that constitutes the base of the hill may require ripping to construct the cut-and-cover section. Because most of the rock near the surface is weathered and fractured, it could be torn loose by large caterpillars equipped with ripping teeth and blasting would be required.

All of the excess soil (shown in Table VI-21A, below) removed from the LA-2 extension tunnel section could potentially be impregnated with oil and gas (hydrocarbon accumulations) and therefore unusable on other segments of the project. Any soils with hydrocarbon accumulations would have to be disposed of at an acceptable sanitary landfill site, either Class I or II.

TABLE VI-21A

EXCAVATION AND BACKFILL REQUIRED

FOR DOWNTOWN LOS ANGELES EXTENSIONS

Alternative	Excavation Cubic Yards	Backfill (Cubic Yards)
LA-2 extension	284,000 (1.7 miles tunnel)	32,000
LA-3 extension	61,000 (1.5 miles aerial guideway)	40,000

Source: PB/KE; California Department of Transportation, 1984.

The extensions of LA-2 and LA-3 would have no additional impacts on topography, soils, geology, and seismicity other than those operations impacts generally discussed for the initial phase in Sections III-111 and IV-111.

220 FLOODPLAINS, HYDROLOGY, AND WATER QUALITY

The extension of LA-2 could have an impact on groundwater quality and solid waste disposal. Subway tunneling could require dewatering of shallow groundwater deposits and muck disposal. The removed water and muck is be expected to be contaminated with oil and tar, which would necessitate wastewater treatment and possible transport of muck to a Class I or Class II landfill.

The disposal of water removed from underground areas containing oil and tar would require a National Pollutant Discharge Elimination System (NPDES) permit. The permit would be issued by the Regional Water Quality Control Board (RWQCB) and would be expected to require wastewater treatment to remove hydrocarbons before discharge. This could be done by an oil/water separator, with the separated oil removed by truck to a Class I or II disposal site.

The operation of the LA-2 extension would require an underground drainage system designed to remove water collected in the tunnel and stations and bring the excess water to the existing drainage facilities at the surface.

The extension of LA-3 would have no significant hydrology or water quality impacts. The cut-and-cover section through Bunker Hill would not have the oily muck disposal problems described for alternative LA-2 (Flower Street Subway) because it would be located on Bunker Hill (area of high relief) and thus not associated with the Los Angeles City Oil Field.

VI-230 VEGETATION AND WILDLIFE

The extension of LA-2 would have only those impacts on vegetation and wildlife described for the initial phase in Sections III-113 and IV-113.

The extension of LA-3 would possibly remove between 10 and 20 additional trees from between 4th/Figueroa Streets and Union Station. The trees that are removed could be replaced in or near the project area. No other impacts to vegetation and wildlife are anticipated.

VI-240 AIR QUALITY

Air quality impacts associated with the extensions of LA-2 and LA-3 are expected to be similar to those discussed for the initial phases in Section V-110 for construction and IV-114 for operation. Additional air quality analysis was not performed for the extensions.

VI-250 NOISE AND VIBRATION

VI-251 Construction

The extension of the Flower Street Subway from 7th Street north to Union Station would require the use of more complex construction methods than the other sections of subway construction. It is possible that a good deal of the subway extension would be at depths which would not allow cut-and-cover construction, but would require a more involved tunneling operation by machine. This would tend to reduce noise at those areas where the operations were underground; however, at the portals there would be noise levels similar to those discussed in Section III-114. As the amount of excess material to be hauled away would be 3 to 4 times that produced for the initial subway segment of LA-2, there would be additional noise associated with hauling activities. The tunneling operation could be expected to take from 6 months to a year, extending the noise impacts over that time-frame.

The LA-3 extension from 3rd Street to Union Station would be built using the same methods as for the initial aerial stage with the addition of an approximate 1,350 feet of cut-and-cover subway construction. The noise impacts would be similar to those discussed in Section III-114 and extend over 12 to 18 months.

The vibration generated by construction activities could be of concern particularly if there were vibration-sensitive land uses (e.g., recording studios and electronic manufacturing) along the alignment. There are no such vibration-sensitive land uses identified for either extension. It is expected that the noise from construction would be the overriding concern.

VI-252 <u>Operation</u>

Noise level and noise exposure information presented in Section IV-115 indicates that the noise impact of the operation of the rail transit project along any of the Los Angeles alternatives would not be significant. Noise exposure estimates at noise-sensitive locations along the proposed routes for future conditions with and without the rail transit system show that the operation of the project would contribute, at most, a fraction of a decibel to the ambient noise environment. Any extension of the rail transit system for the LA-2 and LA-3 alternatives would show similar results, particularly since the LA-2 extension is in a subway configuration.

Study of the projected vibration levels in the downtown Los Angeles areas shows that even with operations on concrete aerial guideways or in subway configuration vibration measures would not differ significantly from those produced with an at-grade alignment. Comparisons of the projected vibration levels with CHABA daytime and nighttime standards indicate that no impacts from any Los Angeles alternatives or extensions should be expected.

VI-260 ROUTE EXTENSION ENERGY IMPACTS

VI-261 <u>Construction</u>

The construction energy required for the two possible route extensions (LA-2, Flower Street Subway extension to Union Station; and LA-3, Olympic/9th Aerial extension to Union Station) is shown in Table VI-26A. Construction of these extensions would be energy-intensive due to the need to construct subway and to the intensely built-up environment.

TABLE VI-26A

CONSTRUCTION ENERGY REQUIRED FOR POSSIBLE SUBWAY AND AERIAL EXTENSIONS IN DOWNTOWN LOS ANGELES

Route Segment	Subway	BTU (in billions)	Aerial	BTU (in billions)
Los Angeles	LA-2	599	LA-3	1,065
	Extension to Union Station	334	Extension to Union Station	387
Mid-Corridor	MC-1	1,069	MC-1	1,069
Long Beach	LB-4	187*	LB-4	187*
Yard		21		21
TOTAL BTUs		2,210		2,729

* Construction of LB-3 would require 152 billion BTUs.

Source: M. L. Frank & Associates; PB/KE, 1984.

VI-262 Operation

Table VI-26B shows the annualized energy requirements of the two possible extensions. The substantial increase in station energy associated with the subway extension reflects the four additional subway stations which would be energy-intensive to operate. The large increase in aerial extension propulsion energy consumption reflects the substantial increase in rail vehicle miles to be traveled due to the use of the three-car trains in this alternative.

TABLE VI-26B

ANNUALIZED ENERGY REQUIREMENTS FOR

SYSTEM ALTERNATIVES

WHICH INCLUDE DOWNTOWN LOS ANGELES EXTENSIONS

(In billions of BTUs)

	Aerial Extension to Union Station*	Subway Extension to Union Station*
Propulsion	251	207
Station Operation	36	96
Maintenance	10	9
Guideway Construction	55	44
Vehicle Manufacturing	10	7
TOTAL	362	363

* Assumes LB-4 alignment in Long Beach. LB-3 alignment energy requirements would differ by less than 1 billion BTUs.

Source: M. L. Frank & Associates; PB/KE, Operation Plan (revised), 1984.

VI-263 Energy Impacts

Separate DTIM computer analyses were not run for the energy impacts of the two possible extensions. However, with regard to the aerial extension, it can be seen that even if the full 85 billion BTU increase in annualized energy attributable to the aerial extension is added to the total Olympic/9th-River Route energy consumption shown in Table V-33B, the extension would still consume less total energy than the No Project alternative. Thus, the aerial alternative with extensions would still cause an energy savings compared to the No Project alternative, even without attributing any additional automobile diversion to it. This is a conservative estimate of its probable performance, as it would probably divert at least some additional auto travel if built.

Because a DTIM analysis was not run on the subway alternative without extension, it is not possible to make a definite conclusion with regard to its energy relationship with the No Project alternative. Differences in train length and auto diversion between the aerial and subway extensions make analogies from the former to the latter difficult. If the subway extension is chosen, additional DTIM runs should be made.

VI-300 SOCIOECONOMIC ENVIRONMENT

VI-310 LAND USE, POPULATION AND HOUSING

VI-311 Construction

Based on the preliminary information available, and assuming that substations could be located on vacant parcels or on portions of already-developed, publicly owned parcels, the extension of LA-2 and LA-3 would not result in property acquisition that would displace existing residents or businesses. However, the possibility of disrupting buildings developed between 1984 and the time of construction of the extensions could occur. LA-3 would require cut-and-cover subway construction across the southeast corner of the county-owned block bounded by 1st, 2nd, Grand, and Flower Streets. If the Music Center facilities planned for the site are built prior to construction of the extension and without consideration of the potential extension, their construction could displace uses directly over the trench area. To avoid this potential problem, if LA-3 is the selected alternative, the location of the future extension should be considered when the site improvements are designed. LA-2 would require tunneling beneath the same block diagonally from the northeast to southwest corners. Tunneling would not require property acquisition but would require additional structural reinforcement of surface improvements. It would also affect the depth of subterranean parking. To avoid complications if alternative LA-2 is selected, the horizontal and vertical alignments of the extension should be considered when the site is developed.

VI-312 Operation

VI-312.1 Land Use

The subway extension of LA-2 to Union Station would put an additional 9,000 residents, 26 million gross square feet of commercial floor area (office, retail, service and hotel), and 121,000 employees and daily shoppers within pedestrian access of stations. The aerial extension of LA-3 to Union Station would provide pedestrian access to the project to an additional 2,700 residents, 15.7 million gross square feet of commercial floor area, and 73,000 employees and daily shoppers. Much of this development would also be served by the Metro Rail system. With the extension, the two alternatives would serve equal amounts of nonresidential development or 45 percent more development than LA-1 would serve. LA-2 would serve 8 percent more residents than LA-1 and LA-3 would serve 44 percent fewer residents than LA-1.

The activity centers, revitalization areas, and public facilities served by the extensions would be comparable to those served by a transfer to the Metro Rail system as described in Section IV-121.12. With the extensions, LA-2 and LA-3 would provide better service to activity centers, about the same level of service to revitalization areas, and service to fewer public facilities than would LA-1.

VI-312.2 Population

Two measures, growth inducement and mobility, are used to evaluate the population impacts of the proposed future extensions to LA-2 and LA-3. The methodology for assessing these impacts is described in Section IV-121.21. Growth-inducing consequences of implementing the extensions for both alternatives would be negligible. However, mobility and accessibility would be improved if the transit line continued to the Union Station terminal.

Both the LA-2 and LA-3 extensions would serve the rapidly developing residential and commercial area in the downtown core, as well as provide a second direct link to the Metro Rail system at Union Station. Currently only LA-1 would continue to Union Station, offering enroute access to the Civic Center core of government employees. Both extensions would provide access to the westside office development, including the Bunker Hill Redevelopment Project. At its present level of development, that area includes over 6 million square feet of office space, as well as 1,000 elderly housing units, 1,000 market-rate apartments, and 1,000 hotel rooms with supporting retail. LA-1 would not directly serve these jobs and businesses. As illustrated in Table VI-31A, the LA-2 extension, with its 4 stations running from 4th and Flower Streets to Union Station, would serve a 1980 population of 4,005 and nearly 4,900 by year 2000. The LA-3 extension would include 3 stations, from 1st-Olive to Union Station, serving a 1980 population of 2,746 and a year 2000 population of over 3,600. The LA-2 extension, because of the additional station, would serve a greater number of transit dependents than would the LA-3 extension.

TABLE VI-31A

NUMBER OF TRANSIT DEPENDENTS

POTENTIALLY SERVED BY EXTENSIONS[1]

	LA-2 Extension		LA-3 Extension	
	1980	2000	1980	2000
Total Population	4,005	4,853	2,746	3,637
Ethnic/Racial Minorities	2,078	3,543	1,604	2,109
Youth	342	971	279	364
Elderly	455[2]	582	269[2]	364
Low-Income	1,041[2]	1,262	714[2]	946

[1] Assumes demographic characteristics in 1980 and 2000 are unchanged.

[2] Derived from population total.

Source: U.S. Bureau of the Census; Southern California Association of Governments; Sedway Cooke Associates, 1984.

With the addition of the LA-2 or LA-3 extensions the earlier mobility/accessibility advantages of LA-1 would be reduced. Table VI-31B details the comparison among the three complete alternatives. LA-3, which would cross the apparel manufacturing and wholesaling district, would not serve as many residents as would LA-1 or LA-2. Both these alternatives would serve a comparable number of residents, but LA-2 would potentially serve a greater number of transit dependents.

TABLE VI-31B

NUMBER OF TRANSIT DEPENDENTS POTENTIALLY SERVED BY ALIGNMENTS WITH EXTENSIONS [1]

	LA-1		LA-2 with Extension		LA-3 with Extension	
	1980	2000	1980	2000	1980	2000
Total Population	10,939	13,533	11,759	13,686	6,146	8,230
Ethnic/Racial Minorities	8,055	9,879	8,818	10,264	3,843	5,185
Youth	2,152	2,707	2,809	3,285	808	1,070
Elderly	1,295[2]	1,624	1,307[2]	1,505	1,231[2]	1,646
Low-Income	5,907[2]	7,308	4,704[2]	5,474	2,274[2]	3,045

[1] Assumes demographic characteristics in 1980 and 2000 are unchanged.

[2] Derived from population total.

Source: U.S Bureau of the Census; Southern California Association of Governments; Sedway Cooke Associates, 1984.

VI-320 COMMUNITY SERVICES

VI-321 Construction

Community services in the vicinity of the possible LA-2 and LA-3 extensions would experience the same adverse impacts during construction as the LA-2 and LA-3 trunklines. Temporary street closures and temporary elimination of on-street parking could restrict auto access to some service facilities. Pedestrian access would also be impaired by temporary closures of crosswalks and sidewalks. These impacts could be lessened by installing appropriate signing indicating alternate access points or alternate parking facilities. Safety of pedestrians going to and from service facilities could be ensured by the construction of walkways, protective canopies, and fences.

Traffic congestion in the vicinity of the possible extensions during construction may result in increased response times for fire, police, and paramedic vehicles. This impact could be partially mitigated by the establishment of close communications between construction management and the providers of emergency services. Also, scheduling construction activities for off-peak hours would minimize traffic congestion and allow for more efficient operation of emergency vehicles.

Cut-and-cover operations and installation of footings for aerial structures would necessitate the relocation of some underground utility lines. These relocation activities may require temporary shut-off of some utilities. Advanced notice would be given to affected utility customers, and every effort would be made to continue provision of utilities where uninterrupted service is absolutely essential.

VI-322 Operation

Construction of either the LA-2 or LA-3 extensions would improve accessibility to a number of downtown Los Angeles community services. With the extensions, accessibility would be improved to a total of 40 service facilities for LA-2 and 38 service facilities for LA-3. Most of these services are housed in government buildings in the Civic Center area. Table VI-32A lists the number of services, by type, located within walking distance (1/4 mile) of proposed LA-2 or LA-3 extension stations.

TABLE VI-32A

COMMUNITY FACILITIES WITHIN ONE-QUARTER MILE OF

EXTENSION STATIONS

Facilities By Type	LA-2 Extension	LA-3 Extension
Schools	1	1
Libraries	2	1
Churches	3	1
Parks	1	1
Medical Facilities	1	0
Government Office Buildings	12	10
Local Social Services	3	3
TOTAL	23	19

Source: M. L. Frank & Associates, 1984.

An increase in criminal activity may occur in and around stations during evening hours. This could place additional strain on the the LAPD's resources. Crime prevention measures that might be employed in LA-2 or LA-3 extension station areas include adequate lighting of sidewalks leading to stations, the use of station design standards to discourage criminal activity, and the development of crime prevention awareness programs to be offered to local employees and residents.

VI-330 ECONOMIC ACTIVITY

VI-331 Construction

VI-331.1 Impact on Business Activity

The significant economic impact resulting from the construction of the proposed project extensions in the LACBD would be the potential disruption to local businesses located along the alternative routes. This disruption could occur when street access would be partially or wholly reduced during construction, thereby obstructing pedestrian and vehicular access to the businesses served by these streets. As shown in Table VI-33A, given the preliminary construction scenario, both of the proposed alternative extension alignments may require partial or entire street closings at various times throughout their construction period.

To mitigate the potential disruption to local businesses due to reduced pedestrian and vehicular access during construction, every effort would be made to minimize the duration of time when any one street block would be closed. At a minimum, one lane would remain open to permit some vehicular traffic flow in addition to construction and emergency vehicles. Special measures would be taken to encourage pedestrian access. In coordination with the local merchants, visibility of the businesses through temporary signing and other measures would be ensured.

VI-331.2 Regional Economic Impact - Direct, Indirect, and Induced

Construction of the proposed LA-2 and LA-3 extensions would have a positive impact on the regional economy as a result of direct and indirect expenditures. Direct construction expenditures would include outlays for all aspects of the system's construction with the exception of vehicular purchase, which would be done outside the Los Angeles region. In addition to the direct capital outlay, the project's construction would lead to indirect and induced expenditures within the region. Using a 2.8 expenditure multiplier, based on studies conducted by SCAG and the U.S Bureau of Economic Analysis (Department of Commerce), these secondary economic impacts have been estimated. Both direct and indirect construction expenditures are shown in Table VI-33B.

TABLE VI-33A

IMPACT ON LOCAL BUSINESS DURING CONSTRUCTION

OF EXTENSIONS

Construction Characteristics	LA-2 Extension	LA-3 Extension
Structure Type	Subway	Aerial; Subway
Time Required to Completion (months)	24	12-18
Number of Lanes Temporarily Closed[1]	At station sites; entire street	3 lanes; or entire block
Number of Businesses[2] along Alignment	493	95
Primary Construction Activity Disruptive to Businesses	Utility relocation; station construction	Installation of guideway

[1]Temporary closure could range from several days to several months. An emergency access lane would remain open at all times.

[2]Estimated by PB/KE on the basis of businesses listed in the Pacific Bell Reverse Directory -- intended only to provide a relative comparison among alternatives. Number of businesses affected and duration of impacts would vary significantly throughout the construction period.

Source: PB/KE, 1984.

TABLE VI-33B

REGIONAL ECONOMIC IMPACT OF EXTENSION CONSTRUCTION ACTIVITY

(Millions of 1984 Dollars)

	LA-2 Extension	LA-3 Extension
Total Direct Output	$112.2[1]	$ 45.6[1]
Indirect and Induced Output	202.0	82.1
Total Project-Related Expenditures	$314.2	$127.7

Source: PB/KE, Long Beach-Los Angeles Rail Transit Project - Task 7.9 Revised Cost Estimates, January 1984.

VI-331.3 Employment

The proposed extensions would have a positive impact on the regional employment base in the construction, manufacturing and related services industries. Total direct and indirect employment resulting from construction of the extensions is presented in Table VI-33C in person-years. Project employment has been forecast on the basis of estimates of direct and indirect construction employment on recent transportation and other major construction projects throughout the United States and on data from the Construction Industry Research Board.

TABLE VI-33C

TOTAL EMPLOYMENT FROM CONSTRUCTION OF EXTENSIONS

	LA-2 Extension	LA-3 Extension
Direct Construction Employment	1,010	410
Relocated Employment	2,020	820
TOTAL	3,030	1,230

Source: PB/KE; Construction Industry Research Board; Williams-Kuebelbeck and Associates, Inc., 1984.

VI-331.4 Retail Sales and Personal Income Taxes

Direct construction employment for the proposed LA-2 and LA-3 extensions would result in the generation of retail sales tax revenue for the State of California, the City of Los Angeles, and the LACTC; and personal income tax revenue for the federal and state governments. Based upon the projected construction employment and the estimated average weekly earnings for heavy construction workers, total wages to be paid to construction workers for the proposed LA-2 and LA-3 extensions are estimated at $35.4 million and $14.4 million, respectively, in 1983 dollars. Of this total, it is estimated that approximately 36 percent would be expended for the purchase of taxable retail goods and services, resulting in total sales tax revenue generation in 1983 dollars as shown in Table VI-33D, below:

TABLE VI-33D

GENERATION OF SALES TAX REVENUE

FROM CONSTRUCTION OF EXTENSIONS

	LA-2 Extension	LA-3 Extension
State	$1,800	$700
Los Angeles City	400	130
LACTC	200	70
TOTAL (thousands)	$2,400	$900

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

In addition to sales tax revenue, the earnings of the direct construction employees would be subject to state and federal income taxation. According to the 1981 U.S. Internal Revenue Service "Statistic of Income - Individual Income Tax Returns" (August 1983) and the 1983 federal and state tax tables, persons earning an annual average income of $35,000 pay an average total of $7,500 and $1,750 in federal and state income taxes, respectively. Based upon the projected construction employment and the estimated total income of the direct construction employees for the extensions, federal and state income taxes to be paid by direct project construction employees are shown in Table VI-33E.

TABLE VI-33E

ESTIMATED INCOME TAXES PAID

BY EXTENSION CONSTRUCTION WORKERS

(in millions of Dollars)

Personal Income Tax	LA-2 Extension	LA-3 Extension
Federal Income Taxes	$7.6	$3.1
State Income Taxes	1.8	0.7
TOTAL	$9.4	$3.8

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

VI-332 Operation

VI-332.1 Property Tax Revenue

The proposed LA-2 and LA-3 project extensions would require subsurface easements, acquisition of right-of-way at Union Station, and permanent property acquisitions for location of substation facilities. The LA-2 extension would require the location of two substations along its route, one at Union Station and one at Olive and 1st Streets. Each substation would require 5,000 square feet of land area and the acquisition cost for the property is estimated at $2.0 million (1983 dollars), based upon recent land sales proximate to these locations. Similarly, the LA-3 extension would require acquisition of 5,000 square feet of land area for location of one substation on its route at Union Station, with an estimated acquisition cost of $1.0 million (1983 dollars).

Based on current assessed values, it is estimated that each substation would result in an annual loss of $3,000 in tax revenue to local government annually. Thus, the LA-2 alternative would result in the annual loss of $6,000, while the impact of LA-3 would be only $3,000 annually.

VI-332.2 Permanent Employment

The proposed project extensions for the alternative LA-2 and LA-3 alignments are not expected to require an increase in the permanent operation workforce of the proposed system. (See Section V-250 for a discussion of the permanent workforce.)

VI-332.3 Retail Sales and Sales Tax Revenue

The proposed project extensions for the alternative LA-2 and LA-3 alignments would not significantly affect regional retail sales volume and tax revenue. The extensions may affect retail sales potential through increased accessibility to existing retail locations along the alignment and enhanced development potential for new retail space in the LACBD.

VI-340 VISUAL QUALITY

VI-341 Construction

The visual impacts resulting from the construction of future extensions of LA-2 and LA-3 would be short-term. They would involve the entire length of the extensions in Los Angeles and would be associated with traffic control, site preparation, and construction. The nature of these visual impacts would be similar to those described previously for Los Angeles in Section 134 of Chapter III. Construction of a subway extension of LA-2 would visually disrupt the length of the street at the level where cut-and-cover occurs and would disrupt the visual character of staging areas for tunneling operations. Construction of an aerial extension of LA-3 would visually disrupt Figueroa, 1st, and Los Angeles Streets from street level to about 30 feet in the air. Impacts along the Hollywood Freeway to Union Station would be similar to those produced by LA-1 in that area.

VI-342 Operation

Impacts are evaluated in terms of the impact measures described in Section 124.1 of Chapter IV. Significant adverse impacts on the overall character, scale, and form of the visual setting in the Los Angeles segment would result primarily from the aerial extension of LA-3. In some instances, the aerial alignment would produce positive impacts. For example, the guideway would increase exposure to and channelize views of cultural and historic properties at Union Station and the Civic Center. The guideway would become a defining boundary for the diverse architectural forms and scale of the Civic Center.

Key adverse impacts of the elevated guideway and stations of LA-3 are described below.

