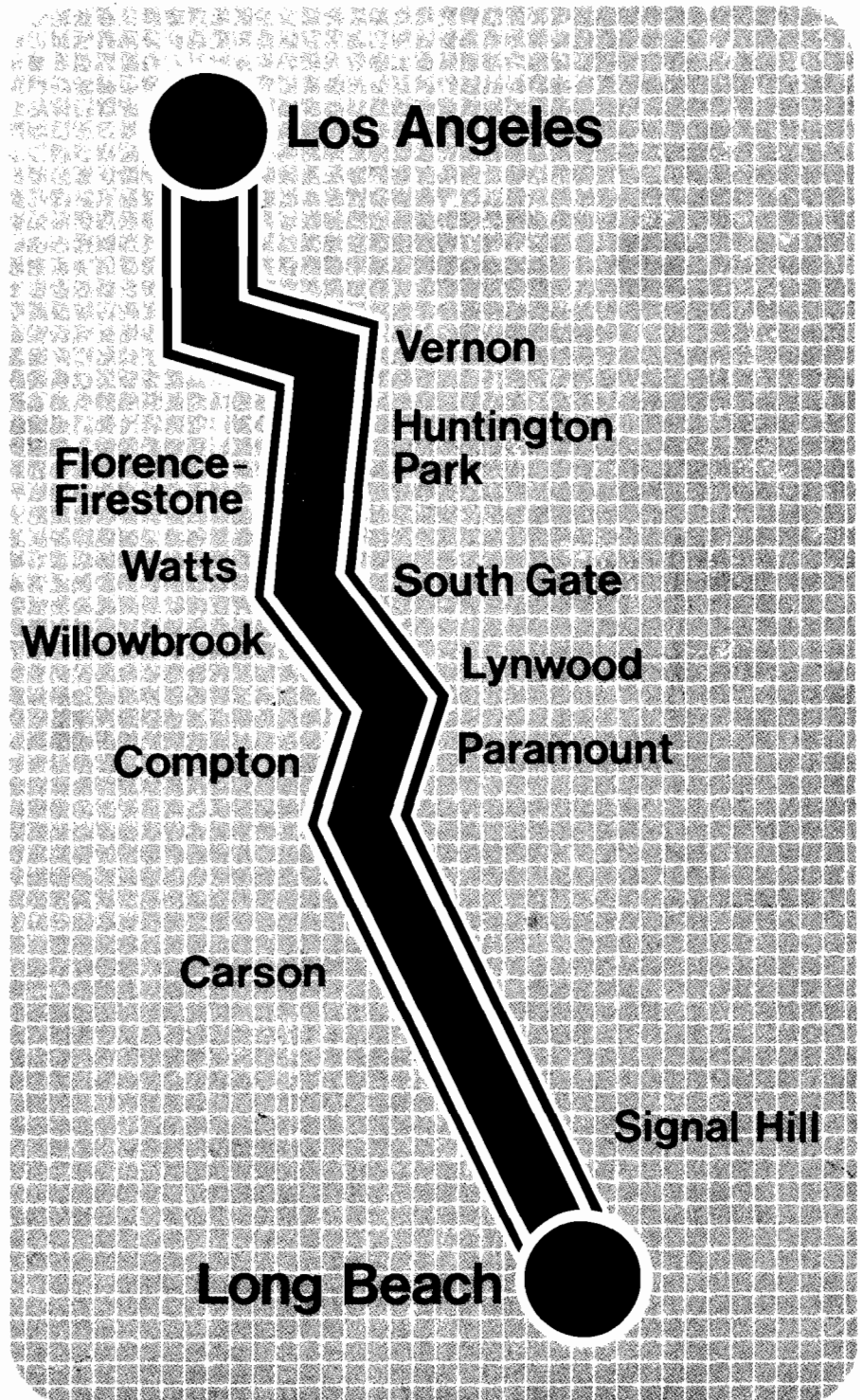


The Long Beach - Los Angeles Rail Transit Project

December 1984



Los Angeles County
Transportation
Commission
403 West 8th Street
Suite 500
Los Angeles
California 90014
(213) 626-0370

2344-1899

Draft Supplemental Environmental Impact Report

(SCH No. 83091415)

The Long Beach-Los Angeles Rail Transit Project

December 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 - Department of Public Works

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





Los Angeles County
Transportation
Commission
403 West Eighth Street
Suite 500
Los Angeles
California 90014
(213) 626-0370

December 3, 1984

Community Organizations
Elected Officials
Government Agencies
Interested Persons and Business

The Los Angeles County Transportation Commission has prepared this draft Supplemental Environmental Impact Report (SEIR) addressing three additional alignment alternatives for the Long Beach segment of the Long Beach-Los Angeles rail transit project. The alternatives are additional to the routes examined for Long Beach in the Commission's May, 1984 Draft Environmental Impact Report (DEIR).

The Commission decided to prepare this draft SEIR on August 15, 1984, after consideration of comments received on the DEIR during June and July, 1984 from community groups and City officials in Long Beach. A public hearing on the contents of this draft SEIR is scheduled for January 9, 1985 at 6:00 p.m. in Long Beach City Hall. All written comments on this draft SEIR are also requested no later than January 9, 1985.

During late January and February, 1985, the Commission will consider the contents of the May, 1984 DEIR as well as this draft SEIR, and all review comments received on both documents, in its evaluation of the various Long Beach alignment alternatives toward selection of a "preferred alternative" for the project. The Commission plans to issue a Final EIR for the project in March, 1985 and formally adopt the preferred alternative at that time.

Sincerely,

A handwritten signature in black ink that reads "Mike D. Antonovich". The signature is written in a cursive, flowing style.

MICHAEL D. ANTONOVICH
Chairman

MDA:bn

RECEIVED

DEC 7 1984

PLANNING DEPT.

Executive Summary

Executive Summary

The following text is a placeholder for the executive summary content, which is rendered as a dense grid of small, illegible characters.

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This Summary portion of the Supplement to the Draft Environmental Impact Report on the Long Beach-Los Angeles Rail Transit Project incorporates by reference the following environmental documents:

- o Volume I: Summary (May, 1984)
- o Volume II: DEIR (May, 1984)
- o Volume III: Design Appendix (May, 1984)
- o Volume IV: Supplement to the DEIR

SUMMARY

S-100 PURPOSE OF PROJECT

The Long Beach-Los Angeles Rail Transit Project is the first light rail corridor to be undertaken as part of a transit improvement program by the Los Angeles County Transportation Commission (LACTC). This program is funded by a one-half percent sales tax increase approved by county voters in 1980. Based on a 1982 feasibility study, the Long Beach-Los Angeles corridor was chosen as the first project to be implemented. A major portion of the project route would be essentially the same as that of the last line operated by the Pacific Electric Railway's "Red Cars", which ceased operation in 1961.

The project has undergone preliminary engineering, and a Draft Environmental Impact Report (DEIR) was issued by the LACTC on May 30, 1984. Since that date a series of public hearings have been held, and numerous written comments have been received. In the Long Beach area, many of these comments requested that additional or modified alignment alternatives be examined. On August 15, 1984, the LACTC authorized preparation of this Supplement to the DEIR to analyze three additional alternatives in the Long Beach area.

S-200 PROJECT DESCRIPTION

The rail transit project, as defined in the Los Angeles County Transportation Commission's (LACTC) May, 1984 Draft Environmental Impact Report (DEIR), is being proposed as a conventional light rail system in the existing Southern Pacific Rail rights-of-way extending from downtown Los Angeles to downtown Long Beach. Proposed alignments in downtown Los Angeles, the mid-corridor, and Long Beach will remain as discussed in the DEIR. Three additional alternatives in the downtown section of Long Beach are presented in the Supplemental DEIR. These routes, known as LB-3 (Broadway Aerial-Modified River Route), LB-5 (Long Beach Boulevard, Two-Way), and LB-6 (Willow Street Terminus), are described in the following sections. They are shown in Figure S-1.

NOTE:
Joins Mid-Corridor Alignment
at Los Angeles River Bridge.

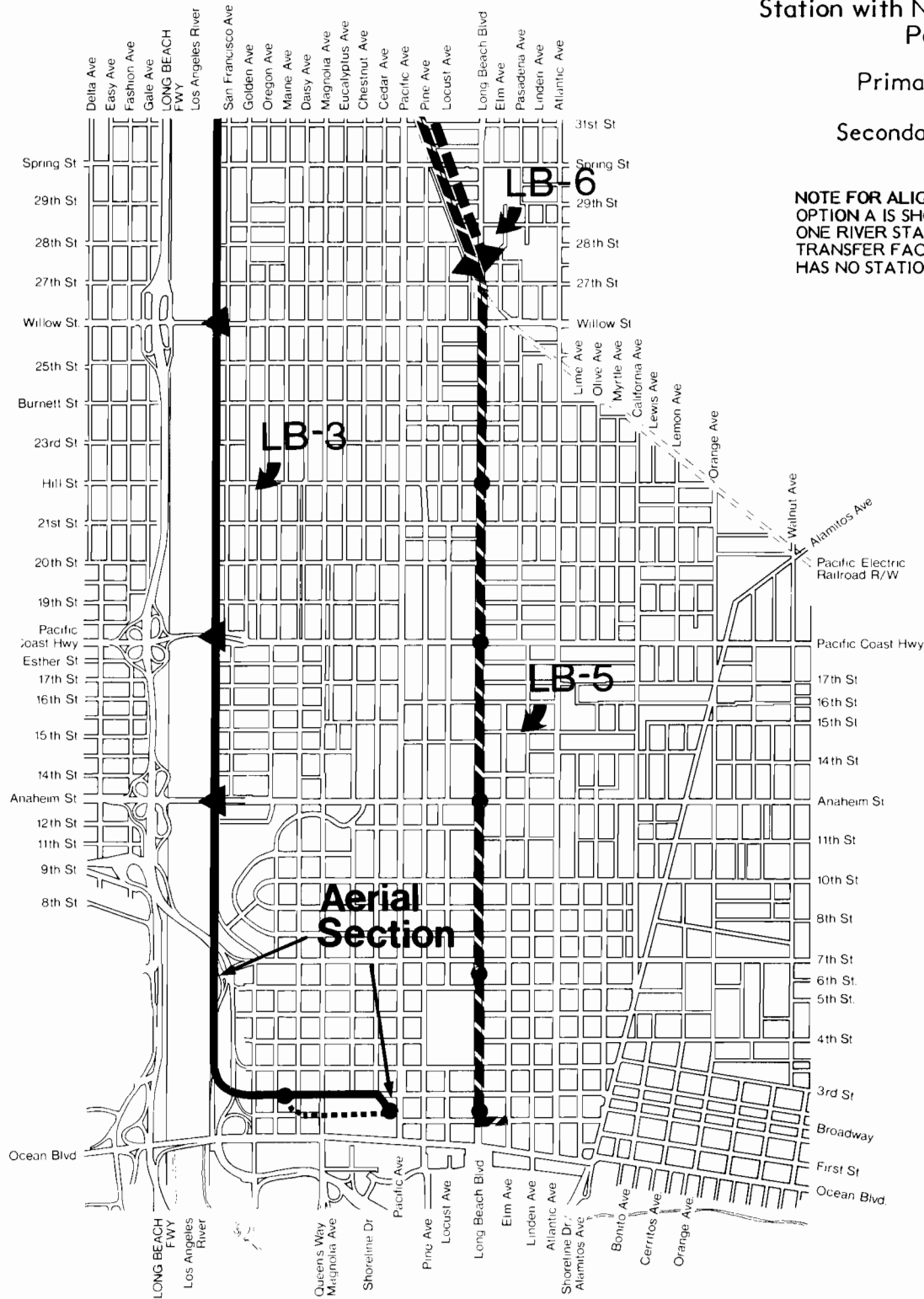
Station ●

Station with Neighborhood
Park and Ride ▼

Primary - Option D ———

Secondary - Option E - - - - -

NOTE FOR ALIGNMENT LB-3:
OPTION A IS SHOWN. OPTION B HAS
ONE RIVER STATION, AN INTERMODAL
TRANSFER FACILITY AT PCH. OPTION C
HAS NO STATIONS ALONG RIVER.



Graphic Scale in feet

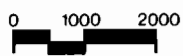


Figure S-1

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

Long Beach
Alignment Alternatives
PARSONS BRINCKERHOFF / KAISER ENGINEERS

S-210 ALTERNATIVE ALIGNMENTS

S-211 Alternative LB-3 (Broadway Aerial-Modified River Route)

This alignment would proceed south from the eastern side of the SPTC Los Angeles River bridge crossing, double tracks would be located just outside the levee on a retained embankment. Along the river, there could be three variations in the number of stations. Option A would have three river stations located at Willow Street, Pacific Coast Highway, and Anaheim Street. All three would have neighborhood parking areas (25 to 100 spaces), bus-to-train transfer facilities, and a kiss-and-ride drop-off area. Option B would have one major river station at Pacific Coast Highway. This station could incorporate a major mode change facility which would include a large park-and-ride facility (up to 1,000 spaces) and possible joint development opportunities. Option C would not have any stations along the river portion of the alignment.

At a point just south of the Long Beach Freeway overpass, the tracks would rise on an aerial structure. At Broadway, the tracks would turn east and continue above the south side of Broadway to a terminus at the Long Beach Civic Center. Aerial stations would be located at the soon-to-be-built World Trade Center and at the Civic Center terminus in Lincoln Park. There are two options for the aerial section entering the downtown area. The primary option (Option D) would run above Broadway to a diagonal terminal station in Lincoln Park. The secondary option (Option E) would penetrate the northeast corner of the World Trade Center and, with a pair of reverse curves, would proceed southeast and traverse the Civic Center complex. The terminal station would be located in Lincoln Park and would lie perpendicular to Pacific Avenue.

S-212 Alternative LB-5 (Long Beach Boulevard, Two-Way)

This proposed baseline alignment would consist of tracks running north and south along Long Beach Boulevard in a reserved median from Willow Street to 7th Street. Landscaping would be provided at station areas only. South of 7th Street, tracks would be installed on either side of the existing landscaped median, and light rail trains would operate in mixed traffic.

An extra cost optional alignment is possible north of 7th Street whereby the street is widened and landscaping is provided between the tracks for the full length of the boulevard.

Stations would be located at Wardlow Road and Willow Street on the Southern Pacific right-of-way. These stations would have neighborhood parking lots. Stations along Long Beach Boulevard would be located at Hill Street,

Pacific Coast Highway, Anaheim Street, 6th/7th Street, and 1st Street. These stations would not have parking associated with them and would all be situated in the median of the street with a center loading platform. Beyond the 1st Street station on Long Beach Boulevard, the tracks would turn to the east to form tail track on 1st Street.

S-213 Alternative LB-6 (Willow Street Terminus)

This alternative would follow the SPTC right-of-way (East Long Beach Branch) and would include stations at Wardlow Road and at the Willow Street terminus (located between 27th and 28th Streets). The Willow Street station would be a transportation center with adequate bus bays, on-site bus turnaround capability, a parking area for about 100 cars, good access, and provision for kiss-and-ride drop-off. Tail track would extend south of the station approximately 300 feet along West American Avenue.

S-220 SYSTEM ALTERNATIVE

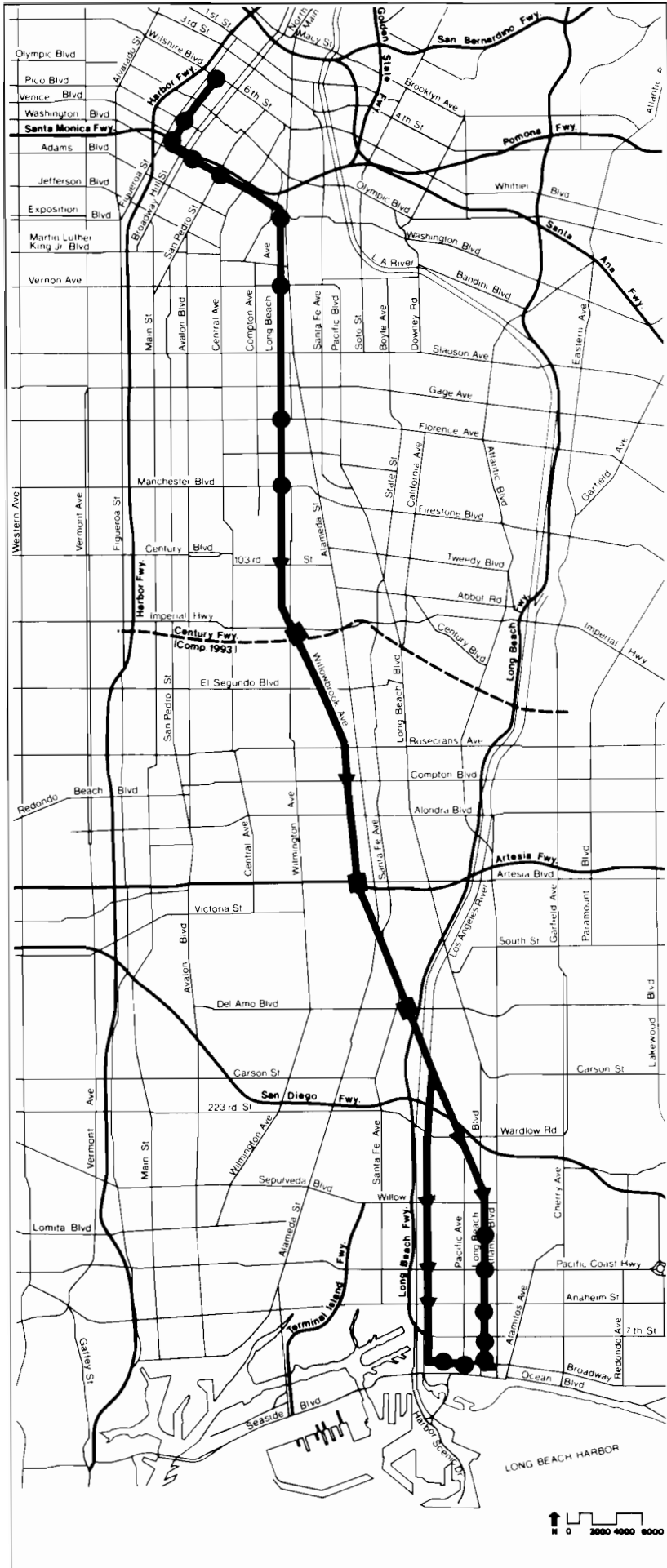
In discussing a system alternative for the Supplement to the DEIR, LA-2 (Flower Street Subway) and MC-1 (Compton At-Grade) are used as the Los Angeles and mid-corridor segments (see Figure S-2).

S-221 Operations Plan

Trains would run approximately every 12 to 15 minutes during normal service hours, with more frequent service during the AM and PM commuting periods. Service would be provided up to 20 hours a day (5:30 AM until 1:30 AM), 365 days a year.

Under some of the Long Beach alternatives discussed in the DEIR, 3-car operations would not be feasible in Long Beach because short east-west block lengths would cause trains stopped at stations to extend into intersections and potentially interfere with traffic. This would not be a factor in the case of the LB-5 (Long Beach Boulevard, Two-Way) alternative; therefore 3-car train length stations (270 feet) are intended.

The LB-3 (Broadway Aerial-Modified River Route) and LB-6 (Willow Street Terminus) alternatives would also have the capability of accommodating 3-car trains because neither would run at-grade in public street rights-of-way.



- Station ●
- Station with Park and Ride ■
- Station with Neighborhood Park and Ride ▼

NOTE:
 ALL SUPPLEMENTAL LONG BEACH ALTERNATIVES SHOWN. FOR LB-3, OPTION A IS SHOWN. LB-6 TERMINATES AT WILLOW STREET STATION.

Figure S-2
System Map

S-222 Patronage

The Southern California Association of Governments (SCAG) conducted patronage modeling estimates for two of the three supplemental alternatives. These were LB-3 (Broadway Aerial) and LB-6 (Willow Street Terminus). Separate modeling runs were conducted for Options A, B, and C under LB-3 (Broadway Aerial). Alternative LB-5 (Long Beach Boulevard, Two-Way) was not modeled because the regional transportation demand model (LARTS) is not sensitive enough to distinguish small variations among transit alignments within central Long Beach. Therefore, patronage estimates shown in the DEIR for LB-4 are used to represent LB-5.

Table I-12A (in Chapter 1, Supplement to the DEIR) summarizes the total daily boardings for the modeled supplemental alternatives.

S-223 Costs

Estimated capital costs for those system alternatives (combinations of corridor segments) which would include the supplemental alternatives under study here are shown in Table S-1. These costs reflect the sum of segment costs, yard and shop costs, and vehicle costs. They do not include right-of-way or relocation assistance costs.

Annual costs for operating alternative LB-3 (Broadway Aerial-Modified River Route) would be substantially the same as those for the original Los Angeles River Route (LB-3); LB-5 (Long Beach Boulevard, Two-Way) would similarly relate to the original LB-4 alternative. The operations cost for the LB-6 (Willow Street Terminus) alignment was not run. However, costs for this alternative would be less than for any other system alternative, as there would be no travel within the central portion of Long Beach.

TABLE S-1

TOTAL DAILY BOARDINGS AND COST ESTIMATES FOR SELECTED SYSTEM ALTERNATIVES¹

	LB-3 (Broadway Aerial)			LB-5 (Long Beach Blvd., Two-Way)	LB-6 (Willow Street Terminal)
	Option A	Option B	Option C		
Total Daily Boardings (Year 2000)	54,750	54,326	52,607	54,702 ²	50,300
Capital Costs ³	406.7	404.1	400.0	389.5	370.5
Operating Costs	8.5	8.5	8.5	8.4	N.A.

¹ Assumes LA-2 (Flower Street Subway) in downtown Los Angeles and MC-1 (Compton At-Grade) in the mid-corridor).

² Estimated to be the same as alternative LB-4 (Atlantic with Pacific Loop) in DEIR.

³ Capital costs in current dollars include: construction of alignment, costs of vehicles, engineering and management, agency costs, and contingency costs. Right-of-way and relocation assistance costs are not included. Preliminary estimates for LB-3 (Modified River Route) right-of-way costs range between \$2 and \$4 million dollars.

Source: Southern California Association of Governments (SCAG) for patronage estimates, 1984; PB/KE for cost estimates, 1984.

S-300 **SIGNIFICANT ENVIRONMENTAL CONSEQUENCES AND
MITIGATION MEASURES**

S-310 **SIGNIFICANT EFFECTS**

The significant environmental effects of the proposed project are associated with specific alternatives as follows:

LB-3 (Broadway Aerial-Modified River Route):

The only significant adverse effect in this alternative would be the displacement of a residential duplex.

All of the river options could create potentially significant noise impacts at some residences.

Mitigation: All of those displaced would receive relocation assistance, which would constitute partial mitigation, but the net impact would still be significantly adverse for those affected.

Noise impacts would be mitigated to insignificant levels by installation of a sound wall.

LB-5 (Long Beach Boulevard, Two-Way):

Removal of the landscaping in the median between 7th and Willow Streets would constitute a significant adverse visual effect.

Mitigation: Some landscaping would be replaced in station areas, resulting in partial mitigation. An optional Long Beach Boulevard conceptual design would preserve the landscaped median at the expense of street widening to maintain an exclusive transitway. This option would remove or relocate some street landscaping on sidewalks in order to widen the street.

LB-6 (Willow Street Terminus):

There are no significant adverse environmental effects associated with this alternative.

S-320 **SUMMARY OF PROJECT IMPACTS**

The following summary of project impacts outlines anticipated impacts in each impact category, the alternative alignment to which the impact applies, a brief description of the impact (and a determination of whether

it is significant or minor), mitigation that has been incorporated into the project or which the LACTC is prepared to undertake if that alternative is selected, and a determination whether the net remaining impact would be significantly adverse. Detailed discussion of each of these impacts can be found in the Supplemental Draft Environmental Impact Report for the Long Beach-Los Angeles Rail Transit Project.

TABLE S-2

SUMMARY OF PROJECT IMPACTS

SUPPLEMENTAL LONG BEACH ALTERNATIVES*

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>
Topography, Soils, Geology					
Construction:	LB-3	Cut-and-cover soil excavation at Willow	Minor Adverse	Proper disposal of excess material	None
Operation:	All	General Southern California seismic risk	Minor Adverse	Soils testing to ensure conformance to codes; operating safety systems	None
	All	Cherry Hill fault crossed by tracks	Potential Adverse	Soils testing to ensure conformance to codes; operating safety systems	None
Floodplains, Hydrology, Water Quality					
Construction:	All	Possible siltation and water run-off during construction	Minor Adverse	Control by catch basin, settling pond, other standard techniques	Very Minor Adverse

* For purposes of this summary table, LB-3 refers to the LB-3 (Broadway Aerial-Modified River Route) alternative.

TABLE S-2 (Continued)

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>
	LB-3	Possible contaminated soils	Minor Adverse	Separate contaminants before disposal	None
Operation:	LB-3 LB-6	Increased run-off from parking lots	Minor Adverse	Install drainage	None
Vegetation and Wildlife					
Construction:	LB-3 LB-5	Removal of trees and existing vegetation; displacement of animals; no endangered species	Minor Adverse	Replace landscaping where appropriate and feasible; Optional LB-5 would restore landscaped median and require street widening	Minor Adverse
Operation:	All	None			None
Air Quality					
Construction:	All	Slight increase in particulates; slight increase in auto emissions	Minor Adverse	Control dust at construction sites	Very Minor Adverse

TABLE S-2 (Continued)

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>
Operation:	All	Slight reduction in pollutant burden for region	Minor Beneficial		Minor Beneficial
	LB-3 LB-6	Slight increase in carbon monoxide at parking lots	Very Minor Adverse	None, within state standards	Very Minor Adverse
Energy					
Operation:	All	Possible slight decrease in regional energy consumption	Possibly Minor Beneficial		Possibly Minor Beneficial
Noise and Vibration					
Construction:	All	Temporary increases around construction sites	Minor Adverse	Use of alternative construction methods, proper scheduling, noise barriers	Minor Adverse
Operation:	LB-3	Noise increase of 5 dBA at some residences	Possibly Significant Adverse	Noise wall	None

TABLE S-2 (Continued)

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>
Land Use, Population, Housing	Construction:				
	All	Purchase of substation sites could require displacement depending on sites	Minor Adverse	Select sites to minimize displacement, relocation assistance	Probably None
	LB-3	Complete or partial acquisition of 30 parcels for Options A, B, C. One duplex, 3 storage sheds, and one industrial property will be displaced	Significant Adverse	Relocation assistance	Significant Adverse
	LB-3	Precludes construction of 75 housing units	Adverse		Adverse
	LB-6	Acquisition and relocation of one commercial property	Minor Adverse	Relocation Assistance	Minor Adverse
	Operation:				
	All	Slight increase in population, employment, housing	Minor Beneficial	None necessary, within adopted plans	Minor Beneficial
LB-3 LB-5	Enhancement of revitalization efforts	Minor Beneficial		Minor Beneficial	

TABLE S-2 (Continued)

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>
Community Services					
Construction:	All	Very slight intermittent increase in response times for emergency vehicles	Minor Adverse	Signage, definition of alternate routes	Minor Adverse
	LB-3	Temporary obstruction of LARIO equestrian trail during relocation	Minor Adverse	Signage, definition of alternate routes	Minor Adverse
	LB-3	Temporary obstruction of bike trail	Minor Adverse	Signage, definition of alternate routes	Minor Adverse
Operation:	All	Improves accessibility to community services; LB-5 has most significant improvement	Beneficial		Beneficial
	LB-3	Access to LARIO bike and equestrian trails would be modified; additional bike access at Anahiem with Option A	None		None
	LB-3	Options D and E take a portion of Lincoln Park	Minor Adverse	Integrate station with proposed redesign of Lincoln Park	Minor Adverse

TABLE S-2 (Continued)

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>
	LB-5 LB-6	Train operations could intermittently block intersections to emergency vehicles	Very Minor Adverse	None possible	Very Minor Adverse
	LB-6	Fencing of rail tracks will improve safety	Minor Beneficial	Existing street crossings will be maintained	Minor Beneficial
	LB-6	Some walk times to community services increased because of fencing	Very minor Adverse	Existing street crossings will be maintained	Very minor Adverse
Economic Activity					
Construction:	All	Increased jobs and purchases in region	Beneficial		Beneficial
	All	Disruption to business during construction	Adverse	Limit number of blocks closed at a time, maintain minimum access	Minor Adverse
Operation:	All	Loss in property tax because of acquisition for project facilities	Minor Adverse	Minimize acquisitions, consider joint development	Minor Adverse
	All	Increases in property and sales bases because of new development	Minor Beneficial		Minor Beneficial

TABLE S-2 (Continued)

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>
Visual Quality					
Construction:	All	Temporary disruption and visual clutter	Minor Adverse	Fencing and barriers where appropriate.	Minor Adverse
Operation:	LB-3	Visual incompatibilities with aerial sections	Minor Adverse	Materials and design, to reduce bulk; landscaping	Minor Adverse
	LB-3	Visual incompatibilities with adjacent residential areas	Minor Adverse	Wall and/or landscaping	Minor Adverse
	LB-5	Removal of about 185 trees in median changes visual character	Significant Adverse	Replace landscaping in station areas where feasible; Optional LB-5 would restore landscaped median and require street widening	Adverse
Historic and Cultural Resources					
Construction:	All	Increased noise, dust; reduced access	Minor Adverse	Standard construction practices to minimize noise, dust, traffic impacts	Minor Adverse
Operation:	LB-3	Visual incompatibilities of aerial structure	Minor Adverse	Materials and design to reduce bulk	Minor Adverse

TABLE S-2 (Continued)

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>	
Traffic and Transportation	Construction:	All	Increased congestion, traffic delays to autos, buses, pedestrians	Adverse	Schedule street closures to reduce impacts, directional signage, traffic control plans	Minor Adverse
		LB-3 LB-5	Reduction in on-street parking	Minor Adverse		Minor Adverse
	Operation:	All	Reduce vehicle miles travelled by autos	Minor Beneficial		Minor Beneficial
		All	Increase transit usage	Minor Beneficial		Minor Beneficial
		LB-3 LB-5	Reduction in some street capacities	Adverse	Restriping, parking reductions at intersections and stations, change signal cycles where necessary	Minor Adverse
		LB-5	Some increased local congestion with at-grade alternative	Adverse	Restriping, parking reductions at intersections and stations, change signal cycles where necessary	Minor Adverse

TABLE S-2 (Continued)

<u>Environmental Factor</u>	<u>Supplemental Alternatives</u>	<u>Description of Impact</u>	<u>Impact Determination</u>	<u>Mitigation</u>	<u>Net Impact</u>
	LB-3 LB-5	Permanent reduction in on-street parking	Minor Adverse	Increase feeder bus	Very Minor Adverse
	LB-3 LB-6	Slight increase in congestion around stations	Minor Adverse	Restriping, parking, reductions at intersections and stations	Minor Adverse
	LB-3 LB-6	Possible spillover parking at Willow, Anaheim stations	Minor Adverse	Strict enforcement of parking regulations	Minor Adverse

S-400 AREAS OF CONTROVERSY

Areas of controversy for the Supplement to the DEIR include issues previously raised, both formally and informally, during the planning and public review process and potential issues that have become apparent during the environmental analysis conducted for the Supplement.

LB-3 (Broadway Aerial-Modified River Route)

- o One duplex would be acquired and demolished for this alternative. Construction of this alternative would preclude construction of a 75-unit housing project on the Los Angeles County Flood Control Property.
- o Some increased noise levels would occur in the residential area of the river portion of the alignment.
- o Access to the horse trail and bikeway would be modified (but fully maintained).
- o This alternative would take a portion of Lincoln Park at the Civic Center, but would incorporate a redesign of the park area.
- o Slight increases in traffic would occur in residential areas around proposed stations.

LB-5 (Long Beach Boulevard, Two-Way)

- o Slightly increased noise levels in residential areas.
- o Visual impact of loss of trees and vegetation in median strip (except at stations) unless street is widened at extra cost.
- o Traffic impacts of running rail transit vehicles in mixed traffic south of 7th Street.

LB-6 (Willow Street Terminus)

There are no environmental areas of controversy for this alternative; however, it would serve fewer of the Long Beach major activity centers such as the Civic Center and Long Beach shopping mall. It would require all rail transit users to transfer to/from buses or park/ride at Willow Street.

S-500 **ISSUES TO BE RESOLVED**

Issues to be resolved on the part of the Los Angeles County Transportation Commission (LACTC) include, but are not limited to, the following:

- (1) Choice of the preferred alignment in the Long Beach area.
- (2) If LB-3 (Broadway Aerial) is the chosen alignment, choice of optional placements along the aerial section on Broadway and the number of stations along the river.
- (3) If LB-5 is the chosen alignment, choice between removing or preserving the median landscaping on Long Beach Boulevard.
- (4) Agreements with affected transit properties for revision of existing bus services to result in the proposed complementary bus network.
- (5) Determination of charges, if any, at parking lots.
- (6) Mechanisms to conduct joint development where this is considered feasible and appropriate.
- (7) Determination of final design issues such as exact placement of stations, traction power substations, use of high-platform stations, or ramps or lifts for handicapped access at low-platform stations.

Depending on the preferred alternative, specific mitigation in the following areas would have to be determined:

- o Noise: The specific method to reduce noise impacts on adjacent residences would have to be developed and implemented.
- o Displacement: A relocation plan in conformance with applicable state and local law would have to be developed and implemented for all alternatives involving housing and/or business displacements.
- o Traffic: Definition of specific traffic mitigation measures such as parking restrictions, striping, traffic signal control changes, and turning movements would have to be developed with each of the local traffic departments depending on the choice of the preferred alternative.

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This Supplement to the Draft Environmental Impact Report on the Long Beach-Los Angeles Rail Transit Project incorporates by reference the previous environmental documents as follows:

- o Volume I: Summary, DEIR
- o Volume II: DEIR, May 1984
- o Volume III: Design Appendix, May 1984

Chapter

1. Introduction
2. Background
3. Methodology
4. Results
5. Discussion
6. Conclusion
7. References
8. Appendix
9. Glossary
10. Index

I PROJECT DESCRIPTION

I-100 DESCRIPTION OF PROPOSED ACTION

The rail transit project, as defined in the Los Angeles County Transportation Commission's (LACTC) May, 1984 Draft Environmental Impact Report (DEIR), is being proposed 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 unincorporated county areas of Florence-Firestone, Willowbrook, and Dominguez Hills.

Proposed alignments in downtown Los Angeles, the mid-corridor and Long Beach will remain as discussed in the DEIR. Three additional alternatives in the downtown section of Long Beach are presented in this Supplemental EIR. These routes, known as LB-3 (Broadway Aerial-Modified River Route), LB-5 (Long Beach Boulevard, Two-Way), and LB-6 (Willow Street Terminus) are described in the following sections. They are shown in Figures I-10A to I-10C.

I-110 ALTERNATIVE ALIGNMENTS

I-111 Alternative LB-3 (Broadway Aerial-Modified River Route)

This alternative is a modified version of the Los Angeles River Route (LB-3) alternative discussed in the DEIR. It is referred to in the text as LB-3 (Broadway Aerial) or simply Modified River Route. Proceeding south from the eastern side of the SPTC Los Angeles River bridge crossing, double tracks would be located just outside the levee on retained embankment. There can be three variations in the number of stations; Option A would have three river stations, Option B would have one major river station at Pacific Coast Highway while Option C would not have any river stations.

Access to the levee bike path would be maintained, and a horse trail north of Willow Street along the foot of the levee would be relocated to the east of the rail transit alignment. At a point just south of 6th Street, the tracks would rise on an aerial structure. At Broadway, the tracks would turn east and continue above the south side of Broadway to a terminus at the Long Beach Civic Center. There are two options for having the aerial section enter the downtown area. The primary option (Option D) would run above Broadway to Cedar Avenue where a southerly turn would lead to a diagonal terminal station in Lincoln Park. The secondary option

NOTE:
Joins Mid-Corridor Alignment
at Los Angeles River Bridge.

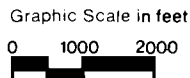
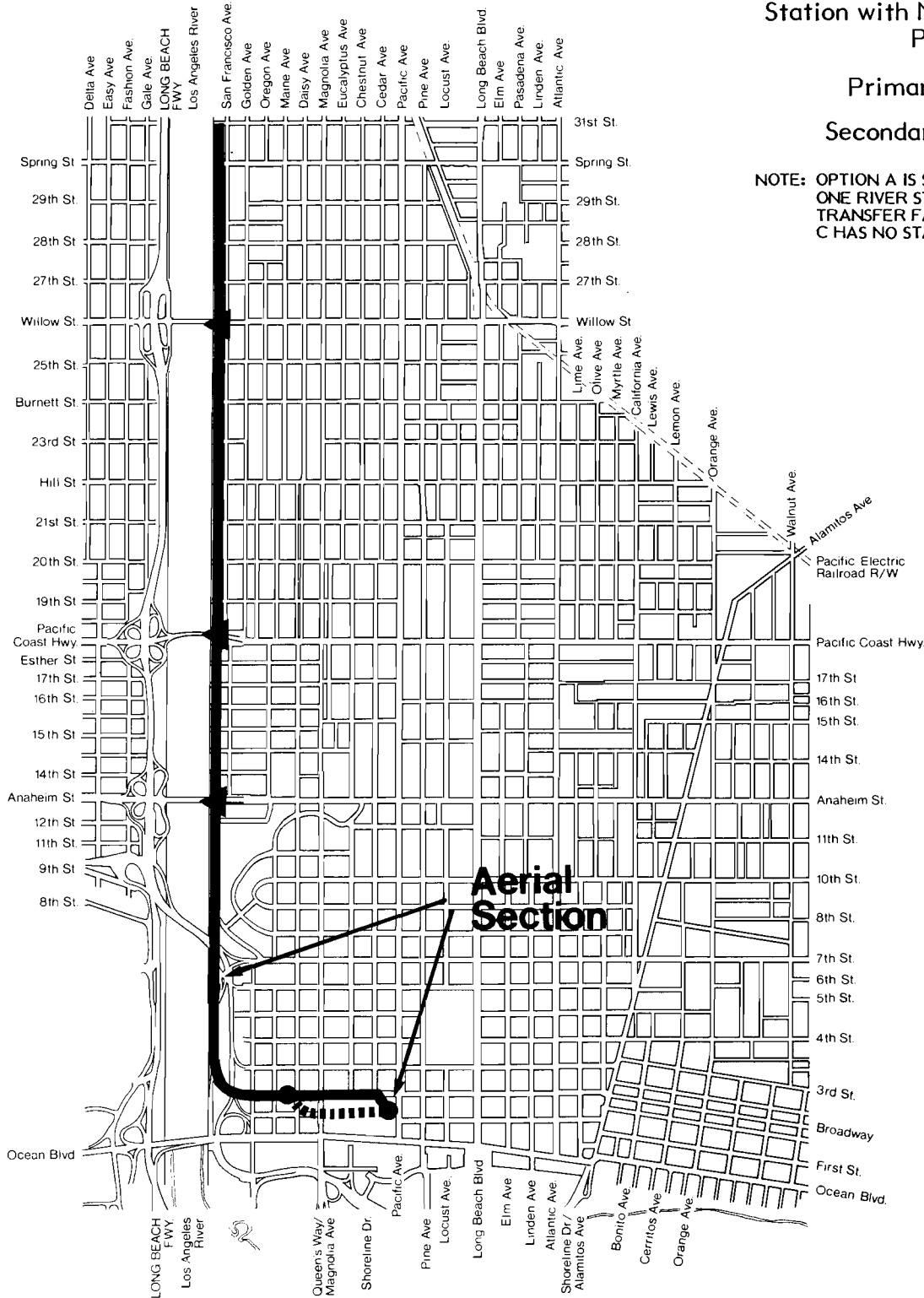
Station ●

Station with Neighborhood
Park and Ride ▼

Primary - Option D ———

Secondary - Option E ■■■■

NOTE: OPTION A IS SHOWN. OPTION B HAS
ONE RIVER STATION, AN INTERMODAL
TRANSFER FACILITY AT PCH. OPTION
C HAS NO STATIONS ALONG RIVER.



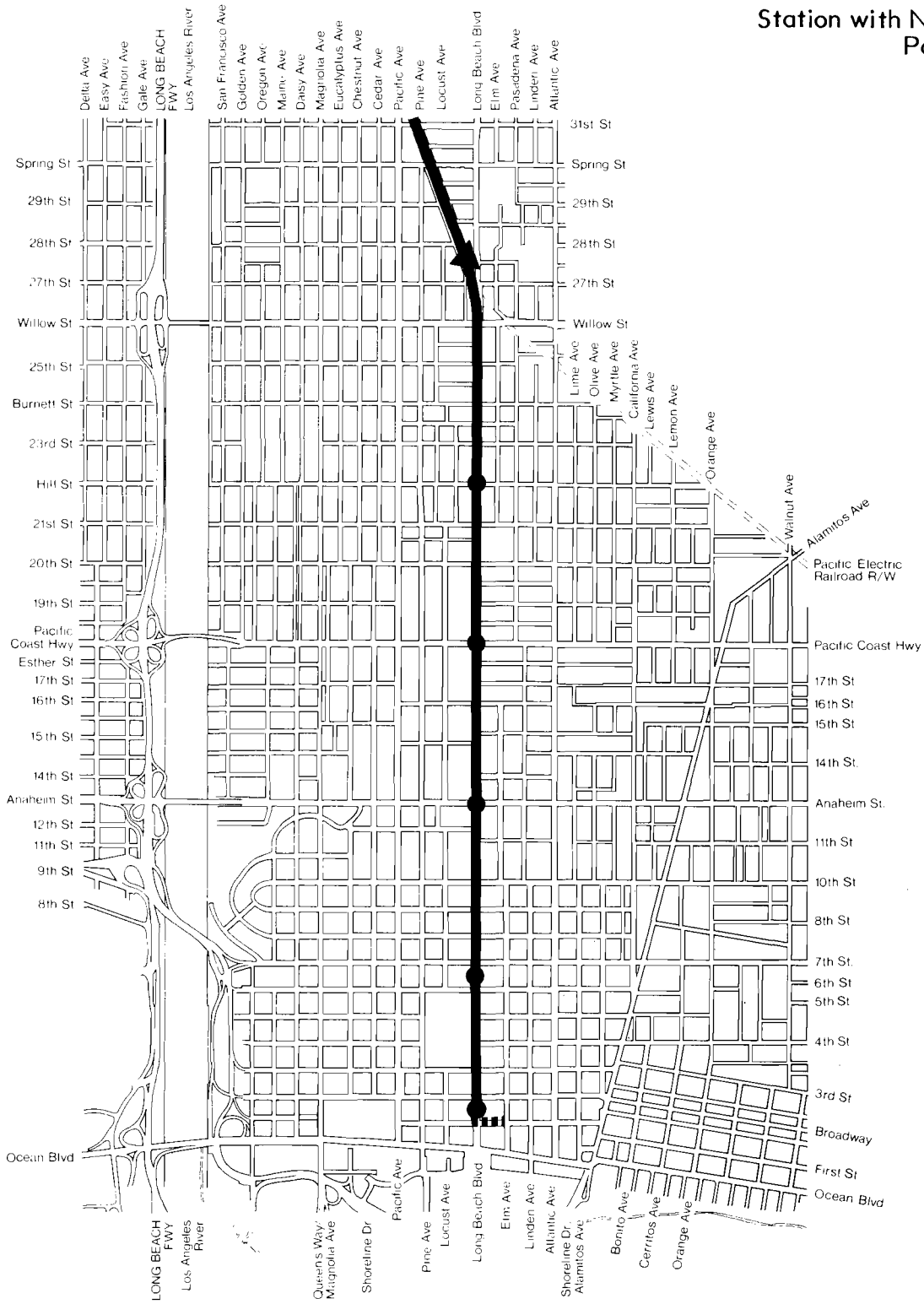
**Modified River Route LB-3
(Broadway Aerial)**

Figure I-10A

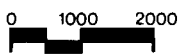
Station ●

Station with Neighborhood Park and Ride ▼

Tail Track ■■■■

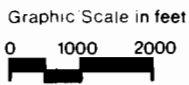
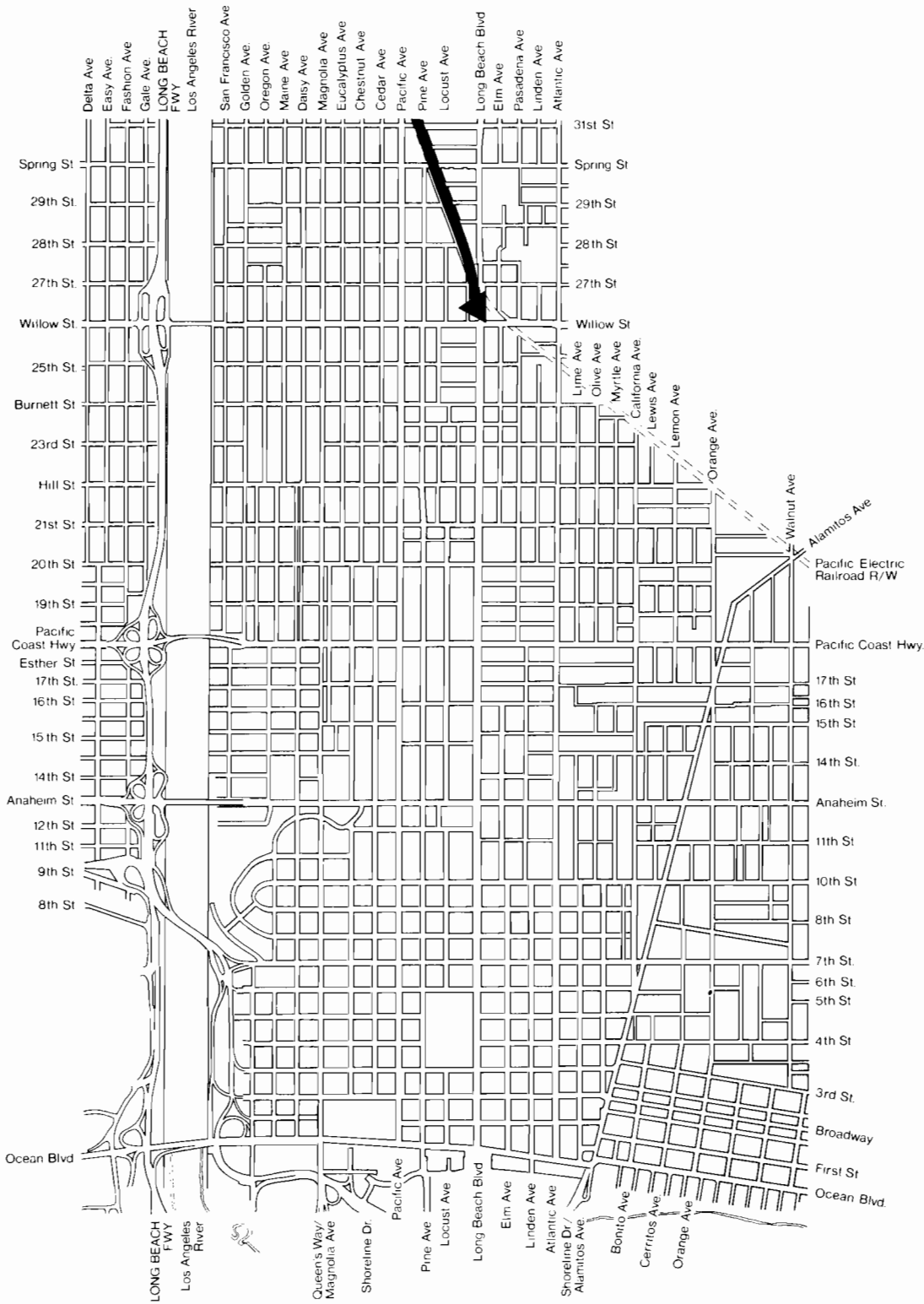


Graphic Scale in feet



Long Beach Blvd. Two-Way LB-5

Figure I-10B



Willow St. Terminus LB-6

Figure I-10C

(Option E) would penetrate the northeast corner of the World Trade Center and, with a pair of reverse curves, proceed to the southeast and traverse the Civic Center complex (see Figures I-32A through I-32R, Plans and Profiles. The terminal station for the secondary option would be located in Lincoln Park and would lie perpendicular to Pacific Avenue. The baseline for the primary option (Option D) analysis would place the aerial guideway mostly on the sidewalk in the street right-of-way with an extension of about 5 feet into the World Trade Center (WTC) property. Variations of that baseline placement to reduce impacts on the street right-of-way would move the alignment onto the WTC property. This would require joint development at the World Trade Center and a major modification of a new parking structure at City Hall. Alternatively the placement could be entirely within the street, causing maximum impacts on Broadway parking and traffic. In the discussion of LB-3 (Broadway Aerial-Modified River Route) contained in this SEIR, Option D (the baseline placement) is assumed unless otherwise stated.

I-112 Alternative LB-5 (Long Beach Boulevard, Two-Way)

The proposed alignment would consist of tracks running north and south along Long Beach Boulevard in a reserved center median from Willow Street to 7th Street. South of 7th Street the tracks would be built at the sides of the existing landscaped median, and the light rail trains would operate in mixed traffic. A terminal station would be located in the median just north of 1st Street, with tail tracks turning east and running in mixed traffic on 1st Street to Elm Street. North of 7th Street, on-street parking would be maintained except in the vicinity of rail stations and bus stops; south of 7th Street, on-street parking would be maintained as at present.

The above description is the "baseline" for LB-5. North of 7th Street it provides for median landscaping only at station areas. An extra cost option is possible north of 7th Street whereby the street is widened and landscaping is provided between the tracks for the full length of the boulevard. This option involves an extra cost of \$2.5 million. This Supplemental DEIR uses only "baseline" costs in tables and evaluations.

I-113 Alternative LB-6 (Willow Street Terminus)

This alternative would follow SPTC right-of-way (East Long Beach Branch) and would terminate at the Willow Street station. Tail track would extend south of the station approximately 300 feet along West American Avenue. Transit service south of the Willow Street terminus would be by transfer to buses.

I-120 PATRONAGE

The Southern California Association of Governments (SCAG) conducted patronage modeling of the supplemental alternatives in a manner similar to

their patronage calculations for the original system alternatives. Four of the five proposed variations were modeled. These were LB-3 (Broadway Aerial), with three options for the number and location of river stations (Options A, B, and C), and the Willow Street Terminus (LB-6). The Long Beach Boulevard, Two-Way alternative (LB-5) was not modeled because the regional transportation demand model (LARTS) is not sensitive enough to distinguish small variations among transit alignments within central Long Beach. Alternatives LB-1, LB-2, and LB-4 were not modeled separately in prior patronage work for the same reason. However, the patronage estimates shown in the DEIR for LB-4 also apply to LB-1, LB-2, and LB-5. LB-6 (Willow Street Terminus) and the Modified River Route alternatives were geographically different enough to model separately.

All of the patronage estimates shown in this document assume LA-2 (Flower Street Subway) in Los Angeles and MC-1 (Compton At-Grade) in the mid-corridor segments of the system.

The full Regional Transportation Plan (RTP) was used as a background transit network, as it was in prior patronage work. The major RTP projects which would affect ridership on the supplemental alternatives include transitways proposed on the Century (I-105), Santa Ana (I-5), and Harbor (I-110) Freeways, as well as the extension of the Artesia Freeway (Route 91) to the Harbor Freeway.

A complementary bus network was also prepared for the supplemental alternatives, the details of which are outlined in Chapter I, Section 220 of this report.

Table I-12A summarizes the daily home-work and the total daily boardings for the modeled supplemental alternatives. Corridor and countywide mode split information are also included in this table for comparison. Base year (1980) and year 2000 figures without the project are shown as well. Table I-12B shows station ons and offs for the supplemental alternatives. As noted in the DEIR, these ridership estimates are best used for drawing comparisons among alternatives rather than as absolute values.

I-130 STATIONS

Station locations for the alignment alternatives under study were selected based on input from the City of Long Beach, the staff of LACTC, and public testimony. Proposed station locations and basic station design concepts for each of the alignment alternatives are discussed in the following sections.

TABLE I-12A
SUMMARY OF YEAR 2000 COUNTY AND REGIONAL MODE SPLIT AND RIDERSHIP IMPACTS
OF SUPPLEMENTAL ALTERNATIVES

Trip Type	1980 Base Year	Year 2000 w/o Project	LB-3 (Broadway Aerial)			LB-5 Long Beach Blvd.	LB-6 Willow St.
			Option A (3 River Stations)	Option B (1 River Station at PCH)	Option C (No River Stations)		
Project Boardings							
Home-work Trips			29,565	29,336	28,408	29,539	27,162
All Other Trips			<u>25,185</u>	<u>24,990</u>	<u>24,199</u>	<u>25,163</u>	<u>23,138</u>
TOTAL DAILY			54,750	54,326	52,607	54,702	50,300
Corridor Mode Split (Home-work Trips)							
Transit	53,200	78,778	80,192	80,101	80,996	80,163	79,700
Auto Drivers	250,824	271,318	270,304	270,408	270,484	270,321	270,657
Auto Passengers	<u>49,845</u>	<u>61,414</u>	<u>61,014</u>	<u>61,001</u>	<u>61,030</u>	<u>61,026</u>	<u>61,153</u>
TOTAL TRIPS	335,869	411,510	411,510	411,510	411,510	411,510	411,510
Countywide Modal Split (Home-work Trips)							
Transit	394,478	645,581	647,505	647,353	646,970	647,034	646,872
Auto Drivers	3,709,710	4,132,554	4,130,783	4,130,922	4,131,208	4,131,579	4,131,129
Auto Passengers	<u>496,901</u>	<u>644,092</u>	<u>643,939</u>	<u>643,952</u>	<u>644,049</u>	<u>643,614</u>	<u>644,226</u>
TOTAL TRIPS	4,601,089	5,422,227	5,422,227	5,422,227	5,422,227	5,422,227	5,422,227

Note: LB-5 figures based on LA-2/MC-1/LB-4 analysis (see text).

Source: Southern California Association of Governments, 1984.

TABLE I-12B

PASSENGER LOADINGS BY STATION
SUPPLEMENTAL LONG BEACH ALTERNATIVES

LB-3 (Broadway Aerial) OPTION A (3 River Stations)		LB-3 (Broadway Aerial) OPTION B (1 River Station at PCH)		LB-3 (Broadway Aerial) OPTION C (No River Stations)	
Station	Total Daily Boardings	Station	Total Daily Boardings	Station	Total Daily Boardings
7th Street	4,179	7th Street	4,211	7th Street	4,246
Pico Boulevard	418	Pico Boulevard	421	Pico Boulevard	417
18th Street	947	18th Street	949	18th Street	940
Broadway	2,397	Broadway	2,389	Broadway	2,387
San Pedro Street	3,187	San Pedro Street	3,229	San Pedro Street	3,176
Washington Boulevard	1,678	Washington Boulevard	1,671	Washington Boulevard	1,675
Vernon Avenue	3,122	Vernon Avenue	3,141	Vernon Avenue	3,133
Slauson Avenue	1,764	Slauson Avenue	1,782	Slauson Avenue	1,758
Florence Avenue	2,537	Florence Avenue	2,520	Florence Avenue	2,513
Firestone Boulevard	2,601	Firestone Boulevard	2,615	Firestone Boulevard	2,595
103rd Street	685	103rd Street	684	103rd Street	699
Imperial Highway	8,842	Imperial Highway	8,846	Imperial Highway	8,659
Compton Boulevard	2,575	Compton Boulevard	2,655	Compton Boulevard	2,658
Artesia Boulevard	2,692	Artesia Boulevard	2,659	Artesia Boulevard	2,629
Del Amo Boulevard	2,916	Del Amo Boulevard	2,863	Del Amo Boulevard	3,646
Willow Street	2,158	Pacific Coast Highway	5,809	World Trade Center	3,622
Pacific Coast Highway	2,894	World Trade Center	2,454	Civic Center	<u>7,854</u>
Anaheim Street	1,965	Civic Center	<u>5,428</u>		
World Trade Center	1,493				
Civic Center	<u>5,700</u>				
TOTAL	54,750	TOTAL	54,326	TOTAL	52,607

Note: System alternatives in above analysis utilized LA-2/MC-1.

TABLE I-12B (Continued)
PASSENGER LOADINGS BY STATION
SUPPLEMENTAL LONG BEACH ALTERNATIVES

LB-5 Long Beach Boulevard		LB-6 (Willow Street Terminus)	
Station	Total Daily Boardings	Station	Total Daily Boardings
7th Street	3,959	7th Street	4,136
Pico Boulevard	412	Pico Boulevard	415
18th Street	937	18th Street	956
Broadway	2,396	Broadway	2,347
San Pedro Street	3,148	San Pedro Street	2,977
Washington Boulevard	1,583	Washington Boulevard	1,667
Vernon Avenue	3,181	Vernon Avenue	3,018
Slauson Avenue	1,752	Slauson Avenue	1,768
Florence Avenue	2,420	Florence Avenue	2,495
Firestone Boulevard	2,531	Firestone Boulevard	2,560
103rd Street	646	103rd Street	666
Imperial Highway	8,207	Imperial Highway	8,149
Compton Boulevard	2,272	Compton Boulevard	2,569
Artesia Boulevard	2,687	Artesia Boulevard	2,654
Del Amo Boulevard	3,582	Del Amo Boulevard	2,617
Wardlow Road	3,173	Wardlow Road	3,795
Willow Street	1,289	Willow Street	<u>7,511</u>
Hill Street	655		
Pacific Coast Highway	3,176		
Anaheim Street	1,862		
6th Street	1,809		
1st Street	<u>3,025</u>		
TOTAL	54,702	TOTAL	50,300

Note: System alternatives in above analysis utilized LA-2/MC-1. Figures for LB-5 are based on LB-4 analysis (see text).

Source: Southern California Association of Governments, 1984.

I-131 LB-3 (Broadway Aerial-Modified River Route)

Along the Modified River Route, three station location options are being considered. The physical characteristics of these proposed LB-3 (Broadway Aerial) stations are summarized in Table I-13A. Station locations under Option A are shown in Figure I-10A.

- o Option A: This option would include three at-grade stations along the river at major street crossings (Willow Street, Pacific Coast Highway, and Anaheim Street), and two downtown stations, one located just west of Daisy Street (at the World Trade Center) and the other at a Civic Center terminus in Lincoln Park. The three stations along the river are proposed to have neighborhood parking areas (25 to 100 spaces), bus-to-train transfer facilities and a kiss-and-ride drop-off area. Bus stop bays would be constructed adjacent to the street overpasses. Conceptual station layouts are shown in Figures I-13A through I-13K.
- o Option B: This option would include one station along the river at Pacific Coast Highway and the same downtown station locations described under Option A. The Pacific Coast Highway station would incorporate a major mode change facility using land (approximately 9 acres) which is proposed to be sold as excess by the City of Long Beach. The size of this parcel would allow a major park-and-ride facility and possible joint development opportunities. A conceptual layout for this station as the only station is shown as Figure I-13L.
- o Option C: This option would include the downtown stations discussed under the previous two options but would contain no stations along the river.

