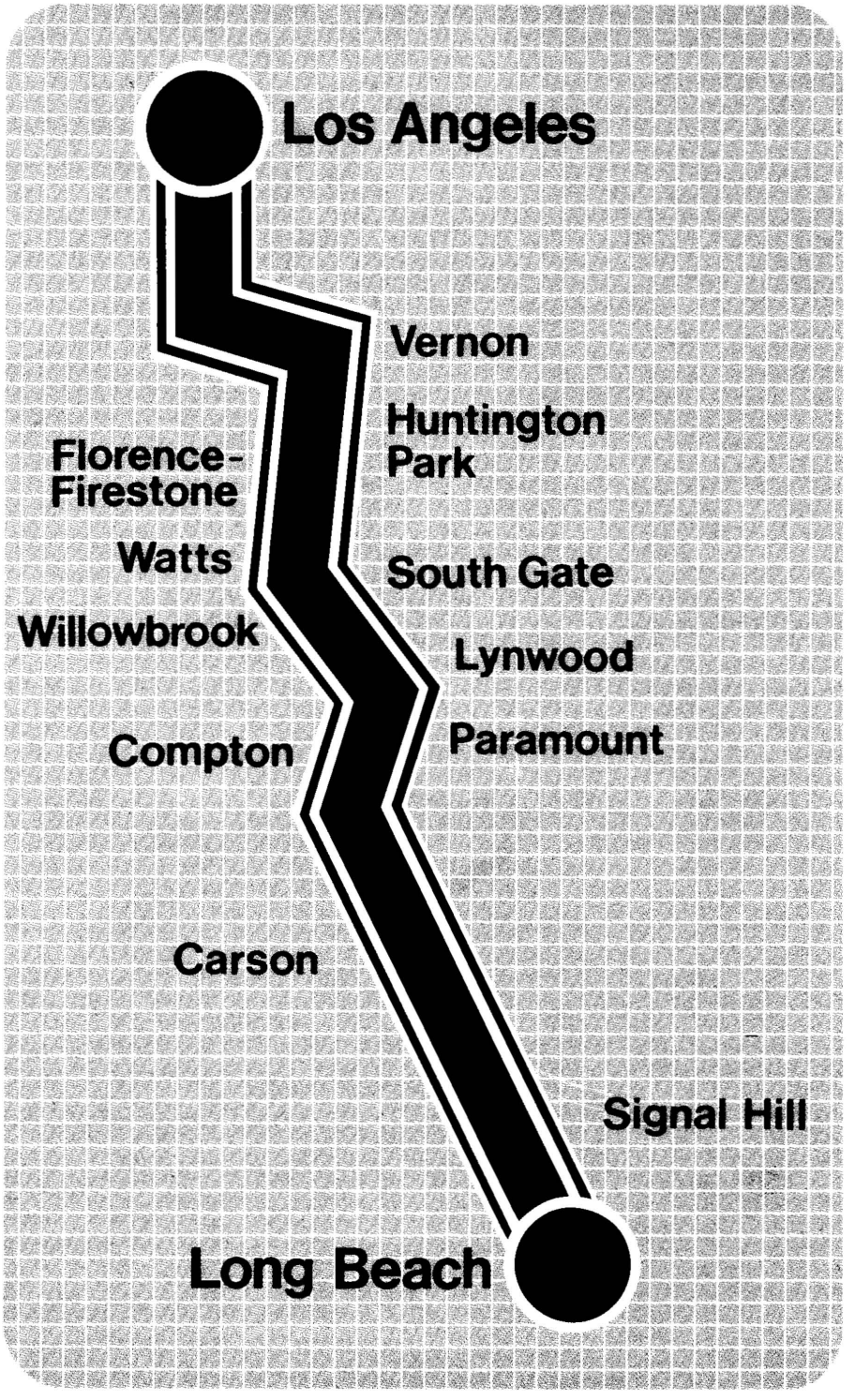
Summary

Draft Environmental Impact Report

The Long Beach - Los Angeles Rail Transit Project

May 1984



LACTC

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Draft Environmental Impact Report

(SCH No. 83091415)

Summary

The Long Beach-Los Angeles Rail Transit Project

May 1984

Parsons Brinckerhoff / Kaiser Engineers in Association With:

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

PARTICIPATING GOVERNMENT AGENCIES

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

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

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

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

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

IN COOPERATION WITH

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

LACTC

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

LACTC

Los Angeles County
Transportation
Commission
354 South Spring Street
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Los Angeles
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(213) 626-0370

May 9, 1984

Interested Persons and Businesses
Community Organizations
Elected Officials
Government Agencies

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

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

In review of the enclosed Summary, if you find that you need detailed information regarding the project's environmental analysis, you may request the full EIR document (also by calling 620-RAIL).

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

Sincerely,

Mike D. Antonovich

MICHAEL D. ANTONOVICH
Chairman

MDA:gb

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

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

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

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

SUMMARY

S-100 PURPOSE OF PROJECT

S-110 BACKGROUND

The Long Beach-Los Angeles Rail Transit Project is part of an on-going transit development process for Los Angeles County in which the Long Beach-Los Angeles corridor and thirteen other corridors in the county have been identified as candidates for transit improvements. This is one of the first rail projects, along with the Metro Rail project being developed by the Southern California Rapid Transit District (SCRTD), to be undertaken following the passage of Proposition A. Proposition A enacted a 1/2-cent sales tax dedicated to transit improvements in Los Angeles County, specifically including rail transit development. The Draft Environmental Impact Report (DEIR) provides the information necessary for the Los Angeles County Transportation Commission (LACTC) to select the preferred alternative (particular rail transit alignment and features to be built) for the Long Beach-Los Angeles corridor.

S-120 GOALS

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

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

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

- The system will be constructed as expeditiously as possible.

S-200 PROJECT DESCRIPTION

The Long Beach-Los Angeles Rail Transit Project is being planned as a conventional light rail system from downtown Los Angeles to downtown Long Beach to serve between 54,000 and 76,000 passengers per day. For purposes of evaluating alternative routes, this corridor has been divided into three segments: downtown Los Angeles, mid-corridor, and Long Beach segments. A number of alternative routes are under consideration within the downtown Los Angeles and Long Beach segments. The proposed line will pass through the cities of Compton and Carson and through the unincorporated areas of Florence-Graham, Willowbrook, and Dominguez Hills in Los Angeles County. The total route will be approximately 22 miles in length, with about 18 miles of it following an existing Southern Pacific

Transportation Company (SPTC) railroad right-of-way (Wilmington and East Long Beach Branches). Capital cost estimates range from $400 to $427 million for most system alternatives; operating costs approximate $13 million per year.