- o A prominent portal structure for the aerial alignment would be located in 1st Street at the intersection with Olive Street.

- o The elevated guideway along 1st Street would be within 61 to 121 feet of the south facade of buildings between Spring and Hill Streets. The visual privacy of about 700 linear feet of office frontage would be seriously affected. The elevated guideway at Figueroa and 3rd Streets would potentially adversely affect the visual privacy of the Bunker Hill Towers, depending upon the configuration of the final alignment.

- o Street trees, primarily Indian Laurel figs, would probably have to be removed on the east side of Los Angeles Street between Aliso and 1st Streets and on the south side of 1st Street between Los Angeles Street and Grand Avenue.

With the LA-2 extension, potentially adverse visual impacts would occur in the station areas where station entrances would alter the visual setting. The analysis of visual impacts depends upon the final selection of station sites and design.

VI-343 Mitigation Measures

The significant adverse visual impacts identified for the aerial extension of LA-3 could not be mitigated, except by an alternative subway alignment.

VI-350 HISTORIC AND CULTURAL RESOURCES

The extension of the Flower Street Subway (LA-2) to Union Passenger Terminal (Union Station) from 7th Street would create temporary visual effects for the California Club on South Flower, the Los Angeles Times Building on 1st Street, the southern edge of the City Hall grounds along 1st Street, the El Pueblo State Historic Park, and Union Station itself. These effects would be due to the shoring of the subway trench and equipment usage during construction. In some areas during the construction of this extension, tunneling may be done by machine completely underground; if any of the properties listed is in an underground tunneling area, there would be no impacts.

The terminal station at Union Station would be underground to the rear of the main building and east of the baggage and utility building. If a direct connection is made to Union Station, it would probably be in the pedestrian passage connecting the station to the trains. None of the decorative elements of the main station building would be affected.

After construction is completed and operations commence, there would be no impacts to any of the properties listed above. There would be a slight increase in pedestrian use of the station and the impacts of such usage would be as discussed for the LA-1 alternative in Section IV-125.

For the Olympic/9th Aerial extension (LA-3) from 3rd Street to Union Station, the effects would be the same as discussed in Section III-125 and IV-125 for the aerial section of LA-1.

There would be effects for two additional properties, the Los Angeles Times and the southern edge of the City Hall grounds along 1st

Street. There would be a substantial visual intrusion during construction and a permanent impact on the viewsheds of the two historic properties when the system is in operation.

VI-400 TRAFFIC AND TRANSPORTATION

VI-410 CONSTRUCTION

The possible future extension of Los Angeles CBD rail alternatives LA-2 and LA-3 (from their initial termini at 7th and Flower and Figueroa and 3rd, respectively, to Union Station) would further affect vehicular traffic and pedestrian movements during the construction period.

Extension of the Flower Street Subway (LA-2) to Union Station, via 1st Street, Los Angeles Street, and along the east side of the Santa Ana Freeway, would involve the same cut-and-cover procedures as was established for the Flower Street Subway section between 7th and 12th Streets. The street opening (cut) would be covered with a temporary decking so traffic and pedestrian movements could continue while construction underground was in progress. During cut periods one traffic lane in each direction would remain open in the line section of the subway, with the elimination of curb parking and modified bus stops and schedules. In station areas at least one traffic lane would remain open at all times to accommodate local access and emergency vehicles. Resulting north-south traffic on Flower Street between 3rd and 7th Streets (existing ADT of 16,000) would be rerouted around the construction area on adjacent parallel streets including Figueroa Street, Hope Street, and Grand Avenue. These streets between 3rd and 7th Streets are presently operating at good levels of service ("C" or better) and by year 2000 are also projected to operate at good levels of service. Therefore, rerouting sections of Flower Street during construction onto these streets would not cause severe congestion in street traffic.

With the exception of Hill Street and Broadway, 1st Street between Grand Avenue and Main Street (existing ADT ranging between 19,000 and 23,000) presently operates at good levels of service. Rerouting resulting traffic during construction onto adjacent parallel streets, such as 2nd, 3rd, and Temple Streets, could be accommodated without causing severe traffic and congestion problems. Both 2nd and 3rd Streets currently operate at good levels of service and, with the exception at Hill and Broadway, are projected to operate at good levels of service in the year 2000. West of Broadway, Temple Street will also operate at good levels of service in the year 2000.

The construction of the north-south section along Los Angeles Street would involve a tunnel under the Hollywood Freeway. With the availability of less congested detour routes, there should be no major congestion caused by the rerouted traffic during construction.

Extension of the Olympic/9th Aerial alternative (LA-3) from 3rd Street through Bunker Hill, then aerial on 1st Street to Los Angeles Street and north to the Hollywood Freeway and Union Station, would involve construction of supports and stations, and placement of elevated guideway similar to the construction established for the aerial section on Figueroa Street between 3rd and 9th Streets. The construction would require the closure of 1 to 3 lanes depending on the type of footings used. Curb parking would be eliminated during construction, and bus stops and schedules would be modified. The impacts during construction along 1st Street and Los Angeles Street would cause resulting traffic to be rerouted on adjacent parallel streets, as indicated above for the Flower Street Subway extension. The impacts from the construction of the aerial structure over the Hollywood Freeway would be similar to the construction impacts identified for the aerial structure in the Broadway/Spring alternative (LA-1) in Section III-140.

VI-420 OPERATION

The possible future extensions in downtown Los Angeles include LA-2 (Flower Street Subway from its terminus at 7th and Flower Street to Union Station) and LA-3 (Olympic/9th Aerial from its terminus at 3rd and Figueroa Street, also to Union Station).

Extension of the Flower Street Subway to Union Station would be via 1st Street, Los Angeles Street and along the east side of the Hollywood Freeway. A screenline check along Washington Boulevard, from Harbor Freeway to Santa Fe Avenue, along the Los Angeles River to Macy Street, produced a reduction in traffic volumes entering and leaving downtown Los Angeles of 0.03 percent, with the Flower Street Subway to Union Station. The AM peak hour traffic volumes on Flower and 1st Streets in the year 2000 would remain virtually unchanged for the Flower Street Subway extension alternative over the No Project alternative.

Flower Street, between 7th and 3rd Streets is presently operating at good levels of service (LOS "C" or better). However, by year 2000 the intersections of Flower Street at 3rd Street and at Wilshire Boulevard will be operating at capacity, with a volume/capacity ratio of 0.98 (LOS "E"). The intersection of Flower Street and the 4th Street ramps, where a station is proposed, would in the year 2000 operate at a good level of service. No significant change in the volume/capacity ratios would be experienced with the extension of the subway line along Flower Street.

Stations are proposed at Olive Street and west of Main Street on 1st Street. The intersections at 1st and Olive Streets and 1st and Main Streets would operate with volume/capacity ratios of 0.77 (LOS "C") and 0.59 (LOS "A"), respectively, in the year 2000 without the project. With the very small reduction in vehicular traffic resulting from the diversion of auto trips to transit, virtually no change in the volume/capacity ratios would be experienced with the extension of the subway line along 1st Street.

Los Angeles Street at Temple and 1st Streets would, in the year 2000, operate with volume/capacity ratios of 0.75 (LOS "C") and 0.89

(LOS "D") respectively. No stations are proposed along Los Angeles Street.

The impacts on parking from the Flower Subway extension to Union Station would be minimal. About 8 curb parking spaces at station locations would be eliminated to provide for improved pedestrian and transit access.

Extension of the Olympic/9th Aerial to Union Station would be through Bunker Hill, then aerial on 1st Street to Los Angeles Street and north to the Santa Ana Freeway. The screenline check along Washington Boulevard/LA River produced a similar reduction of 0.03 percent with the Olympic/9th Aerial to Union Station with Atlantic with Pacific Avenue Loop alternative. The AM peak hour traffic volumes on 1st and Los Angeles Streets, in the year 2000, would remain virtually unchanged for this alternative.

Aerial stations are proposed at Olive and Main Streets on 1st Street. The levels of service at the key intersections on 1st and Los Angeles Streets would be as indicated above for the Flower Street Subway extension to Union Station. No aerial stations are proposed along Los Angeles Street.

In order to maintain the number of through traffic lanes, curb parking along the north side of 1st Street and the east side of Los Angeles Street would be eliminated to compensate for the street widths lost to accommodate the aerial guideway and columns. The extension of the Olympic/9th Aerial to Union Station would eliminate approximately 50 curb parking spaces.

VI-421 Corridor and Regional Impacts

Both the Flower Street Subway and Olympic/9th Aerial extension alternatives would produce a reduction in home-work auto trips within the Long Beach-Los Angeles corridor in the year 2000. The auto trip reductions by alternatives are presented in Table IV-42A. The Olympic/9th extension with LA River Route would produce the highest mode split of 19.59 percent and also would have the highest number of daily boardings (82,713) of any of the rail transit alternatives. In contrast the Flower Street Subway extension with Atlantic with Pacific Avenue Loop would produce a mode split of 19.48 percent and have a daily boarding of 68,837 persons.

The Olympic/9th Aerial extension with the LA River Route would reduce LA County-wide home-work auto trips (from the No Project alternative of 4,132,554) by 0.04 percent, whereas the Flower Street Subway extension would reduce the home-work auto trips by 0.03 percent. The county-wide mode split (home-work trips to home-work person-trips) would be 11.94 percent for the Flower Street Subway extension and 11.95 percent for the Olympic/9th Aerial extension with LA River Route.

TABLE VI-42A

YEAR 2000 HOME-WORK AUTO TRIPS WITHIN THE LB-LA CORRIDOR

(Assuming Possible Downtown Los Angeles Extensions)

Alternative	Home-Work Auto Trips	Auto Trip Reduction	Percent Reduction	Mode Split
No Project	271,318	--	--	19.10%
Flower Street Sub. to Union Station	270,288	-1,030	-0.3	19.48%
Olympic/9th to Union Station	269,930	-1,388	-0.5	19.59%

Source: Southern California Association of Governments, 1984.

VI-422 Rail Transit Impacts on Local Transit Patronage

The change in total daily work trip boardings was examined for 5 selected local transit lines which would parallel the project for much of its length. The results of the evaluation are presented in Table VI-42B. The impacts would vary moderately between the lines with RTD Line 51/320 showing a range from -17 percent to +7 percent and RTD Line 60/360 ranging from +5 percent to -11 percent.

VI-423 Rail Transit Impacts on Major Transit Facilities

The impact of the future extensions of the LACBD alternatives LA-2 and LA-3 (Flower Street Subway and Olympic/9th Aerial alternatives to Union Station) upon other lines having transit systems in the region are summarized below.

o Impacts on Metro Rail:

Both the Flower Street Subway and Olympic/9th Aerial to Union Station alternatives with the Atlantic with Pacific Avenue Loop would provide similar service through downtown Los Angeles; however, they would have opposite effects on Metro Rail patronage. The Flower Street Subway would carry far fewer passengers than the Olympic/9th Aerial (a difference of 14,000 trips) but Metro Rail would carry 13,000 more passengers under the Flower Street Subway alternative than with the Olympic/9th Aerial alternative. The Flower Street Subway alternative actually would produce a 4 percent increase in Metro Rail patrons while Olympic/9th Aerial produced a 2 percent decrease from the base case.

TABLE VI-42B

LOCAL TRANSIT PATRONAGE IMPACTS

YEAR 2000 CHANGE IN TOTAL WORK TRIP BOARDINGS/DAY

ON FIVE SELECTED PARALLEL LOCAL TRANSIT LINES

Alternative	RTD Line 51/320 Daily	RTD Line 51/320 Percent Change No Proj	RTD Line 53 Daily	RTD Line 53 Percent Change No Proj	RTD Line 55 Daily	RTD Line 55 Percent Change No Proj	RTD Line 56 Daily	RTD Line 56 Percent Change No Proj	RTD Line 60/360 Daily	RTD Line 60/360 Percent Change No Proj
No Project	2,585		12,758		2,834		3,599	3,899		
LA-2 to Union Station (MC-1/LB-4)	2,139	-17	12,279	-4	2,462	-13	1,625	-55	4,102	+ 5
LA-3 to Union Station (MC-1/LB-4)	2,763	+ 7	12,056	-6	2,396	-15	1,248	-35	3,484	-11

Source: Southern California Association of Governments, 1984.

- Impacts on I-5 Transitway:

  Both the rail transit alternatives would reduce ridership on the I-5 transitway -- the Flower Street Subway by 5.9 percent and the Olympic/9th Aerial by 8.1 percent. The reductions in the I-5 transitway patronage from the year 2000 base case would be approximately 10,400 and 14,300 respectively.

- Impact on Harbor Freeway Transitway:

  Both rail transit alternatives would reduce ridership on the Harbor transitway -- the Flower Street Subway by 2.9 percent and the Olympic/9th Aerial by 7.9 percent. The reductions in the transitway patronage from the year 2000 base case would be approximately 1,900 and 5,200 respectively.

- Impact on Century Freeway Transitway:

  Both the Flower Street Subway and Olympic/9th Aerial alternatives would reduce ridership on the transitway by approximately 2,100 and 8,100 respectively.

VI-500 CUMULATIVE IMPACTS OF RELATED PROJECTS

Cumulative impacts of related projects during the construction for the extensions of LA-2 (Flower Street Subway) and LA-3 (Olympic/9th Aerial) would be most intense at Union Station. As described previously in Section III-140 for the Broadway/Spring Couplet (LA-1) all related projects could potentially interface with the extensions of LA-2 and LA-3 at Union Station. Phasing construction schedules and coordinating construction activities would be most effective in reducing potential conflicts.

Most of the cumulative operational impacts associated with the extensions would be similar to those discussed for the initial phases of LA-2 and LA-3. The major exception would be that if LA-2 or LA-3 is extended to Union Station, there would be an increase in competition for space and ridership among the various transit operators. Given the variety of transit coming into Union Station, each individual line may suffer a loss of patrons from the addition of other lines.

Chapter VII

VII. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

VII-10 INTRODUCTION

The proposed project would result in some adverse environmental effects which could not be completely avoided or mitigated. This applies to both the construction and operations phases of the project. It is the purpose of this section to summarize the nature and extent of these effects. A detailed description of individual impacts can be found in the impact sections of this report (see Chapters III, IV, and V).

Generally, the most significant unavoidable construction impacts would be noise, vibration, traffic disruption, reduced access, visual intrusion, loss of trees, historic and park property acquisition, business disruption, business displacement in Long Beach, and loss of housing. The most significant unavoidable operations impacts would be noise, vibration, traffic disruption, reduced access, incompatible land use (MC-3 only), reduction in property values, and geologic hazards.

VII-100 CONSTRUCTION IMPACTS

VII-110 NOISE AND VIBRATION

A temporary increase in noise and vibration would occur on all the proposed alternatives during construction. Average daily noise levels would range between 75 and 85 dBA (CNEL) within 50 feet of construction activity. Intermittent peak noise periods could be as high as 90 dBA (CNEL) within 50 feet of construction activity at specific areas such as the subway station at 7th and Flower Streets (LA-2), Compton Grade Separation (MC-2), and locations of aerial guideway columns (LA-1, LA-3, and flyovers for the mid-corridor).

The use of low-noise-generating equipment, prefabricated components, maximum physical separation (distance), scheduling construction activities during high ambient noise periods (daytime), and (in extreme cases) the use of noise walls would partially mitigate expected increases in noise levels; however, these measures would not totally alleviate the problem.

VII-120 TRAFFIC DISRUPTION/REDUCED ACCESS

During the construction period, the length of time required to traverse the corridor would increase. There would also be reduced accessibility to some residences, businesses, and public facilities along portions of all proposed alternatives. Automobile access would be impaired as a result of temporary street closures and congestion resulting from spillover onto adjacent streets (detours). Total street closure could occur at times for up to an entire block for at-grade sections in downtown Long Beach and downtown Los Angeles. Access to the cut-and-cover section on Flower Street (between 12th Street and 7th Street -- alternative LA-2) would be severely limited. Aerial sections would inherently be less problematic because columns would be placed at approximately 80-foot intervals away from street intersections. Impacts in the mid-corridor would be limited to intersections with Willowbrook Avenue and major cross streets, particularly in the Compton area, if alternative MC-2 is selected. None of the other north-streets would be significantly affected. Pedestrian activity in all construction areas would be greatly curtailed due to reduced sidewalk capacity and necessary safety precautions.

Emergency vehicles would have lower response times within and adjacent to construction zones due to overall constrained access resulting from detours, spillover congestion, and construction activity. Traffic disruption and reduced access impacts would be partially mitigated by adequate detours, appropriate signing, scheduling construction activity during non-peak hours, informational programs, and special traffic control methods such as flaggers, if necessary.

VII-130 VISUAL QUALITY

On all alternatives there would be the visual intrusion of incompatible construction activities and equipment which would contribute to a general sense of disruption. Visual impacts would be most intense near aerial segments (due to high-level construction activity) where they are near historic sites and parks (such as Union Station, El Pueblo, Broadway/Spring Historic Districts and Father Serra Park) in downtown Los Angeles, Watts Station and Watts Towers (Simon Rodia State Historic Park) in the mid-corridor, and Wittmore Park in Long Beach.

Visual impacts during construction would be temporary in nature and no practicable mitigation would be available.

VII-140 LOSS OF TREES

Alternative LA-1 would remove between 107 and 118 trees. Alternatives LB-1 and LB-4 would remove approximately 15 trees if Option A is constructed. These trees would be replaced; however, due to limited space and operations of the rail transit project, many of them would be permanently lost.

VII-150 HISTORIC AND PARK PROPERTY ACQUISITION

Right-of-way would potentially be acquired in Father Serra Park and at Union Station. A small area for column footing would be required in Father Serra Park, possibly only in the existing parking lot, for alternative LA-1. Portions of the baggage and utility building and incidental structures (e.g., sidewalks, stairways, and parking spaces) at Union Station would potentially be affected for aerial guideway construction (alternatives LA-1 and LA-3). Two feet of a terrazzo sidewalk in front of the Los Angeles Theater on Broadway would be permanently removed for construction of LA-1 in the Broadway Historic District. Final engineering design would determine if the park and Union Station structures could be avoided. Research and photo documentation would be used as mitigation for acquisition impacts.

VII-160 BUSINESS (Disruption of Areas)

There would be some temporary adverse impact on retail and commercial activity of establishments located on streets used by the rail transit project. There would be potential loss of sales during construction periods due to partial or total street closures, sidewalk closures, noise, and dust. This impact would be limited primarily to downtown Los Angeles and Long Beach (all alternatives). Impacts would be greatest within at-grade construction areas. The overall impact to individual establishments would be determined by the length of time construction activity is present, dependence of business on walk-in or drive-in trade, and the financial health of the establishment.

Mitigation would be through (1) maintenance of vehicular and pedestrian traffic wherever and whenever possible, (2) scheduling of activity to minimize total time required and to allow intervals when construction is not occurring, (3) contractor performance of specific actions and monitoring to minimize annoyance due to noise and dust and to ensure that traffic is being maintained, and (4) provision of special signing or other devices for business establishments to compensate for loss of visibility or reduction in access.

Total mitigation is not possible and some loss of sales would be highly probable. Total impact on each of the downtown areas would be relatively insignificant; however, impact on specific streets, blocks, or individual establishments might be considerable. Marginal businesses might fail, although the total number of such failures would be small.

VII-170 BUSINESS (Displacement)

The number of commercial properties which may be acquired for right-of-way purposes along Atlantic Avenue would be 80 with Option A, 35 with Option B, and none with Option C. These acquisitions would be necessary for alternatives LB-1 and LB-4. Employee displacement would be 340 employees for Option A, 167 for Option B and none for Option C.

Available mitigation would be through compensation and relocation services under the enactment of the California Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (California Government Code, Chapter 16). This act provides for assistance in locating replacement property and payment for actual moving and related costs, in addition to the fair market value paid for the business. If a business cannot be relocated without a substantial loss of patronage and chooses to go out of business rather than move, it can be eligible for a payment in lieu of moving costs, up to $10,000.

Total mitigation might not be possible. Comparable space at affordable rents might not be available for all businesses displaced, though it is likely that most could be accommodated. If some businesses choose to terminate operations or relocate outside the area there would be a loss of employment, but such a loss could be offset by the positive economic impacts of the project on redevelopment of local business.

VII-180 LOSS OF HOUSING

The selection of either alternative LB-1 or LB-4 in Long Beach would require acquisition of dwelling units and displacement of residents under both Option A and Option B. Option A would displace 556 people in 229 dwelling units, and Option B would displace 212 people in 87 units. Option C would require no loss of dwelling or relocation.

Available mitigation would be through compensation and relocation services under the enactment of the California Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (California Government Code Chapter 16). This act provides for assistance in locating housing. For the homeowner this can include, in addition to the fair market value paid for the property, a payment of up to $15,000 to cover purchase differential, increased interest costs, and incidental costs incurred in purchasing a replacement home. All moving costs are also paid for all persons displaced. If displaced persons cannot be accommodated within the financial constraints of the Relocation Assistance Act then Last Resort Housing would be implemented which allows new housing to be constructed. For the renter, up to $4,000 to cover a rental differential may be provided.

Total mitigation might not be possible. Comparable housing at affordable rents in the surrounding area might not be available for all persons displaced. Those not able to relocate in the immediate area could be placed nearby or possibly in outside areas of their choosing if it is determined to be acceptable under the Relocation Assistance Act. Additional mitigation might be available through the provision of new housing by the City of Long Beach as part of its redevelopment efforts.

VII-200 OPERATIONS IMPACTS

VII-210 NOISE AND VIBRATION

Impacts would occur from operation of the rerouted freight trains onto the West Santa Ana Branch for alternative MC-3. Increases in noise levels would be between 4 and 12 dBA CNEL due to the intrusion of freight traffic into an area that has not experienced any for over 20 years. The freight traffic would potentially increase vibration that would affect the Watts Towers (Simon Rodia State Historic Park). Preliminary analysis indicates that adverse vibration impacts on Watts Towers could be mitigated to an acceptable level through the use of vibration dampening materials put in place during reconstruction of the West Santa Ana Branch tracks.

Due to lower ambient noise levels along the Los Angeles River Route (alternative LB-3), the operation of the rail transit project would add 5 dBA CNEL to existing levels, which would affect surrounding neighborhoods.

The rail transit traffic noise and vibration would be mitigated by providing an acceptable noise level for the various land use categories. This would probably be achieved by use of noise and vibration walls. There may be residents in some areas who would find even the mitigated noise and vibration levels objectionable because of the increase over the previous levels.

VII-220 TRAFFIC DISRUPTION/REDUCED ACCESS

This would be experienced in the mid-corridor during operation of the project if alternative MC-3 is selected. Rerouted trains onto the West Santa Ana and San Pedro Branch lines would increase motor vehicle waiting time at intersections along Alameda Street; however, a corresponding decrease in waiting time would occur along Willowbrook Avenue. Grade crossings would be constructed at-grade with automatic gates. No other mitigation is anticipated.

Pedestrian access to the mid-corridor's existing commercial and public facilities would be decreased due to the proposed 6-foot high fence that would separate the rail transit and freight tracks from the surrounding neighborhoods. Some areas would have pedestrian access across the rail facilities spaced between 1/4 and 1 mile apart.

There would be an increase in the amount of traffic and pedestrian activity on surface streets around station sites and park-and-ride lots, causing congestion during peak commuter periods. All alternatives would have similar impacts.

VII-230 VISUAL QUALITY

The operation of the rail transit project and freight traffic along the West Santa Ana Branch (MC-3 only) would represent a visual intrusion into areas that presently do not have such activity. There would be obstructed views due to placement of the guideway structures and stations. Aerial sections would create shadows and visually dominate the locales where they are constructed. In downtown Los Angeles for alternative LA-3, especially along Olympic Avenue and 9th Street, the aerial guideway would be in close proximity to existing buildings; this would obscure the view from one side of the street to the other. Mitigation measures would focus on minimizing the height and width of the aerial section to the greatest extent possible, especially at stations. Use of center support columns would also reduce potential impact. Aside from using the most aesthetically pleasing design, no other practicable mitigation would be available.