I-132 Alternative LB-5 (Long Beach Boulevard, Two-Way)

The selection of LB-5 station locations was based primarily on the identification and evaluation procedures used to determine station locations for the Long Beach alternatives discussed in the DEIR. As a result, proposed LB-5 stations would be located on approximately the same cross streets as the Atlantic Avenue, Two-Way (LB-1) alternative. The physical characteristics of proposed LB-5 station locations are summarized in Table I-13A. Station locations are shown in Figure I-10B.

TABLE I-13A

STATION LOCATIONS AND CHARACTERISTICS

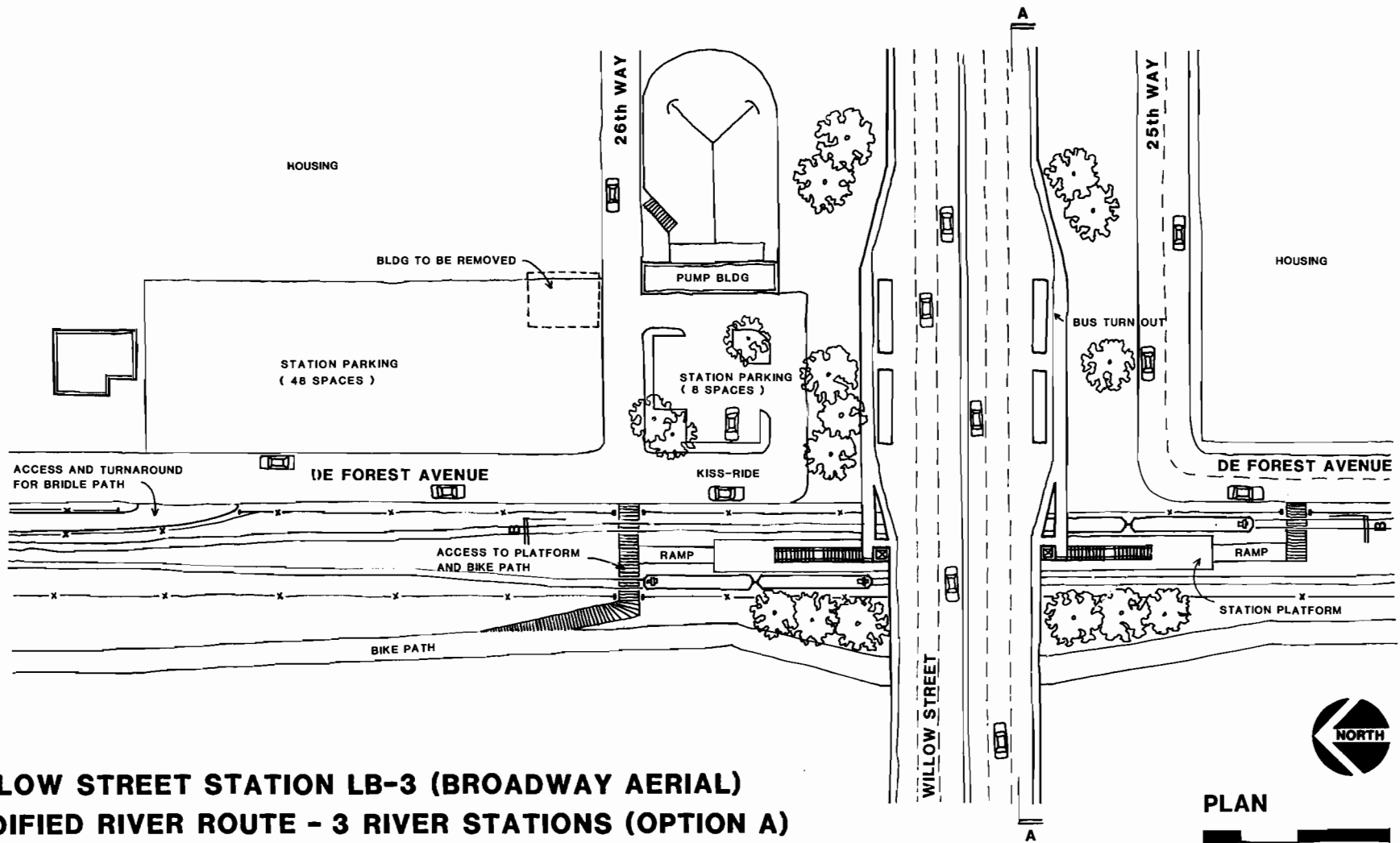
	<u>Profile</u>	<u>Placement In Right-Of-Way</u>	<u>Platform Location</u>	<u>Additional Parking</u>
<u>LB-3 (Broadway Aerial-Modified River Route)</u>				
Willow Street	at-grade	N.A.	center	56 spaces
Pacific Coast Highway	at-grade	N.A.	center	Option A: 100 spaces Option B: up to 1,000 spaces*
Anaheim Street	at-grade	N.A.	center	25 spaces
World Trade Center	aerial	curbside	center	none
Civic Center	aerial	N.A.	center	none
<u>LB-5 (Long Beach Boulevard, Two-Way)</u>				
Wardlow Road ⁺	at-grade	exclusive	center	50 spaces
Willow Street ⁺	at-grade	exclusive	center	100 spaces
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	median	center	none
<u>LB-6 (Willow Street Terminus)</u>				
Wardlow Road ⁺	at-grade	exclusive	center	50 spaces
Willow Street ⁺	at-grade	exclusive	center	100 spaces

* Under Option B there are no stations at Willow Street and Anaheim Street along the river; Option C is not listed because there are no stations at all along the river.

+ The Southern Pacific Transportation Company is in the process of filing for abandonment of its East Long Beach branch within the City of Long Beach. This will permit the Wardlow Road and Willow Street stations for LB-5 or LB-6 to be in an exclusive right-of-way.

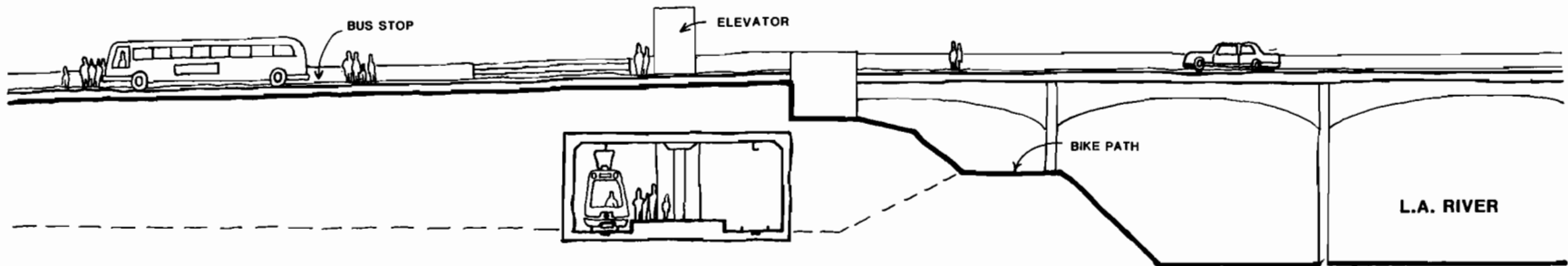
Source: PB/KE, 1984

I-12

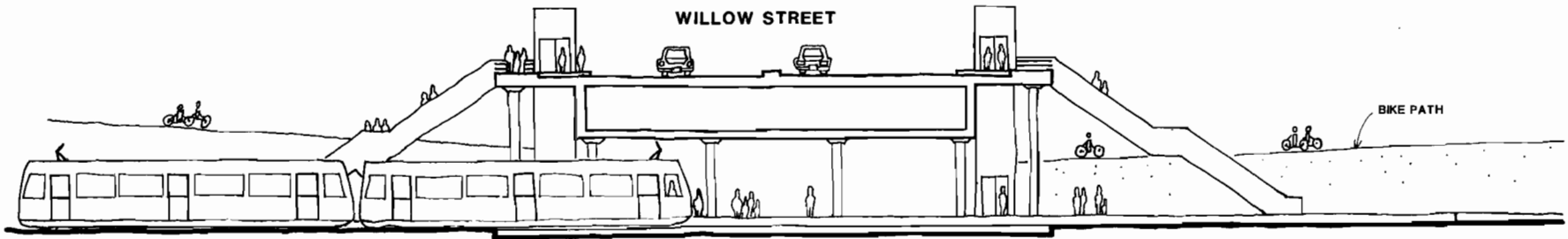


**WILLOW STREET STATION LB-3 (BROADWAY AERIAL)
MODIFIED RIVER ROUTE - 3 RIVER STATIONS (OPTION A)**

Station Concept Subject To Change In Final Design



A



B

**WILLOW STREET STATION LB-3 (BROADWAY AERIAL)
MODIFIED RIVER ROUTE - 3 RIVER STATIONS (OPTION A)**

SECTIONS



Station Concept Subject To Change In Final Design

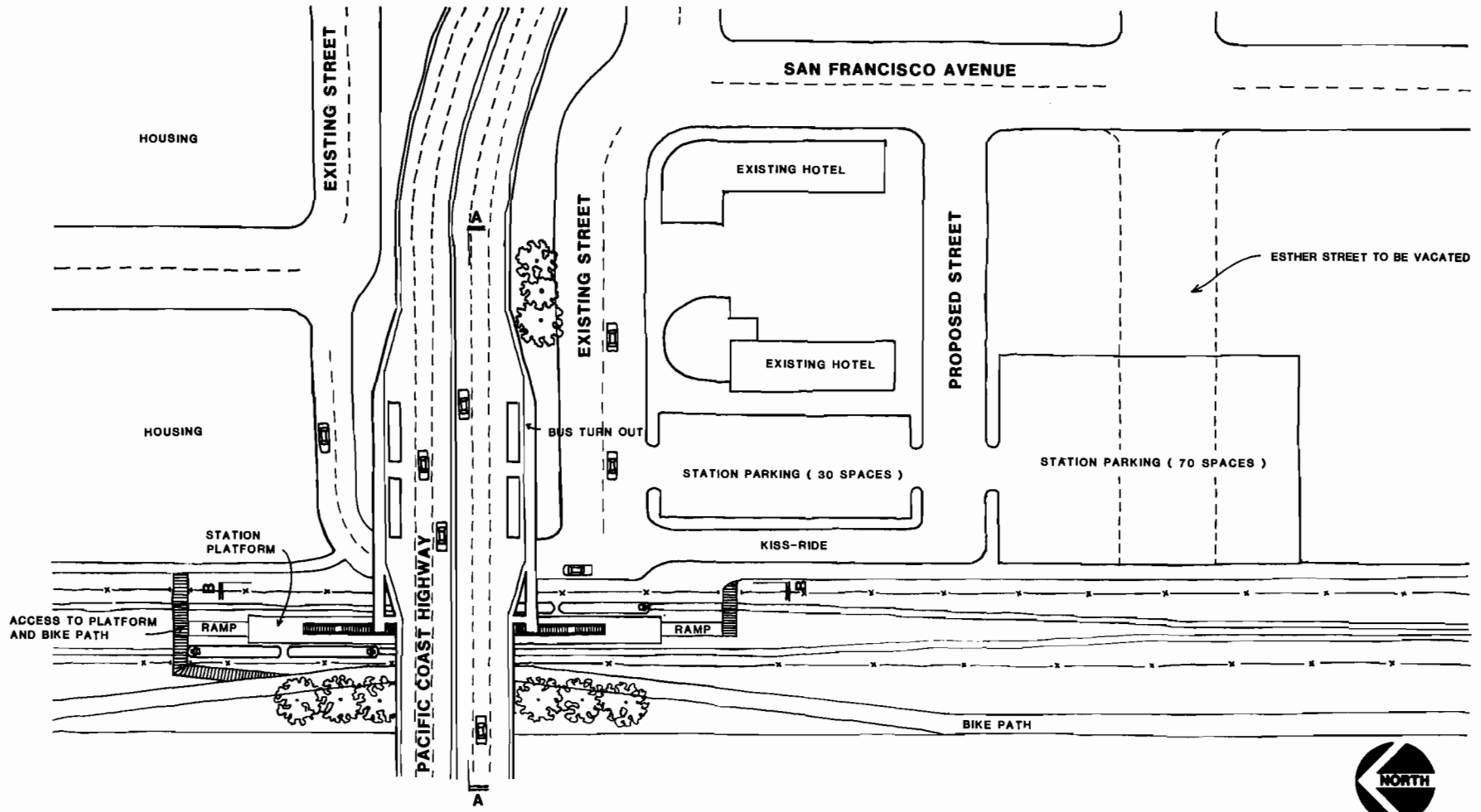
Figure I-13B

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

Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS

I-13

I-14



**PACIFIC COAST HIGHWAY STATION LB-3 (BROADWAY AERIAL)
 MODIFIED RIVER ROUTE-THREE RIVER STATIONS (OPTION A)**

Station Concept Subject To Change In Final Design

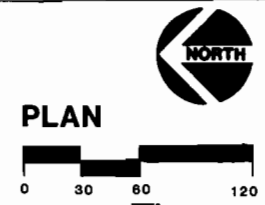
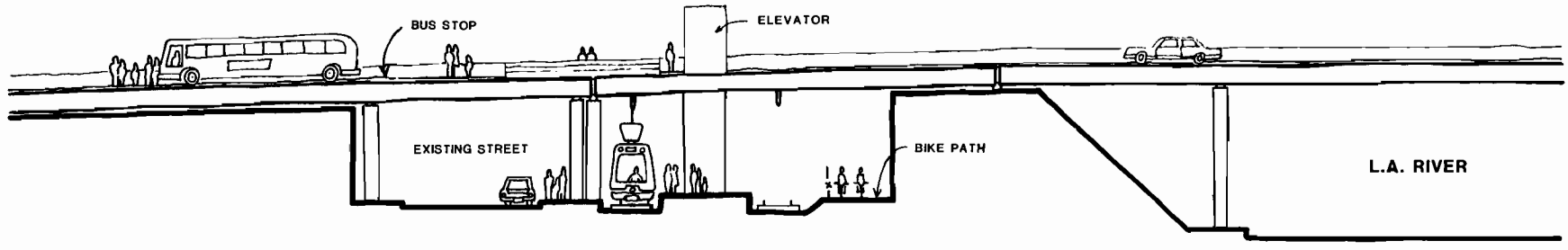
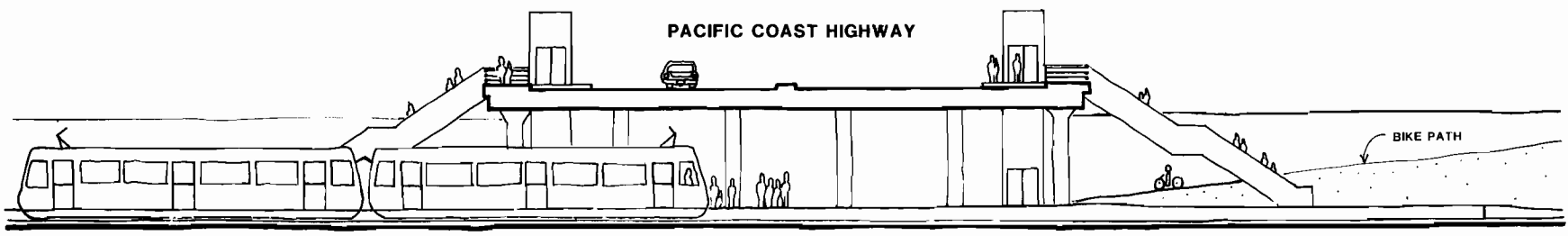


Figure I-13C

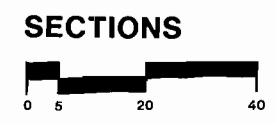


A



B

**PACIFIC COAST HIGHWAY STATION LB-3 (BROADWAY AERIAL)
 MODIFIED RIVER ROUTE (OPTION A OR B)**

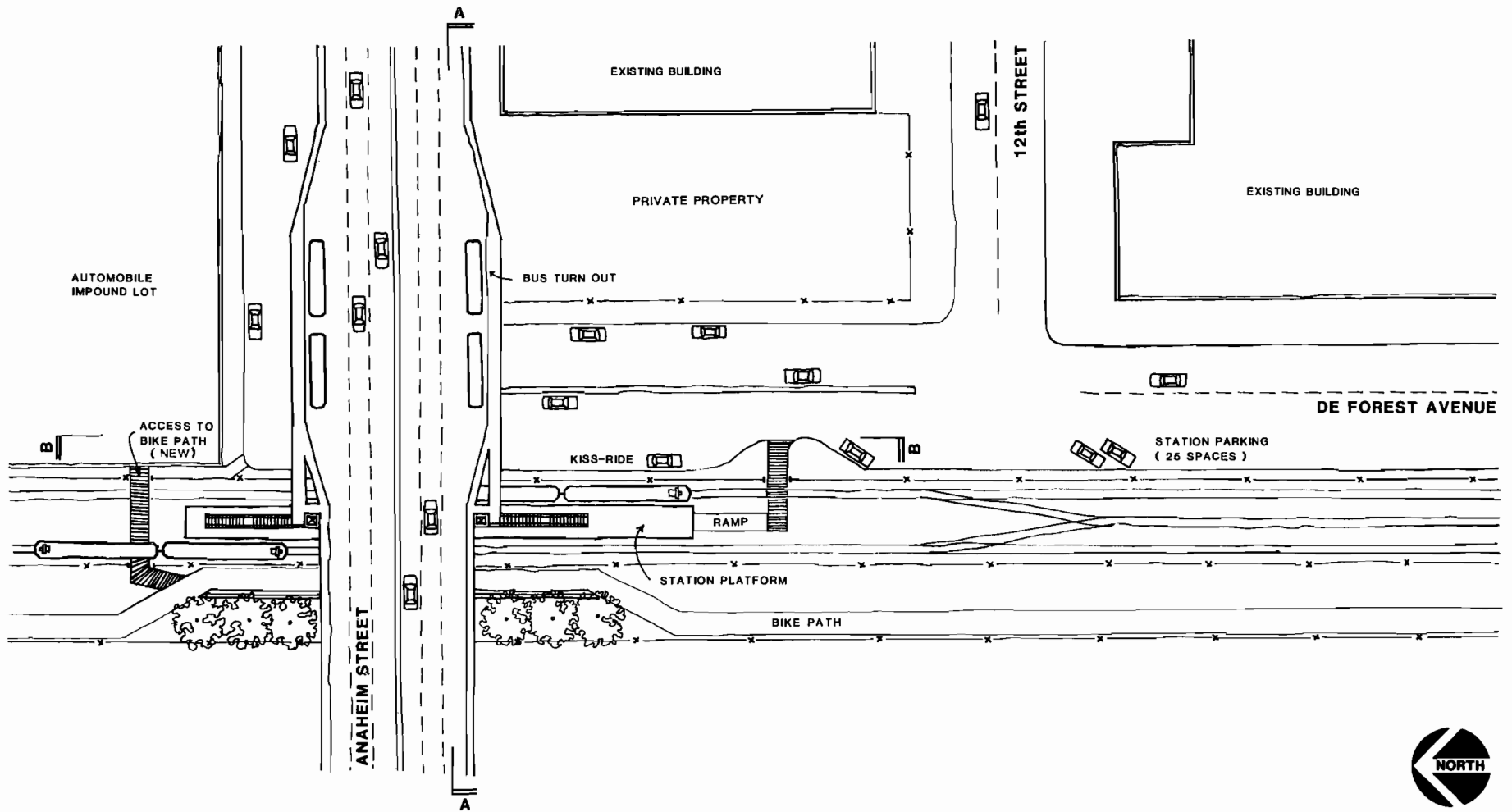


Station Concept Subject To Change In Final Design

Figure I-13D

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

Station Concept
 PARSONS BRINCKERHOFF / KAISER ENGINEERS



**ANAHEIM STREET STATION LB-3 (BROADWAY AERIAL)
MODIFIED RIVER ROUTE - 3 RIVER STATIONS (OPTION A)**

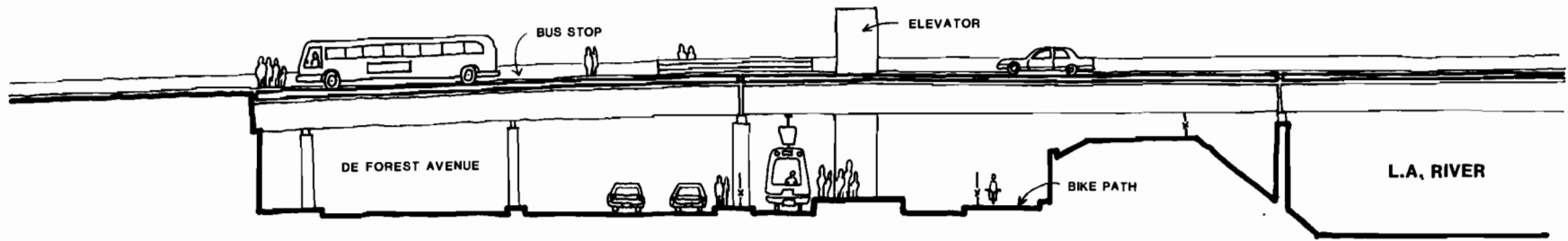
Station Concept Subject To Change In Final Design



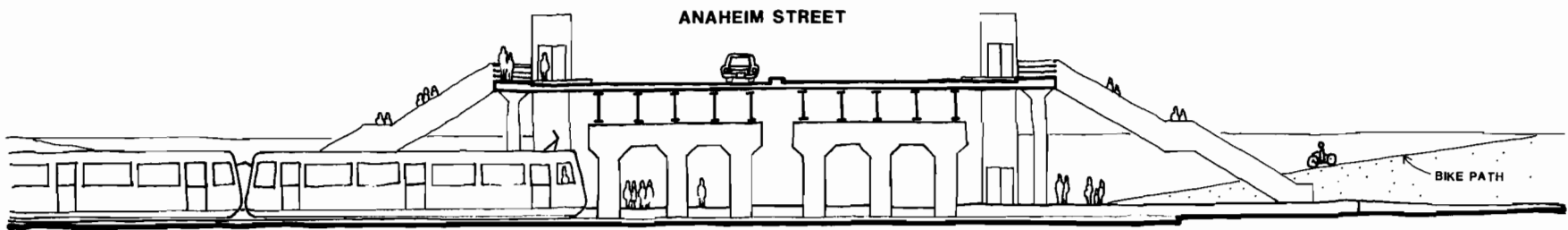
PLAN



Figure I-13E



A



B

**ANAHEIM STREET STATION LB-3 (BROADWAY AERIAL)
MODIFIED RIVER ROUTE - 3 RIVER STATIONS (OPTION A)**

SECTIONS

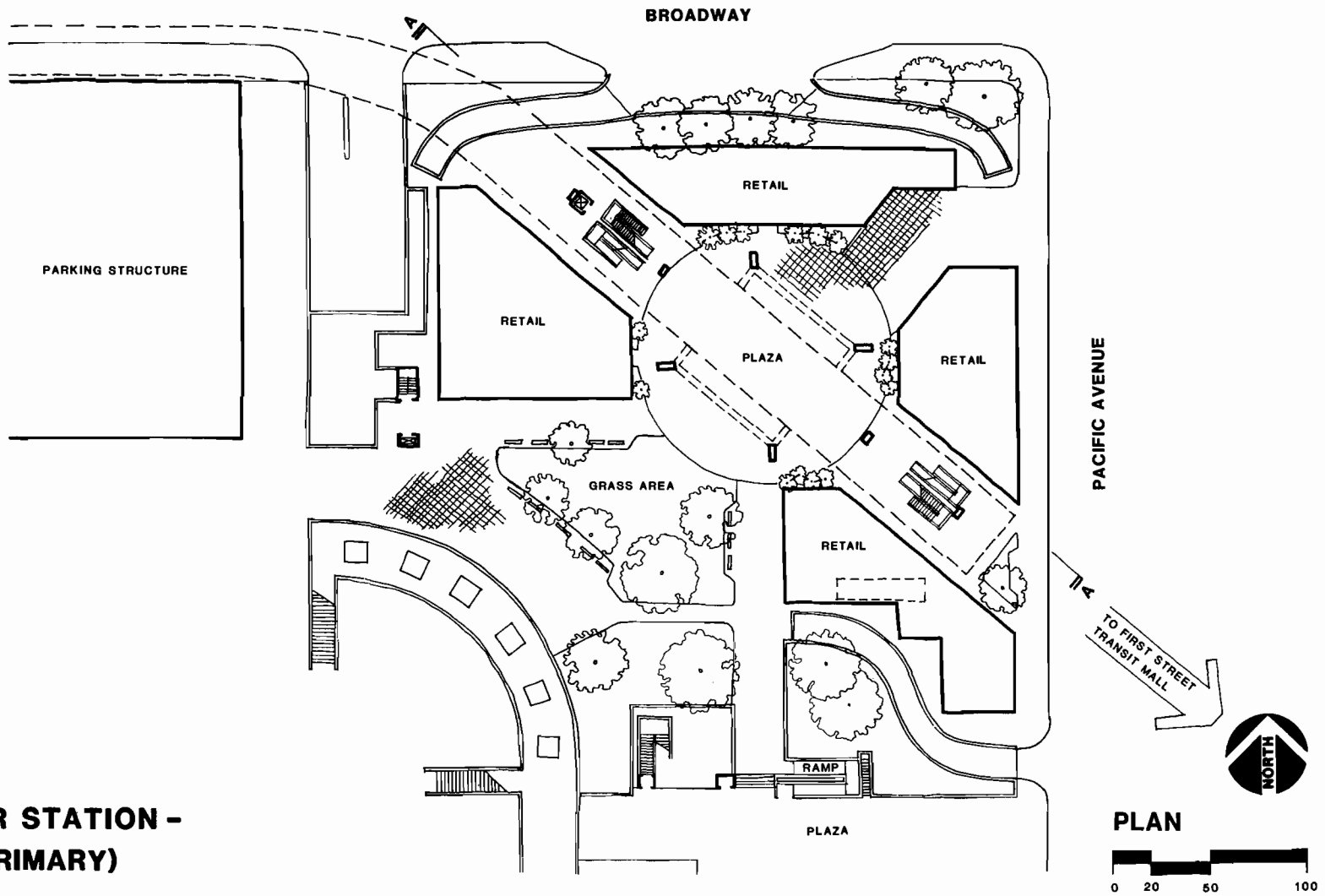


Station Concept Subject To Change In Final Design

Figure I-13F

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

Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS



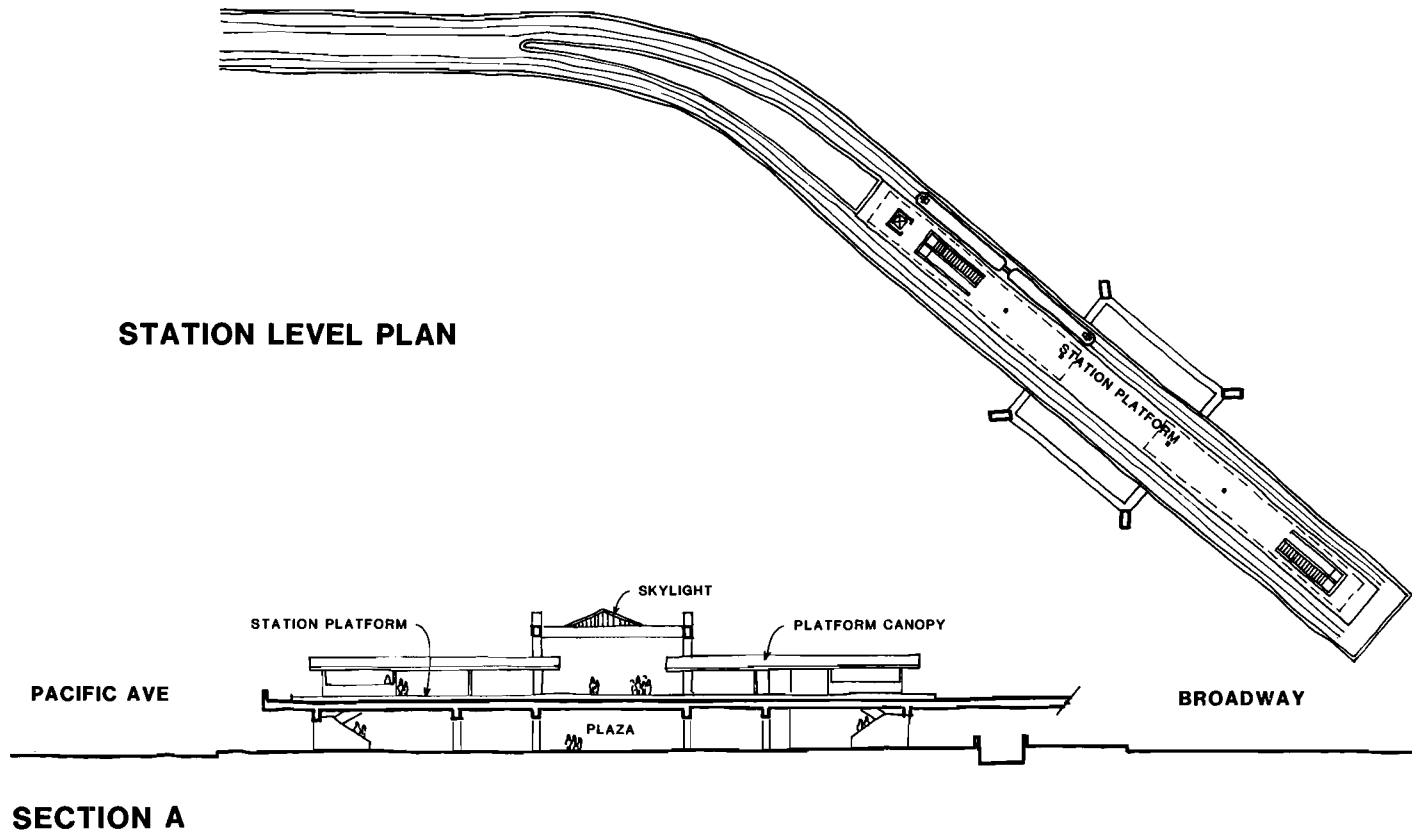
I-18

**CIVIC CENTER STATION -
OPTION D (PRIMARY)**

Station Concept Subject To Change In Final Design

Figure I-13G

I-19



**CIVIC CENTER STATION -
OPTION D (PRIMARY)**

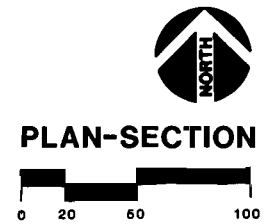
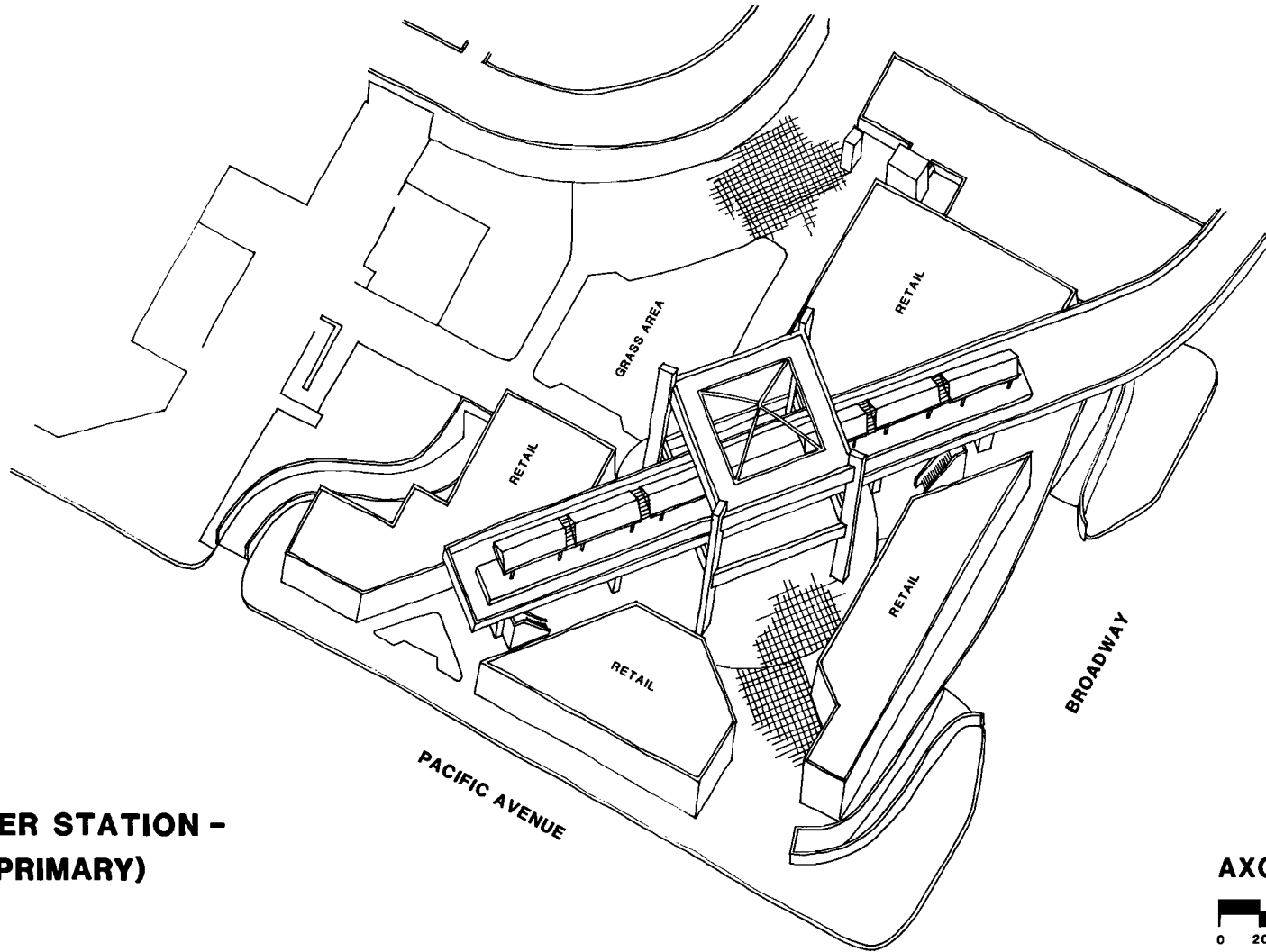


Figure I-13H

Station Concept Subject To Change In Final Design

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

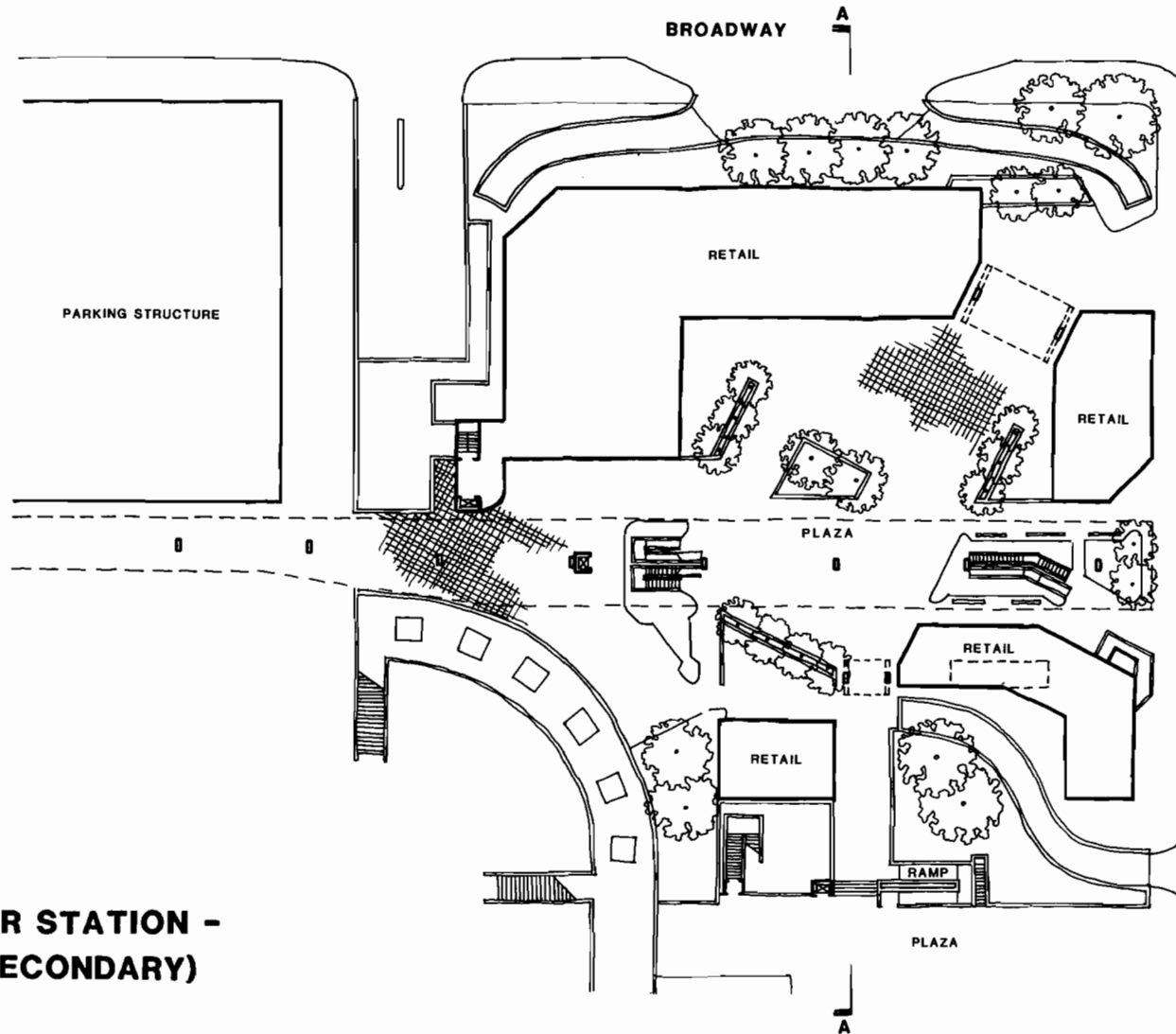
Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS



**CIVIC CENTER STATION -
OPTION D (PRIMARY)**

Station Concept Subject To Change In Final Design

Figure I-131



**CIVIC CENTER STATION -
OPTION E (SECONDARY)**

Station Concept Subject To Change In Final Design

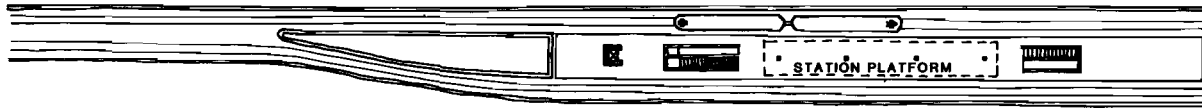
PACIFIC AVENUE



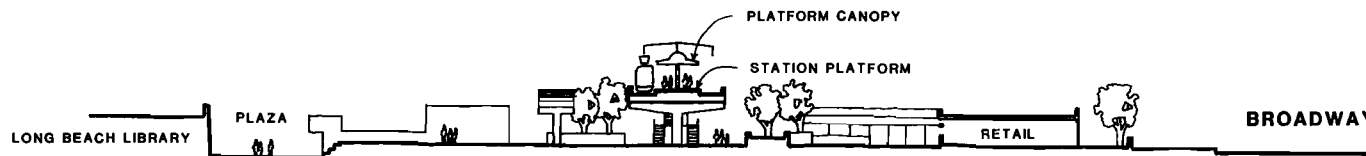
PLAN



Figure I-13J



STATION LEVEL PLAN



SECTION A

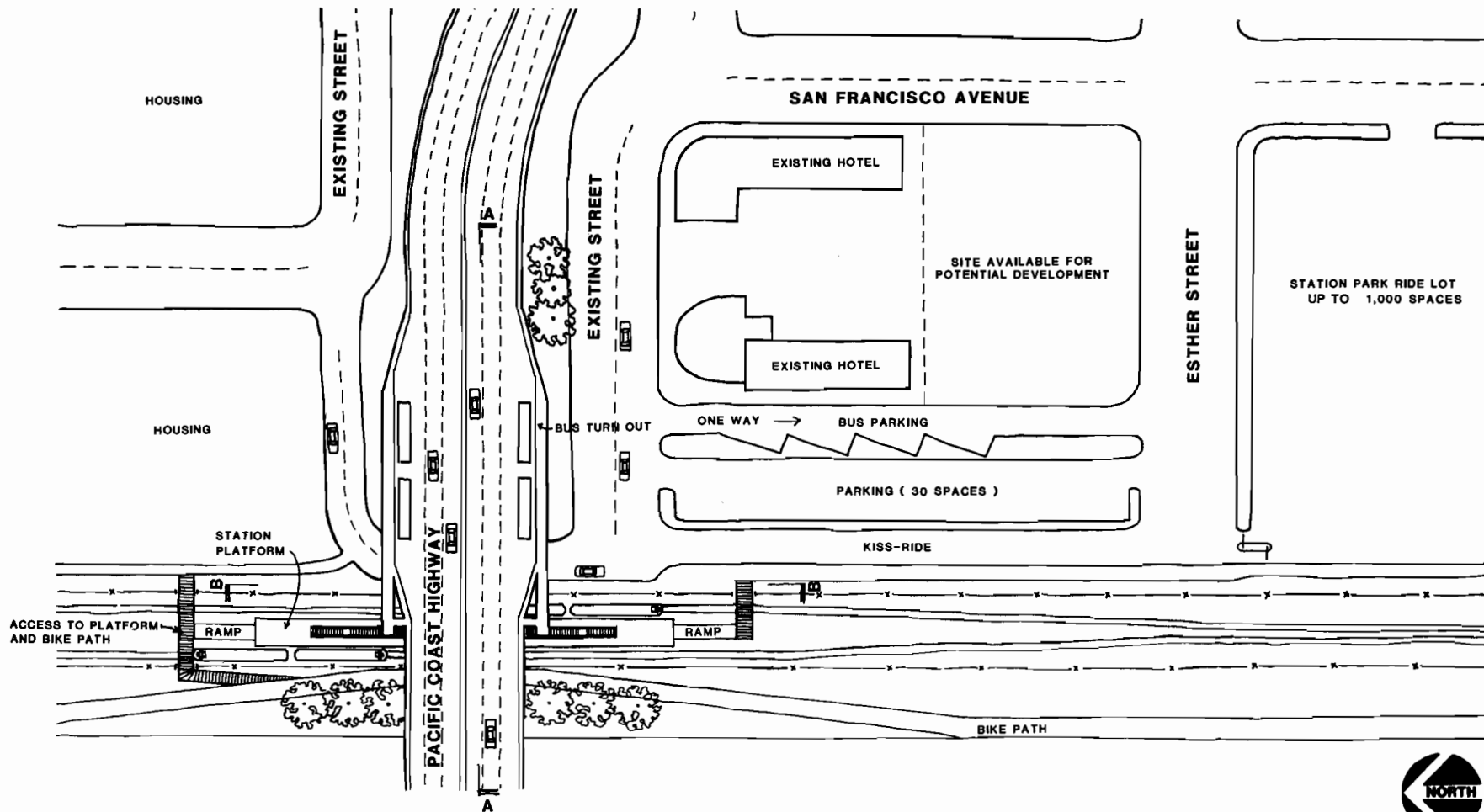
**CIVIC CENTER STATION -
OPTION E (SECONDARY)**



Figure I-13K

Station Concept Subject To Change In Final Design

I-23



**PACIFIC COAST HIGHWAY STATION LB-3 (BROADWAY AERIAL)
MODIFIED RIVER ROUTE - ONE RIVER STATION (OPTION B)**

Station Concept Subject To Change In Final Design

Figure I-13L

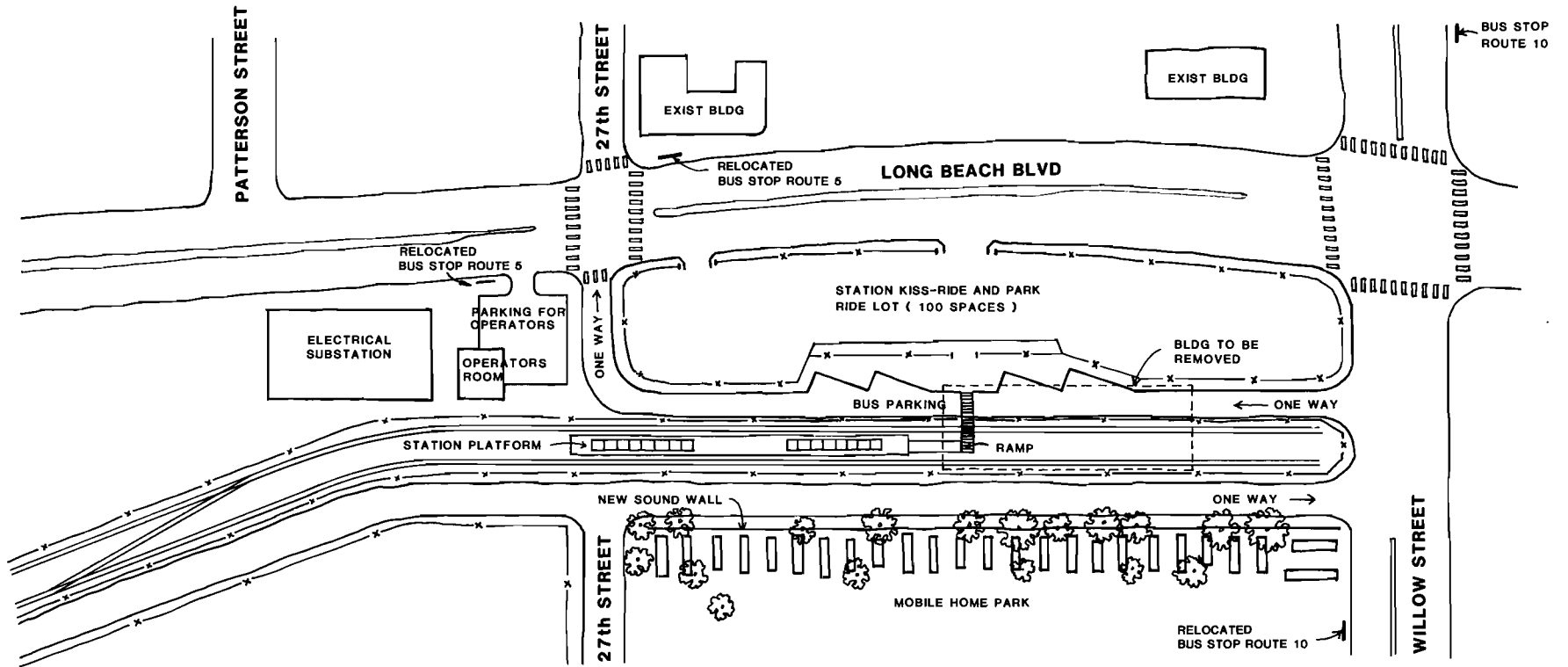
**Long Beach - Los Angeles
RAIL TRANSIT PROJECT**
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS

1-133 LB-6 (Willow Street Terminus)

As a terminal station, the Willow Street station would be expanded to become a transportation center which would include adequate bus bays (both on- and off-street), on-site turnaround capability for buses terminating at the center, a moderately large parking area, good access, and provision for kiss-and-ride drop-off. The physical characteristics of the Willow Street Terminus alternative are summarized in Table I-13A. The location of the Willow Street Terminus stations is shown in Figure I-10C. The conceptual layout of this station is shown in Figure I-13M.

I-25



**WILLOW STREET at LONG BEACH BLVD. STATION
LB-6 (WILLOW TERMINUS ALTERNATIVE)**



PLAN



Station Concept Subject To Change In Final Design

Figure I-13M

**Long Beach-Los Angeles
RAIL TRANSIT PROJECT**

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Station Concept
PARSONS BRINCKERHOFF / KAISER ENGINEERS

I-200 OPERATIONS

I-210 OPERATING CHARACTERISTICS

The alternatives under study in this document would operate with the same frequencies of service as the alternatives discussed in the DEIR. Number of cars per train and average operating speeds could vary under the new alternatives, however.

I-211 Number of Cars Per Train

Under some of the Long Beach alternatives discussed in the DEIR, 3-car operations would not be feasible in Long Beach because short east-west block lengths would cause trains stopped at stations to extend into intersections and potentially interfere with traffic. This would not be a factor in the case of the LB-5 (Long Beach Boulevard, Two-Way) alternative; therefore, 3-car train length station platforms (270 feet) are intended.

The LB-3 (Broadway Aerial-Modified River Route) and the LB-6 (Willow Street Terminus) alternatives would have the capability of accommodating 3-car trains because neither would run at-grade in public street right-of-way.

I-212 Average Operating Speeds

Average peak hour operating speeds for each of the alignment alternatives under study are listed in Table I-21A. These speeds assume 20-second dwell times with an additional 5 percent added to running times to provide for uncertain factors.

I-220 COMPLEMENTARY BUS NETWORK

Proposed bus route and frequency modifications for local and express bus services are summarized below for each of the alignment alternatives under study. Detailed information regarding the proposed changes can be obtained in two memoranda on the subject prepared by PB/KE on August 16, 1984 and August 21, 1984.

TABLE I-21A
 AVERAGE PEAK HOUR OPERATING SPEEDS^{1, 2}

<u>Alternative</u>	<u>Southbound (MPH)</u>	<u>Northbound (MPH)</u>
LB-3 (Broadway Aerial-Modified River Route)		
Option A	31.2	31.2
Option B	35.9	36.0
Option C	38.9	39.0
LB-5 (Long Beach Boulevard, Two-Way)	23.8	23.8
LB-6 (Willow Street Terminus)	35.2	35.2

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

² From Del Amo station.

Source: PB/KE, 1984.

I-221 LB-3 (Broadway Aerial-Modified River Route)

I-122.1 Option A: Three River Stations

- o LBT Line 10A, 17A - new feeder bus service on the Willow Street and Pacific Coast Highway corridors, operating during peak hours.
- o LBT Lines 8, 15, and 16 - increase service frequencies during peak periods.
- o LBT Line 16 - terminate service at Del Amo station.
- o RTD Lines 360, 456, and 457 - eliminate service.

I-221.2 Option B: One river station at Pacific Coast Highway

Route and frequency modifications for Option B would be the same as Option A but without new service on Line 10A.

I-221.3 Option C: No River Stations

Same as Los Angeles River Route alternative (LB-3) discussed in DEIR.

I-222 LB-5 (Long Beach Boulevard, Two-Way)

- o LBT Line 5 - reduce service frequencies during peak hours.
- o LBT Lines 8, 15, and 16 - increase service frequencies during peak hours.
- o LBT Line 16 - terminate at Del Amo LRT station.
- o RTD Line 457 - terminate service at Del Amo LRT station.
- o RTD Lines 360 and 456 - eliminate service.

I-223 LB-6 (Willow Street Terminus)

- o LBT Lines 5, 6, 15, and 16 - increase service frequencies during peak periods.
- o LBT Shuttle - new shuttle service on Long Beach Boulevard operating between the 1st Street Transit Mall and the Willow Street station.
- o LBT Line 6 - redirect route to interface with LRT at the Willow Street station.
- o LBT Line 10A - new service on Willow Street corridor operating during the peak periods.
- o RTD Line 457 - terminate service at Del Amo station.
- o RTD Lines 360 and 456 - eliminate service.

I-300 CONSTRUCTION SCENARIO

I-310 GENERAL

The following subsection generally discusses Long Beach alternatives not previously presented in the DEIR. The construction methods for LB-6 (Willow Street Terminus) are the same as described in the DEIR for the railroad right-of-way in the mid-corridor segment. Local construction impacts are discussed in Chapter III of this Supplement to the DEIR. Impacts of the original alternatives are discussed in Chapter III of the DEIR.

The typical sequence of construction activities discussed on pages I-65 through I-67 of the DEIR would remain the same for the new Long Beach alternatives.

Disposal sites for excess or contaminated materials coming from the proposed project and new alternatives have been revised from what was presented on Table I-51B (page I-67 of the DEIR) and are listed in Table I-31A.

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 affect on traffic, residences, and businesses.

Each of the proposed alternatives would require differing construction times, materials, and methods. See Table I-31B for estimated construction quantities for each new alternative. Lengths of time required to construct each alternative are shown on Table I-31C.

Plans and Profiles for the construction of the LB-3 (Broadway Aerial) and LB-5 (Long Beach Boulevard, Two-Way) are shown as Figures I-32A through I-32R which follows this discussion.

**TABLE I-31A
DISPOSAL SITES**

<u>Material</u>	<u>Class of Site</u>	<u>Location</u>
Toxic (hazardous)	Class I*	Casmalia, Santa Barbara County
		Westmoreland, Imperial County
		Kettleman Hills, Kings County
		Bakersfield, Kern County (petroleum related wastes only)
Unusable (organic mixed)	Class II	Puente Hills (Monterey Park closed)
Asphalt, Concrete	Recycle	Irwindale
Usable Backfill	Class III	Clean backfill material not used on the proposed project can be disposed of at the following locations: LA Harbor for land reclamation purposes; Century Freeway Project and LA County landfills for covering rubbish.

* The Class I BKK site in West Covina, Los Angeles County has recently closed for toxic wastes.

Source: PB/KE 1984.

TABLE I-31B
ESTIMATED CONSTRUCTION QUANTITIES FOR EACH ALTERNATIVE (Includes Stations)¹

Alternative	Excavation Material Excess	Backfill	Ballast-Subballast			Concrete Beams Precast	Pavement Restoration Asphalt/ Concrete	Walkway- Decking	Rebar		Steel Rails	Timber- Formwork		Timber Ties
			IN	CUBIC	YARDS				IN	POUNDS		IN	CUBIC	
LB-3 (Broadway Aerial)														
<u>Option A</u>														
3 River Stations	38,000	47,000	52,000	12,000	29,000	3,000	2,000	2,121,000	3,671,000	121,000	55,000			
<u>Option B</u>														
1 River Station	26,000	41,000	52,000	10,000	29,000	3,000	2,000	1,960,000	3,671,000	95,000	55,000			
<u>Option C</u>														
No River Stations	22,000	37,000	52,000	9,000	29,000	1,000	2,000	1,871,260	3,671,000	84,000	55,000			
LB-5 (Long Beach Blvd. Two-Way)	46,000	13,000	29,000	5,000	-	10,000	1,000	140,000	2,430,000	19,000	- ²			
LB-6 (Willow St.Terminus)	39,000	8,000	25,000	3,000	-	2,000	1,000	72,000	1,698,000	6,000	30,000			

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 Concrete ties.

Note: All figures rounded to nearest thousand.

Source: PB/KE, 1984.

TABLE I-31C
ESTIMATED LENGTH OF TIME REQUIRED
TO CONSTRUCT EACH ALTERNATIVE¹

<u>Alternative</u>	<u>Length In Miles²</u>	<u>Length of Time³ Required (Months)</u>
LB-3 (Broadway Aerial) All Options	At-Grade 3.91 Elevated 0.69	24-30
LB-5 (Long Beach Blvd., Two-Way)	At-Grade 2.7	24-30
LB-6 (Willow St. Terminus)	At-Grade 2.1 (Ends with Mid-Corridor)	Completed with Mid-Corridor Segment, 20-24

¹ Construction activities in each corridor segment would need to occur simultaneously for the proposed project to be completed within 30 months.

² Distance is measured from where alternative leaves the existing SPTC ROW.

³ The construction of stations for any of the supplemental alternatives would not add significantly to the overall construction time.

Source: PB/KE, 1984.

I-320 TYPICAL CONSTRUCTION METHODS

I-321 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 aerial guideways and station structures. The utilities would be modified and relocated 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, for those alignment alternatives which affect

street rights-of-way. In some instances it is possible that block-long sections of some Long Beach streets would be closed to general traffic temporarily. Every effort would be made to maintain local access to businesses; however, access might be restricted occasionally. Pedestrian and local and emergency vehicular access would remain open. Special facilities, such as handrails, fences, and walkways, would be provided for the safety of pedestrians, where necessary, for all alternatives.

Various pipelines and flood control fixtures cross perpendicularly to the modified LB-3 alignment. These facilities will need to remain in service during the construction phase. If it is necessary to relocate flood control pipelines or fixtures because of the rail transit guideway, then these modifications would be conducted during the dry summer months. The Hill Street pumping station would similarly be modified during the non-rainy season.

Construction of LB-3 (Broadway Aerial) would not necessitate extensive relocation of utilities along the Los Angeles River. Relocation of utilities would be limited to those that cross perpendicularly to the proposed alignment, affected overhead power and communication lines, and underground pipelines crossing or parallel to the ROW. Most of these utilities could be relocated during construction of the transit guideway and would not require advance disruption.

Construction of the Willow Street underpass for LB-3 (Broadway Aerial) would require that all existing utilities crossing perpendicular to the proposed alignment with Willow Street be modified. The relocation of the existing telephone communication line and associated manholes would be incorporated with the construction activities for the concrete box structure underpass of Willow Street.

Existing utilities located above ground (on poles) along the proposed alignment between Willow Street and Pacific Coast Highway (State Route 1) would be relocated for alternative LB-3 (Broadway Aerial). They could be placed underground or moved to an adjacent area, whichever is most appropriate.

The pipeline and pump station between Willow Street and Pacific Coast Highway (PCH) would need to be relocated and modified under alternative LB-3 (Broadway Aerial). Within these same geographic limits, demolition activities involving one duplex, a number of garages, and structures at the Long Beach City Maintenance Yard would also occur.

An at-grade crossing for the existing SPTC spur line to cross the light rail tracks would need to be constructed near Fairbanks Avenue for LB-3 (Broadway Aerial). This crossing would involve only minor modifications to the existing spur line and would not interfere with SPTC operations.

Alternative LB-3 (Broadway Aerial) -- all options -- would pass under major streets and freeways, including Wardlow Road, Willow Street, Anaheim Street, Pacific Coast Highway, the San Diego Freeway, and the Long Beach Freeway. All construction activities would occur within existing bridge structures (bays) and not interfere with normal traffic patterns with the exception of Willow Street. During the reconstruction of Willow Street, traffic lanes would be partially closed until temporary decking is put in place and full service is resumed, or traffic would be shifted to one side of the street (one lane in each direction) at a time while the box structure is completed.

During the construction of the aerial guideway along Broadway under LB-3 (Broadway Aerial), foundation sites for aerial guideway support columns could be located in areas where there are minimal or no utilities below. Where not possible to avoid existing utilities, the sites would have to be modified or relocated. Some of the travel lanes would need to be closed temporarily. It may be possible to schedule the most disruptive construction activities during non-peak business hours to reduce traffic problems due to lane closures. If the aerial guideway supports are incorporated into the World Trade Center parking garage structure, construction disruption to traffic along that portion of Broadway may be reduced.