S-210 DESCRIPTION OF PROPOSED RAIL ALTERNATIVES

A lengthy screening and review process was conducted in early 1983 primarily through numerous meetings the LACTC held with various agency staffs of Los Angeles County and of the cities of Long Beach, Los Angeles, and Compton. A total of ten of the most feasible and attractive alternative alignment routings in the three segments were recommended and approved for further study: three in downtown Los Angeles, three in the Compton area of the mid-corridor segment, and four in Long Beach.

For the purpose of comparative studies, alternatives for both a baseline rail system and a corridor bus system were defined and evaluated. The rail alternatives are described below; the bus alternative is described in the DEIR.

S-211 Downtown Los Angeles

The three Los Angeles alignments shown in Figure S-1 are as follows:

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

- Alternative LA-2 (Flower Street Subway): This alternative would begin as a double subway track at the Metro Rail station at 7th and Flower Streets. After proceeding southward under Flower Street, the tracks would emerge from a portal, located between 11th and 12th Streets. From the portal the double tracks would continue southerly at grade, in a reserved median in Flower Street. At Washington Boulevard the double tracks would proceed eastward, as in LA-1, to the SPTC right-of-way at Long Beach Avenue.

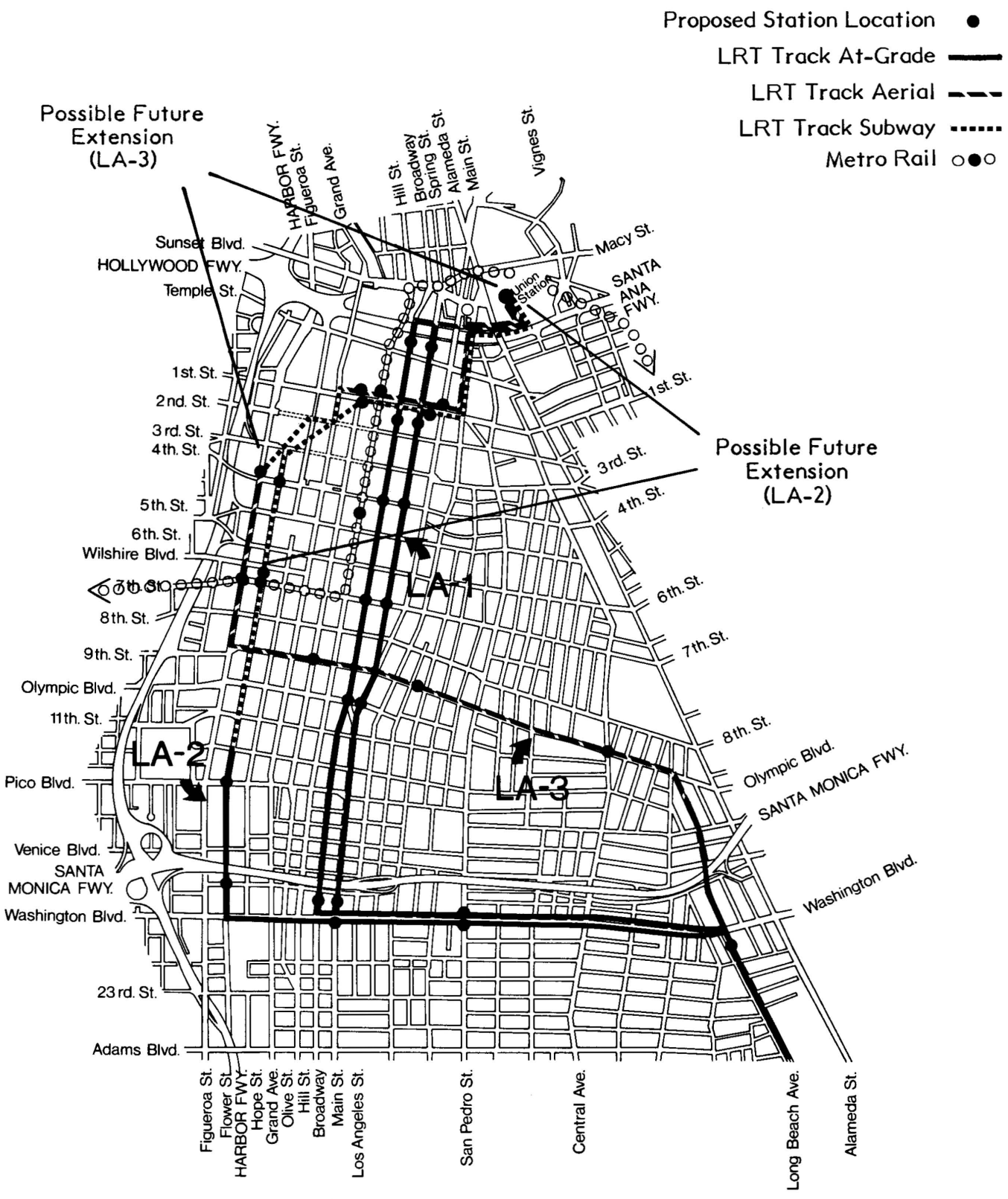

Figure S1

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Downtown Los Angeles Alignment Alternatives

PARSONS BRINCKERHOFF / KAISER ENGINEERS

A possible future extension of this alignment to Union Station has been assessed. Such an extension is not part of this project, and Union Station may not be the ultimate terminus. However, the extension studied would continue in a subway north on Flower Street to 1st Street and then turn easterly on 1st to Main Street. There the tracks would turn north, then east along and under the Hollywood Freeway and finally north to Union Station.

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

  A possible future extension of this alignment (not part of the current project) could proceed as follows: At 3rd Street, the line would turn east and go underground through the Bunker Hill area. It would then portal on 1st Street to an aerial line east of Hill Street. The line would continue on 1st Street to Los Angeles Street where it would turn north and proceed to the Hollywood Freeway. After swinging northeast along and over the Hollywood Freeway, it would terminate at Union Station. Although Union Station has been studied as an ultimate terminus, further studies may change extension routings.