VII-240 LAND USE

The operation of the freight trains on the West Santa Ana Branch (MC-3 only) would represent a permanent intrusion of an incompatible use in many areas (e.g., neighborhoods, local commercial and public facility zones). There has been no freight operation on the West Santa Ana Branch for approximately 20 years.

VII-250 REDUCTION IN PROPERTY VALUES

The property values adjacent to aerial segments in downtown Los Angeles might be adversely affected (Olympic, 9th, Figueroa). Mitigation measures for reduction in property values would be similar to those described for visual impacts. Designing the rail transit guideway in the most aesthetically pleasing manner would lessen its impact on surrounding properties.

VII-260 GEOLOGICAL HAZARDS

Despite construction of the rail transit guideway to the highest possible seismic safety standards, there would still remain some risk of injury to transit patrons and non-patrons alike near or using the rail transit during a major earthquake. This hazard would occur in all alternatives.

Chapter VIII

VIII OTHER ALTERNATIVES

VIII-100 NO PROJECT ALTERNATIVE

The No Project alternative is included as a basis for comparison of conditions which would potentially occur in the year 2000 without the proposed project. All potential impacts described in Chapters III, IV, and V are based on the differential between the particular alternative being evaluated and the No Project alternative.

Not building the rail transit project would provide neither concentrated transit service nor an incentive for concentrating development to achieve the basic transportation-related land use goals identified in Section 121.11 of Chapter IV. Since the project would produce no significant adverse land use impacts that could not be substantially mitigated, the No Project alternative would also not offer any meaningful advantages over the project alternatives with respect to such land use impacts.

In addition, the No Project alternative would offer no strategies for enhancing mobility and accessibility; and as development occurs and traffic congestion worsens, mobility and accessibility would diminish, leaving residents of the corridor, particularly transit-dependent individuals, worse off than they are currently, and than they would be under no project.

The No Project alternative would not meet the transportation needs in the existing rail corridor since there would be no major change in current transit modes or travel patterns. Changes that could occur with the No Project alternative would essentially consist of maintenance, repair, and minor modifications of the existing road network and bus system.

The existing street network which currently handles the majority of the travel demand in the corridor would be expected to carry the anticipated growth of employment in downtown Los Angeles and Long Beach. With significant increases in vehicular traffic projected for the year 2000, both the bus service and vehicular traffic would encounter significantly reduced travel speeds and increased delays during the peak traffic periods.

It should also be noted that there are no significant differences in environmental impact between the No Project alternative and the Bus alternative (discussed below). Under the No Project alternative, transit travel in the proposed rail corridor would continue to be served by the SCRTD bus system. Even though the term "no project" implies that no construction would take place, it does not totally disallow the possibility of capital expenditures for additions to and periodic replacement of the existing bus fleet.

None of the benefits or significant adverse impacts attributed to the proposed Long Beach-Los Angeles Rail Transit project would be realized.

VIII-200 BUS ALTERNATIVE

VIII-210 DESCRIPTION

To develop a Bus alternative for the purpose of comparison with the various rail alternatives, alternative bus alignments were developed within the Los Angeles, mid-corridor, and Long Beach segments of the Long Beach-Los Angeles rail transit corridor. In conformance with the evaluation procedures established for the rail alternatives, potential bus alternatives were evaluated for each of the three segments. The results of the evaluation process and identification of the candidate bus alternatives were presented in a workshop session, held on July 25, 1983, to participants from the project team agencies (LADOT, LA City Planning, SCAG, SCRTD, CRA, Caltrans, City of Long Beach, and Los Angeles County Road Department), LACTC, and the rail transit consultant (PB/KE). Bus alternative alignments in each segment were presented. Comments from interested agencies were received and incorporated into the final selection of the bus alternatives.

Figure VIII-21A presents the Bus alternative recommended for further analysis and comparison to the rail alternatives and the no project alternative. The alignment would be as follows:

- Los Angeles Segment (Broadway/Spring Couplet via Olympic Boulevard). From Union Station, the bus alignment would proceed west on Macy Street to Broadway; south on Broadway to Olympic Boulevard; and east on Olympic Boulevard to Alameda Street. From the south, the alignment would approach the downtown via Alameda Street, turn west on Olympic Boulevard to Spring Street, proceed north on Spring Street to Macy Street, and attain access to Union Station via Macy Street.

- Mid-Corridor Segment (Alameda/Artesia/Long Beach). The alignment would proceed south on Alameda Street to Artesia Boulevard, east on Artesia Boulevard, and then south on Long Beach Boulevard.

- Long Beach Segment (Long Beach Boulevard Two-Way). The bus alignment would proceed southbound on Long Beach Boulevard to First Street and the Long Beach Transit Mall where it would turn west and terminate. The Bus alternative would follow the same alignment when proceeding northbound out of Long Beach.

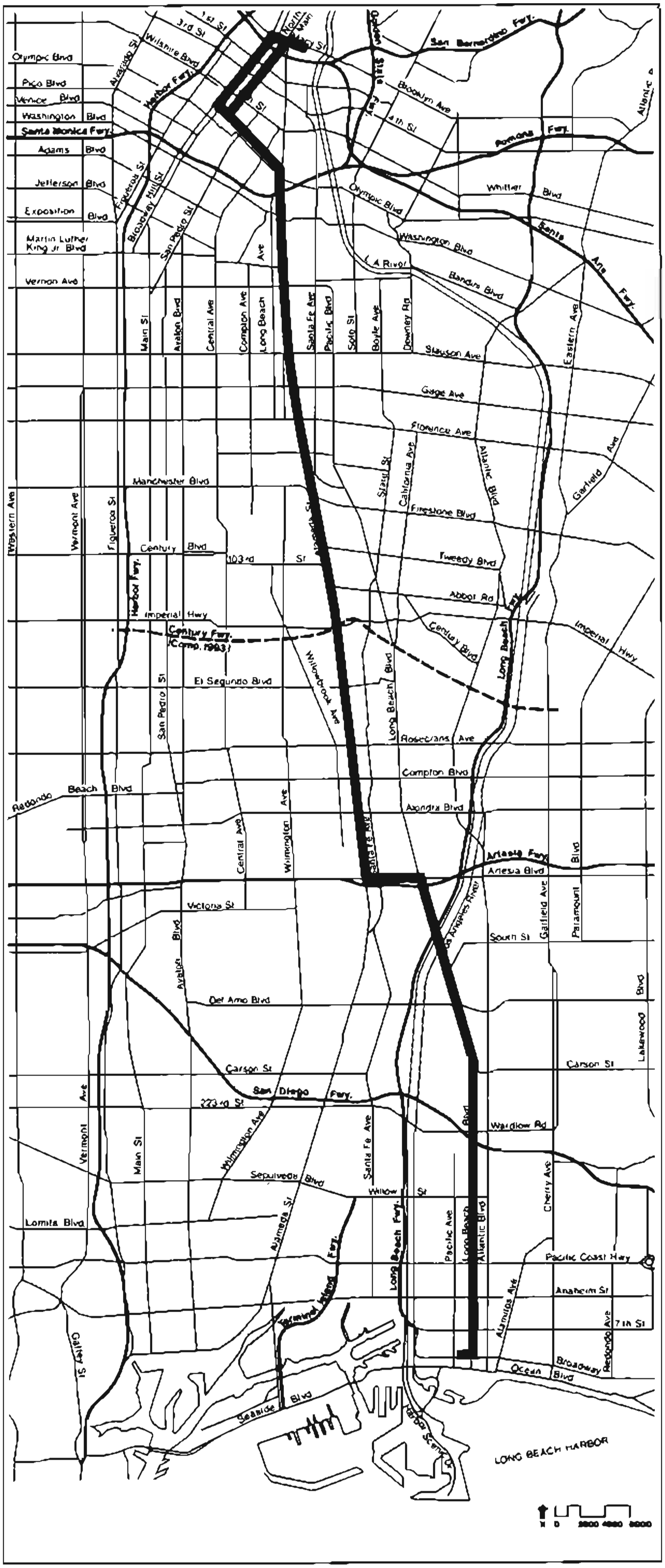


Figure VIII-21A

Bus Alternative

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

PARSONS BRINCKERHOFF / KAISER ENGINEERS

VIII-211 Patronage

The Bus alternative would produce an average daily ridership in the year 2000 of 21,980. In contrast, the light rail transit alternatives would produce daily ridership ranging between 54,446 and 76,300 passengers. The maximum daily bus boardings would be 1,996 at Washington Boulevard. The maximum southbound daily boardings would be 1,141 at Olympic/Alameda. The total daily boardings and alightings for the Bus alternative, including passenger loadings, are presented in Table VIII-21A.

Peak hour patronage was calculated for the Bus alternative using a peak hour factor of 12 percent. The resulting peak hour, peak direction patronage would be 2,638. The total daily maximum peak hour loadings in each direction would be 5,470, or 657 during peak hour connecting periods. These projected demands were used to establish equipment quantities and operations measures.

VIII-212 Systems Operations

VIII-212.1 Preliminary Operating Characteristics

A conceptual operating plan was developed for the Bus alternative for the Long Beach-Los Angeles corridor. The operating characteristics are discussed below.

VIII-212.2 Frequency of Service

The bus system would operate seven days per week, 20 hours per day, from 5:30 AM until 1:30 AM. Service would be less frequent during off-peak hours and on weekends and holidays. Headways of 6 to 8 minutes would be required during peak period, 12 to 15 minutes during off-peak periods and 20 minutes during weekends and holidays.

VIII-212.3 Fleet Size

Bus vehicle types considered for this study included conventional and articulated types. Design capacity, including standees, is generally calculated to be approximately 140 percent of seated capacity. This is the value generally used by operating properties to determine peak time service capacity. For this analysis the following design capacities were assumed:

- o Conventional Bus - 68 passengers
- o Articulated Bus - 98 passengers

The fleet size requirements would be as follows:

- o A fleet of conventional 40-foot buses would require 33 vehicles including spares.

TABLE VIII-21A

TOTAL DAILY PASSENGER BOARDINGS BY BUS STOP

Stop	Total Boardings	Stop	Total Boardings
Los Angeles Street	31	Imperial Highway	1,197
Main Street	21	El Segundo Boulevard	2
Broadway/Spring Street*	99	Rosecrans Avenue	11
Temple Street*	14	Compton Boulevard	29
1st Street*	176	Alondra Boulevard	0
3rd Street*	197	Greenleaf Boulevard	387
5th Street*	102	Artesia Blvd./Alameda Street	0
7th Street*	382	Susanna Road	370
Broadway/Spring Street*	2,338	Artesia-Long Beach Boulevard	151
Maple Street	172	Victoria Street	1,029
San Pedro Street	269	Market Street	55
Central Avenue	608	Del Amo Boulevard	467
Olympic Boulevard	1,141	San Antonio Drive	296
Washington Boulevard	1,996	Wardlow Road	124
41st Street	1,383	Willow Street	946
Vernon Avenue	1,061	Hill Street	108
55th Street	398	Pacific Coast Highway	876
Slauson Avenue	948	Anaheim Street	270
Gage Avenue	217	10th Street	183
Florence Avenue	1,409	7th Street	21
Nadeau Street	441	4th Street	231
Firestone Boulevard	977	Broadway	215
103rd Street	99	1st Street	395
Century Boulevard	138		
		TOTAL	21,980

* Includes both northbound and southbound stops of couplet.

Source: Southern California Association of Governments, 1984.

- A fleet of articulated 60-foot buses would require 24 vehicles including spares.

Peak hour headways would be 6 and 8 minutes for the conventional and articulated buses respectively. A bus turnaround time of 6 minutes was added to the roundtrip time to allow ample time for crew changing and loading and unloading of passengers.

VIII-212.4 Average Operating Speeds and Times

The run times and speeds were determined for the Bus alternative by roadway segments between Los Angeles Union Station and the Transit Mall on 1st Street in Long Beach. The bus travel speeds range from 8 mph to 31 mph and the total average trip time from end to end is 86 minutes.

Table VIII-21B provides a general comparison of travel time, patronage, and operating costs between the Bus Alternative and the rail transit baseline system alternative.

VIII-213 Complementary Bus Network

A supporting bus network to complement the Long Beach to Los Angeles Bus alternative was developed. The proposed bus route modifications for local and express services are summarized below:

- RTD Lines 55, 56, 60, 119, 360, 456, and 457 - reduce service frequencies during peak periods (15-30 minute headways).

- RTD Line 119 - extend service during peak hours south on Atlantic Avenue to terminate on Alondra.

- RTD Line 358 - eliminate service.

VIII-214 Costs

VIII-214.1 Capital Costs

Recent procurements by SCRTD indicate that the first cost of conventional advanced design buses is approximately $160,000. Negotiations for articulated buses indicate a cost of approximately $260,000 each. Total initial capital costs for the additional conventional or articulated buses would be as follows:

- Conventional Buses - 33 x 160,000 = $5,280,000

- Articulated Buses - 24 x 260,000 = $6,240,000

VIII-214.2 Operating Costs

The cost to operate a fleet of vehicles is shown in two categories, operator labor cost and energy (fuel) costs.

TABLE VIII - 21B

COMPARISON OF BUS ALTERNATIVE

TO RAIL TRANSIT BASELINE SYSTEM ALTERNATIVE

	Rail Transit Baseline System Alternative[1]	Bus Alternative
Travel Time (between 1st Street at Long Beach Boulevard and 7th Street at Spring Street)	55 minutes	74 minutes[2]
Weekday Patronage	54,446	21,980
Capital Cost (1984 dollars)	407.2 million[3]	6.2 million[4]
Annual Operating Costs (1984 dollars)	13.2 million	2.2 million[4]

Note: [1]Broadway/Spring Couplet with Atlantic Avenue Two-Way and Atlantic with Pacific Avenue Loop.

[2]As additional comparative information, the corresponding scheduled travel times for SCRTD bus routes 360 (limited) and 456 (freeway flyer), which would continue to operate under the Bus alternative, are 66 and 45 minutes, respectively.

[3]Does not include right of way costs.

[4]For Bus alternative using articulated buses.

Source: LACTC, 1984.

Using an operator/vehicle ratio and an annual labor rate similar to the rail transit analysis (1.9 operators per vehicle and $30,000 per year per operator) would result in the following costs:

- o A fleet of conventional 40-foot buses would require 55 operators at an annual cost of $1,650,000.

- o A fleet of articulated 60-foot buses would require 40 operators at an annual cost of $1,200,000.

Data from a 1981 UMTA report, "National Urban Mass Transportation Statistics," indicates that the average annual fuel and lubrication cost for the SCRTD bus fleet is approximately $8,700 per vehicle. Data on articulated bus operation (Mass Transit, December 1981) regarding prototype trials by General Motors (GM) indicates that articulated buses in the 60-foot size and weight range consume approximately 15 percent more fuel than conventional GM buses. Based upon these data, the fuel costs are estimated to be as follows:

- o A fleet of 33 conventional buses would require $287,100 for fuel and lubricants.

- o A fleet of 24 articulated buses would require $420,100 for fuel and lubricants.

VIII-214.3 Maintenance Costs

Date from the 1981 UMTA report (cited above) also indicates that the annual scheduled and non-scheduled maintenance cost per motor bus, as incurred by the SCRTD, is approximately $23,200. There may be minor differences between conventional and articulated bus maintenance costs because of the articulation, but for the purposes of this study costs would be considered equal.

- o A fleet of 33 conventional buses would cost approximately $765,600 per year for maintenance.

- o A fleet of 24 articulated buses would cost approximately $556,800 per year for maintenance.

VIII-220 AIR QUALITY

Implementing the Bus alternative within the same corridor in the place of the proposed rail transit project would not reduce vehicle miles traveled (VMT) in the local area (Regional Statistical Areas 20, 21, 23). This study area, defined by SCAG, encompasses the proposed rail transit corridor.

SCAG's transportation modeling indicates that increases in VMT over the no project levels would occur in Long Beach and the mid-corridor for the Bus alternative. As compared to the No Project alternative, VMT would be slightly reduced in downtown Los Angeles which would offset gains in the mid-corridor and Long Beach. Removing small amounts of traffic (reducing VMT) from downtown Los Angeles streets would lessen congestion and result in minor increases to travel speed, thereby lowering overall levels of reactive organic gases (ROG) and carbon monoxide (CO) in the transit corridor (RSAs 20, 21, and 23). The following table (Table VIII-22A) compares the Bus alternative with the No Project alternative.

TABLE VIII-22A

COMPARISON OF MOTOR VEHICLE TRAVEL AND EMISSIONS

BETWEEN NO PROJECT AND BUS ALTERNATIVES FOR THE YEAR 2000

Light-Duty Motor Vehicle Travel Characteristic	No Project	Bus
VMT: thousands of miles/day	27,476	27,486
AM Peak Speed: average miles/hour	19.2	19.4
PM Peak Speed: average miles/hour	21.4	21.8
ROG: tons/day	33.15	33.05
NOX: tons/day	30.49	30.55*
CO: tons/day	351.8	350.7
SOX: tons/day	2.19	2.19
TSP: tons/day	7.57	7.57

NOTE: All values presented are indicative of travel conditions in RSAs 20, 21, and 23 on an average annual day. Heavy-duty vehicular traffic is not included.

* NOX increases as vehicle speeds go up.

Source: SCAG, "Air Quality Impacts," February 9, 1984.

There would be no construction involved with the Bus alternative and, therefore, no construction-related impacts to air quality. The operation of the Bus alternative would comply with the South Coast Air Basin (SCAB) Air Quality Management Plan (AQMP). However, the minor improvements to overall air quality would not be significantly different from the No Project alternative and not as great as any of the rail projects modeled by SCAG.

VIII-230 ENERGY

Energy requirements for the Bus alternative were estimated on a regional (Southern California) basis. Comparing the Bus alternative to the No Project alternative (see following Tables VIII-23A and VIII-23B) indicates that there would be a 1,120 billion BTU savings

TABLE VIII-23A

ANNUALIZED REGIONAL TRANSPORTATION ENERGY REQUIREMENTS

AND THE BUS ALTERNATIVE*

(in Billions of BTUs)

Component	Year 1980	No Project	Bus
Vehicle Propulsion			
Automobile	548,272	538,536	537,423
Bus	3,798	5,374	5,378
Metro Rail	--	642	642
Subtotal	552,070	544,552	543,443
Vehicle Maintenance			
Automobile	119,487	164,622	164,615
Bus	107	129	129
Metro Rail	--	102	102
Subtotal	119,594	164,853	164,846
Vehicle Manufacture			
Automobile	82,147	113,177	113,173
Bus	128	155	155
Metro Rail	--	18	18
Subtotal	82,275	113,350	113,346
Guideway Construction			
Metro Rail	--	218	218
Subtotal	--	218	218
Station Operation			
Metro Rail	--	453	453
Subtotal	--	453	453
TOTAL ENERGY CONSUMPTION	753,939	823,426	822,306

* 304 days used for annualized year.

Source: Southern California Association of Governments, "Energy Impacts," February 9, 1984.

TABLE VIII-23B

VEHICULAR FUEL CONSUMPTION IN THE REGION IN THE YEAR 2000[1]

	Vehicular Miles Traveled	Person-Trips	Passenger Miles Traveled	Fuel Used and Type[2]
NO PROJECT ALTERNATIVE				
Light-Duty Vehicles	305,198,343	48,997,583	426,143,970	12,779,689 gallons of gasoline
Buses	382,708	1,411,748	19,393,212	114,927 gallons of diesel fuel
Metro Rail	30,620	406,788	2,101,740	177,400 kilowatt hours of electricity
TOTAL	305,611,671	50,816,119	447,638,922	
BUS ALTERNATIVE				
Light-Duty Vehicles	305,186,283	48,998,991	426,126,950	12,753,267 gallons of gasoline
Buses	383,003	1,388,630	19,217,465	115,016 gallons of diesel fuel
Metro Rail	30,620	428,498	2,137,662	177,400 kilowatt hours of electricity
TOTAL	305,599,906	50,816,119	447,482,077	

[1] Southern California modeling region: includes Los Angeles, Orange, Ventura, and the most highly urbanized portions of Riverside and San Bernardino counties. All data are quoted directly from model output, produced by the Southern California Association of Governments.

[2] Average heat content of fuels estimated by SCAG would be as follows:

125,000 BTUs/gallon of gasoline
1,387,000 BTUs/gallon of diesel fuel
10,520 BTUs/kilowatt hour of electricity

Source: Southern California Association of Governments, "Energy Impacts," February 9, 1984; Metro Rail figures from Los Angeles Rail Rapid Transit Project, Metro Rail - Draft Environmental Impact Report, March 1983.

per year with the Bus alternative. This would be a 0.1 percent reduction in the region's transportation energy demand. This would represent a minor energy savings although not significantly different from the No Project alternative on a comparative regional basis. In comparison, the baseline rail alternative would save 1338 billion BTUs per year.

VIII-240 NOISE AND VIBRATION

This alternative would involve the provision of additional north-south bus service in the corridor beyond that which would occur as a result of natural population and employment growth. The projected schedule for the Bus alternative would be approximately the same as for the rail transit. Therefore, some conclusions concerning potential noise impact can be drawn.

As shown in Table 11D of Section IV-115, the noise of buses is comparable to the noise of a rail vehicle. Thus, as the number of buses to be added to the roadway network would be approximately comparable to the number of rail vehicles to be added under the proposed rail transit system, the noise exposure implications would be comparable to those of the rail transit project. These effects are discussed in Sections III-114 and IV-115.

As a second way to examine the potential noise impact of additional buses, it is necessary to project the incremental change in noise exposure resulting from the incremental change in traffic volumes. Fairly large changes in traffic volumes are necessary to effect a modest change in noise exposure. For example, traffic volumes would have to double for there to be a 3 dBA increase in noise exposure, which is a barely noticeable increase.

It is unlikely that bus operations would double under the bus option. Even if such a doubling were to occur, and the portion of the noise environment due to bus traffic were to increase by 3 dBA, this would result in a total noise environment change of less than 3 dBA (since in most areas the noise of buses is only one of several components to the total noise environment). Thus, the bus option would have a small or insignificant noise impact along the proposed corridor.

VIII-250 LAND USE AND POPULATION

VIII-251 Land Use

The proposed Bus alternative would serve the same general area as the light rail line. However, in the mid-corridor, the areas to which pedestrian access would be provided would differ. Furthermore, because a bus line would not be perceived as concentrating service in a fixed area or as a major capital investment (as would a fixed rail system), it would not provide the incentive to concentrate or focus development activity to the same extent as the rail transit project.

(The potential for focusing development at fixed rail stations is discussed in Section IV-321.1.)

The area to which the Bus alternative would provide pedestrian access in the Los Angeles segment would be comparable to that provided by LA-1 (Broadway/Spring Couplet) except that the Bus alternative would serve the produce market on Olympic Boulevard rather than Washington Boulevard and the Broadway/Spring corridor south of Olympic Boulevard. As a result, it would serve about the same number of employees and shoppers but fewer residents than LA-1.

In the mid-corridor buses would travel along predominantly industrial frontages on Alameda Street. Employment density in the Alameda Street corridor would be higher than along the Wilmington Branch, but residential density would be lower. On Alameda Street north of Artesia Boulevard, there are fewer concentrations of retail activity and fewer public facilities and revitalization areas than on the proposed light rail route. The Bus alternative would serve the following redevelopment areas: the Alameda Street Corridor Target Area in the unincorporated county, the edge of the Compton CBD Redevelopment Area, and a portion of the Compton Walnut Industrial Redevelopment Area.