For alternative LB-5 (Long Beach Boulevard, Two-Way) there will be no significant utility relocation because the proposed alignment will be located in the existing median. The median of Long Beach Boulevard was the historical alignment for the former Pacific Electric line; therefore, most utilities were placed away from the road bed. There will be utility reconstruction at cross-streets where utilities cross perpendicular to the proposed alignment.

Minor streets and alleyways would be temporarily closed during the LB-5 construction period. 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 traffic 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.

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-322 At-Grade Guideway Construction

o Along Los Angeles River (LB-3 - Modified River Route)

Along the Los Angeles River, the guideway would be at-grade with little or no pavement to remove. Typical construction methods would involve the clearing and grading of a new roadbed for the new rail transit. After rough grading is completed, a foundation course would be prepared and subballast, ballast, and ties would be put in place for the rail transit. A fence generally eight feet high would be erected on both sides of the rail transit tracks, except at access points for the bike trail in station areas where gates or openings would be provided. In residential areas, the fence would extend approximately five feet above an approximately three-foot high sound absorption wall along the east edge of the guideway; in some areas along the west side of the guideway, it would be necessary to extend the fence above a retaining wall built into the side of the levee.

Generally, construction would move rapidly for LB-3 (Broadway Aerial) 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 $1\frac{1}{2}$ miles of transit guideway. The most intense construction activities would take place at the station locations and underpasses.

Cut-and-cover construction would be used for alternative LB-3 (Broadway Aerial) -- all options -- at Willow Street. This construction technique would generally consist of cutting open the prescribed section of Willow 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) is covered with a temporary decking, traffic and pedestrian movement could continue above while construction of a concrete box structure begins below, or the cut operation could be done a half street width at a time to facilitate continual traffic movement on the other half. The concrete box structure would be constructed as a new underpass that would accommodate the light rail facility (and station under Option A).

Retaining walls would need to be constructed to hold the light rail roadbed and Los Angeles River levee at Wardlow Road, between 16th Street and Anaheim Street, and at the approach to the aerial guideway structure. These retaining walls would be erected either on a continuous-spread footing or pile footing, depending on soil conditions. If poor soil conditions exist in the area, a pile footing would be selected. In addition, the wall of the levee may have to be

supported by sheet piles on the bank side which would be driven in during construction. The side wall would be constructed in segments beginning at one end of the trench and continuing to the other. After the wall is 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 put into place when the retaining walls are completed.

A retaining wall structure for the approximately 600-foot approach to the aerial guideway would also be constructed. Construction methods would be similar to what is described for retaining the levee.

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

o Central Long Beach (LB-5)

It is estimated that it would generally take 60 days to construct a one-block section of the line at-grade (LB-5), an average block being 300 to 600 feet in length. Pavement/median removal 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. A paved "mountable" median would be used except at intersections and station locations. As an alternative to the "mountable" curb, reflectors and a painted median area could be used.

Equipment used for construction of the tracks 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-323 Aerial Guideway Construction

Aerial structures are required for the southern portion of alternative LB-3 (Broadway Aerial) for all options.

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. The aerial guideway segment could require from 6 to 9 months to complete. Three or more columns could be erected simultaneously with work occurring more than one block at a time. The schedule will be dependent on the degree of physical integration of the aerial guideway and structures of

the World Trade Center, as well as possible modification of the new City Hall parking structure. It is possible that within the World Trade Center site, the aerial guideway could be supported by the parking garage structure to be built for the World Trade Center.

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 of 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. Occupancy of traffic lanes in this effort would apply only in the case in which the aerial guideway is placed within the Broadway right-of-way.

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 (three traffic lanes) of working space at all times during installation. Closure of additional traffic lanes may be necessary for equipment access. The deep-set pile method is one of the most disruptive techniques available for constructing foundations, but since 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 widespread 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 precast 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 might 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 along Broadway in and around the proposed World Trade Center, Public Safety Building, Broadway Parking Garage, and Civic Center would require special construction methods to insure adequate clearance and emergency access to facilities. Staged construction would probably be used to minimize access and detour problems.

In the case of the Broadway Parking Garage, repositioning existing support columns would be required if the guideway is placed off-street. Constructing these columns would require breaking the base slab and pouring new columns and putting in new support beams that would span between column lines. Adequate bracing of all columns would also be required.

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.

I-324 Special Features

Special allowances would be made to preserve the use of bike and horse trails affected by the construction of LB-3 (Broadway Aerial) and by all alternatives in the vicinity of the Los Angeles River bridge. (See Chapter III, Section 222 of this report). Reconstructed bike trail access points would be 12 feet wide and paved. Bike path access ramps into light rail stations and local streets would have a maximum grade of 8 percent. The relocated horse trail would also be 12 feet wide with a natural surface (locally occurring soil). Underpasses for horse trails would be high enough (15 feet) and have adequate light to allow for unimpaired equestrian use.

I-325 Stations

All stations would be constructed simultaneously with the various segments of the system. These stations would be constructed from standard building materials, such as brick, concrete, steel, and heavy plastic, which are durable and resistant to vandalism. It is intended that the stations will use platforms extending 2½ feet above the top of rail, for level-entry passenger movement to/from the light rail vehicles. Typically, ramps will provide wheelchair and pedestrian access to the platforms.

For LB-3 (Broadway Aerial) bus turnouts would be constructed on the cross-streets above the stations along the river alignment. Elevator and stairway access would be provided to reach the station platform. These bus turnouts would require retained fills and special concrete structures to

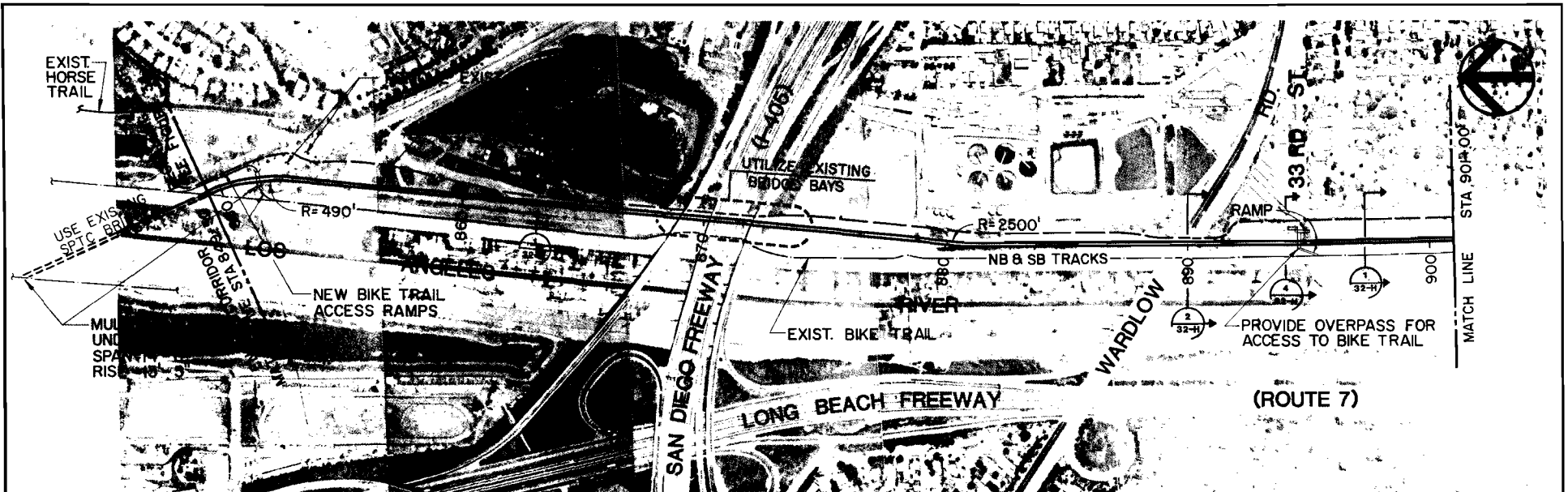
be built during station construction. Aerial guideway station construction (World Trade Center and Civic Center) would require additional foundation columns to support the platform.

I-326 Safety and Security During Construction

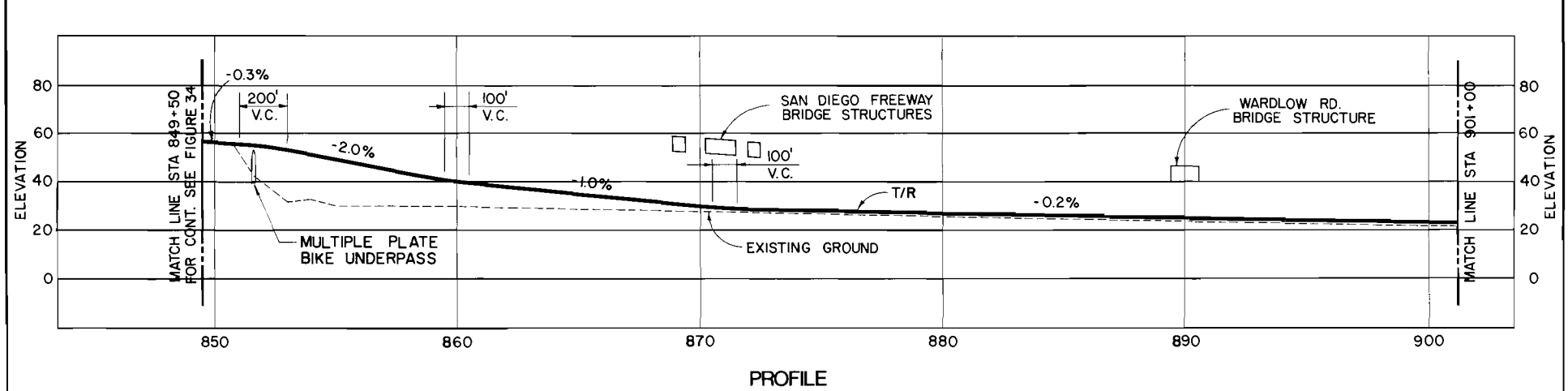
Safety and security during construction would basically consist of providing for the safe passage of vehicles and pedestrians through the construction area and protecting construction sites and equipment/material storage areas from vandalism and theft.

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.

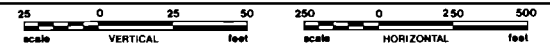
Construction areas would be fenced and lighted wherever appropriate. Some areas, such as material and equipment storage sites, would require stationing of security personnel.



PLAN



PROFILE

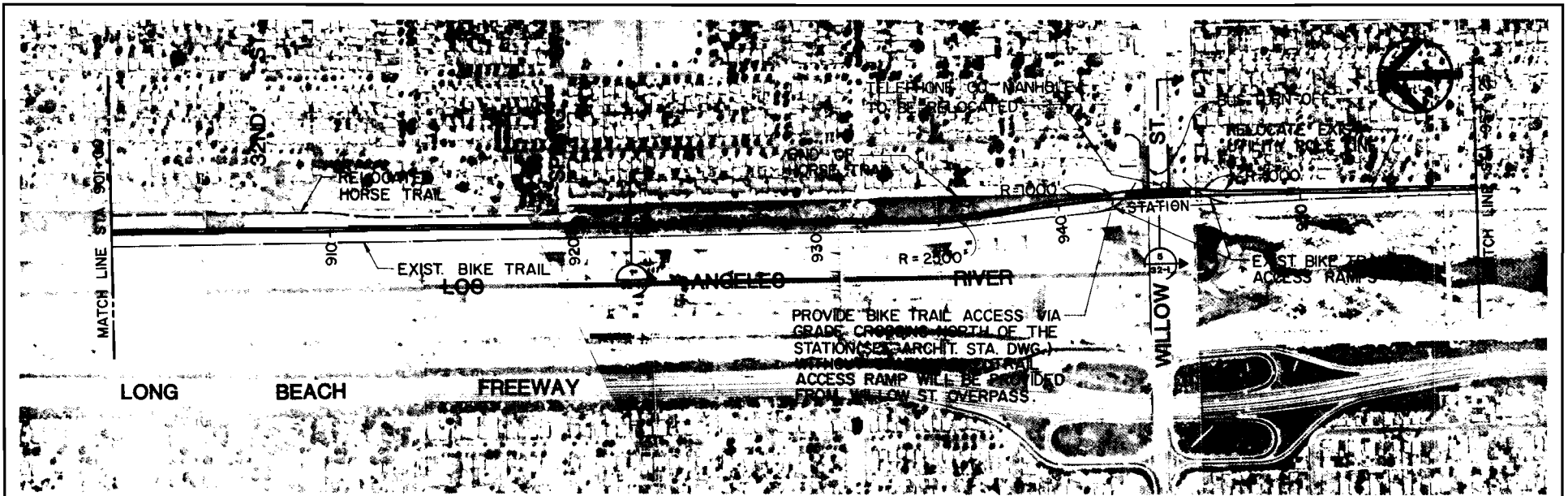


Long Beach - Los Angeles RAIL TRANSIT PROJECT
 LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Plan and Profile
 Long Beach LB-3 (Broadway) Aerial
 MODIFIED RIVER ROUTE

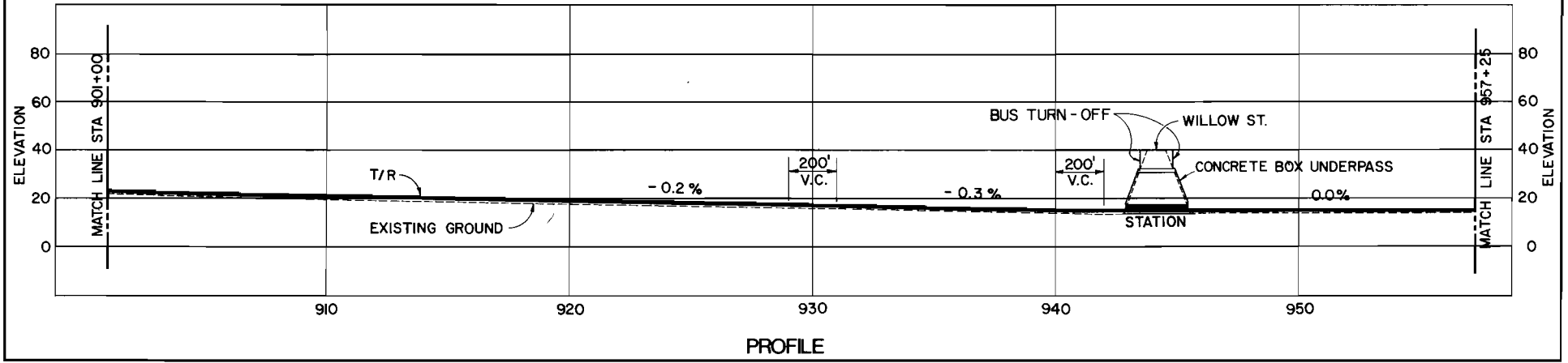
Figure I-32A
 NOTE: OPTION A IS SHOWN. OPTION B HAS ONE RIVER STATION, AN INTERMODAL TRANSFER FACILITY AT PCH. OPTION C HAS NO STATIONS ALONG RIVER.
 PARSONS BRINCKERHOFF / KAISER ENGINEERS

I-40

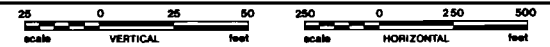


PLAN

I-41



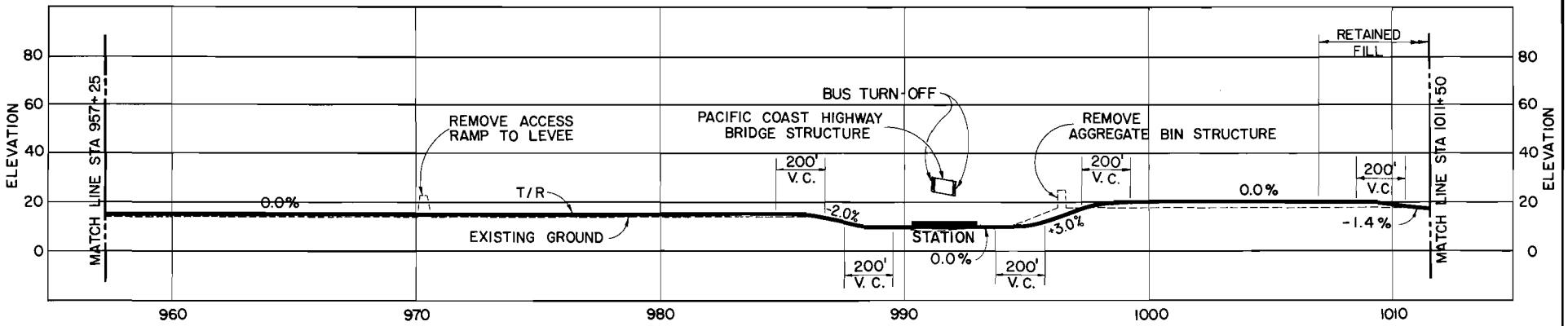
PROFILE



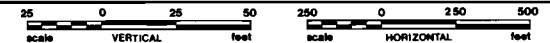
<p>Long Beach - Los Angeles RAIL TRANSIT PROJECT LOS ANGELES COUNTY TRANSPORTATION COMMISSION</p>	<p>Plan and Profile Long Beach LB-3 (Broadway Aerial) MODIFIED RIVER ROUTE</p>	<p>Figure I-32 B NOTE: OPTION A IS SHOWN. OPTION B HAS ONE RIVER STATION, AN INTERMODAL TRANSFER FACILITY AT PCH. OPTION C HAS NO STATIONS ALONG RIVER. PARSONS BRINCKERHOFF/KAISER ENGINEERS</p>
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PLAN



PROFILE



I-42

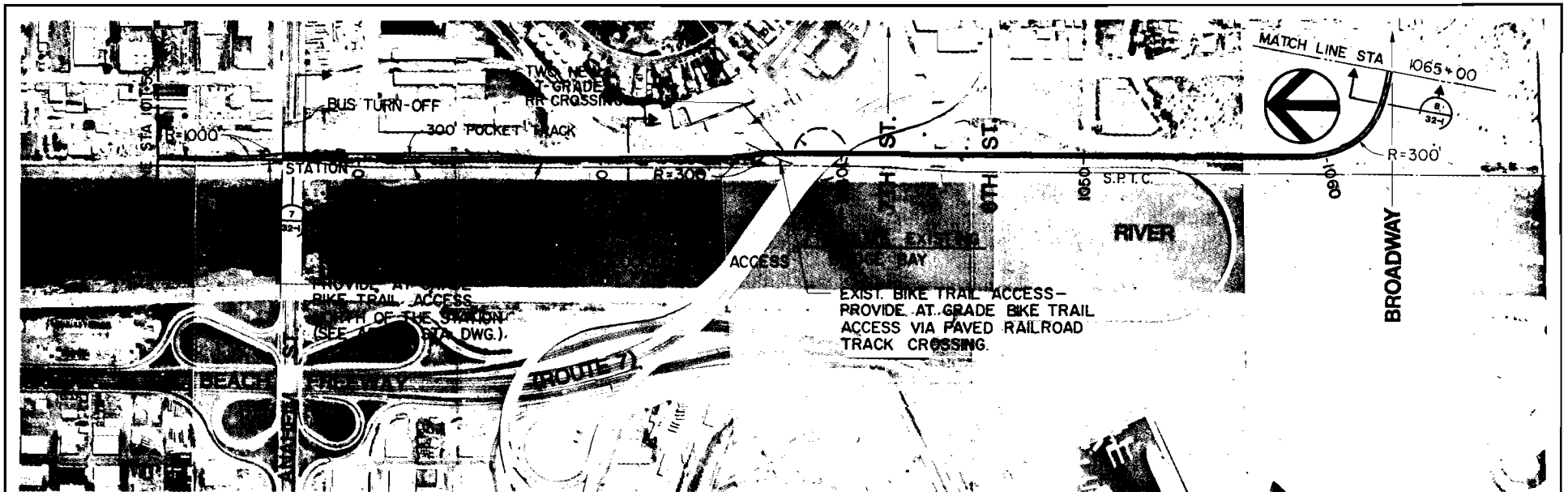
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RAIL TRANSIT PROJECT
 LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Plan and Profile
Long Beach LB-3 (Broadway Aerial)
 MODIFIED RIVER ROUTE

Figure I-32 C

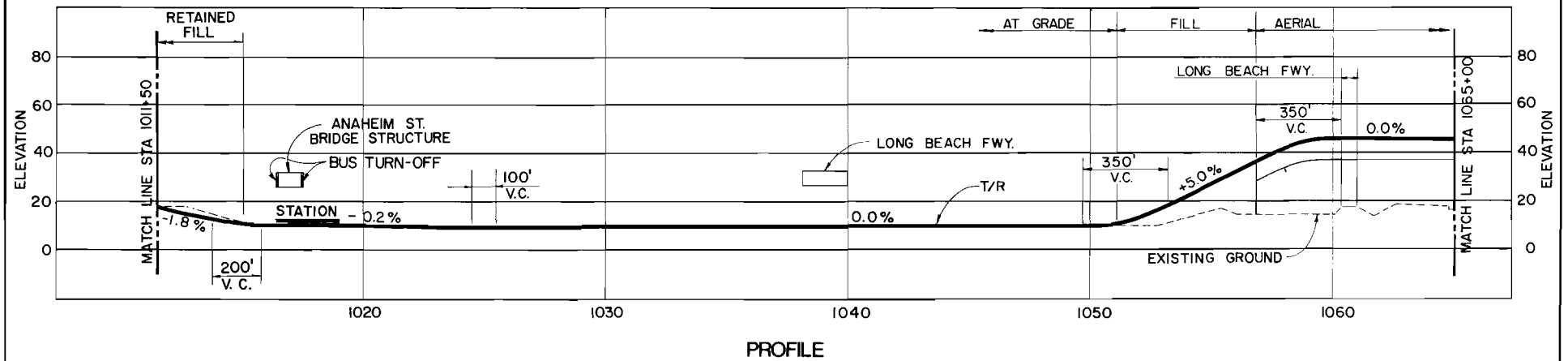
NOTE: OPTION A IS SHOWN. OPTION B HAS ONE RIVER STATION, AN INTERMODAL TRANSFER FACILITY AT PCH. OPTION C HAS NO STATIONS ALONG RIVER.

PARSONS BRINCKERHOFF/KAISER ENGINEERS

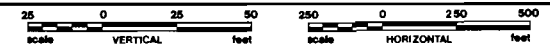


PLAN

I-43



PROFILE



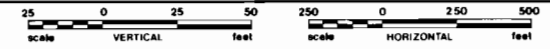
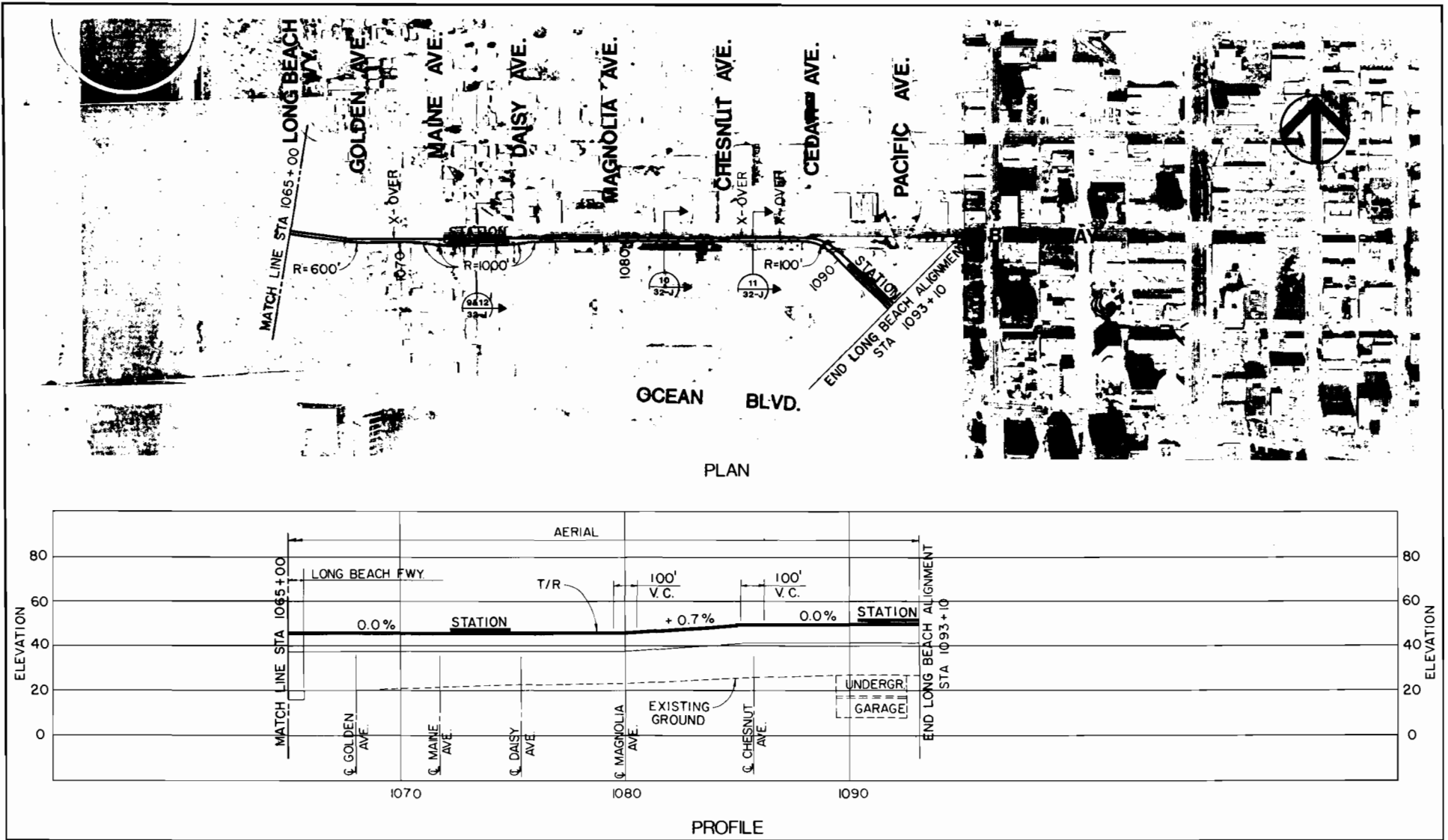
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RAIL TRANSIT PROJECT
 LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Plan and Profile
Long Beach LB-3 (Broadway)
 Modified River Route (Aerial)

Figure I-32 D

NOTE: OPTION A IS SHOWN. OPTION B HAS ONE RIVER STATION, AN INTERMODAL TRANSFER FACILITY AT PCH. OPTION C HAS NO STATIONS ALONG RIVER.

PARSONS BRINCKERHOFF/KAISER ENGINEERS

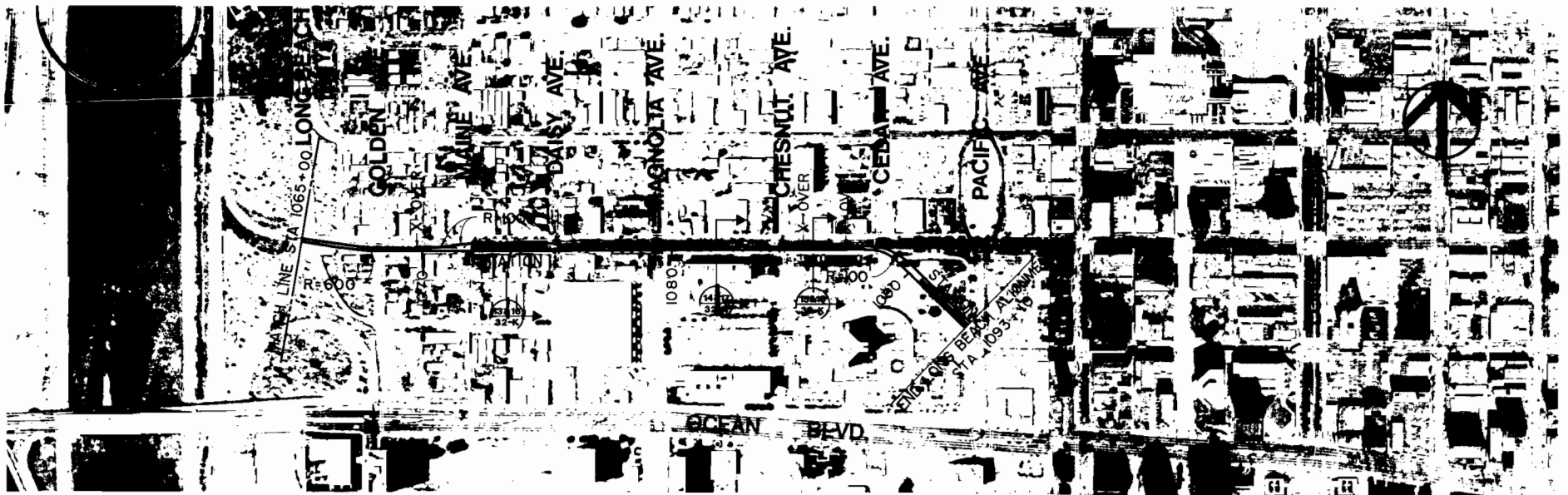


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RAIL TRANSIT PROJECT
 LOS ANGELES COUNTY TRANSPORTATION COMMISSION

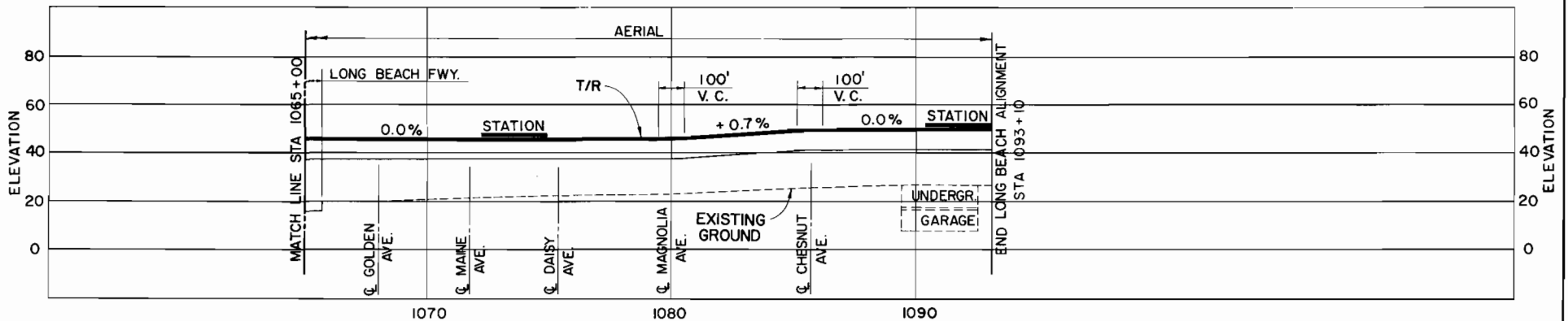
Plan and Profile
 Long Beach LB-3 (Broadway Aerial)
 Modified River Route
 Option D-Primary

Figure I-32 E

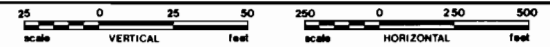
PARSONS BRINCKERHOFF/KAISER ENGINEERS



PLAN



PROFILE



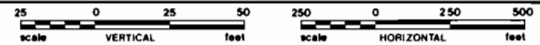
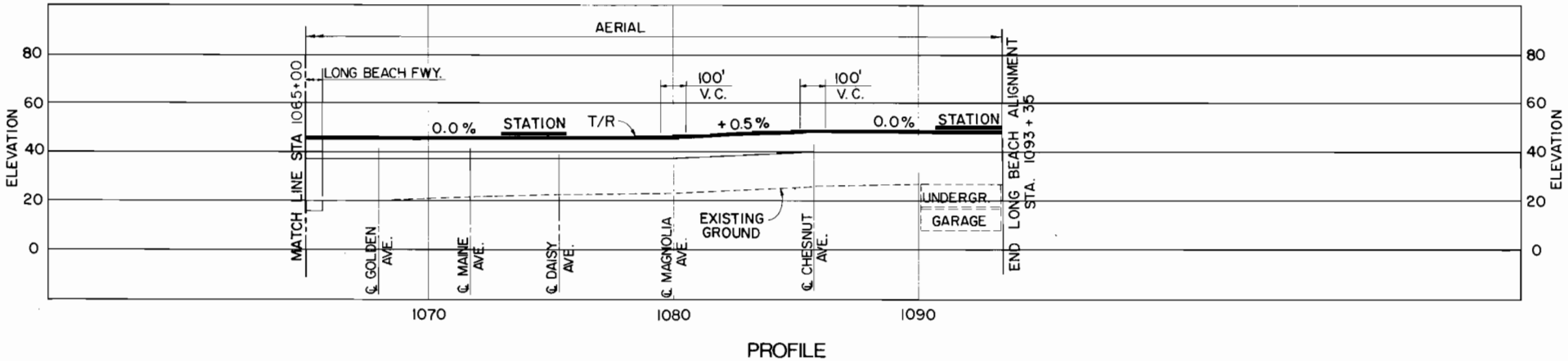
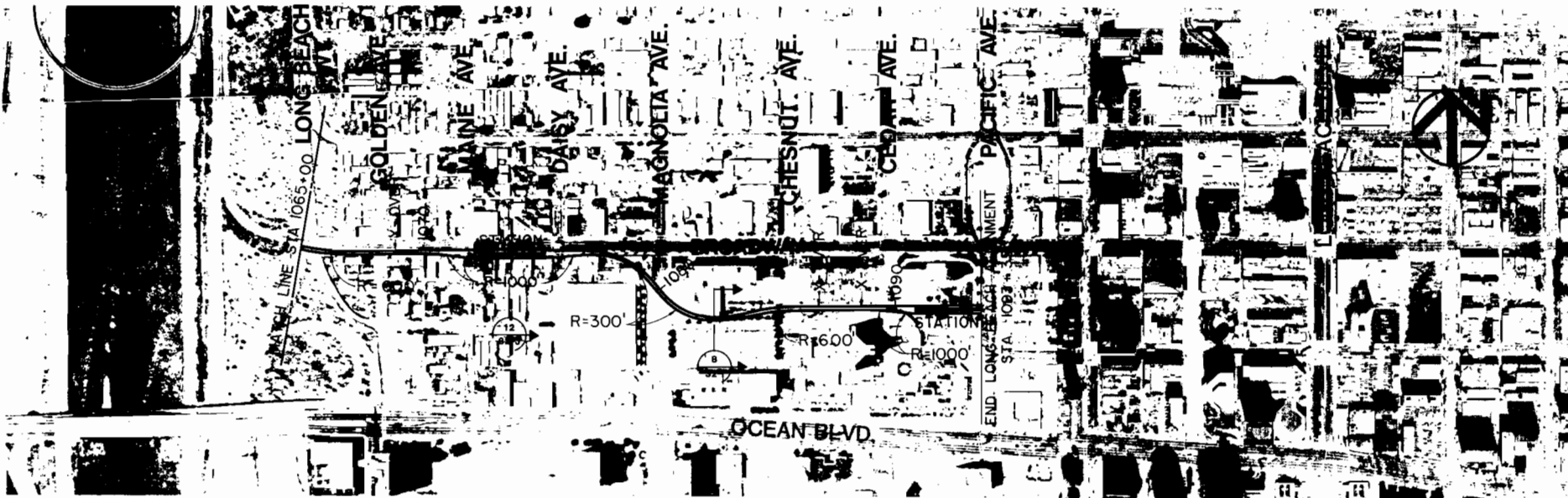
Long Beach - Los Angeles
RAIL TRANSIT PROJECT
 LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Plan and Profile

Long Beach LB-3 (Broadway Aerial)
 Option D-Primary
 MODIFIED RIVER ROUTE

Figure I-32 F

PARSONS BRINCKERHOFF/KAISER ENGINEERS



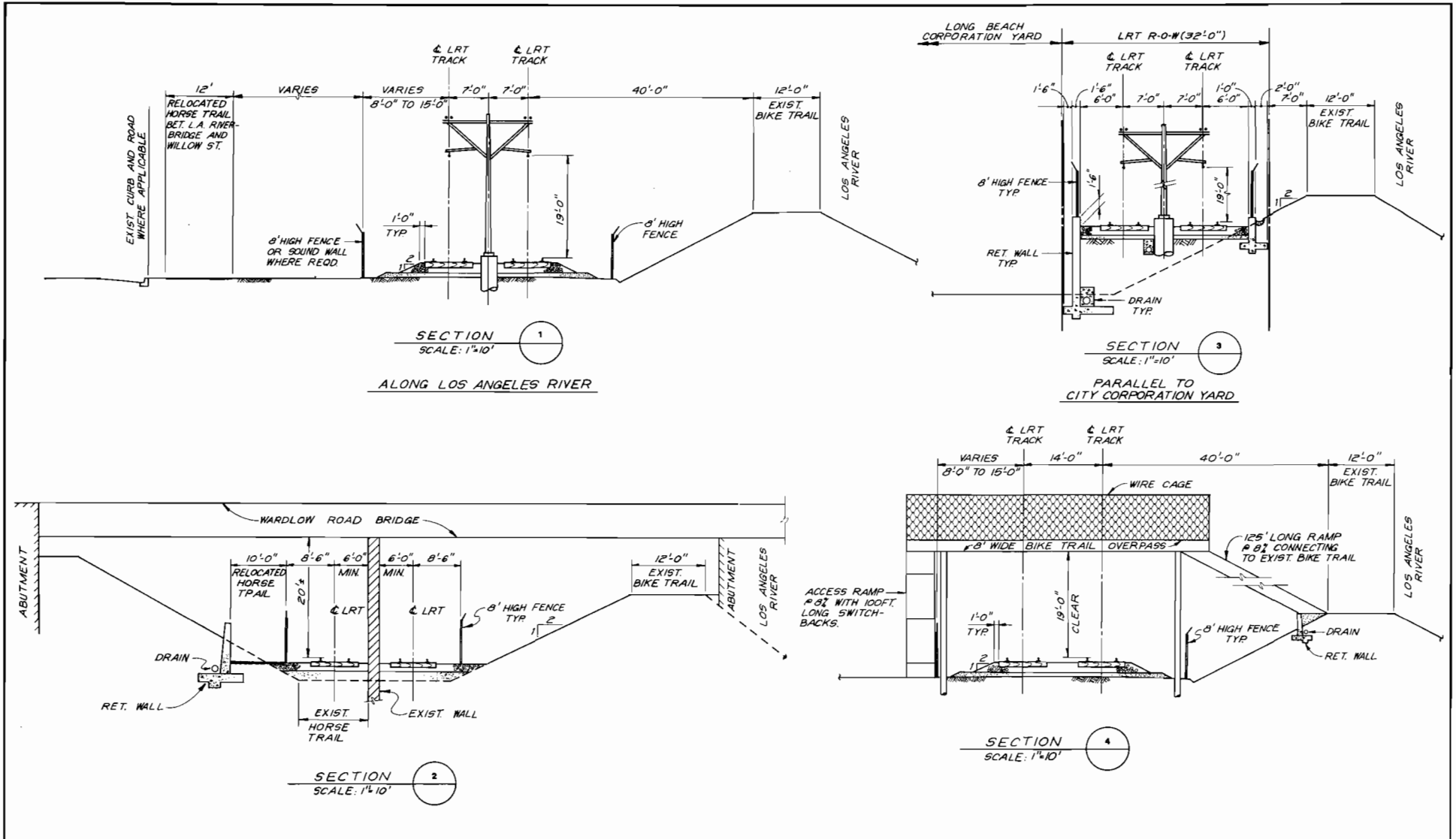
Long Beach - Los Angeles
RAIL TRANSIT PROJECT
 LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Plan and Profile
 Long Beach LB-3
 MODIFIED RIVER ROUTE

Figure I-32 G

LB-3 (Broadway Aerial
 Option E - Secondary)

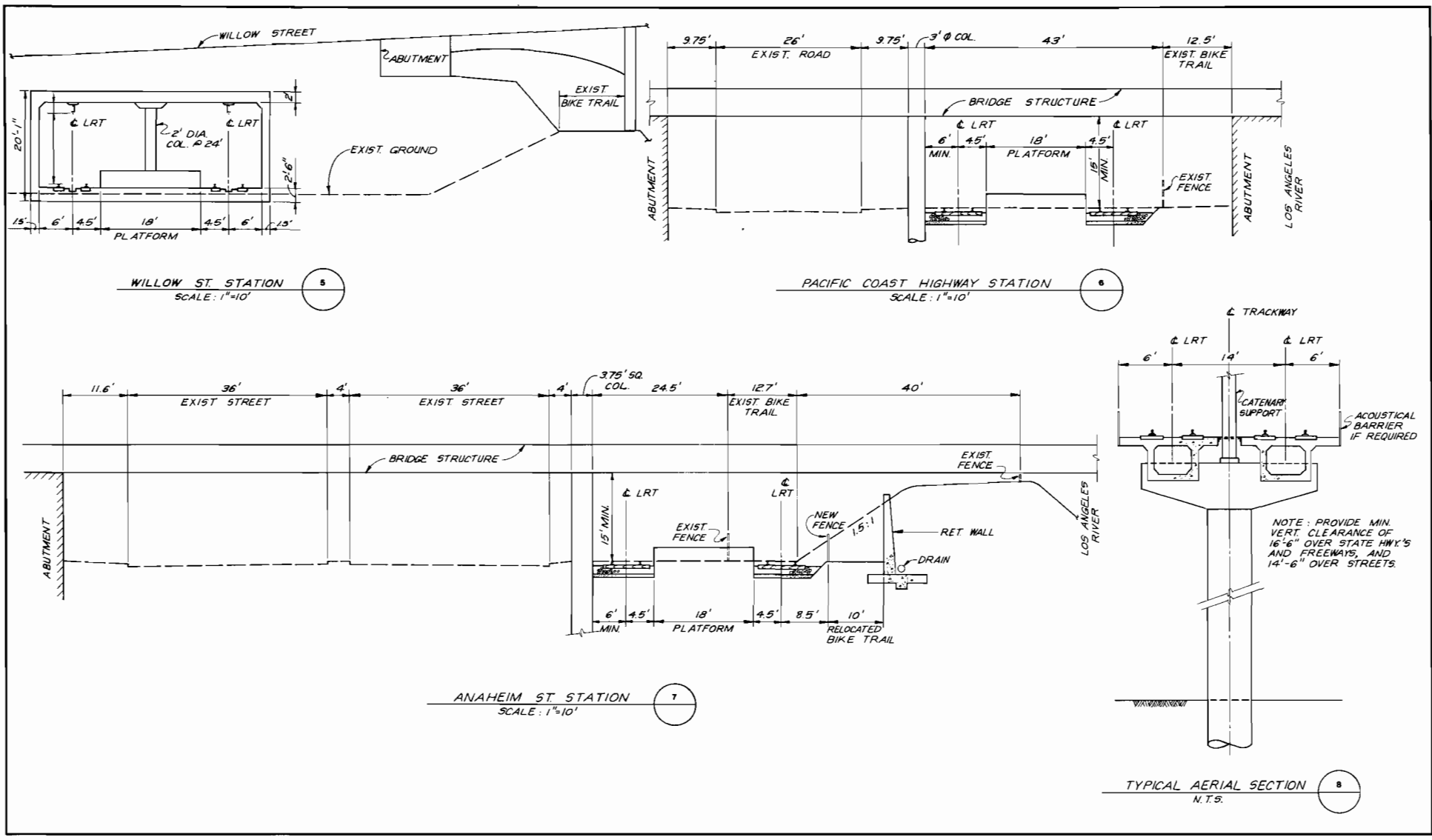
PARSONS BRINCKERHOFF/KAISER ENGINEERS



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

Typical Sections
MODIFIED RIVER ROUTE

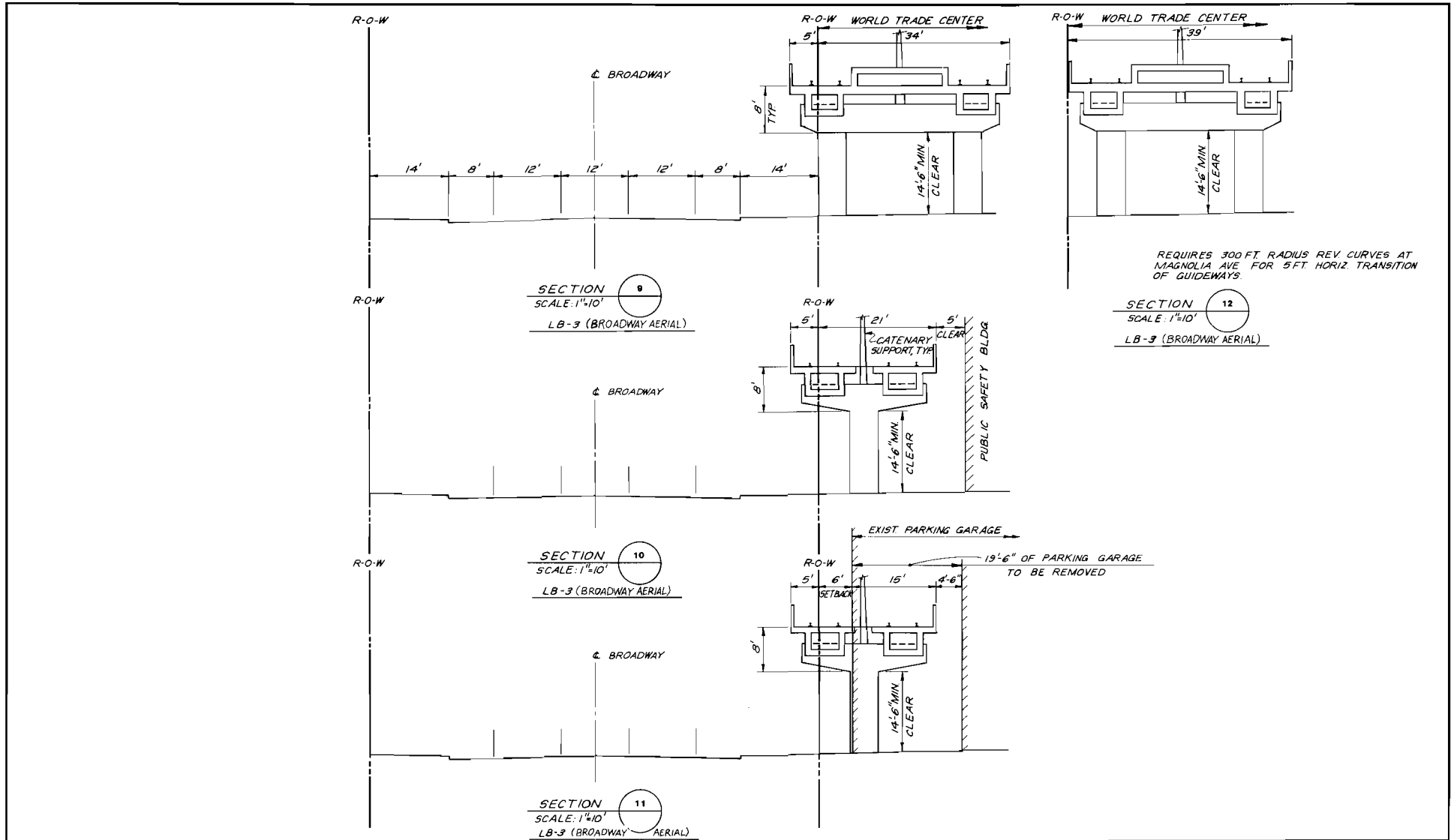
Figure I-32 H

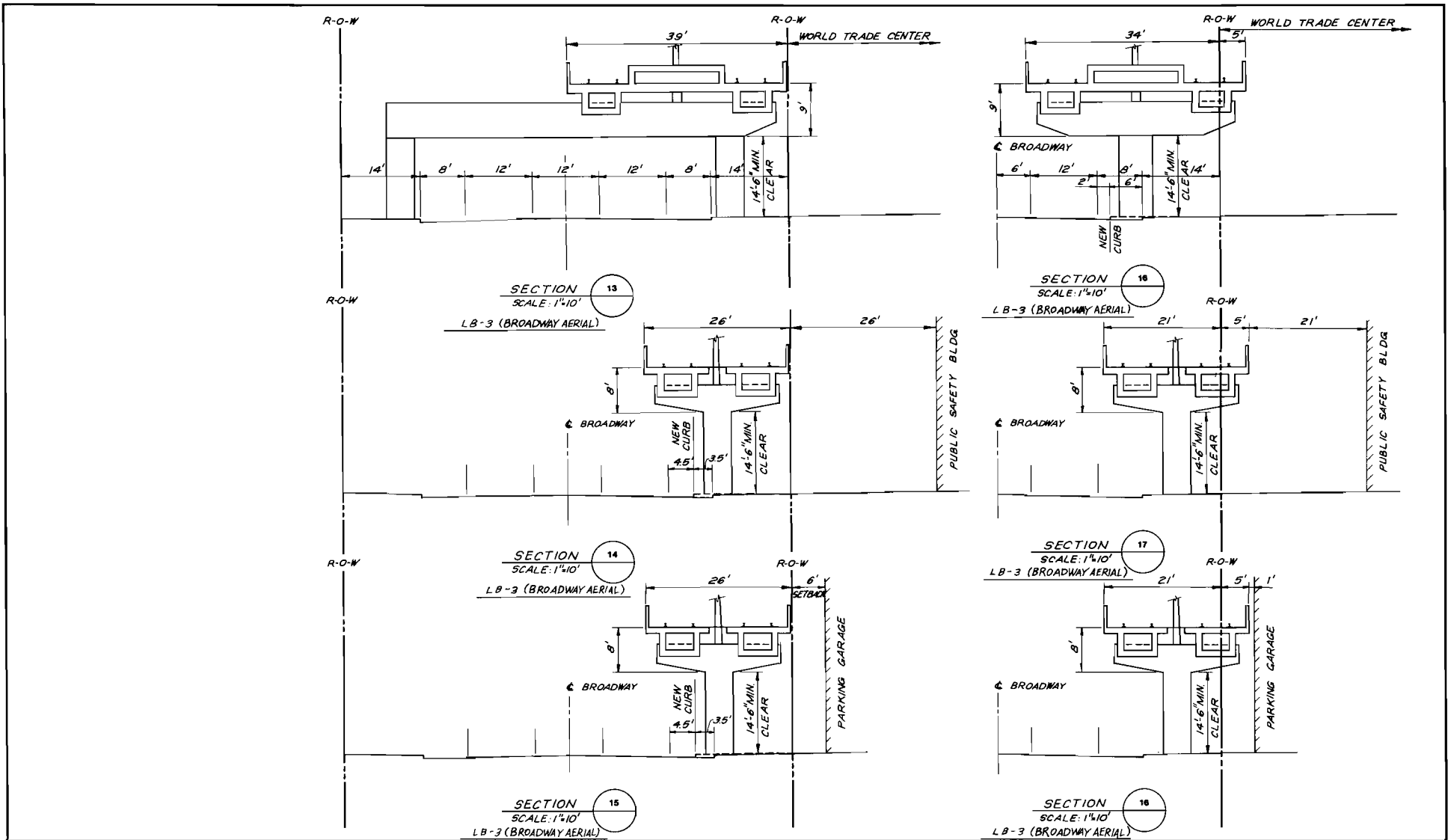


Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

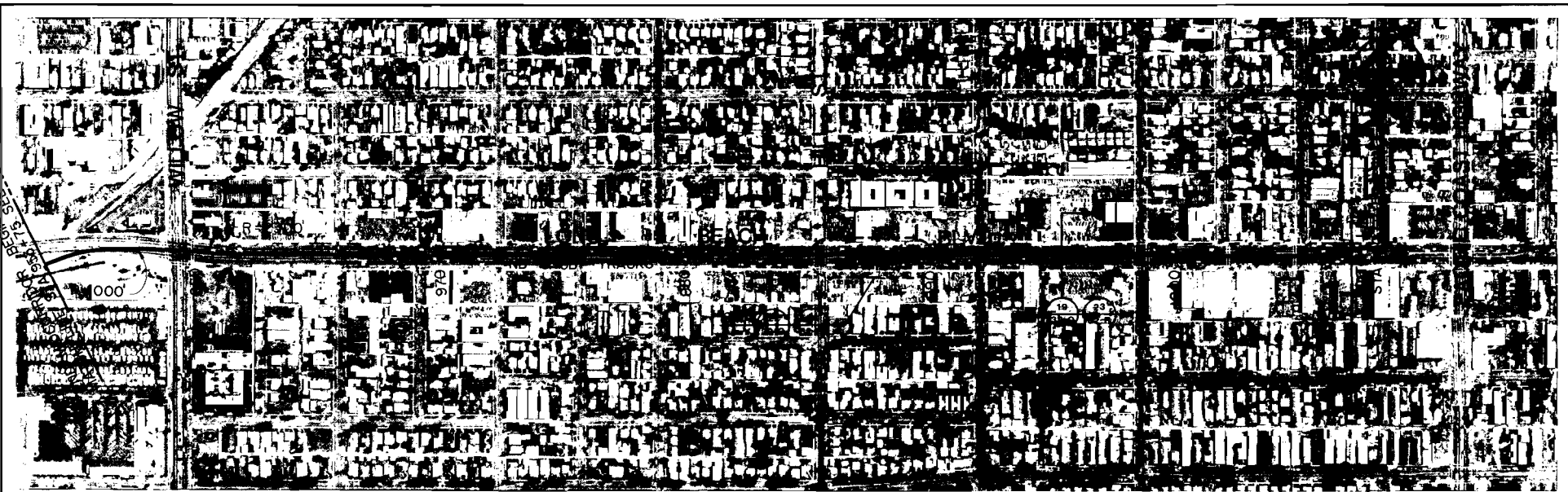
Typical Sections
MODIFIED RIVER ROUTE

Figure I-32 I

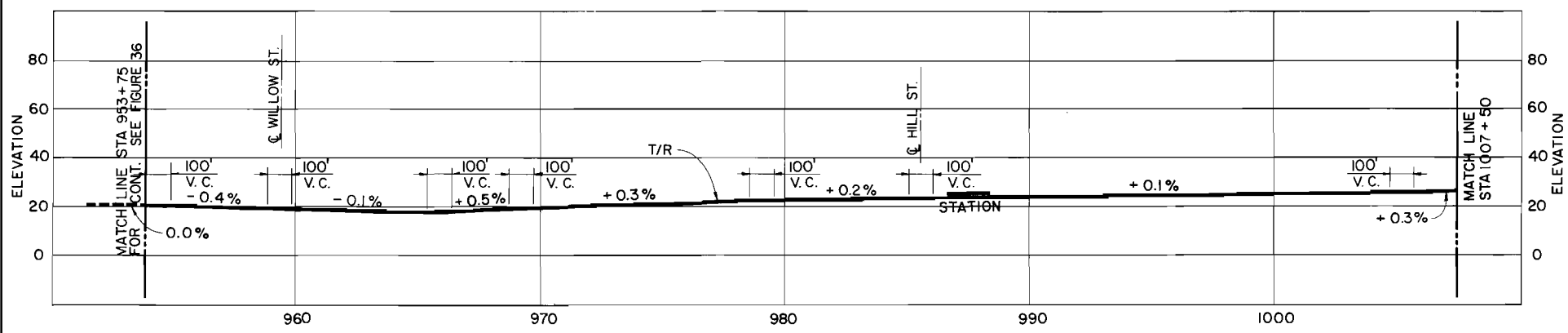




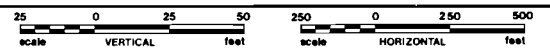
I-51
MATCH LINE STA 953+75
FOR CONT. SEE FIGURE 36
BEGIN LONG BEACH
FIGURE 36



PLAN



PROFILE

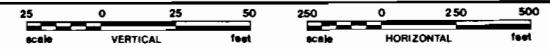
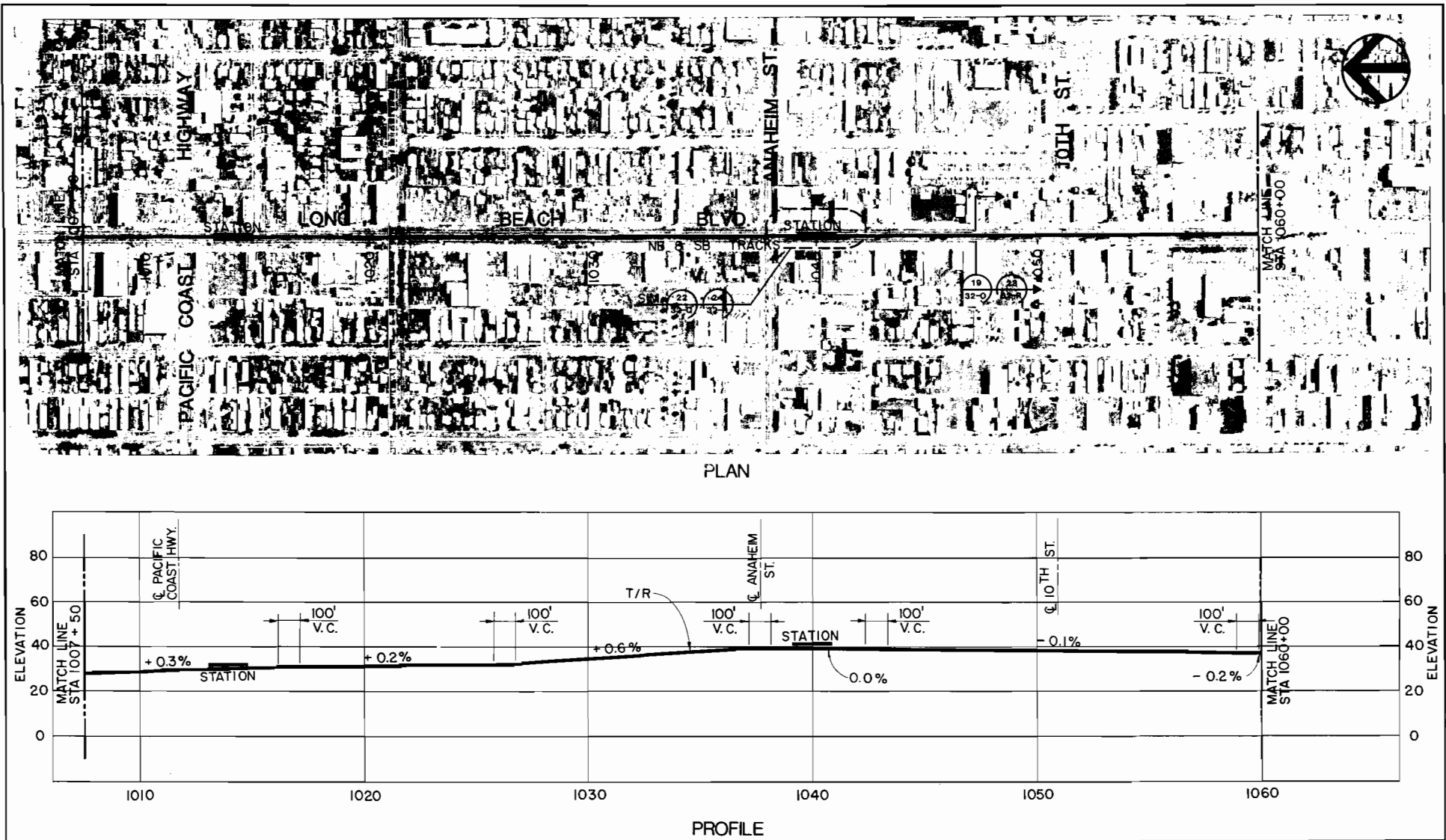


Long Beach - Los Angeles
RAIL TRANSIT PROJECT
LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Plan and Profile
Long Beach (LB-5)
LONG BEACH BLVD. TWO WAY

Figure I-32 L

PARSONS BRINCKERHOFF/KAISER ENGINEERS



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

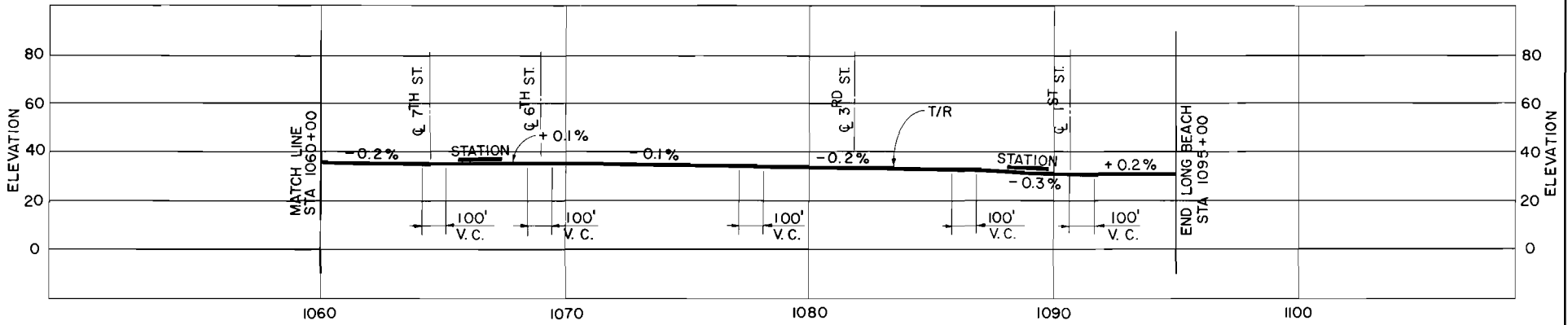
Plan and Profile
 Long Beach (LB-5)
 LONG BEACH BLVD. TWO WAY

Figure I-32 M

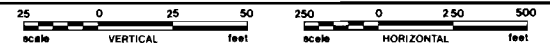
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PLAN



PROFILE



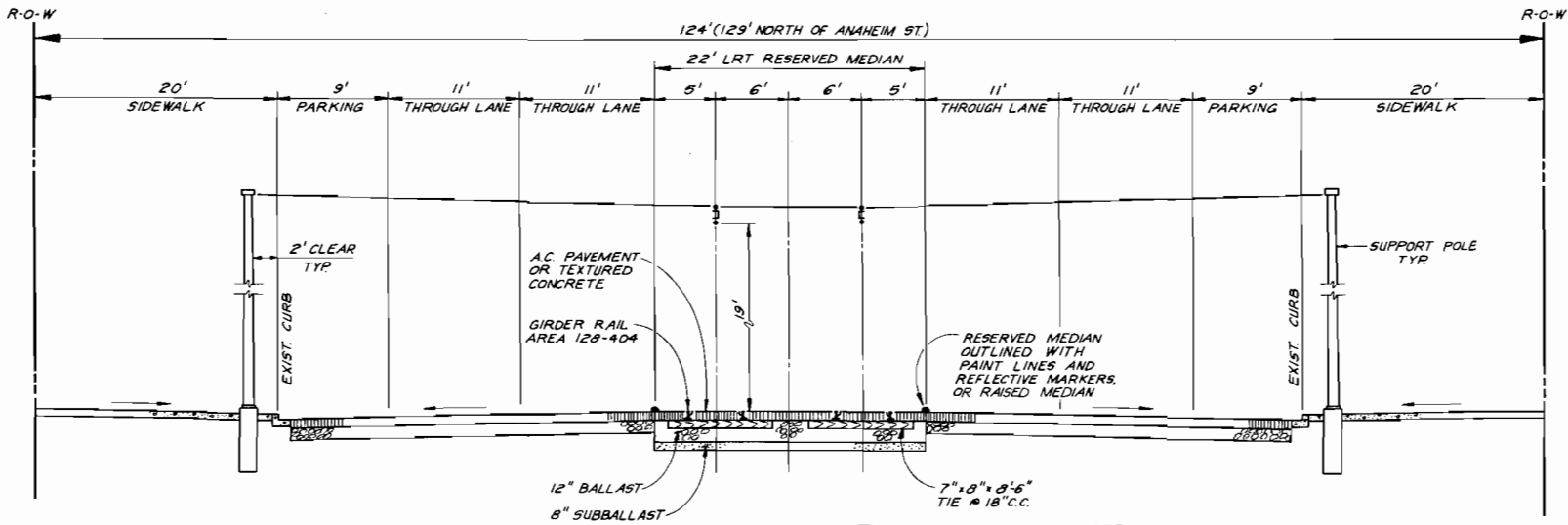
Long Beach - Los Angeles
RAIL TRANSIT PROJECT
 LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Plan and Profile
Long Beach (LB-5)
 LONG BEACH BLVD. TWO WAY

Figure I-32 N

PARSONS BRINCKERHOFF/KAISER ENGINEERS

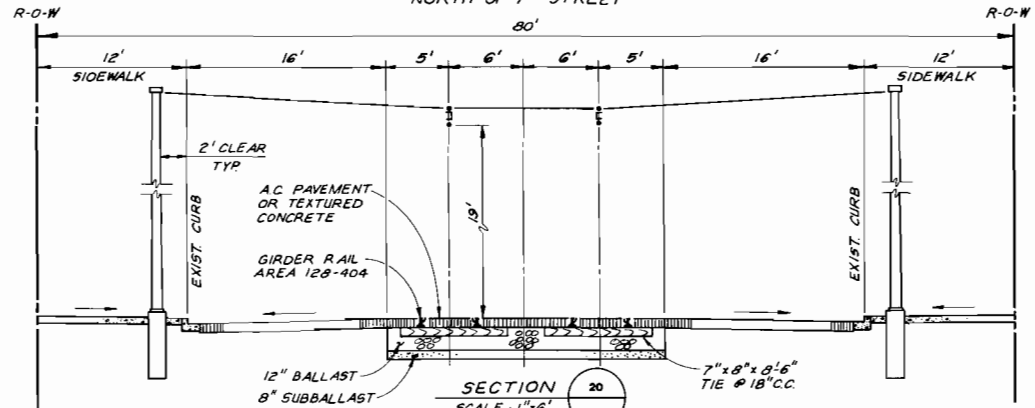
I-53



SECTION 19
SCALE: 1"=6'

NOTE:
PARKING LANES WILL BE ELIMINATED
AND SIDEWALKS NARROWED AT STATIONS.

