Electric Trolley Bus Project

Draft Environmental Impact Report

November 13, 1992

Southern California Rapid Transit District
425 South Main Street
Los Angeles, CA 90013-1393

RTD

NOTICE OF AVAILABILITY OF THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE ELECTRIC TROLLEYBUS PROJECT

The Southern California Rapid Transit District (SCRTD), in cooperation with the Los Angeles County Transportation Commission (LACTC), Long Beach Public Transit and Montebello Bus Lines, has released a Draft Environmental Impact Report (DEIR) for public review and comment. This DEIR analyzes the environmental impacts created by the facilities construction and the operation of Electric Trolleybuses (ETBs) in various areas of Los Angeles County.

Enclosed is the DEIR for your information and comment. The Public Comment period for the DEIR runs from November 13 through December ~~28~~ 30, 1992.

All written comments pertaining to this EIR must be received by December ~~28~~ 30, 1992 and be addressed to:

Susan Phifer, EIR Coordinator
Southern California Rapid Transit District
425 South Main Street
Los Angeles, CA 90013-1393

The ETB Project will replace diesel buses with Electric Trolleybuses on all or part of 12 bus lines that are currently operated by the Southern California Rapid Transit District, Long Beach Public Transit, and Montebello Bus Lines. Buses powered with electric motors are quiet and emit no exhaust.

ETBs are similar in appearance to conventional transit buses but they have two poles that extend from the top of the bus to two electric contact wires that are suspended about 18 feet above the roadway. Electrical power is supplied to the overhead contact wires from Traction Power Substations which are located along the route and are spaced about one mile apart. The Substations convert standard AC current as supplied by the local electric utility company to 750 Volts DC which is used by the ETBs.

ETBs have favorable environmental impacts such as zero emission, quieter operation and absence of engine-generated heat. Several impacts have been identified which may be of concern to some people. These include: installation of additional street poles, suspension of overhead wires and minor street disruption during construction.

The construction program includes urban design measures to mitigate the impact of overhead equipment and enhance streetscapes along Electric Trolleybus Boulevard routes. The urban design component may include one or more of the following: street trees, enhanced ETB stop shelters, sidewalk improvements, and specially designed poles.

Southern California Rapid Transit District 425 South Main Street, Los Angeles, California 90013 (213) 972-6000

ETB Community workshops will be conducted at several locations in the Los Angeles County during the months of November and December 1992. A list of the community workshops is enclosed.

A public hearing on the DEIR has been scheduled for Tuesday, December 15, 1992 at 4:00 p.m. at SCRTD Headquarters, 425 South Main Street, Los Angeles. For further information, please call the ETB "Hotline" (213) 972-3901 for a recorded announcement.

Albert Perdon, P.E.
Director
Transit Systems Development

Attachments

Community ETB Workshops

TRI-CITIES LINE

Tri-Cities Line: Line S182

Date: Monday, November 16, 1992

Time: *Presentation #1* - 4:30 p.m.
Presentation #2 - 6:30 p.m.
Library Auditorium
110 N. Glenoaks (Corner of Olive)
Burbank, CA

Date: Wednesday, November 18

Time: *Presentation #1* - 4:30 p.m.
Presentation #2 - 6:30 p.m.

Site: Wilson Middle School Auditorium
300 S. Madre
Pasadena, CA

Date: Thursday, November 19

Time: *Presentation #1* - 4:30 pm
Presentation #2 - 6:30 p.m.

Site: Glendale City Hall,
Council Chambers
613 E. Broadway
Glendale, CA

SAN GABRIEL VALLEY

San Gabriel Valley: Line 70

Date: Wednesday, December 2, 1992

Time: 6:30 - 8:00 p.m.

Site: Monterey Park City Hall
320 W. Newmark
Monterey Park, CA

SOUTH BAY

South Bay: Line 40

Date: Saturday, December 5

Time: 12:30 - 2:00 p.m.

Site: Challengers Boys & Girls Club
5029 S. Vermont Ave.
Los Angeles, CA

Date: Tuesday, December 1

Time: 6:00 - 7:30 p.m.

Site: Lawndale City Hall
14717 Burin Ave.
Lawndale, CA

LONG BEACH

Long Beach Lines 40, 50, 60, 90

Date: Saturday, November 21, 1992

Time: 10:00 a.m. - 12:00 p.m.

Site: Southern California Gas Company
2400 E. Spring St.,
Long Beach, CA

Community ETB Workshops

DOWNTOWN

Downtown Lines:	16, 18, 45, 204
Date:	Thursday, November 19, 1992
Time:	*Presentation #1* - 4:30 p.m. *Presentation #2* - 6:30 p.m.
Site:	Los Angeles City College, Student Center, Clausen Hall 855 N. Vermont Ave. Los Angeles, CA

SAN FERNANDO VALLEY

San Fernando Valley Line:	560
Date:	Thursday, December 3, 1992
Time:	4:30 p.m. - 6:30 p.m.
Site:	San Fernando Valley Boys & Girls Club 11251 Glenoaks Blvd. Pacoima, CA

EAST AREA LINES

East Area Lines:	66/67, 18, Montebello 10
Date:	Tuesday, December 1, 1992
Time:	6:30 - 8:00 p.m.
Site:	East Los Angeles College, Cafeteria 1301 Brooklyn Ave. Monterey Park, CA

East Area Line:	30/31
Date:	Thursday, December 3, 1992
Time:	6:00 - 8:00 p.m.
Site:	Boyle Heights Senior Center 2839 East 3rd Street Los Angeles, CA

PROTOTYPE DEMONSTRATION PROJECT

Prototype Demonstration Project along:	Line 30/31
Date:	Tuesday, November 17, 1992
Time:	6:00 - 8:00 p.m.
Site:	Japanese-American Cultural Community Center, 244 South San Pedro St. Room B & C, 2nd Floor Los Angeles, CA

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SCH # 92061075

November 13, 1992

Southern California Rapid Transit District
425 South Main Street
Los Angeles, CA 90013-1393

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SUMMARY

S.1 INTRODUCTION AND PURPOSE

S.1.1 INTRODUCTION

The Southern California Rapid Transit District (RTD) and the Los Angeles County Transportation Commission (LACTC), in cooperation with Long Beach Public Transit and Montebello Bus Lines, propose to convert 19 bus lines (18 existing and one newly proposed) within Los Angeles County from diesel-fueled buses to zero-emission electric trolley buses (ETBs). This Environmental Impact Report (EIR) addresses the conversion of 12 bus lines under Phase I of the project. Operators of these lines are RTD, Montebello Bus Lines and Long Beach Transit.