S-212 Mid-Corridor

The differences among the mid-corridor alternatives are limited to the Compton area between Watts and Dominguez Junctions. North and south of these points, only one alignment is under consideration. The full mid-corridor alignment is shown in Figure S-4, and the three mid-corridor alternatives for the Compton area are shown in Figure S-2. Descriptions of the three mid-corridor alternatives are as follows:

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

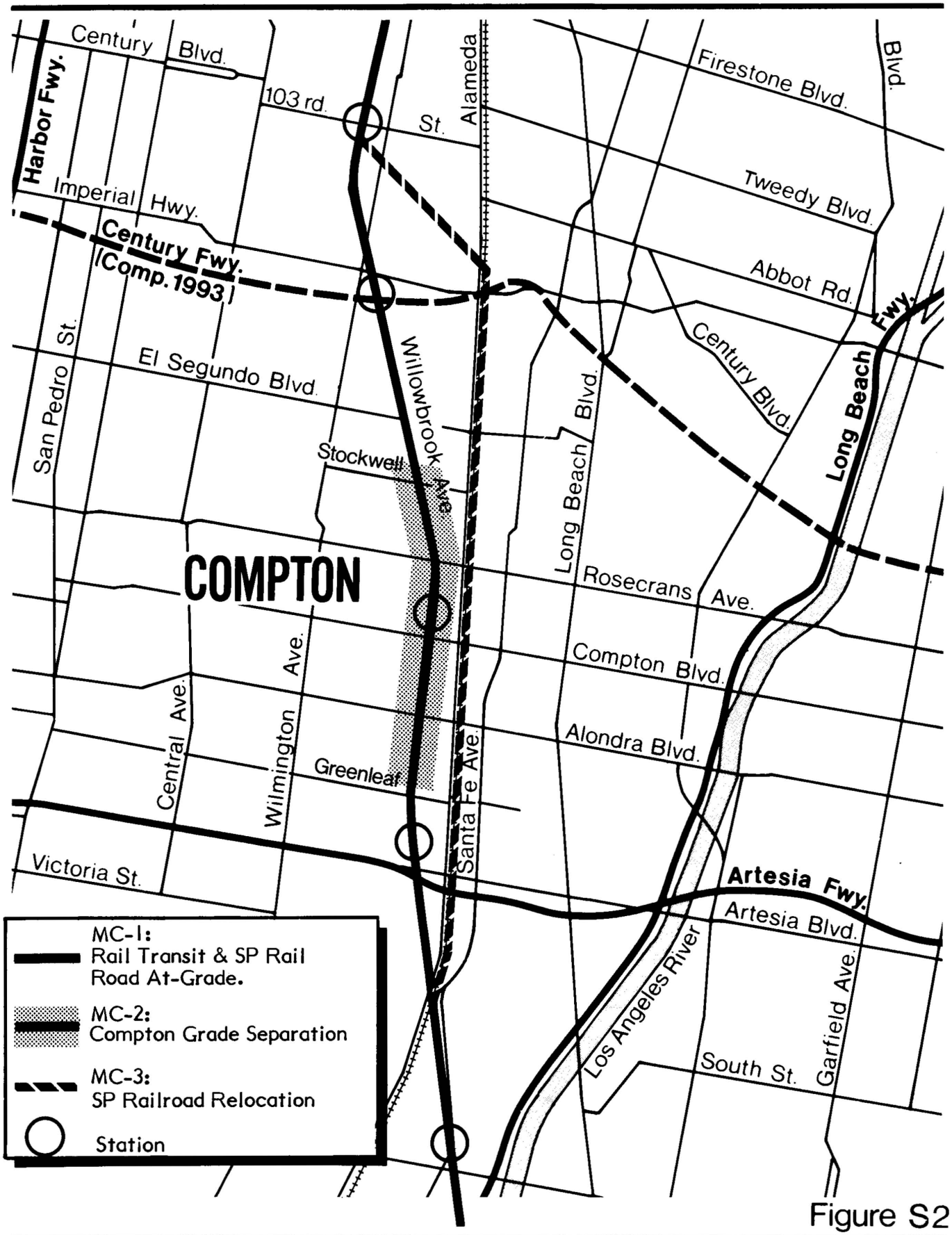

Figure S2

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Mid-Corridor Alignment Alternatives

PARSONS BRINCKERHOFF / KAISER ENGINEERS

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

- Alternative MC-3 (SPTC Railroad Relocation): SPTC rail freight operations would be rerouted from the Wilmington Branch at Watts Junction to the San Pedro Branch (along Alameda Street) via the West Santa Ana Branch. The railroad's Wilmington Branch operations would follow the San Pedro Branch to Dominguez Junction. Thus, from Watts Junction to Dominguez Junction, the rail transit system would operate at-grade in an exclusive right-of-way.

S-213 Long Beach

The Long Beach alternatives are shown in Figure S-3 and are described below:

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

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

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

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

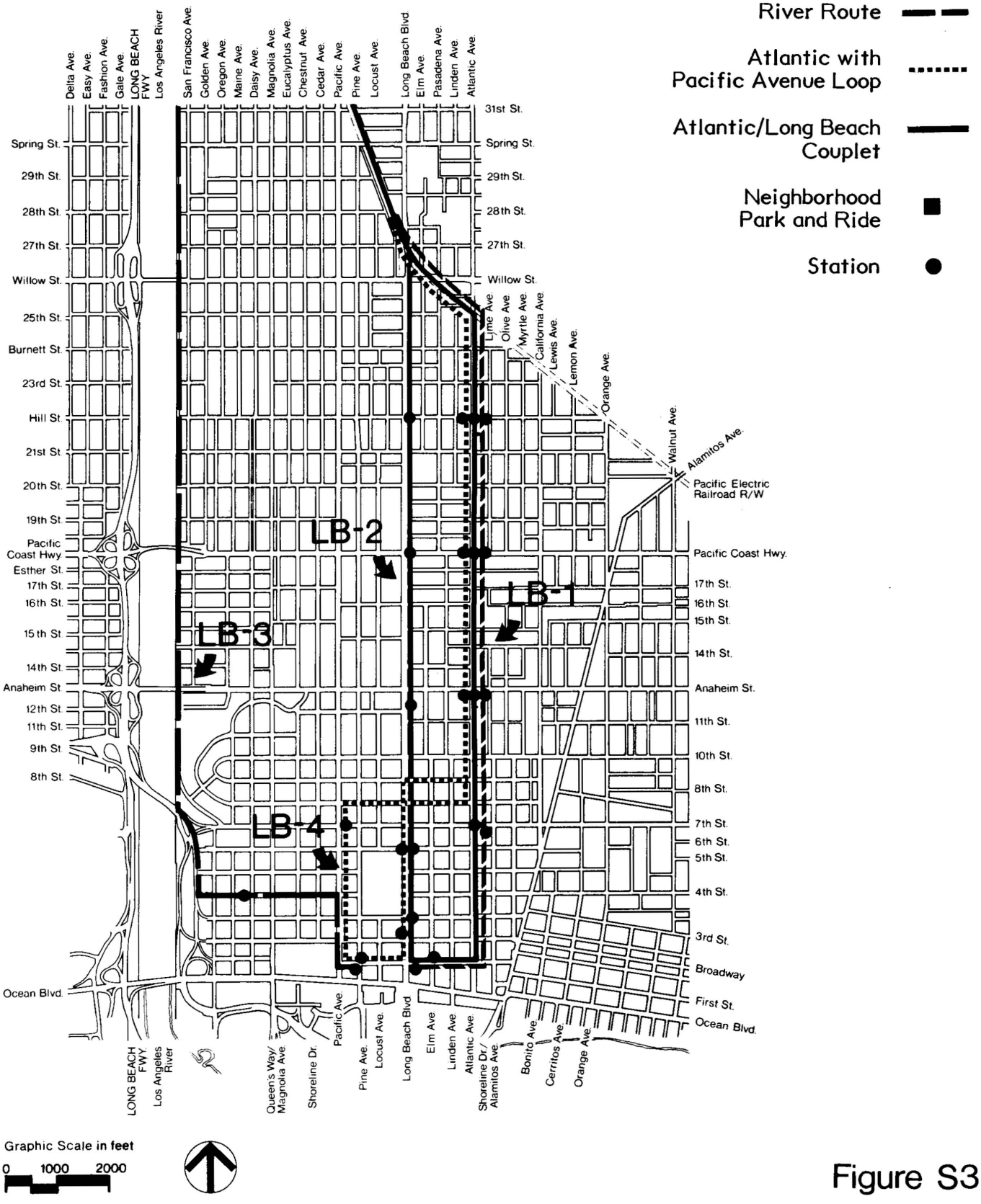

Figure S3

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Long Beach Alignment Alternatives

PARSONS BRINCKERHOFF / KAISER ENGINEERS

Avenue from Anaheim Street to the SPTC right-of-way near Willow Street. South of Anaheim Street, the system would run in mixed traffic.

In an attempt to minimize property acquisitions while maintaining efficient rail transit operations, the following three alignment options are under investigation for the portions of alternatives LB-1 and LB-4 along Atlantic Avenue north of Anaheim Street.

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

S-220 BASELINE SYSTEM ALTERNATIVE

A baseline system alternative -- a full 22-mile route including all at-grade alignments -- has been defined to assist in comparing and evaluating the performance, cost, and impact characteristics of each of the alternative rail transit systems. The baseline system alternative includes the alignment alternatives shown in Table S-1.

Although a baseline system has been identified, the final system will be selected from the 36 possible system alternatives comprised of downtown Los Angeles, mid-corridor and Long Beach alternatives.

TABLE S-1

BASELINE SYSTEM ALTERNATIVE

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

Source: Los Angeles County Transportation Commission, 1983.

The baseline alternative is shown in Figure S-4, which also provides capsule summaries of the physical and operating characteristics of the proposed system.

S-230 SYSTEM CHARACTERISTICS

S-231 Vehicles

Conventional light rail vehicle technology was chosen for the Long Beach-Los Angeles Rail Transit Project for several reasons. First, among the rail vehicle technologies considered, only conventional light rail systems can be constructed without the great expense of full grade separation. Second, the light rail system will be compatible with at-grade crossings of existing railroad tracks in the mid-corridor. Third, it will be possible to use the same vehicles in the future while upgrading the guideway with more grade separations. Finally, the light rail vehicle will be compatible with the tracks and tunnels of the SCRTD's Metro Rail system. If required by the future rail system, it would be possible to move cars on the Metro Rail tracks to other light rail lines.

Light rail vehicles are capable of operating as single cars or in trains. They would be designed for high-or low-platform passenger loading, depending on the alignment alternatives selected for construction. Six-axle articulated vehicles have been recommended. Expected minimum passenger capacity for each six-axle vehicle is 64 seated passengers and 110 standees, for a total of 174.

Ride characteristics, vehicle interior, appearance, climate, and sound control would all be designed to maximize passenger comfort. Propulsion would be by electric motors and power would be collected by an overhead wire by means of a pantograph installed on the vehicle roof.

When the vehicles run in the street, they would be operated in the same manner that a bus driver controls a bus. In exclusive rights-of-way, vehicles would operate at higher speeds, with a wayside signal control system. Maximum speed would be 55 mph in the mid-corridor and 25 mph on street-running segments.

S-232 Stations

Selection of potential station locations was based on such evaluation criteria as system operating speed, proximity to traffic generators, passenger security and safety, ridership potential, availability of land, development impact potential and relative cost. The station locations selected for each of the alignments under consideration are shown in Figure S-1 for downtown Los Angeles; Figure S-4 for the mid-corridor; and Figure S-3 for Long Beach. Park-and-ride lots would be provided at Imperial Highway, Artesia Boulevard and Del Amo Boulevard. Smaller "neighborhood" parking facilities would be included at four other mid-corridor locations (see Figure S-4).

For concept planning and environmental impact purposes, an array of station concept plans was developed to respond to different right-of-way conditions, vertical alignment possibilities, horizontal alignments, and various platform configurations. General features incorporated into these concept plans are as follows:

- o High-level station platforms (station platforms at the same level as the light rail vehicle floor) are preferred for "rapid transit" performance, but final determination of platform height at the various stations will depend upon further design studies of the route alternatives selected for construction. Platform lengths will be 270 feet (three car lengths) except for most platforms under alternatives LA-1, LB-1, 2, and 4, which will be 180 feet (two car lengths).

- o Parking lots, access ways to stations, and all other system elements would be accessible with full provisions for elderly and handicapped patrons.

- o Stations and their equipment would be designed to function without a station agent on duty at any station.

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

- o Public restrooms would not be provided at stations.

- o Passenger waiting areas would protect passengers from the driven rain and would be shaded against the sun.

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

S-233 Yards and Shops

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

Two sites, one for a primary yard and one for a satellite yard, have been identified as the locations most suitable for further investigation. The proposed site for the main yard and shop is located east of the Long Beach Freeway, west of the Los Angeles River, south of Compton Creek and north of Carson Street. The site is currently for sale and could accommodate full vehicle and maintenance-of-way facilities, as well as storage for 60 vehicles. The proposed satellite yard

Project Data Sheet - Baseline System *

DESCRIPTION

Light Rail Transit technology operating between downtown Los Angeles and downtown Long Beach. Two-track system throughout except for single-track crossing over the Los Angeles River. Vehicles operate entirely at-grade, except for aerial section from Broadway or Spring Street to Union Station, and three new grade-separations at Slauson Junction, Dominguez Junction, and Cota Crossing and one existing at Firestone Boulevard. Vehicles generally operate in mixed traffic in downtown Los Angeles and Long Beach, and in reserved right-of-way between Washington Boulevard in Los Angeles and Willow Street in Long Beach.

LENGTH

22 miles end to end.

ALTERNATIVES INCLUDED

Los Angeles - Broadway/Spring Couplet (LA-1)
Mid-Corridor - Compton At-Grade (MC-1)
Long Beach - Atlantic with Pacific Avenue Loop (LB-4)

VEHICLE (NOMINAL)

Six-axle articulated LRT car, approximately 80 feet long, with about 64 seated passengers and 110 standees during average peak hour conditions.