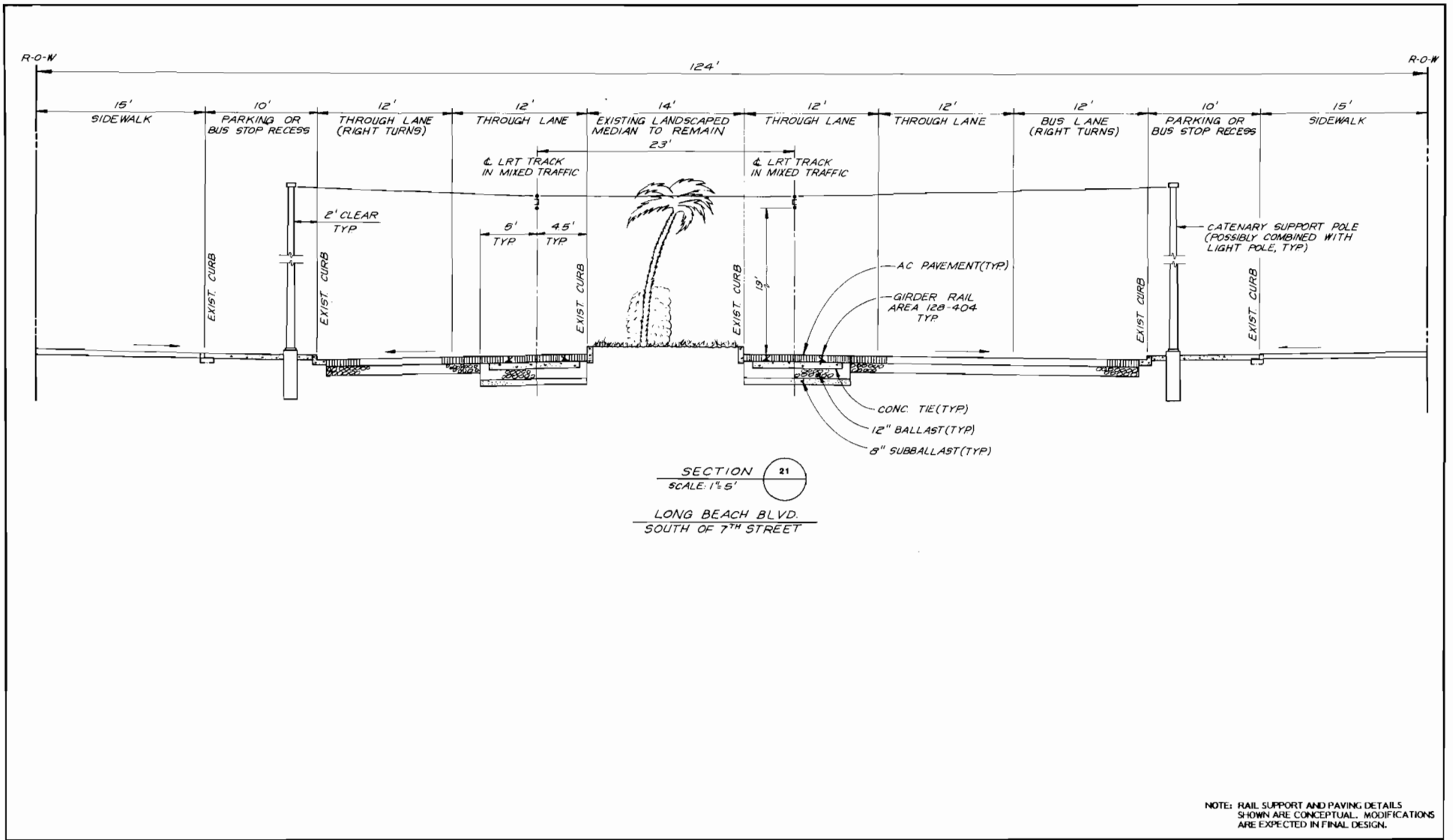
LONG BEACH BLVD.
NORTH OF 7TH STREET



SECTION 20
SCALE: 1"=6'

NOTE: RAIL SUPPORT AND PAVING DETAILS SHOWN ARE CONCEPTUAL. MODIFICATIONS ARE EXPECTED IN FINAL DESIGN.

I-54



I-55

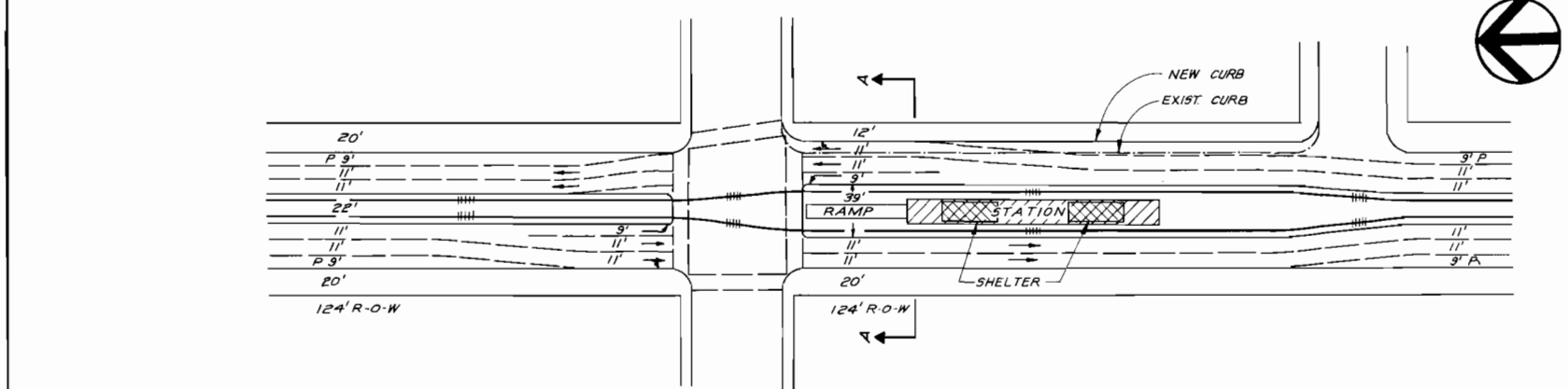
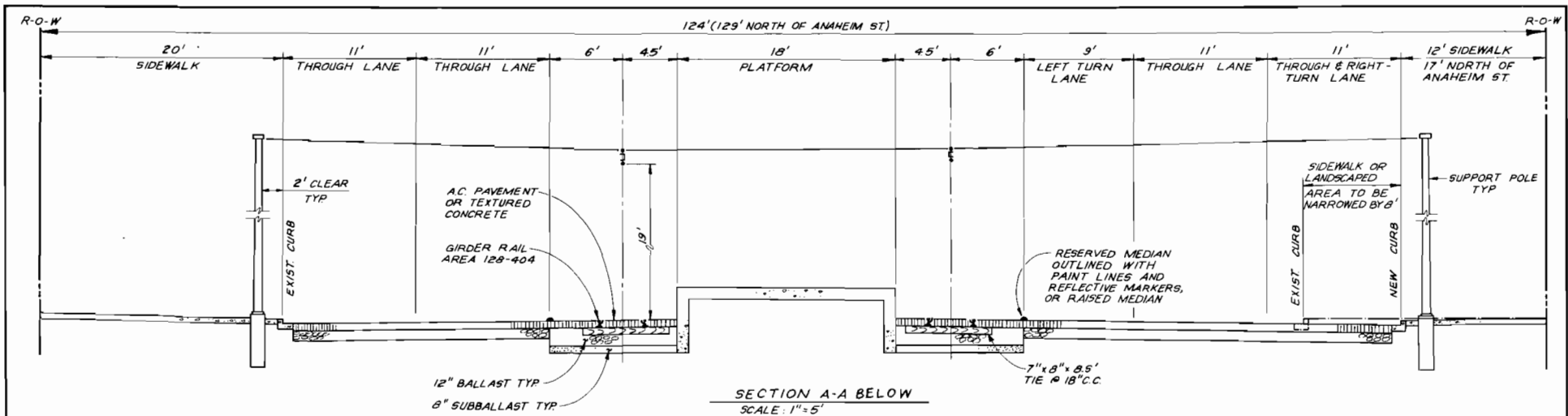
S.C.R.T.D. LIBRARY

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

Typical Sections
 LONG BEACH BLVD. TWO WAY

Figure I-32 P

PARSONS BRINCKERHOFF/KAISER ENGINEERS



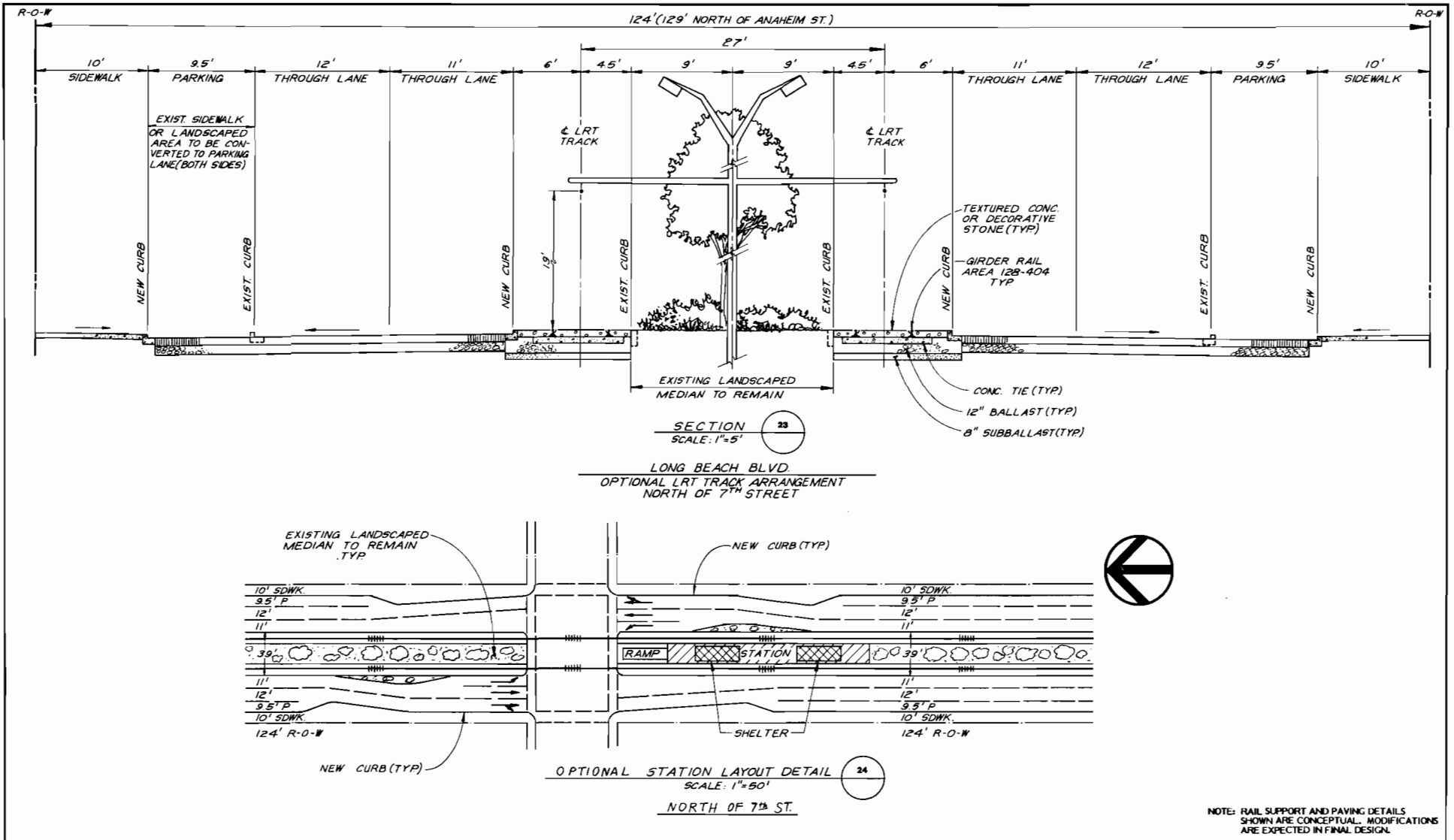
NOTE: RAIL SUPPORT AND PAVING DETAILS SHOWN ARE CONCEPTUAL. MODIFICATIONS ARE EXPECTED IN FINAL DESIGN.

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

Typical Sections
 LONG BEACH BLVD. TWO WAY

Figure I-32 Q

PARSONS BRINCKERHOFF/KAISER ENGINEERS



I-57

I-400 COSTS

I-410 CAPITAL

All capital costs associated with implementing the three alternatives under study have been estimated based on the most current conceptual designs and implementation plans. The cost estimates are fully documented in the working paper entitled, "Cost Estimates of Additional Long Beach Alternatives" (PB/KE, October 1984) and are summarized in Tables I-41A and I-41B.

The figures presented in Table I-41A are summaries by alignment alternative taken from a common starting point from the Los Angeles River bridge. All figures reflect 1983 prices and do not include allowances for inflation. Costs were figured in 1983 dollars so they would be comparable with the other Long Beach alternatives examined in the DEIR. Note that in Table I-61A of the DEIR, costs shown for LB-1, LB-2, and LB-4 are from Willow Street (end of mid-corridor segment), while for the original LB-3, costs are from Los Angeles River bridge.

Table I-41B contains estimated total costs for these system alternatives (assuming LA-2 and MC-1 for the downtown Los Angeles and mid-corridor segments, respectively) which include the alternatives under study. These costs reflect the sum of segment costs, yard and shop costs, and vehicle costs. They do not include right-of-way or relocation assistance costs. Preliminary estimates for right-of-way acquisition for all options of LB-3 (Broadway Aerial) range from \$2 to \$4 million.

I-420 OPERATIONS AND MAINTENANCE

Annual costs for operating and maintaining the rail transit system were estimated in the DEIR for LB-2 and LB-3. These costs were calculated using existing 1984 unit costs for labor, materials, and energy. For the system alternatives under study here, the cost estimates for LB-3 (Broadway Aerial-Modified River Route) would be substantially the same as those estimated for the original LB-3, and LB-5 (Long Beach Boulevard, Two-Way) costs would similarly relate to the original LB-2 alternative.

An operations analysis for the LB-6 (Willow Street Terminus) alignment was not run. The cost for operations and maintenance for this alternative would be less than any of those calculated for the DEIR alternatives as the distance traveled would be less.

TABLE I-41A
SUMMARY OF CAPITAL COST ESTIMATES
ALL LONG BEACH ALTERNATIVES¹
(Millions of 1983 Dollars)

	<u>Construction and Procurement</u> ²	<u>E/M/A/C</u> ³	<u>Total</u> ⁴	<u>Optional Costs</u> ⁵
<u>Supplemental EIR Alternatives</u>				
LB-3 (Broadway Aerial- Modified River Route)				885,000
Option A: 3 river stations	36,465,095	16,919,805	53,384,900	
Option B: 1 river station	34,709,767	16,105,333	50,815,100	
Option C: No river stations	31,914,412	14,808,288	46,722,700	
LB-5 (Long Beach Boulevard, Two-Way)	24,581,557	11,405,843	35,987,400	2,520,000
LB-6 (Willow St. Terminus)	11,627,663	5,395,237	17,022,900	
<u>Original DEIR Alternatives</u>				
LB-1 (Atlantic Avenue - double track, exclusive median)				
Option B (8-foot widening, parking mostly eliminated)	26,644,877	12,363,223	39,008,100	468,800
LB-2 (Long Beach Blvd./ Atlantic Avenue Couplet)	31,221,037	14,486,563	45,707,600	
LB-3 (Original River Route)	24,217,070	11,235,330	35,449,400	
LB-4 (Atlantic Avenue - double track, exclusive median- Pacific Avenue Loop)	31,040,436	14,402,764	45,443,200	468,800

¹ All Long Beach alternative costs shown here are calculated from the south end of the Los Angeles River Bridge. Costs shown for LB-1, LB-2 and LB-4 in Table I-61A of the DEIR were calculated from the Willow Street station.

² Initial right-of-way estimates for all options of LB-3 (Broadway Aerial and original River Route) range from \$2 to \$4 million; right-of-way and relocation estimates for LB-1 and LB-4 Option A (22-foot widening of Atlantic Avenue) range from \$17 to \$20 million.

³ Engineering and Management - 15%
Agency Cost - 7%
Contingency - 20% of Total

⁴ The total does not include right-of-way or vehicles; see note 2 above.

⁵ Optional costs include modification to city parking structure for LB-3 (Broadway Aerial), 22-foot widening of Atlantic Avenue for LB-1 and LB-4 to maintain parking with reserved LRT median, and additional landscape and street improvements for LB-5 (Long Beach Boulevard, Two-Way), but do not include any additional right-of-way costs.

Source: PB/KE, 1984.

TABLE I-41B
SUMMARY OF CAPITAL COST ESTIMATES BY
SELECTED SYSTEM ALTERNATIVES¹

(Millions of 1983 Dollars)

<u>System Alternative</u>	<u>Construction and Procurement</u> ⁴	<u>E/M/A/C</u> ³	<u>Total</u> ⁴
LB-3 (Broadway Aerial)			
Option A	\$277.8	\$128.9	\$406.7
Option B	276.0	128.1	404.1
Option C	273.2	126.8	400.0
LB-5 (Long Beach Boulevard, Two-Way)	266.0	123.5	389.5
LB-6 (Willow Street Terminus)	253.1	117.4	370.5

¹ Assumes LA-2 and MC-1.

² Includes all construction materials, labor, services, and vehicles. Also includes maintenance facilities.

³ Engineering and Management - 15%
Agency Cost - 7%
Contingency - 20% of Total

⁴ The total does not include right-of-way. LB-3 (Broadway Aerial) right-of-way costs may be \$2 to \$4 million.

Source: PB/KE, 1984.

I-500 RELATED PROJECTS

The related projects which might be affected by the Long Beach alternatives discussed in this Supplemental DEIR remain the same as those listed in Appendix I of the DEIR (May 1984), with the addition of the Terminal Island Coal Facility which is discussed in Appendix 1 - Related Projects of this Supplement to the DEIR.

It should also be noted that the LACTC has decided to fund a light rail system on the Century Freeway Transitway rather than the bus/HOV system assumed in the DEIR (see Appendix 1). Other than a very slight increase in patronage, this change to light rail does not significantly alter the regional environmental impacts as discussed in Chapter V of this document.

I-600 INTENDED USE OF SEIR

I-610 LISTING OF AGENCIES USING SEIR

This SEIR 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 SEIR as part of the funding approval process.

I-620 LIST OF APPROVALS FOR WHICH THE SEIR WILL BE USED

Depending on the alternative selected for implementation, the following agencies could use the SEIR as part of the process of issuing permits or approvals necessary to construct the project (Table I-62A):

TABLE I-62A

REQUIRED PERMITS AND APPROVALS

<u>Agency</u>	<u>Type Of Approval</u>
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, construction permits
County Flood Control District	Easements or right-of-way acquisition, overcrossing approvals, possible need for modifications to district facilities

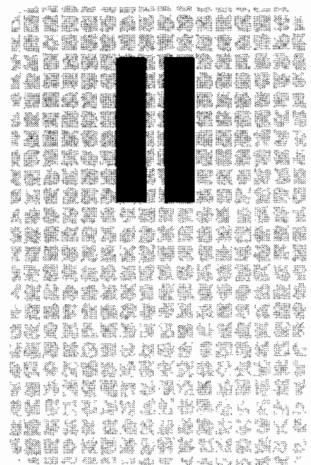
TABLE I-62A (Continued)

REQUIRED PERMITS AND APPROVALS

Agency	Type Of Approval
County Sanitation District	Possible acquisitions of easements, relocations, permit for disposal
City of Los Angeles	Right-of-way acquisition, possible zone changes for specialized facilities, construction permits
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, building permits
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 ENVIRONMENTAL SETTING

II-100 NATURAL ENVIRONMENT

II-110 TOPOGRAPHY, SOILS, GEOLOGY, AND SEISMICITY

The Long Beach segment of the project corridor would begin 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 the tides) would 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.

There are three naturally occurring soil types found within the Long Beach area. These are the Hanford, Tujunga-Soboba, and Ramona-Placential soil associations as determined by the U.S. Soil Conservation Service. Hanford soils are well-drained, very deep, moderately dense, and have good available water-holding capacities. Erosion hazards are moderate and water runoff slow over most of this soil association. Tujunga and Soboba soils occur in combination, making up one association. The soils of this association are excessively drained with slow runoff potential and are rapidly permeable, indicating only a minimal erosion hazard. Those soils are also subject to occasional overflow.

The Ramona and Placential soils occur in combination, making up one association. The soils of this association are moderately drained with medium to rapid runoff potential, creating a moderate to high erosion hazard.

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

The City of Long Beach is situated on a coastal plain. The coastal plain area contains significant oil fields. These oil fields include Wilmington Oil Field, the Dominguez Oil Field, Signal Hill Oil Field and several shoreline wells.

The Long Beach area is seismically active as evidenced by several earthquakes recorded during historic time. A high level of earthquake activity is considered to be normal for the region. The last major earthquake to significantly affect Long Beach was the 1933 earthquake (epicenter located off Newport Beach), which registered a magnitude of 6.3 on the Richter Scale.

The major fault which may affect the project is the Newport-Inglewood/Cherry Hill Fault. The maximum credible earthquake magnitude (Richter Scale) on this fault would be a 7.0.

Potential for liquefaction exists in the Long Beach area. Liquefaction occurs where saturated, loosely-compacted, granular soil exists within 30 feet of the ground surface, and saturation of soils develops from perched groundwater and percolation of winter storm runoff. Liquefaction is a process whereby these loose saturated soils lose their shear strength and become liquefied during seismic loading (activity).

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

None of the alternative alignments in the City of Long Beach encroaches onto any federally defined floodplain or significantly impedes drainage flows. As with the original alternatives in the DEIR, drainage control for the supplemental alternatives would consist of using existing facilities which would be modified as necessary. Residents along the river portion of the modified LB-3 alignment have reported flooding. Detailed flood studies would be performed if this route were selected, and if warranted, pumping capacity would be increased through either modifications to existing facilities or construction of additional ones.

Due to the high level of urbanization in Long Beach, the majority of the surface hydrology is a function of precipitation and storm runoff into drainage channels. The Los Angeles River is the principal drainage course. The average slope is sufficient to give good surface drainage over most of the Long Beach area except for sloughs and several small tidal marshes near the seashore.

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.

The channelization of the Los Angeles River provides adequate protection for potential flooding hazards.

None of the proposed additional alignment alternatives would be subject to inundation by coastal flooding from seasonal wave action.

Water bodies which might be affected by the additional alignment are the Los Angeles River and tidal prisms, San Pedro Bay/outer Los Angeles-Long Beach Harbor, and the West Coast Groundwater basin.

The Los Angeles River travels southerly through Long Beach flowing into the Pacific Ocean at San Pedro Bay. The Los Angeles River is mostly concrete-lined and serves an extremely limited freshwater and wildlife habitat.

Surface waters in the project corridor are primarily limited to runoff 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 runoff of excess irrigation water applied in urban areas and some municipal and industrial wastewater.

The West Coast Groundwater basin underlies Long Beach and contains a large amount of groundwater which is primarily used for municipal and industrial purposes. Groundwater levels have been gradually rising in recent years due to limits set on extraction and heavier than usual rainfall.

The average depth to groundwater is relatively shallow (less than 50 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

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 Long Beach area.

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. Benefi-

cial 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 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.

Birds in the Long Beach segment of the project corridor are 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 such as ground squirrels, gophers, rabbits, possums, and skunks 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 (Sylvilagus audubonii) and there is evidence of either stray dogs, foxes, or coyotes. There may also be feral cats in the area.

Alternative LB-3 (Broadway Aerial-Modified River Route), all options, would skirt the edges of the Los Angeles River Flood Control Channel and the Long Beach Freeway (Route 7). Vegetation found along this alternative is primarily weeds, since the proposed alignment has been extensively disturbed by development and construction for the flood control channel and freeway.

Alternative LB-5 (Long Beach Boulevard Two-Way) would proceed northbound and southbound in the Long Beach Boulevard median. The Long Beach Boulevard median has been landscaped with 271 mature trees of various species including Moreton Bay fig (Ficus macrophylla), California fan palm (Washington filifera), jacaranda (Jacaranda ovalifolia), Fern pine (Podocarpus ssp), bottle brush (Callistemon ssp), Kafir plum (Harpephyllum caffrum), Carrot wood (Cupania anacardioides), and magnolia (Magnolia ssp). The areas between the trees have been planted with grasses and various shrubs. The Long Beach Boulevard route also has non-native vegetation used for landscaping associated with adjacent businesses and residences.

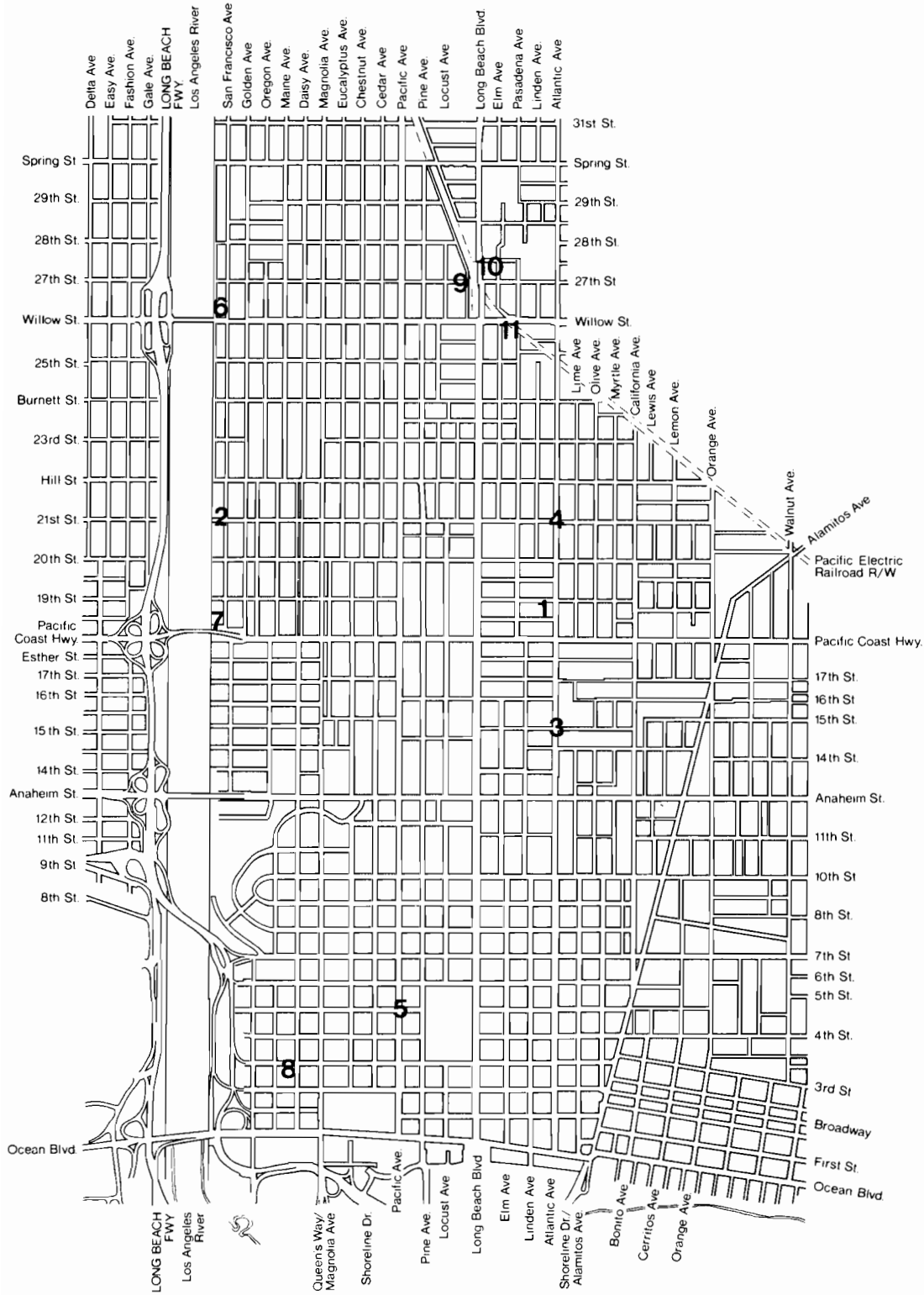
II-140 NOISE AND VIBRATION

Downtown Long Beach is an urbanized area where the major noise source is surface traffic. This is particularly the case along Atlantic Avenue and Long Beach Boulevard, both major arterials which represent a significant portion of the LB-1, LB-2 (as contained in the DEIR), and LB-5 alignment alternatives. In comparison to downtown Los Angeles, downtown Long Beach has lower building density, lower building heights, wider streets, and lower traffic volumes which result in significantly lower noise exposure.

In contrast to the relatively heavy traffic on Long Beach Boulevard, there is virtually no traffic along most of the proposed corridor for LB-3 (Broadway Aerial-Modified River Route) 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; therefore, the present noise level along the north-south river portion of LB-3 (Broadway Aerial-Modified River Route) is relatively low except at major cross streets.

To document the existing noise and vibration environment along the proposed corridors, long-term (24-hour) noise measurements were taken at six locations, supplemented by short-term (10-15 minute) measurements at five additional locations (see Figure II-14A). Location 1 (near Atlantic Avenue) and Location 9 (near Willow Street and Long Beach Boulevard) are representative of areas with significant traffic exposure. Locations 2, 6, and 7 (along the Los Angeles River) are representative of the environment along the north-south river portions of LB-3, with Locations 6 and 7 including noise contributions from Willow Street and Pacific Coast Highway, respectively. Location 8 is representative of a downtown location with some shielding of traffic noise.

Descriptions of the long-term measurement locations and measurement results in terms of Community Noise Equivalent Levels (CNEL) are provided in Table II-14A. Also listed are the short-term measurement locations and the average sound levels over the measurement period (L_{eq}) at those locations.



Graphic Scale in feet

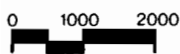


Figure II-14A

TABLE II-14A

NOISE AND VIBRATION MEASUREMENT DATA - LONG BEACH

Map Key	Location	Measured Sound Levels in dBA	Comments*
1.	Residence 500 block of Dayman Ave.	65 CNEL	Long-term measurement
2.	Residence 900 block of 21st St.	57 CNEL	Long-term measurement
3.	Gospel Memorial Church 5th and Atlantic Ave.	70 L _{eq}	Short-term measurement
4.	Faith and Nettles Christian Center 21st St. & Atlantic Ave.	74 L _{eq}	Short-term measurement
5.	First United Methodist Church 5th St. & Pacific Ave.	68 L _{eq}	Short-term measurement
6.	Residence 2600 block of San Francisco Avenue	63 CNEL	Long-term measurement
7.	Residence 1800 block of San Francisco Avenue	60 CNEL	Long-term measurement
8.	Hotel Lynford 600 block of 3rd Street	59 CNEL	Long-term measurement
9.	Trailer Park 233 E. Willow Street	62 CNEL	Long-term measurement
10.	SE corner of 27th Street and Long Beach Blvd.	67 L _{eq}	Short-term measurement
11.	200' south of Willow on Southern Pacific right-of-way	66 L _{eq}	Short-term measurement

* Long-term = 24 hours
Short-term = 10-15 minutes

Source: Bolt Beranek & Newman; Locations 1-5, noise measurements taken in 1983; Locations 6-11, noise measurements taken in 1984.

The CNEL represents an average of the A-weighted noise levels occurring over a 24-hour period, with adjustments applied to those levels occurring during evening and nighttime hours to account for the greater sensitivity of people to noise levels during these hours. (The A-weighted scale is used because it incorporates a frequency weighting of the sound signal which simulates the sensitivity of the human ear to sounds of different frequencies.) Specifically, the noise levels occurring between 7PM and 10PM have an adjustment of 5 dBA, while noise levels occurring between 10PM and 7AM 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.

Taking distance differences into account, noise measurements obtained at the various locations along the heavily traveled streets in Long Beach are fairly comparable to those noise measurements obtained from heavily trafficked streets 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. They contrast with significantly higher noise levels throughout most of downtown Long Beach.

Short term ambient vibration measurements were obtained at Locations 3 and 5. 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-200 SOCIOECONOMIC ENVIRONMENT

II-210 LAND USE, POPULATION, AND HOUSING

II-211 Land Use

Land uses in the Long Beach area as of 1980 are depicted on Figure II-21A. The map shows that land uses along the alternative Long Beach alignments vary considerably. The river route traverses large single-family residential neighborhoods north of Pacific Coast Highway, industrial areas between Pacific Coast Highway and 6th Street, and higher density residential and commercial areas, as well as offices south of 6th Street. In contrast, LB-5 (Long Beach Boulevard, Two-Way) traverses only commercial areas. Table II-21A summarizes the station area land uses in greater detail. The table compares existing land uses with zoning and general plan land use designations, allowing determination of whether rail stations are compatible with current activities within the station area and, more importantly, if they will be compatible with future uses proposed for the station areas. These future uses, as designated in the Long Beach General Plan, are illustrated in Figure II-21B. The discussion of their compatibility is presented in Chapter IV, Section 211.2. The following description characterizes the land uses in the Long Beach area in greater detail.

- o North of Wardlow Road. A mix of land uses borders the SPTC right-of-way (LB-1, LB-2, LB-4, LB-5, and LB-6) and the Los Angeles River channel, LB-3, and LB-3 (Broadway Aerial), including single- and multi-family housing, a church facility, a park, a country club, and industrial activities.
- o 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; Pacific Hospital, and related medical facilities; and Long Beach Unified School District facilities to the west. Single-family housing is the predominant use to the east and west of the railroad right-of-way.
- o Willow Street to Pacific Coast Highway. Auto-oriented sales and service are the predominant uses along Long Beach Boulevard. Mixed retail uses are also concentrated along Willow Street and Pacific Avenue. The vast majority of the area outside these three major roads is residential. It 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 to Walnut Avenue.

- o Pacific Coast Highway to Anaheim Street. Commercial uses along Long Beach Boulevard south of Pacific Coast Highway are predominantly automobile dealerships and auto-related sales and service businesses. Commercial strip development extends east and west on both sides of the Pacific Coast Highway. Near the river are several motels, heavy commercial, and low intensity retail uses. Marginal commercial uses are mixed with predominantly single-family housing on Atlantic Avenue. The primary land uses outside these corridors are a mix of multi-family and single-family housing between Long Beach Boulevard and Magnolia Avenue and industrial uses west of Magnolia Avenue.
- o South of Anaheim Street. This portion of the Long Beach area is more intensely developed than the portions further north. With respect to non-residential uses, retail uses are concentrated along Anaheim Street and in a north-south band between Pacific and Elm Avenues. Long Beach Plaza, a regional shopping mall, anchored by Wards, Buffums, and J.C. Penney's, is bounded by Long Beach Boulevard, Pine Avenue, 3rd Street, and 6th Street. Office space is concentrated in the Redevelopment Area south of 3rd Street between the Los Angeles River and Elm Avenue. Major uses in this area from west to east include the proposed World Trade Center, high-rise financial institutions along the south side of Ocean Boulevard, the Civic Center Complex, and the Convention Center at the terminus of Long Beach Boulevard south of Ocean Boulevard. The only industrial activities in this area are concentrated along the river between Anaheim Street and 6th Street.

South of Anaheim Street to 7th Street, residences are a mix of multi-family and single-family housing, typically two to three stories high. The proportion of multi-family units and multi-family mixed with commercial/retail businesses increases progressively south of 7th Street. South of 4th Street, residences are typically in high-rise structures, interspersed with hotels and commercial structures.

II-212 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, to 181,000 square feet per year for the period 1980 to 1983. In 1983 alone 386,000 square feet were absorbed during the first six months. While the absorption rate has not kept up with the supply, its

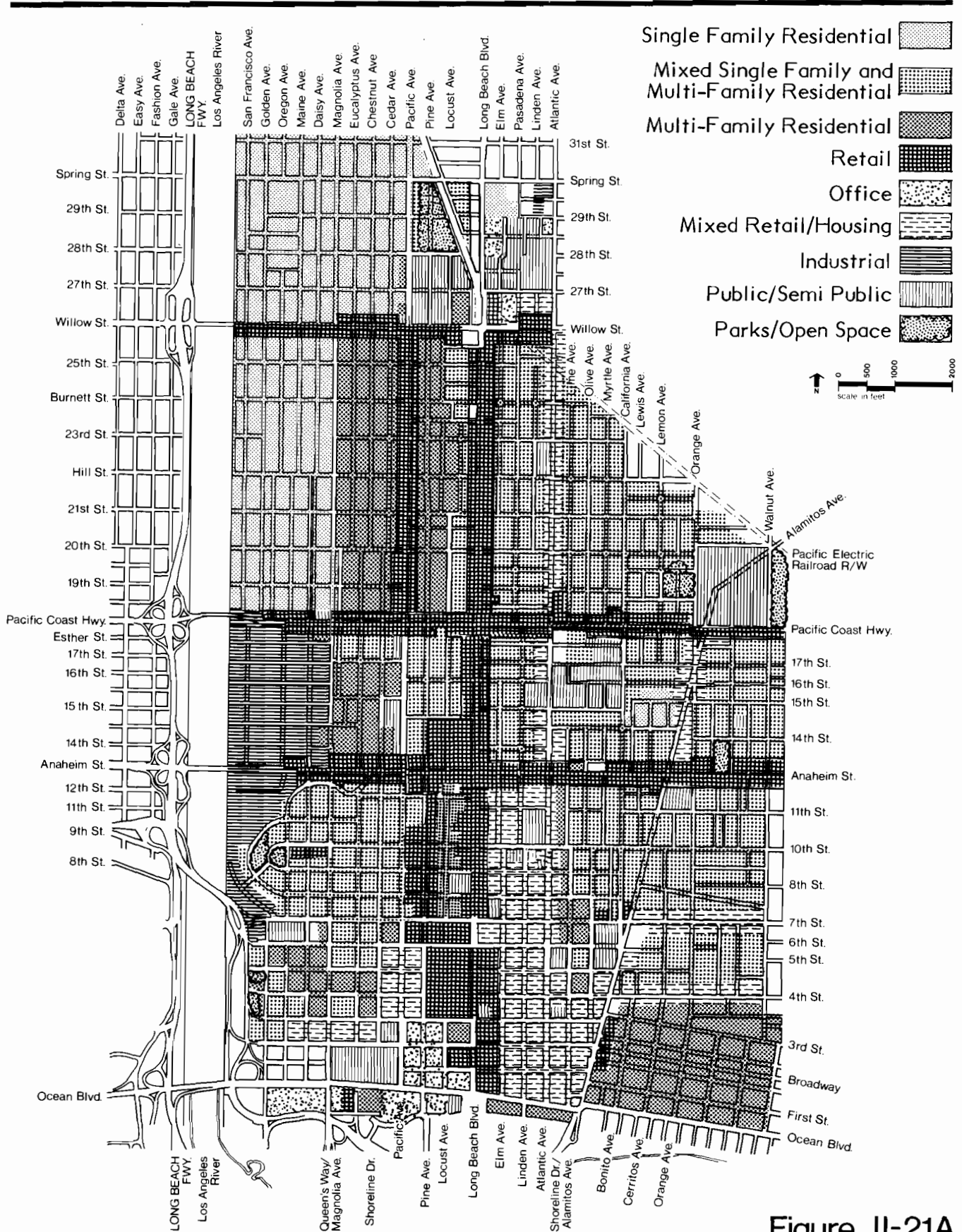


Figure II-21A

TABLE 11-21A

STATION AREA LAND USE PROFILES, 1980: LONG BEACH

	Residential	Commercial	Industrial	Public Facilities/ Open Space	Mixed Use	"UNDERUTILIZED" LAND	
						Commercial Parking	Vacant
<u>LB-3 (Broadway Aerial) Option A</u>							
Willow Street							
Land Use (acres)	34	2	0	3	0	0	0
	88%	4%	0%	8%	0%	0%	0%
General Plan	84%	16%	0%	0%	0%	*	*
Zoning	84%	16%	0%	0%	0%	*	*
Pacific Coast Highway							
Land Use (acres)	12	5	14	0	0	0	0
	39%	16%	45%	0%	0%	0%	0%
General Plan	49%	0%	51%	0%	0%	*	*
Zoning	35%	5%	51%	9%	0%	*	*
Anaheim Street							
Land Use (acres)	2	0	45	0	0	0	0
	5%	0%	95%	0%	0%	0%	0%
General Plan	21%	0%	79%	0%	0%	*	*
Zoning	94%	0%	0%	6%	0%	*	*
World Trade Center							
Land Use (acres)	34	8	0	8	0	3	13
	52%	12%	0%	12%	0%	4%	20%
General Plan	16%	66%	0%	18%	0%	*	*
Zoning	48%	18%	0%	12%	22%	*	*
Civic Center							
Land Use (acres)	15	41	0	24	0	6	16
	15%	40%	0%	24%	0%	5%	16%
General Plan	16%	60%	0%	24%	0%	*	*
Zoning	15%	57%	0%	19%	9%	*	*
<u>LB-3 (Broadway Aerial) Option B</u>							
Pacific Coast Highway	same as Option A						
World Trade Center	same as Option A						
Civic Center	same as Option A						
<u>LB-3 (Broadway Aerial) Option C</u>							
World Trade Center	same as Option A						
Civic Center	same as Option A						
<u>LB-5 (Long Beach Boulevard, Two-Way)</u>							
Wardlow Right-of-Way ²							
Land Use (acres)	98	2	0	5	0	0	4
	90%	1%	0%	5%	0%	0%	4%
General Plan	85%	5%	0%	10%	0%	*	*
Zoning	85%	5%	0%	10%	*	*	*
Willow Street ²							
Land Use (acres)	28	14	0	64	0	0	4
	25%	13%	0%	58%	0%	0%	4%
General Plan	0%	5%	0%	75%	20%	*	*
Zoning	10%	20%	0%	70%	0%	*	*

TABLE II-21A (Continued)

STATION AREA LAND USE PROFILES, 1980: LONG BEACH

"UNDERUTILIZED" LAND

	<u>Residential</u>	<u>Commercial</u>	<u>Industrial</u>	<u>Public Facilities/ Open Space</u> ¹	<u>Mixed Use</u>	<u>Commercial Parking</u>	<u>Vacant</u>
Hill Street							
Land Use (acres)	74	19	0	4	0	0	1
	76%	19%	0%	4%	0%	0%	1%
General Plan	72%	23%	0%	5%	0%	*	*
Zoning	73%	24%	0%	3%	0%	*	*
Pacific Coast Highway							
Land Use (acres)	56	22	1	2	0	0	1
	68%	27%	1%	2%	0%	0%	1%
General Plan	65%	35%	0%	0%	0%	*	*
Zoning	56%	44%	0%	0%	0%	*	*
Anaheim Street							
Land Use (acres)	37	43	0	6	0	3	1
	41%	48%	0%	7%	0%	3%	1%
General Plan	32%	21%	0%	7%	40%	*	*
Zoning	35%	58%	0%	7%	0%	*	*
6th/7th Streets							
Land Use (acres)	24	33	0	14	0	1	14
	28%	40%	0%	16%	0%	1%	16%
General Plan	17%	46%	0%	4%	33%	*	*
Zoning	25%	73%	0%	2%	0%	*	*
1st Street							
Land Use (acres)	11	43	0	3	0	1	18
	15%	57%	0%	4%	0%	0%	24%
General Plan	12%	88%	0%	0%	0%	*	*
Zoning	0%	90%	0%	0%	10%	*	*

LB-6 (Willow Street Terminus)

Wardlow Right-of-Way² same as LB-5

Willow Street² same as LB-5

¹ Public Facilities/Open Space excludes public rights-of-way.

² Station is identical to the LB-1, LB-2, and LB-4 stations of the same name.

* = No corresponding land use category.

Source: Sedway Cooke Associates, 1984.

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.

As of 1980 there were no competitive first class hotels in downtown or north Long Beach. Between 1980 and 1984 two hotels of this type were built near the Convention Center with a total of 762 rooms. Two additional facilities totaling 880 rooms are planned in the same area.

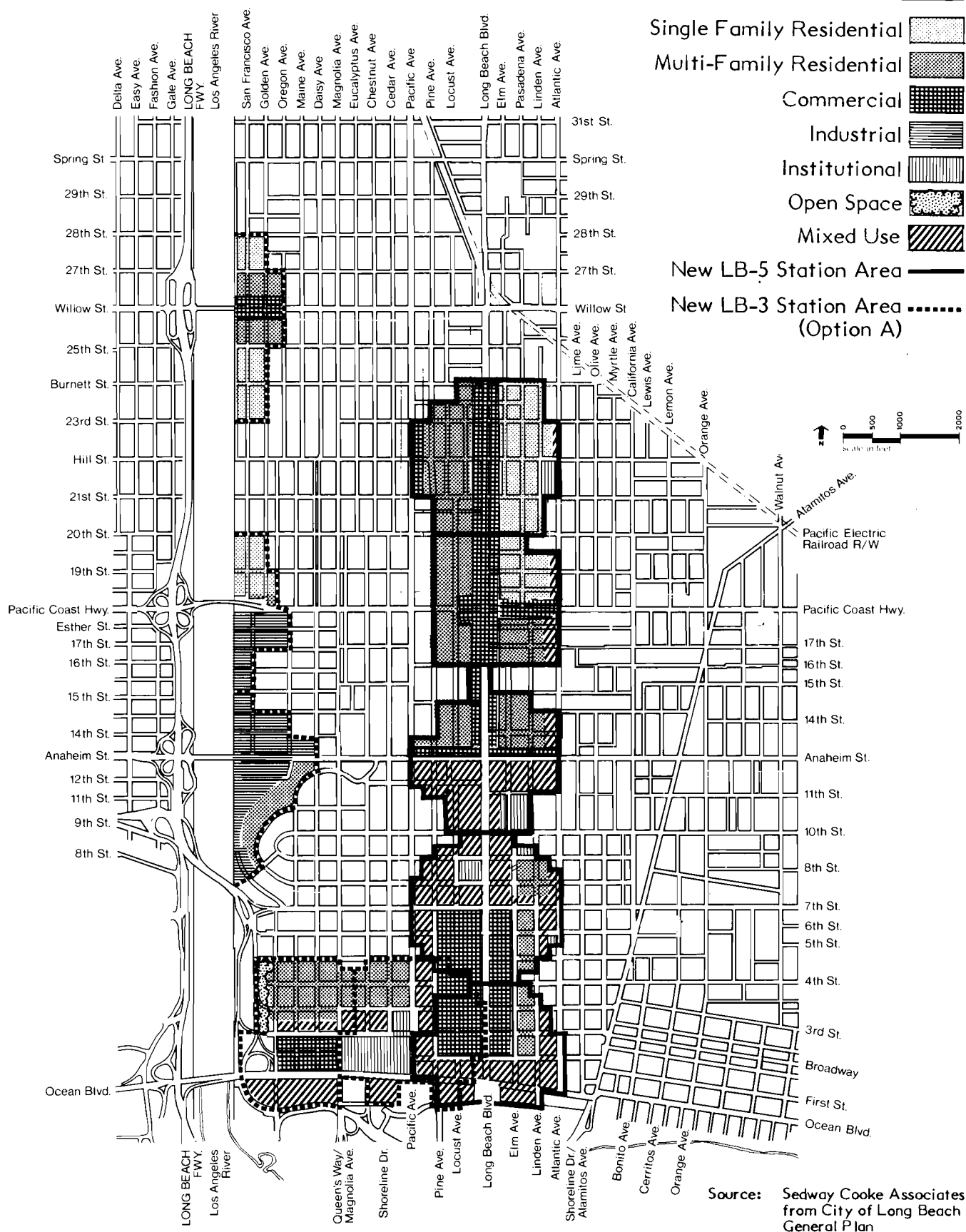
Of the estimated 7 million square feet of retail space available in the entire Long Beach segment in 1980, 1.9 million square feet were located in the 1.2 square-mile Long Beach downtown area bounded by the Los Angeles River, the Pacific Ocean, California Avenue, and 7th Street. An additional 700,000 square feet were constructed between 1980 and 1983. Figure II-21B shows proposed land use according to the Long Beach General Plan.

II-213 Population

The alternatives under study would vary greatly in their potential to enhance mobility and accessibility for the residents of Long Beach. Of the alternatives proposed, the Long Beach Boulevard Two-Way would be of potential benefit to the greatest number of people. Approximately 17,800 people currently live within its station areas (1/4 mile radius).

The LB-3 (Broadway aerial) Option A alignment with 3 river stations would potentially serve 7,125 residents, the greatest number of people among the Modified River Route alternatives. Option B (1 river station at Pacific Coast Highway) would rank second, with a resident population of 6,112 and Option C with no river stations would be the least beneficial, serving only 5,169 residents.

Table II-21B displays selected demographic characteristics of the station areas.



Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Figure II-21-B GENERAL PLAN LAND USES IN STATION AREAS

PARSONS BRINCKERHOFF KAISER ENGINEERS

TABLE 11-21B
1980 STATION AREA SELECTED DEMOGRAPHIC CHARACTERISTICS

	<u>Population</u>	<u>Percent 0-17 Years</u>	<u>Percent 65+ Years</u>	<u>Percent Black</u>	<u>Percent Spanish Origin</u>	<u>Percent Asian/ Pacific Islander</u>
<u>LB-3 (Broadway Aerial) Option A</u>						
Willow Street	1,013	26	16	26	14	14
Pacific Coast Highway	943	30	11	27	25	12
Anaheim Street	0	0	0	0	0	0
World Trade Center	3,229	26	9	6	41	7
Civic Center	<u>1,940</u>	3	55	2	7	2
TOTAL	7,125	20	23	10	26	7
<u>LB-3 (Broadway Aerial) Option B</u>						
Pacific Coast Highway	943	30	11	27	25	12
World Trade Center	3,229	26	9	6	41	7
Civic Center	<u>1,940</u>	3	55	2	7	2
TOTAL	6,112	23	29	9	33	7
<u>LB-3 (Broadway Aerial) Option C</u>						
World Trade Center	3,229	26	9	6	41	7
Civic Center	<u>1,940</u>	3	55	2	7	2
TOTAL	5,169	17	27	4	21	5
<u>LB-5 (Long Beach Blvd., Two-Way)</u>						
Wardlow Right-of-Way ¹	2,700	16	27	8	7	9
Willow Street	1,348	20	22	16	15	9
Hill Street	3,091	31	10	33	21	5
Pacific Coast Highway	4,047	34	7	35	27	9
Anaheim Street	2,296	29	8	51	27	12
6th/7th Street	2,265	11	47	4	14	6
1st Street	<u>2,037</u>	3	50	3	6	2
TOTAL	17,774	22	22	24	18	8
<u>LB-6 (Willow Street Terminus)</u>						
Wardlow Right-of-Way ¹	2,700	16	27	8	15	9
Willow Street	<u>1,348</u>	20	22	16	7	9
TOTAL	4,048	17	25	11	10	9

¹ Station is identical to the LB-1, LB-2, and LB-4 station of the same name.

Source: U.S. Bureau of the Census, 1980; Sedway Cooke Associates, 1984.

Approximately 4,000 people reside within the station areas of LB-6 (Willow Street Terminus) alternative. Of all the Long Beach alignments, the Willow Street Terminus alternative would be of potential benefit to the smallest number of residents.

II-214 Housing

The total number of housing units within the station areas of each of the alternatives ranges from 1800 (LB-6) to 8800 (LB-5). Because LB-5 has more stations and serves a more densely populated area, its proposed station areas would contain more housing units than those located along the river route alternatives (ranging from 3200 units with Option C to almost 4,000 units with Option A). The number of units for river alternatives varies only slightly among the three river station options because the highest residential densities are in the downtown station areas.

Between 1980 and 2000, housing in the area of Long Beach traversed by the alternatives under study is expected to grow at an average annual rate of 1.1 percent. This rate is higher than what has been estimated for the county during the same period and can be attributed to the city's housing objective of increasing residential density in the central and downtown areas.