S.1.2 PURPOSE

The proposed project has five primary objectives:

- to improve the quality of public transit service delivered to the rider relative to noise and vibration in order to increase the use of public transit.
- to comply with the South Coast Air Quality Managment District's 1991 Final Air Quality Management Plan and reduce air pollution in the County, particularly along heavily travelled transit routes.
- to reduce noise and thermal pollution from bus operations.
- to conserve energy and serve as a hedge against the threat of rising costs and the dwindling and insecure supplies of liquid and gaseous fuels.
- to impart an image of urban permanence to bus lines.

The project would improve the quality of transit for bus riders in the following ways:

- It would provide a more comfortable ride because acceleration would be smoother and engine vibration would be reduced.
- The use of ETBs would provide a quieter ride because of elimination of noise from diesel bus engine idling and acceleration.
- The ride would be more comfortable for passengers because ETBs have no diesel fumes which can penetrate the interior of the bus.
- The "hot seat" at the rear of the diesel bus would be eliminated because in ETBs, electric motors are located away from passengers and generate little heat.

The project would also provide a number of improvements for pedestrians and waiting passengers:

- There would be no diesel fumes drifting across bus stops, sidewalks and pedestrian areas.

- The use of quiet ETBs would eliminate noises from diesel bus engine idling and acceleration.

- The "hot wake" or path of heat from diesel bus tailpipes would be eliminated.

The South Coast Air Quality Management District's (SCAQMD's) 1991 Final Air Quality Management Plan (AQMP) requires that ozone, carbon monoxide and nitrogen dioxide levels to be reduced by 25 percent by the end of 1994, by 40 percent by the end of 1997 and by 50 percent by the end of the year 2000 from the base year of 1987. Adoption schedules for control measures have been prioritized in the 1991 AQMP. The "Zero Emission Urban Bus Implementation" control measure to reduce reactive organic gases (ROG), nitrogen oxides (NO_x), carbon monoxide (CO) and particulate matter (PM_{10}) is listed as priority 34 and Control Measure Number MG-1. Under the heading, "Proposed Method of Control," the AQMP states:

> "Because of its demonstrated commercial and technological feasibility, bus electrification appears to be the most likely compliance strategy. In particular, the proposed method of control is to install overhead trolley wires for power transmission to transit buses operating along major fixed routes. Services that run continuously along major arterials at intervals of 15 minutes or less would be candidates for conversion from diesel operation directly to electric operation." (Final AQMP, Appendix IV-C, "District's Mobile and Indirect Source Control Measures," South Coast Air Quality Management District, July 1991.)

The 1991 Final AQMP shows a proposed implementation date of 1994-2000 for the "Zero-Emission Urban Bus Implementation" Control Measure (Table 7-3, pg. 7-18) and assumes that 30 percent of all vehicle miles traveled by urban buses in the SCAB would be electric (Table ES-2A, pg. ES-9). The proposed Phase I and II ETB Project would approximate this 30 percent assumption.

In addition to addressing the project's primary objectives of transit service improvement and pollution reduction, RTD and LACTC have designed the proposed system with a secondary objective of enhancing the the urban design and aesthetic quality of the ETB routes. The project includes landscaping and other design elements that are intended to improve the quality of the public environment at ETB stops and along sidewalks to be used by ETB riders.

In any major capital project, tradeoffs will be required, and the implementation of the ETB project is no exception:

- ETBs are less capital intensive than rail projects programmed for implementation, but are more expensive than internal combustion engine buses or other alternative fuel buses.

- Sufficient funds must be made available to operate the integrated bus, trolley bus and rail systems so that their anticipated benefits can be fully realized.

- To the extent that a shortfall scenario develops, implementation of any major capital project could actually reduce the transit carrying capacity anticipated for the region.

S.2 DESCRIPTION OF THE PROPOSED PROJECT

Conversion of the 12 proposed routes to ETB service would involve the construction of electrical and mechanical equipment along the routes, replacement of existing buses with new ETBs, modifications to existing maintenance facilities, modifications of traffic signals and lighting systems at some locations and additional land acquisition for expansion of existing maintenance facilities and development of new maintenance facilities and substations. These components are described below in section S.2.2. Section S.2.1 describes the proposed routes. The project would not change the majority of the routes' existing characteristics such as the number of bus stops, the scheduled time between bus arrivals at each stop along the route and operating hours. Changes could occur over a period of time in response to changes in service demand. An increase in the bus fleet would be required.

S.2.1 PROJECT LOCATION

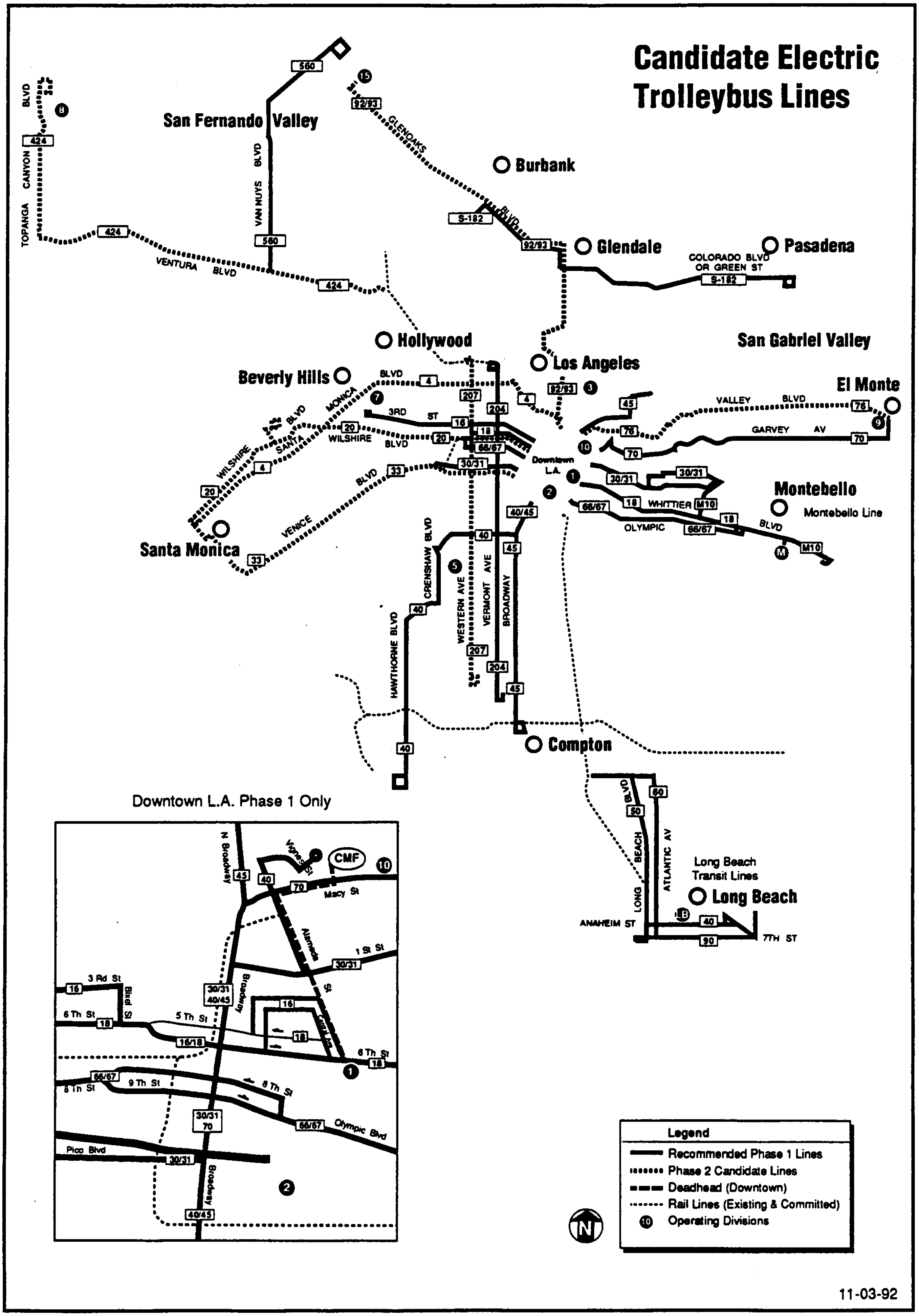
The 12 bus lines proposed for ETB service in Phase I include the most travelled lines in the area. They are spread throughout Los Angeles County and cover downtown Los Angeles, South-Central Los Angeles, the Westside, the Eastside, the San Fernando Valley, Long Beach, the South Bay and the San Gabriel Valley. Proposed ETB routes typically would follow existing bus routes or portions of existing routes. The proposed routes are illustrated in Figures S-1 through S-16.