STATION FACILITIES

Shelters, benches, information services, elevator and/or escalator access to aerial stations, bus transfer facilities, and park-and-ride lots at some stations.

OPERATIONS CRITERIA (PRELIMINARY)

Five two-car trains per hour in each direction during weekday off-peak times. Ten 2-car trains per hour during peak periods. Lower during evenings, weekends, and holidays. Operates 20 hours per day, 365 days per year.

FARE COLLECTION

Pre-purchase at stations; self service system with inspectors. Transfer with Metro Rail system with compatible tickets and/or attendant at interface station. Transfer with bus at rail transit stations provided, with credit or discount.

YARD AND SHOP FACILITIES

Main and satellite yard. Two sites now under investigation--one in Los Angeles and one in Long Beach. Main yard to have full maintenance facilities and storage for 60 cars. Satellite yard to have storage for 14 cars and a light maintenance facility.

TRACTION POWER

750V DC supplied through single-wire catenary throughout.

* A BASELINE SYSTEM HAS BEEN IDENTIFIED FOR STUDY AND COMPARISON PURPOSES; ALTERNATIVES ARE UNDER CONSIDERATION IN LOS ANGELES, THE COMPTON AREA, AND IN LONG BEACH.

STATIONS

1. Union Station
2. Temple Street*
3. First Street/Second Streets*
4. Fourth Street*
5. Seventh Street*
6. Olympic Boulevard*
7. 18th Street*
8. San Pedro Street
9. Washington Boulevard
10. Vernon Avenue
11. Slauson Avenue
12. Florence Avenue
13. Firestone Boulevard
14. 103rd Street
15. Imperial Highway
16. Compton Boulevard
17. Artesia Boulevard
18. Del Amo Boulevard
19. Wardlow Road
20. Willow Street
21. Hill Street
22. Pacific Coast Highway
23. Anaheim Street
24. Sixth Street*
25. Third Street
26. First Street

* Includes both northbound and southbound stations of couplet or loop.

SIGNALS, COMMUNICATIONS, AND CROSSINGS

Manual (operator) control in mixed traffic in downtown areas. Use of block signalling with automatic train protection in the mid-corridor area. Grade crossing protection provided at all grade crossings in the Mid-Corridor. Highway traffic signal coordination throughout the mid-corridor. Radio communication between operators and central control. Central control to be housed with SCRTD Metro Rail control.

PATRONAGE

An estimated 54,446 boardings per day.

CAPITAL COST

$407 million

ALIGNMENT DESCRIPTION

The baseline system begins in the city of Los Angeles (north end) with an aerial, stub-end station located next to Union Station. From there, it proceeds south and then west along the Hollywood Freeway on aerial structure. An at-grade one-way track couplet is created by a southbound track on Broadway and a northbound track on Spring and Main Streets. They come together on Washington Boulevard, and proceed in a reserved median to Long Beach Avenue. At that point the two tracks join the existing Southern Pacific Transportation Company railroad right-of-way (Wilmington and East Long Beach Branches) and proceed south to Willow Street in the city of Long Beach. The double rail transit tracks are located on the west side of the SPTC track from Washington Boulevard to Slauson Avenue, where they cross on structure over the SPTC track. The Slauson Avenue station is on aerial structure. A third aerial station is located at Firestone Boulevard, an existing bridge. The rail transit tracks cross over the SPTC San Pedro Branch Line at Dominguez Junction, and are grade separated with the UP track at Cota Crossing. A new double-track bridge will be provided at Compton Creek. The transit line will use a single-track bridge over the Los Angeles River. The tracks will leave the SPTC right-of-way at Atlantic Avenue just below Willow Street in the city of Long Beach. Double tracks will be provided on Atlantic, together in a median. At Ninth Street, a single one-way track will turn west to Long Beach Boulevard, then south to First Street. There it will turn west to Pacific Avenue, then north on Pacific to Eighth Street. The single track will turn east on Eighth Street to rejoin the other track at Atlantic Avenue.