South of Artesia Boulevard, the Bus alternative would serve the Long Beach Boulevard corridor where both employment and residential densities are higher than in the light rail corridor. The predominant land use along the bus route is commercial, consisting of retail frontages north of Del Amo Boulevard, low-rise offices interspersed with retail and residential between Del Amo and the San Diego Freeway, and primarily retail frontages south to the proposed light rail right-of-way. In this portion of the corridor the Bus alternative would provide pedestrian access to greater concentrations of residential and nonresidential activity and to more public facilities than would the light rail transit project.

In the Long Beach segment the Bus alternative would travel along Long Beach Boulevard, which is the city's commercial spine. It would provide pedestrian access to about two-thirds of the residents who would have access to LB-2 (the Atlantic/Long Beach Couplet) and somewhat fewer employees and shoppers. It would have the advantage of traveling on a long-established transit route in Long Beach.

In summary, with respect to the geographic areas served, the Bus alternative would be comparable to the light rail alternative. With respect to the kind of service and its influence on development patterns, the Bus alternative would be likely to have less effect than the light rail alternative.

VIII-252 Population

In contrast to the rail alternatives, the Bus alternative would have little or no effect on population growth. Its major population effect would be to improve service and accessibility in the corridor. The Bus alternative in the Los Angeles segment would follow the 9th Street/Olympic corridor and then turn north along either Broadway or Spring Street to Union Station. This route would provide access to major employment and activity centers, such as the flower and produce markets, the garment district, the Civic Center core, and Union Station. While it would not serve the office center on the west side of downtown Los Angeles, its more direct route to Union Station would result in better time savings for long distance commutes, relative to existing service. The route in the mid-corridor would parallel the rail transit alternative and would provide opportunities to enhance accessibility to a slightly different set of activity centers, as described in Section 251 of this chapter. Within the Long Beach segment, the Bus alternative would be similar to light rail alternative LB-2 without service to Atlantic Avenue. The route would offer a direct connection to the regional shopping center and to the Transit Mall on 1st Street.

In summary, the Bus alternative would not be expected to significantly affect population growth but would improve accessibility over present conditions to desirable destinations in the Long Beach-Los Angeles corridor. Its route would be extremely convenient for east/west transfers, as it is intercepted by a number of intersecting bus lines. However, a direct connection to the Metro Rail Project would be provided only at Union Station. Mobility may be constrained since the buses would not be traveling within their own guideway but in mixed traffic with autos. As development occurs, primarily in the downtowns, traffic congestion would worsen and travel times for the Bus alternative would increase. In contrast, the rail alternatives would operate within their own rights-of-way, exclusively in the mid-corridor and to varying extents in the downtowns. Consequently, they would not be subject to as many street circulation problems as would the Bus alternative.

VIII-260 ECONOMIC ACTIVITY

The Bus alternative would have virtually no direct or indirect impact on the economies of the Los Angeles region, the project corridor or any of the three corridor subareas. No impacts during the "construction" phase would occur as no fixed facilities would be required, and bus vehicle manufacture would occur at a location outside of the region.

Any impact on economic activity during operation of the augmented bus system would be limited to increased expenditures and employment associated with operating and maintaining the bus coaches. No measureable effect on businesses located along the route alignment would result. Based on anticipated fleet sizes of 33 conventional coaches or 24 articulated coaches, additional personnel would be required as follows (Table VIII-26A):

TABLE VIII-26A

PROJECTED EMPLOYMENT WITH THE BUS ALTERNATIVE

	Conventional	Articulated
Operators	55	40
Mechanics	20	15
TOTAL	75	55

Source: Williams-Kuebelbeck and Associates, Inc., 1984.

In addition to this direct employment, an approximately equal number of indirect and induced jobs would be created as a result of expenditures for labor and materials. Thus, the total potential employment impact of the Bus alternative would range from 110 (articulated buses) to 150 (conventional buses) permanent jobs.

VIII-270 VISUAL QUALITY

There would be no adverse visual impacts associated with the Bus alternative in downtown Los Angeles. The buses would not change the visual setting of the adjacent areas through which they are routed, nor would they obstruct existing short-range or long-range views.

Similarly, no visual impacts would be expected in the mid-corridor, where buses would be routed along Alameda Street and Long Beach Boulevard, visually non-sensitive areas. In Long Beach, buses would be routed along Long Beach Boulevard, an existing bus corridor, and terminate in the existing 1st Street Transit Mall. This proposal would not change the visual setting nor obstruct existing views.

VIII-280 TRAFFIC AND TRANSPORTATION

The traffic impacts of the Bus alternative alignment were analyzed for the AM peak period in the year 2000 using 9 screenlines drawn within the project corridor: 2 in Los Angeles CBD, 4 in the mid-corridor and 3 in Long Beach (see Figures IV-13A, IV-23A, and IV-33A). Each screenline crossed an average of 8 major arterials. The resultant traffic volumes are presented in Table VIII-28A.

TABLE VIII-28A

YEAR 2000 AM PEAK PERIOD TRAFFIC VOLUMES

BUS ALTERNATIVE

	No Project	Bus Alternative
Screenline 1: LA CBD Between Grand Avenue and Olive Street		
Eastbound	13,242	13,237
Westbound	15,067	15,067
TOTAL	28,309	28,304
Screenline 2: LA CBD Between 5th and 6th Streets		
Southbound	7,321	7,341
Northbound	9,375	9,411
TOTAL	16,696	16,752
Screenline 6: Mid-Corridor Between Compton and Alondra Boulevards		
Southbound	27,007	25,698
Northbound	36,049	37,031
TOTAL	63,056	62,729
Screenline 7: Mid-Corridor Between Slauson and Florence Avenues		
Southbound	11,106	11,152
Northbound	26,709	26,776
TOTAL	37,815	37,928
Screenline 8: Mid-Corridor Between Wilmington and Central Avenues		
Eastbound	16,127	16,115
Westbound	24,407	24,367
TOTAL	40,534	40,482
Screenline 9: Mid-Corridor Between Alameda Street and Pacific Avenue		
Eastbound	14,738	14,723
Westbound	27,381	27,439
TOTAL	42,119	42,162
Screenline 3: Long Beach Between Pacific Coast Highway and Anaheim Street		
Southbound	21,985	22,704
Northbound	22,512	21,676
TOTAL	44,497	44,380
Screenline 4: Long Beach Between Atlantic and Orange Avenues		
Eastbound	7,848	5,707
Westbound	24,221	24,005
TOTAL	32,069	29,712
Screenline 5: Long Beach Between Long Beach Freeway and Magnolia Avenue		
Eastbound	8,903	8,818
Westbound	17,721	17,721
TOTAL	26,624	26,539

Note: AM Peak Period is between 6:30 AM and 8:30 AM weekdays.

Source: Southern California California Association of Governments, 1984.

Screenlines 1 and 2 in Los Angeles CBD produced a very small variation in the east-west traffic between the condition and the Bus alternative. North-south traffic would show an increase of 0.3 percent over the condition. The Bus alternative would produce lower eastbound traffic than any of the light rail or No Project alternatives.

In the mid-corridor, Screenline 6 (between Compton and Alondra Boulevards) showed the highest variation in traffic volumes. The southbound traffic would show a decrease of 4.8 percent for the Bus alternative over the condition. (By contrast all the rail transit alternatives would show even larger decreases in traffic, as high as 7.6 percent with the Olympic/9th Aerial with Los Angeles River Route alternative.) The variations in traffic on Screenlines 7, 8 and 9 with the Bus alternative would be small when compared to the no project condition.

Screenline 4, in Long Beach between Atlantic and Orange Avenues, showed the greatest reduction (27 percent) in the eastbound traffic for the Bus alternative over the no project condition which would be similar to the light rail alternatives. Variations in traffic on the other Long Beach screenlines were small in comparison, ranging from no change to a reduction of 1.3 percent.

A summary of traffic impacts for the Bus alternative is presented in Table VIII-28B. A screenline check along Washington Boulevard from Harbor Freeway to Santa Fe Avenue, then along the Los Angeles River to Macy Street shows the change in the traffic entering and leaving downtown Los Angeles from the south. The Bus alternative would produce virtually no change in vehicular traffic over the no project condition. By comparison, all of the light rail alternatives would show a slight reduction in traffic entering and leaving the CBD, ranging from 0.04 percent to 0.15 percent.

The total daily vehicle miles traveled (VMT) in the Los Angeles CBD would decrease insignificantly (0.015 percent) with the Bus alternative. The daily VMT in the mid-corridor would increase with the Bus alternative (0.03 percent). In comparison, the light rail alternatives would produce a decrease in VMT of between 0.04 percent to 0.11 percent.

A screenline check along the south of Carson Street from Long Beach Municipal Airport to Alameda Street shows that with the Bus alternative, the traffic volume entering and leaving Long Beach from the south would increase by 0.17 percent over the no project condition. In contrast, the light rail alternatives would produce a reduction of 0.69 percent to 0.76 percent. The total VMT in Long Beach with the Bus alternative would produce an increase of 0.09 percent as compared to a reduction in VMT of about 0.3 percent for the light rail alternatives.

The change in the year 2000 peak hour traffic volumes on major arterials comprising the Bus alternative route over the no project

TABLE VIII-28B

SUMMARY OF YEAR 2000 TRAFFIC IMPACTS

BUS ALTERNATIVE

	No Project	Bus Alternative Change Over No Project
1. Screenline Traffic Volumes (2-Way)		
Crossing Washington Blvd./ LA River	1,759,927	+68
Crossing South of Carson St.	341,974	+592
2. Peak Hour Traffic Volumes		
Crossing Washington Blvd./ LA River		
Inbound AM Peak	275,414	+11
Outbound PM Peak	189,883	+ 7
Crossing South of Carson St.		
Inbound AM Peak	53,515	+94
Outbound PM Peak	36,896	+64
3. Daily Vehicle Miles Traveled (VMT)		
In Los Angeles CBD	3,588,763	-526
In Mid-Corridor	18,157,120	+4831
In Long Beach	8,002,250	+7185
4. Daily Vehicle Hours Traveled		
In Los Angeles CBD	139,444	-876
In Mid-Corridor	711,933	-8453
In Long Beach	284,803	-1306

Source: Southern California Association of Governments, 1984.

condition would be very small, ranging from virtually no change to less than +0.1 percent. The change in ratios for key intersections with major cross streets along the Bus alternative route would also be insignificant.

VIII-281 Corridor and Regional Impacts

Within the Long Beach-Los Angeles corridor, the no project condition should result in 271,318 home-work auto trips in the year 2000. The Bus alternative would produce a small increase of 0.20 percent in the home-work auto trips over the no project condition. On a countywide level, the Bus alternative would cause an insignificant increase in the home-work auto trips by 632 (0.02 percent) over the no project condition. Also, the Bus alternative would reduce the total transit trips of 1,434,424 countywide by 0.14 percent.

A summary of Long Beach-Los Angeles corridor and the Los Angeles county and regional traffic impacts for the Bus alternative in the year 2000 is presented in Table VIII-28C.

VIII-282 Impacts on Local Transit Patronage

The extent to which the local transit patronage in the Los Angeles-Long Beach corridor would be affected by the Bus alternative was measured at three screenlines across the corridor. Findings of the screenline analysis showing change in local transit total daily trip volumes are presented in Table VIII-28D.

The prime indicator of the local transit impacts examined was the change in total daily work trip boardings on 5 selected bus lines which would parallel the bus alignment for much of its length. The results of the evaluation are presented in Table VIII-28E. The most significant change would be on Line 4-39 (RTD Line 60/360) where the daily work trips would be reduced by 67 percent.

VIII-283 Impact of Bus alternative on Major Transit Facilities

The Bus alternative, although quite similar to the year 2000 no project condition, would produce considerably different volumes on the Metro Rail system. Under the year 2000 condition, 381,889 total trips would be made on Metro Rail, whereas the Bus alternative would produce a 5.5 percent increase in Metro Rail trips. On the Santa Ana transitway (I-5) and the Harbor transitway (I-110), the Bus alternative would produce an increase in patronage of 645 (+0.3 percent) and 2,358 (+3.5 percent) respectively. The impact on the Century Freeway transitway (I-105) would be a decrease of 7,497 (-5.1 percent) in total patronage.

TABLE VIII-28C

SUMMARY OF YEAR 2000 CORRIDOR AND REGIONAL TRAFFIC IMPACTS

BUS ALTERNATIVE

	No Project	Bus Alternative	Change From No Project Alternative
1. Daily Vehicle Miles Traveled (VMT)			
LB-LA Corridor	29,748,133	29,759,623	+ 11,490
Los Angeles County	177,795,425	177,786.300	- 9,125
Region	305,198,343	305,186,283	- 12,060
2. Average Trip Length			
LB-LA Corridor	9.02	9.02	0
Los Angeles County	8.94	8.94	0
Region	8.70	8.70	0
3. Vehicle Hours Traveled			
LB-LA Corridor	1,136,180	1,125,545	- 10,635
Los Angeles County	6,442,411	6,392,717	- 49,694
Region	11,143,762	11,034,740	-109,022

Source: Southern California Association of Governments, 1984.

TABLE VIII-28D

YEAR 2000 CHANGE IN LOCAL TRANSIT TOTAL DAILY TRIP VOLUMES

BUS ALTERNATIVE

	LA CBD Screenline So. of Washington		Mid-corridor Screenline No. of Century		South Corridor Screenline Long Beach No. of PCH	
Alternative	Daily Trips	Change in Local Transit Trips	Daily Trips	Change in Local Transit Trips	Daily Trips	Change in Local Transit Trips
No Project	36,152		9,918		9,669	
Bus alternative	28,698	-21%	7,466	-25%	8,230	-5%

Source: Southern California Association of Governments, 1984.

TABLE VIII-28E

YEAR 2000 CHANGE IN TOTAL WORK-TRIP BOARDINGS/DAY

ON FIVE SELECTED PARALLEL LOCAL TRANSIT LINES

BUS ALTERNATIVE

	Bus Line									
	4-34		4-35		4-36		4-37		4-39	
Alternative	Daily	Percent Change from No Project	Daily	Percent Change from No Project	Daily	Percent Change from No Project	Daily	Percent Change from No Project	Daily	Percent Change from No Project
No Project	2,585		12,758		2,834		3,599		3,899	
Bus Alternative	2,400	-7	13,371	+5	2,785	-2	3,170	-11	1,270	-67%

Note: Line 4-34 = RTD Line 51/320
Line 4-35 = RTD Line 53
Line 4-36 = RTD Line 55
Line 4-37 = RTD Line 56
Line 4-39 = RTD Line 60/360

Source: Southern California Association of Governments, 1984.

VIII-300 Environmentally Superior Alternative

The California Environmental Quality Act guidelines call for discussion of the "environmentally superior alternative," in consideration of avoidance of adverse impacts of the proposed action. For "local" impacts, i.e., those that occur close to the project, the Bus alternative would create fewer adverse impacts on vegetation, wildlife, noise, displacement, visual quality, and historic structures. However, the differences between the adverse impacts of the Bus alternative and the adverse impacts of most of the rail transit alternatives are very slight. On a regional basis, the rail transit alternatives are generally superior to the Bus alternative and to no project: regional miles traveled would be reduced, air quality would improve, energy usage would decline, and transit service levels would be improved. Again, the differences between the rail alternatives and the Bus alternative would be very slight. Overall, the level of transit service provided to residents of the corridor would be greater with the rail alternatives.

The environmentally superior alternative in terms of avoidance of any significant adverse local impacts would be the No Project alternative. However, none of the beneficial impacts associated with project implementation would occur if the project is not built.

Appendix

1

APPENDIX 1

RELATED PROJECTS

NAME: Los Angeles Rail Rapid Transit Project (Metro Rail Project)

RESPONSIBLE AGENCIES: Southern California Rapid Transit District (SCRTD), Urban Mass Transportation Administration (UMTA).

DESCRIPTION/LOCATION: The locally preferred rail rapid transit project is an 18.6-mile subway including 18 stations. It would run from Union Station through downtown Los Angeles, west along the Wilshire Corridor, and then north through the Fairfax community and West Hollywood. The line would then proceed eastward to serve Hollywood and continue through the Cahuenga pass to the San Fernando Valley. Metro Rail is expected to be in operation by 1990 and a daily ridership of 360,000 is projected by the year 2000.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: Interface with the Metro Rail system would occur at Union Station with the Broadway/Spring Couplet (LA-1) and at the 7th Street station with the two westside alternatives (LA-1 and LA-3). The 7th Street stations of LA-2 and LA-3 would be constructed to accommodate both rail systems while separate but interconnected terminal stations will be constructed at Union Station. Transfer opportunities will be made available at all three Metro Rail/LB-LA Rail Transit Project interfaces.

STATUS: The FEIS has been published and tentatively approved by UMTA.

NAME: American High Speed Bullet Train

RESPONSIBLE AGENCY: American High Speed Rail Corporation

DESCRIPTION/LOCATION: The proposed 130-mile alignment would run from Los Angeles International Airport (LAX) to downtown Los Angeles and south through Orange County to downtown San Diego. From LAX to Union Station, an existing ATSF right-of-way would be used. South from Union Station through LA County, the route would follow the west bank of the LA River to the SPTC Santa Ana Branch, which it would follow into Orange County. The system is scheduled for completion in 1988. At that time it is expected to carry 100,000 passengers per day on 45 round trips.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: Interfaces between the Bullet Train and the light rail system would occur at Union Station, where transfer opportunities would exist, and at

Slauson Junction, where the east/westbound Bullet Train would intersect the north/southbound light rail alignment. At the latter location an elevated light rail guideway and station are proposed to clear the existing SPTC freight tracks. To clear both the SPTC freight tracks and the elevated light rail guideway and station, the Bullet Train would require even greater elevation, possibly as high as 232 feet.

STATUS: The project is currently in the environmental review process. A DEIR is scheduled for completion in mid 1984.

NAME: Proposed U.S. Postal Facility on Vacant Goodyear Tire Site

RESPONSIBLE AGENCIES: U.S. Postal Service

DESCRIPTION/LOCATION: If constructed, the new postal facility would be located on the site of the former Goodyear Tire Plant. The proposed site contains approximately one million square feet and is bounded by Gage Avenue on the north, Florence Avenue on the south, Central Avenue on the east, and McKinley Avenue on the west. The new postal facility would serve as a mail processing and distribution center, replacing Terminal Annex in downtown Los Angeles. Total employment for the project is expected to be 4,700 (1,530 during the day shift). Most of these employees will be transferred from the present facility at Terminal Annex.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: The proposed postal facility would be located approximately one mile west of the rail transit alignment. The only significant impact the facility would have on the rail transit system is the generation of east-west traffic crossing the alignment. This is most likely to occur at the Florence Avenue crossing where an estimated 1,095 vehicles originating from the facility will cross the alignment during the PM peak period.

STATUS: An Environmental Assessment was completed in May, 1983. This report is being used to determine whether or not an EIS will be required.

NAME: San Bernardino Freeway - Busway Extension

RESPONSIBLE AGENCIES: California Department of Transportation (Caltrans), Federal Highway Administration (FHWA)

DESCRIPTION/LOCATION: The proposed project involves extending the 11-mile San Bernardino Freeway busway by about 3/4 mile from its current westerly terminus at Mission Road to Alameda Street just south of Union Station in downtown Los Angeles. A typical cross-section of the busway extension would be a 54-foot-wide elevated structure with a median barrier separation.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: The San Bernardino Freeway busway extension will carry only buses and high occupancy vehicles (HOV). At present, the busway carries 24,000 bus and 8,000 HOV person-trips per day. By the year 2000, it is expected to carry 60,000 bus and 13,000 HOV person-trips daily. The busway will terminate at Alameda Street and not actually enter Union Station. From this point, busway users would have access to Union Station where they could transfer to other local buslines, Amtrak, Trailways intercity buses, and the proposed Metro Rail and LB-LA Rail Transit Project systems.

STATUS: The FEIS for the San Bernardino busway was approved by the FHWA in September, 1981. This approval made the project eligible for funding. Construction is scheduled to begin in mid-1984 with final completion expected in 1986.

NAME: Interstate 110 Freeway Transitway-Harbor Freeway Corridor

RESPONSIBLE AGENCIES: Caltrans, FHWA

DESCRIPTION/LOCATION: The proposed transitway would be a bi-direction/two-lane bus/HOV facility constructed in the Harbor Freeway corridor (I-110) between San Pedro and the Convention Center in the City of Los Angeles, a distance of 22 miles. The bus/HOV transitway would function as a limited service trunk line with a bus feeder system. Access will be provided at nine locations. The transitway would be constructed to allow conversion to rail service when patronage warrants a change. The peak directional bus/HOV traffic is projected to be 61,400 person-trips per day.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: Since the service areas of the two systems overlap, it is possible that they will be competing with each other for riders.

The two systems would eventually be interlinked by means of an east-west transitway to be constructed as part of the Century Freeway (I-105) project. Transit stations built along I-105 will provide access to both the rail transit line and the I-110 transitway. If and when the I-105 and I-110 transitways are converted to rail transit, it may be possible to run through trains from the LB-LA system to the Harbor transitway and vice versa, via I-105.

STATUS: The DEIS has been circulated and the comment period was closed in March 1983. Preparation of the FEIS is in progress. State and federal funds have been committed to the project and construction could begin in the 1983/84 fiscal year.

NAME: Interstate 5 Freeway Transitway-Santa Ana Corridor

RESPONSIBLE AGENCIES: Caltrans, FHWA

DESCRIPTION/LOCATION: The proposed transitway would be constructed on the Santa Ana Freeway (I-5) between the Los Angeles CBD and the Fullerton park-and-ride lot, a distance of 21 miles. A branch connector would also be constructed along the I-605 freeway from the I-5/I-605 interchange in Downey and Santa Fe Springs to the I-605/SPTC West Santa Ana Branch underpass in Downey, and along the SPTC right-of-way from I-605 to the Orange County line in Cerritos.

Alternatives studied for the I-5 transitway include bus/HOV and rail transit. A 2.5-percent increase in transit ridership and a maximum reduction of approximately 750,000 vehicle miles traveled in the I-5 corridor is expected with the completion of the transitway.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: If the bus/HOV alternative is chosen, the I-5 transitway would not connect directly with the LB-LA line. The bus/HOV terminus would be at Whittier/6th Street and would not extend to Union Station. High frequency bus service would be provided from the terminus to the central business district with connections to the rail transit line.

The rail transit alternative would terminate at Union Station via the San Bernardino transitway. This would require converting the existing San Bernardino busway to rail transit operations. If this option is implemented, interface between the Santa Ana transitway and the LB-LA line would occur at Union Station where transfer opportunities will be made available.

STATUS: The DEIS was circulated to the public and the comment period ended in September 1983. Since that time, the I-110 Harbor Freeway transitway was tentatively approved and funds committed for its construction. Because available federal funding has been allocated to the I-110 project, the I-5 transitway has been dropped from immediate consideration. The California Transportation Commission is currently studying various options by which transit service might be improved in the I-5 freeway corridor without construction of the proposed transitway. The most likely option is increased bus service on the existing facility. The construction of a transitway is still included in Caltrans' long-range plans, but implementation dates have not been established.