Prototype demonstration segments are proposed to be constructed as a means of developing and refining administrative, construction and operation procedures for the ETB project. Implementation of prototype lines would also allow for various forms of mitigation measures identified in this Executive Summary to be evaluated and refined for subsequent ETB segments.

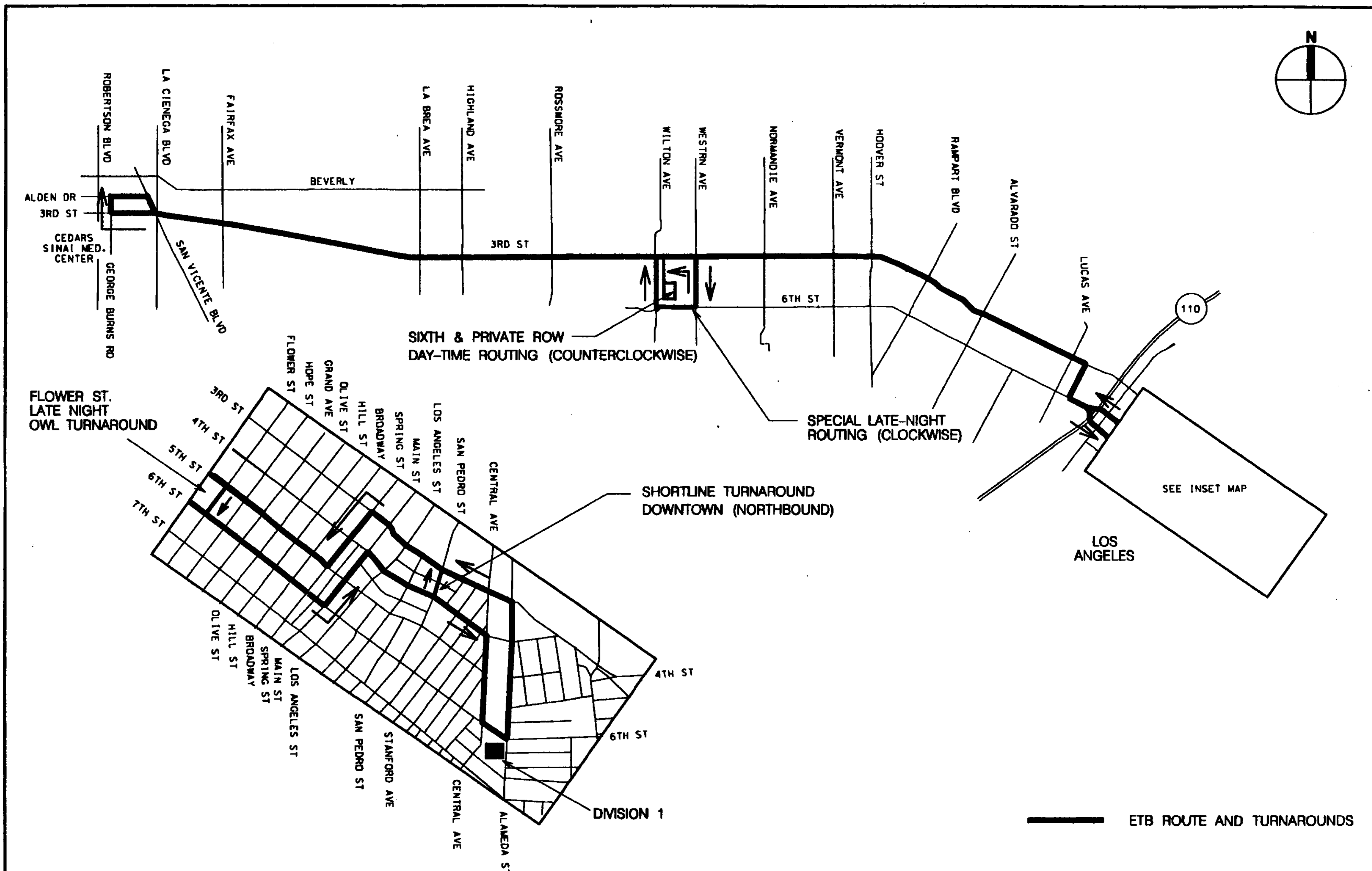
S.2.2 ETB SYSTEMS AND COMPONENTS

ETBs are propelled by electric motors that receive power from electric traction power substations (TPSSs) along the routes. The system used to provide electrical power to the buses is subdivided into the power distribution system (PDS) and the overhead contact system (OCS). The PDS includes TPSSs and associated underground cables. The OCS includes overhead wires and the structures used to support those wires.