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

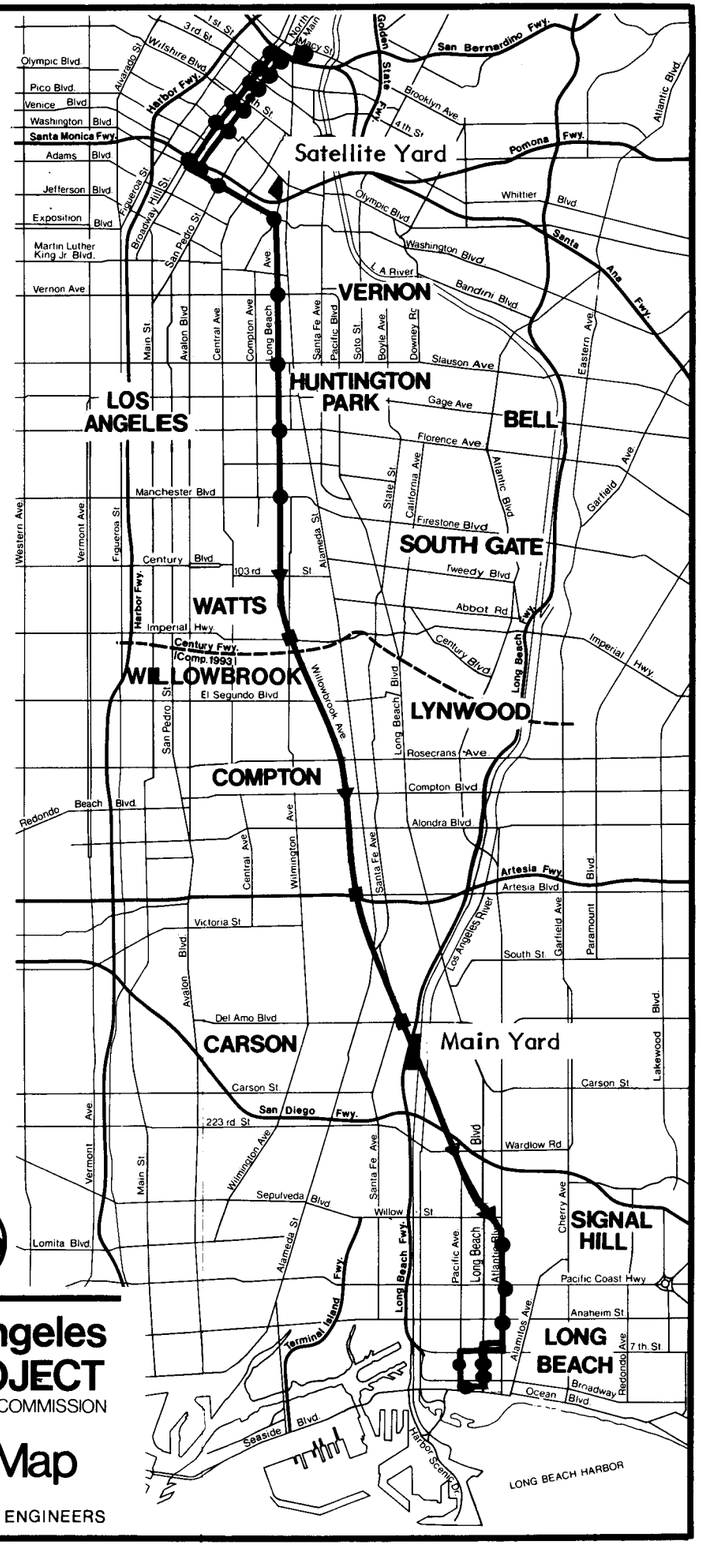

Figure S-4

Long Beach - Los Angeles RAIL TRANSIT PROJECT

LOS ANGELES COUNTY TRANSPORTATION COMMISSION

Baseline System Map

PARSONS BRINCKERHOFF / KAISER ENGINEERS

is located directly adjacent to Long Beach Avenue between 12th and 14th Streets in downtown Los Angeles. The property would accommodate a relatively efficient layout for vehicle movement and have a storage capacity for 14 vehicles. The locations of the candidate primary and satellite yards are shown in Figure S-4.

S-234 Costs

Estimated capital costs for certain system alternatives (combinations of segments), shown in Table S-2, include segment costs, yard and shop costs, and vehicle costs. Based on the most current conceptual designs and operations plans, these estimates range from a low of $399.4 million for the Flower Street Subway, Compton At-Grade, Atlantic with Pacific Avenue Loop (LA-2, MC-1, LB-4) system alternative to a high of $560.4 million for the Olympic/9th Aerial, Compton Grade Separation, Atlantic with Pacific Avenue Loop (LA-3, MC-2, LB-4) system alternative (not shown in Table S-2).

Annual costs for operating and maintaining the rail transit system were estimated for four system alternatives, including costs for labor, materials, and energy, as summarized in Table S-2. All costs are expressed in current dollars.

S-235 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. It is anticipated that reduced service (15 to 20 minute intervals) would be offered at night, and on holidays and weekends. At full operation the system would provide service 20 hours a day (5:30 AM until 1:30 AM), 365 days a year.

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

TABLE S-2

TOTAL DAILY BOARDINGS AND COST ESTIMATES

FOR SELECTED SYSTEM ALTERNATIVES

	Broadway/ Spring At-Grade (baseline)	Flower Street Subway	Olympic/9th Aerial	Olympic/ 9th Aerial w/ Los Angeles River Route
Total Daily Boardings[1] (year 2000)	54,446	54,702	76,303	70,444
Capital Costs[2] (millions of dollars)	$407.2	$399.4	$427.3	$411.9
Extra Cost for MC-2	135.3	135.3	135.3	135.3
Annual Operations and Maintenance Costs[3] (millions of dollars)	$13.2	$12.5	$13.5	$12.9

[1] With respect to patronage, system alternatives are representative of any mid-corridor and any of the Long Beach alternatives LB-1, LB-2, or LB-4, except as noted.

[2] Capital costs in current dollars include: construction of alignment, costs of vehicles, engineering and management, agency cost, and contingency costs. MC-2, Compton Grade Separation, is the only alternative that varies significantly with regard to cost.

[3] Operations and maintenance costs (in current dollars) include labor, material, and energy costs.

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

S-236 Patronage

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

Due to the costliness and duplication involved in generating forecasts for all possible system alternatives, a representative sample of four

system alternatives was selected for modeling. The selection of these alternatives was based on a need to analyze patronage associated with various cost and environmental scenarios as well as to cover the full range of possible ridership estimates.

Model-generated estimates of total daily boardings for each of these system alternatives (considered representative of other potential alternative combinations) can be found in Table S-2. These estimates range from a low of 54,446 for the baseline alternative to a high of 76,303 for the Olympic/9th Aerial, Compton At-Grade, Atlantic with Pacific Avenue Loop (LA-3, MC-1, LB-4) system alternative.

S-237 Fare Collection

A "barrier free" system has been identified as the most viable approach to fare collection for the Long Beach-Los Angeles system. This system would provide for self-service (vending machine) pre-purchase of fares at transit stations. Proof-of-fare payment would be shown to "inspectors" onboard the trains. A zoned-fare system would be used which would consist of at least three zones. Procedures for transfer between the Long Beach-Los Angeles rail project and the Metro Rail system are under study.

S-300 SIGNIFICANT ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

3-310 SIGNIFICANT EFFECTS

The significant environmental effects of the proposed project are associated with specific alternative routes in each segment as follows:

Los Angeles: The only alternative in this segment with potential significant effects is LA-3, the aerial alternative, which would create significant adverse visual intrusion and incompatibilities with adjacent structures.

Mitigation: LA-1 or LA-2 avoids the visual impacts of LA-3, although the aerial portions of LA-1 could have potential adverse visual impacts on Father Serra Park and Union Station. LA-3 visual impacts can be partially mitigated by careful design of the shape, materials, and dimensions of the aerial structure.

Mid-Corridor: The diversion of rail freight traffic in MC-3, would result in a shift of the noise environment; there would be a noticeable decrease in noise impact in those communities south of Watts Junction along the Wilmington Branch and a significant increase in noise exposure and impacts along the communities that border the West Santa Ana and San Pedro Branches. MC-3 would create potentially significant vibration impacts on the historic Watts Towers and adverse visual impacts on the historic Watts Station.

Mitigation: Vibration impacts on Watts Towers would be fully mitigated in project design. Depending on the feasibility of sound-proofing, noise impacts could be reduced to an acceptable level. The acquisition of noise easements could also serve as a mitigation measure. Visual impacts on the historic Watts Station could only be partially mitigated through design of the aerial structure.

MC-1 and MC-2 would maintain rail freight noise levels on the Wilmington Branch. MC-3 would shift them to the West Santa Ana and San Pedro Branches. MC-1 and MC-2 would not create adverse vibration and visual impacts associated with MC-3 at Watts Station and Watts Towers.

Long Beach: Construction of a reserved transit median on Atlantic Avenue for LB-1 or LB-4 would create significant displacement impacts. LB-3 would displace 3 homes and require taking a portion of Willmore Park. LB-3

would also create potentially significant noise impacts at a few residences.