NAME: Interstate 105-Century Freeway/Transit Corridor

RESPONSIBLE AGENCIES: Caltrans, FHWA

DESCRIPTION/LOCATION: When constructed, the I-105 freeway/transitway will be a 6-lane, fully access-controlled highway between Sepulveda Boulevard near LAX and the I-605 freeway in the City of Norwalk. The project length is 17.2 miles and has a basic right-of-way width of 320 feet. The median area of the project will initially contain exclusive bus/HOV lanes. The bus/HOV could be converted to a rail facility in the future if found desirable to do so. The ADT on the section of I-105 freeway intersecting the light rail line is expected to be 10,700 during the evening peak period (4 PM to 6 PM) with 10 percent using the bus/HOV lanes.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: The I-105 freeway/transitway would intersect the LB-LA line at 117th Street in the community of Willowbrook. A dual station would be located at this point where patrons could transfer from one system to the other. According to Caltrans, most of the riders transferring from the I-105 facility to the LB-LA line would have come from an easterly direction. Riders coming from the west would have an intervening opportunity at the Harbor Freeway transitway.

STATUS: The FEIS for the I-105 freeway/transitway was approved in 1977. Acquisition of the right-of-way has been underway and preliminary construction activities are beginning on portions of it. Overall completion of I-105 is expected by 1990. Construction of the segment of I-105 that would intersect with the LB-LA line is scheduled to begin in 1986.

NAME: Intermodal Container Transfer Facility (ICTF)

RESPONSIBLE AGENCIES: Los Angeles Harbor Department, Long Beach Harbor Department and the Southern Pacific Transportation Company

DESCRIPTION/LOCATION: The ICTF will provide a closer, more centralized location for the transfer of marine-oriented containers from the container terminals to the rail transfer yards. At present these containers are trucked 22 to 28 miles from the ports area to downtown Los Angeles railyards. With construction of the ICTF, containers transported by SPTC would be trucked only 4 to 6 miles. The site proposed for the ICTF would, in its ultimate development, encompass 260 acres bounded by Sepulveda Boulevard and Willow Street on the south, 223rd Street on the north, the Los Angeles and Long Beach city limits on the east, and the Los Angeles and Carson city limits on the west.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: Containers that were once trucked to downtown Los Angeles railyards would be transported by freight trains operating in the same SPTC right-of-way (the Wilmington Branch) to be occupied by the LB-LA line. At present, there are 7 through train movements daily on the Wilmington Branch. If the ICTF is constructed, that number could increase by 14.

STATUS: The FEIR was certified by the Los Angeles and Long Beach Boards of Harbor Commissioners in October 1982. The first phase of construction is scheduled from spring 1984 to 1990. Expansion of the facility will occur during two additional construction phases scheduled for 1991 to 1995 and 1996 to 2000, respectively.

NAME: Long Beach International Coal Project

RESPONSIBLE AGENCIES: Port of Long Beach

DESCRIPTION/LOCATION: This project involves the construction of a coal transshipment terminal in the northwest portion of the Port of Long Beach on the north bank of the Cerritos channel between Berths 89 and 94. The function of this facility will be to transfer coal from unit trains originating from mines located throughout the western United States to ships bound for Pacific Rim countries. It is expected that when completed the terminal would transfer 15 million tons of coal per year.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: The proposed coal train access to the Port of Long Beach would be via the UP San Pedro Branch or the ATSP's Harbor District. If, however, a railroad consolidation plan currently being considered by SCAG is implemented, all rail fright traffic bound for the ports of Long Beach and Los Angeles would use the SPTC San Pedro Branch.

At present, 2 to 4 daily coal train passages to the Port of Long Beach on the UP and ATSF tracks. This frequency would increase to 6 to 8 daily passages with the construction of the transfer facility. Since all three of the possible coal train routes parallel and intersect the proposed LB-LA line, significant auto traffic impacts may result with the increased frequency of rail freight movement.

STATUS: The FEIR is scheduled for completion in 1984. Construction of the project will not begin until the Port of Long Beach can be assured of securing the coal export contracts necessary to support the operation of the facility.

NAME: San Pedro Bay Ports Access Study

RESPONSIBLE AGENCIES: Southern California Association of Governments (SCAG)

DESCRIPTION/LOCATION: In order to accommodate the projected increase in rail freight traffic to the Ports of Long Beach and Los Angeles, SCAG is investigating various alternatives for routing SPTC, UP and ATSF rail traffic from their respective mainlines to the two ports.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT: One of the above-mentioned alternatives is to consolidate all through train movement of all three railroads to a single rail corridor from the mainlines to the ports. Of the number of rail corridors considered for consolidated freight movement, the SPTC San Pedro Branch has been selected as the preferred alternative. The SPTC San Pedro Branch parallels the proposed LB-LA Rail Transit Project alignment from Washington Boulevard to the Dominguez Junction where a grade-separated intersection would occur. If the consolidation alternative is implemented in the SPTC San Pedro Branch Corridor, the number of through trains using the San Pedro Branch would increase significantly, thus combining with the light rail line to impede east-west auto traffic patterns.

STATUS: Currently under study by SCAG.

Appendix

2

APPENDIX 2

GLOSSARY OF TERMS AND ABBREVIATIONS

Above-Grade: Above existing ground level

Absorption Rate: The amount of newly constructed floor space in a given geographical area that is occupied over a period of time; the absorption rate is usually averaged on an annual basis

ADT: Average Daily Traffic (sum of two direction traffic volumnes)

Aerial Station: A passenger station in which the guideway and platform are located on an above-grade structure

Air Quality Hot Spot: A location where ambient carbon monoxide concentrations exceed the national ambient carbon monoxide concentrations

Alignment: The horizontal location of a guideway or roadway

AM Peak Period: Between 6:30 AM and 8:30 AM on weekdays

ANL: Argonne National Laboratory

AQMA: Air Quality Management Area

AQMD: Air Quality Management District

AQMP: Air Quality Management Plan

ARB: Air Resources Board

Articulated Bus: An extra-long bus that has the rear portion flexibly but permanently connected to the forward portion, providing a continuous interior through the two parts

Articulated Light Rail Vehicle: A light rail car consisting of two or more full-size units free to swivel with the inner ends being carried on a common bogie. Passengers are allowed free access through the articulated joint.

At-Grade: A guideway or road with vertical alignment at elevations generally the same as the surrounding areas (i.e., not elevated or depressed)

ATSF: Atchison, Topeka and Santa Fe Railway

Ballast: An integral part of the track structure composed of crushed rock or slag, the function of which is to support rails, distribute loads, and provide drainage for the track structure

Barrier-Free Fare Collection: A fare collection system which provides for self-service (vending machine) pre-purchase of fares at transit stations with proof-of-fare payment by on-board inspectors

Baseline System Alternative: A project system comprised of the Broadway/Spring Couplet (LA-1), the Compton At-Grade (MC-1) and the Atlantic with Pacific Avenue Loop (LB-4) alternatives. This system alternative has been identified for the purpose of evaluating the performance, cost and impact characteristics of each of the alternative light rail systems

Below-Grade: Below existing ground level

Berm: A horizontal ledge cut between the foot and the top of an embankment to stabilize the slope by intercepting sliding earth.

BTU: (British Thermal Unit): An energy unit equal to the quantity of heat required to raise the temperature of one pound of water one degree farenheit

Bunker Hill Redevelopment Project: A project established by the City of Los Angeles Community Redevelopment Agency in 1959 to redevelop the Bunker Hill neighborhood of downtown Los Angeles. To date, project activities have included: removing slum housing and deteriorated commercial properties; regrading Bunker Hill; and improving the tax base of the area by the construction of mixed-use commercial, residential and public services development

Busway: A roadway which is used exclusively for buses, usually operating in express service

CALINE Model: California Line Source Model. A mathematical model developed by the Caltrans Transportation Laboratory to predict carbon monoxide levels in the atmosphere

CALTRANS: California Department of Transportation

Carpool: An automobile with three or more occupants

Catenary: An overhead wire configuration from which a transit vehicle collects power

CBD: Central Business District

CBD Redevelopment Project: A project established by the Los Angeles Community Redevelopment Agency to eliminate blight, foster growth and create a new residential community (i.e., South Park) in the downtown Los Angeles Commercial core

CCTV: Closed circuit television

CEC: California Energy Commission

Centers Concept Plan: An urban design concept incorporated into the City of Los Angeles General Plan which promotes the development of high intensity activity centers and the preservation of low density suburban centers

Census Tract: Small areas into which large cities and adjacent areas are divided by the U.S. Census for the purpose of providing comparable small area statistics

Central Groundwater Basin: A hydrographic basin which includes the south central portion of Los Angeles County

CEQA: California Environmental Quality Act, 1970

CHABA: Committee on Hearing Bioacoustic and Biomechanics, National Academy of Sciences

CNEL: (Community Noise Equivalent Level): An average of the A-weighted noise levels occurring over a full 24-hour period, with adjustments applied to those levels occurring during evening and nighttime hours in order to account for the greater sensitivity of people to noise and vibration levels during these hours. Specifically the noise levels occurring between 7 PM and 10 PM have an adjustment of 5dB, while noise levels occurring from 10 PM to 7 AM have an adjustment of 10dB. These weighted evening and nighttime noise levels are then averaged together with the unweighted daytime noise levels to provide an equivalent hourly average

Contra-Flow Lane: A highway or street lane on which public mass transit or other specially designed vehicles operate in a direction opposite to that associated with the normal flow of traffic

Couplet: An adjacent pair of one-way streets running in opposite directions designed to add continuity and capacity to the roadway and facilitate the flow of traffic

CRA: Los Angeles Community Redevelopment Agency

Cut-and-Cover Construction: A method of tunnel construction in which a trench is first excavated, a tunnel structure is constructed, and the trench is then backfilled

dBA: A-weighted decibels which correspond to subjective perception of noise levels by the human ear

Decibel: A unit of measurement of the intensity of sound

DIER: Draft Environmental Impact Report (a State of California environmental document)

DEIS: Draft Environmental Impact Statement (a federal environmental document)

Delphi Technique: A forecasting technique in which future scenarios are developed by gathering the opinions of people who have considerable knowledge of the issue in question

Dewatering: Removing water from a construction site, such as a tunnel or a trench, by pumping or draining

Displacement: Act of displacing firms, persons, and households from structures taken by eminent domain for transit rights-of-way and later to be demolished or relocated to permit transitway construction

Downtown People Mover Project (DPM): A now-cancelled aerial guideway project which would have connected Union Station with the Los Angeles Convention Center

Drawdown: The magnitude of the change in water surface level in a well, reservoir or natural body of water resulting from the withdrawal of water

DTIM: Direct Travel Impact Mode

Dwell Time: The total time from the instant that a train stops in a station until it resumes moving

Elastic Demand: Demand for a commodity or service which increases with a concurrent increase in the supply of the same commodity or service

Elderly/Senior Persons: Persons 65 years or older

Emergency Vehicle: Any vehicle normally used by state or local law enforcement, fire and medical authorities, or private industry to provide emergency service

Fail-Safe Design: A design which permits continued operation in spite of the occurrence of a failure

FEIR: Final Environmental Impact Report (a State of California environmental document)

FEIS: Final Environmental Impact Statement (a federal environmental document

FEMA: Federal Emergency Management Agency

FHWA: Federal Highway Administration

FIRM: Federal Insurance Rate Maps. Maps published by FEMA to indicate flood potential for various areas

Fractional Impact Methodology: A means of taking into account the absolute level of the future noise environment, the level of the existing noise environment, and the distribution of people exposed to various noise levels

Fugitive Dust: Any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man

Gap Closure: Completion of a link between two existing segments of a road or rail system

Grade Crossing: A physical arrangement of two transportation routes where there is a physical interference between rail and other vehicles on each route

Grade Separation: Intersection of guideways or roads with different vertical alignments where there is a reduction or elimination of conflict between the respective alignments

Guideway: The structure and its appurtenances upon which the transit vehicle will travel and be guided

Headway: The time separation between two trains, both traveling in the same direction on the same tract, measured from the time the head end of the leading train passes a given reference point to the time the head end of the train immediately following passes the same reference point

Home-Work Trip: A person-trip originating at home and terminating at one's place of work

HOV (High Occupancy Vehicle): Autos used in carpools (three or more persons) and vanpools

Infill: Vacant land suitable for development in existing urban areas.

Interface: The junction between two transportation systems or subsystems

Junction: A location where train routes converge or diverge

Kiss-and-Ride: Auto drop-off and pick-up of transit riders

LA-1: Broadway/Spring Couplet, At-Grade, Alternative

LA-2: Flower Street Subway Alternative

LA-3: Olympic/9th Aerial Alternative

LA Basin: A coastal plain bounded on the northeast by the San Gabriel Mountains, Puente Hills, and San Jose Hills; on the northwest by the Santa Monica Mountains; on the west by the Pacific Ocean; on the southwest by the Palos Verdes Hills and San Pedro Bay; and on the east and southeast by the Santa Ana Mountains

LADOT: City of Los Angeles Department of Transportation

LACTC: Los Angeles County Transportation Commission

Landfills:

- o Class I: Accepts hazardous wastes and all other non-radioactive wastes

- o Class II: Accepts nontoxic biologically or chemically degraded and inert materials

- o Class III: Accepts non-degradable, non-water soluble solids and inert materials

- o Class IV: Designed to Class II Standards but accepts certain Class I materials that are minimally hazardous

LAPD: Los Angeles Police Department

LARTS: Los Angeles Regional Transportation Study

LB-1: Atlantic Avenue Two-Way Alternative

LB-2: Atlantic/Long Beach Couplet Alternative

LB-3: Los Angeles River Route Alternative

LB-4: Atlantic with Pacific Avenue Loop Alternative

LBTC: Long Beach Transit Company

L_{dn}: (Day-Night Noise Level): Measurement of subject response to noise levels over 24 hours, expressed in A-weighted decibels. The 24-hour period is divided into day and night periods with the night period (i.e., 10 PM to 7 AM) having an adjustment added to account for greater sensitivity to noise at that time

L_{eq} (Energy Equivalent Level): A number representing average sound energy over a measurement period, expressed in A-weighted decibels

Little Tokyo Redevelopment Project: A project established by the Los Angeles City Redevelopment Agency in 1970. The primary objectives of this project have been to eliminate blight, improve appearance, improve circulation and stimulate the economy

LOS (Level of Service): The relative quality of service provided by various transportation alternatives (i.e., Level of Service "a" is free flow, and Level of Service "F" is stop and go)

Low-Income Household: Households with incomes below 125% of the federally defined poverty level

LRT: Light Rail Transit

LRV: Light Rail Vehicle

LWP (Level Weighted Population): A measure of the number of people affected by a weighted noise level determined by the fractional impact methodology

Market-Rate Housing: Housing where cost is determined by the housing market and not affected by such factors as subsidies or rent control

MC-1: Compton At-Grade Alternative

MC-2: Compton Grade Separation Alternative

MC-3: SPTC Railroad Relocation

Metro Rail Project: A proposed 18.6-mile rail rapid transit line designed to connect downtown Los Angeles with the San Fernando Valley via the Wilshire Corridor, Hollywood and the Cahuenga Pass

Mixed Traffic: Roadway traffic which includes autos, buses, trucks and light rail vehicles

Mode Split: The division of person-trips among available modes of transportation

Mode of Access Split: The division of transit station arrivals among available modes of transportation

Multi-Family Housing Unit: A housing contained in a structure having more than one housing unit

National Register (of Historic Places): A listing maintained by the Heritage Conservation and Recreation Service of architectural, archaeological, and cultural sites of local, state, or national significance

NEPA: National Environmental Protection Act, 1969

NII: Noise Impact Index

Nonattainment Area: An area designated by the United States Environmental Protection Agency as presently violating the National Ambient Air Quality Standards

NOx: Oxides of Nitrogen (nitrogen oxide and nitrogen dioxide). Pollutants released during combustion of fossil fuels

NPDES: National Pollution Discharge Elimination System

Noise Sensitive Receptor: A land use with a high degree of sensitivity to noise. Such uses include homes, churches, schools, medical facilities and theaters

No Project Alternative: A future condition without the proposed project against which the project alternatives can be compared

Overcrowded Housing Unit: A housing unit which is occupied by more than one person per room

Park-and-Ride: Commuter transit service and associated facilities oriented toward passengers who drive to station areas in private autos and park

PB/KE: Parsons Brinckerhoff/Kaiser Engineers

Peak Hour: The 60-minute period in a typical weekday which accommodates the largest number of automobile or transit patrons

Pedway: A walkway facility designed exclusively for pedestrians which serves to alleviate pedestrian-vehicular conflict

Person-Trip: A trip made by a person by any mode or combination of modes for any purpose

Person-Year: A measurement of the amount of employment generated by the construction of a project, generally defined as 2080 man-hours

Platform, Center: The portion of a station between and directly adjacent to the tracks where trains stop to load or unload passengers

Platform, Side: The portion of a station at one side of a trackway directly adjacent to the tracks where trains stop to load and unload passengers

PM Peak Period: Between 3:00 PM and 6:00 PM on weekdays

Portal: An entrance or exit of a subway

PPM: Parts Per Million

Public Transit Disabled: Presence of a physical, mental, or other health condition which has lasted six or more months which limits or prevents a person from using public transportation

ROW (Right-of-Way): Land or rights to land used or held for transit operations or public way

RSA: Regional Statistical Area

RTP: Regional Transportation Plan

RWQCB: Regional Water Quality Control Board

San Pedro Bay Ports Access Study: A Southern California Association of Governments study which investigates various alternatives for accommodating the projected increase in rail freight traffic between the SPTC, UP and ATSF mainlines and the ports of Los Angeles and Long Beach

SCAB (South Coast Air Basin): An area consisting of Los Angeles County south of the crest of the San Gabriel Mountains, all of Orange County, and Riverside and San Bernardino counties west of Banning Pass

SCAG: Southern California Association of Governments

SCAG Region: An area comprised of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura Counties

SCAG-82: The growth forecast policy of the Southern California Association of Governments which consists of a set of population, employment, housing and land use forecasts for the SCAG Region, supported by assumptions and policies regarding future growth

Screenline: An imaginary line, usually following such physical barriers as rivers or railway tracks, along which traffic counts may be conducted or compared

SCRTD: Southern California Rapid Transit District

SCRTD Sector Improvement Plan (SIP): The basic program outlining near-term SCRTD bus service improvements in Los Angeles County

SEDAB: Southeast Desert Air Basin

Signal Pre-emption: Traffic signal logic incorporated in hardware to modify normal signal phasing for preferential treatment of transit vehicles

SOAP: Signalization Optimization Analysis Program

SPTC: Southern Pacific Transportation Company

Station Area: The area within a one-quarter mile radius of a station site

Stud-end Tracks: A dead-end track

Substation: A facility containing electrical equipment, such as transformers or switch gear, which provides power to stations and vehicles

System Alternative: A total transit system comprised of one downtown Los Angeles, one mid-corridor and one Long Beach routing alternative. There are 36 possible system alternatives for the Long Beach-Los Angeles Rail Transit Project

Task Force Fire Station: A City of Los Angeles Fire Department Station which houses two engine companies, one truck company and 10 on duty fire fighters

Tidal Prism: The portion of an estuary influenced by tides

Queue: A line of vehicles waiting at a traffic signal, or otherwise hindered in free travel

Transit-Dependent Person: A person who does not have a private vehicle available or who cannot drive and who must use public transport in order to travel

Transportation Mode: A form of transportation (e.g., automobile, bus, light rail transit, commuter rail, pedestrian, bicycle)

TSM (Traffic System Management): A process for planning and operating a unitary system of urban transportation with key objectives of conservation of fiscal resources, energy, environmental quality and quality of life

UMTA: Urban Mass Transportation Administration

Underpinning: Permanent or temporary supports replacing or reinforcing older ones beneath a wall or column

UP: Union Pacific Railroad

UPT: Union Passenger Terminal (Union Station)

USGS: United States Geological Survey

Vacancy Rate: The ratio between the number of vacant housing units and the total number of units in the area

Value Capture: A means whereby the land adjacent to a transportation facility is purchased, managed or controlled in order for the public to share in potential financial and community development benefits from the facilities not otherwise possible

V/C Ratio: Volume-to-Capacity Ratio. Relationship of transport system usage to the number of patrons which can be accommodated for the same period of time

VMT (Vehicle Miles of Travel): The aggregate total number of miles traveled by all vehicles over a given roadway or on all roadways within a specified geographic area during a given period of time

Watts Redevelopment Project: A project established by the Los Angeles City Redevelopment Agency in 1966 to revitalize a 107-acre area of Watts. To date, the project has been responsible for new housing, neighborhood shopping facilities and infrastructure improvements

Willowbrook Neighborhood Development Project: A project established by the Los Angeles County Community Development Commission to revitalize a 365-acre area in the unicorporated county area of Willowbrook. Major development activities proposed as part of this project include a regional shopping center and a transit center to be constructed in conjunction with the Century Freeway project

Work Disabled: Presence of a physical, mental, or health condition which has lasted six or more months an which limits or prevents a person's ability to work

Zoned Fare System: A fare structure in which the cost of a trip is a function of the number of zones traveled

Appendix 3

APPENDIX 3

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Appendix

4

NOTICE OF PREPARATION

FROM: Los Angeles County
Transportation Commission
354 S. Spring Street
Suite 500
Los Angeles, CA 90013

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report.

The Los Angeles County Transportation Commission as Lead Agency, will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by LACTC when considering issuance of permits or other approvals for the project.

The project description, location, and probable environmental effects are contained in the attached materials. A copy of the Initial Study is attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but not later than 45 days after receipt of this notice.

Please send your response to Ms. Sharon Robinson Sivad-el, Environmental/Community Specialist, at the address shown above, including the name of an appropriate contact person in your agency for continued EIR coordination.

PROJECT TITLE: Long Beach-Los Angeles Rail Transit Project

Date: August 30, 1983

LFM:gb

PROJECT OVERVIEW

BACKGROUND

The Long Beach-Los Angeles Rail Transit Project is the first rail project to be undertaken as part of a transit improvement program by the Los Angeles County Transportation Commission. This program is funded by a one-half percent sales tax increase approved by County voters in 1980. Thirteen countywide transportation corridors were designated by the 1980 ballot measure (including the downtown Los Angeles-San Fernando Valley corridor of the Wilshire Metro Rail Project). Based on a 1982 feasibility study, the Long Beach-Los Angeles corridor was chosen to be the first project implemented. Most of the project route would be essentially the same as the last line operated by the Pacific Electric Railway's "Red Cars", which ceased operation in 1961. New alignments are proposed within Long Beach and downtown Los Angeles. The proposed alignments are shown on the attached figures. The project has entered preliminary engineering, with schedule targets of 1985 for commencement of construction and 1987-88 for initiation of service.

PROJECT DESCRIPTION

The rail project is being planned as a conventional light rail system in the existing Southern Pacific rail rights-of-way (Wilmington and East Long Beach branches) extending from downtown Los Angeles to downtown Long Beach. The proposed line would pass through the cities of Compton and Carson, and the County unincorporated areas of Florence-Graham, Willowbrook, and Dominguez Hills. The line is expected to carry between 27,000 and 37,000 passengers per day.

The route would be approximately 22 miles in length. Approximately 18 miles of the route would follow the existing Southern Pacific rights-of-way shown in Figure MC-1. Proposed alignments in the two downtown areas are shown in Figures LA-1 through 3 and LB-1 through 4. Potential station locations are identified on the figures.

More detailed descriptions of the proposed alignments are provided below.

Baseline Project

- The term "baseline project" refers to a minimum project configuration established by LACTC June 22, 1983. There are a number of "options" to this minimum configuration as described below. In downtown Los Angeles, the "baseline project" is proposed as an at-grade "couplet", with one track proceeding north within the existing bus contraflow lane on Spring Street, and with a return track proceeding south in the right-hand travel lane of Broadway Street. A short aerial transition of the two tracks into Union Station is proposed. The "couplet" tracks would connect to the Southern Pacific rights-of-way via a two-track alignment in the median of Washington Boulevard. In the "mid-corridor" area, along the Southern Pacific Wilmington and East Long Beach branches, grade separations are proposed at three railroad crossings (Cota Crossing, Slauson Junction, and Dominguez Junction). In Long Beach, an at-grade two-track alignment is proposed along Atlantic Boulevard, generally in a new median reservation, extending to 1st Street, then turning west on 1st Street to terminate at Long Beach Boulevard.