Figure S-1



Candidate Electric Trolleybus Lines
San Fernando Valley
Burbank
Glendale
Pasadena
Hollywood
Los Angeles
Beverly Hills
San Gabriel Valley
El Monte
Montebello
Montebello Line
Santa Monica
Compton
Long Beach
Long Beach Transit Lines
Downtown L.A.
TOPANGA CANYON BLVD
VAN NUYS BLVD
VENTURA BLVD
GLENOAKS BLVD
COLORADO BLVD OR GREEN ST
WILSHIRE BLVD
SANTA MONICA BLVD
3RD ST
VENICE BLVD
VALLEY BLVD
GARVEY AV
WHITTIER BLVD
OLYMPIC
CRENSHAW BLVD
HAWTHORNE BLVD
WESTERN AVE
VERMONT AVE
BROADWAY
LONG BEACH BLVD
ATLANTIC AV
ANAHEIM ST
7TH ST
Downtown L.A. Phase 1 Only
N Broadway
Vignes St
CMF
Macy St
Alameda St
1 St St
3 Rd St
Bixel St
6 Th St
5 Th St
Central Ave
8 Th St
9 Th St
Olympic Blvd
Pico Blvd
Legend
Recommended Phase 1 Lines
Phase 2 Candidate Lines
Deadhead (Downtown)
Rail Lines (Existing & Committed)
Operating Divisions
N
11-03-92



DESIGNED BY	LACTC	ELECTRIC TROLLEYBUS PROJECT	FIGURE S-2	DRAWING FILE EIR\RTD16.DGN	CONTRACT NO.
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IN CHARGE		RTD		PLOT DATE 10/19/92	SHEET NO.
DATE 10/06/92					

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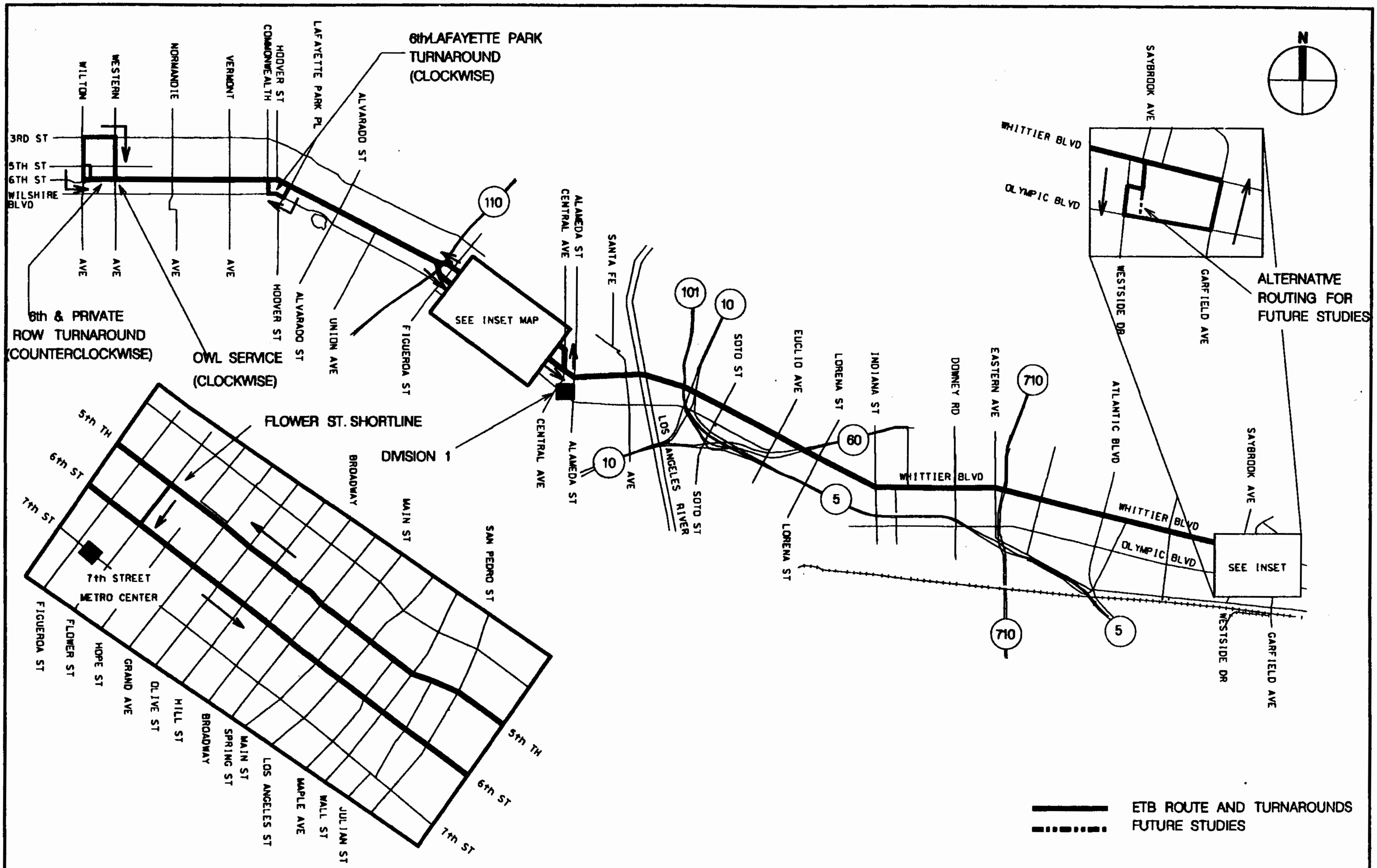

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DATE 10/07/92				

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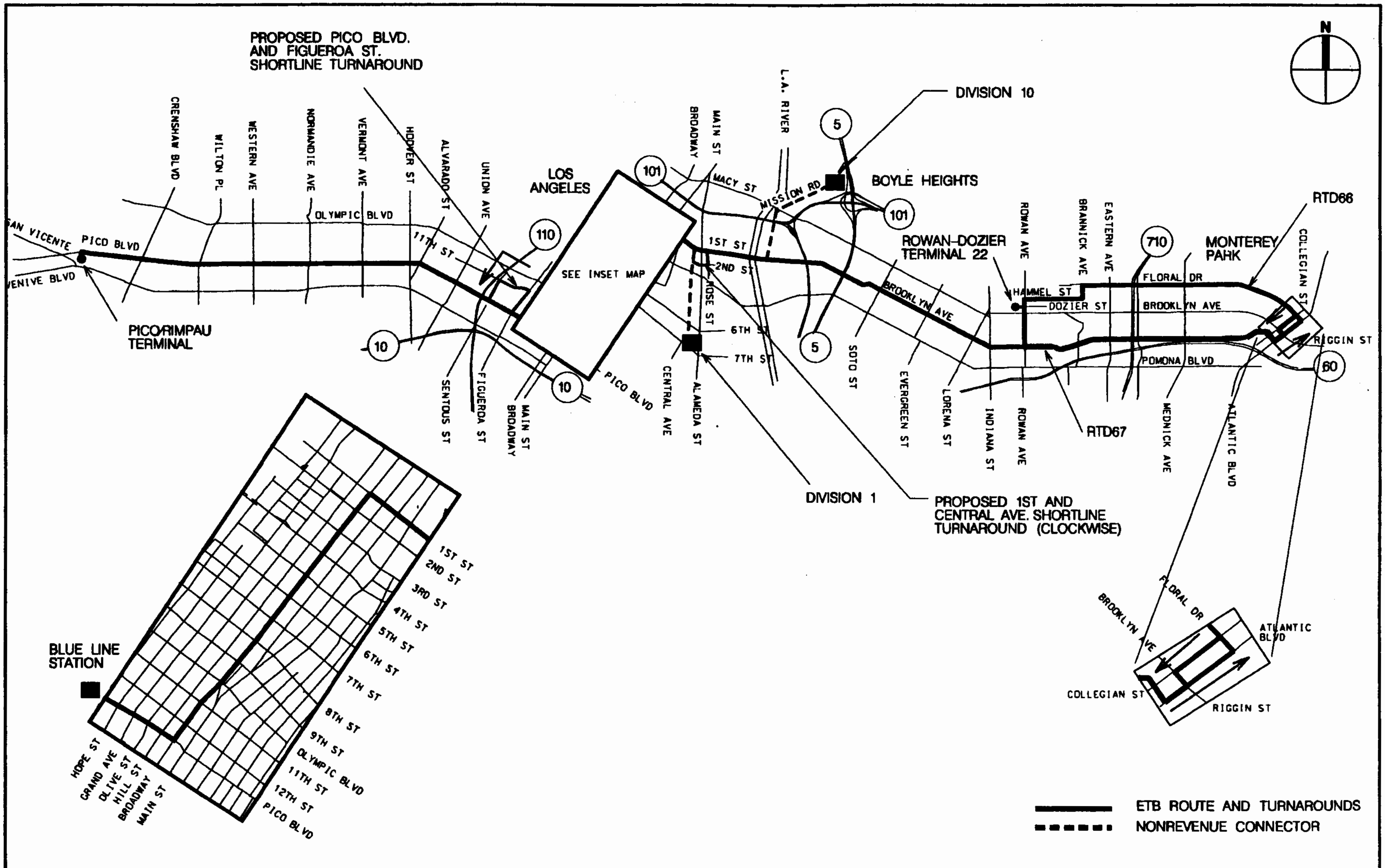