Mitigation: Two options have been proposed to reduce the amount of residential and business displacement associated with LB-1 and LB-4, north of Anaheim Boulevard on Atlantic Avenue. Option C would completely avoid the significant adverse displacement impacts of Option A, at the expense of reduced curb parking and loading zones. Option B would reduce displacement by about half, but would still create significant adverse displacement effects.

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

Noise impacts on LB-3 could be mitigated with sound-proofing and other techniques. Facilities in Willmore Park could be relocated.

Selection of LB-2 would minimize displacement impacts.

3-320 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 Draft Environmental Impact Report for the Long Beach-Los Angeles Rail Transit Project.

TABLE S-3

SUMMARY OF PROJECT IMPACTS

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
Topography, Soils, Geology					
Construction:	All	Cut-and-cover soil excavation	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
	LB	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
	LA	LA-2: Water table incursion	Minor Adverse	Dewater subway	None
		LA-1 & LA-2: Contaminated soils	Minor Adverse	Separate contaminants before disposal	None

TABLE S-3 (Continued)

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
	MC	MC-2: Flooding in trench	Minor Adverse	Install drainage and trench culverts	None
Operation:	All	Increased run-off from parking lots, yards	Minor Adverse	Install drainage	None
	LA LB	Water from yard operations	Minor Adverse	Separate oil before disposal, recycle wash water	None
Vegetation and Wildlife					
Construction:	All	Removal of some trees and existing vegetation; displacement of animals; no endangered species	Minor Adverse	Replace landscaping where appropriate and feasible	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
Operation:	All	Slight reduction in pollutant burden for region	Minor Beneficial		Minor Beneficial

TABLE S-3 (Continued)

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
	MC	Slight increase in carbon monoxide at parking lots	Very Minor Adverse	None, within state standards	Very Minor Adverse
Energy					
Operation:	All	Slight decrease in regional energy consumption	Minor Beneficial		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:	MC	MC-3: Noise increases from 4-12 dBA at sensitive receptors on West Santa Ana Branch	Significant Adverse	Noise barriers, sound proofing, purchase noise easements	Possibly Significant Adverse
	MC	MC-3: Removal of rail freight noise on Wilmington Branch	Significant Beneficial		Significant Beneficial
	MC	MC-3: Possible vibration impacts on Watts Towers	Possibly Significant Adverse	Detailed study of vibration; incorporate vibration reduction techniques into project	None
	LB	LB-3: Noise increase of 5 dBA at some residences	Possibly Significant Adverse	Noise barriers, sound proofing, noise easements	None

TABLE S-3 (Continued)

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
Land Use, Population, Housing					
Construction:	LA LB	Purchase of substation sites could require displacement depending on sites	Minor Adverse	Select sites to minimize displacement, relocation assistance	Probably None
	MC	Displacement of a tenant at one proposed parking site	Minor Adverse	Relocation assistance	Minor Adverse
	LB	LB-1 & LB-4: Depending on final design could displace as many as 229 dwelling units and 80 businesses	Significant Adverse	Reducing property takings also reduces parking/bus loading available on Atlantic Avenue; relocation assistance	Significant Adverse
	LB	LB-3: Displaces 3 residences, precludes construction of 75 housing units	Significant Adverse	Relocation assistance	Adverse
Operation:	All	Slight increase in population, employment, housing	Minor Beneficial	None necessary, with adopted plans	Minor Beneficial
	All	Enhancement of revitalization efforts	Minor Beneficial		Minor Beneficial

TABLE S-3 (Continued)

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
	MC	MC-3 introduces incompatible land use on W. Santa Ana Branch	Minor Adverse	Noise mitigation for residents	Minor Adverse
Community Services					
Construction:	All	Temporary obstruction of emergency vehicle access	Minor Adverse	Signage, definition of alternate routes	Minor Adverse
Operation:	All	Improves accessibility to community services	Beneficial		Beneficial
	All	Train operations could block intersections to emergency vehicles	Very Minor Adverse	None possible	Very Minor Adverse
	MC	Some walk times to community services increased because of fencing	Very Minor Adverse	Existing legal track crossings will be maintained	Very Minor Adverse
	MC	Fencing of rail tracks will improve safety	Minor Beneficial		Minor Beneficial
	LB	LB-1 & LB-4: Option C would reduce bus loading zones at schools, reduce curb parking at churches	Adverse	Move bus loading to side streets, provide off-street parking for schools	Adverse

TABLE S-3 (Continued)

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
	LB	LB-3 reduces access to bike path and horse trail	Adverse	Other access points available	Minor Adverse
	LB	LB-3 takes a portion of Willmore Park	Adverse	Relocate basketball court	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
Visual Quality					
Operation:	LA	LA-3 & LA-1: Visual incompatibilities on aerial portion of routes	Significant Adverse	Materials and design to reduce bulk of structure	Significant Adverse

TABLE S-3 (Continued)

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
	MC	Visual incompatibilities with aerial sections	Minor Adverse	Materials and design, landscaping	Minor Adverse
	LB	LB-3: Visual incompatibilities with adjacent residential areas	Minor Adverse	Wall and/or landscaping	Minor Adverse
Historic and Cultural Resources					
Construction:	LA	LA-1: Column footings at Father Serra Park and Union Station	Minor Adverse	Archeological and historic mitigation in consultation with SHPO	Minor Adverse
	LA	LA-1: Widening Broadway removes historic sidewalks and lamp standards	Adverse	Replace lamp standards, consult with SHPO on other mitigation	Minor Adverse
	LB	LB-1 & LB-4 require taking 2 houses of potential significance	Minor Adverse	Significance and mitigation to be determined with SHPO	Potential Adverse
Operation:	LA	LA-3 & LA-1: Visual incompatibilities of aerial structure	Minor Adverse	Materials and design to reduce bulk	Minor Adverse

TABLE S-3 (Continued)

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
	MC	MC-3: Visual incompatibilities of aerial structure on Watts Station	Minor Adverse	Materials and design to reduce impact	Minor Adverse
	MC	MC-3: Potential vibration impacts on Watts Towers	Possibly Significant Adverse	Detailed study of vibration; incorporate vibration reduction techniques into project	None
Traffic and Transportation					
Construction:	All	Increased congestion, traffic delays to autos, buses, pedestrians	Minor Adverse	Schedule street closures to reduce impacts, directional signage, traffic control plans	Minor Adverse
	LA, LB	Reduction in 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

TABLE S-3 (Continued)

Environmental Factor	Segment	Description of Impact	Impact Determination	Mitigation	Net Impact
	LA LB	Reduction in some street capacities some increased local congestion with at-grade alternatives	Adverse	Restriping, parking reductions at intersections and stations, change signal cycles where necessary	Minor Adverse
	LA LB	Permanent reduction in on-street parking	Adverse	Increase feeder bus	Minor Adverse
	MC	Slight increase in congestion around stations	Minor Adverse	Restriping, parking, etc., as in LA, LB.	Minor Adverse
	MC	Slight increase in traffic delays at grade crossings	Adverse	Develop coordinated traffic control system for rail transit	Minor Adverse

S-400 AREAS OF CONTROVERSY

Areas of controversy for this project include issues previously raised during the planning and consultation process, both formally and informally, and potential issues that have become apparent during the environmental analysis conducted for the project.