Housing in the study area ranges from low-rent, single-room occupancy apartments found in the central and downtown areas to large, high-value, single-family homes in the Bixby Knolls/California Heights neighborhood. Approximately 64 percent of the housing stock in the study area is multi-family and 67 percent is renter-occupied. Average household size is a low 2.2 persons per unit which is probably a reflection of the large number of senior citizens living in Long Beach.

II-220 COMMUNITY SERVICES

Table II-22A summarizes the existing community service facilities by type found in the area of Long Beach traversed by the alignment alternatives under study. Figures II-22A and II-22B show the distribution of these facilities. A more detailed description of existing community services in Long Beach can be found in the DEIR (pages II-122 through II-126).

Because the implementation of the Modified River Route could conflict with a number of local public recreational facilities, these facilities are discussed further in Sections 221 and 222.

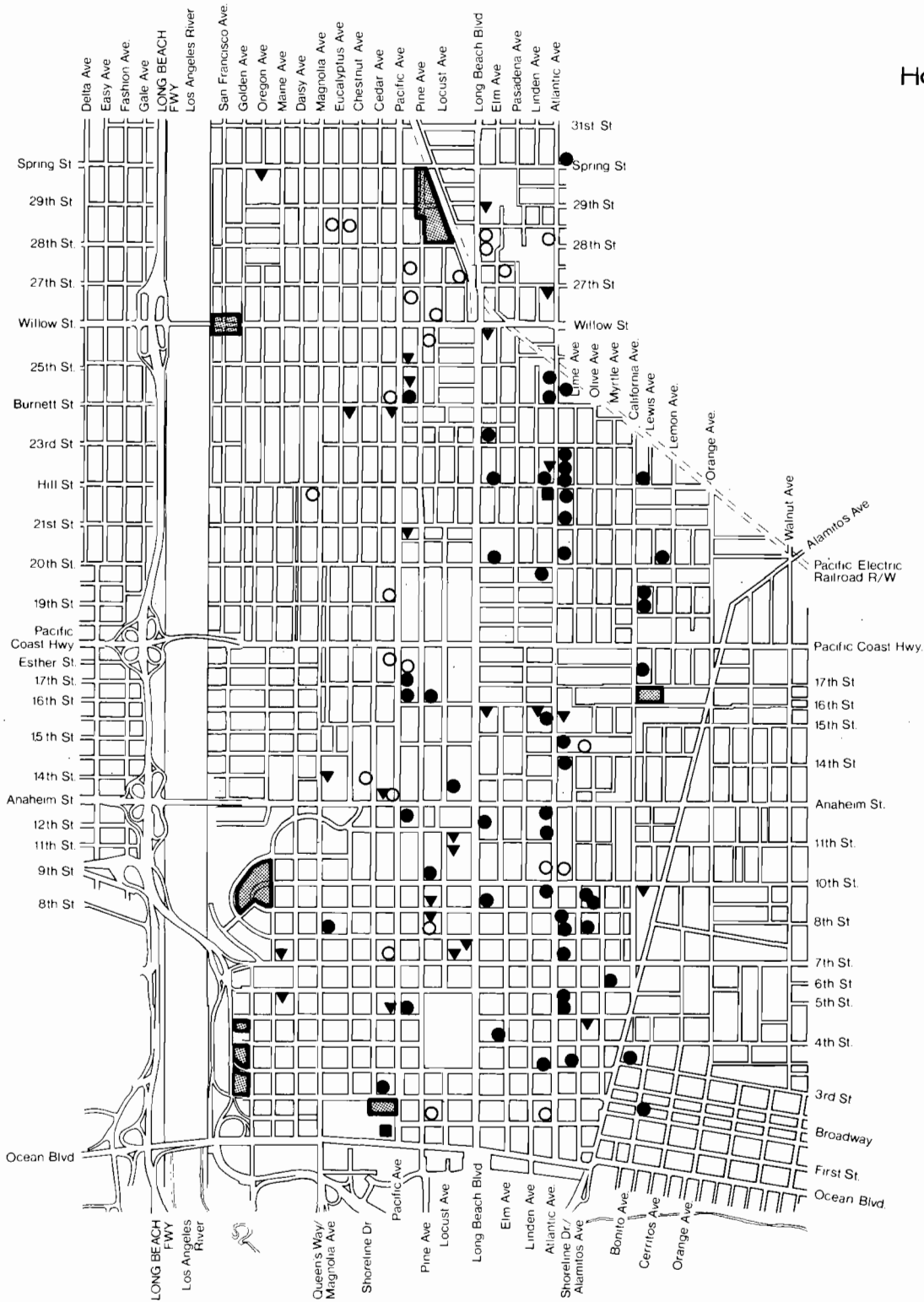
TABLE II-22A
NUMBER OF COMMUNITY SERVICE FACILITIES BY TYPE
IN VICINITY OF ALIGNMENT ALTERNATIVES

Facilities By Type

Schools	27
Libraries	2
Churches	57
Parks	7
Medical Facilities	27
Police Stations	1
Fire Stations	5
Government Offices	16
Local Social Services	44

Source: Myra L. Frank & Associates, 1983.

- School ▼
- Library ■
- Church ●
- Hospital/Clinic ○
- Park ▣



Graphic Scale in feet

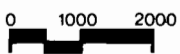


Figure II-22A

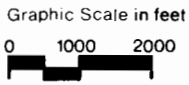


Figure II-22B

II-221 LARIO Regional Bike/Equestrian Trail

The Los Angeles River Rio Hondo Trail (LARIO) is a regional bike/equestrian/pedestrian trail system stretching from the San Gabriel mountains to San Pedro Bay. A portion of the trail runs along the Los Angeles River levee, adjacent to the LB-3 (Broadway Aerial) alignment, from the SPTC bridge crossing to where the alignment turns east on Broadway. The bikeway is located on top of the levee in a separate right-of-way designated for the exclusive use of bicycles and pedestrians. Access points are located at Del Amo Boulevard, Wardlow Road (34th Street), Hill Street (pedestrian stairs), Willow Street, Pacific Coast Highway, Chester Place, and Queensway Landing. The equestrian trail is located at the toe of the levee.

II-222 Parks

There are four city-maintained parks adjacent to or in close proximity to the LB-3 (Broadway Aerial) alternative. The names and locations of these parks are described below and shown in Figure II-22A.

- o Lincoln Park: Located over a two-level underground parking structure in the northeast corner of the Civic Center complex, Lincoln Park would be the location of the terminal station of the LB-3 (Broadway Aerial) alternative.
- o Willmore Park: This park extends along Topaz Court from 5th Street to Broadway but is divided into three separate, unconnected pieces. These three pieces are located between 5th Street and Ocean Park Avenue, 4th Street and 3rd Street, and 3rd Street and Broadway.
- o Drake Park: Located between Loma Vista Drive and Maine Avenue at 10th Street.
- o An unnamed, city-maintained "beautified area" is located on both sides of Willow Street between Golden and DeForest Avenues.

II-230 ECONOMIC ACTIVITY

II-231 Employment

As shown in Table II-23A, 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.

TABLE II-23A

1983 NON-GOVERNMENT EMPLOYMENT BY INDUSTRY
TOTAL CORRIDOR AND LONG BEACH STUDY AREAS

Industry	Total Corridor		Long Beach		
	Number	Percent	Number	Percent	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	<u>100,357</u>	<u>22.4</u>	<u>28,106</u>	<u>36.0</u>	<u>28.0</u>
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.

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-3 (Broadway Aerial), LB-5 (Long Beach Boulevard, Two-Way), and LB-6 (Willow Street Terminus) alternative alignments is presented in Table II-23B and Table II-23C. The total estimated employment of the station areas in 1980 and 2000 is shown below by alternative alignment (Table II-23D).

Of the three alternatives under consideration, the LB-5 alignment with 9,850 persons had the highest concentration of employment in 1980. Should projected developments occur, the LB-5 station area employment would grow by 3.7 percent annually, increasing to 19,830 persons in the year 2000. Station area employment along the LB-3 (Broadway Aerial) Option A alignment is projected to grow at a faster rate, and would increase total employment to 20,990 persons by the year 2000, if all projected developments occur.

II-232 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, was in retail 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.

TABLE 11-23B
 STATION AREA EMPLOYMENT WITHOUT PROJECT
 LB-3 (BROADWAY AERIAL-MODIFIED RIVER ROUTE) OPTIONS A, B, and C

<u>Station</u>	<u>1980¹</u>	<u>2000²</u>	<u>Total Change</u>	
			<u>Number</u>	<u>Percent</u>
Willow Street ³	30	30	-	-
Pacific Coast Highway ⁴	510	510	-	-
Anaheim Street ³	1,180	1,180	-	-
World Trade Center	830	7,950	7,120	757
Civic Center Terminus	4,470	11,320	6,850	153
Total Option A	7,020	20,990	13,970	200
Total Option B	5,810	19,790	13,980	240
Total Option C	5,300	19,280	13,980	264

Note: May not add to totals due to rounding.

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.

³ Option A only.

⁴ Options A and B only.

Source: PB/KE, 1984.

TABLE 11-23C
 STATION AREA EMPLOYMENT WITHOUT PROJECT
 LB-5 (LONG BEACH BOULEVARD, TWO-WAY)
 LB-6 (WILLOW STREET TERMINUS)

Station	1980 ¹	2000 ²	Total Change	
			Number	Percent
Wardlow Road ³	40	40	-	-
Willow Street ³	540	540	-	-
Hill Street	420	420	-	-
Pacific Coast Highway	1,060	1,090	30	3
Anaheim Street	1,330	1,500	170	13
6/7th Streets	2,880	4,250	1,370	48
1st Street	3,580	11,990	8,410	134
Total LB-5	9,850	19,830	9,980	101
Total LB-6	580	580	-	-

Note: May not add to totals due to rounding.

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.

³ Included in LB-5 and LB-6.

Source: PB/KE, 1984.

TABLE II-23D
STATION AREA EMPLOYMENT
LONG BEACH

<u>Alternative</u>	<u>Year 1980</u>	<u>Year 2000</u>
LB-3 (Broadway Aerial)		
Option A (3 River Stations)	7,020	20,990
Option B (1 River Station)	5,810	19,790
Option C (No River Stations)	5,300	19,280
LB-5 (Long Beach Blvd., Two Way)	9,850	19,830
LB-6 (Willow Street Terminus)	580	580

Source: PB/KE, 1984.

II-233 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-23E and II-23F provide the employment by industry and occupation for the Long Beach study area resident labor force.

TABLE II-23E
 1980 EMPLOYMENT OF RESIDENTS BY INDUSTRY
 PROJECT CORRIDOR AND LONG BEACH

<u>Industry</u>	<u>Project Corridor</u>		<u>Long Beach</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
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	<u>10,654</u>	<u>4.2</u>	<u>3,787</u>	<u>4.0</u>
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-23F

1980 EMPLOYMENT OF RESIDENTS BY OCCUPATION
PROJECT CORRIDOR AND LONG BEACH

<u>Industry</u>	<u>Project Corridor</u>		<u>Long Beach</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
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	<u>17,001</u>	<u>6.6</u>	<u>4,731</u>	<u>4.8</u>
TOTAL	258,640	100.0	97,585	100.0

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

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-234 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 2 percent annual 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.

II-240 VISUAL QUALITY

Visual settings for each of the additional alternative routes in the Long Beach area are described below. Two of the alternatives would be located in the Long Beach Boulevard corridor, with one of the alternatives terminating at Willow Street. The Modified River Route (Options A, B and C) would be substantially west of the other two alternatives.

II-241 LB-3 (Broadway Aerial-Modified River Route)

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. Vista views along the berm are terminated by four bridges crossing the Los Angeles River at Willow Street, Pacific Coast Highway, Anaheim Street, and the Long Beach Freeway at 8th Street.

A residential community of single-family homes lies east of the Los Angeles River between Wardlow Road and Pacific Coast Highway. The residences south to Willow Street are set back 125 feet from the berm, creating a wide linear open space that incorporates a bridle path (from Willow Street north). Immediately north of the Willow Street bridge there are vacant lots that disrupt the continuity of the residential facade along DeForest Avenue. Open space provides some visual buffer between the bridge and the adjacent residential community.

South of Willow Street to Pacific Coast Highway, the majority of the residential lots are reached via San Francisco Street and, therefore, are oriented away from the Los Angeles River. Between Willow Street and Hill Street, backyard fences create a visual wall along an access road which is an undeveloped extension of DeForest Avenue. Between Hill Street and Pacific Coast Highway, residential lots extend to the berm of the Los Angeles River, thereby creating a short stretch of open landscaped space.

South of Pacific Coast Highway to the Los Angeles Freeway bridge at 8th Street, city maintenance garages, industrial buildings, and warehouses of varied scale and bulk set randomly within storage yards and parking lots present a disorganized visual setting. Utility poles and overhead wires contribute further to the visual clutter. The bridges at Pacific Coast Highway and Anaheim Street are visually buffered from adjacent uses by adjoining access roads.

The Long Beach Freeway borders the Los Angeles River from 7th Street south to Broadway. Landscaped open space lies between the freeway and the river.

Broadway is not a visually well-defined street; the varying height, bulk, and scale of the buildings and intermittent street trees are insufficient to define the street space. Parking lots and mixed land uses disrupt the street facade.

Lincoln Park, a public plaza, is a landscaped oasis along Broadway. Visually, it connects Broadway to the landscaped Civic Center Mall. The City Hall Tower is a prominent landmark. Ramps leading to the underground garage block direct access to Broadway and restrict movement to the Civic Center Mall to one walkway. Parking lots and the surrounding low-rise buildings are insufficient in scale to define and visually enclose the park.

II-242 LB-5 (Long Beach Boulevard, Two-Way)

A wide right-of-way, a median strip with mature palm trees, and streetscape improvements establish the visual character of Long Beach Boulevard from 1st Street to 6th Street. There is a continuous commercial street facade from Ocean Boulevard north to 3rd Street; however, the scale of the buildings in relation to the width of the street is insufficient to define the street space. The view south along Long Beach Boulevard is terminated by the massive Long Beach Convention Center. The Long Beach Plaza, set back on the west side of the Boulevard between 3rd and 6th Streets, changes the street space definition and breaks the continuity of the commercial street facade with its inward orientation. The palm trees in the median strip, north to 15th Street, visually divide the street into

two channels. North of 6th Street, Long Beach Boulevard is characterized by a strip commercial zone with fast food, retail, and auto service shops, while north of Anaheim Street, automobile showrooms and used car lots predominate. The low discontinuous street facade results in weaker street space definition, which is further diminished by the change from palm trees to shorter and more intermittently spaced trees in the median strip north of 15th Street.

II-243 LB-6 (Willow Street Terminus)

Long Beach Boulevard north of Willow Street is visually poorly defined and disorganized. A siding track of the SPTC Railroad used for the storage of tank cars is located in a large undeveloped lot. The SPTC rail alignment crosses Long Beach Boulevard north of Willow Street. The few buildings along the Boulevard are varied in scale, inconsistently sited and set back within parking lots. The overall visual setting is one of an open, undefined space. Utility poles and overhead wires are significant visual elements in the horizon. An established mobile home park with mature landscaping borders the east side of the SPTC siding area and presents a consistent residential facade.

II-250 HISTORIC AND CULTURAL RESOURCES

In order to document the structures with potential for historic or cultural significance along the modified routes, additional research was performed. This research consisted of two phases. The first was a review of the supplemental routes using the Long Beach Cultural Heritage Survey Report. This report, produced under the direction of the City of Long Beach, encompasses the major area of the modified Long Beach alternatives. However, the area surveyed for the Long Beach inventory of the downtown area did not contain any structures north of Anaheim Street; therefore, a field survey (the second phase) was performed by an architectural historian to survey those areas not covered previously by the City of Long Beach and to re-survey the remainder of the route alternatives.

The criterion for adding a structure to the list of those with potential for historic or cultural worth was the appearance of recognizable period architectural features which showed the possibility of historic and/or architectural value.

In the DEIR, Table II-42J listed 72 buildings which were either on the National Register of Historic Places (2 buildings are so designated), had local designation with the aforementioned survey by the city, or were identified during the previous field survey.

For LB-3 (Broadway Aerial), additional structures were inventoried. Those located on Broadway were identified as having potential for further research and as being within the area of potential impact. They will be added to those listed in the DEIR and are shown on Figure II-25A as numbers 73 through 76. They are:

- o 73. Apartment Building
727 West Broadway
- o 74. Commercial/Apartment Building
451-457 West Broadway
- o 75. Wood Frame Residential/Commercial
421 West Broadway
- o 76. Apartments/Commercial
401 West Broadway

Long Beach Boulevard (the route of LB-5) was previously surveyed for LB-2 (Atlantic/Long Beach Couplet). The historic buildings identified are listed below and shown in Figure II-25A.

- o 3. Biltmore Apartments
336 E. 1st Street
- o 31. Apartments
312-16 E. 8th Street
- o 45. Stores
240 Long Beach Boulevard
- o 46. U.S. Post Office and Federal Offices
300 Long Beach Boulevard
(National Register Site)
- o 47. Barr House
629 Long Beach Boulevard
- o 48. School
835 Long Beach Boulevard
- o 49. School
847 Long Beach Boulevard
- o 50. Stores
1125 Long Beach Boulevard

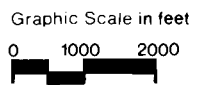
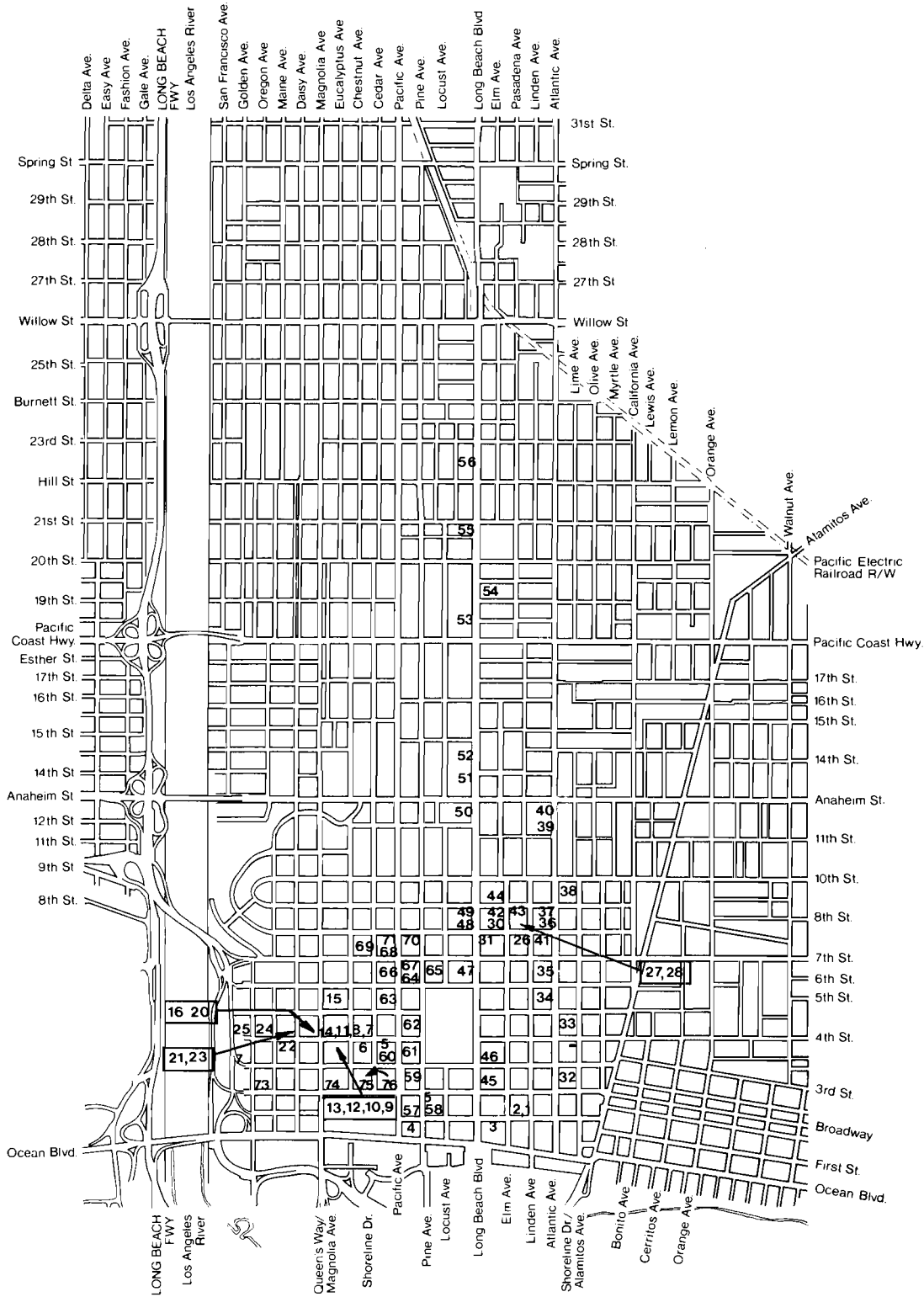


Figure II-25A

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

Historic Resources
 in Long Beach
 PARSONS BRINCKERHOFF / KAISER ENGINEERS

- o 51. House
1215 Long Beach Boulevard
- o 52. Farmers and Merchants Bank
1401 Long Beach Boulevard
- o 53. Garage
1817 Long Beach Boulevard
- o 54. Garage
1910 Long Beach Boulevard
- o 55. House
2069 Long Beach Boulevard
- o 56. House
2247 Long Beach Boulevard

There were no buildings of historic interest found along the route of LB-6.

II-300 TRAFFIC AND TRANSPORTATION

II-310 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 (or 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. A recently completed City of Long Beach 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, 9 additional intersections in the CBD would operate at LOS "D" or worse. Figure II-31A 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-320 TRANSIT

The principal public transit operator in the Long Beach Area is the Long Beach Transit Company (LBT). The RTD 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.

Existing Conditions
 Year 2000 Conditions
 AM Peak

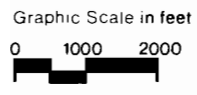
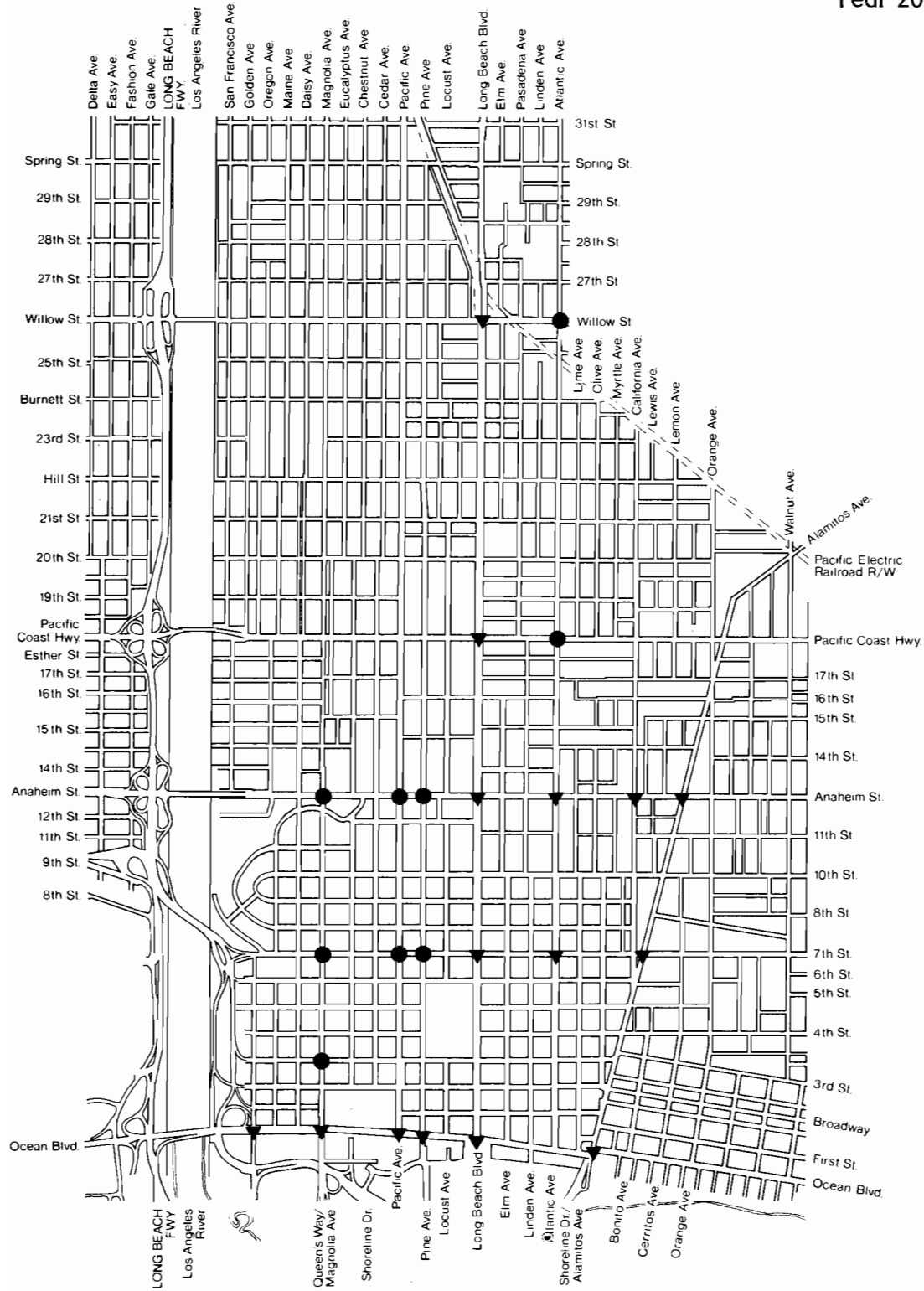


Figure II-31A

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 1st Street facility. In addition, 4,500 transfers were projected to take place at this location. The citywide transit mode split is in the area of 4 percent of the total person-trips; the transit mode split to/from downtown is approximately 8 percent of the total person-trips.

II-330 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) as identified in the DEIR, approximately the following number of parking spaces are available within 1/4 mile radius of the proposed alternative stations (Table II-33A).

TABLE II-33A
PARKING AVAILABLE WITHIN ONE-QUARTER MILE
OF SELECTED STATIONS IN LONG BEACH

<u>Station</u>	<u>Number of Parking Spaces</u>		
	<u>On-Street</u>	<u>Off-Street</u>	<u>Total</u>
LB-3 (Broadway Aerial)			
Willow Street at L.A. River	360	50	410
PCH at River	280	50	330
Anaheim at River	110	60	170
LB-5 (Long Beach Blvd., Two-Way)			
Hill Street	1,000	650	1,650
Pacific Coast Highway	800	800	1,600
Anaheim Street	800	2,000	2,800
LB-6 (Willow Street at 27th)	380	130	510

Source: PB/KE, 1984.

Chapter

1. Introduction
2. Theoretical Framework
3. Methodology
4. Data Collection
5. Results
6. Discussion
7. Conclusion
8. References
9. Appendix
10. Bibliography

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. Refer to Figures III-10A through III-10C during this discussion.

III-100 NATURAL ENVIRONMENT

III-110 TOPOGRAPHY, SOILS, GEOLOGY, and SEISMICITY

The additional Long Beach alignment alternatives would be located in areas that have been largely disturbed by prior development, indicating that the soil could be contaminated with urban debris (pieces of asphalt, concrete, steel, and wood). Soil contaminated with urban debris is generally not suitable for use in major construction projects and would be disposed of at a local landfill site. Table III-11A shows the excavation and backfill required for the additional alignment alternatives.

The modified LB-3 alternative would have an aerial segment (0.69 mile) along Broadway in downtown Long Beach and would be founded on recent alluvial soils of sand and gravel. The possibility of some oil-bearing strata or pockets of oil also exists due to the close proximity of oil fields. Any soil contaminated with oil would be disposed of at an appropriate landfill site, either Class I or Class II. Due to the potentially variable soil and seismic conditions, at least 25 piles may be required to 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 aerial guideways. 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 construction methods would be used beyond what is specified to meet California building codes.

Alternatives LB-5 (Long Beach Boulevard, Two-Way) and LB-6 (Willow Street Terminus) would be constructed at-grade and would not require the special construction techniques used for aerial sections. Safety devices, shoring, and falsework would be implemented where appropriate (e.g., at underpasses) to minimize potential risks associated with seismic hazards (earthquakes) during construction.

NOTE:
Joins Mid-Corridor Alignment
at Los Angeles River Bridge.

Station ●

Station with Neighborhood
Park and Ride ▼

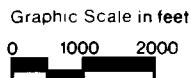
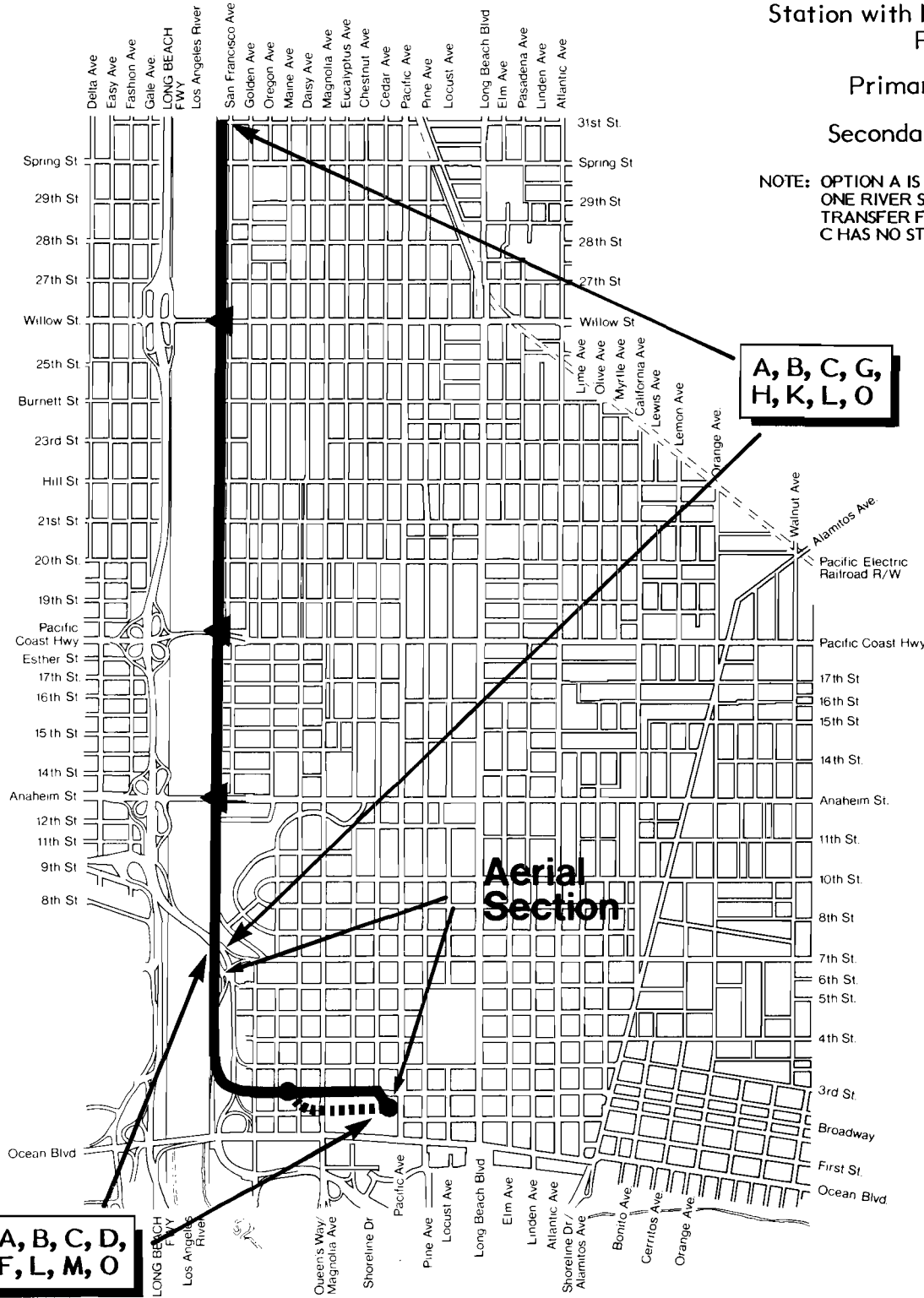
Primary - Option D ———

Secondary - Option E ■■■■

NOTE: OPTION A IS SHOWN. OPTION B HAS
ONE RIVER STATION, AN INTERMODAL
TRANSFER FACILITY AT PCH. OPTION
C HAS NO STATIONS ALONG RIVER.

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



Modified River Route LB-3
(Broadway Aerial)

Figure III-10A

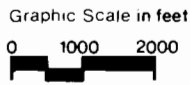
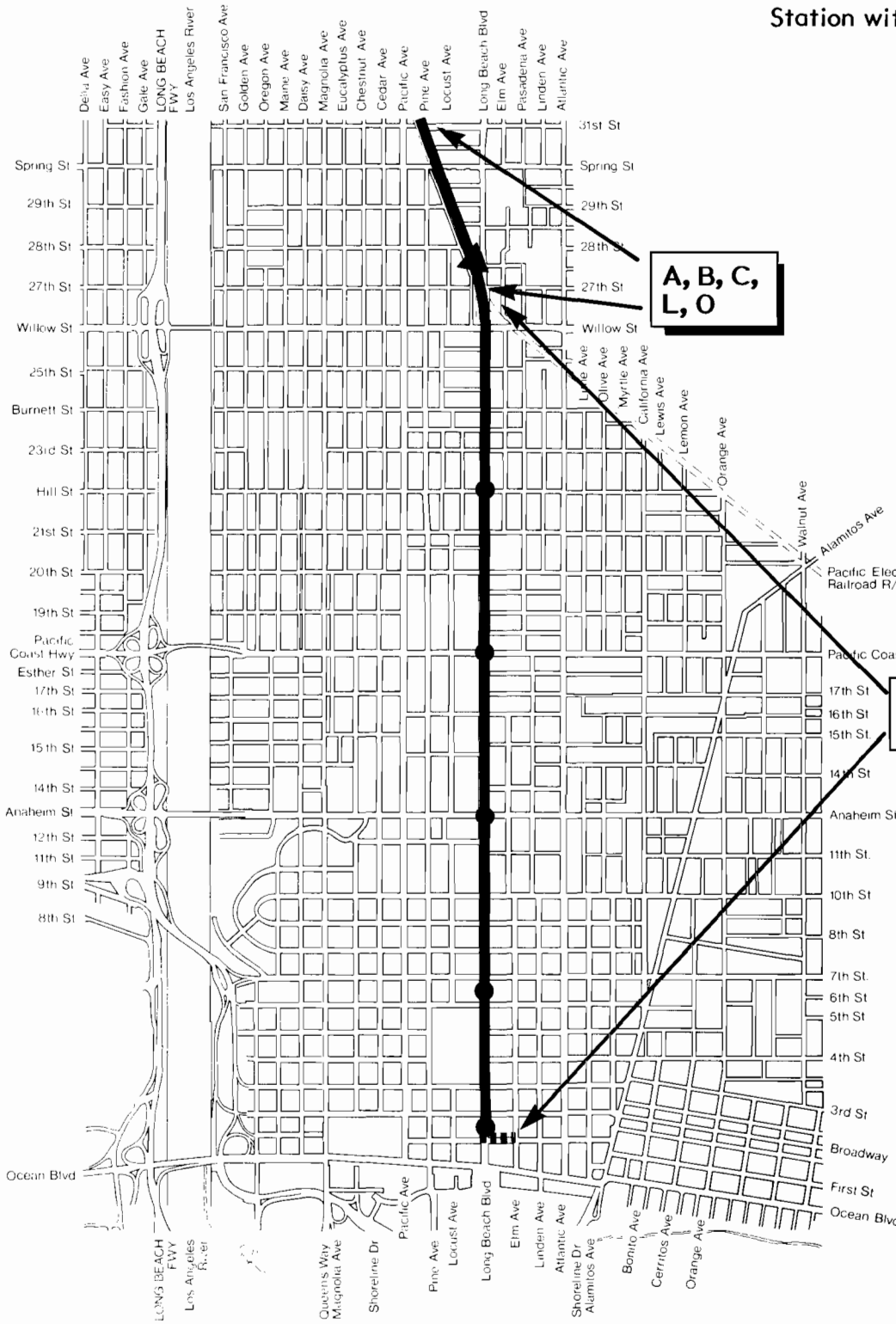
Station ●

Station with Neighborhood Park and Ride ▼

Tail Track ■■■■

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



Long Beach Blvd. Two-Way LB-5

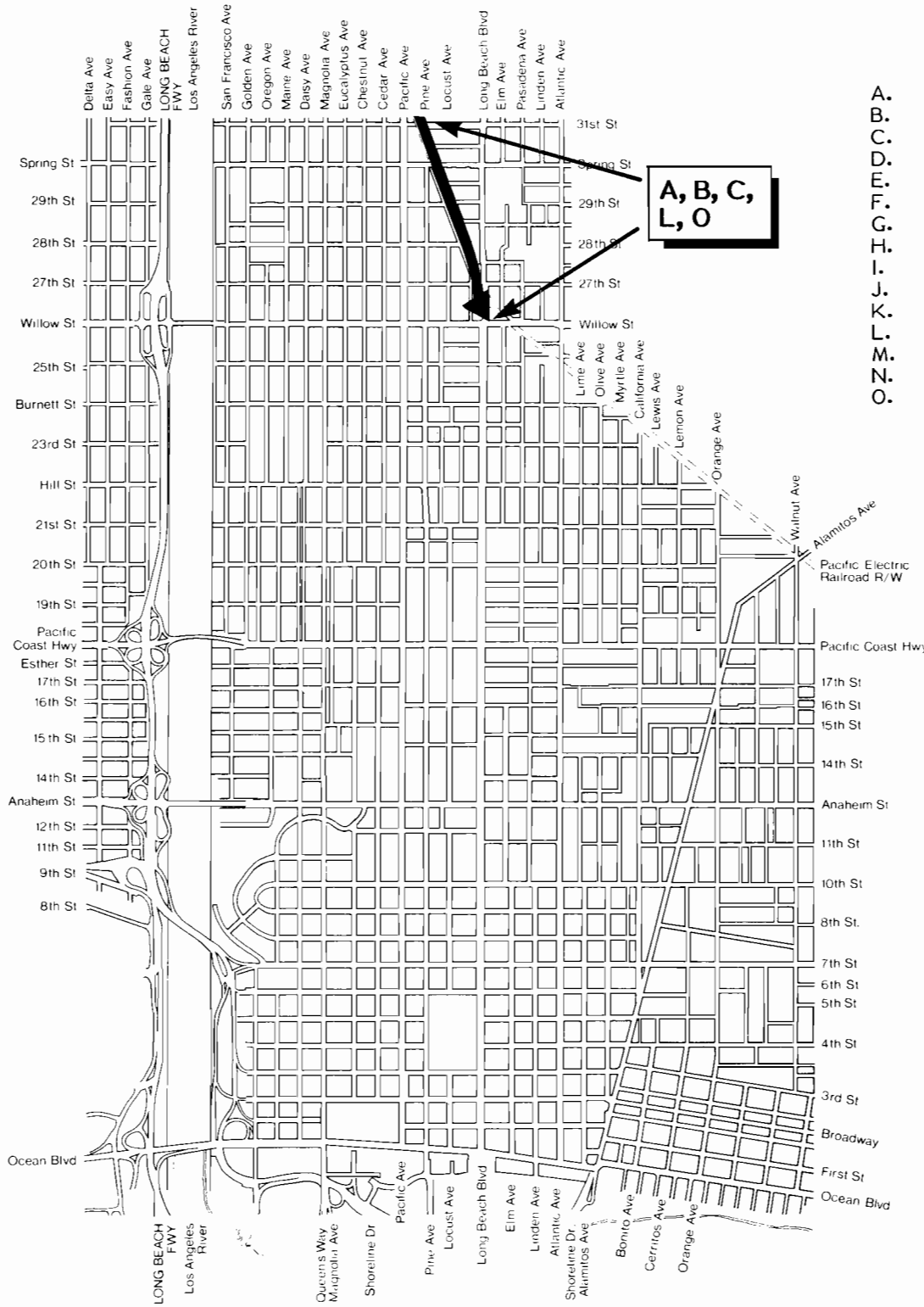
Figure III-10B

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

Impacts During Construction

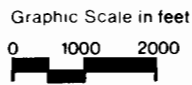
PARSONS BRINCKERHOFF / KAISER ENGINEERS

Station with Neighborhood
Park and Ride ▼



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



Willow St. Terminus LB-6

Figure III-10C

TABLE III-11A
EXCAVATION AND BACKFILL REQUIRED FOR LONG BEACH

<u>Alternative</u>	<u>Excavation (Cubic Yards)</u>	<u>Backfill (Cubic Yards)</u>
LB-3 (Broadway Aerial)		
Option A	38,000	47,000
Option B	26,000	41,000
Option C	22,000	37,000
LB-5 (Long Beach Boulevard, Two-Way)	46,000	13,000
LB-6 (Willow Street Terminus)	39,000	8,000

Source: PB/KE, 1984.

III-120 FLOODPLAINS, HYDROLOGY, AND WATER QUALITY

According to the Federal Insurance Rate Maps (Firm), there would be no impacts to any established floodplain during the construction of any of the supplemental Long Beach alternatives. However, local residents have stated that in some areas where the proposed tracks are to be located along the Los Angeles River, short-term flooding has occurred during recent heavy rains. Prior to construction, a hydrology study would be completed to gauge the extent of the problem and what means would have to be used to ensure that the project does not exacerbate any existing problem.

Impacts on hydrology would be related to water runoff 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.

Flood control pumping stations are located along the proposed alignment for the modified LB-3 (Broadway Aerial) alternatives. The pump station at Hill Street would be modified during the construction of any of the LB-3

options, and modification work would be scheduled to occur during the summer months when runoff from storms, and thus the potential need for the facility, would be at a minimum.

The temporary catch basins and settling ponds installed during the construction phase would mitigate any potential impact to the pumping stations from water runoff and siltation due to construction activities.

Erosion and sedimentation occurring during clearing and grading operations could cause adverse impacts on water quality. Every effort would be made to keep all construction activities out of the LA River for the LB-3 (Broadway Aerial) alternatives.

Constructing the foundations for the aerial guideway along Broadway will require some excavation. The City of Long Beach is situated on top of the Wilmington Oil Field. Soils contaminated with oil and tar may be encountered, necessitating 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-130 VEGETATION AND WILDLIFE

The Los Angeles River and floodplain are not in a natural state, but wetland vegetation has become established creating a wildlife habitat within the river and tidal prism. On the east side of the river there is a levee with a bicycle path on top. Adjacent to the levee is a buffer zone separating open space and residential uses. The buffer zone contains no wetlands and consists of ornamental and ruderal vegetation. Sections of the buffer zone between the SPTC Los Angeles River bridge and Willow Street are used for equestrian trails.

Construction of the proposed project would remove all existing vegetation within the light rail right-of-way. Where deemed desirable or appropriate, permanent landscaping is proposed for the light rail corridor and the stations. Displaced wildlife, such as birds and rodents, would return of its own accord after the construction phase.

The containment of the light rail guideway within the buffer zone will create no significant impacts to wildlife and vegetation.

Alternative LB-5 will be constructed within the existing landscaped median on Long Beach Boulevard. The median was originally landscaped in 1966/1967 and new landscaping has been continually added since then. The landscaped vegetation includes common varieties. No rare or endangered species occur along Long Beach Boulevard.

Construction of alternative LB-5 would require the removal of all the landscaped vegetation within the median from Willow Street to 7th Street. Under the baseline LB-5 configuration, vegetation would be replaced at station locations. Under the optional LB-5 configuration, the street would be widened to provide for a continuous median strip of vegetation. In this regard, the optional configuration could be considered a mitigation measure for loss of landscaping. Since the subject vegetation does not include unique habitat or rare and endangered species, its removal is not considered a significant adverse impact. However, visual quality would be affected (see Chapter III Section 240).

III-140 NOISE AND VIBRATION

Noise from construction activities is of most concern in locations where sleep or speech interference is a consideration. Sensitive receptors include residences, hotels and motels, schools, hospitals, and religious facilities. Sustained high noise levels near such receptors may be disruptive to normal activity during daytime hours and unacceptable at night. Typical noise levels produced by construction equipment are listed in Table III-14A. Many cities and counties have provisions in their local noise ordinances which address construction noise levels and limit the time of operations. For example, the City of Long Beach has set forth standards which include a prohibition of nighttime construction activities. The actual number of people and dwelling units significantly affected by construction noise and vibration cannot be quantified because the impacts will be intermittent. Chapter IV identifies the number of people and dwelling units affected by system operations.

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 a 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 for intermittent construction activity.

TABLE III-14A
AVERAGE NOISE LEVELS FOR CONSTRUCTION EQUIPMENT

<u>Equipment</u>	<u>Average A-Weighted Noise Level at 50 Feet, dB</u>
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.

In order to estimate the construction noise exposure in Long Beach, scenarios were developed describing the number, type, location, and operating cycle of the construction equipment that could be required for each of the 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 construction of retaining walls and retained fill as required among each of the Long Beach alternatives. The estimates range from 78 to 88 dBA on a daily CNEL basis, and 76 to 80 dBA on an annual average CNEL basis.

While the daily values are 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, the high annual average CNEL values are indicative of the relatively 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.

III-141 Mitigation Measures

There are more residences (both single-family and multi-family) in the northerly portions of the Long Beach alternatives and more commercial and office properties in the southern portions. Residences are expected to be more sensitive to construction noise. Mitigation measures for Long Beach noise-sensitive areas are similar to those identified in the DEIR and would include:

o Use of Alternative Methods and Modified Construction Equipment

In the last few years, more attention has been given to the development and use of low-noise-generating construction equipment. Specifications for the 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 the equipment would be scheduled to maintain the lowest possible overall noise levels by (1) planning the higher noise level operations during the peak ambient periods, and (2) avoiding, as much as possible, peaks and impulse noise, as relatively uniform sound levels tend to be less obtrusive.

III-200 SOCIOECONOMIC ENVIRONMENT

III-210 DISPLACEMENT

Construction of the LB-3 (Broadway Aerial-Modified River Route) would require the complete or partial acquisition of 30 parcels of property located along the Los Angeles River portion of the alignment. The characteristics of the properties by type of acquisition and by option are detailed in Table III-21A below.

TABLE III-21A
SURVEY OF PROPERTY ACQUISITION*
LB-3 (BROADWAY AERIAL)

	<u>Option A</u> (3 River Stations)	<u>Option B</u> (1 River Station)	<u>Option C</u> (No River Stations)
<u>Full Take</u>			
Private	6	7	6
Public	9	9	9
<u>Partial Take</u>			
Private	6	5	6
Public	9	9	9

* By number of parcels

Source: PB/KE, 1984.

Included among the 30 pieces of property to be acquired are one duplex (two units), three storage sheds, and one industrial property. The duplex is located on 20th Street off San Francisco Avenue, and the sheds are located nearby. It is estimated that up to six persons could be displaced through the acquisition of the housing units.

Preliminary engineering studies indicate that three power substation sites of approximately 6,000 feet each would need to be located along the Modified River Route. Ideally, these substations would be located within the parcels already identified as scheduled for acquisition.

The LB-3 (Broadway Aerial) alternative would not require acquisition of any commercial property, churches, or community service facilities.

LB-5 would not require the acquisition of any property for the rail alignment, but two power substation sites of approximately 6,000 square feet each would need to be located along the alignment; because there are several vacant parcels and commercial parking lots in the vicinity, no structures are expected to be affected. For LB-6, only one commercial property would be taken, and a power substation would be located within the SPTC right-of-way in the vicinity of Willow Street.

III-211 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, Section 7260 et seq. (Uniform Relocation Assistance and Real Property Acquisition Policies Act) mandates 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.

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.

III-220 COMMUNITY SERVICES

III-221 Services

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 some Long Beach community facilities during construction. These impacts would be most significant along Long Beach Boulevard.

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 would be particularly significant in the vicinity of the LB-5 (Long Beach Boulevard, Two-Way) and the LB-6 (Willow Street Terminus) alignments because of the close proximity of several major hospitals with emergency rooms.

III-222 Recreational Facilities

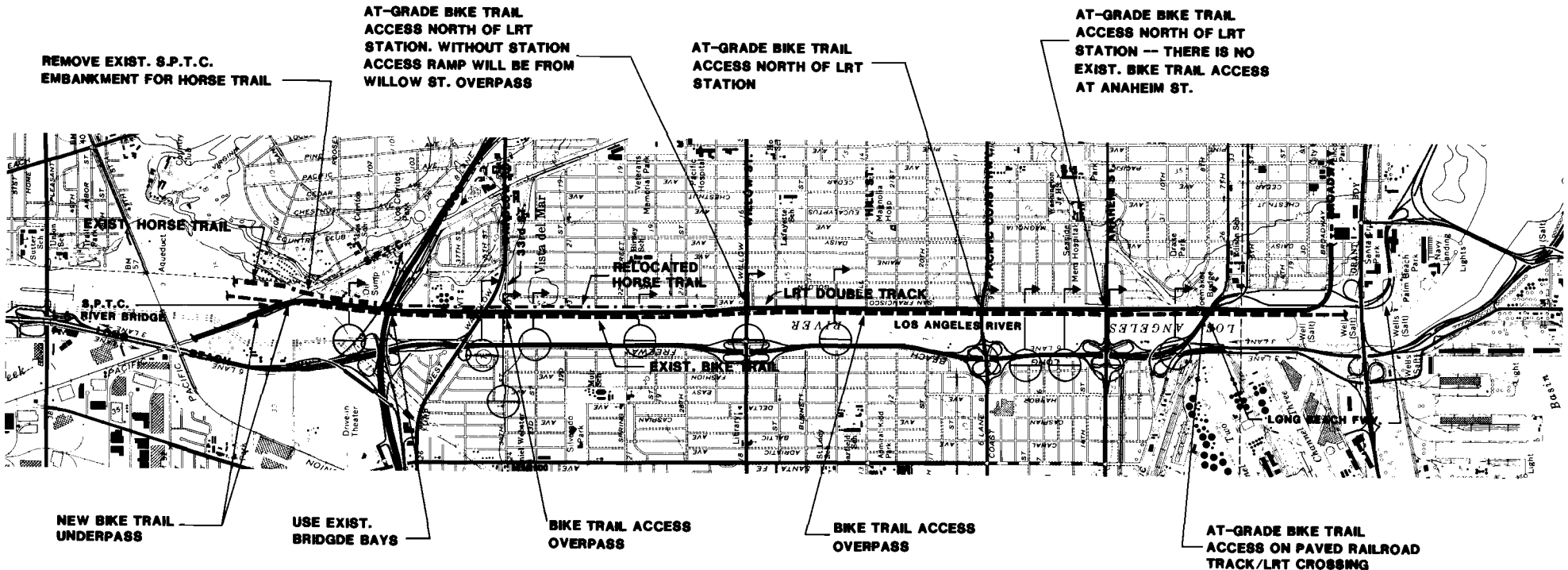
Construction of the LB-3 (Broadway Aerial) -- all options -- would necessitate the realignment of the LARIO Regional Equestrian Trail which would parallel the proposed rail alignment from the SPTC bridge crossing to the equestrian trail's terminus at Willow Street. This realignment would place the equestrian trail to the east of the rail transit alignment (see Figure III-22A). An 8-foot-high fence or combination soundwall/fence would separate the train from the trail, and a turnaround/entry area for horses would be located slightly north of the Willow Street station. Access points would be maintained at Wardlow Road (34th Street) and Willow Street. During the realignment of the equestrian trail, access to and/or use of portions of the trail may be temporarily denied.

The present alignment of the LARIO Regional Bike Route, which is located on top of the Los Angeles River levee, would be maintained with implementation of LB-3 (Broadway Aerial). Existing access to the bike route at Wardlow Road (34th Street), Willow Street, Hill Street, Pacific Coast Highway, and Chester Place would be preserved. If a station is constructed at Anaheim Street (Option A), additional access to the bike route would be provided by the construction of an at-grade bike/pedestrian crossing located immediately north of the station site. Identical grade crossings would be provided at Willow Street and Pacific Coast Highway if stations are constructed at these locations (Option A for Willow Street station, Options A or B for Pacific Coast Highway station).

If stations are not constructed at Willow Street and Pacific Coast Highway (Option C), access to the bike route would be provided by ramps leading from the street overpasses. Bike route access at Wardlow Road and Hill Street would be provided by the construction of bike/pedestrian overcrossings, which may be temporarily obstructed during construction activities in the vicinity of these bike route access points. Bike path access at Chester Place would be at-grade across the light rail/SPTC spur crossing.

If either LB-5 (Long Beach Boulevard, Two-Way) or LB-6 (Willow Street Terminus) is implemented, an underpass would be constructed just east of the SPTC Los Angeles River bridge crossing to allow for passage of the bike route and the equestrian trail under the rail transit tracks. Under alternative LB-3 (Broadway Aerial), a portion of the railroad embankment would be removed at this location to enable the equestrian trail to pass to the east of the light rail guideway; the underpass would also be built, but for bicycles only. The bike route and equestrian trail may be temporarily rerouted during construction in this area.

111-14



Long Beach River Route LB-3 (Broadway Aerial)



Figure III-22A

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

Bike Trail & Horse Trail Facilities

PARSONS BRINCKERHOFF / KAISER ENGINEERS

III-223 Utilities

Relocation or modification of utilities is possible during the construction of any of the alternatives under study. The proposed LB-3 (Broadway Aerial) alignment is crossed at two to four locations by flood control pipelines. These pipelines and their accompanying pumps could require relocation. Further description of potential construction impacts on utilities is included in Section I-321 of Chapter I.

III-224 Mitigation Measures

Because emergency medical facilities are located in the vicinity of the proposed LB-5 (Long Beach Boulevard, Two-Way) alignment and construction activities would result in diminished access, 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-320, 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 Medical Center.

Obstructed access to the bike route or the equestrian trail resulting from construction activities could be mitigated by the placement of signs which indicate the location of the nearest open access point. During the realignment of the equestrian trail, detours around construction activities will generally be provided. During the construction of the Wardlow Road underpass, however, there would not be sufficient space under Wardlow Road to accommodate both construction activity and use of the equestrian trail. A detour over Wardlow Road would be considered too dangerous; therefore, during construction of the Wardlow Road underpass, the through travel along the trail would be temporarily disrupted. Use of portions of the trail north and south of the underpass would still be possible, however.

If shutoff of utilities is required during relocation or modification, customers would be given advanced notice of location and duration of shutoffs. Relocation of flood control pipelines and pumps would occur during the summer months when there is less potential for rain.

III-230 **ECONOMIC ACTIVITY**

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-3 (Broadway Aerial) and LB-5 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 alternatives under consideration, LB-3 (Broadway Aerial-Modified River Route) would cause the least disruption, since it would potentially affect only 32 businesses. LB-5 would affect a significantly higher number of adjacent businesses (222); however, the track would run in the median (north of 7th Street) or mixed traffic (south of 7th Street) and would not be directly adjacent to businesses. See Table III-23A for impacts on businesses during construction, by alignment alternative.

III-231 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 local vehicular traffic flow and access by delivery vehicles. Special measures would be taken to encourage pedestrian access and off-street parking. In coordination with the local merchants, visibility of the businesses through temporary signing and other measures would be maintained.

III-240 VISUAL QUALITY

The visual impacts resulting from construction of the project would occur along the entire length of the rail alternatives in Long Beach 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. The aerial segments of LB-3 (Broadway Aerial) 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 construction phase would result from the presence of heavy construction equipment, construction barriers, the stockpiling of construction material, and the temporary storage of waste materials.

TABLE III-23A
 IMPACT ON BUSINESSES DURING CONSTRUCTION
 ADDITIONAL ALIGNMENT ALTERNATIVES
 LONG BEACH

Construction Characteristic	LB-3		LB-5	LB-6 ⁵
	(Along River only)	(Aerial Guideway along Broadway)		
Structure Type	At-Grade	Aerial	At-Grade	At-grade
Time Required to Completion (months)	18-24 ³	20-24 ³	20-24 ⁴	20-24
Number of Lanes Temporarily Closed ¹	2 lanes; on Willow Street Bridge; also PCH and Anaheim if stations built	2 lanes; or entire block	2 lanes; or entire block, downtown only	2 lanes; on cross-streets
Number of Businesses Along Alignment ²	9	23	222	0
Primary Construction Activity Disruptive to Businesses	Utility relocation; Willow St. underpass station construction	Utility relocation; Aerial Guideway station construction	Utility relocation; track laying; station construction	Utility relocation; track laying; station construction
Relative Magnitude of Disruption	Minimum	Moderate	Moderate	Minimum

- ¹ Temporary closure could range between several days to several months. An emergency access lane would remain open at all times. Block closures, if required, would be minimized in occurrence and duration.
- 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 affected but rather the impact would vary significantly throughout the construction period by number of businesses and duration of impact.
- ³ Construction times for river segment and aerial segment would be concurrent.
- ⁴ Total construction time for guideway; construction would proceed in block-length segments in sequence, and would not disrupt entire length of Long Beach Boulevard simultaneously.
- ⁵ Construction time and all activities for building LB-6 would be incorporated within the mid-corridor schedule.

Source: PB/KE, 1984.

The LB-6 (Willow Street Terminus) alternative would be constructed in the SPTC rail right-of-way and siding area and therefore would cause no major visual disruption to existing neighborhoods and traffic.

III-250 HISTORIC AND CULTURAL RESOURCES

Of the additional alternatives for the rail transit project in Long Beach, only two of the three, LB-5 (Long Beach Boulevard, Two-Way) and LB-3 (Broadway Aerial-Modified River Route), have potentially historic buildings located along their proposed routes. These structures are shown on Figure II-25A. For LB-6 (Willow Street Terminus), there were no potential historic or cultural resources located.

The buildings identified for the Long Beach Boulevard segment of LB-2 (Atlantic/Long Beach Couplet), number 3 and numbers 45 through 56 in Chapter II, Section 250 are the same structures which could be affected if LB-5 (Long Beach Boulevard, Two-Way) is constructed in Long Beach. Because the rail construction for LB-5 will be done within the boundaries of the street right-of-way, there would be no significant impacts due to track construction. Construction of the stations proposed for this alternative would present a visual intrusion, but this visual impact would not be adverse or significant.

The survey and research performed for both the DEIR and the Supplement to the DEIR found no historical structures along the original Los Angeles River Route (LB-3) or LB-3 (Broadway Aerial-Modified River Route). However, the survey conducted in October 1984 identified four structures which might be affected visually by the construction of the aerial guideway on Broadway. Guideway and column construction would cause adverse visual impacts to these structures, which are across the street width of Broadway, i.e., 80 feet away. These adverse visual impacts would be temporary in duration.