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IN CHARGE	LACTC	RTD	PLOT DATE 10/19/92	SHEET NO.
DATE 10/14/92				

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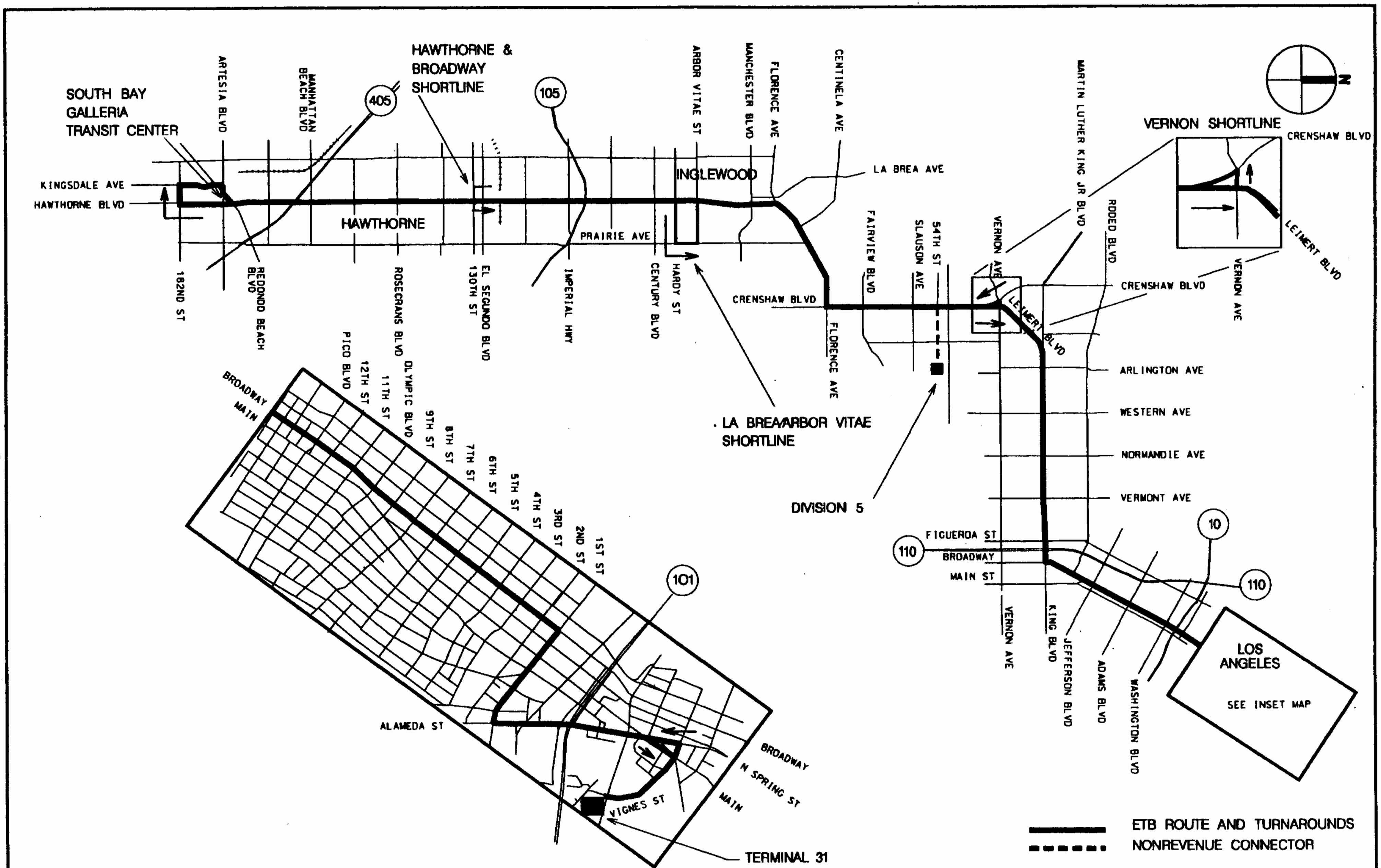