Alignment alternative selection in each corridor segment presents potential controversy, as follows:

S-410 LOS ANGELES

LA-1: Potential traffic conflicts with autos and buses; widening Broadway with reductions in curbside parking and sidewalk widths; visual impacts of aerial freeway crossing in the Union Station area.

LA-2: Widening Flower Street from the portal at 11th Street south to Washington Boulevard for the transit reservation and reduction in curbside parking, street and sidewalk widths.

LA-3: Visual impacts of aerial structure, particularly along Olympic/9th; possible associated decline in adjacent property values.

Alternative alignments in Los Angeles: Instead of connecting with the SPTC right-of-way at Washington Boulevard, it has been suggested that either LA-2 or LA-3 continue southerly to the University of Southern California and Exposition Park. LACTC's evaluation of the suggested route raised doubts about its feasibility. If the suggested route were to run on surface streets, traffic interference and limited opportunities for street widening would be major impediments. If the suggested route were to be grade separated, its cost would be prohibitive under the objectives of this project (i.e., minimize grade separation).

The LACTC has determined that USC and Exposition Park will be served by a different rail corridor, along the Harbor Freeway. The first step towards construction of such a route is Caltrans' plan to build a busway in the Harbor Freeway, which could be converted to a rail line.

Potential extensions of alternatives LA-2 and LA-3: Whether or where to extend the two westside alternatives was raised as a consideration in the overall alignment selection. For this reason, extensions to Union Station for either LA-2 or LA-3 are briefly assessed in this document, although extensions of the westside alignment alternatives are not part of the project as proposed.

S-420 MID-CORRIDOR

All of the mid-corridor alternatives raise questions concerning traffic impacts on major cross-streets in the mid-corridor. Although the traffic analysis has indicated that a traffic control system for the rail transit project could be coordinated with the traffic control system for autos on adjacent streets, the details of the signalization program remain to be specified in final design. The rail transit project will have minimal impact on traffic on cross streets over and above that due to future rail freight operations. The project will increase bus and auto traffic in the vicinity of stations.

Informal pedestrian access across the SPTC right-of-way will be reduced with all of the alternatives because of fencing. The fencing will represent an improvement in safety, but it will also be an inconvenience to some residents and result in longer walk trips to community facilities in some portions of the mid-corridor.

In order to address the City of Compton's goal to remove existing through rail freight traffic from the center of the city, two alternatives have been developed in that portion of the mid-corridor. Each of these alternatives has potential controversy associated with it, as follows:

MC-2: Grade separating the alignment through downtown Compton would permanently bisect the community, would require closing several through streets, and would add substantially to project cost.

MC-3: Reintroducing rail freight traffic on the West Santa Ana Branch would:

1) Significantly increase noise levels adjacent to the West Santa Ana Branch. The type of mitigation to be employed to reduce this noise could be an area of controversy.

2) Significantly reduce noise levels for residents along the Wilmington Branch in the Willowbrook and Compton areas.

3) Create potentially significant vibration impacts on the historic Watts Towers and the associated State Historic Park. These vibration impacts can, however, be mitigated to an acceptable level.

4) Create a visual intrusion and potentially imcompatible land use into the neighborhoods adjacent to the West Santa Ana Branch.

5) Create an adverse visual impact on historic Watts Station due to grade separation of transit over the freight diversion.

S-430 LONG BEACH

All of the Long Beach alternatives would require rail transit vehicles to run in the street right-of-way, with associated potential bus and auto conflicts. Slightly increased noise levels in some residential areas could occur with any of the alternatives.

Displacement of homes and businesses is a potentially significant area of controversy for Atlantic Avenue two-way alignments north of Anaheim Street (LB-1 and LB-4), as outlined below.

LB-1 & LB-4: There are three subalternatives being considered along Atlantic Avenue north of Anaheim Street reflecting different impacts on street traffic, parking, and displacement of adjacent businesses and residents. Option A would maintain all traffic and parking lanes, but would require displacement of as many as 229 dwelling units or 556 people in order to provide an exclusive median for rail transit operations. Option A would also displace approximately 80 businesses with as many as 340 employees.

Option B would maintain some parking, but would displace 87 dwelling units, 212 residents, 35 businesses, and approximately 167 employees. Option C would not require displacement of any businesses or residents, but would require partial takings of some vacant parcels and commercial properties at station areas. It would also reduce bus loading zones at schools, curbside parking, and eliminate left turns at Hill Street.

LB-3: Three housing units would be acquired and demolished for this alternative. Construction of this alternative would preclude construction of a 75-unit housing project on Los Angeles County Flood control Property.

Additionally, access to horsetrails and a bikeway would be reduced by this alternative. It could also require taking a portion of park land at Willmore Park.

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 each of the corridor segments.

2) Agreement with the Southern Pacific Transportation Company (SPTC) to accommodate the rail transit project within the SPTC right-of-way.

3) Design of a traffic signalization/rail transit control coordination plan in the mid-corridor to optimize auto and rail transit movements.

4) Agreements with affected transit properties for revision of existing bus services to result in the proposed complementary bus network.

5) Collaboration with SCRTD (the project operator) in determination of fares to be charged on the rail system.

6) Determination of charges at parking lots.

7) Determination of platform height (high or low) at stations.

8) Mechanisms to conduct joint development where this is considered feasible and appropriate.

9) Determination of final design issues such as exact placement of stations, traction power substations, ramps or lifts for handicapped access at low-platform stations.

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

- Visual: For the aerial alternative (LA-3), inclusion of third-rail pickup capability on rail transit vehicles at potential increased cost. Eliminating the overhead wires and poles would reduce the visual impact of the aerial guideway.

- Noise: The specific method to reduce noise impacts on adjacent residents and businesses will have to be developed and implemented. MC-3 is the only alternative with significant adverse noise impacts.

- Vibration: For MC-3, potential vibration impacts on the Watts Towers will have to be determined and specific mitigation measures incorporated into project design.

- Displacement: A relocation plan in conformance with applicable state and local law will have to be developed and implemented for all alternatives involving housing and business displacements.

- Traffic: Definition of specific traffic mitigation measures such as parking restrictions, striping, traffic signal control changes, and turning movements will have to be developed with each of the local traffic departments depending on the choice of the preferred alternative.