All historic structures would be affected temporarily by increased construction noise, dust, and impeded access. No permanent adverse construction effects are anticipated for any of the structures identified.

III-300 TRAFFIC AND TRANSPORTATION

III-310 ASSESSMENT

Long Beach alternative LB-3 (Broadway Aerial) Option A, which would follow the Los Angeles River south to 6th Street, would require cut-and-cover construction at Willow Street for a new underpass that would accommodate the rail transit facility. The cut-and-cover operation would use half the street width at a time, facilitating continual two-way traffic movement on the other half of the street. The vehicular traffic (25,000 vehicles per day) operation would be significantly affected during the construction period, with occasional queues of traffic possible during peak periods.

Construction of stations along the river alignment would require an additional structure on both sides of the existing bridges for the bus turnouts. Impacts to the existing bus services and vehicular traffic operations from construction of the bus turnouts adjacent to the street overpasses, with the exception of Willow Street, would be minimal.

The alignment along the river south of 6th Street would become elevated, proceed south to Broadway and turn east, terminating at the Civic Center just west of Pacific Avenue and the 1st Street Transit Mall. Construction of the aerial guideway along Broadway would affect vehicular traffic (8,000 vehicles per day) exiting at the Broadway off-ramp and heading east. However, with the elimination of curb parking and temporary modifications to bus stops and service schedules, at least two traffic lanes could be maintained along Broadway.

Rerouting some of the eastbound vehicular traffic around the construction area on Broadway would result in minor increases in traffic on 6th Street and Ocean Boulevard between the freeway and Pacific Avenue. Slight increases in traffic volumes would also occur on north-south streets such as Magnolia, Pacific and Pine Avenues, between 6th Street and Ocean Boulevard. With the exception of Ocean Boulevard, the detour streets are all operating at good levels of service (above "D") and could easily accommodate the increased traffic during the construction period.

Alternative LB-3 (Broadway Aerial) Option B would have only one additional station along the Los Angeles River at Pacific Coast Highway, which would include a bus-to-train transfer facility, a major park-and-ride lot, and a kiss-and-ride drop-off area. Construction of these facilities adjacent to the Pacific Coast Highway overpass would result in minimal disruption from construction-related traffic to the existing bus service and vehicular traffic operations.

Alternative LB-3 (Broadway Aerial) Option C would not have any stations along the river alignment. Its construction impact on traffic would be essentially limited to the impact discussed above for construction of the Willow Street underpasses.

Alternative LB-5 (Long Beach Boulevard, Two-Way) provides for rail tracks to be constructed in a reserved median in the center of the street south to 7th Street. Traffic demand of about 22,000 vehicles per day on Long Beach Boulevard would be severely affected during construction, with the worst congestion occurring north of Anaheim Street. With the temporary elimination of curb parking, it could be feasible to maintain two traffic lanes in each direction during the peak periods. Between 7th Street and the 1st Street transit mall, the LRT would utilize existing traffic lanes next to the planted median. In this area, two lanes could be maintained during construction in the southbound direction if traffic is permitted to temporarily use the southbound transit lane. In the northbound direction, at least one traffic lane would be maintained during construction. The impact to vehicular traffic operations south of 7th Street would be somewhat reduced compared to the section to the north, since traffic demand is lower (17,000 vehicles per day).

During construction on Long Beach Boulevard, through traffic could be diverted to adjacent parallel arterials including Atlantic Avenue, Pacific Avenue, and Pine Avenue. Some of the minor cross-streets would be temporarily closed. Major cross-streets would be partially closed, half the street at a time, while relocating utilities and constructing the trackbed. Two-way traffic would be maintained on the other half of the cross-street. Curb parking along the cross-street approaches and along the Boulevard would be eliminated during construction. After the trackbed is constructed across a local street and the roadway is restored to its permanent condition, vehicles would resume original traffic patterns. Construction of the rail guideway would proceed in a sequence of block lengths; the entire length of the Boulevard would not be disrupted simultaneously.

The high frequency of transit service on Long Beach Boulevard would also be severely affected during construction. Existing bus routes, bus stops, and schedules would need to be temporarily modified.

In LB-6 (Willow Street Terminus), the rail transit tracks would terminate at the Willow Street station between 27th Street and 28th Street. Construction of this alternative would include a park-and-ride lot and an off-street bus turnaround facility at this location. During construction, impacts to existing bus service and vehicular traffic operations from construction-related activities would occur primarily along Long Beach Boulevard north of Willow Street. This alternative would have the least impact of all the Long Beach alternatives on traffic operations during construction.

III-320 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 On-street curb parking would be temporarily eliminated to accommodate construction operations and traffic flow on streets where construction is taking place, 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 all construction procedures developed by the City of Long Beach and the "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 signage would be developed to alert motorists to the location and duration of the project construction activities. In special instances, temporary traffic lights or modifications to traffic lights may be used to expedite traffic diversions.
- 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.
- o 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-400 CUMULATIVE IMPACTS OF RELATED PROJECTS

There is one major related project that could begin construction within the same time period as the rail transit project. This project is the proposed World Trade Center along the south side of Broadway west of the Civic Center. In addition, redevelopment is planned along the north side of Broadway in this area.

Design options for the rail transit project along Broadway (LB-3 with aerial) include some that would encroach upon the World Trade Center site necessitating coordination of the design of the rail transit facility with the design of the World Trade Center. Once design considerations have been determined, construction activities would also need to be coordinated and scheduled appropriately.

The overall cumulative impact in downtown Long Beach during construction would be most noticeable should two or more projects be underway at the same time, especially on Broadway. 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 could allow two or more ongoing projects to make use of the same equipment, labor, staging areas, detours, haul routes, recyclable 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 could 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.

Chapter

IV

IV LOCAL IMPACTS AND MITIGATION MEASURES DURING OPERATION

IV-100 NATURAL ENVIRONMENT

IV-110 TOPOGRAPHY, SOILS, GEOLOGY, AND SEISMICITY

Seismic conditions in the Long Beach area could affect the rail project; however, its construction and operation would have no effect on existing seismic conditions.

The proposed supplemental alternatives would be located in a highly active seismic area under the influence of the Newport-Inglewood (Cherry Hill) Fault zone. The Long Beach alternatives would consist of two proposed modes of operation: at-grade along the river along the railroad right-of-way and Long Beach Boulevard, and elevated along Broadway. During moderate and major earthquakes, all 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 would be designed to withstand collapse from a maximum credible earthquake.

The Long Beach area has underlying soils potentially 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 Long Beach 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.

In addition to groundshaking and liquefaction hazards, 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 \pm). 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 provides for system shut-down and evacuation measures should conditions occur that make vehicle operation hazardous.

None of the additional Long Beach alignment alternatives would affect geological features, mineral resources, or agricultural soils.

Mitigation measures for groundshaking and liquefaction in Long Beach would be similar to those discussed for the downtown Los Angeles alternatives (see Chapter IV, Section 111 of the DEIR, May 1984).

IV-120 FLOODPLAINS, HYDROLOGY, AND WATER QUALITY

No federally defined floodplains would be affected in Long Beach. Alternative LB-3 (Broadway Aerial-Modified River Route) would be adjacent to the toe of the slope for the Los Angeles River levee; permits from the U.S. Army Corps of Engineers and the Los Angeles County Flood Control District would be required to construct and operate the rail transit facility in this area.

Residents along the LB-3 (Broadway Aerial) river alignment have reported flooding incidents. Detailed flood studies would be performed if this route were selected, and if warranted, pumping capacity would be increased through modification to existing pump facilities or construction of additional pump facilities.

Two of the three low depressions that exist in downtown Long Beach would be crossed by the at-grade alignment for alternative LB-5 (Long Beach Boulevard, Two-Way).

Only the low spot between 32nd Street and Canton Avenue adjacent to 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 along LB-5 and LB-6, 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 runoff of polluted surface water from proposed parking lots and other newly paved surfaces. These minor effects would be most noticeable at discharge points and in estuaries and harbors.

Mitigation for impacts to drainage and water quality could include improvements to existing culverts, gutters, catch basins, and settling ponds, and construction of all such elements, as needed.

IV-130 VEGETATION AND WILDLIFE

All existing landscaping, ruderal (weedy) vegetation, and wildlife within the rights-of-way for the Long Beach alternatives would be either removed or relocated. None are endangered species. The amount of vegetation and wildlife to be removed would be relatively small and considered insignificant; however removal of vegetation on Long Beach Boulevard would have a visual impact (see IV-242.2).

Alternative LB-3 (Broadway Aerial) would be located along the toe of the slope of the east bank (levee) of the Los Angeles River. Operating the rail project at the toe of the levee outside of the channel would have no effect on 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. Most types of vegetation used as project landscaping would require continual watering and trimming throughout their lifetime or until they are removed. Displaced wildlife such as birds and rodents would likely return to the corridor of their own accord after the construction phase.

IV-140 AIR QUALITY

This section describes the potential air quality impacts associated with the supplemental alternatives.

With respect to localized impacts at intersections, the effects of improved automobile engine technology coupled with improvements postulated in the Regional Air Quality Management Plan are such that no effect on local air quality is expected with the project, irrespective of specific alignment. Year 2000 carbon monoxide levels (the primary determinant of local pollution) are expected to be approximately one-fourth of 1980 levels. The supplemental alternatives, as well as the previously defined alternatives, would have no effect on carbon monoxide concentrations at intersections.

The second area of concern for localized air quality is in the vicinity of parking lots. The DEIR analysis was done for the major parking lots proposed as part of the original alternatives, and the conclusion was reached that no significant effect would occur. The complete microscale analysis performed for the DEIR considered the contributions to local carbon monoxide levels from (a) ambient levels, (b) local streets and freeways adjacent to the parking lot, and (c) the activity within the parking lot itself.

As the microscale analysis pointed out, ambient carbon monoxide is the largest contributor to local concentration. Also, expected improvements in automobile technology are such that levels of carbon monoxide from all contributory sources (including ambient) are expected to decline to about one-third of their 1980 levels. This means that year 2000 expected concentrations at project parking lots, either with or without project implementation, would be well below the present federal (35 ppm) and state (20 ppm) standards.

Along the river alignment a major parking facility is proposed for LB-3 (Broadway Aerial) under Option B. This facility would be located at Pacific Coast Highway and would have a capacity of up to 1,000 autos, as well as bus parking and turn-out arrangements. The parking lot/station area is designed in such a way as to facilitate the orderly flow of vehicles, and thus no unusual idling is expected. The layout of this Pacific Coast Highway facility is similar to the Artesia Boulevard facility (Volume III, Design Appendix, Station Concept Figure No. 17) in that it has a major arterial (Pacific Coast Highway) operating in an east-west direction across the parking lot, and it has a local street (San Francisco Avenue) operating in a north-south direction, parallel to the facility. Because of the similarity of the Pacific Coast Highway and Artesia Boulevard layouts, a comparison can be drawn between these two facilities for analysis purposes. The areas of dissimilarity are as follows: (1) the Pacific Coast Highway facility would have a capacity up to 1,000 parking spaces, whereas the Artesia Boulevard facility would have 650 spaces; (2) the Artesia Boulevard facility would have traffic contributions from both Artesia Boulevard and the Artesia Freeway, whereas with the Pacific Coast Highway facility the Long Beach Freeway would be at some distance away; and (3) the Pacific Coast Highway facility has its nearest signalized intersections at a further distance, compared with the Artesia Boulevard facility, thus producing a smoother flow of traffic.

In the case of the Artesia Boulevard facility, the contributions to carbon monoxide levels were as follows: ambient (11.3 ppm), street traffic (0.1 ppm), parking lot (0.56 ppm), for a total of 11.96 ppm. It can be assumed that the street traffic contribution for the Option B Pacific Coast Highway facility would be approximately equivalent (this is most likely a conservative assumption), as well as the ambient contribution. Recognizing that the layouts and usage of the two facilities would be similar, a

simple factoring technique can be used to estimate the contribution from the parking lot itself. Thus, the ratio of parking spaces in the two cases (1,000 spaces/650 spaces = 1.54), applied to the Artesia Boulevard parking lot contribution (0.56 ppm), yields a parking lot contribution of 0.88 ppm for the Pacific Coast Highway facility, resulting in a total estimated concentration of 12.28 ppm. This is still well below both the federal and state standards, and therefore no significant impact is expected.

As is the case in downtown Los Angeles and in the mid-corridor, technological improvements in the automobile between 1980 and year 2000 are such that local carbon monoxide contributions at intersections will not approach federal and state standards. For this reason and taking into account the results of earlier intersection analysis done for Long Beach, no significant impact on carbon monoxide concentrations is expected from the supplemental alternatives.

IV-150 NOISE AND VIBRATION

IV-151 Noise

Except for a portion of LB-3 (Broadway Aerial-Modified River Route), 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, however, is much quieter, with measured CNEL values of 57 to 63 dBA.

Table IV-15A 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, both in the intensity and duration of the noise exposure. Table IV-15B provides a comparison of the noise exposure of the light rail system with other transportation sources. The table shows that on a typical downtown street with moderate traffic flow, at 50 feet from the street centerline, the existing CNEL is approximately 64 dBA. In comparison, the CNEL due to a 3-car light rail transit system at 20 mph would be 54 dBA for an at-grade configuration and 57 dBA for a configuration on aerial guideway.

In order to evaluate the potential noise impact from the proposed light rail operations on residential areas in Long Beach, 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

TABLE IV-15A
 COMPARISON OF MAXIMUM NOISE LEVELS FOR
 VARIOUS VEHICLE PASSBYS

<u>Type Vehicle</u>	<u>Maximum Level at 50 ft., dBA</u>	
	<u>30 mph</u>	<u>50 mph</u>
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

Source: Bolt Beranek & Newman, 1984.

TABLE IV-15B
 COMPARISON OF NOISE EXPOSURE FOR
 VARIOUS TRANSPORTATION SOURCES

<u>Transportation Source</u>	<u>CNEL at 50 ft. (dBA)</u>
Downtown Long Beach Traffic (10,000 - 15,000 ADT)	64
Major Freeway (120,000 ADT)	81
Rail Freight Traffic (6 trains/day on the SPTC Wilmington Branch)	68
3-Car Light Rail Transit	
20 mph at-grade	54
20 mph on aerial guideway	57
45 mph at-grade	61
45 mph on aerial guideway	64

Source: Bolt Beranek & Newman, 1984.

measure (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.

The results of this analysis are presented in Table IV-15C. 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 section of the table shows the existing conditions, and the final sections show conditions for the year 2000, both without 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 (the level generally considered to be an unacceptable noise environment for residential areas)
- o The Level Weighted Population (LWP)
- 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-15C 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 implementation of project alternatives LB-1, LB-2, LB-4, or LB-5. Thus no discernible impact is expected for these alternatives.

Because of the lower noise environment along the Los Angeles River, the LB-3 (At-Grade) and LB-3 (Broadway Aerial) alternatives show an increase in impact for future years with the project. Also, guidelines of the American Public Transit Association (APTA) list a limit of 75 dBA for the maximum nighttime passby level of rail transit vehicles at 50 feet for adjoining residential land use; this limit will be exceeded along the Los Angeles River portion of all the LB-3 (Broadway Aerial) options, unless mitigated.

To mitigate possible noise impact, a sound barrier wall is recommended for LB-3 from Wardlow Road to Pacific Coast Highway. Such a wall would be topped by fencing and would reduce rail transit noise levels by at least 5 dBA (bringing the maximum transit levels to below 75 dBA within 50 feet). Table IV-15C shows that this wall would be effective in reducing

TABLE IV-15C
NOISE IMPACT ANALYSIS RESULTS FOR LONG BEACH

Alternative	Total No. People ¹	Existing			Year 2000					
					No Project			Project		
		65+ ²	LWP ³	NII ⁴	65+ ²	LWP ³	NII ⁴	65+ ²	LWP ³	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
<u>Modified River Portion</u>										
LB-3 (At-Grade)	4504	949	987	.22	956	1165	.26	960	1294	.29
LB-3 (At-Grade) with 5dB Noise Barrier								956	1242	.28
<u>Broadway Portion</u>										
LB-3 (Broadway Aerial)	2329	83	138	.06	89	201	.09	91	276	.12
LB-3 (Broadway Aerial) with 5 dB Noise Barrier								89	223	.10
LB-4	8464	3988	3533	.42	5114	5114	.60	5132	5204	.61
LB-5	1148	298	492	.43	339	543	.47	339	543	.47

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.

Note: Since LB-6 does not extend into central Long Beach, it has not been included in this table.

Source: Bolt Beranek & Newman, 1984.

the impact of the project; the NII for LB-3 (Broadway Aerial), for example, is reduced by 20 percent. For residences along the Los Angeles River away from major cross-streets, where noise levels currently are low, this barrier would be most effective in reducing total noise levels. Assuming an approximate distance of 11,000 feet, the mitigation cost would be \$660,000.

As far as nonresidential noise-sensitive receptors are concerned, Table IV-15D shows that at all such locations the project's contribution to the future CNEL would be insignificant.

Because the noise of light rail vehicles emanates primarily from the interaction of the wheel on the rail, noise levels increase with operating speeds. For this reason, in the immediate vicinity of passenger stations

noise levels would be considerably less than would be expected if the rail vehicles were to pass through the area without stopping. Therefore, any potential noise impact resulting from a passenger station arises from the increase in traffic flow in the vicinity of the station rather than from rail operations.

A straightforward way of measuring the potential noise impact in station areas is to look at the increase in CNEL resulting from projected increases in traffic flow. Preliminary estimates of the changes in traffic flow in the vicinity of passenger stations resulting from the light rail system are relatively small, typically well below 25 percent at any of the stations. Such an increase in traffic flow would result in less than a 1 dB increase in noise exposure, which is an insignificant (and imperceptible) increase in exposure. As a result, any noise generated by the rail system or road traffic serving the rail system would not significantly add to existing noise levels from traffic in the vicinity of any of the passenger stations, including the various stations proposed along LB-3 (Broadway Aerial) and the Willow Street Terminus station.

TABLE IV-15D
NOISE EXPOSURE ESTIMATES FOR NONRESIDENTIAL
NOISE-SENSITIVE RECEPTORS IN LONG BEACH

Type	Nearest Street Intersection	CNEL (dBA)			
		Future No Project	Transit Vehicle	Future With Project	Project Contribution
<u>LB-3 (Broadway Aerial-Modified River Route)</u>					
Primary (Option D)					
Park	Broadway & Golden	71.5	53.0	71.6	0.1
Lincoln Park	Broadway & Pacific	67.6	60.0	68.3	0.7
Secondary (Option E)					
Park	Broadway & Golden	71.5	53.0	71.6	0.1
Lincoln Park	Broadway & Pacific	66.7	60.0	67.5	0.8
<u>LB-5 (Long Beach Blvd. 2-Way)</u>					
Day School	Long Beach & Willow	72.3	52.5	72.4	0.1
3 Churches	Long Beach, 9th-23rd	70.5	52.5	70.6	0.1
Technical School	Long Beach & 16th	70.5	52.5	70.6	0.1
Church	Long Beach & Hill	65.9	48.5	66.0	0.1
Church	Long Beach & 20th	65.9	48.5	66.0	0.1

Note: No sensitive receptors are located along LB-6.

Source: Bolt Beranek & Newman, 1984.

IV-152 Vibration

Groundborne vibration is generated during light rail vehicle operations as the steel wheels of the rail vehicle run 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 track structure is higher. Rail vibration can travel through the ground to nearby building foundations and to be transmitted through the structural members of the building to the occupants.

To assess the impact of potential vibration levels, criteria developed by the National Academy of Sciences' Committee on hearing and Bioacoustics (CHABA) were used (shown in graphic form in Figure IV-15A). 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 DuWag 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-15A shows measured octave band vibration levels for 50-foot and 100-foot distances from the track for a 30 mph operating speed in Edmonton.

Vibration levels at which there is a risk of damage are considerably higher (by some 40 dB) than the levels expected from the light rail system. No damage would occur to either structures or landforms along any of the proposed alternatives. Nonetheless, the track structure as well as the light rail vehicle wheels would include resilient materials to minimize vibration and noise; the rails would be continuously welded to eliminate any "clickety-clack" effect.

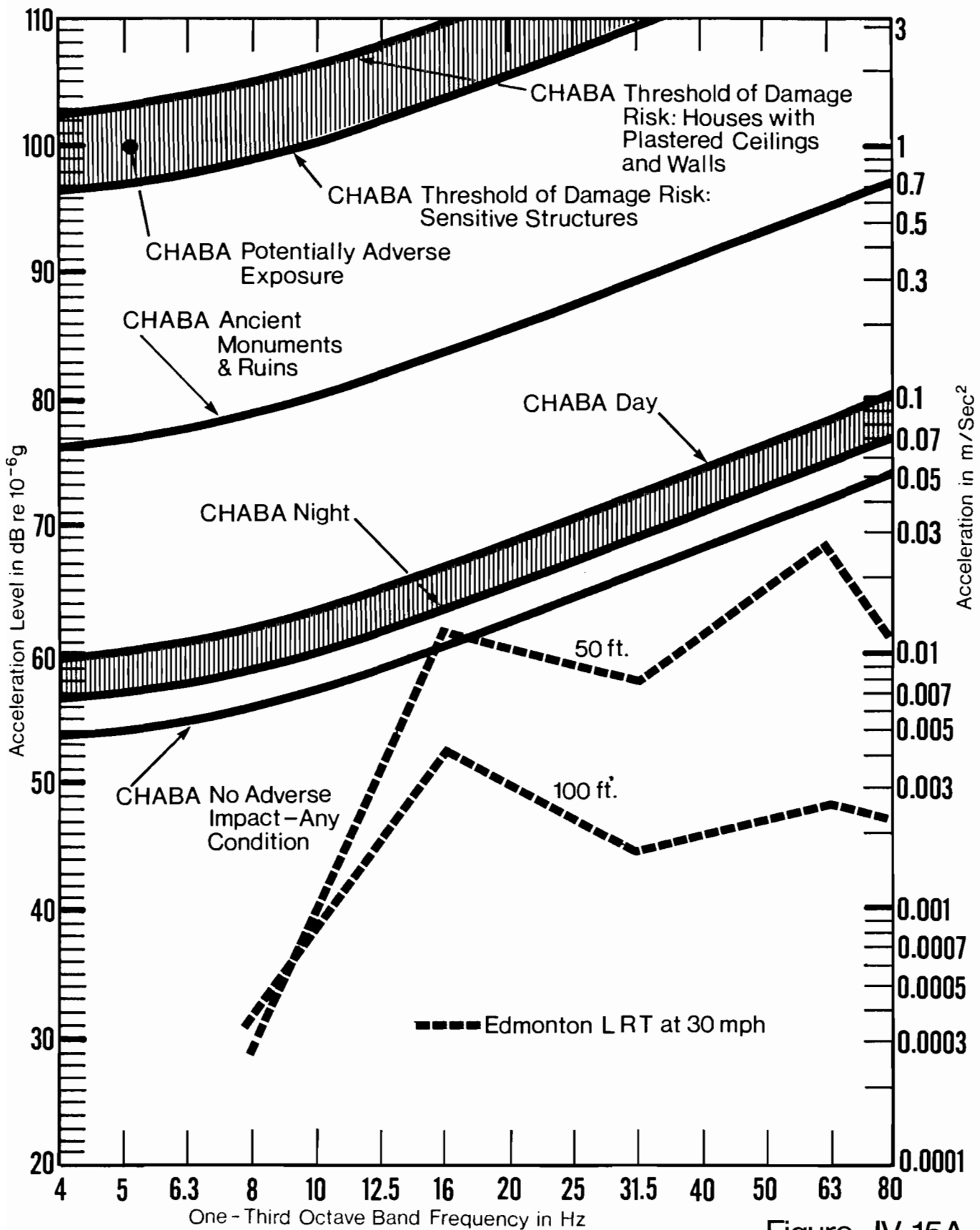


Figure IV-15A

IV-200 SOCIOECONOMIC ENVIRONMENT

IV-210 LAND USE, POPULATION AND HOUSING

IV-211 Land Use and Development

The land use impacts of the new Long Beach alternatives are measured in two ways: the amount of project-induced development and its likely location, and the conformity of the alternatives to goals and objectives expressed in general, community, and redevelopment land use plans.

IV-211.1 Growth-Inducing Impacts

The overall growth induced by rail transit service in the Long Beach segment is expected to be modest. Table IV-21A shows where this growth is expected to occur. As with the alternatives evaluated in the DEIR (May 1984), 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 current overall occupancy rate is 70 percent. Additional retail businesses may locate in the vicinity of stations where rail boardings and bus transfers are projected to be high. These stations include Hill Street, Pacific Coast Highway, and Anaheim Street with LB-5, and Willow Street with LB-6.

The induced office growth would be comparable for all the alternatives except LB-6. An estimated 400,000 gross square feet of office space may be occupied as a result of rail service. With LB-3 (Broadway Aerial), this infill growth would probably be evenly split between the World Trade Center and Civic Center stations. With LB-5, it would probably concentrate around the 1st Street station. Additional retail space with the Modified River Route options would be minimal. With LB-5, an estimated 100,000 gross square feet would develop, 20,000 in the Hill Street station area, 40,000 in the Pacific Coast Highway station area, and 40,000 in the Anaheim Street station area. With LB-6, the additional pedestrian traffic at Willow Street because of the bus/rail transfers could induce approximately 10,000-20,000 gross square feet of retail development.

211.2 Conformance with Land Use Plans

Measures to evaluate the conformance of the rail transit alternatives with local land use plans were defined in the DEIR (May 1984). These measures include the ability to serve population concentrations, commercial centers, and activity/growth centers; to connect with other transit/transportation systems; to enhance revitalization efforts; to avoid adversely affecting adjacent land uses; and to enhance joint development opportunities.

TABLE IV-21A
DEVELOPMENT WITHIN ONE-QUARTER MILE OF STATIONS
LONG BEACH

Stations	Existing in 1980					1980-2000: New Development Without Project					Possible Additional Development by 2000 With Project				
	Office (000s of gross sq ft)	Retail (sq ft)	Hotel (acres)	Indust. (acres)	Housing (Units)	Office (000s of gross sq ft)	Retail (sq ft)	Hotel (acres)	Indust. (acres)	Housing (Units)	Office (000s of gross sq ft)	Retail (sq ft)	Hotel (acres)	Indust. (acres)	Housing (Units)
LB-3 (Broadway Aerial) Option A															
Willow Street	0	15	0	0	367	0	0	0	0	90	0	0	0	0	10
Pacific Coast Highway	0	80	0	14	385	0	0	0	0	50	0	0	0	0	20
Anaheim Street	0	25	0	45	0	0	0	0	0	0	0	0	0	0	0
World Trade Center	224	41	0	0	1,537	1,955	50	500	0	1,880	200 ¹	0	0	0	180
Civic Center	<u>767</u>	<u>958</u>	<u>0</u>	<u>0</u>	<u>1,659</u>	<u>1,680</u>	<u>439</u>	<u>380</u>	<u>0</u>	<u>420</u>	<u>200¹</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>70</u>
TOTAL	991	1,119	0	59	3,948	3,635	489	880	0	2,440	400 ¹	0	0	0	280
LB-3 (Broadway Aerial) Option B															
Pacific Coast Highway	0	80	0	14	385	0	0	0	0	50	0 ¹	0	0	0	30
World Trade Center	224	41	0	0	1,537	1,955	50	500	0	1,880	200 ¹	0	0	0	180
Civic Center	<u>767</u>	<u>958</u>	<u>0</u>	<u>0</u>	<u>1,659</u>	<u>1,680</u>	<u>439</u>	<u>380</u>	<u>0</u>	<u>420</u>	<u>200¹</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>70</u>
TOTAL	991	1,079	0	14	3,581	3,635	489	880	0	2,350	400 ¹	0	0	0	280
LB-3 (Broadway Aerial) Option C															
World Trade Center	224	41	0	0	1,537	1,955	50	500	0	1,880	200 ¹	0	0	0	180
Civic Center	<u>767</u>	<u>958</u>	<u>0</u>	<u>0</u>	<u>1,659</u>	<u>1,680</u>	<u>439</u>	<u>380</u>	<u>0</u>	<u>420</u>	<u>200¹</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>70</u>
TOTAL	991	999	0	0	3,196	3,635	489	880	0	2,300	400 ¹	0	0	0	250

IV-13

TABLE IV-21A (Continued)
DEVELOPMENT WITHIN ONE-QUARTER MILE OF STATIONS
LONG BEACH

Stations	Existing in 1980					1980-2000: New Development Without Project					Possible Additional Development by 2000 With Project				
	Office (000s of gross sq ft)	Retail (sq ft)	Hotel (sq ft)	Indust. (acres)	Housing (Units)	Office (000s of gross sq ft)	Retail (sq ft)	Hotel (acres)	Indust. (acres)	Housing (Units)	Office (000s of gross sq ft)	Retail (sq ft)	Hotel (acres)	Indust. (acres)	Housing (Units)
LB-5 (Long Beach Blvd., Two-Way)															
Wardlow Road	13	0	0	0	1,196	0	0	0	0	230	0	0	0	0	60
Willow Street	91	115	0	0	906	0	0	0	0	150	0	0	0	0	30
Hill Street	0	209	0	0	1,420	0	0	0	0	170	20	20	0	0	40
Pacific Coast Highway	87	371	0	1	1,629	0	0	15	0	290	40	40	0	0	70
Anaheim Street	66	558	0	0	1,010	46	6	0	0	400	40	40	0	0	90
6th/7th Street	411	755	0	0	1,604	34	628	0	0	1,220	0 ¹	0	0	0	280
1st Street	676	658	0	0	1,139	2,026	286	1,100	0	920	400 ¹	0	0	0	210
TOTAL	1,344	2,666	0	1	8,607	2,106	935	1,100	0	3,380	400 ¹	100	0	0	780
LB-6 (Willow St. Terminus)															
Wardlow Road	13	0	0	0	1,196	0	0	0	0	90	0	0	0	0	50
Willow Street	91	115	0	0	609	0	0	0	0	50	0	10-20	0	0	50
TOTAL	104	115	0	0	1,805	0	0	0	0	140	0	10-20	0	0	100

¹ Infill: Defined as occupancy of existing structures, in contrast to new construction.

Source: Sedway Cooke Associates, 1984; M.L. Frank & Associates, 1984.

o Serve Population Concentrations

The new alternatives serve different types of corridors. The Modified River Route options would traverse a low density residential area north of the Pacific Coast Highway and a concentrated multi-family area in the downtown area. For these options, the residential population potentially served by rail transit is largely influenced by the number and location of stations. Although LB-5 (Long Beach Boulevard, Two-Way) would run along a retail strip for its entire length, a larger proportion of the alignment's station areas are residential in nature. Thus, LB-5 would serve a greater resident population within walking distance than LB-3. The LB-6 (Willow Street Terminus) alignment would serve a residential neighborhood composed of single-family and multi-family units located within walking distance, but buses would feed the station from a large extended area. A comparison of the alternatives is presented in Table IV-21B.

TABLE IV-21B

YEAR 2000 STATION AREA POPULATION DENSITIES

	<u>Total Population</u>	<u>Ranking</u>	<u>Population per Residential Square Mile</u>	<u>Ranking</u>
LB-3 (Broadway Aerial) 3 River Stations	8,705	2	57,435	3
LB-3 (Broadway Aerial) 1 River Station	7,394	3	77,576	2
LB-3 (Broadway Aerial) No River Stations)	6,455	4	84,310	1
LB-5 (Long Beach Blvd., Two-Way)	20,393	1	39,791	4
LB-6 (Willow Street Terminus)	5,392	5	27,388	5

Source: Sedway Cooke Associates, 1984.

The table shows that LB-5 (Long Beach Boulevard, Two-Way) would serve the greatest number of residents within 1/4 mile (walking distance) of the stations. The stations of the Modified River Route options would serve only 32-43 percent of the number of people served by the LB-5 alignment stations. The addition of the Willow Street, Pacific Coast Highway, and/or Anaheim Street stations to the Modified River Route Option C would not significantly increase the residential population within walking distance of rail transit, since only 2,000 people reside within 1/4 mile of these three stations. The LB-6 alignment would only serve 26 percent of the number of people (living within walking distance) served by the LB-5 stations.

The two downtown aerial stations for the Modified River Route show especially high population densities because of the number of high-rise apartments within a short walking distance of the stations. Consequently, the Modified River Route options occupy the top rankings in terms of population density. The Willow Street Terminus would serve station areas with the lowest population density and would also rank lowest in terms of total population potentially served.

o Serve Commercial Centers

The area between Pacific and California Avenues, south of the Pacific Coast Highway, contains the densest employment and shopping activity in the Long Beach segment. This area includes Long Beach Boulevard, the city's major commercial corridor. Offices are concentrated at the south end of this area, particularly below 3rd Street.

LB-5 (Long Beach Boulevard, Two-Way) is the only alternative providing direct access to both the retail and office centers. The Modified River Route would not serve retail activity along Long Beach Boulevard but would directly serve the city's high-rise offices. The LB-6 (Willow Street Terminus) alternative would not provide rail service to any of the city's commercial centers; access to these centers would require transfers to connecting buses.

The total number and density of employees and shoppers who would have pedestrian access to stations for each alternative are shown in Table IV-21C.

TABLE IV-21C
YEAR 2000 EMPLOYMENT/SHOPPING DENSITIES

<u>Alternative</u>	<u>Total Employees and Daily Shoppers (Within 1/4 Mile of Stations)</u>	<u>Ranking</u>	<u>Employee/Shopper Density</u>	
			<u>Employees and Daily Shoppers per Square Mile</u>	<u>Ranking</u>
LB-3 (Broadway Aerial)				
Option A (3 River Stations)	69,000	2	155,000	4
Option B (1 River Station)	67,000	3	215,000	2
Option C (No River Stations)	64,000	4	243,000	1
LB-5 (Long Beach Blvd., Two-Way)	128,000	1	126,000	3
LB-6 (Willow Street Terminus)	4,000	5	12,000	5

Note: Assumes 30 shoppers per day per 1,000 gross square feet of retail space, one employee per 300 gross square feet of office space, one employee per 500 gross square of retail space, one employee per hotel room, and 25 employees per acre of industrial use.

Source: Sedway Cooke Associates, 1984.

All alternatives except LB-6 (Willow Street Terminus) would provide pedestrian access to areas having much greater concentrations of employees and shoppers than the segment as a whole. The LB-5 (Long Beach Boulevard, Two-Way) alternative would serve by far the greatest number of pedestrians. With this alternative, shoppers represent approximately 85 percent of the pedestrians served, and the majority of these people would be near the Long Beach Plaza.

The second-ranking alternative, LB-3 (Broadway Aerial) Option A, would serve about 50 percent of those served by LB-5. The three additional stations included as part of Option A would increase the number of pedestrians with access to the rail system by approximately 5,000, as compared to Option C (no river stations). Along the river portion of the route, most of these additional employees and shoppers would be located in the vicinity of the Pacific Coast Highway station. With each of the Broadway Aerial options, approximately two-thirds of the total benefitting pedestrians would be those near the World Trade Center and the Civic Center.

LB-6 offers the fewest benefits in terms of serving employees and shoppers. Approximately 6 percent of the number of people served by LB-3 (Broadway Aerial) stations would benefit from LB-6. In comparing LB-6 with LB-5, this percentage is even less (3 percent).

o Serve Activity/Growth Centers

The centers of recent and planned growth in the Long Beach segment include the major commercial area bounded by 6th Street, Elm Avenue, Pacific Avenue, and the south frontage of Ocean Boulevard; the Civic Center immediately to the west; the World Trade Center between the Civic Center and the Los Angeles River; and the visitor-serving facilities south of the Convention Center.

LB-5 (Long Beach Boulevard, Two-Way), with stations on Long Beach Boulevard at 6th/7th Streets and at 1st Street, would directly benefit the major commercial area and the Convention Center. The Civic Center would be within a 1/2 mile of the 1st Street station. Only the World Trade Center would be beyond a reasonable walking distance from service on the LB-5 route. Service to activity/growth centers with the Modified River Route would be improved relative to LB-5, because these centers would be easily accessible from the World Trade Center and Civic Center stations. However, the retail activities at the northern end of the primary commercial area, such as Long Beach Plaza, over one-quarter mile away, would be less accessible. The addition of the river stations would not enhance service to any of the city's growth/activity centers. Furthermore, the areas around the river stations are not projected to experience any development.

The LB-6 (Willow Street Terminus) alternative, by terminating rail service in north Long Beach, would not directly serve the city's major growth centers.

o Connect with Other Transit/Transportation Systems

The major regional transportation systems with which the Long Beach rail alternatives could connect are the San Diego Freeway and the downtown Long Beach Transit Mall between Long Beach Boulevard and Locust Avenue on 1st Street.

In comparison with the alternatives evaluated in the DEIR, the new rail alternatives would not improve connections to the San Diego Freeway. Motorists wishing to park along the alignment and use rail service would still need to travel two miles north on the Long Beach Freeway to use the Del Amo Boulevard station park-and-ride lot. All of the alternatives except LB-6 (Willow Street Terminus) would terminate rail service within

two blocks of the Long Beach Transit Mall, thereby providing excellent access to the city's primary bus transfer location. The Willow Street Terminus would not provide a rail/bus connection in the downtown area, although bus routes would connect the rail station at Willow Street with the Transit Mall.

o Enhance Revitalization Efforts

The downtown portion of the Downtown-Tideland Redevelopment Project would be most directly and centrally served by LB-5 (Long Beach Boulevard, Two-Way). All Modified River Route alternatives would serve the western end of the project area well. The Tidelands portion of the project area would not be served by any of these alternatives. LB-6 (Willow Street Terminus) would not directly enhance revitalization efforts in the city's redevelopment area.

o Compatibility of Project Facilities with Adjacent Land Uses

Land use conflicts can arise when the conduct or enjoyment of activities at sites adjacent to the proposed rail project are adversely affected by the line's operation.

All LB-3 (Broadway Aerial) options would require using a portion of Los Angeles County Flood Control land for a portion of their route. In addition, this alignment would traverse large stretches of lands designated in the general plan and zoned for low-density residential uses.

North of downtown, the river portion of the LB-3 (Broadway Aerial) alignment is identical to the original River Route (LB-3) defined in the DEIR. In brief, the alignment from the San Diego Freeway south to Pacific Coast Highway (PCH) would be located adjacent to property which is zoned for single-family or multi-family housing and has been developed as large single-family tracts. This residential stretch can be separated into three segments, each with varying degrees of compatibility to the rail alternative to the west, as follows:

1) At the north end between Willow Street and Wardlow Road, the residential parcels are 100 feet from the proposed line, including the width of De Forest Avenue between Willow Street and Spring Street. 2) Between Willow and Hill Streets, residential parcels are still separated from the line by De Forest, but the total distance is reduced to 40 feet. 3) From Hill Street to PCH, residential parcels are located 80-100 feet from the rail right-of-way, with the exception of three to five structures at least three of which (a duplex and two sheds) would be removed.

The passage of rail vehicles through this residential portion of the Modified River Route alignment would intermittently disrupt the quiet in the area. A station at Willow Street could be considered incompatible with the residential character of adjacent land use. Moreover, there are residential uses immediately north of PCH which could be indirectly affected by station facilities immediately south of PCH, particularly with Option B (maximum 1,000-space parking lot and major transfer facility). For example, the parking lots could be potential sources of increased vehicular traffic, noise, and air pollution, and would require night lighting. As long as the proposed lots are not located on parcels zoned for residential uses or Neighborhood Commercial (CN), they would be permitted by zoning. If sited on parcels zoned Limited Commercial (CL), Retail Commercial (CR), or Central Business (CB), they would require a conditional use permit.

At Pacific Coast Highway, the station would be adjacent to a budget motel, and at Anaheim Street the station would be surrounded by predominantly industrial/vehicular storage areas. From Pacific Coast Highway south to 7th Street, the adjacent land is zoned for industrial activities. From 7th Street to Broadway, the adjacent land use is a freeway right-of-way. Generally, the existing land uses around the proposed PCH and Anaheim stations would be considered compatible with the operation of a light rail system.

In contrast, the aerial guideway along the south side of Broadway may encroach on air space in a commercially zoned area planned for the World Trade Center. It would continue alongside or through the Civic Center site, affecting views, shading the underlying areas, and displacing landscaping. The rail station at the Civic Center complex would also revise pedestrian circulation in and use of Lincoln Park.

LB-5 (Long Beach Boulevard, Two-Way) would run in the street right-of-way of Long Beach Boulevard, south of Willow Street. The city's general plan designates this alignment primarily for commercial uses, and the segment between Anaheim and 7th Streets for a mix of uses. This entire route is commercially zoned and used primarily for retail activities. A rail line would not be incompatible with these land uses.

The Willow Street Terminus (LB-6) would be located exclusively in public rights-of-way, and the nearby mobile home park would be separated from the station facilities by a sound wall. Thus, the land uses adjacent to this alternative are not likely to be adversely affected.

The compatibility of project facilities must be examined in terms of future land uses, as well as existing land uses. If properly sited, stations would support proposed land uses by enhancing their visibility and accessibility.

The appropriate land uses, in turn, could generate ridership for the transit system and thereby improve its cost effectiveness.

Figure IV-21A shows the station areas for the Modified River Route and the Long Beach Boulevard, Two-Way alternatives, as well as the type of land uses proposed for these areas by the city's general plan. The proposed uses north of 7th Street are much more intensive along the Long Beach Boulevard, Two-Way than along the river route; that is, the uses would accommodate greater concentrations of people, generate more trips, and would be more intensely developed. Accordingly, Long Beach Boulevard for this stretch is more suited to rail service. All downtown station areas along both the Long Beach Boulevard, Two-Way and the Broadway Aerial are proposed to be or already are intensively developed. These uses are compatible with and support rail service.

o Enhance Joint Development Opportunities

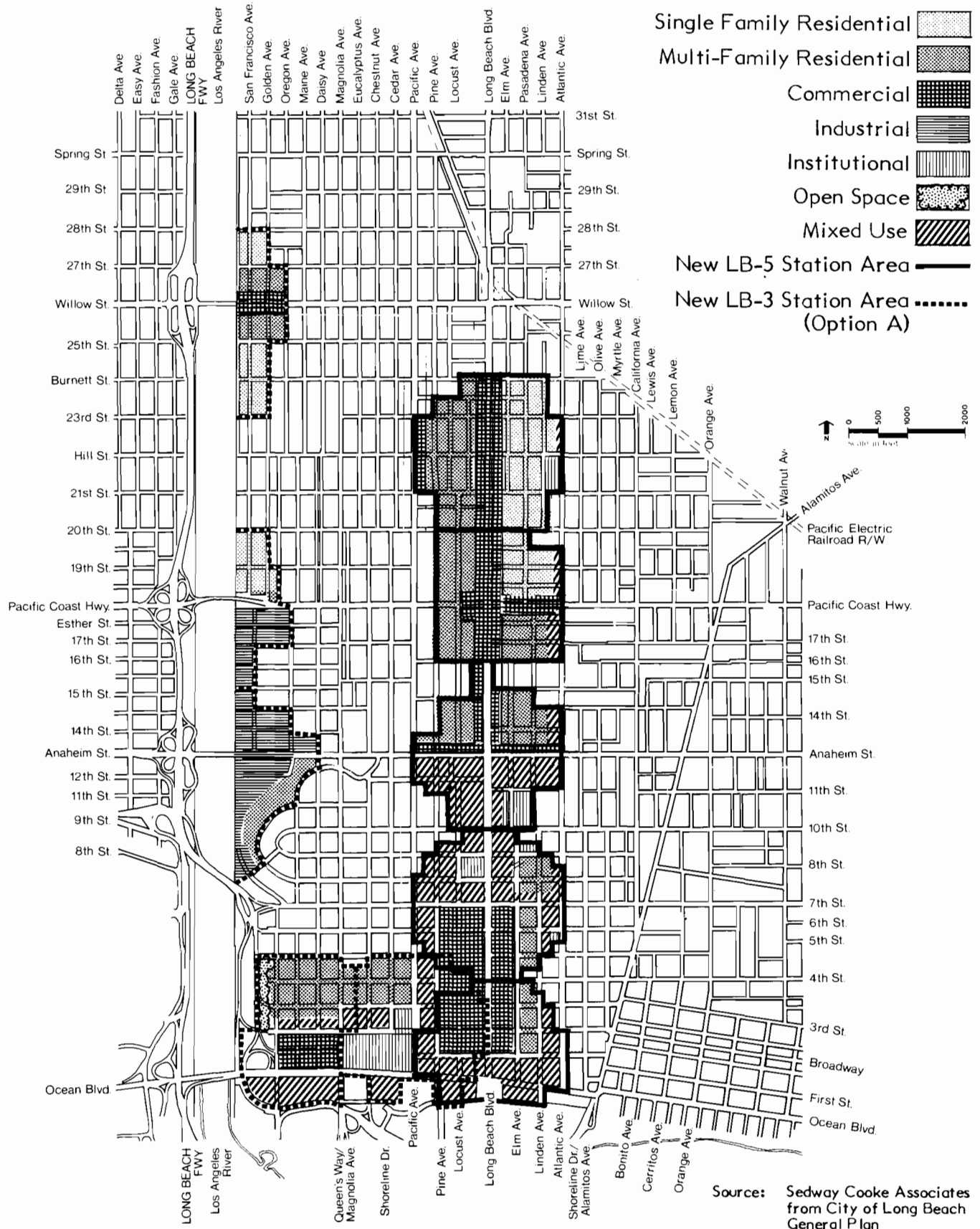
Each of the Long Beach alternatives, except for the Willow Street Terminus, contains considerable land within one-quarter mile of downtown stations that is currently vacant or used for commercial parking. Much of this "under-utilized" supply of land is proposed for development by the year 2000. Nevertheless, there would still be sites available for new construction, as well as sites for intensification (that is, where the existing use is underutilized relative to the intensity of development permitted by zoning and the general plan). The LB-5 alternative could spur the greatest redevelopment as it traverses the greatest amount of underutilized land, located primarily between Pacific and California Avenues, south of Burnett Street. The Broadway Aerial options serve a smaller amount of potentially developable land that is bound by Broadway, Magnolia Avenue, 7th Street, and the Los Angeles River.

As noted in the DEIR, land that must be acquired for power substations can serve as joint development sites, provided that the sites are large enough or can be incorporated as part of a larger development site.

IV-212 Population

IV-212.1 Impact Measures

Population impacts are evaluated in terms of the number of station area residents potentially served by the transit line. This measure suggests a change in the mobility for those people and a change in accessibility to major destinations. The increase in mobility and accessibility provided by rail service and the corresponding reduction in the use of automobiles



Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Figure IV-21-A GENERAL PLAN LAND USES IN STATION AREAS

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would be considered a positive impact. Of particular importance are the changes in mobility for residents who are considered transit dependent. These include ethnic minorities, youth, elderly, and low-income households. Increased mobility for these segments of the population would be a positive impact.

IV-212.2 Changes in Mobility and Accessibility

Population growth induced by the rail project is expected to be insignificant, as discussed in the DEIR. Using a growth factor determined by SCAG, year 2000 population in the Long Beach segment of the corridor is estimated at 297,715 with the project, which is less than one-half of one percent over SCAG's estimate of 296,315 without the project.

LB-5 (Long Beach Boulevard, Two-Way) would potentially serve the greatest number of people. Its seven stations served a 1980 population of 17,774 residents and would serve a year 2000 population projected at 20,393. LB-3 (Broadway Aerial) with no river stations, in contrast, served a 1980 resident population of 5,169 with its two downtown stations, and would serve a projected population of 6,455 in the year 2000. The Broadway Aerial with three river stations served 7,125 residents in 1980 and would serve 8,705 in the year 2000, providing the greatest accessibility and mobility among the Broadway Aerial options. LB-6 (Willow Street Terminus) would offer the least mobility for local residents and the least accessibility to major destinations and growth centers.

Significantly, although LB-5 would serve the largest population, its station areas are not projected to grow very rapidly. As shown in Table IV-21D, population within its station areas is expected to grow by 15 percent, while the entire Long Beach segment, as discussed in the DEIR, is expected to grow by 16 percent. The Willow Street station area is the fastest growing station area among the alternatives discussed and is expected to grow by 33 percent. This area would receive transit access with both LB-5 and LB-6; however, level of service would vary. Because LB-6 would terminate at the Willow Street station, mobility for individuals in the area would improve only if they desired to travel north. To go south towards downtown Long Beach, transit riders would still have to travel by bus. In contrast, LB-5 (Long Beach Boulevard, Two-Way) could offer service in either direction and would serve two to three times the population of any other alternative.

Demographic characteristics of the station areas vary widely as was shown in Chapter II, Section 213. Long Beach has concentrations of the elderly representing approximately half the population in the area surrounding the southernmost stations (World Trade Center and Civic Center on the Modified River Route alternative, and 1st Street and 6th/7th Streets on the

Long Beach Boulevard, Two-Way alternative). Significant numbers of Blacks, Hispanics, and Asians live in the station areas of LB-5 and LB-3 (Broadway Aerial). Over 50 percent of the population at the Willow Street, Pacific Coast Highway, and World Trade Center station areas along the Modified River Route are members of an ethnic minority. Along Long Beach Boulevard, the Hill Street, Pacific Coast Highway, and Anaheim Street stations are comprised of from 55 to 90 percent Blacks, Hispanics, and Asians.

TABLE IV-21D
POPULATION GROWTH WITHIN ONE-QUARTER MILE OF STATIONS¹
LONG BEACH

<u>Alternatives</u>	<u>1980 Population</u>	<u>2000 Population</u>	<u>Change 1980-2000</u>
LB-3 (Broadway Aerial)			
Option A (3 River Stations)	7,125	8,705	22%
Option B (1 River Station)	6,112	7,394	21%
Option C (No River Stations)	5,169	6,445	25%
LB-5 (Long Beach Blvd., Two-Way)	17,774	20,393	15%
LB-6 (Willow Street Terminus)	4,048	5,392	33%

¹ 1980 station area population is determined at the census block level. The proportion of station area 1980 population to the census tracts which encompass the blocks in used to derive station area population for 2000.

Source: U.S. Bureau of the Census, 1980; Sedway Cooke Associates, 1984.

Table IV-21E shows that LB-5 (Long Beach Boulevard, Two-Way) would potentially serve the greatest number of transit dependents. In addition, it would directly serve the retail strip along Long Beach Boulevard and the major commercial job center in downtown Long Beach. This enhances LB-5's potential to increase the mobility of transit dependents residing within its station areas and therefore also improves the accessibility of their likely destinations.

TABLE IV-21E

NUMBER OF LONG BEACH RESIDENTS LIKELY TO BE TRANSIT DEPENDENT
WITHIN ONE-QUARTER MILE OF STATIONS¹

LONG BEACH

	Ethnic/Racial Minority ²		Youth		Elderly	
	1980	2000	1980	2000	1980	2000
LB-3 (Broadway Aerial)						
Option A	3,080	3,763	1,447	1,768	1,632	1,994
Option B	2,528	3,058	1,187	1,436	1,474	1,783
Option C	1,928	2,404	902	1,125	1,374	1,713
LB-5 (Long Beach Blvd., Two-Way)	8,698	9,980	3,984	4,571	3,864	4,433
LB-6 (Willow Street Terminus)	1,178	1,569	699	931	1,026	1,367

¹ Although the demographic profile of downtown Long Beach is likely to change between 1980 and 2000, the proportion these groups represent of the 1980 population has been applied to the year 2000 station area population to arrive at projections of the future number of transit dependents.

² Ethnic/Racial Minority includes Blacks, Hispanics, Asians and Pacific Islanders, which together comprise the bulk of the non-White population. Information on low-income households, another factor which signifies transit dependency, is not available.

Source: U.S. Bureau of the Census, 1980; Sedway Cooke Associates, 1984.

The Modified River Route options would serve the Civic Center and major elderly concentrations in its southernmost stations. LB-3 (Broadway Aerial) would also serve the retail strip along Broadway. Likely destinations for the elderly population are retail concentrations and hospitals; since the Modified River Route options would serve only minor retail concentrations and no major hospital facilities, these alternatives would offer limited local service to these transit dependents, although they could potentially improve regional mobility.

IV-213 Housing

IV-213.1 Assessment

The rail system is not expected to 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. Station areas located in downtown Long Beach 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. Little residential growth is expected in the station areas along the Los Angeles River with or without the project. The Pacific Coast Highway and Anaheim Street station areas are predominantly industrial and the City does not foresee any significant changes in land use.

Alternative LB-3 (Broadway Aerial) is projected to induce the construction of between 250 and 280 housing units depending on the option selected. Most of the project-induced residential development associated with this alternative would occur in the World Trade Center or Civic Center station areas. There is no potential for residential development in the Anaheim Street station area and limited potential in the Willow Street and Pacific Coast Highway station areas (an estimated 10 and 20 units respectively). Induced residential development for each alternative under study is shown in Table IV-21A (see Section IV-211.1, Growth-Inducing Impacts).

Implementation of the LB-3 (Broadway Aerial) would preclude the construction of a housing project currently being planned through a joint venture between the Los Angeles County Community Development Department and the Building Industry Association. This project would ultimately consist of 75 single-family detached units located in the proposed LB-3 (Broadway Aerial) right-of-way between 34th and Spring Streets. Construction is scheduled to begin sometime in 1985.

SCAG's projections indicate that by the year 2000, implementation of the LB-5 (Long Beach Boulevard, Two-Way) alternative would be responsible for inducing the construction of approximately 780 additional housing units. The greatest number of project-induced units would be at the 6th/7th Street and 1st Street station areas, 280 and 210 units respectively.

LB-6 (Willow Street Terminus) is projected to add only 50 units in the vicinity of the stations.

IV-213.2 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-220 COMMUNITY SERVICES

The number of community service facilities by type that would be located within the station areas of the proposed route alternatives is shown in Table IV-22A.

TABLE IV-22A
COMMUNITY FACILITIES WITHIN ONE-QUARTER

<u>Facilities By Type</u>	<u>LB-3 (Broadway Aerial)</u>			<u>LB-5</u>	<u>LB-6</u>
	<u>Option A</u>	<u>Option B</u>	<u>Option C</u>		
Schools	0	0	0	13	2
Libraries	1	1	1	2	0
Churches	1	1	1	27	0
Parks	2	1	1	2	1
Medical Facilities	1	1	1	16	9
Government Offices	5	5	5	10	1
Local Social Services	1	1	1	23	1
TOTAL	11	10	10	93	14

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

Some Long Beach community service facilities would experience minor adverse impacts during the operation of the proposed rail transit alternatives. In general, however, facilities located in station areas would benefit from improved access.

If the LB-3 (Broadway Aerial-Modified River Route) alternative is selected, all existing points of access to the LARIO Bike Route will be maintained. An additional access point will be added if a station is built at Anaheim Street (Option A). All at-grade bike/pedestrian crossings will be equipped with warning signs to ensure safety while crossing the track. Bells and lights may also be used to warn of approaching trains.

Alternative LB-3 (Broadway Aerial) will be designed to ensure safe usage of the LARIO equestrian trail. An eight-foot high fence or combination soundwall/fence will separate the train from the transit track. The underpass at Wardlow Road will be adequately lit and of sufficient width to ensure the safe passage of horses.

If alternative LB-5 or LB-6 is selected, rail transit tracks running in the SPTC right-of-way from the Los Angeles 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 such as Veteran's Park and a number of commercial establishments. To maintain pedestrian access to local community services, an at-grade or above-grade pedestrian crossing could be constructed between Spring and 28th Streets.

The Long Beach Police Department may have to expand its law enforcement activities in response to crimes against transit passengers walking to and from stations, and against the vehicles of transit passengers parked in neighborhood streets surrounding stations. The project would include CCTV surveillance at stations and the use of transit police and security guards.

Emergency vehicles crossing either the LB-5 or LB-6 alignments at-grade may encounter delays of between 30 to 45 seconds resulting from transit operations which could increase response times.

If the LB-5 or LB-6 alternative is selected, the bike/equestrian underpass on the east side of the SPTC bridge crossing would be designed with the safety of both equestrians and bicyclists in mind.

IV-230 ECONOMIC ACTIVITY

IV-231 Property Tax Revenue

Of the three new alternative routes under consideration for the proposed project in Long Beach, only LB-3 (Broadway Aerial-Modified River Route) and LB-6 (Willow Street Terminus) would require moderate private property takings and public easements for the track alignment.

Each of the proposed alignments would require permanent property acquisition for the location of substations along their route. Alignments LB-3 and LB-5 would each require two substations, while the LB-6 alignment would require one substation. It is estimated that each substation would require 5,000 square feet of land area. As the exact locations for the substations are 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.

New retail and housing development in conjunction with the proposed project would increase the property tax base in the Long Beach CBD 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 Table IV-21A (Section 211.1 of this chapter) 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-23A.

TABLE IV-23A
INCREASE IN ANNUAL PROPERTY TAX REVENUE
CITY OF LONG BEACH

<u>Indirectly Induced New Land Use</u>	<u>LB-3¹ (Broadway Aerial)</u>	<u>LB-5 (Long Beach Blvd., Two-Way)</u>	<u>LB-6 (Willow Street Terminus)</u>
Retail	-	\$ 70,000	\$14,000
Office	\$400,000	400,000	-
Housing	<u>530,000</u>	<u>665,000</u>	<u>40,000</u>
TOTAL REVENUE	\$930,000	\$1,135,000	\$54,000

¹ Same for all river route options.

Source: PB/KE, 1984.

IV-232 Local Business Activity

Two of the three additional Long Beach alternatives, LB-3 (Broadway Aerial) and LB-5, would provide service to the major commercial development area of the city, as well as to the Convention Center. Alternatives LB-3 (Broadway Aerial) and LB-5 would provide service to the Civic Center while only LB-3 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 activities. The relatively modest size of the station volumes, the highly developed and intensely planned nature of the downtown Long Beach area, and the 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 Long Beach CBD through the enhanced potential for new retail uses. Based on projections presented in Table IV-21A and assuming an average annual taxable sales volume of \$100 per square foot in 1983 constant dollars, the proposed LB-5 and LB-6 alignments could indirectly generate annual retail sales tax revenue of \$650,000 and \$130,000, respectively. The retail sales tax revenue would be distributed to the state, the City of Long Beach and the LACTC.

IV-233 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-23B follows:

TABLE IV-23B

NET ANNUAL FISCAL IMPACT

LONG BEACH ALTERNATIVES

<u>Cost/Benefit/Source</u>	<u>LB-3¹ (Broadway Aerial)</u>	<u>LB-5 (Long Beach Blvd., Two-Way)</u>	<u>LB-6 (Willow Street Terminus)</u>
Property Tax Loss ²	\$ (4,500)	\$ (1,800)	\$ (1,800)
Property Tax Gain	930,000	1,135,000	54,000
Retail Sales Tax Gain	<u>-</u>	<u>650,000</u>	<u>\$130,000</u>
TOTAL BENEFIT	\$925,500	\$1,738,200	\$182,200

Note: ¹ Same for all Modified River Route options.

² Includes alignment, maintenance yard, substations.

Source: PB/KE, 1984.