DESIGNED BY	LACTC	ELECTRIC TROLLEYBUS PROJECT	FIGURE S-5 ETB-40, ROUTE MAP	DRAWING FILE EIR\RTD40.DGN / CONTRACT NO.
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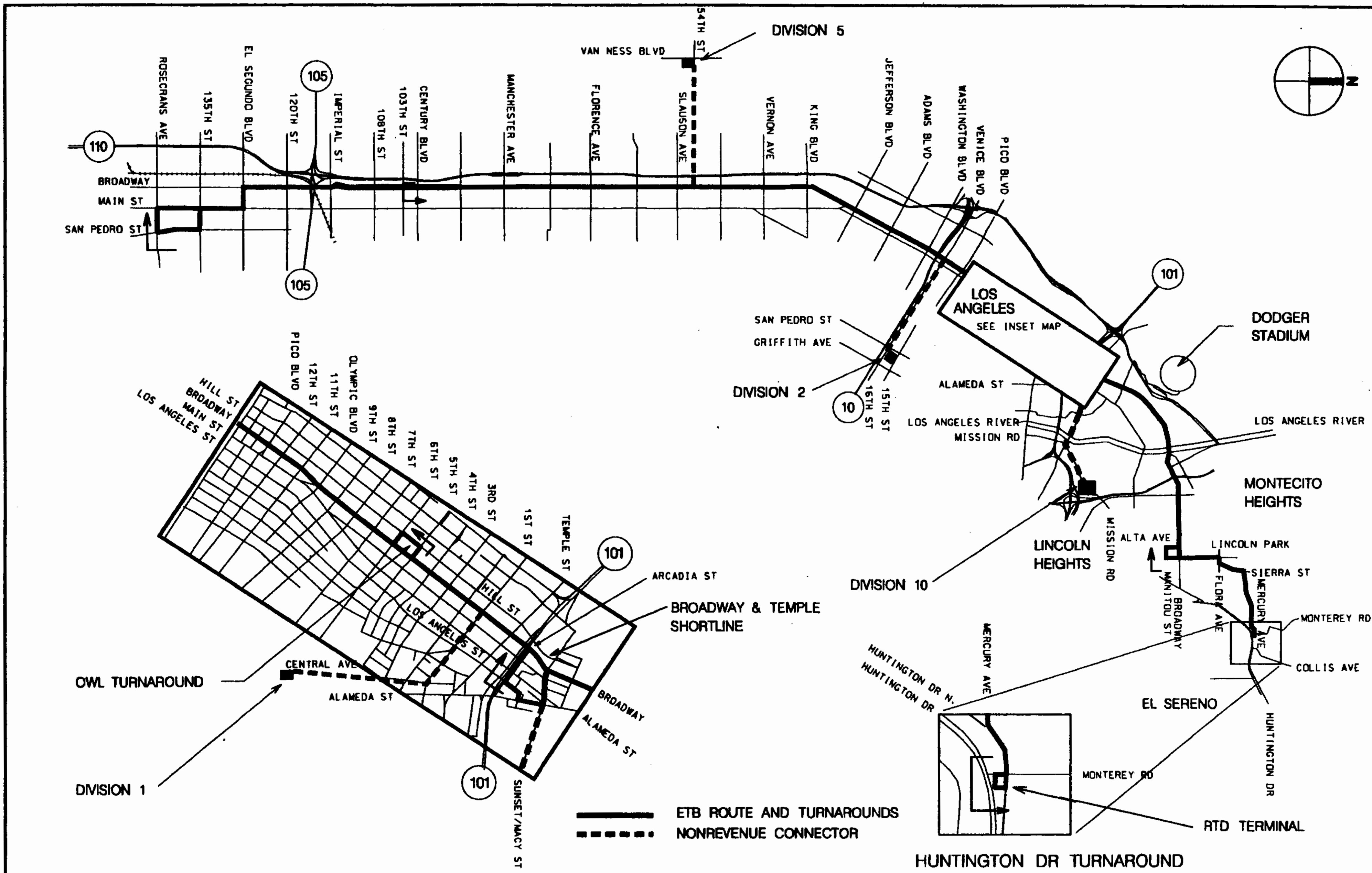
CHECKED BY		ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED		USER NAME ACG/SVP / SCALE NTS
IN CHARGE		RTD		PLOT DATE 10/19/92 / SHEET NO.
DATE 10/14/92				



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IN CHARGE	ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED		DRAWING NO. ETB-45
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			SCALE NTS
			PLOT DATE 10/20/92
			SHEET NO.

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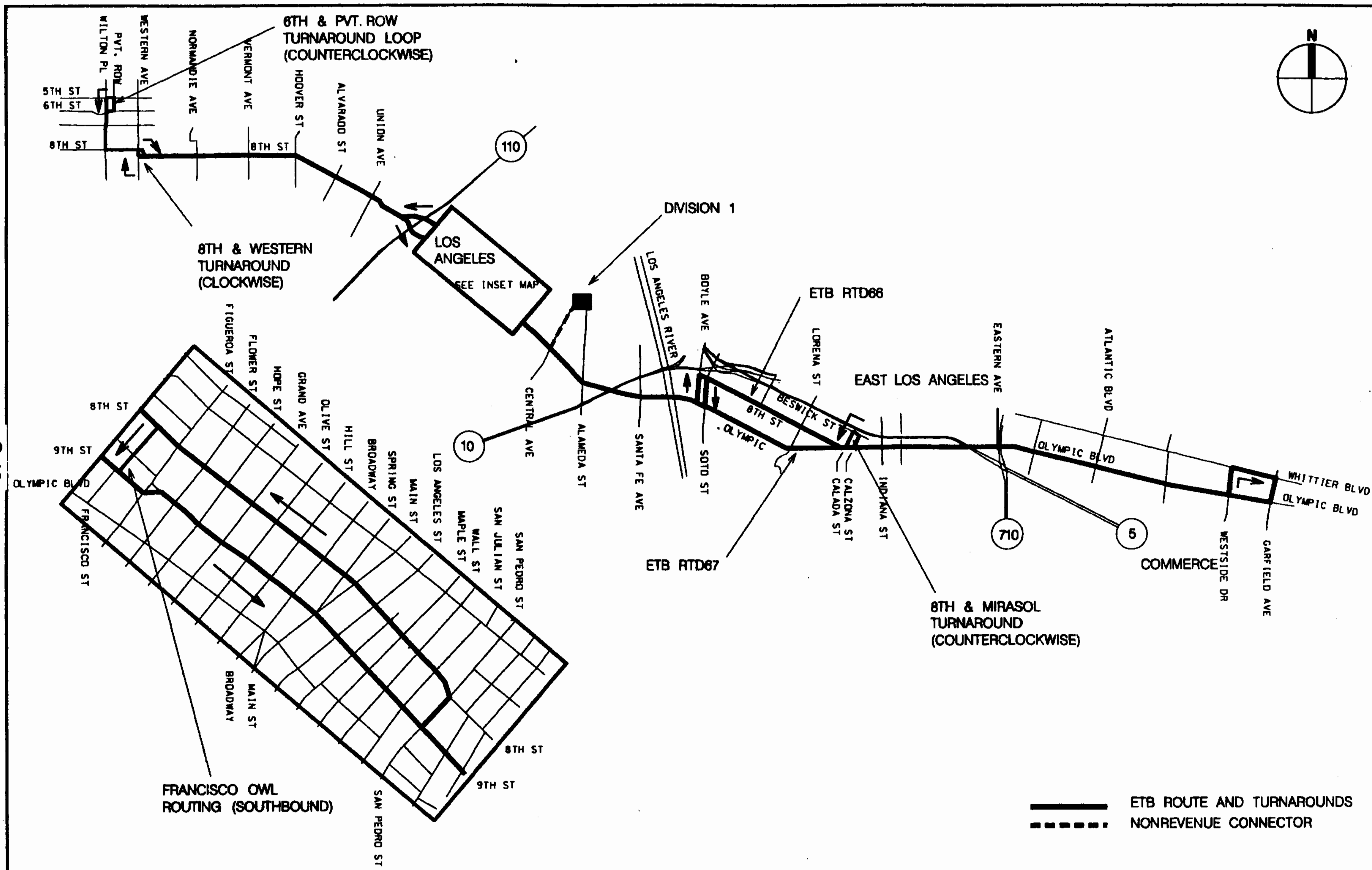