Route Alternatives in Downtown Los Angeles

- A Flower Subway alternative would proceed at-grade west on Washington Boulevard and north on Flower Street to approximately 11th Street. The subway portal would be located just south of 11th Street and the subway alignment would extend north to terminate at the SCRTD Metro Rail 7th and Flower Station.

- A Figueroa Aerial alignment would proceed at-grade north on Long Beach Avenue to a point just south of Olympic Boulevard. At this point the alignment would transition to an elevated configuration and would turn westerly across Olympic and 9th Streets to Figueroa Street. At Figueroa Street, the alignment would turn north and continue to terminate at the SCRTD Metro Rail 7th and Flower Station. However, it should be noted that as of the date of this Notice of Preparation, the City of Los Angeles is expected to request, and LACTC is expected to approve an extension of this alternative to a new terminus on Figueroa Street immediately south of 3rd Street.

Route Alternatives in the Mid-corridor

- In the Compton Civic Center area an open-cut depressed grade separation containing both transit tracks and the Southern Pacific freight tracks is under study for inclusion in the project. If constructed, it would extend from El Segundo Boulevard on the north to Greenleaf Avenue on the south.

o As an alternative to the open-cut depressed profile option in Compton, LACTC has requested the Southern Pacific railroad's consideration of a re-routing of the railroad's Wilmington Branch freight traffic to the railroad's San Pedro Branch, from Watts Junction to Dominguez Junction, by constructing an additional freight track on the San Pedro Branch. If this proposal is of interest to Southern Pacific, it is possible that LACTC may adopt this element as part of the Long Beach-Los Angeles rail transit project in lieu of continuing development of the open-cut depressed profile option for the project in the City of Compton.

Route Alternatives in Long Beach

o Atlantic Avenue Two-Way with a Pacific Avenue Loop, as under "Baseline Project" in Long Beach except with the southbound track turning west on 9th Street, south on Long Beach Boulevard, west on 1st Street, north on Pacific Avenue, east on 8th Street, and returning north on Atlantic Avenue.

o Atlantic/Long Beach Couplet, an at-grade alignment proceeding south on Long Beach Boulevard, east on 1st Street, and north on Atlantic Avenue.

o Los Angeles River Route, a two-track system proposed to follow a right-of-way at the foot of the eastern embankment of the Los Angeles River channel south to 4th Street. The alignment would proceed easterly along 4th Street to Pacific Avenue, then turn south on Pacific Avenue then turn east on 1st Street to terminate at Long Beach Boulevard.

DESCRIPTION OF POSSIBLE FUTURE EXTENSIONS TO THE PROPOSED PROJECT

Although not parts of the proposed project, LACTC's EIR will address the environmental impacts of possible future extensions to the project in downtown Los Angeles, as follows:

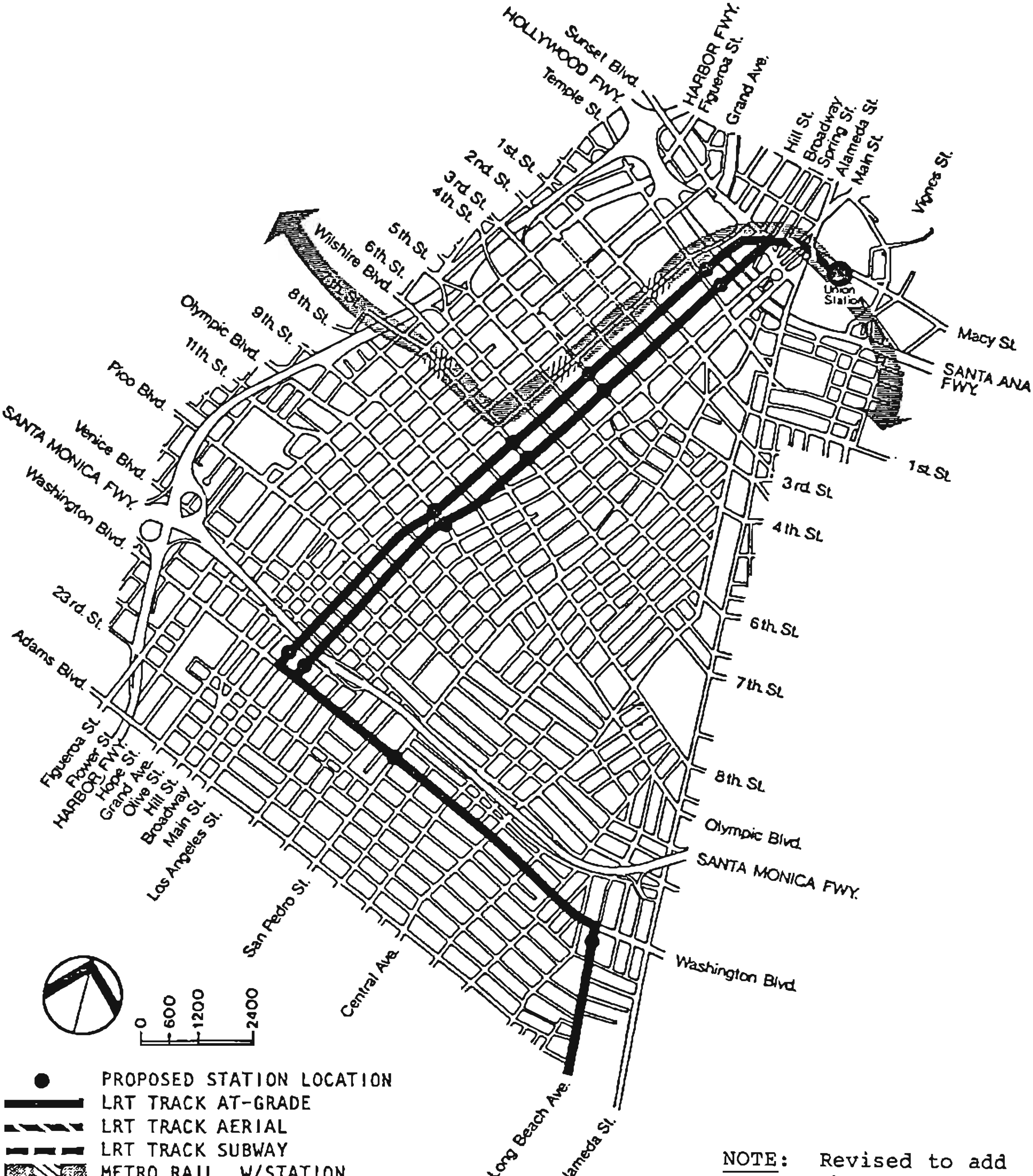
- An extension of the Flower Subway, from the proposed SCRTD Metro Rail 7th and Flower station termination point under the project, could be constructed north under Flower Street to 3rd Street, cross diagonally under Grand Avenue, north to 1st Street, east on 1st to Los Angeles Street, north on Los Angeles, under the Hollywood Freeway and turning east to terminate under Union Station.

- An extension of the Figueroa Aerial, from the SCRTD Metro Rail 7th and Flower station or the 3rd Street termination points under the project, could be constructed northon Figueroa Street to cross diagonally and enter a subway profile under Grand Avenue, north on Grand Avenue to 1st Street, turning east and resuming a elevated configuration along 1st to Los Angeles Street, crossing the Hollywood Freeway and turning east to terminate at Union Station.

POTENTIAL ENVIRONMENTAL ISSUES

An Initial Study Checklist has been completed and is attached. The Initial Study applies to all proposed alignments outlined in this notice. The appended supplemental notes provide additional details about the potential impacts noted in the checklist.

Generally, there are no significant physical environmental constraints, but the proposal could result in visual, behavioral, and minor noise impacts on adjacent areas.

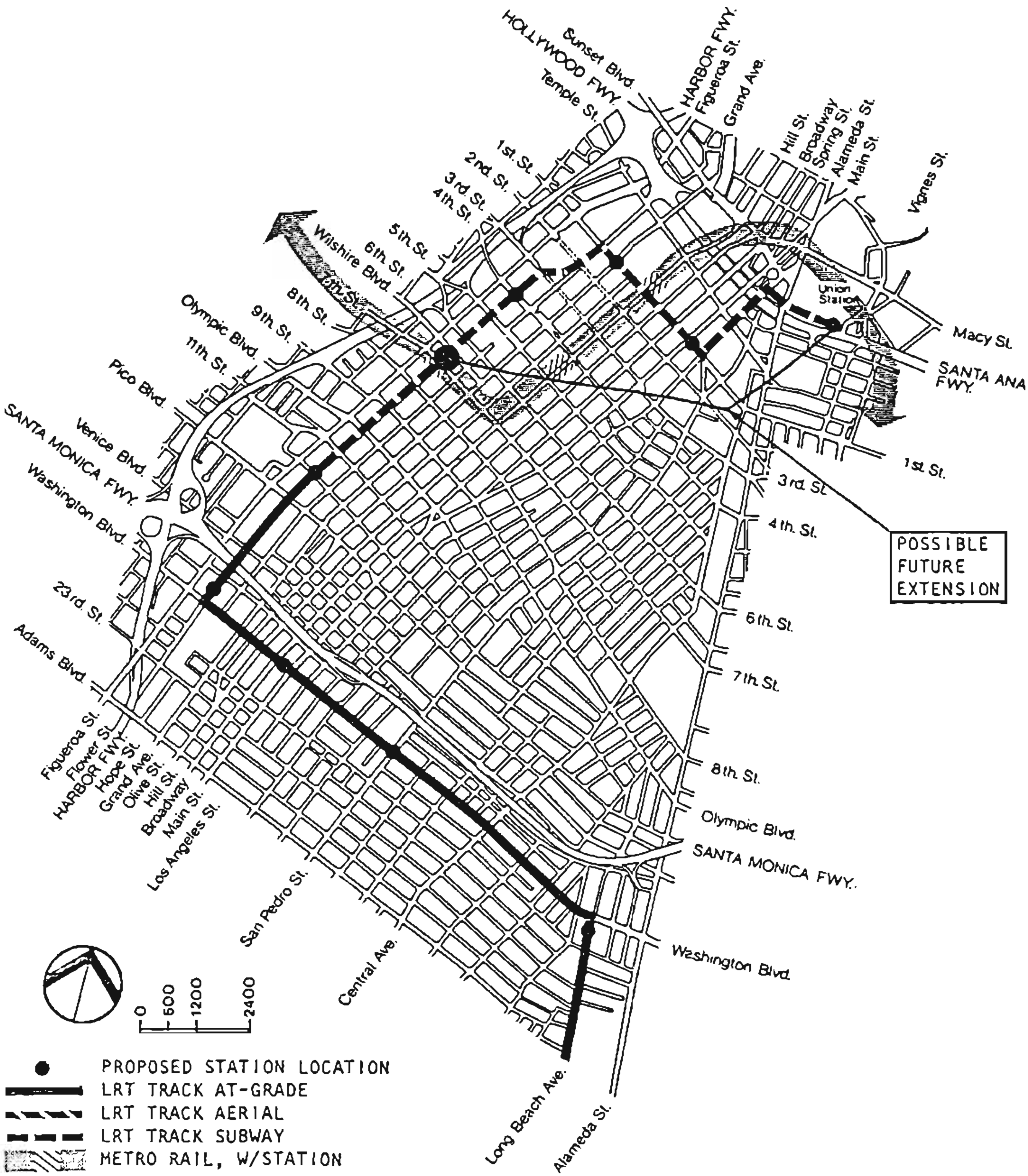


NOTE: Revised to add the San Pedro Station

LA-1

Long Beach - Los Angeles RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

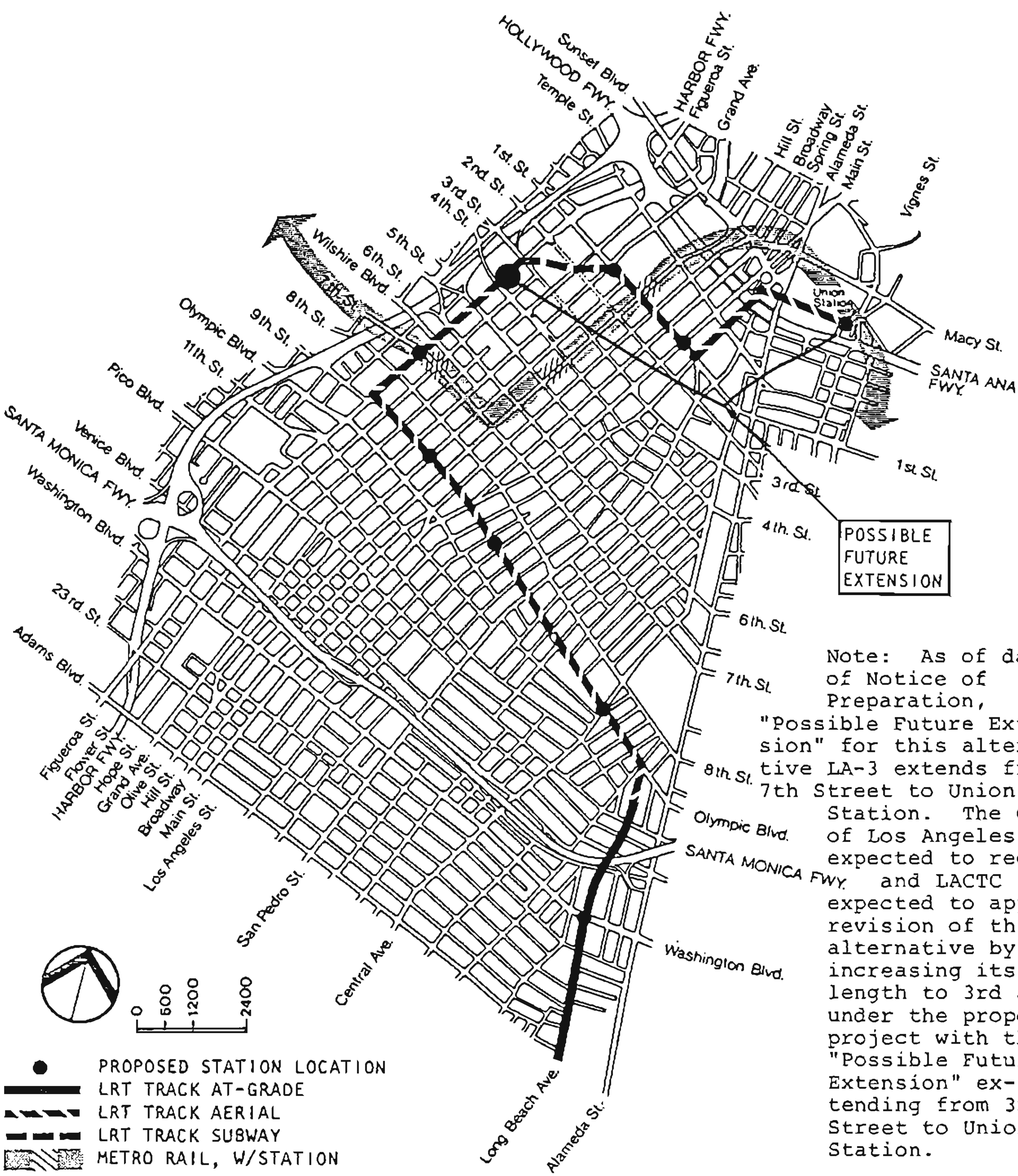
Downtown Los Angeles Alignment Alternatives
PARSONS BRINCKERHOFF/KAISER ENGINEERS



LA-2

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS

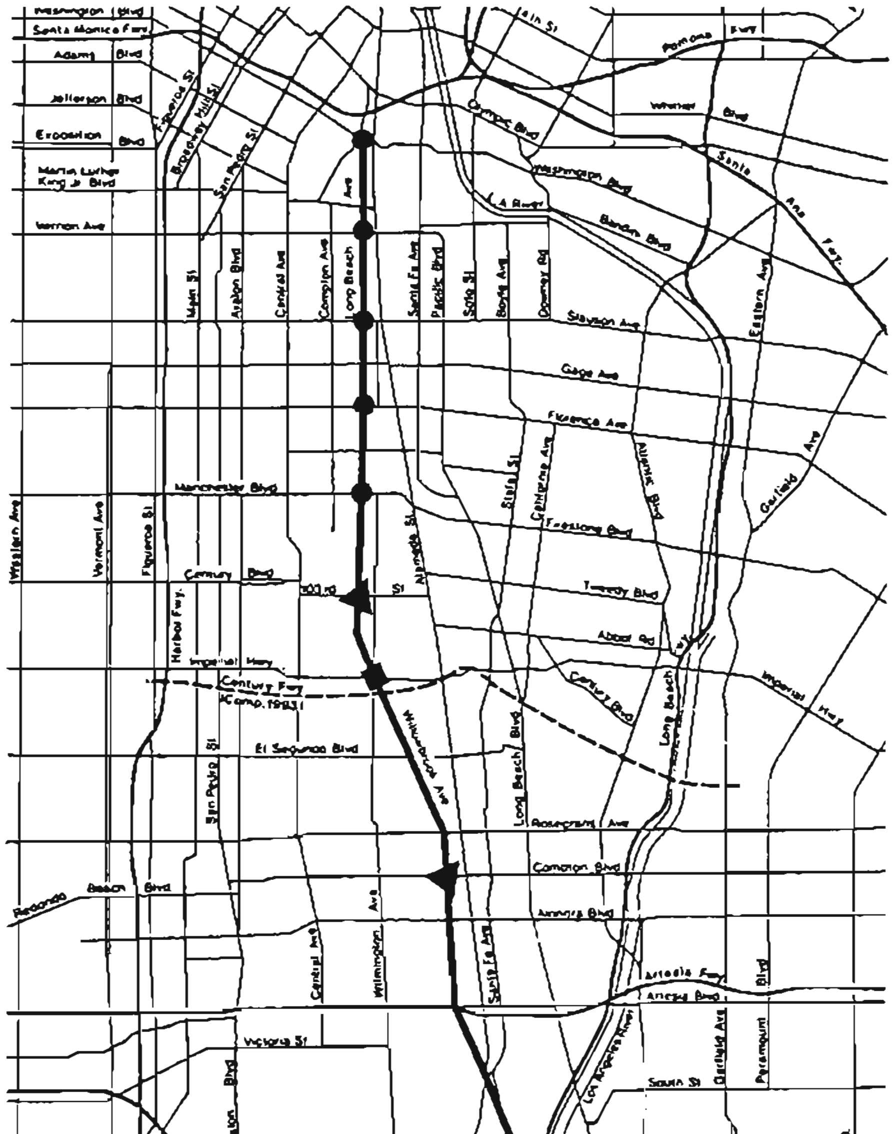


Note: As of date of Notice of Preparation, "Possible Future Extension" for this alternative LA-3 extends from 7th Street to Union Station. The City of Los Angeles is expected to request and LACTC is expected to approve revision of this alternative by increasing its length to 3rd Street under the proposed project with the "Possible Future Extension" extending from 3rd Street to Union Station.

LA-3

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS



● PROPOSED STATION

■ STATION WITH PARK & RIDE

▼ NEIGHBORHOOD PARK & RIDE

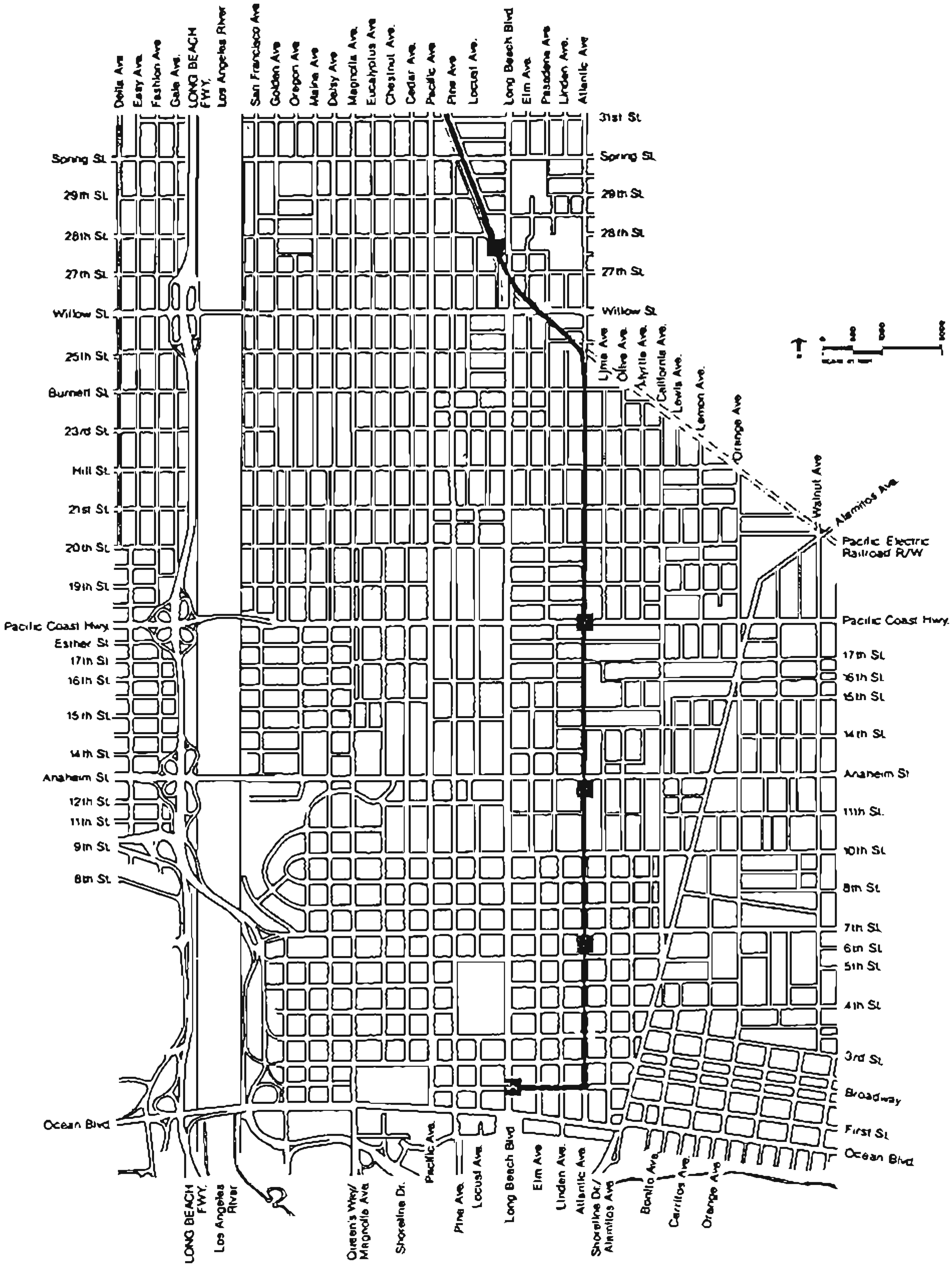
MC-1

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Mid Corridor Alignment Alternative