IV-240 VISUAL QUALITY

IV-241 Impact Measures

Impacts are evaluated in terms of the impact measures described in Chapter IV, Section 124.1 of the DEIR (May 1984). These measures consider changes in views, in visual setting, in the appearance of the street facade, and in the appearance of the street space; the compatibility of the system's components with the prevailing scale of buildings; and the visual proximity of the system to adjacent land uses.

IV-242 Impact Assessment

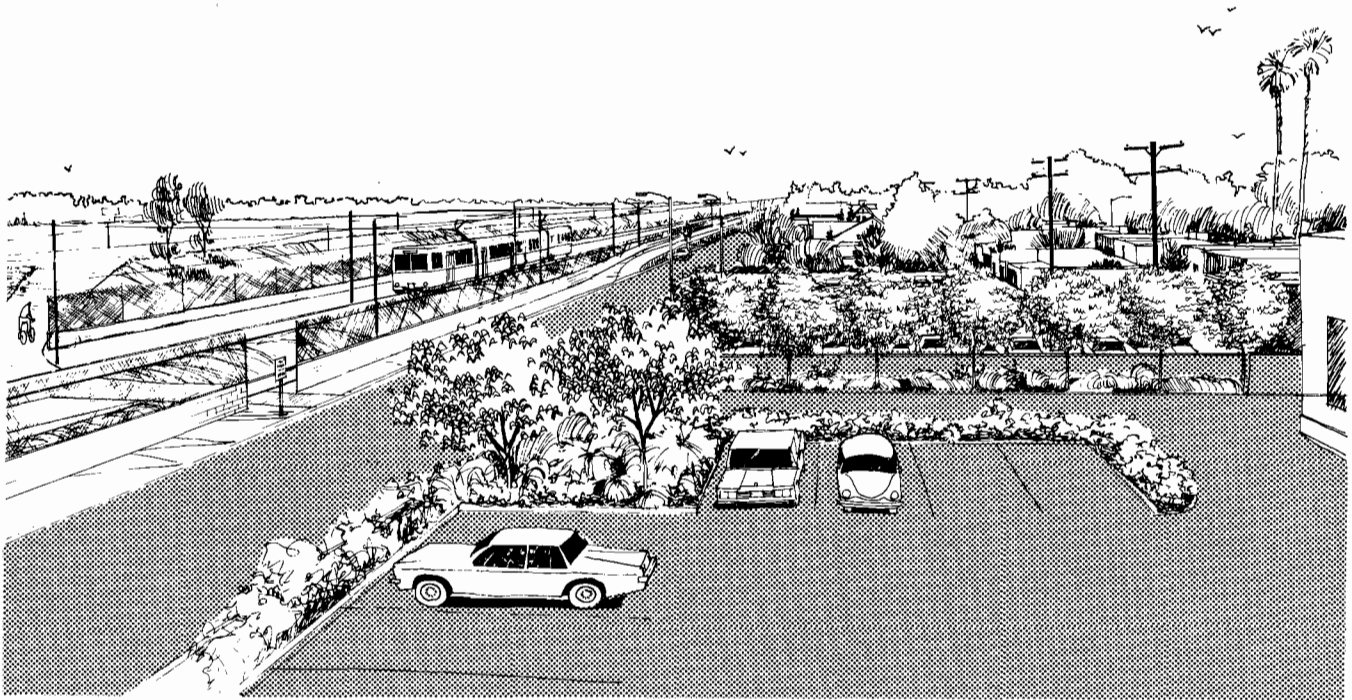
The most significant visual impacts in the Long Beach segment would be caused by the aerial portions of LB-3. With its overhead wires and support poles, the aerial structure would be a dominant visual element whose impact would vary according to its context. The at-grade segments would have relatively insignificant adverse impacts on the overall character, scale, and form of the visual setting in Long Beach. The

following discussion identifies the changes in the visual setting affected by each alternative. The discussion addresses the impact from the perspective of both viewers of the project at street level and users of the project riding in the rail vehicles.

IV-242.1 LB-3 (Broadway Aerial-Modified River Route)

This alignment along the base of the supporting berm of the Los Angeles River would alter the visual setting south of Wardlow Road to 8th Street. Key impacts are identified below:

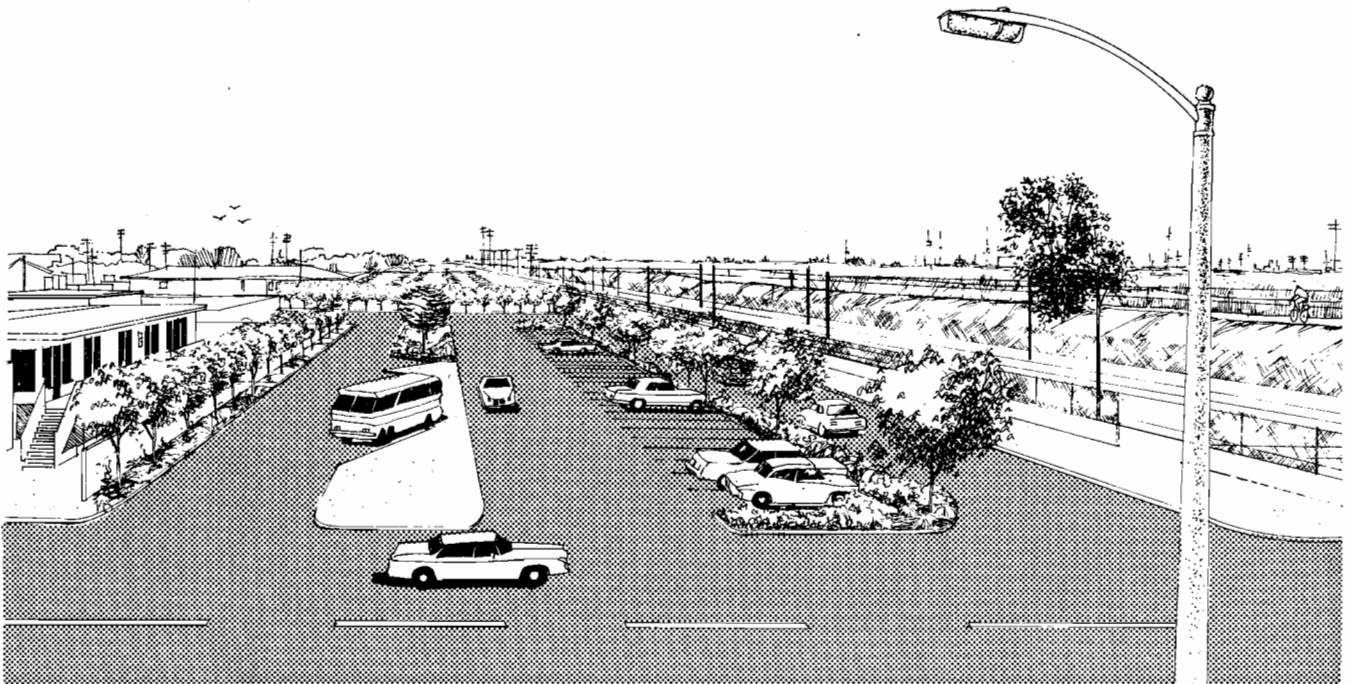
- o The 24-foot-high catenary support poles, spaced 100 to 130 feet on center, and electrical overhead would be the most visible impact of this alternative. Between Willow and Hill Streets, the impact would be negligible given existing utility poles and overhead wires along the Los Angeles River berm.
- o A chain link fence (eight feet high) would parallel the right-of-way throughout its length and increase its visibility to passersby.
- o The bridle path would be relocated closer to De Forest Avenue and the fronting residential units. Figure IV-24A shows this area before and after construction of LB-3 (Broadway Aerial).
- o Two bike trail overpasses would be constructed south of Wardlow Road, and at Hill Street, within the viewshed of the adjacent residences.
- o If stations are built the bridges at Willow Street, Pacific Coast Highway, and Anaheim Street would be widened to allow for bus turnouts, creating more prominent structures within the viewshed of the adjacent residences.
- o The vacant lots on the north side of Willow Street adjacent to a residential community would be developed for station parking and kiss-and-ride.
- o Some existing structures would be removed or modified, creating a change in the visual environment. Residential units at 20th Street and several storage sheds between 19th and 20th Street would be removed. A Los Angeles County pump station at Hill Street would require modification.
- o The station area at Pacific Coast Highway would upgrade a disorganized visual setting. Figure IV-24B shows this area before and after construction of Option B (1 river station at Pacific Coast Highway).



Looking north from Willow Street along the Los Angeles River levee in 1984 (above) and after construction of LB-3 Broadway Aerial (below). The rail line would be located below the levee and access to the bike path and bridle path would be relocated as shown in this sketch.

Long Beach - Los Angeles
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Figure IV-24- A
VISUAL ANALYSIS
PREPARED BY SEDWAY COOKE ASSOCIATES
PARSONS BRINCKERHOFF / KAISER ENGINEERS



Looking south from Pacific Coast Highway along the Los Angeles River levee in 1984 (above) and after construction of LB-3 Broadway Aerial, Option B (below). The rail line would be located below the levee. The river station with its related bus bays, parking, and kiss-and-ride facilities would be developed as shown in this sketch. Additional parking (up to 1,000 spaces) would be provided south of Esther Street as shown in the background of the lower sketch.

**Long Beach - Los Angeles
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**Figure IV-24- B
VISUAL ANALYSIS**

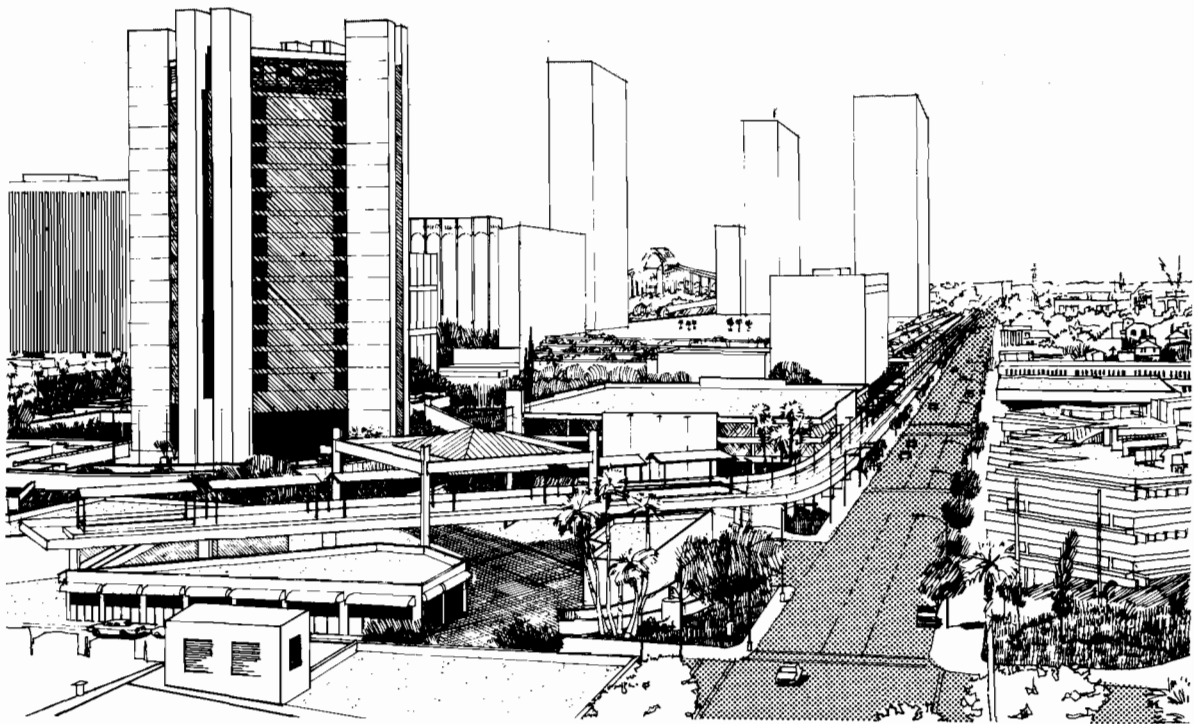
PREPARED BY SEDWAY COOKE ASSOCIATES
PARSONS BRINCKERHOFF / KAISER ENGINEERS

The Modified River Route's aerial alignment would change the visual setting of the Willmore Park open spaces between 6th and Broadway. This impact is not considered significant because the park would be separated from the aerial guideway by existing northbound and southbound freeway ramps. The only potential adverse effect could occur at Broadway and Topaz where the guideway would be across the street from the southern end of the park.

The elevated guideway along Broadway would produce the most significant impacts on the overall character, scale, and form of the visual setting. The guideway structure would be 15 feet from the ground to the underside and 24 to 26 feet wide. It would be supported by five- to seven-foot-wide columns at roughly 80-foot intervals. Catenary support poles (at 100-foot to 130-foot intervals) and overhead wires would extend approximately 25 feet above the guideway. The underside of the aerial stations at the World Trade Center and Civic Center would stand approximately 15 feet above the ground, be 39 feet wide at the platform level, and extend about 250 feet in length.

The elevated guideway would be within the viewshed of the residential units on the north side of Broadway. If the World Trade Center aerial station is located entirely within the public right-of-way of Broadway, it would be supported by a structural bent. This support structure would create a visual "tunnel" along Broadway for the approximately 250-foot length of the station and would significantly alter the street space. If located partially within the private right-of-way of the World Trade Center, either double- or single-column supports would be used and would entail a lesser visual impact. On the positive side, for project patrons, there would be increased visual exposure to the Civic Center and its raised plaza level walkways.

The elevated guideway would alter the visual setting of the Broadway corridor. There are several placements under consideration for the aerial guideway; however, they all would be located along the south side of Broadway from Golden to Cedar Avenues (and to Magnolia Avenue in Option E). The placements differ from one another in the location of the guideway in relation to the street right-of-way. One placement would locate the guideway to the south of the street right-of-way, over adjacent private property. This would require taking a 26-foot-deep strip of land for the entire length of the alignment, and a 39-foot-deep strip of land at the World Trade Center station area. A 19.5-foot-deep section of the new City Hall parking structure, between Chestnut and Cedar Avenues, would be taken by utilizing this placement. No street trees would be removed or parking places displaced by the private right-of-way placement. Figure IV-24C shows Broadway and Lincoln Park before and after such construction.



Bird's eye view of Broadway looking west from its intersection with Pacific Avenue in 1984 (above) and after construction of LB-3 Broadway Aerial, Option D (below). The Civic Center station would be located over Lincoln Park and retail uses would be developed around it as shown. This rendering represents an extra-cost option for this alternative in which the guideway would be located south of the street right-of-way, incorporated within the World Trade Center's 5-story parking base, and would require modification of the Civic Center parking structure.

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**Figure IV-24-C
VISUAL ANALYSIS**

PREPARED BY SEDWAY COOKE ASSOCIATES
PARSONS BRINCKERHOFF / KAISER ENGINEERS

Alternatively, the elevated guideway could be located within the street right-of-way over the south sidewalk. In this case, two placement variations are under consideration: one would be entirely within the street right-of-way, and the other would extend five feet into private right-of-way. If street right-of-way is used, 16 street trees would be removed. If private right-of-way is used only six street trees would be removed. If the guideway placement is entirely in the street right-of-way, a parking lane could be accommodated between the 80-foot on-center guideway columns, although the columns would displace existing parking spaces at intervals along the entire length of Broadway. If placement used both public and private rights-of-way, the 80-foot on-center columns would displace parking spaces only along the 250-foot length of the World Trade Center station.

Using the street right-of-way, the aerial structure on the south side of Broadway would visually restrict the street space for pedestrians. The guideway would shade the street beneath it throughout the year. The mid-morning and late-afternoon shadows would be restricted to the sidewalk directly under the guideway. With private right-of-way placement, the guideway would shade the sidewalk throughout the year. During the heat of the summer months, this arcade effect could be considered a positive impact.

The elevated structure along the south side of Broadway could adversely affect the visual privacy of about 270 linear feet of office frontage at the new World Trade Center depending on its design. It would be within five feet, 21 feet, or 26 feet of the facade of the Public Safety Building depending on the placement used. Because visual privacy would not be an issue at a parking facility, the proximity of the elevated guideway to the new City Hall parking structure would not be an adverse visual impact.

In addition, the overhead wires and support poles above the guideway itself would alter the area's visual setting. However, their impact would be partially minimized by the presence of existing mid-rise buildings, which would either obscure views of, or provide a backdrop for, the wires and poles.

In LB-3 (Broadway Aerial) Option E, the elevated guideway would curve south across Magnolia Avenue, through the parking area of the Public Health and Safety Building, over the Civic Center Mall, and terminate at the Civic Center station. Although parking spaces and trees would be potentially displaced by the alignment of the elevated guideway through the parking lot, this is not a visually sensitive area and it would not be considered a negative impact. The elevated guideway would alter the visual setting of the pedestrian-oriented Civic Center Mall. Eleven trees and the clock tower could be displaced by the alignment. Visual privacy of the fronting office buildings would not be an issue, as the window

facades are over 120 feet from the guideway. On the positive side, for the project patrons, the guideway using Option E would expose more views of the Civic Center than Option D.

The diagonal Civic Center station (Option D) would alter the visual setting of Lincoln Park by displacing land used as park. Lawns and landscaping would be partially removed. The guideway would shade the northeast corner of the park throughout the year. There would be a major revision of the park and plaza to take advantage of the joint development potential at the terminal station in keeping with the City of Long Beach's Conceptual Civic Center Redesign. In this option, the character of Lincoln Park would be permanently changed by the surrounding retail structures and light rail station. However, the site design and architectural treatment of the station would result in a dramatic "gateway" visual effect for pedestrians crossing the area as well as for transit patrons arriving or departing. The Civic Center station of LB-3 Option E would have similar impacts. Because of its east-west alignment, the shadows cast by the guideway on its north side would cover more of the plaza throughout the year.

IV-242.2 LB-5 (Long Beach Boulevard, Two-Way)

This alignment would have relatively insignificant adverse impacts on the overall character, scale, and form of the visual setting in Long Beach. The alignment would occur at-grade and therefore would require catenary support poles, electrical overhead, and trackway on city streets. The 24-foot-high poles, spaced 100 to 130 feet on-center, would be the most visible impact of this alternative alignment. Under the baseline configuration for LB-5, the poles would be placed in the sidewalks at the curb line, and overhead support wires would span the street. Under the optional configuration in which the street is widened to provide a landscaped median, overhead poles could be placed along the centerline of the median or at the sides of the median, keeping the traffic lanes free of overhead span wires.

Visually non-sensitive segments of Long Beach Boulevard exist between Willow and 7th Streets 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. North of 7th Street the trackway's alignment would be in a reserved median at the center of the street, displacing the existing landscaped median. Tall mature palm trees in the center median between 15th and 7th Streets visually divide the wide right-of-way into two channels. The displacement of about 120 trees for the trackway's median alignment would be an adverse visual impact. North of 15th Street the median

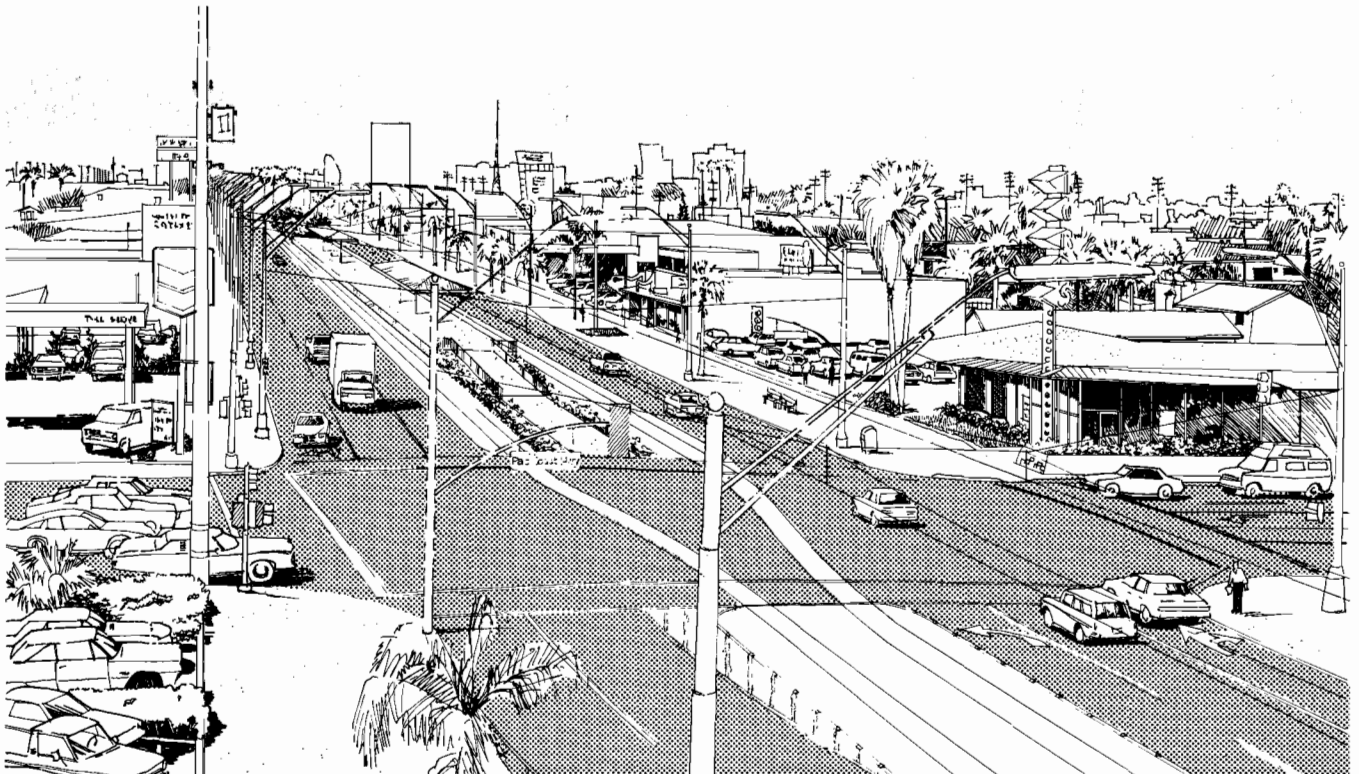
landscaping is more varied and intermittent; about 65 additional trees, that contribute less to the visual definition of street channels, would be displaced by the alignment. Figure IV-24D shows a view of Long Beach Boulevard looking south at its intersection with Pacific Coast Highway and the station area after construction of alternative LB-5.

Long Beach Boulevard from 7th Street south to 1st Street is especially sensitive visually because the right-of-way has been reconstructed to include streetscape improvements: bus lay-bys and parking areas, signage, historic light standards, street furniture, and sidewalk paving. South of 7th Street, the trackway's alignment would be in mixed traffic on either side of the existing landscaped median. The tall palm trees in the center median visually divide the street into two channels, even though the street space is weakly defined by a mixed scale of buildings with an intermittent commercial street facade. No street trees would be removed along the alignment south of 7th Street. After station construction, landscaping and trees would replace the existing landscaping. The taller buildings would break the silhouette of the electrical overhead, diminishing its adverse visual impact. The catenary support poles would become an additional streetscape element and would therefore be a minor visual intrusion.

IV-242.3 LB-6 (Willow Street Terminus)

This alignment would terminate north of the downtown area at Willow Street and Long Beach Boulevard. It would create no adverse visual impacts as this is a visually non-sensitive segment of the alignment. Long Beach Boulevard's expansive right-of-way and a development pattern of low-rise buildings inconsistently sited and set back within parking lots results in a discontinuous street facade and an undefined street space in the station area. Utility poles and overhead wires are prominent features of the visual setting.

The Willow Street Terminus would develop the west side of Long Beach Boulevard, an area utilized by the SPTC Railroad as a siding area for the storage of tank cars. In addition, a low-rise commercial building and its parking lots would be taken. The station area development would be a positive visual impact. The planned relationship of station components and landscaping would organize an underutilized and visually chaotic area. The catenary support poles and electrical overhead would have no negative impact along an alignment set back from Long Beach Boulevard, given the existing visual setting of utility poles and overhead wires. Street trees located along Long Beach Boulevard, encircling the station's parking area, would begin to define the street space. Figure IV-24E shows this area before and after construction of the Willow Street Terminus.

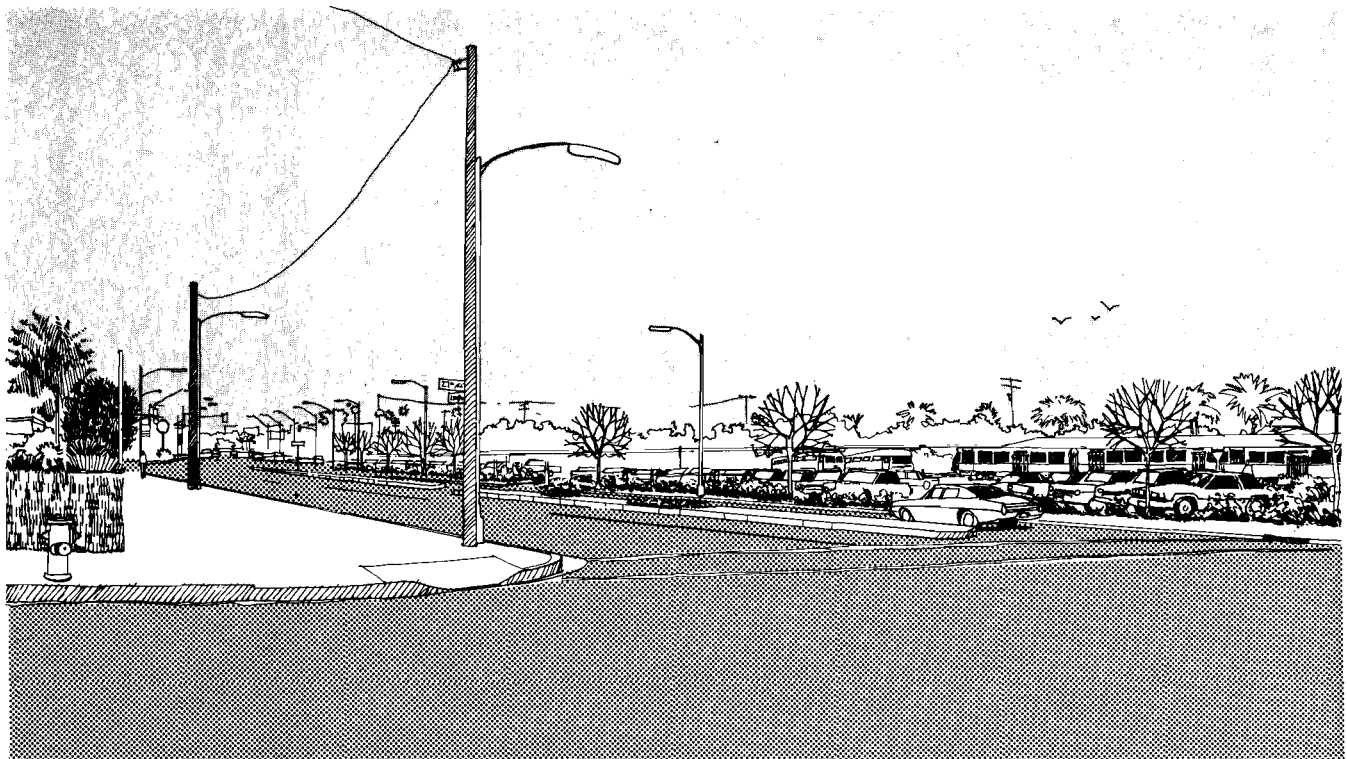


Bird's eye view of Long Beach Boulevard looking south at its intersection with Pacific Coast Highway in 1984 (above) and after construction of LB-5 (below). The rail line would be located in a reserved center median. The station area would be landscaped, and the east sidewalk narrowed to allow for a left turn lane.

Long Beach - Los Angeles
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LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Figure IV-24- D
VISUAL ANALYSIS

PREPARED BY SEDWAY COOKE ASSOCIATES
PARSONS BRINCKERHOFF / KAISER ENGINEERS



Looking southwest across Long Beach Boulevard from its intersection with 27th Street in 1984 (above) and after construction of LB-6 (below). The Willow Street Terminus with its related bus bays, parking, and kiss-and-ride facilities would be located in the former SPTC railroad siding area as shown in this sketch.

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Figure IV-24- E
VISUAL ANALYSIS

PREPARED BY SEDWAY COOKE ASSOCIATES
PARSONS BRINCKERHOFF / KAISER ENGINEERS

IV-243 Mitigation Measures

Along LB-3 (Broadway Aerial-Modified River Route) from Wardlow Road south to 7th Street, high landscaping and continuous planting of trees would diminish the visual intrusion caused by the chain link fence along the alignment, and by prominent bridge structures, bike trail overpasses, bridle paths, and parking areas that fall within the viewshed of adjacent residential communities. Views of the chain link fence and catenary support poles would be obscured to some extent against the backdrop of the high, landscaped berm of the Los Angeles River.

Along Broadway, the major adverse impacts of the aerial guideway on the visual setting could be mitigated by selecting another corridor and/or locating the alignment at-grade. The adverse impacts on the visual setting and street space would be significantly diminished by the selection of a placement within the private right-of-way of the World Trade Center rather than in the street right-of-way. No street trees or parking spaces would be displaced; the visually restricted street space for pedestrians and the visual "tunnel" created by the World Trade Center aerial station would be avoided. Shading of the sidewalk and street, however, would be an unavoidable impact. Minor cosmetic measures, such as decorative lighting on the shaded underside of stations, could be employed to soften the effect of the guideway. However, such measures would not fully mitigate the adverse visual impacts.

The taking of a 19.5-foot-deep section of the new City Hall parking structure could be mitigated by selecting one of the other placements. However, the additional cost to the project of the taking would have to be measured against the adverse visual impacts caused by the other placements.

The selection of LB-3 Option E (curves through Civic Center) would mitigate the visual intrusion on the Public Safety Building caused by the other options. The replacement of trees along the Civic Center Mall and the relocation of the clock tower, if necessary, would mitigate the impact of their removal. The location of the Civic Center station, however, would permanently change the character of Lincoln Park, an unavoidable impact.

The visual prominence 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. This is not under consideration at the present time. The opportunity for joint development at the World Trade

Center site and the integration of the aerial guideway and World Trade Center station within the project's five-story parking base would significantly diminish the visual prominence of the overhead wires and support poles as viewed from the adjacent residential areas.

Along Long Beach Boulevard (under LB-5), the disruption to the visual setting caused by the displacement of the landscaped median strip would be mitigated if the optional light rail track arrangement were adopted. This plan would integrate exclusive light rail tracks alongside the existing landscaped median to create an enlarged reserved median. The Long Beach Redevelopment Agency could use the construction of the rail transit project as an opportunity to coordinate streetscape improvements and landscaping along Long Beach Boulevard. The addition of mature street trees could be used to break the silhouette of the electrical overhead and to mask the catenary support poles. The existing mature palm trees could be relocated. Partial mitigation of disruption to the visual setting along the Boulevard could also be accomplished by the placement of trees and landscaping at the station areas.

IV-250 HISTORICAL AND CULTURAL RESOURCES

The only historical structures identified for the LB-3 (Broadway Aerial - Modified River Route) alternative were found along the proposed aerial section on Broadway. The guideway structure is located in the southernmost area of the Broadway street right-of-way, thereby minimizing the visual impacts of the operation of the rail transit project on the structures with historic potential (see Figure II-25A). Therefore there would be no significant adverse impacts to potentially historic structures with the operation of LB-3 (Broadway Aerial).

As a general rule, without any extenuating circumstances to the contrary, the reinstatement of rail service on a street where there had been such service in the past does not constitute an adverse effect to the potential historic resources which line that street. As this is the case for LB-5, there will be no significant impacts to potential historic resources identified along Long Beach Boulevard.

As there were no structures of historic interest located for LB-6, there would be no impacts.

IV-300 TRAFFIC AND TRANSPORTATION

IV-310 TRAFFIC

In the City of Long Beach, the impacts to vehicular traffic and pedestrian flows on major streets with the rail transit operations on the new alternative alignments would result in minor differences in congestion over the original Long Beach alignments presented in the DEIR. Traffic projections for the year 2000 base condition, as well as volume/capacity (V/C) ratios and levels of service (LOS) for street segments were established by the City of Long Beach in the "Long Beach Downtown Circulation and Access Study" (Barton Aschman, 1983), and the "Long Beach CBD Follow Up" study (Barton Aschman, September 1984). The studies included all projects associated with the city's capital improvement programs and private development projects.

IV-311 General Findings

With the implementation of the rail transit project, traffic volumes in the year 2000 would differ slightly from the year 2000 no project conditions due to the vehicular trips that would be diverted to the rail system. Screenline analysis conducted for the previous Long Beach rail alternatives and proportioned for the new alternatives indicate that during the AM peak hour, traffic entering and leaving Long Beach from the north would be reduced by approximately 2,500 daily trips, a magnitude similar to the previous alternatives presented in the DEIR.

A summary of impacts of the new Long Beach rail alternatives in combination with downtown Los Angeles and mid-corridor alternatives, proportioned from previous alternatives, is presented in Table IV-31A. Traffic impacts, including V/C ratios and LOS at key intersections in Long Beach, adjacent to rail stations, are presented in Table IV-31B. The differences in traffic impacts and related mitigation measures for the new rail alternatives are discussed below.

IV-312 Localized Impacts

IV-312.1 LB-3 (Broadway Aerial Modified River Route) - Option A

This Modified River Route alternative has three additional stations located at Willow Street, Pacific Coast Highway, and Anaheim Street.

Because parking at the three stations along the Los Angeles River is limited to neighborhood type parking, park-and-ride activity would create no appreciable impacts to the street system in the vicinity of the stations.

TABLE IV-31A

YEAR 2000 SUMMARY OF TRAFFIC IMPACTS

	Change From No Project Condition					
	No Project	LB-3 (Broadway Aerial)			LB-5	LB-6
		Option A	Option B	Option C	(LB Blvd., Two-Way)	(Willow Street Terminus)
Project Boardings						
Home-Work Trips	-	29,565	29,136	28,408	29,539	27,162
All Other Trips	-	25,185	24,990	24,199	25,163	23,138
Total Daily	-	55,750	54,326	52,607	54,702	50,300
* Screenline Traffic Volumes Crossing South of Carson Street	341,374	-2,350	-2,271	-2,074	-2,534	-1,910
Peak Traffic Volumes Crossing South of Carson Street						
Inbound AM Peak	53,515	-366	-354	-323	-395	-298
Outbound PM Peak	36,896	-253	-247	-223	-273	-206
Daily Vehicle Miles Travelled (VMT in Long Beach)	8,002,250	-21,116	-20,406	-18,636	-22,769	-17,162
Daily Vehicle Hours Travelled in Long Beach	284,803	-2,458	-2,375	-2,169	-2,650	-1,997

* Average Daily Travel Two-Way.

Source: Southern California Association of Governments, 1984.

TABLE IV-31B

YEAR 2000 V/C RATIOS AT KEY INTERSECTIONS NEAR PROJECT

AM PEAK HOUR

LONG BEACH

Intersections	No Project*		LB-3 (Broadway Aerial)						LB-5		LB-6	
			Option A (3 River Stations)		Option B (1 River Station)		Option C (No River Stations)		(Long Beach Blvd., 2-Way)		(Willow St. Terminus)	
			V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Long Beach Blvd./Willow St.	1.25	F	1.24	F	1.24	F	1.24	F	1.25	F	1.26	F
Long Beach Blvd./Hill St.	0.74	C	0.72	C	0.72	C	0.72	C	0.74	C	0.72	C
Long Beach Blvd./Pacific Coast Hwy.	1.03	F	1.01	F	1.01	F	1.01	F	1.03	F	1.01	F
Long Beach Blvd./Anaheim St.	0.82	D	0.80	D	0.80	D	0.80	D	0.82	D	0.81	D
Long Beach Blvd./6th St.	0.95	E	0.92	E	0.92	E	0.92	E	0.96	E	0.94	E
Long Beach Blvd./3rd St.	0.65	B	0.62	B	0.62	B	0.62	B	0.66	B	0.64	B
Pacific Ave./1st St.	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C	0.72	C
Broadway/Magnolia Ave.	1.02	F	1.02	F	1.02	F	1.02	F	1.02	F	1.02	F
Broadway/Pacific Ave.	0.74	C	0.74	C	0.74	C	0.74	C	0.74	C	0.74	C

* V/C Ratios have been revised as per "Long Beach CBD Follow Up" study - (Barton Aschman, September 26, 1984).

Note: V/C = Volume/Capacity Ratio
 LOS = Level of Service

Source: City of Long Beach; Southern California Association of Governments, 1984.

Virtually no change in the overall peak hour traffic or the average speeds is expected on Willow Street, Pacific Coast Highway, and Anaheim Street near the project site. With adequate roadway design features developed for access to the major off-street facilities, via local side streets, there should be no significant change in the level of service of the major roadway system.

Along Broadway, the guideway for the aerial structure carrying double tracks would be located in the south sidewalk. In the primary option (Option D) the alignment would continue east on Broadway and turn south at Cedar Avenue, terminating at a City Hall station just west of Pacific Avenue and 1st Street, whereas the secondary option (Option E) would proceed east along Broadway and turn south into the proposed World Trade Center at Daisy Avenue. Under both Broadway options, the aerial station for the baseline location at the World Trade Center would occupy the south curb lane, which is presently being used for parking. If another placement is chosen, the impacts to parking and traffic would be eliminated.

With the aerial station at World Trade Center restricting the curb lane from being used as a through travel lane during the peak traffic periods, the traffic operations in this street segment would be affected by merging conditions; however, five approach lanes would still be available at the intersection of Broadway and Magnolia Avenue, where the volume/capacity ratios should not be changed by the project.

There would be about 5,700 total daily boardings at the Pacific Avenue/1st Street (City Hall) station. Pedestrian access between the east end of the station platforms and the 1st Street Transit Mall will be accommodated by existing at-grade crossings.

Recent CBD studies conducted for the City of Long Beach show future traffic on Broadway, west of Magnolia Avenue, to increase from an existing 8,000 vehicles per day to a build-out condition of 30,000 vehicles per day. Should these projections be realized, the level of service of traffic operations during the peak hours would drop from the present good level to a forced flow condition (LOS "F"), in spite of parking restrictions on both sides of Broadway during the peak traffic periods.

IV-312.2 LB-3 (Broadway Aerial-Modified River Route) - Option B

In this alternative, a single river station at Pacific Coast Highway is assumed on the Modified River Route. The aerial structure is retained downtown along Broadway, with stations at the World Trade Center and City Hall. The vehicular traffic and pedestrian impacts under both the primary and secondary Broadway aerial options would be similar to those encountered in Option A.

Vehicular traffic circulation in the vicinity of the Pacific Coast Highway station at the LA River would be affected due to the peak hour commuter usage of the station facilities. A 1,000-car (maximum) park-and-ride facility, a kiss-and-ride drop-off area, and an off-street bus-to-train transfer lot have been proposed at the station area adjacent to the Pacific Coast Highway overpass. Based on station mode of arrival estimates for the AM peak hour, approximately 30 percent of the total boardings would arrive via the automobile, which would account for about 150 vehicles parking in the park-and-ride lot during the AM peak hour. No significant change in the overall peak hour traffic or the average speeds is expected on Pacific Coast Highway at the Los Angeles River overpass, between the No Project and the rail transit alternatives. The slight reduction in vehicular traffic resulting from this alternative would be offset by the increase in station-related vehicular activities. With adequate roadway design features developed for access into the major off-street facilities via side streets such as San Francisco Avenue and Esther Street, there should be no significant change in the level of service of Pacific Coast Highway. There would be some minor traffic increases on San Francisco and Esther Avenue. These are not residential streets and impacts on industrial uses are expected to be slight.

IV-312.3 LB-3 (Broadway Aerial - Modified River Route) - Option C

This option would have no stations along the river, but would retain two aerial stations in the Long Beach CBD. The impacts on both vehicular traffic and pedestrian movements from north of Willow Street to Broadway would show virtually no change from the No Project alternative.

The vehicular and pedestrian impacts under both the primary (Option D) and secondary (Option E) Broadway Aerial options would be similar to those encountered for Options A and B.

IV-312.4 LB-5 (Long Beach Boulevard, Two-Way)

The alternative LB-5 alignment would utilize the reserved median on Long Beach Boulevard, between the SPTC tracks to the north and 7th Street to the south, to facilitate the rail transit operations. South of 7th Street the LRT would operate on existing travel lanes in mixed traffic, between 7th Street and the 1st Street Transit Mall. Two parallel tracks would serve the northbound and southbound rail transit operations on Long Beach Boulevard in Long Beach.

Year 2000 AM peak hour traffic volumes on Long Beach Boulevard between Willow Street and 1st Street would show a small reduction (less than 2.0 percent) over the no project condition, for the rail alternative. Analysis of future traffic conditions along Long Beach Boulevard show

traffic volumes on segments of Long Beach Boulevard, north of Anaheim Street, approaching 30,000 vehicles per day, with unacceptable operational levels of service reaching "F" (or forced flow conditions) at Willow Street and Pacific Coast Highway. The impact from LRT operations at key intersections along Long Beach Boulevard would be minimal, since the light rail trains would adhere to the traffic signals along the Boulevard in the same manner as buses and general traffic. Level of Service (LOS) values and V/C ratios are shown in Table IV-31B. LOS values are the same with or without the project in operation; the V/C ratios vary by less than .03 percent.

With the elimination of curb parking on both sides of the street at intersections and station areas along Long Beach Boulevard, two through traffic lanes and a separate left-turn lane could be maintained at intersection approaches in each direction, in addition to the reserved median for the rail operations. Normal signal operations, with minor adjustments in relocating signal fixtures, could satisfactorily facilitate the rail transit, pedestrian, and vehicular movements along Long Beach Boulevard. However, due to conflicts between vehicular traffic and pedestrians, some impacts would still occur at intersections with left turning traffic crossing the tracks to reach left turn pockets and at station locations. South of 7th Street, where the LRT would operate in mixed traffic, minor impacts to vehicular traffic would occur at 1st Street due to the LRT turning movements conflicting with vehicular traffic.

IV-312.5 LB-6 (Willow Street Terminus)

In the LB-6 (Willow Street Terminus) alternative the LRT tracks located in the SPTC right-of-way would terminate at the Willow Street station between 27th and 28th Streets. Overall ridership will be the least -- 50,300 -- compared to the other Long Beach alternatives (52,607 to 54,750). This alternative would reduce direct access in Long Beach. Local access will be via LBT local bus and shuttle bus system.

On major north-south Long Beach arterials the morning peak hour traffic volumes in the year 2000 would show minor reductions in overall traffic volumes compared to the no project condition. No significant change in traffic operations level of service is expected (see Table IV-31B). Due to the termination of the rail transit line at the Willow Street station, heavy boarding volumes (7,511 passengers per day) will necessitate provision of such key facilities as bus turnaround, park-and-ride, and kiss-and-ride. Location of these facilities would be off-street, adjacent to the station, so that the impacts on vehicular traffic on major streets in the vicinity of the station are minimal. All access to the bus/rail transfer facility and park-and-ride lots would be through one-way movements only, Willow Street in and Long Beach Boulevard out, thereby minimizing vehicular impacts at access points.

The LB-6 (Willow Street Terminus) alternative would have the least impact on vehicular traffic operations and pedestrian movements in Long Beach; however, it would also provide the least access and circulation in downtown Long Beach.

IV-313 Mitigation Measures

In Long Beach, the traffic mitigation measures would include Transportation System Management (TSM) improvements 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", July 1983 and the "Long Beach CBD Follow Up," September, 1984. Traffic mitigation measures to be considered for the Long Beach alternatives include:

- o Eliminate curb parking in the vicinity of key intersections and rail station locations along Long Beach Boulevard.
- o Modify traffic signal phases to accommodate the projected traffic pattern, particularly with regard to left turn conflicts with rail transit vehicles.

IV-320 TRANSIT

The bus transit system in Long Beach for year 2000 base condition would be the existing bus system. 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.

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.

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; present routes could be rerouted to connect to proposed rail stations; or a new feeder bus route could be implemented to provide an alternative mode of access to the automobile. These would be scheduled 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 and in Chapter I, Section 220 of this document for each of the rail transit alternatives in Long Beach. Detailed information regarding the proposed changes can be obtained in the PB/KE memoranda entitled, "Complementary Bus Network for Long Beach LRT Alternatives", dated August 16 and August 29, 1984.

IV-321 LB-3 (Broadway Aerial - Modified River Route) Option A

- o LBT Lines 8, 15, 16 - increase service frequencies during peak periods.
- o LBT Lines 10A, 17A - new feeder bus services on Willow Street and Pacific Coast Highway corridors, operating during the peak periods.
- o LBT Line 16 - terminate service at Del Amo LRT stations.
- o RTD Lines 360, 456, 457 - eliminate service.

IV-322 LB-3 (Broadway Aerial - Modified River Route) Option B

- o LBT Lines 8, 15, 16 - increase service frequencies during peak periods.
- o LBT Line 16 - terminate service at Del Amo LRT station.
- o LBT Line 17A - new feeder bus service on Pacific Coast Highway corridor operating during the peak periods.
- o RTD Lines 360, 456, 457 - eliminate service.

- IV-323 LB-3 (Broadway Aerial - Modified River Route) Option C
- o LBT Lines 8, 15, 16 - increase service frequencies during peak periods.
 - o LBT Line 16 - terminate service at Del Amo LRT station.
 - o RTD Lines 360, 456, 457 - eliminate service.
- IV-324 LB-5 (Long Beach Boulevard, Two-Way)
- o LBT Line 5 - reduce service frequencies during peak periods.
 - o LBT Lines 8, 15, 16 - increase service frequencies during peak periods.
 - o LBT Line 16 and RTD Line 457 - terminate service at Del Amo LRT station.
 - o RTD Lines 360 and 456 - eliminate service.
- IV-325 LB-6 (Willow Street Terminus)
- o LBT Lines 5, 6, 15, 16 - increase service frequencies during peak periods.
 - o LBT Line 6 - redirect route to interface with LRT at Willow Street station.
 - o LBT Line 10A - new feeder bus service on Willow Street corridor operating during the peak periods.
 - o LBT Shuttle - new shuttle service on Long Beach Boulevard operating between the 1st Street Transit Mall and the Willow Street station.
 - o RTD Lines 360 and 456 - eliminate service.
 - o RTD Line 457 - terminate service at Del Amo station.

Rail transit impacts on local transit patronage in Long Beach were proportioned for each of the new LRT alternatives, based on a southerly screenline analysis, and are presented in Table IV-32A. Bus transit trips for the screenline routes would decline because of shifts to the rail transit project. However, overall transit usage in Long Beach would increase with the rail project in operation.

TABLE IV-32A
YEAR 2000 CHANGE IN BACKGROUND BUS TRANSIT TRIPS
IN LONG BEACH

FUTURE CONDITION Year 2000	<u>South Corridor Screenline*</u> <u>North of Pacific Coast Highway</u>	
	Daily Trips	Percent Change from No Project
No Project	9,659	--
LB-3 (Broadway Aerial) Option A	6,787	-30
LB-3 (Broadway Aerial) Option B	6,840	-29
LB-3 (Broadway Aerial) Option C	7,063	-27
LB-5 (Long Beach Blvd., Two-Way)	6,793	-30
LB-6 (Willow St. Terminus)	7,387	-24

* Screenline bus routes include those RTD and LBT north-south routes which closely parallel the rail corridor.

Source: Southern California Association of Governments, 1984.

IV-330 PARKING

IV-331 Assessment

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 (i.e., 5,311 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-33A summarizes the reduction in the number of curbside parking spaces in Long Beach for each of the alternatives.

TABLE IV-33A
 REDUCTION IN CURBSIDE PARKING SPACES¹
 LONG BEACH

<u>Long Beach Alternative</u>	<u>Approximate Number of Spaces Lost</u>
LB-3 (Broadway Aerial)	
Option A (3 River Stations)	15
Option B (1 River Station)	15
Option C (No River Stations)	15
LB-5 (Long Beach Blvd., Two-Way)	60
LB-6 (Willow Street Terminus)	0

¹ The percentage of curbside parking spaces lost is .01 or less in all cases.

Source: PB/KE, 1984.

Alternative LB-5 would eliminate curbside parking spaces on Long Beach Boulevard at intersections and station locations. Alternative LB-3 (Broadway Aerial) -- all options -- would basically eliminate curbside parking spaces along Broadway between Maine and Daisy Avenues to accommodate the aerial (World Trade Center) station at Daisy Avenue.

The rail transit project could potentially reduce peak parking demand in the Long Beach CBD. A small reduction in daily vehicular traffic volumes entering Long Beach under the various Long Beach light rail alternatives would produce a corresponding overall reduction in demand for parking in the CBD. To some extent this reduction in demand would compensate for the parking spaces lost due to the implementation of the rail transit project.

Park-and-ride and neighborhood parking facilities for the LB-3 (Broadway Aerial) and LB-6 (Willow Street Terminus) alternatives would be provided near rail transit stations. A major park-and-ride facility of up to 1000 spaces, is proposed at the Pacific Coast Highway (PCH) station under LB-3 (Broadway Aerial) Option B. Further refinement of the number of spaces for the PCH (Option B) station would be done during final engineering.

Estimated arrivals by auto at the park-and-ride stations are shown in Table IV-33B. The total arrivals by auto reflect rail transit boarding passengers and include park-and-ride, kiss-and-ride, and arrivals by carpools. Also shown in this table is the number of vehicles which would park at the lots during the AM peak hour, determined by factoring total arrivals. Based on these estimates prepared by SCAG, it appears that there would be sufficient parking at PCH for Options A or B. There is a potential for spillover parking at Willow and Anaheim Streets (Option A) and at LB-6 (Willow Street Terminus).

IV-332 Mitigation Measures

Year 2000 parking conditions at the rail station areas in the Long Beach CBD would be constrained 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 traffic 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.

For rail transit stations beyond the outskirts of the Long Beach CBD which have a significant park-and-ride demand, the following mitigation measures could be implemented:

- o Provide maximum park-and-ride facilities with provision for adequate circulation. Additional parking facilities could require displacement of existing residential and/or commercial structures.
- o Increase the feeder bus service to the rail transit stations to provide a mode of access alternative to the automobile. The complementary bus network designed for the rail transit would provide such service.
- o Provide preferential parking for car pools and van pools at stations areas.
- o Discourage spillover parking on neighborhood and residential streets by strict law enforcement.

TABLE IV-33B

PARKING SUPPLY AND USAGE BY SYSTEM ALTERNATIVES*

Location of Park-and-Ride Facility (by stations)	Proposed Number of Parking Spaces	AM Peak Hour Auto-Related Arrivals		
		LB-3 (Broadway Aerial) Option A	LB-3 (Broadway Aerial) Option B	LB-6 (Willow Street Terminus)
Willow Street Terminus	100	-	-	170 ¹ (160) ² [100] ³
Pacific Coast Highway/L.A. River	100*	104 ¹ (98) ² [71] ³	210 ¹ (200) ² [146] ³	
Willow Street/L.A. River	56 (neighborhood parking)			
Anaheim Street/L.A. River	25 (neighborhood parking)			

Note: No parking spaces are provided for LB-3 (Broadway Aerial) Option C. LB-5 (Long Beach Boulevard, Two-Way) has only neighborhood parking lots at Willow Street and Wardlow Road.

* With LB-3 (Broadway Aerial) Option B, up to 1000 spaces.

- ¹ 000 Passengers arriving by auto (AM Peak only).
- ² (000) Total auto arrivals (includes carpools and kiss-and-ride).
- ³ [000] Vehicles parking at stations (excludes kiss-and-ride).

Source: SCAG, 1984. The breakdown of passenger auto arrivals was obtained from the total observations taken by Cambridge Systematic, Inc. in June, 1981 in the RTD on-board, OCTD on-broad, and RTD Park-and-Ride mail-out surveys.

The rail transit alternatives, within varying degrees, would by themselves be an important parking mitigation measure, since they would provide an attractive alternative to automobile travel for access to and circulation within the Long Beach CBD.

IV-400 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, the Terminal Island Coal Project, and improvements that may be programmed resulting from the San Pedro Bay Ports Access (consolidation) Study. Due to the fact that most of these other projects only indirectly affect the downtown area, they would have no significant cumulative impact on Long Beach. However, the World Trade Center development, depending on the alternative selected, could directly benefit in varying degrees by having close or direct access to the rail transit project. Having direct rail transit access could increase the attractiveness of the World Trade Center development to potential tenants. Employees or clients of the tenants could travel to and from the businesses located there by rail transit and not need additional parking.

Chapter

V

SCPTD LIBRARY

V REGIONAL IMPACTS

The regional impacts of construction and operation of the supplemental rail transit alternatives for Long Beach 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.

When a system alternative is discussed, LA-2 (Flower Street Subway) and MC-1 (Compton At-Grade) are assumed as the Los Angeles and mid-corridor segments as shown in Figure V-1.

V-100 CONSTRUCTION IMPACTS

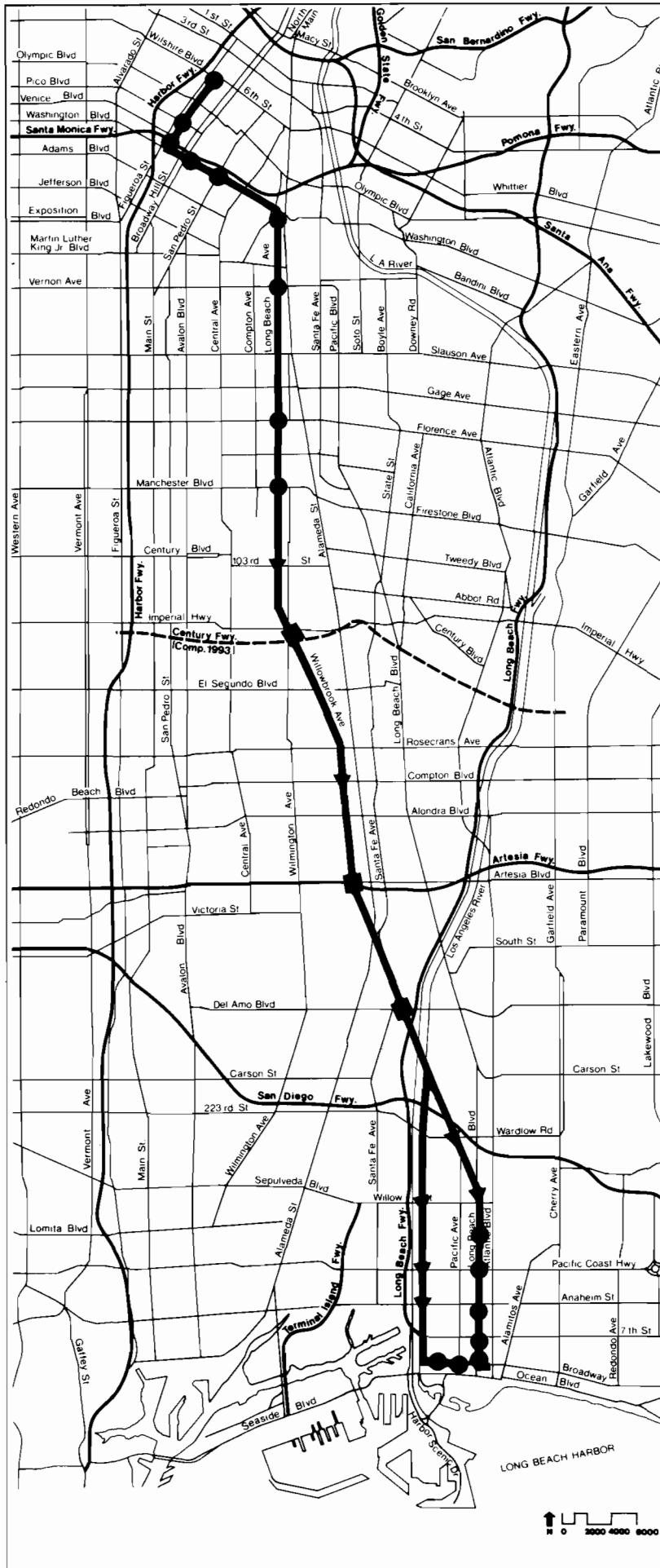
V-110 REGIONAL AIR QUALITY

V-111 Emissions

As noted in the DEIR, there are two basic sources of emissions which are of concern during the construction of the project: construction equipment powered by diesel or gasoline-fueled engines, and fugitive dust produced whenever soils are disturbed.

As a result of construction activities, the area surrounding the selected route could experience increases in emissions of carbon monoxide, reactive organic gases, nitrogen oxides, sulfur oxides, and particulates. The direct sources of these emissions include operation of machinery and equipment (powered by fossil fuels) and travel of the construction work force to and from construction sites by means of motor vehicles. Construction activities could also result in local traffic delays, detours, and congestion, which may cause additional emissions attributable to increased motor vehicle idling. Moreover, some of the construction energy demand may be met by electrical power generated within the South Coast Air Basin, which would have associated air pollutant emissions.

Dust from construction projects, called "fugitive" dust, is produced when construction machinery disturbs the existing soil and local winds make it airborne. Such emissions are generally proportional to the volume of earth being moved. This source of construction emissions is typically not a



- Station ●
- Station with Park and Ride ■
- Station with Neighborhood Park and Ride ▼

NOTE:
 ALL SUPPLEMENTAL LONG BEACH ALTERNATIVES SHOWN. FOR LB-3, OPTION A IS SHOWN. LB-6 TERMINATES AT WILLOW STREET STATION.

Figure V-1
 System Map

serious problem, because the size of particles generated tends to be larger than other forms of particulate matter, and as a result the dust settles a short distance from the source.

The LB-3 (Broadway Aerial-Modified River Route) in the supplemental alternatives would necessitate the construction of retained fill in three locations: Wardlow Road; between 16th and Anaheim streets; and at the approach to the aerial guideway as the guideway makes the turn to Broadway. Additional earth movement would take place at the Willow Street underpass, and fill would be needed for transition from the Los Angeles River bridge to the toe of the slope at the Los Angeles River levee. In addition, if the Modified River Route is the preferred alternative, earth movement activities would be required at each of the stations, the number of which would be dependent on the option selected. Also, minor amounts of dust would be produced at the two aerial stations along Broadway in Long Beach. While these additional contributions to fugitive dust are new to the original definition of the project, they are all localized and do not constitute major contributions in the context of the project as a whole.

The dust which could be created by the construction of LB-5 would have a similar impact to that outlined for LB-2 (discussed in the DEIR, May 1984). Construction of LB-6 would create less dust than any alternative discussed in the DEIR. Therefore, the conclusions reached in the original DEIR still hold: air pollutant emissions will be insignificant on a regional basis.

V-112 Mitigation Measures

As noted in the DEIR, South Coast Air Quality Management District Rules and Regulations apply to the proposed project. Rule 403, in particular, gives specific criteria for limitations on fugitive dust emissions.