DESIGNED BY	LACTC	ELECTRIC TROLLEYBUS PROJECT	FIGURE S–7
DRAWN BY ACG/SVP		A • C • G ENVIRONMENTS SUBMITTED	ETB–66/67, ROUTE MAP
CHECKED BY		ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED	RTD
IN CHARGE			
DATE 10/14/92			

DRAWING FILE EIR\RTD66.DGN	CONTRACT NO.	
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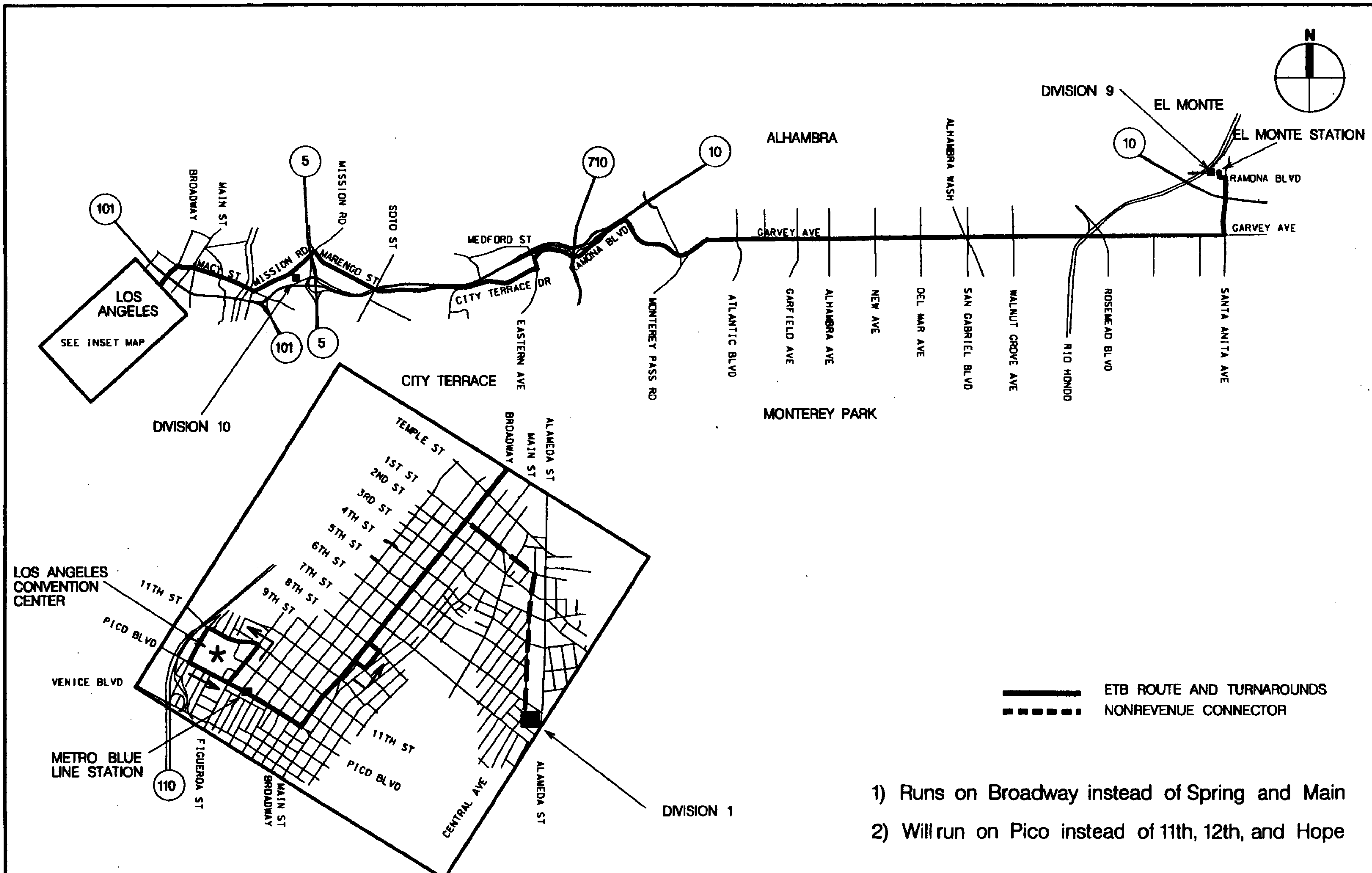

DESIGNED BY
DRAWN BY ACG/SVP
CHECKED BY
IN CHARGE
DATE 10/14/92

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APPROVED

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FIGURE S-8
ETB-70, ROUTE MAP

DRAWING FILE EIR\RTD70.DGN	CONTRACT NO.	
REFERENCE FILE ETAKMAPS	DRAWING NO. ETB-70	REV.
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PLOT DATE 10/19/92	SHEET NO.	