PARSONS BRINCKERHOFF / KAISER ENGINEERS

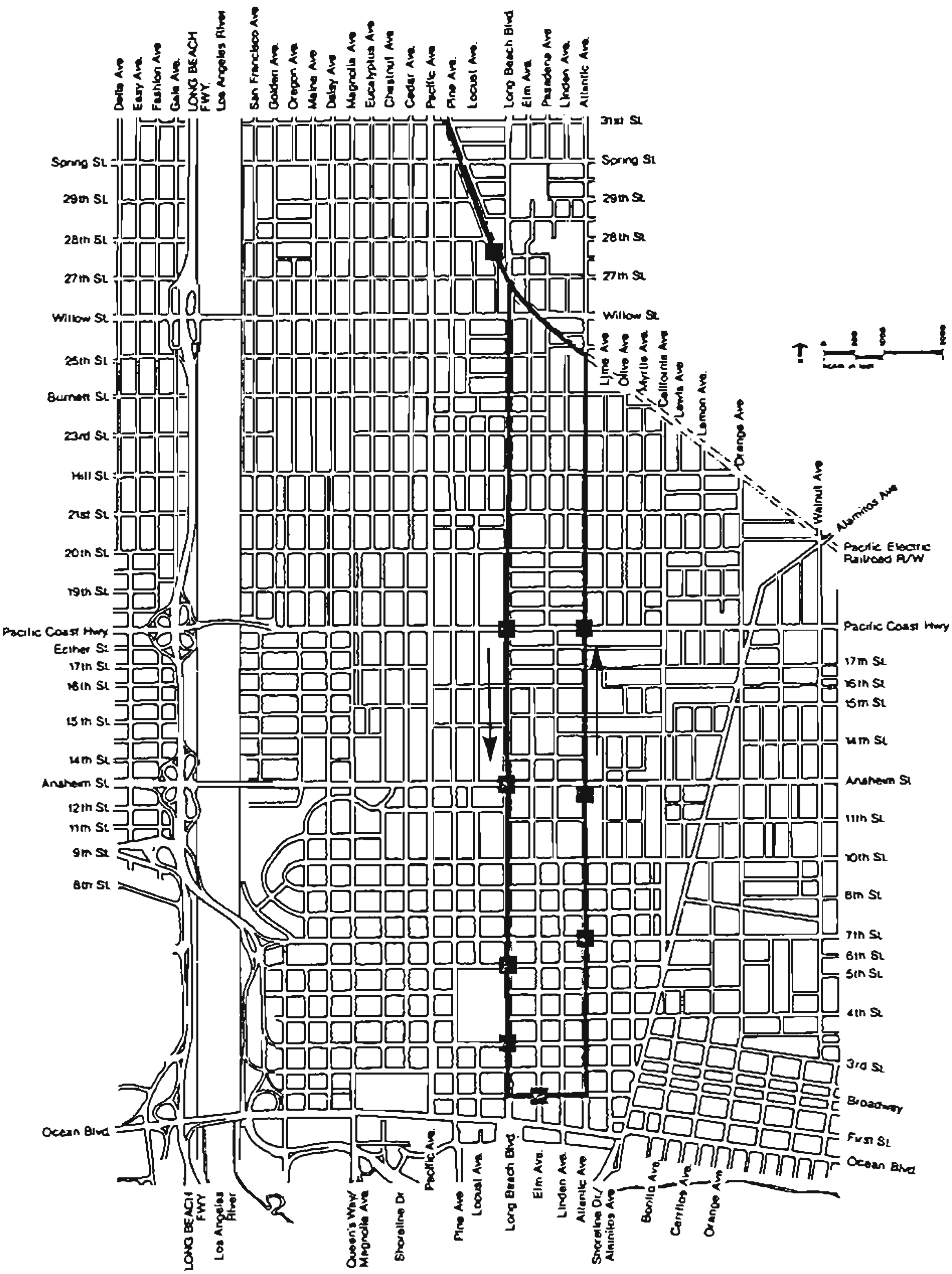


LB-1

Atlantic Ave. Two-Way

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Long Beach
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS

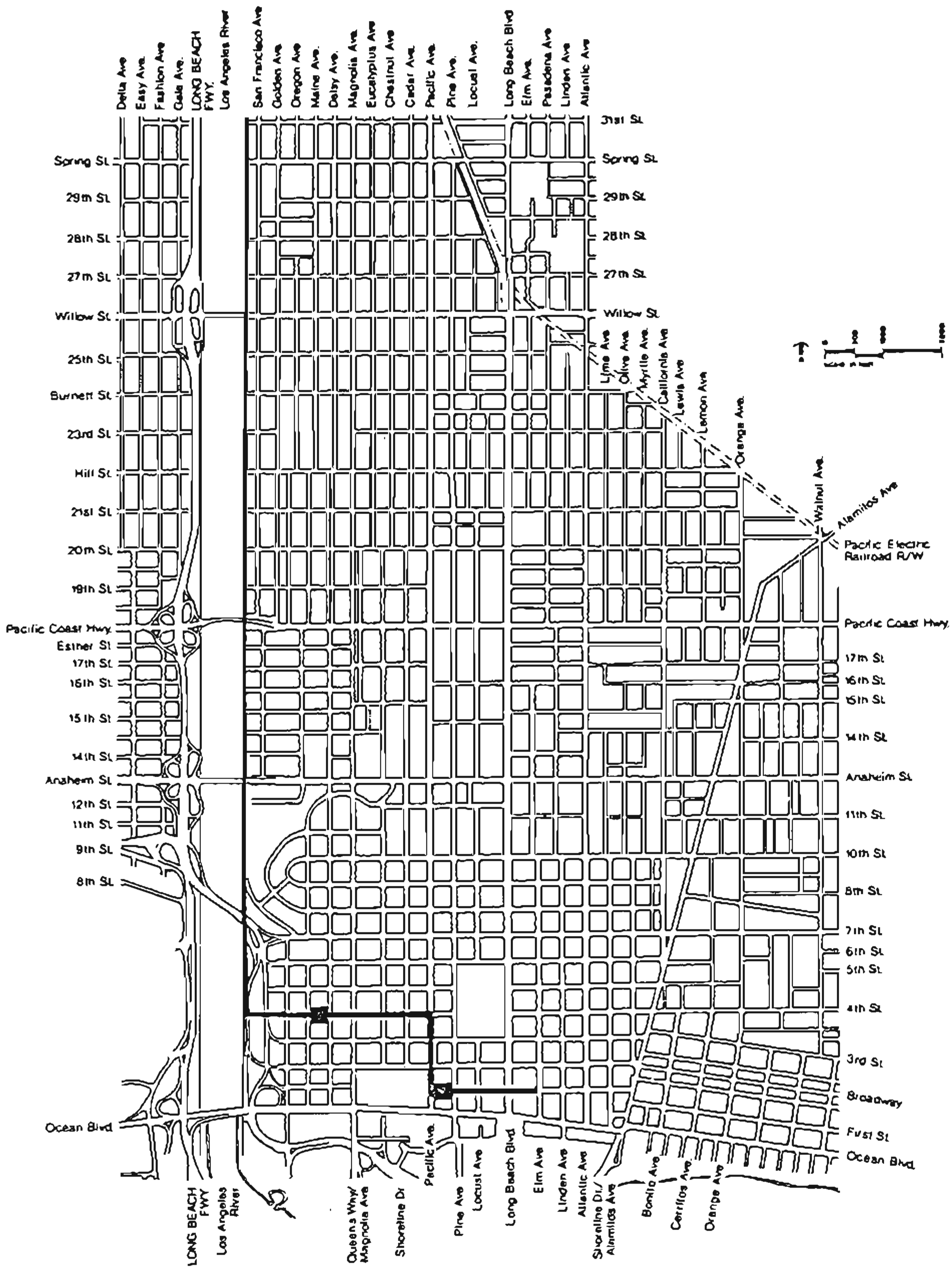


LB-2

Atlantic / Long Beach Couplet

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Long Beach
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS

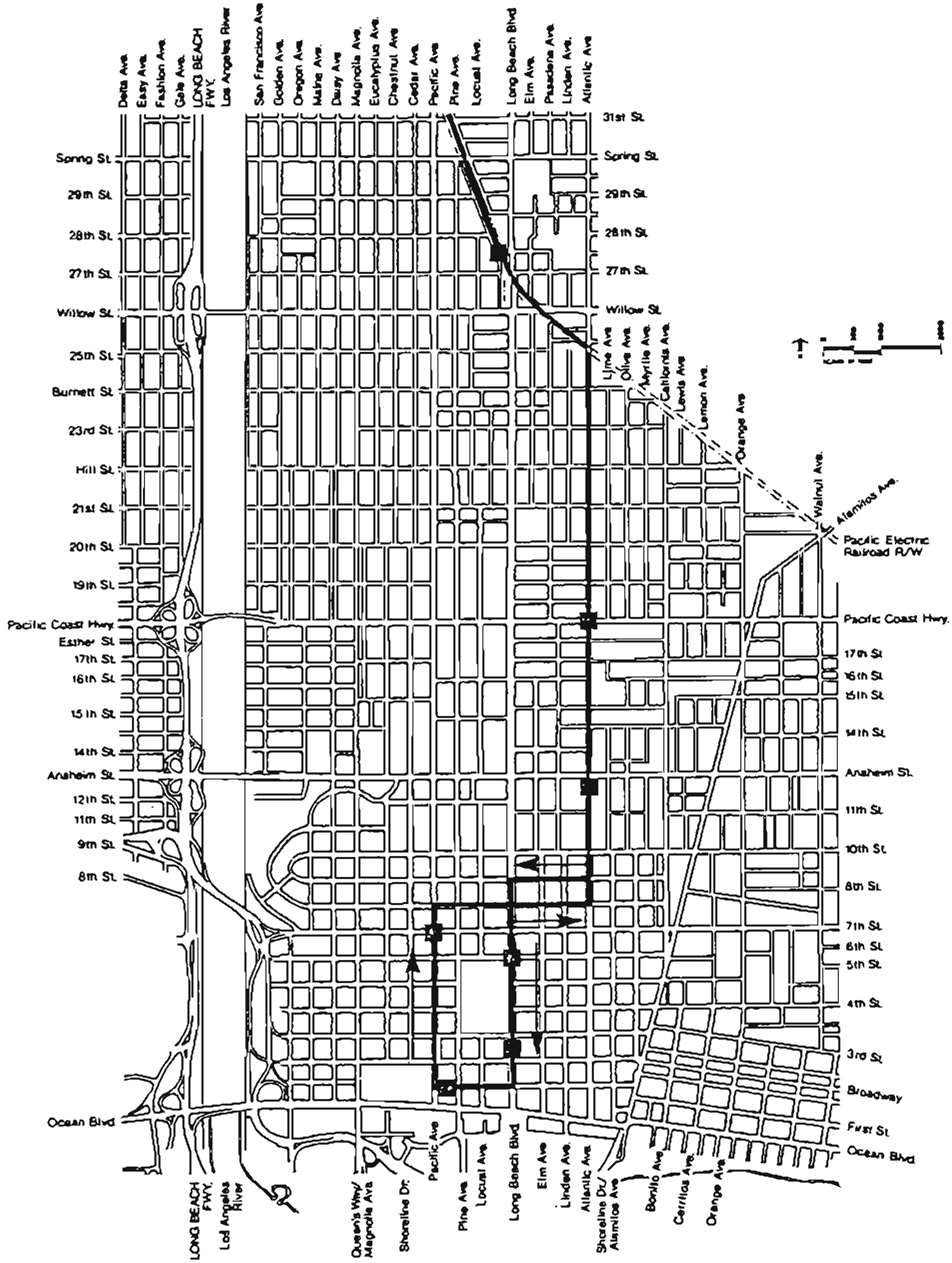


LB-3

River Route

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Long Beach
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS



LB-4

Pacific Avenue Loop

Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Long Beach
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS

INITIAL STUDY CHECKLIST

	YES	MAYBE	NO
1. EARTH: Will the proposal result in...			
a. unstable earth conditions or changes in geologic substrutures?		x	
b. disruptions, displacements, compaction, or over-covering of the soil?	x		
c. change in topography or ground surface relief features?			x
d. the destruction, covering or modification of any unique geologic or physical features?			x
e. any increase in wind or water erosion of soils, either on or off the site?			x
f. changes in deposition or erosion of beach sands or changes in siltation, deposition or erosion which may modify the channel of a river or the bed of the ocean or any bay, inlet of lake?			x
g. exposure of people or property to geologic hazards, such as earthquakes, landslides, mud-slides, ground failure, or similar hazards?	x		
2. AIR: Will the proposal result in...			
a. air emisssions or deterioration of ambient air quality?		x	
b. the creation of objectionable odors?			x
c. alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?			x
d. expose the project residents to severe air pollution conditions?			x
3. WATER: Will the proposal result in...			
a. change in currents, or the course of direction of water movements in either marine or fresh waters?			x
b. changes in absorption rates, drainage patterns or the rate and amounts of surface water runoff?		x	
c. alterations to the course or flow of flood waters?			x
d. change in the amount of surface water in any water body?			x
e. discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?			x
f. alteration of the direction or rate of flow of ground waters?			x
g. change in the quantity of ground waters, either through direct additions, withdrawals or through interception of an aquifer by cuts or excavation?			x
h. Reduction in the amount of water otherwise available for public water supplies?			x
i. Exposure of people or property to water related hazards, such as flooding or tidal waves?			x
j. changes in the temperature, flow or chemical content of surface thermal springs?			x

INITIAL STUDY CHECKLIST

	YES	MAYBE	NO
4. PLANT LIFE: Will the proposal result in...			
a. change in the diversity of species, or number of any species of plants?			x
b. reduction of the numbers of any unique, rare or endangered species of plants?			x
c. introduction of new species of plants into an area, or a barrier to the normal replenishment of existing species?			x
d. reduction in acreage of any agricultural crop?			x
5. ANIMAL LIFE: Will the proposal result in...			
a. change in the diversity of species or numbers of any species of animals?			x
b. reduction of the numbers of any unique, rare or endangered species of animals?			x
c. introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?			x
d. deterioration to existing fish or wildlife habitat?			x
6. NOISE: Will the proposal result in...			
a. increases in existing noise levels?		x	
b. exposure of people to severe noise levels?			x
7. LIGHT AND GLARE: Will the proposal...			
a. produce new light or glare from street lights or other sources?		x	
b. reduce access to sunlight of adjacent properties due to shade or shadow?		x	
8. LAND USE: Will the proposal result in an alteration of the present or planned land use of an area?		x	
9. NATURAL RESOURCES: Will the proposal result in...			
a. increase in the rate of use of natural resources?	x		
b. depletion of any non-renewable natural resource?		x	
10. RISK OF UPSET: Will the proposal involve...			
a. a risk of an explosion or the release of hazardous substances in the event of an accident of upset conditions?		x	
b. possible interference with an emergency response plan or an emergency evacuation plan?		x	
11. POPULATION: Will the proposal result in...			
a. the relocation of any persons because of the effects upon housing, commercial or industrial facilities?		x	
b. change in the distribution, density or growth rate of the human population of an area?		x	

	YES	MAYBE	NO
12. HOUSING: Will the proposal...			
a. affect existing housing, or create a demand for additional housing?		x	
b. have an impact on the available rental housing in the community?		x	
c. result in demolition, relocation or remodeling of residential, commercial, or industrial buildings or other facilities?		x	
13. TRANSPORTATION/CIRCULATION: Will the proposal result in...			
a. generation of additional vehicular movement?		x	
b. effects on existing parking facilities, or demand for new parking?	x		
c. impact upon existing transportation systems?	x		
d. alterations to present patterns of circulation or movement of people and/or goods?	x		
e. alterations to waterborne, rail or air traffic?	x		
f. increase in traffic hazards to motor vehicles, bicycles, or pedestrians?	x		
14. PUBLIC SERVICES: Will the proposal have an effect on...			
a. fire protection?		x	
b. police protection?		x	
c. schools?	x		*
d. parks or other recreational facilties?	x		*
e. maintenance of public buildings, including roads?		x	*
f. other governmental services?		x	*
15. ENERGY: Will the proposal result in...			
a. use of exceptional amounts of fuel or energy?			x
b. increase demand upon existing sources of energy or require the development of new sources of energy?	x		
16. UTILITIES: Will the proposal result in a need for new systems, or alternations to the following utilities?			
a. power or natural gas?		x	
b. communications systems?		x	
c. water?		x	
d. sewer or septic tanks?		x	
e. storm water drainage?		x	
f. solid waste and disposal?		x	
17. HUMAN HEALTH: Will the proposal result in...			
a. creation of any health hazard or potential health hazard?			x
b. exposure of people to potential health hazards?			x
18. AESTHETICS: Will the proposed project result in...			
a. the obstruction of any scenic vista or view open to the public?		x	
b. the creation of an aesthetically offensive site open to public view?		x	*
c. the destruction of a stand of trees, a rock out-cropping or other locally recognized desirable aesthetic natural feature?		x	
d. any negative aesthetic effect?		x	

	YES	MAYBE	NO
19. RECREATION: Will the proposal result in an impact on the quality or quantity of existing recreational opportunities?		x	
20. CULTURAL RESOURCES: Will the proposal result in...			
a. the alteration of or the destruction of a prehistoric or historic archaeological site?		x	
b. adverse physical or aesthetic effects to prehistoric or historic buildings, structures or objects?		x	
c. the potential to cuase a physical change which would affect unique ethnic cultural values?			x
d. the restriction of existing religious or sacred uses in the potential impact area?			x
21. NAVIGABLE WATERWAYS AND COASTAL ZONES: Will the proposal...			
a. result in adverse impacts on navigation and use navigable waterways?			x
b. result in inconsistencies with the approved coastal zone management program?		x	
22. MANDATORY FINDINGS OF SIGNIFICANCE:			
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitate of fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animals or eliminate important examples of the major periods of California history or prehistory?			x
b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals.			x
c. Does the project have impacts which are individually limited, but cumulatively considerable?		x	
d. Does the project have environmental effects which cause substantial adverse effects on human beings either directly or indirectly?			x

INITIAL STUDY COMMENTS

Earth

The Flower Street Subway and Compton Open Cut Depression alignments may result in a change in geologic substructure and settlement from dewatering activities. Both alignments would result in disruption and displacement of soil, compaction of remaining soil, soil removal, design of a haul route for trucks and choosing of a disposal location.

Construction of park-and-ride areas would result in an increase in impermeable surface.

The at-grade alignments in Long Beach would cross a potentially active fault zone.

Air

No regional air quality impacts are anticipated. There may be microscale impacts due to cross-traffic delays and the addition of parking facilities.

Water

Increased surface runoff may occur at proposed park-and-ride facilities.

Noise

Construction activities may result in increased noise levels above ambient conditions.

Light And Glare

Station sites, park-and-ride facilties, and maintenance/storage areas will require installation of additional lighting.

Aerial segments (Figueroa Street, railroad grade separation structures) may result in increased shade/shadow impacts on adjacent buildings.

Land Use

Land use changes may result as a result of implementing any alternative alignment.

Natural Resources

Natural resources (e.g., wood, gravel, concrete) will be used in construction of any alternative alignment.

Risk Of Upset

Along the midcorridor, the event of an accident on the Southern Pacific freight track, may expose people to hazardous materials.

Along any alignment, a stall or accident in an intersection may result in a delayed response time for emergency vehicles.

Population

Secondary development which the project might induce could result in minor population shifts or density changes.

Housing

Secondary development, which may be induced by implementation of the proposed project, may impact both rental and owner-occupied housing with the project corridor.

Siting of yards and shops for maintenance faciltíes may require acquisition of additional properties.

Transportation/Circulation

Any of the proposed alignments may result in decreased automobile usage, and increased bus usage. Additional demand on existing parking facilties may result from this proposed project and additional park-and-ride facilities are proposed.

Increased usage of high occupancy vehicles may result from this proposed project resulting in a beneficial impact on the existing transportation system.

Patterns of rail freight traffic in the midcorridor area may be altered as a result of this proposed project.

There is potential for increased hazards resulting from additional cross-traffic conflicts and pedestrian movement in the vicinity of the rail facilities.

Public Services

Implementation of the proposed project may result in increased personnel demands for responsible police and fire agencies.

Energy

There will be an increased demand for electrical power.

Utilities

The Flower Street Subway and the Compton open cut depression may require relocation of underground utilities. The Figueroa Street aerial alignment may require relocation of underground utilities depending upon placement of support columns.

Additional sewer lines and/or enclosed treatment plants may be required at maintenance facilties.

Additional storm drains may be required for any of the proposed alignments, park-and-ride lots, or maintenance sites.

Minimal increases in solid waste generation may result from implementation of the proposed project.

Aesthetics

Aerial alignments (Figueroa Street, railroad grade separation structures) may result in negative aesthetic impacts.

Cultural Resources
Union Station is an area noted as likely to yield archaeological artifacts and may be impacted by the proposed alignment.

The Figueroa Street aerial alignment may visually affect historical structures.

Navigable Waterways And Coastal Zone
All Long Beach alignments include areas located within the coastal zone.

Mandatory Findings Of Significance
Any proposed alternative, when assessed with the other projects proposed in the corridor area, may result in a cumulative impact.

POTENTIAL MITIGATION MEASURES

The following measures are being considered for inclusion in the project to mitigation possible construction (short-term) and project (long-term) effects.

Earth: Standard City and County Building Code measures as applicable to grading and/or subway construction activities.

Air: Standard watering and dust control measures to reduce air quality impacts from particulate emissions.

Water: Installation of adequate drainage systems to reduce impact of surface water runoff in maintenance facility and park-and-ride lots.

Noise: Use of construction machinery equipped with noise abaters. Control of hours of operation to avoid impacts on residential areas.

Light and Glare: Use of directional lighting when possible to avoid impact on adjacent residential areas.

Transportation/Circulation: Standard City and County required measures to mitigate potential hazard to vehicle and pedestrian traffic during construction period. Appropriate use of controls on parking, turning, traffic channelization, signalization, etc. to mitigate potential effect of LRT operation on vehicle traffic.

APPENDIX 4

S U M M A R Y O F R E S P O N S E S

AGENCY	DATE	SIGNATURE	COMMENTS ENVIROMENTAL	OTHER	LOCATION IN EIR
<u>Federal</u>					
Fed. Hwys. (D.C.)	9/13/83	E.W. Cleckley		Forwarded to Division Admin., Bruce E. Cannon in Sacramento.	
Fed. Hwys. (Region 9)	10/13/83	Bruce E. Cannon	A. Encroachment onto federally funded roadways requires NEPA and 23 CFR 771 clearance.		A. Possible encroachment discussed in Chapter I; Chapter III, Sections 130 and 230. Permits and clearances, see Chapter I, Section 920.
			B. Relationship to San Bernardino Busway.		B. Reference to San Bernardino (El Monte) Busway found in Chapter III, Section 140; Chapter IV, Section 140; and Appendix 1, Related Projects.
			C. Traffic circulation.		C. Discussion of traffic circulation found in Chapters II, III, IV, V, VII, and VIII.
Fed. Railroad Adm.	9/14/83	M.W. Klein		No responsibility for permits or approvals.	

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
Army Corps/Eng.	10/4/83	J.P. Fast	If MC-1 and LB-3 call for dredge or fill in LA River 404 permit necessary.		See Section 920, Chapter I.
UMTA - Region 9	12/5/83	B. Hynes-Cherin	As no federal funding, no federal document required.	Would like copies of future environmental documents.	
State					
Clearinghouse	9/16/83	Dan Conaty		Distribution list for state agencies.	
Caltrans Dist. 07	10/13/83	W.B. Ballantine	A. Increase in traffic near stations especially at I-105 and Imperial Hwy., Rte. 7 and Del Amo, I-405 and Wardlow, and Pacific Coast Hwy.		A. Discussion of increase in traffic contained in Chapter III, Section 230 and 330 and Chapter IV, Section 230 and 330.
			B. Patronage methods and assumptions should be thoroughly discussed.		B. See Chapter I, Section 240.
			C. Change checklist, 14(c) to yes and 18(b) to maybe.		C. Checklist revised.
Calif. Hwy. Patrol	10/28/83	R.L. Johnson		A. Would like to be kept informed on project.	