Of those possible mitigation measures which can be used to limit fugitive dust production, site watering is the most frequently used. This method can reduce construction site dust emissions by as much as 50%. It is intended that this method would be used to limit fugitive dust at construction sites associated with this project. The construction contractor will be responsible for complying with construction specifications, and the South Coast Air Quality Management District has enforcement responsibility with respect to fugitive dust.

Also as noted in the DEIR, combustion emissions generated by 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

V-121 Assessment

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 Long Beach 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 Southern California region.

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" (PB/KE; M.L. Frank & Associates, 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 of the additional alignment alternatives including the three options of the Modified River Route and the two-way at-grade alternative (LB-5) proposed for Long Beach Boulevard. The total projected energy required to construct each alternative, including electrical components, is shown in Table V-12A. The least energy (90 billion BTUs) would be expended if the LB-6 (Willow Street Terminus) alternative is built as the preferred alternative. The most energy intensive option (378 billion BTUs) would involve building the LB-3 (Broadway Aerial-Modified River Route) alternative.

TABLE V-12A

ENERGY CONSUMED DURING PROJECT CONSTRUCTION

<u>Additional Alignment Alternatives, Long Beach</u>	<u>Energy Use During Project Construction (billions of BTUs)</u>
LB-3 (Broadway Aerial) Option A (3 River Stations)	378
LB-3 (Broadway Aerial) Option B (1 River Station)	358
LB-3 (Broadway Aerial) Option C (No River Stations)	340
LB-5 (Long Beach Boulevard, Two-Way)	159
LB-6 (Willow Street Terminus)	90*

* Energy use incorporated in mid-corridor segment.

Source: M.L. Frank & Associates, "Construction Energy Technical Report;" PB/KE, 1984.

V-122 Mitigation Measures

Beyond selection of a less energy-consuming alternative, mitigation of this possible level of energy use would rely principally on the following conservation and recycling efforts: (1) planning excavation activities and dump sites to minimize the number of trucks used and the hauling distances, (2) reusing existing rail steel and lumber wherever possible, and (3) 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 Long Beach segments, the direct construction expenditures are estimated to range from \$17.0 million to \$53.4 million. Within Long Beach, the LB-3(Broadway Aerial) Option A alternative would generate the highest regional expenditure. These expenditures include outlay for all aspects of the system's construction with the exception of vehicular purchase, as this would be done outside the Los Angeles region.

In addition to 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 from \$47.6 million to \$149.5 million.

Of three system alternatives considered, the third alternative in Table V-13B is projected to cost the least and therefore generate the lowest total direct and indirect regional expenditures, while the first alternative is projected to be the high-cost system alternative and would therefore have the most significant regional expenditure impact.

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 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.

TABLE V-13A

TOTAL REGIONAL ECONOMIC IMPACT OF LONG BEACH ALTERNATIVES

(Millions of 1983 Dollars)

<u>Alternative</u>	<u>Total Direct Expenditures</u>	<u>Indirect and Induced Output</u>	<u>Total Regional Impact*</u>
LB-3 (Broadway Aerial) ⁺			
Option A (3 River Stations)	\$53.4	\$96.1	\$149.5
Option B (1 River Station)	50.8	91.4	142.2
Option C (No River Stations)	46.7	84.1	130.8
LB-5 (Long Beach Blvd., Two-Way)	35.9	64.6	100.5
LB-6 (Willow St. Terminus)	17.0	30.6	47.6

* Based upon a 2.8 SCAG multiplier.

+ Assumes reverse curves through Civic Center (Option E).

Source: Southern California Association of Governments; U.S. Department of Commerce Bureau of Economic Analysis; PB/KE; 1984.

TABLE V-13B
REGIONAL ECONOMIC IMPACT OF SYSTEM ALTERNATIVES

(Millions of 1983 Dollars)

<u>System Alternative¹</u>	<u>Direct Expenditures²</u>	<u>Indirect and Induced Expenditures</u>	<u>Total Regional Impact</u>
LB-3 (Broadway Aerial) ³ Option A	\$275.8	\$496.4	\$772.2
LB-5 (Long Beach Blvd., Two-Way)	258.3	464.9	723.2
LB-6 (Willow St. Terminus)	239.4	430.9	670.3

¹ LA-2 and MC-1 are assumed as the segment alternatives for Los Angeles and the mid-corridor.

² Includes all aspects of system construction except vehicle procurement.

³ Assumes reverse curves through Civic Center (Option E).

Source: PB/KE, 1984.

TABLE V-13C
TOTAL DIRECT AND INDIRECT CONSTRUCTION EMPLOYMENT
FOR LONG BEACH ALTERNATIVES
(Person-Years of Effort)

Alternative	Direct Construction Employment ¹	Related Employment ²	Total
LB-3 (Broadway Aerial) ⁺			
Option A (3 River Stations)	481	962	1,443
Option B (1 River Station)	457	914	1,371
Option C (No River Stations)	420	840	1,260
LB-5 (Long Beach Blvd., Two-Way)	323	646	969
LB-6 (Willow Street Terminus)	153	306	459

+ Assumes reverse curves through Civic Center (Option E).

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: Construction Industry Research Board; PB/KE, 1984.

The total employment impact for the Long Beach alignments ranges between 459 and 1,443 person-years. Direct construction employment for these alternatives would range between 153 and 481 person-years. Total direct and secondary employment by system alternative, including maintenance yards and shops, is shown in Table V-13D in person-years. Assuming an even employment level over a three-year construction schedule, this would represent somewhat less than one percent of the 1980 Los Angeles County construction employment of 122,400 persons.

TABLE V-13D

TOTAL CONSTRUCTION EMPLOYMENT BY SYSTEM ALTERNATIVE

<u>System Alternative¹</u>	<u>Direct Construction Employment</u>	<u>Related Employment</u>	<u>Total Project- Related Employment</u>
LA-3 (Broadway Aerial) ² Option A	2,482	4,964	7,446
LB-5 (Long Beach Blvd., Two-Way)	2,325	4,650	6,975
LB-6 (Willow Street Terminus)	2,155	4,310	6,465

¹ LA-2 and MC-1 are assumed as the segment alternatives for Los Angeles and the mid-corridor.

² Assumes reverse curves through Civic Center (Option E).

Source: PB/KE, 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 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 (Long Beach alternatives shown) are estimated to range between \$75.4 million and \$86.9 million in 1983 dollars (California Employment Development Department). Of this total, it is estimated that between \$27.1 million and \$31.3 million would be expended for the purchase of taxable retail goods and services, resulting in total sales tax revenue generation of \$1.8 million to \$2.0 million in 1983 dollars (based on the California taxable retail sales expenditures/personal income relation estimated at 36 percent).

State and local sales tax revenue to be generated from direct construction employment for the three alternative system routes is shown in Table V-13E.

TABLE V-13E

SALES TAX REVENUE

(Millions of Dollars)

<u>Tax Revenue</u>	<u>State</u>	<u>City of Los Angeles</u>	<u>LACTC</u>	<u>Total Sales</u>
LB-3 (Broadway Aerial) ⁺ Option A (3 River Stations)	\$1.6	\$0.3	\$0.1	\$2.0
LB-5 (LB Blvd., Two-Way)	1.5	0.3	0.1	1.9
LB-6 (Willow St. Terminus)	1.5	0.2	0.1	1.8

+ Assumes reverse curves through Civic Center (Option E).

Source: PB/KE, 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, the range of federal and state income taxes to be paid by direct project construction employees is estimated in Table V-13F.

TABLE V-13F

PROJECT-GENERATED INCOME TAXES

	<u>Personal Income Tax (millions)</u>
Federal Income Taxes	\$16.2 to \$18.6
State Income Taxes	\$ 3.8 to \$ 4.3
TOTAL	\$20.0 to \$22.9

Source: PB/KE, 1984.

V-140 CUMULATIVE IMPACTS OF RELATED PROJECTS

Within the Long Beach area, there would be short-term impacts for all the potential construction projects that could occur including other transportation facilities as well as residential, commercial, and industrial developments. These short-term impacts would include the economic gains from the influx of workers into the area (employment), increased sales tax revenue, 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. These would primarily affect localized areas but would have slight regional impacts as well. 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. During construction, none of the proposed projects, either in combination or alone, is expected to cause significant adverse impacts to the regional area.

V-200 OPERATIONAL IMPACTS

V-210 TRAFFIC AND TRANSPORTATION

V-211 Los Angeles County

The transportation system in the year 2000, used for the patronage and traffic impact studies, is as described in the Regional Transportation Plan (RTP) (SCAG, 1980). According to the RTP, the system includes the Metro Rail Line busways on the I-10, I-110, I-5, and I-105 (Century) Freeways. (The I-105 Freeway was recently selected as a rail project by LACTC.) 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.

A summary of the Los Angeles County and regional mode split and ridership impacts for system alternatives with various Long Beach segments in the year 2000 is presented in Table V-21A. To analyze the system-wide impacts, LA-2 and MC-1 were used as the Los Angeles and mid-corridor segment alternatives. The largest reduction in home-work auto trips countywide (with the supplemental Long Beach alternatives) of 0.02 percent would be achieved by the LB-5 (Long Beach Boulevard, Two-Way) as the Long Beach segment of the system alternative. The countywide mode split for home-work trips (transit trips to total trips) would be 11.93 percent for the LB-5 segment to complete the system alternative, as opposed to the 11.90 percent for the No Project alternative. All the supplemental Long Beach alternatives as part of the corridor system would improve transit ridership at the county and regional levels, but by very minor amounts. All Long Beach supplemental alternatives would also increase transit capacity within the corridor for future use.

Assuming LA-2 and MC-1 as the Los Angeles and mid-corridor segments of the system, Table V-21B summarizes the year 2000 Los Angeles County and regional traffic impacts for the system alternatives, using each of the Long Beach supplemental alignments. All the supplemental Long Beach alternative alignments, when analyzed as part of the system alternative, would reduce automobile travel, but by very minor amounts. While comparisons can be made in relative terms among the Long Beach segment alternatives as part of the system, the reductions shown are insignificant on a county and regional level.

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)	LB-3 (Broadway Aerial)			LB-5 (LB Blvd. 2-Way)	LB-6 (Willow St.)
		Option A (3 River Stations)	Option B (1 River Station)	Option C (No River Stations)		
1) <u>Los Angeles County Mode Split</u>						
Home-Work Transit Trips	647,581	647,505	647,353	646,970	647,034	646,872
Home-Work Vehicle Drivers	4,132,554	4,130,783	4,130,922	4,131,208	4,131,579	4,131,129
Home-Work Auto Passenger	<u>644,092</u>	<u>643,939</u>	<u>643,952</u>	<u>644,049</u>	<u>643,614</u>	<u>644,226</u>
TOTAL HOME-WORK PERSON TRIPS	5,422,227	5,422,227	5,422,227	5,422,227	5,422,227	5,422,227
2) <u>Los Angeles County</u>						
TOTAL TRANSIT TRIPS	1,434,424	1,437,430	1,437,214	1,436,532	1,437,727	1,436,060
Increase Over No Project	0	3,006	2,790	2,108	3,303	1,636
3) <u>Region</u>						
TOTAL TRANSIT TRIPS	1,818,536	1,822,525	1,822,262	1,821,216	1,822,554	1,820,645
Increase Over No Project	0	3,989	3,726	2,680	4,018	2,109

Note: LA-2 and MC-1 are assumed as the Los Angeles and mid-corridor segments for these system comparisons.

Source: Southern California Association of Governments, 1984.

TABLE V-21B
SUMMARY OF YEAR 2000 COUNTY AND REGIONAL TRAFFIC IMPACTS OF SYSTEM¹ ALTERNATIVES

Trip Type	No Project (with Full RTP)	LB-3 (Broadway Aerial)			LB-5 ² (LB Blvd., 2-Way)	LB-6 (Willow St.)
		Option A (3 River Stations)	Option B (1 River Station at at PCH)	Option C (No River Stations)		
1) Daily Vehicle Miles Traveled (VMT)						
Los Angeles County	177,795,425	177,722,571	177,729,612	177,747,362	177,670,460	177,755,457
Change from No Project	0	-72,854	-65,813	-48,063	-124,965	-39,968
Region	305,198,343	305,091,426	305,095,441	305,125,290	305,056,340	305,142,003
Change from No Project	0	-106,917	-102,902	-73,053	-142,003	-49,836
2) Daily Vehicle Trips						
Los Angeles County	19,891,866	19,890,183	19,890,305	19,890,726	19,888,902	19,890,918
Change from No Project	0	-1,728	-1,561	-1,140	-2,964	-948
Region	35,091,382	35,088,932	35,089,024	35,089,708	35,088,128	35,090,240
Change from No Project	0	-2,450	-2,358	-1,674	-3,254	-1,142
3) Average Trip Length (miles/veh.)						
Los Angeles County	8.94	8.94	8.94	8.94	8.93	8.94
Change from No Project	0	0	0	0	-.01	0
Region	8.70	8.70	8.70	8.70	8.69	8.70
Change from No Project	0	0	0	0	0	0
4) Vehicle Hours Traveled						
Los Angeles County	6,422,411	6,388,496	6,390,489	6,400,066	6,387,382	6,404,297
Change from No Project	0	-33,915	-31,922	-22,345	-35,029	-18,114
Region	11,143,762	11,028,105	11,035,730	11,065,708	11,027,264	11,082,614
Change from No Project	0	-115,657	-108,032	-77,703	-116,498	-61,148

¹ LA-2 and MC-1 are assumed as the Los Angeles and mid-corridor segments of the system.

² The numbers used to represent LB-5 are from the original DEIR, Table V-21B (LA-2/MC-1/LB-4). Due to the size of the analysis zones of the model, all of the central Long Beach segment alternatives (LB-1, LB-2, LB-4, and LB-5) show no differences.

Source: Southern California Association of Governments, 1984; PB/KE, 1984.

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 0.04 percent. Table V-21C presents the corridor level auto trip reduction by alternative.

TABLE V-21C

YEAR 2000 HOME-WORK AUTO TRIPS WITHIN THE LB-LA CORRIDOR¹

<u>Alternative</u>	<u>Home-Work Auto Trips</u>	<u>Reduction</u>	<u>Percent Reduction</u>	<u>Transit Mode Split</u>
Year 2000 No Project	271,318	0	0	19.1 %
LB-3 (Broadway Aerial)				
Option A (3 River Stations)	270,304	-1,014	-0.4	19.49%
Option B (1 River Station)	270,408	-910	-0.3	19.47%
Option C (No River Stations)	270,484	-834	-0.3	19.44%
LB-5 (LB Blvd., Two-Way)	270,321	-997	-0.4	19.48%
LB-6 (Willow Street Terminus)	270,657	-661	-0.2	19.37%

¹ LA-2 and MC-1 are assumed as the Los Angeles and mid-corridor segments.

Note: The various alternatives present only a 0.2 percent variation in auto trip reduction within the corridor.

Source: Southern California Association of Governments, 1984.

The corridor-level transit mode split is very high when compared to the Los Angeles countywide levels. With the No Project alternative the corridor mode split would be 19.1 percent transit. The greatest mode split of 19.49 percent would be achieved with LB-3 (Broadway Aerial-Modified River Route) Option A.

A summary of the Long Beach-Los Angeles corridor-level traffic impacts for the system alternatives in the year 2000 is presented in Table V-21D. The results are similar to the countywide impacts, whereby all the alternatives would produce a small reduction in total daily vehicle miles traveled and vehicle hours traveled. The greatest reduction in VMT of 0.15 percent would be achieved with the LB-5 alternative.

TABLE V-21D
SUMMARY OF YEAR 2000 CORRIDOR TRAFFIC IMPACTS OF SYSTEM ALTERNATIVES

<u>Trip Type</u>	<u>No Project (with Full RTP)</u>	<u>LB-3 (Broadway Aerial)</u>			<u>LB-5 (LB Blvd., 2-Way)</u>	<u>LB-6 (Willow St.)</u>
		<u>Option A</u>	<u>Option B</u>	<u>Option C</u>		
1) Daily Vehicle Miles Traveled (VMT)	29,748,133	29,707,128	29,708,119	29,710,934	29,704,339	29,712,652
Change from No Project	0	-40,405	-40,014	-37,199	-43,794	-35,481
2) Vehicles Hours Traveled (VHT)	1,136,180	1,124,462	1,125,701	1,128,643	1,123,285	1,130,249
Change from No Project	0	-11,718	-10,473	-7,537	-12,895	-5,931

Note: LA-2 and MC-1 are assumed as the Los Angeles and mid-corridor segments.

Source: Southern California Association of Governments, 1984.

V-213 Impacts on Local Transit Patronage

Estimated changes in daily work-trip boardings were obtained by proportioning for the same selected bus lines as in the DEIR (see Chapter V, Section 213). The results indicated that the most significant change would occur on RTD line 56, with a 50 percent reduction in boardings for the LB-5 (Long Beach Boulevard, Two-way) alternative. Reduction in other bus routes would be less significant under each Long Beach alternative, ranging from a reduction of 18 percent for the Long Beach Boulevard, Two-Way alternative to a slight increase in ridership of about two percent with the Modified River Route alternatives.

V-214 Impacts on Major Transit Facilities

The impact of the rail transit project (with supplementary Long Beach alternatives) upon various other line haul transit systems in the region would show similar results to those identified in Chapter V, Section 214 of the DEIR. Reduction in ridership on the Interstate 5 Transitway would be about seven percent, since the I-5 Transitway and the rail project with the supplementary Long Beach alternatives would offer competing service to southeast Los Angeles County. The reduction in the Harbor Transitway patronage would range from two to seven percent, with the Modified River Route alternatives showing a greater reduction than either the LB-5 (Long Beach Boulevard, Two-Way) or the LB-6 (Willow Street Terminus) alternatives due to competing service with the LRT project in the South Bay area. Ridership impacts on the Century Freeway Transitway would not vary significantly for any alternative, since the transitway and Rail Transit Project would act as reciprocal feeders for each other. Daily ridership on the Century Transitway would show a minor increase of about 2 percent with the LB-5 (Long Beach Boulevard, Two-Way) alternative.

V-220 AIR QUALITY

The analysis of regional air quality impacts associated with the supplemental alternatives is based on a proportioning technique, with the proportion values calculated based on the results of previous analysis done for the DEIR. Using the results of this previous analysis, the following factors were found:

$$\begin{array}{l} \text{ROG} = 1.2039 \times 10^{-6} \text{ tons/day/VMT} \\ \text{NOX} = 1.1120 \times 10^{-6} \text{ " } \\ \text{CO} = 12.7736 \times 10^{-6} \text{ " } \\ \text{SOX} = 0.0797 \times 10^{-6} \text{ " } \\ \text{TSP} = 0.2754 \times 10^{-6} \text{ " } \end{array}$$

Using these factors and applying them to the VMT estimates associated with each of the supplemental alternatives yields the regional and corridor burden estimates shown in Table V-22A. A review of this table leads to the conclusion that none of the supplemental alternatives have a significant impact at the regional level when compared to the no project alternative.

TABLE V-22A

COMPARISON OF YEAR 2000 MOTOR VEHICLE TRAVEL AND
EMISSIONS AMONG SUPPLEMENTAL ALTERNATIVES

Light-Duty Motor Vehicle Travel and Emission Characteristics	Year 2000 No Project	LB-3 (Broadway Aerial)			LB-4 (Similar To LB-5)	LB-6 Willow Street
		Option A 3 River Stations	Option B 1 River Station	Option C No River Stations		
<u>Regional Characteristics</u>						
VMT (000 miles/day)	305,198	305,177	305,178	305,184	305,028	305,188
ROG (tons/day)	367.43	367.40	367.40	367.41	367.22	367.41
NOX (tons/day)	339.38	339.36	339.36	339.36	339.36	339.37
CO (tons/day)	3,898.48	3,898.21	3,898.22	3,898.30	3,896.31	3,898.35
SOX (tons/day)	24.32	24.32	24.32	24.32	24.31	24.32
TSP (tons/day)	84.05	84.05	84.05	84.05	84.01	84.05
<u>Corridor-Level Estimates (9.0% of Regional Total)</u>						
VMT (000 miles/day)	27,476	27,466	27,466	27,466	27,433	27,467
ROG (tons/day)	33.15	33.07	33.07	33.07	33.00	33.07
NOX (tons/day)	30.49	30.54	30.54	30.54	30.50	30.54
CO (tons/day)	351.80	350.84	350.84	350.84	350.10	350.85
SOX (tons/day)	2.19	2.19	2.19	2.19	2.18	2.19
TSP (tons/day)	7.57	7.56	7.56	7.56	7.55	7.56

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

V-230 ENERGY

The analysis of regional energy impacts in the DEIR indicated that all of the rail transit alternatives would have a small, positive impact on regional energy use in the year 2000. That conclusion was true for system alternatives ranging from 54,400 (baseline) to 76,600 patrons. The regional energy impacts analysis conducted for the DEIR consisted of computer-generated energy consumption estimates for each of the transit systems modeled as part of patronage work, together with attendant vehicular use, both light duty vehicles and buses. These estimates are produced through the use of the DTIM model, which takes patronage model output and converts it into energy consumption estimates. Use of the DTIM model is dependent upon completion of a highway assignment. Differences in energy usage on a regional basis between the original alternatives and these alternatives is insignificant. Highway assignment was not completed for the supplemental alternatives because of cost and time constraints. The regional energy impacts for these supplemental alternatives would be very similar to those impacts for the original alternatives because the patronage and auto diversion estimates are very similar to the original baseline alternative (LA-1/MC-1/LB-4) estimates.

To support this conclusion, two comparisons are drawn between the supplemental alternatives and the original alternatives in the DEIR: first, a comparison of annualized energy requirements for system alternatives and, second, an estimate of automobile fuel consumption.

Table V-23A compares annualized light rail transit energy requirements of the original baseline and LB-3 alternatives with the supplemental alternatives. LB-5 (Long Beach Boulevard, Two-Way) and LB-6 (Willow Street Terminus) have lower annualized energy requirements than either LB-4 or LB-3. Of the Modified River Route alternatives, LB-3 Option C (No River Stations) exceeds the LB-4 estimate by three billion BTUs, about one percent. Options A and B (3 River Stations and 1 River Station, respectively) exceed the baseline and original river route estimates by 12-30 billion BTU (4-10 percent). Table V-23B in the DEIR reported total year 2000 transportation energy requirements as 823,426 billion BTU without the project and 822,088 with the baseline (LA-1, MC-1, LB-4) alternative. Light rail energy requirements represented .03 percent of regional energy demand, so a variation of 4 to 10 percent is insignificant on a regional basis.

TABLE V-23A
 YEAR 2000 ANNUALIZED LIGHT RAIL TRANSIT ENERGY REQUIREMENTS
 (in Billions of BTUs)

Component	LA-1/MC-1/LB-4 (Baseline)	LA-1/MC-1/LB-3 (Original River Route)	LA-2/MC-1/LB-3 (Broadway Aerial)			LA-2/MC-1/LB-5	LB-6 ⁴ (LA-2/MC-1)
			Option A ¹	Option B ²	Option C ³		
Vehicle Propulsion	205	199	216	203	198	180 ³	143
Vehicle Maintenance	9	9	9	9	9	8	6
Vehicle Manufacture	7	8	8	8	8	6	5
Guideway Construction	37	46	41	41	40	37	33
Station Operation	<u>22</u>	<u>19</u>	<u>36</u>	<u>31</u>	<u>28</u>	<u>26</u>	<u>25</u>
TOTAL	280	281	310	292	283	257	212

¹ 3 additional stations.

² 1 additional regional station with park-and-ride.

³ Travels in reserved median.

⁴ Ends with MC-1.

Source: PB/KE, 1984.

For the second comparison, automobile fuel consumption, a unit fuel consumption factor (0.04187 gallons of gasoline/VMT) was calculated, based on DEIR estimates of automobile fuel consumption associated with prior system alternatives. This factor was then applied to the regional VMT estimates attributable to each of the supplemental alternatives, resulting in motor vehicle fuel consumption estimates. This approach assumes that fuel consumption attributable to buses and trucks and that associated with LRT propulsion will remain approximately equivalent with estimates produced for the DEIR. This assumption is valid, given the fact that the general scope of the project is not significantly altered by the supplemental alternatives. Using the approach described above, automobile fuel consumption estimates were calculated for the supplemental alternatives which ranged from a low of 12,777,469 to a high of 12,778,239 gallons of gasoline consumed daily, depending upon the alternative selected. The expected comparable figure for the No Project alternative is 12,779,689 gallons of gasoline per day. This represents a maximum variation of 0.02% and therefore an insignificant impact is found on regional energy consumption.

V-240 LAND USE, POPULATION, AND HOUSING

At the regional level, land use and population changes as a result of the supplemental Long Beach segment alternatives are projected to be minimal. A similar conclusion was reached for the original Long Beach segment alternatives. The potential employment and population growth induced by the project have been projected by SCAG to be about 1.0 percent above year 2000 growth estimates without the project. (Chapter IV, Section 121 of the DEIR outlines the methodology used in reaching this conclusion.)

V-250 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 the DEIR. Of those described, there are three projects that in combination with the Rail Transit Project would have important effects on travel patterns in the Los Angeles Metropolitan Region. These are the Century Freeway, the Harbor Freeway Transitway, and Metro Rail. By using the Regional Transportation Plan as a basis for evaluation, these projects and their effects are included in this supplemental analysis. All these transit projects, including the Rail Transit Project, do not so much induce growth or change as they accommodate planned development within the areas served. One of the impacts of the Long Beach-Los Angeles 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 PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

VI-100 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, and business disruption in Long Beach. The most significant unavoidable operations impacts would be noise, vibration, traffic disruption, reduced access, reduction in property values, and geologic hazards.

VI-200 CONSTRUCTION IMPACTS

VI-210 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 location of aerial guideway columns (LB-3 Broadway Aerial).

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.

VI-220 TRAFFIC DISRUPTION/REDUCED ACCESS

During the construction period, the length of time required to traverse the corridor would increase. Reduced accessibility to some residences, businesses, and public facilities along portions of all proposed alternatives would also occur. Automobile access would be impaired as a result of temporary street closures and occasional congestion resulting from spillover onto adjacent streets (detours). Total street closure, except for local access, could occur at times for up to an entire block for at-grade sections in downtown Long Beach. The Broadway sections would inherently be less

problematic because columns would be placed at approximately 80-foot intervals away from street intersections. Impacts along the Los Angeles River would be limited primarily to intersections with Willow Street (where a new underpass would be constructed) and other major cross-streets (Hill, Anaheim, and Pacific Coast Highway).

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.

VI-230 VISUAL QUALITY

On all alternatives the visual intrusion of incompatible construction activities and equipment would contribute to a general sense of disruption. Visual impacts would be most intense near aerial segments (due to high-level construction activity).

Visual impacts during construction would be temporary in nature and no practicable mitigation would be available.

VI-240 LOSS OF TREES

Alternative LB-5 would remove 185 mature trees north of 7th Street to Willow Street. Some of these trees would be replaced and/or relocated, especially at station areas. However, due to limited space available within the Long Beach Boulevard median and the daily operation of the rail transit project, many trees would be permanently lost, unless the "optional" configuration for widening of the Boulevard is adopted, at an approximate additional cost of \$2.5 million.

VI-250 BUSINESS (Disruption of Areas)

There would be some temporary adverse impact on the retail and commercial activity of establishments located on streets used by the rail transit project, specifically the 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 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:

- o maintenance of vehicular and pedestrian traffic wherever and whenever possible;
- o scheduling of activity to minimize total time required and to allow intervals when construction is not occurring;
- o contractor performance of specific actions and monitoring to minimize annoyance due to noise and dust and to ensure that traffic is being maintained;
- o provision of special signing or other devices for business establishments to compensate for loss of visibility or reduction in access.

Total mitigation would not possible and some loss of sales would be probable. Total impact on each of the areas would be relatively insignificant; however, impact on specific streets, blocks, or individual establishments might be considerable.

VI-260 BUSINESS (Displacement)

The non-residential private property which would require relocation if acquired on behalf of this project is limited to two parcels. One is an industrial parcel along the river portion of all LB-3 (Broadway Aerial) options and the other is a commercial property which would be taken if LB-6 (Willow Street Terminus) were constructed.

Three power substation sites of approximately 6,000 square feet each would need to be located along the Modified River Route. Every effort would be made to place these substations on the parcels already scheduled for acquisition. For LB-5, two power substations would need to be located along the alignment; because several vacant parcels and commercial parking lots exist in the vicinity, no structure should be affected.

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, but at its discretion, LACTC would consider additional mitigation beyond the requirements of law. Comparable space at an affordable rent might not be available. If the business chose 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.

VI-270 LOSS OF HOUSING

The selection of any alternative along the Los Angeles River in Long Beach would require acquisition of dwelling units and displacement of residents under Options A, B, and C. All options would displace approximately six people in two units. Alternatives LB-5 and LB-6 would not effect any housing units.

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 Section 7260 et seq). This act provides for assistance in locating replacement 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 the purchase differential, increased interest costs, and incidental costs incurred in purchasing a replacement home. Moving costs up to \$5000 are also paid for all households displaced. If displaced persons cannot be accommodated within the conditions of the Relocation Assistance Act, then "Last Resort Housing" provisions would be implemented, allowing 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 or through the discretion of LACTC. A Relocation Assistance Plan will be produced by LACTC after an alternative is selected.

VI-300 OPERATIONS IMPACTS

VI-310 NOISE AND VIBRATION

Due to lower ambient noise levels along any of the Modified River Route alternatives (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.

VI-320 TRAFFIC DISRUPTION

There would be an increase in the amount of traffic and pedestrian activity on surface streets around station sites and park-and-ride lots, which may cause some congestion during the peak commuter periods. All alternatives would have similar impacts.

VI-330 VISUAL QUALITY

The aerial segment along Broadway in downtown Long Beach would cause shadowing of the street and sidewalk. It is also possible that property values will be enhanced. Mitigation measures would focus on the location of the aerial alignment within the street right-of-way. Aside from selecting another corridor and/or locating the alignment at-grade, this would be an unavoidable adverse impact. The location of the Civic Center station would permanently change the visual setting and character of Lincoln Park by displacing park land. The degree of change would depend on the amount of joint development potential utilized at the station area. Aside from relocating the station area, no other practical mitigation would be available.

VI-340 REDUCTION IN PROPERTY VALUES

The property values adjacent to aerial segments in downtown Long Beach might be adversely affected (Broadway). It is also possible that property values would be enhanced. 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.

VI-350 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 while near or using the rail transit during a major earthquake. This hazard would occur in all alternatives.

Appendix

1

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APPENDIX I
RELATED PROJECTS

The related projects remain as published in the DEIR with the following corrections to the write-up for the Interstate 105 Transit Corridor Project and with the addition of the Terminal Island Coal Facility.

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 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~~ a light rail facility. ~~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 rail 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:

Terminal Island Coal Facility

RESPONSIBLE AGENCIES:

Los Angeles Harbor Department, Army Corps of Engineers.

DESCRIPTION/LOCATION:

This 150-acre transshipment facility would be located on the southern part of Terminal Island immediately to the east of Earl Street. The Function of this facility would be to transfer coal, or possibly other dry bulk items, from unit trains to cargo ships. When completed, the terminal would be capable of transferring 15 million tons of coal annually.

RELATIONSHIP TO LB-LA RAIL TRANSIT PROJECT:

A number of alternative access routes are being considered to accommodate the additional coal train passages expected as a result of the proposed facility. The preferred alternative is a consolidation plan proposed by SCAG which would route all SPTC, UP, and ATSF rail traffic along the current SPTC San Pedro Branch. If the access route selected parallels or intersects the proposed LB-LA line, significant auto traffic impacts may result with the increased frequency of rail freight movement.

STATUS:

A draft EIS/EIR is being prepared and should be ready for distribution in early 1985.

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 volumes

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 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 fahrenheit

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 that 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 track, 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

LBT:
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

NO_x (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 PM and 6 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 and 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 (RTD):

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

Stub-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 who 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 unincorporated 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 and 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

BIBLIOGRAPHY

The Bibliography remains as published in the DEIR with the following additions:

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Appendix

4

APPENDIX 4
NOTICE OF PREPARATION

LACTC

Los Angeles County
Transportation
Commission
354 South Spring Street
Suite 500
Los Angeles
California 90013
(213) 626-0370

September 26, 1984

Dear Sir:

SUBJECT: Notice of Preparation of a Supplement to
the Draft Environmental Impact Report on the
Long Beach/Los Angeles Rail Transit Project

The Los Angeles County Transportation Commission (LACTC) as lead agency has prepared a Draft Environmental Impact Report (DEIR) describing the environmental effects and consequences of the twenty-two mile proposed light rail system between downtown Los Angeles and downtown Long Beach. During the review and comment period on this document, which closed on July 16, 1984, significant public testimony has led the LACTC to decide to prepare a supplement to the DEIR for three additional alternatives in the City of Long Beach.

We will need to know the views of your agency as to the scope and content of the environmental information which is necessary for your agency to pursue its statutory responsibilities in connection with the additional alternatives for the proposed project. Your agency, as a responsible agency, will need to use the DEIR and its supplement prepared by LACTC when considering issuance of permits or other approval for the project. If your agency is not a responsible agency as defined by CEQA, we would still request your participation in defining the scope and content of the supplement document.

The description of the additional alternatives designated as LB-3 B/D, LB-5 and LB-6 including their configurations, locations, and probable environmental effects, are contained in the attached materials. If additional information is needed, a copy of the summary or the complete DEIR may be requested from the LACTC office.

Due to the time limits mandated by state law, your response must be sent at the earliest possible date and not later than thirty days after receipt of this this notice.

September 26, 1984
Page 2

Please send your response to Ms. Sharon Robinson Sivad-el, Manager of External Affairs, at the LACTC. Please include the name of the appropriate contact person in your agency for continued environmental coordination.

Thank you for your continued cooperation.

Sincerely,

A handwritten signature in cursive script that reads "Daniel S. Caufield". The signature is written in black ink and is positioned above the typed name and title.

DANIEL S. CAUFIELD
Program Director,
Long Beach-Los Angeles
Rail Transit Project

DSC:gb

Enclosure

SUPPLEMENTAL EIR OVERVIEW

BACKGROUND:

The Long Beach-Los Angeles Rail Transit Project is the first light rail corridor to be undertaken as part of a transit improvement program by the Los Angeles County Transportation Commission (LACTC). This program is funded by a one-half percent sales tax increase approved by county voters in 1980. 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.

The project has undergone preliminary engineering and a Draft Environmental Impact Report (DEIR) was issued by the LACTC on May 30, 1984. Since that date a series of public hearings have been held, and numerous written comments have been received. In the Long Beach area, many comments requested that additional or modified alignment alternatives be examined. On August 15, 1984, the LACTC authorized preparation of a supplement to the DEIR to analyze three additional alternatives in the Long Beach area.

PROJECT DESCRIPTION:

The rail project, as defined in the DEIR, is being proposed 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 unincorporated county areas of Florence-Graham, Willowbrook, and Dominguez Hills. The line is expected to carry between 50,000 and 70,000 passengers per day by the year 2000.

Proposed alignments in downtown Los Angeles and the mid-corridor will remain as discussed in the DEIR. Three additional alternatives in the downtown section of Long Beach will be studied in the Supplemental EIR. These routes, known as LB-3 (B/D), LB-5, and Willow Terminus are described as follows:

A. LB-3 (B/D) MODIFIED RIVER ROUTE

One element of the concept for the modified River Route is to have three additional stations over those shown in the

DEIR (Figure 1). These would be located at Willow Street, Pacific Coast Highway (PCH) and Anaheim Street. As conceptualized these three stations would have neighborhood sized parking areas (30 to 50 spaces), bus-to-train transfer facilities and a kiss-and-ride drop off area.

There are two additional options in regards to stations to be studied for the Supplement. The first would have only one additional station at PCH. This station, if a single station, would incorporate a major mode change facility using the land (approximately 9 acres) which is proposed to be sold as excess by the City of Long Beach. The size of the parcel would allow a major park-and-ride and possible joint development opportunities. The second additional station option is to not add any stations.

The other element of the modified River Route would be an aerial light rail guideway connection into downtown Long Beach. There are two major options of having the aerial section enter the downtown area to be studied for the Supplemental EIR. The primary option would run along the south side of Broadway with a diagonal terminal station at the Civic Center, oriented toward the 1st Street Transit Mall.

The secondary option under consideration would , with a pair of curves, penetrate the northeast corner of the World Trade Center (WTC) site and the center of the Civic Center Plaza.

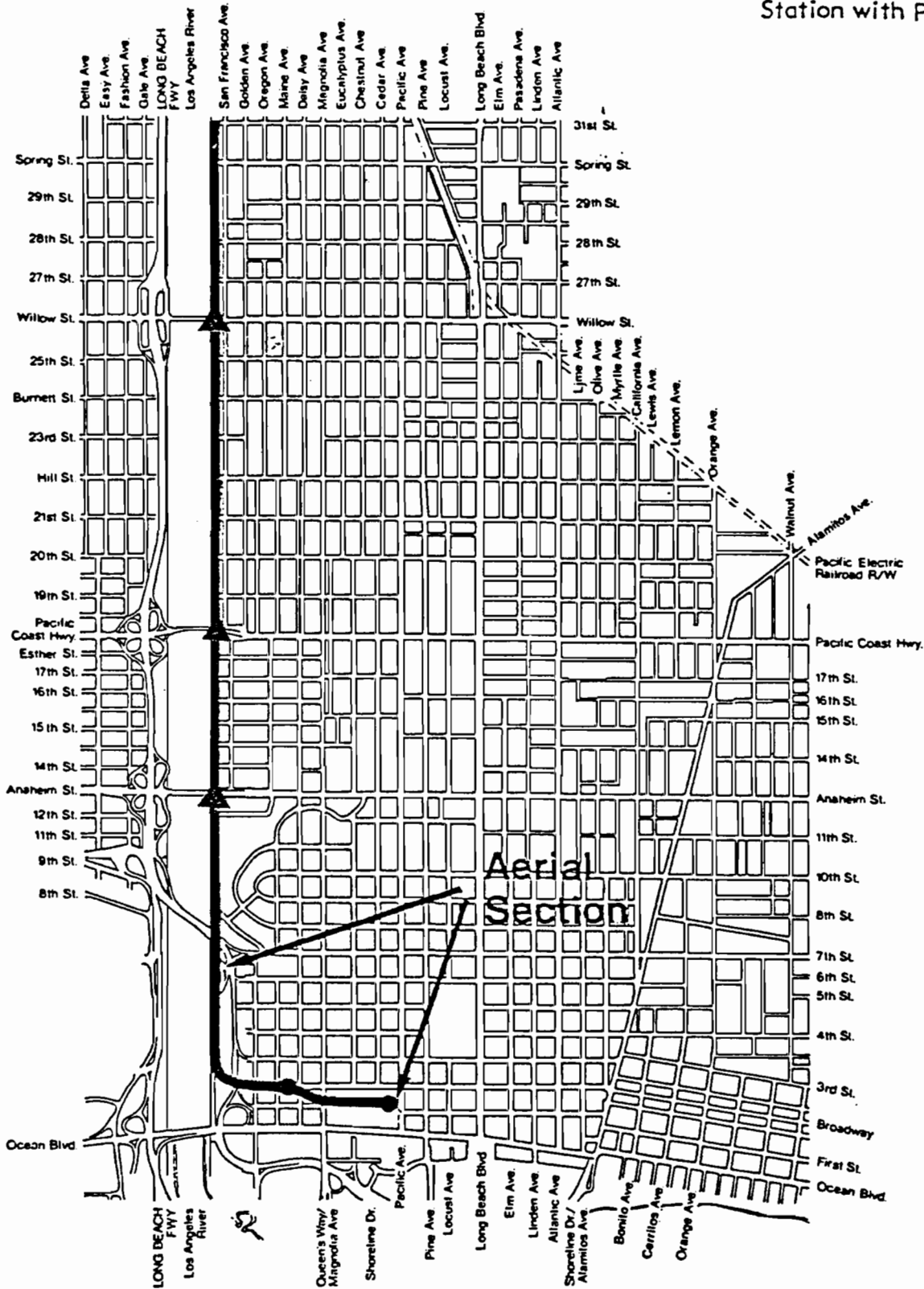
For both the aerial guideway alignment options, the portion of the guideway along Broadway might be placed in the public street right-of-way, or off of the public street right-of-way along the south side of Broadway. The latter placement would bring the guideway within five feet of the Public Safety Building at Magnolia, would require the reconstruction of the north side of City Hall Parking Structure, and would require a joint development agreement with the developers of the World Trade Center.

There would be two downtown stations, one located just to the west of Daisy Street (at the World Trade Center) and the other at the Civic Center terminus. The terminal station would either involve a minimal redesign of Lincoln Park to incorporate the aerial station, or alternately, the

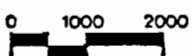
NOTE:
Joins Mid-Corridor Alignment
At Los Angeles River Bridge.

Station ●

Station with Park and Ride ▲



Graphic Scale in feet



River Route

Figure 1

city could choose to design a major revision of the park and plaza to create joint development potential.

B. LB-5: LONG BEACH BOULEVARD, TWO-WAY

For discussion and evaluation in the Supplement to the EIR, this alignment would be in a reserved median at the center of the street running north and south on Long Beach Boulevard (Figure 2). Stations would be located at Hill Street, Pacific Coast Highway, Anaheim Street, between 6th and 7th Street and at 1st Street. The tracks can be placed in exclusive reservation and all traffic lanes maintained without widening the street curbs, if landscaping is provided only at the station areas (where curbs have to be repositioned anyway). Provision of landscaping along the reserved median between stations would require repositioning of curbs, light poles, ect. along the entire length of the street.

The turnback tracks will be on 1st Street, east of the Transit Mall, and would require signal protection for the light rail train movements.

Movements of the light rail trains from the Willow Street Station onto the Long Beach Boulevard reservation would also be by protected signal.

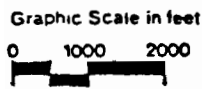
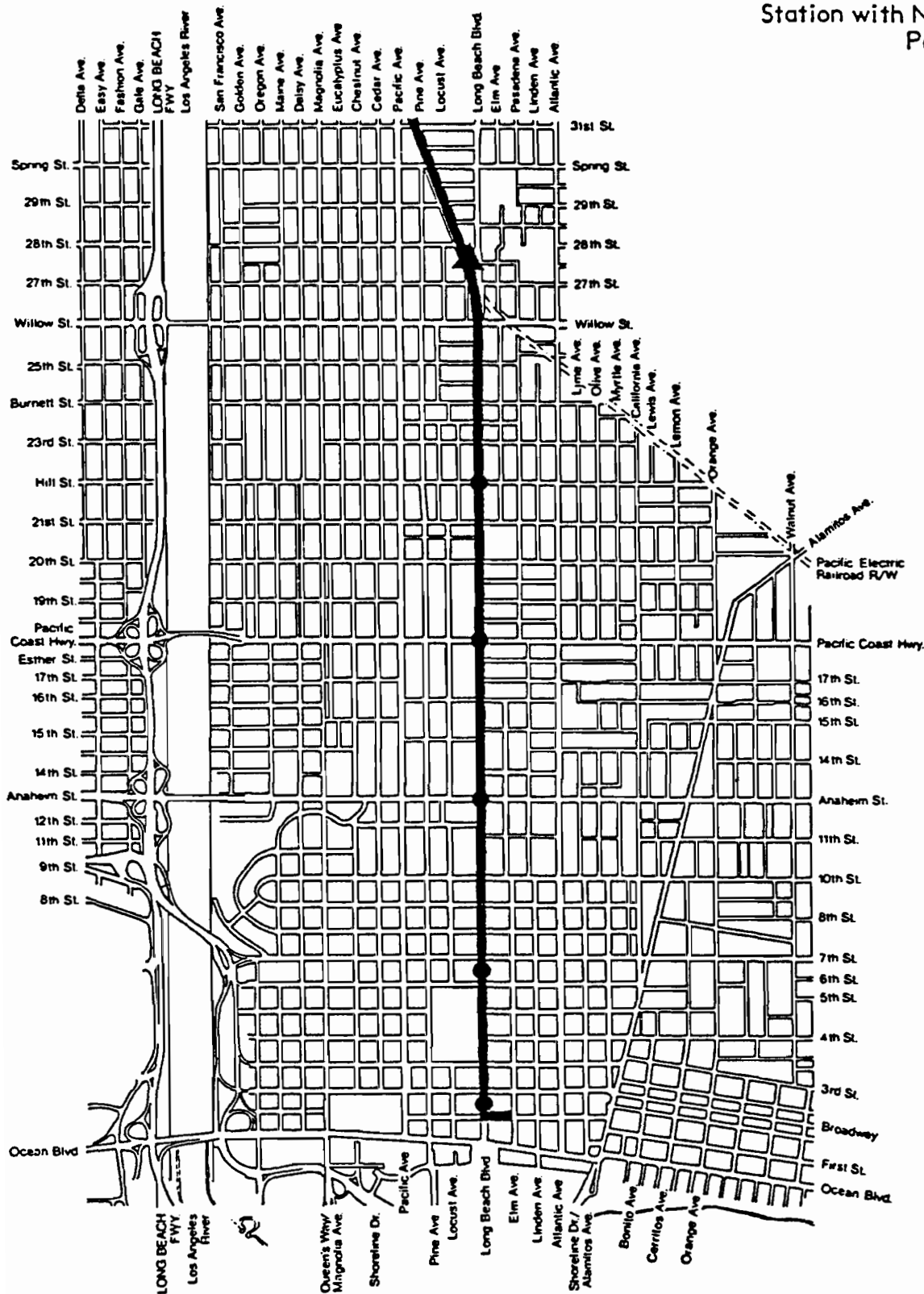
C. WILLOW TERMINUS

Due to the heavy auto, light rail, bus and pedestrian activity which can be expected at the Willow Street station if this station is the terminus of the line, even as a temporary measure (5 to 15 years), a transportation center would be developed (Figure 3). Such a center would include adequate bus bays (both on and off-street), on-site turn around capability for buses terminating at the center, a moderately large parking area, good access, and provision for kiss-and-ride drop off.

Through bus routes on Long Beach Boulevard and Willow Street would stop at bus turnouts on-street. The design criteria will be to maintain two lanes for through traffic.

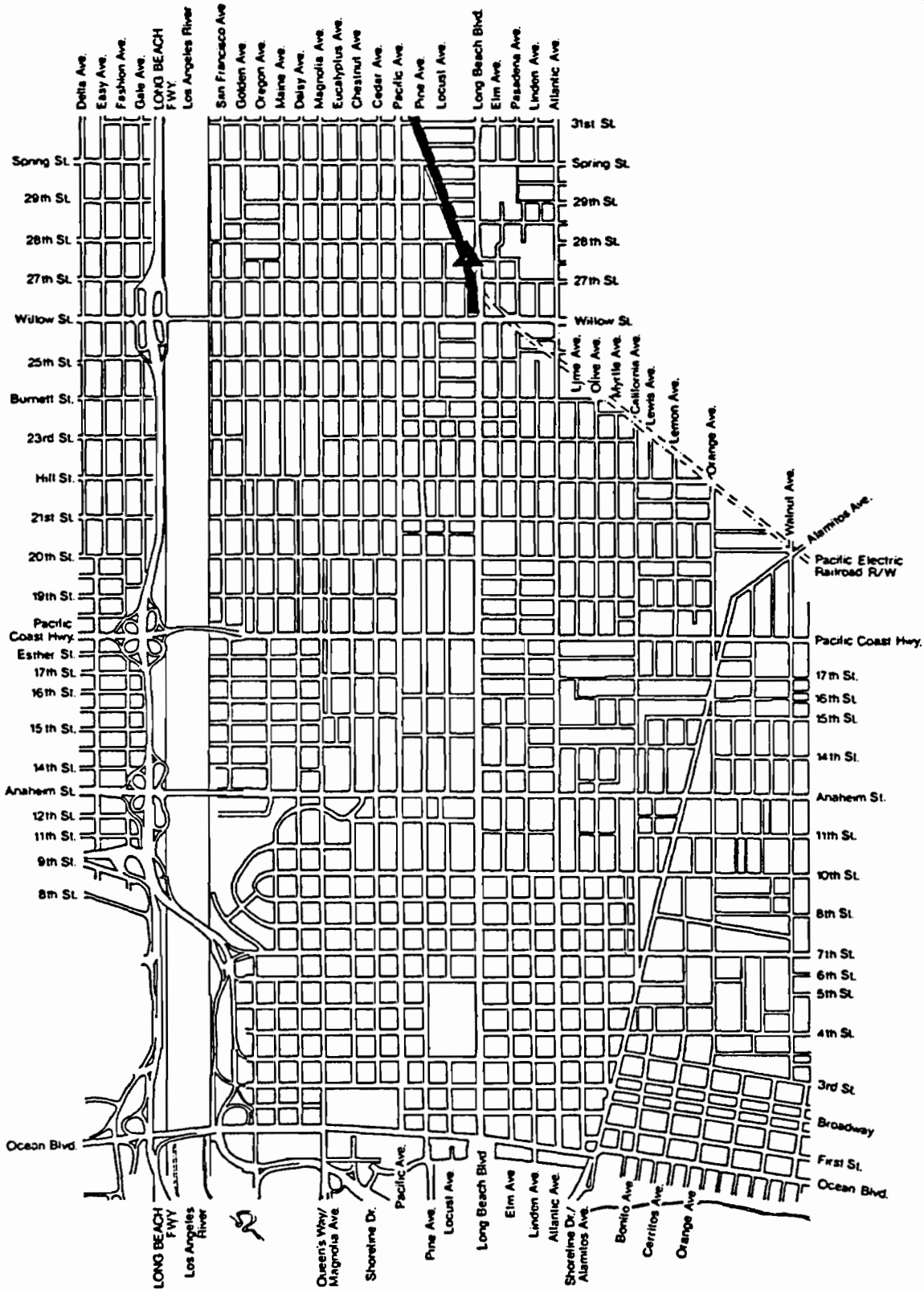
Station ●

Station with Neighborhood Park and Ride ▼

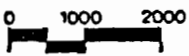


Long Beach Blvd. Two-Way

Figure 2



Graphic Scale in feet



Willow St. Terminus

Figure 3

Northbound buses would need a protected signal to access the station.

PROBABLE ENVIRONMENTAL EFFECTS

Environmental effects may be found in the following areas:

Air - the DEIR has shown no regional air quality impacts. There may be microscale impacts due to cross-over traffic automobile delays.

Noise - construction activities may result in a temporary increase in noise levels above existing ambient conditions. Changes in station locations may result in localized noise increases.

Land Use - land use changes may result from the implementation of the modified alternatives.

Economic - construction and/or operation of the light rail line on Long Beach Boulevard may affect the businesses located on that street.

Natural Resources - there will be a commitment of natural resources (e.g., wood, gravel, and concrete) to the construction of the project, including the modified alternatives discussed in this supplement.

Transportation and Circulation - Patterns of vehicle and pedestrian circulation in Long Beach may be altered as a result of this project. There is the potential for minor additional cross-traffic conflicts and delays along the Long Beach Boulevard alternative.

Utilities - construction may result in the movement and/or replacement of some utilities.

Cultural Resources - there is a potential to impact historic buildings along Broadway.

The supplement to the DEIR will be focused on the above areas. Other potential areas of environmental significance, such as: earth, water, population, secondary development, and navigable waterways and coastal zone have been found not to be affected by the proposed

supplement or are covered adequately in the main document (i.e., the DEIR on the LB-LA Rail Transit Project) and will not be discussed in the supplement.

Revised 9/24/84

**APPENDIX 4
SUMMARY OF RESPONSES**

<u>Agency</u>	<u>Date</u>	<u>Signature</u>	<u>Environmental Comments</u>	<u>Other Comments</u>	<u>Location in Supplement to DEIR</u>
<u>Federal</u>					
Federal Highway Administration	10/18/84	Bruce E. Cannon	Have reviewed proposal, no comments. Request copy of document be sent when available.		
Urban Mass Transit Administration	10/10/84	Brigid Hynes-Cherin	Not a participant in the process; however, wishes LACTC to consider the relationship of the alternative stations and routes to existing bus system as well as other proposed rail systems.		See Chapter I, Section 220; Chapter II, Section 320; Chapter III, Section 320; Chapter IV, Section 320; and Chapter V, Section 213 and 214.
<u>State</u>					
Department of Aging	10/16/84	Alice Gonzales	No comments. Not a "responsible agency."		
Department of Health Services	10/26/84	Jerome S. Lukas	Enclosed are guidelines for noise study reports, for information and assistance.		See Chapter II, Section 140; Chapter III, Section 140; Chapter IV, Section 150; and Chapter VI, Sections 210 and 310.
Department of Transportation (Caltrans)					
Division of Transportation Planning	10/19/84	D.L. Wieman	Comments will be made by Los Angeles office (District 7).		

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

<u>Agency</u>	<u>Date</u>	<u>Signature</u>	<u>Environmental Comments</u>	<u>Other Comments</u>	<u>Location in Supplement to DEIR</u>
(Caltrans) cont'd. District 7	10/19/84	W.B. Ballantine	<p>1) Document should address frequency and length of trains and anticipated queues on Pacific Coast Highway (PCH). The geometrics (stopping sight distance) on PCH must be adequate.</p> <p>2) Document the demand for parking for both River Route Options (1 station vs. 3 stations) to ensure an appropriate amount of parking at PCH.</p> <p>3) Discuss the Queue/Time Delay with interconnect at Long Beach Blvd. for LB-5.</p>		<p>1) Station will be grade separated from Pacific Coast Highway. See Section I - Project Description.</p> <p>2) See discussion on station parking, Chapter IV, Section 330.</p> <p>3) See Chapter IV, Section 312.1.</p>
Department of Water Resources	10/11/84	Jack J. Coe	<p>1) Document should discuss and consider potential impacts on the water resources.</p> <p>2) Prevention of sedimentation, debris or other restraint on floodways or drainage should be considered during construction, operation, and maintenance.</p>		See Chapter II, Section 120; Chapter III, Section 120; and Chapter IV, Section 120.

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

<u>Agency</u>	<u>Date</u>	<u>Signature</u>	<u>Environmental Comments</u>	<u>Other Comments</u>	<u>Location in Supplement to DEIR</u>
UCLA	10/08/84	Susan Colby	All areas schedule for EIR review should be subjected to archival research.		Long Beach areas were researched and surveyed for DEIR. As no new alignment areas are being proposed, no new survey is necessary.
<u>County</u>					
Department of Regional Planning	10/09/84	Norman Murdoch	Scope and content of the Supplement should be consistent with that of the original DEIR.		As much as possible the format and analysis is similar to the original DEIR.
Road Department	10/25/84	T.A. Tidemanson	Supplemental covers area outside county jurisdiction; no comments.		
County Sanitation Districts	10/29/84	Marvin Holmes		Contact District regarding easements if needed in relation to district facilities.	
<u>Cities</u>					
Long Beach (City Manager)	10/22/84	John E. Dever	1) <u>LB-3 Modified River Route</u> a) Aesthetic impacts of the aerial guideway on Broadway at the Long Beach Freeway entrance. Impacts of the structure and operations on the Public Safety Building, Civic Center parking structure, and Lincoln Park.		a) See Chapter III, Section 240, and Chapter IV, Section 240.

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

<u>Agency</u>	<u>Date</u>	<u>Signature</u>	<u>Environmental Comments</u>	<u>Other Comments</u>	<u>Location in Supplement to DEIR</u>
Long Beach (cont'd)			<p>b) Also, consider all impacts of aerial pedestrian crossing of Pacific Ave.</p> <p>2) <u>LB-5 (LB Blvd., Two-Way)</u></p> <p>a) Concerned over removal of median landscaping, addition of overhead wires, and potential negative visual impacts on mall south of 7th.</p> <p>b) Also of major concern is the impact of the rail project on traffic along Long Beach Blvd. Include findings of current traffic studies</p>		<p>b) Aerial pedestrian crossing not part of project.</p> <p>a) See Chapter III, Section 240; and Chapter IV Section 240.</p> <p>b) See Chapter II, Section 300; Chapter III, Section 300; and Chapter IV, Section 310.</p>
Long Beach Fire Department	10/15/84		Listing of contents for Supplement to DEIR.		Documents include all of list with the exception of possible future extensions in Long Beach. None are contemplated at this time.

APPENDIX 4 (Continued)

SUMMARY OF RESPONSES

<u>Agency</u>	<u>Date</u>	<u>Signature</u>	<u>Environmental Comments</u>	<u>Other Comments</u>	<u>Location in Supplement to DEIR</u>
City of Los Angeles - Bureau of Engineering	10/17/84	Phil King	As the proposed document pertains to Long Beach, no comments.		
City of Los Angeles Police Department	10/18/84	J.D. Jones		Additional alternatives do not require any addi- tional information for Police Dept. to meet its responsibilities.	
City of Los Angeles - Port of Los Angeles	10/16/84	W. Calvin Hurst	No additions to scope and content as contained in Notice of Preparation		
Signal Hill	10/29/84	Christine A. Shingleton	Please use comments on DEIR submitted on July 17,1984 as response to Notice of Preparation for Supplement to DEIR.		Comments on DEIR will be responded to in the Final EIR.

Appendix



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APPENDIX 5

LIST OF PERSONS/ORGANIZATIONS CONTACTED

The list of persons and organizations contacted remains as was published in the DEIR with the following additions:

Barton-Aschman Associates, Sandy Miller

Long Beach Transit Company

Appendix

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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; Chris Anderson, Robert Bramen, Mike Davis, Darius Irani, Zelda Laskowski, Steve Line, Joe McTague, and Robert C. Schaevitz.

MYRA L. FRANK & ASSOCIATES, Los Angeles and San Marino, CA.

Responsible for EIR management, coordination and preparation; housing and community services; historic and cultural resources; and portions of energy and air quality analyses. Key personnel include:

Myra L. Frank, Principal-in-Charge; Lea Chartock, Roger Hatheway, Joan A. Kugler, Gary Petersen, and William P. Wickham.

SEDWAY COOKE ASSOCIATES, San Francisco, CA.

Responsible for land use, population, and visual quality analyses and portions of graphic design. Key personnel include:

Nicole Chapman, Neil Hart, Rod Jeung, and Janet Parrish.

BOLT BERANEK & NEWMAN, INC., Canoga Park, CA.

Responsible for noise and vibration analyses. Key personnel include:

Myles A. Simpson

CALIFORNIA DEPARTMENT OF TRANSPORTATION, Los Angeles, CA.

Responsible for biotic resources analyses. Key personnel include:

Dan Butler and John Sully.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS,
Los Angeles, CA.

Responsible for patronage estimations and projections. Key personnel include:

Richard Spicer, Hong Kim, and Murray Goldman.

KENNARD DESIGN GROUP, Los Angeles, CA.

Responsible for conceptual design work for the various stations types. Key personnel include:

Robert Kennard and Mike Darmento.

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 and Javad Saebfar.

Production Assistants:

Michelle Burton, Gerry Kingsbury, Ruth Rigney.