S U M M A R Y   O F   R E S P O N S E S

AGENCY	DATE	SIGNATURE	COMMENTS ENVIROMENTAL	OTHER	LOCATION IN EIR
Calif. Hwy. Patrol (Cont'd.)				B. At later date would discuss security issues of design and location of stations.	
Dept. Parks & Rec.	9/21/83	James P. Doyle	Traffic and parking impacts on: El Pueblo de los Angeles and Watts Towers State Parks.		See discussions on Los Angeles and parking in Chapters II, III, and IV for El Pueblo. No parking or traffic impacts at Watts Towers.
Health Services	10/24/83	J.S. Lukas	Noise impacts and number of people affected. Noise/EIR guidelines attached.		Discussion of noise contained in Chapter II, Sections 214, 314 and 414; Chapter III, Section 114, 214 and 314, and Chapter IV, Sections 115, 215 and 315.
Historical Preservation	9/21/83	Knox Mellon	A. Visual impacts of aerial alignments on significant historic structures.		A. Visual impacts in downtown Los Angeles refer to Chapter III, Section 125, and Chapter IV, Section 125. See also Section 124 Chapter IV on Los Angeles' visual quality. For Visual Impacts to Watts Station, see Chapter III, Section 225. See also Section on Mid-Corridor's visual quality, Chapter IV, Section 224.

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
Historical Preservation (Cont'd.)			B. Survey for Historic Structures at demolition sites (structures on historic registers or 50+ years in EIR).		B. All possible acquisition sites were surveyed. For possible demolition, see Chapter III, Section 325.
Public Utilities	10/17/83	W.L. Oliver	Need traffic volumes, circulation patterns, vehicle mix to determine proper railroad crossing protection.	Need to up-grade crossing gates.	See traffic and transportation sections in Chapters II, III, and IV.
Regional Water Quality	10/6/83	Raymond Hertel	A. Minimize construction/ erosion impacts.		A. Construction impacts will be minimized by use of proper techniques, see Chapter I, Section 500.
			B. Quantify additional flow to sanitary sewers to demonstrate capacity. Consider cumulative.		B. Transit stations will not be equipped with sanitary facilities; project will have minimal effect on sewer capacity.
			C. Discharge to other than sanitary sewer; location quality and quantity.		C. See public utilities discussion as contained in community services sections, Chapters II, III, and IV.
Water Resources	9/13/83		No comment as no impact on water resources.		

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS ENVIROMENTAL	OTHER	LOCATION IN EIR
UCLA	10/6/83	Susan Colby	Archeological archival and field survey plus detailed mitigation.		Survey and research performed by Caltrans' environmental staff, see Chapter III, Section 125.
<u>County of LA</u>					
Fire Department	10/26/83	George Demos		Suggest using fire and life safety criteria as developed by Metro Rail.	Coordination with Metro Rail undertaken by Los Angeles County Transportation Commission (LACTC) staff.
Flood Control	9/16/83	(Form)		A. Need for improvement to storm drains.	A. and B. Drainage plans and plans for improvements to utilities will be completed during final engineering.
				B. Drainage plan for each site.	
				C. Permit required for construction affecting district right of way or storm drains.	C. All necessary permits will be acquired prior to construction.
Dept. of Regional Planning	11/1/83	Norman Murdoch	Consider the following: o Project design and security. o Employment and training. o Economic development. o Potential for joint development. o Protection of historic and cultural resources.	A. Develop line to maximize potential for revitalization and development. B. Minimize impacts on street system during construction and operation	<u>Project Design</u> - See Chapter I Section 400; <u>Employment, Economics and Joint Development</u> - See Chapters II, III and IV sections on land use and economic activity. <u>Historic</u> - See Chapters II, III and IV, sections on historic and cultural resources.

S U M M A R Y   O F   R E S P O N S E S

COMMENTS

AGENCY	DATE	SIGNATURE	ENVIROMENTAL	OTHER	LOCATION IN EIR
Dept. of Regional Planning (Cont'd.)					<u>Street System</u> - See Chapter II and Chapter III traffic and transportation sections.
Road Department	11/1/83	T.A. Tidemanson	Include data regarding the following: o Costs of various alternatives. o Predicted patronage. o Patronage diverted from bus o Detailed assessment of traffic impacts.	A. MC-2 (Depressed track) through Compton should continue south of Alondra Boulevard. B. Realize request to grade separate all east-west arterials with year 2000 ADT of 20,000 vehicles or more deleted due to cost. C. Will continue to work closely with traffic consultants.	<u>Costs</u> - See Chapter I, Sections 600 and 750. <u>Patronage</u> - See Chapter I Sections 240 and 720. <u>Traffic Impacts</u> - Refer to Chapters II, III, and IV, IV, Sections on traffic and transportation.
Co. Sanitation	9/23/83	Joseph Reilly	Difficult to assess impacts prior to final alignment selection.		

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
Sheriff	10/12/83	James D. White	Safety concerns should address: station design, revenue collection, lighting/landscaping, parking lot design, access controls, hrs. of operations, agency.		See Chapter III and IV, Community Services.
Regional					
SCRTD	9/28/83	John A. Dyer		Interface with 7th and Flower, Metro Rail.	Station at 7th and Flower will maximize transfer opportunities with Metro Rail.
SCRTD	10/20/83	John A. Dyer	Review long-term operational impacts re traffic, parking, and safety (security). Elderly and handicapped accessibility.	A. Cost effectiveness of bus/light rail system.	Operational Impacts - See Chapter IV.
				B. Cost/revenues of each alternative.	Cost of System - See Chapter I, Section 600 and 750.
				C. Impacts and compatibility in LACBD.	Refer to Los Angeles sections in Chapters II, III, and IV.
City of Los Angeles					
City Clerk	9/2/83	Elias Martinez		Referred to Transportation and Traffic Committee of LA City Council.	

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

			COMMENTS		
AGENCY	DATE	SIGNATURE	ENVIROMENTAL	OTHER	LOCATION IN EIR
Bureau of Engineering	8/31/83	Bruce H. Rollo	A. Traffic study for all streets in the vicinity of park-and-ride and stations. Dedicated and improved to adopted minimum City Standards.		A. See Chapters II, III, IV, and V; traffic and transportation sections.
			B. Utilities, new to be installed; impacts on existing sewer and storm drain.		B. Public utilities discussed in Chapters II, III, and IV in sections on community services.
			C. Complete noise study and "adequate" air quality.		C. Noise discussion contained in Chapters II, III, and IV sections on noise and vibration. Air quality discussion will be found in Chapters II, IV, and V sections on air quality.
Bureau of Engineering	10/6/83	D.J. McNeil	A. Complete traffic and circulation. Including dedication and improvement of streets.		A. See Chapters II, III, and IV, traffic and transportation sections.
			B. Initial Study Checklist should change 14(e) from No to Maybe. Impacts on street maintenance.		B. Checklist revised.
			C. Initial Study Checklist 14(f) should change from No to Maybe? Impacts on "other governmental		C. Checklist revised.

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
Bureau of Engineering (Cont'd.)			D. As B in Rollo letter (Utilities).		D. Public utilities discussion contained in community services sections of Chapters II, III, and IV.
			E. Air emission and noise studies.		E. Results of noise studies contained in Chapters II, III and IV; sections on noise and vibration. Air emissions discussion found in air quality sections of Chapters II, IV, and V.
Fire Department	10/3/83	Donald E. Barlete	A. Seismological impacts on aerial (and subway) structure.	A. Form fire/life safety committee to develop safety criteria. Use Metro Rail as baseline.	A. See sections on topography, soils, geology, and seismicity in Chapters II, III, and IV. Also discussion in Section 210, Chapter VI and Section 260 in Chapter VII.
			B. Metro Rail methane gas study (petroliferous area) to be completed 10/83.	B. No standard building codes for subway (follow Metro Rail).	
Port of Los Angeles	10/3/83	W. Calvin Hurst	A. Impacts to rail freight on both Wilmington and San Pedro branches including: time and delay safety and accident potential, consolidation of rail freight and rail-to-rail interface.	A. Priority list of grade separations.	A. Discussion of rail freight contained in mid-corridor traffic and transporation sections; see Chapter II, Section 334; Chapter III 322 and Chapter IV, Section 230.
			B. Noise and vibration impacts.		B. Chapters II, III, IV and VII all have sections on noise and vibration.

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
Port of Los Angeles (Cont'd.)			C. Traffic and circulation in downtown LB and LA. Also interface of rail and vehicles along rail corridors.		C. Discussion of traffic and circulation can be found in various sections in Chapters II, III, IV, V, and VII.
Street Maintenance	9/28/83	Edward D. Longley	Public Services, 14(e) on checklist should be maybe rather no for maintenance of public buildings including roads.		Checklist revised.
Department of & Power	10/19/83	Edward Gladback	A. Any change in existing tracks alignment or grade will affect existing high voltage transmission lines.	Power supply for project is available and will be supplied as per dept. rules and regulations. It is contained in the long range plan.	A. No anticipated effects on high voltage transmission.
			B. Dust abatement procedures necessary during construction.		B. Dust abatement will be enforced during construction along with other proper construction techniques. See Chapter V, Section 110.
Building Bureau	10/21/83	K.R. Ayers	Newport-Inglewood fault: potential for damage to tracks during seismic event.		

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
Police Department	10/21/83	Daryl F. Gates	Light rail system will cause new patterns of crime impacts and require hiring of additional police officers.	Concept Design Report does not adequately cover police service costs.	See community services sections by segment in Chapters II, III, and IV.
Transportation	10/26/83	Donald R. Howery	Include grade separation as mitigation measure in addition to others.	Notice of Preparation should be changed to reflect refinement of Concept Design Report.	A limited number of grade separations are being planned, see Section 230 of Chapter III.
Local Agencies					
City of Carson	10/20/83	Patricia Nemeth	A. Cumulative impacts on rail traffic (SCAG Consolidated Rail Corridor Study) and of increase rail traffic.		A. Discussion of rail freight contained in mid-corridor traffic and transportation sections. See Chapter II, Section 339; Chapter III, Section 232, and Chapter IV, Section 230.
			B. Specific analysis on traffic impacts at crossings Del Amo and Santa Fe, and Del Amo and Alameda.		B. See mid-corridor traffic discussion: Chapter II, Section 330; Chapter III, Section 230; and Chapter IV, Section 236.
City of Compton	10/4/83	Monroe Smith		A. Supports depressed grade separation.	
				B. Emergency access at grade should be restricted as little as possible.	

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

			COMMENTS		
AGENCY	DATE	SIGNATURE	ENVIROMENTAL	OTHER	LOCATION IN EIR
City of Compton (Cont'd.)				C. Access to tracks by emergency vehicles if depressed.	
City of Gardena	10/12/83	W. Ballenger	No adverse environmental effects to transit system.	A. Support and welcome project.	
				B. Will integrate bus routing.	
City of Long Beach	9/6/83	W.H. Storey	A. Seismic, Newport-Inglewood may not be active.	A. Change baseline description to Atlantic with with Pacific Ave. loop.	A. Refer to sections on geology and seismicity in Chapter II, III, and IV.
			B. Conformance with Air Quality Maintenance Plan.	B. Relocate station from 7th-Pacific south to 6th.	B. Air quality information can be found in Chapter II, IV, and V in section entitled Air Quality.
			C. Noise impacts.		C. Chapters II, III, IV, VI, and VII all contain discussion of noise impacts.
City of Long Beach	9/13/83	J.E. Dever		Study additional station between Compton Blvd. and Del Amo.	Station located at Artesia Blvd.
City of South Gate	9/21/83	Robert A. Phillips	A. Project description including station design and capacities.	Would like copy of EIR.	A. See Chapter I.

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
City of South Gate (Cont'd.)			B. Discuss impacts on land use, relocation and need for new housing.		B. Refer to Chapters II, III, IV for discussion on land and housing. Displacement discussed in Chapter III, Section 321.
			C. Traffic and circulation changes in travel patterns, congestion, street re-alignments, parking, number and types of vehicles using facilities. Impacts on paving and signals.		C. and D. Discussion of traffic and transportation found in Chapters II, III, IV, V, VII, and VIII.
			D. Changes in rail traffic.		
			E. Noise, air quality, and aesthetic impacts.		E. <u>Noise</u> - See noise and vibration sections for each segment in Chapters II, III, and IV. <u>Air Quality</u> - See air quality sections for each segment in Chapters II, IV, and V. <u>Aesthetic Impacts</u> - See visual quality Sections 124, 224, and 324 of Chapter IV.
City of Torrance	9/22/83	R.W. Hildebrand	A. Impacts and changes in future development patterns.	Suggest additional station for River Route (LB-3) at Pacific Coast Hwy.	A. See Chapter IV; Sections 120, 220, and 320.

APPENDIX 4 (Continued)

S U M M A R Y   O F   R E S P O N S E S

AGENCY	DATE	SIGNATURE	COMMENTS ENVIROMENTAL	 OTHER	LOCATION IN EIR
City of Torrance (Cont'd.)			B. Impacts on bus interface with Torrance transit. (Letter described in detail all routes.)		B. See transit portions of traffic and transportation sections, Chapters II, IV, and V.
Port of Long Beach	9/14/83	Leland R. Hill	Impact to rail freight transportation.	A. Would like copy of draft EIR.	Discussion of rail freight contained in mid-corridor traffic and transportation sections; see Chapter II, Section 334; Chapter III Section 322, and Chapter IV Section 230.
				B. If River Route chosen then permit would be necessary.	
<u>General Public</u>					
Christian Life Church	9/21/83	T. Ray Rachels		Need additional station at Pacific and Wardlow.	

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
City of South Gate (Cont'd.)			B. Discuss impacts on land use, relocation and need for new housing.		B. Refer to Chapters II, III, IV for discussion on land and housing. Displacement discussed in Chapter III, Section 321.
			C. Traffic and circulation changes in travel patterns, congestion, street re-alignments, parking, number and types of vehicles using facilities. Impacts on paving and signals.		C. and D. Discussion of traffic and transportation found in Chapters II, III, IV, V, VII, and VIII.
			D. Changes in rail traffic.		
			E. Noise, air quality, and aesthetic impacts.		E. Noise - See noise and vibration sections for each segment in Chapters II, III, and IV. Air Quality - See air quality sections for each segment in Chapters II, IV, and V. Aesthetic Impacts - See visual quality Sections 124, 224, and 324 of Chapter IV.
City of Torrance	9/22/83	R.W. Hildebrand	A. Impacts and changes in future development patterns.	Suggest additional station for River Route (LB-3) at Pacific Coast Hwy.	A. See Chapter IV; Sections 120, 220, and 320.

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

AGENCY	DATE	SIGNATURE	COMMENTS: ENVIROMENTAL	COMMENTS: OTHER	LOCATION IN EIR
City of Torrance (Cont'd.)			B. Impacts on bus interface with Torrance transit. (Letter described in detail all routes.)		B. See transit portions of traffic and transportation sections, Chapters II, IV, and V.
Port of Long Beach	9/14/83	Leland R. Hill	Impact to rail freight transportation.	A. Would like copy of draft EIR.	Discussion of rail freight contained in mid-corridor traffic and transportation sections; see Chapter II, Section 334; Chapter III Section 322, and Chapter IV Section 230.
				B. If River Route chosen then permit would be necessary.	
<u>General Public</u>					
Christian Life Church	9/21/83	T. Ray Rachels		Need additional station at Pacific and Wardlow.	

Appendix

5

APPENDIX 5

LIST OF PERSONS/ORGANIZATIONS CONTACTED

CITY OF LONG BEACH

City Schools	Leon Taylor
Community Development	Dave Lund Kathy Graham
Engineering	Dick Backus Jim Pott
Fire Department	Allan R. Carter
Housing Authority	Dick Mayor
Planning Department	Robert Paternoster Bob Brady Bud Crow Jim Rafferty Harold Simkins William H. Storey
Police Department	Chief Charles B. Ussery
Port of Long Beach	Byron Buck
Public Works Department	Jim Chin Ron Creighton

CITY OF LOS ANGELES

Bureau of Engineering	Alma Carlisk Basum Hanna
Community Redevelopment Agency	Aziz Banajan Frances Banerjee Tom Forushiro John Given Ileana Liel Ruckins McKinley

Department of Public Works	
Department of Water and Power	Nancy Niles
Fire Department	Captain Jeffery
Housing Authority	Nancy Ryerson
Planning Department	Glenn Blossom David Leslie Phyliss Nathanson Jon Perica Bill Spencer
Police Department	Captain T.L. Searcy
Port of Los Angeles	Art Goodwin Lillian Kawasaki
Transportation Planning	Donald A. Dove Phil Aker

CITY OF CARSON

Community Development	Pat Nemeth

CITY OF COMPTON

Compton Municipal Water Company	
Fire Department	Batallion Chief Kredit
Office of the City Manager	Laverta Montgomery
Planning/Zoning Department	Robert Gavin Jerry Gadt Maynard Young
Police Department	Chief James Carrington
Public Works	Angel Espiritu

CITY OF HUNTINGTON PARK

Community Development Department	James Funk
Redevelopment Department	Mike Martin

CITY OF LYNWOOD

Planning Department	Sandra Read

CITY OF SIGNAL HILL

Planning Department	Christine Shingleton

CITY OF SOUTH GATE

Community Development	Robert A. Phillip

CITY OF VERNON

Community Services	Victor Vaits

COUNTY OF LOS ANGELES

Community Development Commission	Jim Draughon Mark Grisham Kathy Ikari Jesse Lewis Jeff Westbrook
Department of Parks and Recreation	Bill Maupin
Fire Department	Captain Provost
Flood Control District	C.F. Eshelby
Health Services Department	

Martin Luther King Hospital	George Garcia
Office of the Assessor	Walter Jackson
Office of the Auditor-Controller	
Road Department	Roland Etchevery Ed Rugel Don Roye Henry Wong
Sanitation Districts 1, 8, and 3	
Sheriff's Department	Captain J.A. Anderson
Southern California Rapid Transit District	Rudy Beuermann
Water Works Districts 10 and 16	

STATE OF CALIFORNIA

Employment Development Department	
Regional Water Quality Control Board	David Carlson
Department of Parks and Recreation	Earl Carlson (Sacramento) A. Ulm (Los Angeles)
El Pueblo State Historic Park	Jean Bruce Pool
State Office of Historic Preservation	James Fisher Aaron Gallup Steve Mikesell
University of California, Berkeley	Robert Leachman

UNITED STATES GOVERNMENT

United States Bureau of the Census	John Hernandez Bud Steinfield
United States Department of Commerce, Bureau of Economic Analysis	
United States Postal Service	Dave Wills

PRIVATE

American Automobile Association	
American High Speed Rail	Pam Engebretson
California Construction Industry Research Board	
Compton Development Corporation	Bob Shields
Dominquez Water Company	
Downtown Long Beach Hotel Association	Jane Montgomery
Economic Research Corporation	Si Richardson
Greater Los Angeles Visitors and Convention Bureau	
Greater Telephone Company of California	
Keyser-Marston Associates	Michael Conlon
Landauer and Associates	
Long Beach Area Convention & Visitors Council	
Long Beach Gas Company	
Los Angeles Conservancy	Ruthann Lehrer
Los Angeles Hotel Association	
Memorial Hospital Medical Center of Long Beach	Personnel Office
Metropolitan Water District	Jay Malinowski
Pacific Bell Telephone Company	
Park Water Company	
Southern California Gas Company	
St. Mary Medical Center	Denise Smith
Watts Labor Community Action Committee	David Alpaugh Louise Manauel

APPENDIX 6

LIST OF PREPARERS

LOS ANGELES COUNTY TRANSPORTATION COMMISSION.

Lead agency responsible for EIR. Key personnel include:

Rick Richmond, Executive Director; Paul Taylor, Deputy Executive Director; Daniel Caufield, Project Director; Ed Richardson, Linda Ford McCaffrey, Sharon Robinson Sivad-el, and Larry Gallagher.

PARSONS BRINCKERHOFF/KAISER ENGINEERS, Los Angeles, CA.

Responsible for preliminary engineering -- topographical, floodplains, water quality, vegetation, wildlife, safety, security, traffic and transportation analyses -- and graphic design. Key personnel include:

George M. Duarte, Project Manager; Ray Snyder, Deputy Project Manager; Chris Anderson, Rey Belardo, John Bergerson, Robert Bramen, Nick Brown, Ben Cavin, Alan Cuthbertson, Mike Davis, Bernice Gross, Darius Irani, Norman J. Jester, Donald D. Kriens, Kal Krishnan, Zelda Laskowski, Steve Line, Chuck Lowder, Joe McTague, George Paulson, Robert C. Schaevitz, Cheri Sheets, Ash Siddig, and Barbara Wilson.

MYRA L. FRANK & ASSOCIATES, San Marino, CA.

Responsible for EIR management, coordination and preparation; and housing, community services, and portions of energy and air quality analyses. Key personnel include:

Myra L. Frank, Principal-in-Charge; Steven F. Brye, Joan A. Kugler, Sharon C. Peelor, Laiky K. Tamny, and William P. Wickham.

SEDWAY COOKE ASSOCIATES, Los Angeles, CA.

Responsible for land use, population, and visual quality analyses and portions of graphic design. Key personnel include:

Neil Hart, Rod Jeung, Janet Parrish, Juliana Pennington, Jack Schnitzius, Patricia Smith, and Linda Wagstaff.

BOLT BERANEK & NEWMAN, INC., Canoga Park, CA.

Responsible for noise and vibration analyses. Key personnel include:

Myles A. Simpson and Michael P. Bucka.

WILLIAMS-KUEBELBECK and ASSOCIATES, INC., Marina del Rey, CA.

Responsible for economic impacts and financial analyses. Key personnel include:

William Whitney and Lori Campana

CALIFORNIA DEPARTMENT OF TRANSPORTATION, Los Angeles, CA.

Responsible for design of structures, historic, cultural and biotic resources analyses. Key personnel include:

Richard Baker, Susan Brown, Dan Butler, George Casen,
Steve Michalak, Charles Pearson, John Sully, and Lois Webb

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS, Los Angeles, CA.

Responsible for air quality and energy analyses, patronage estimations and housing projections. Key personnel include:

Richard Spicer, Tim Douglas, Larry Foutz, Miriam Gensemer,
Gil Hicks, Hong Kim, Dennis Macheski, Gordon Palmer,
Gary Petersen, Cathy Tyrrell, Bill Wells, and Millie Yamada.

KENNARD DESIGN GROUP, Los Angeles, CA.

Responsible for conceptual design work for the various stations types. Key personnel include:

Robert Kennard, Les Makowski, and Mohamed Kashani-Jou.

PACIFIC INTERNATIONAL ENGINEERS, Los Angeles, CA.

Responsible for schematic concepts for the various overhead contact system alternatives and order of magnitude costs for each option. Key personnel include:

Gregory Parks and Warner Selman

J. WARREN AND ASSOCIATES, Oakland, CA.

Responsible for civil engineering effort with particular emphasis on the railroad trackwork plans and arrangements. Key personnel include:

John T. Warren, Johnson W. Yee, Javad Saebfar,
Eugenie P. Thomson, and James W. Yee

DEPARTMENT OF TRANSPORTATION, LOS ANGELES, CA.

Assisted in portal location of LA-2, preliminary engineering of at-grade sections with respect to traffic lane widths and layouts, and mid-corridor traffic study. Key personnel include:

Sam Furata, Don Howry, Tom Jones, and Alice Lepis

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT, LOS ANGELES, CA.

Prepared preliminary designs for 7th and Flower Metro Rail station inferface with LA-2 and LA-3; assisted with interface concepts at Union Station and various aspects of transit operations integration. Key personnel include:

Jim Crawley, Doug Lowe, Bill Rhine, Joel Sandberg, and
Gary Spivack.

CERTIFIED PERSONNEL SERVICES, Los Angeles, CA.

Production Assistants:

Michelle Burton, Nevada Jones, and Henrietta McQueen