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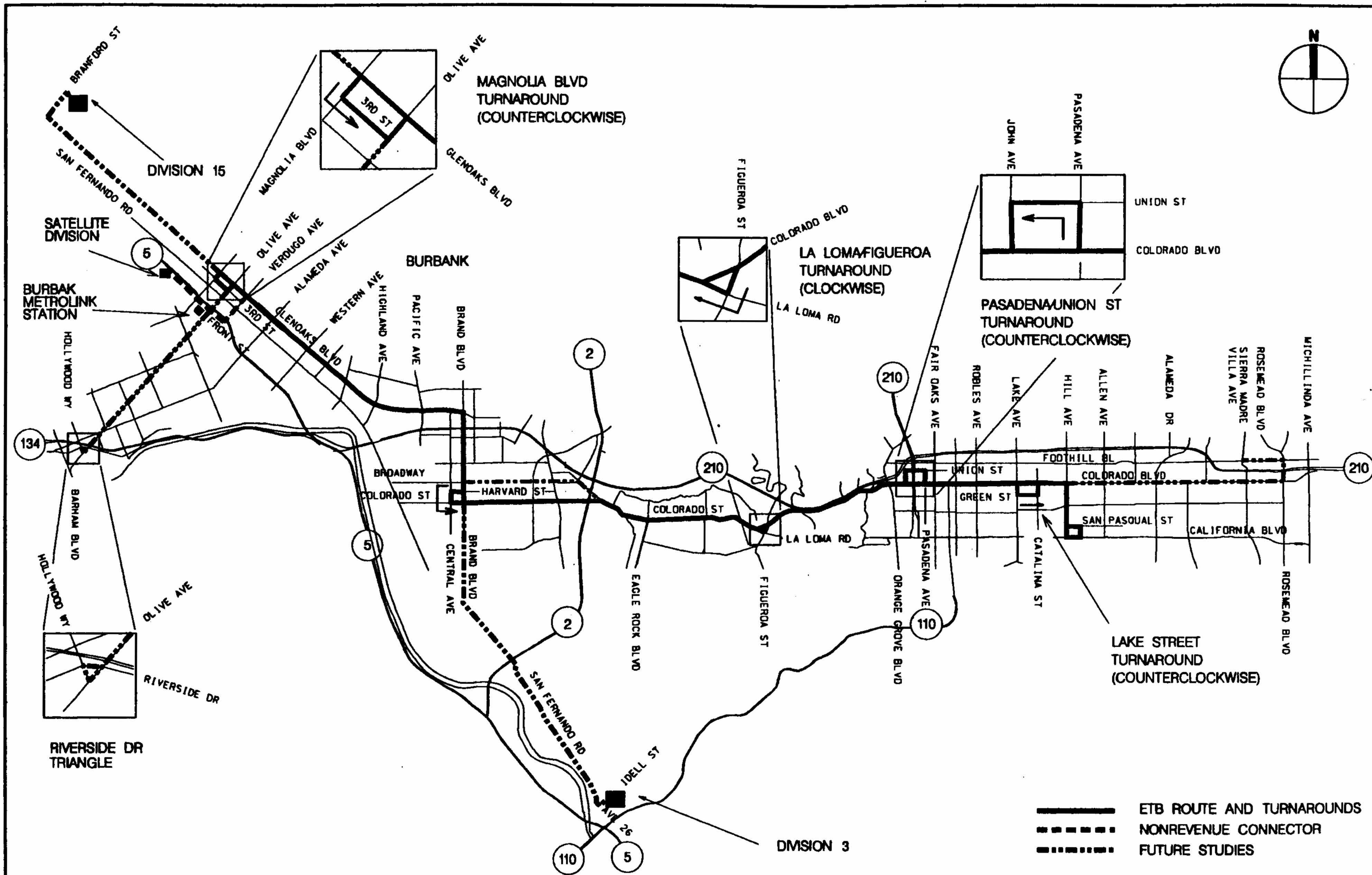

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CHECKED BY		A • C • G ENVIRONMENTS SUBMITTED		USER NAME ACG/SVP	SCALE NTS	
IN CHARGE		ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED		PLOT DATE 10/19/92	SHEET NO.	
DATE	10/15/92	RTD				

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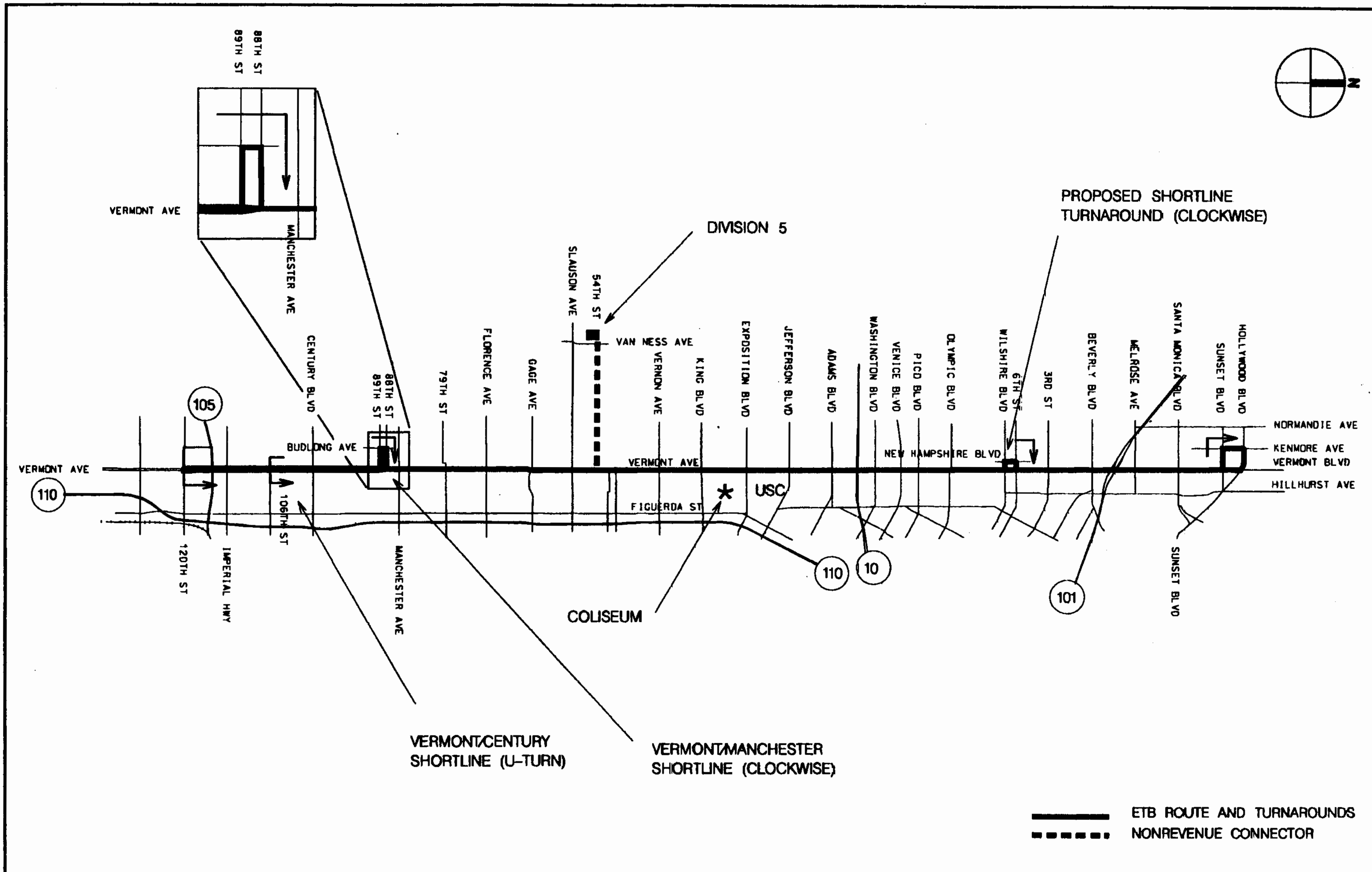

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IN CHARGE	LACTC		DRAWING NO. ETB-204
DATE 10/15/92	SUBMITTED		REV.
	APPROVED		USER NAME ACG/SVP
	RTD		SCALE NTS
			PLOT DATE 10/19/92
			SHEET NO.

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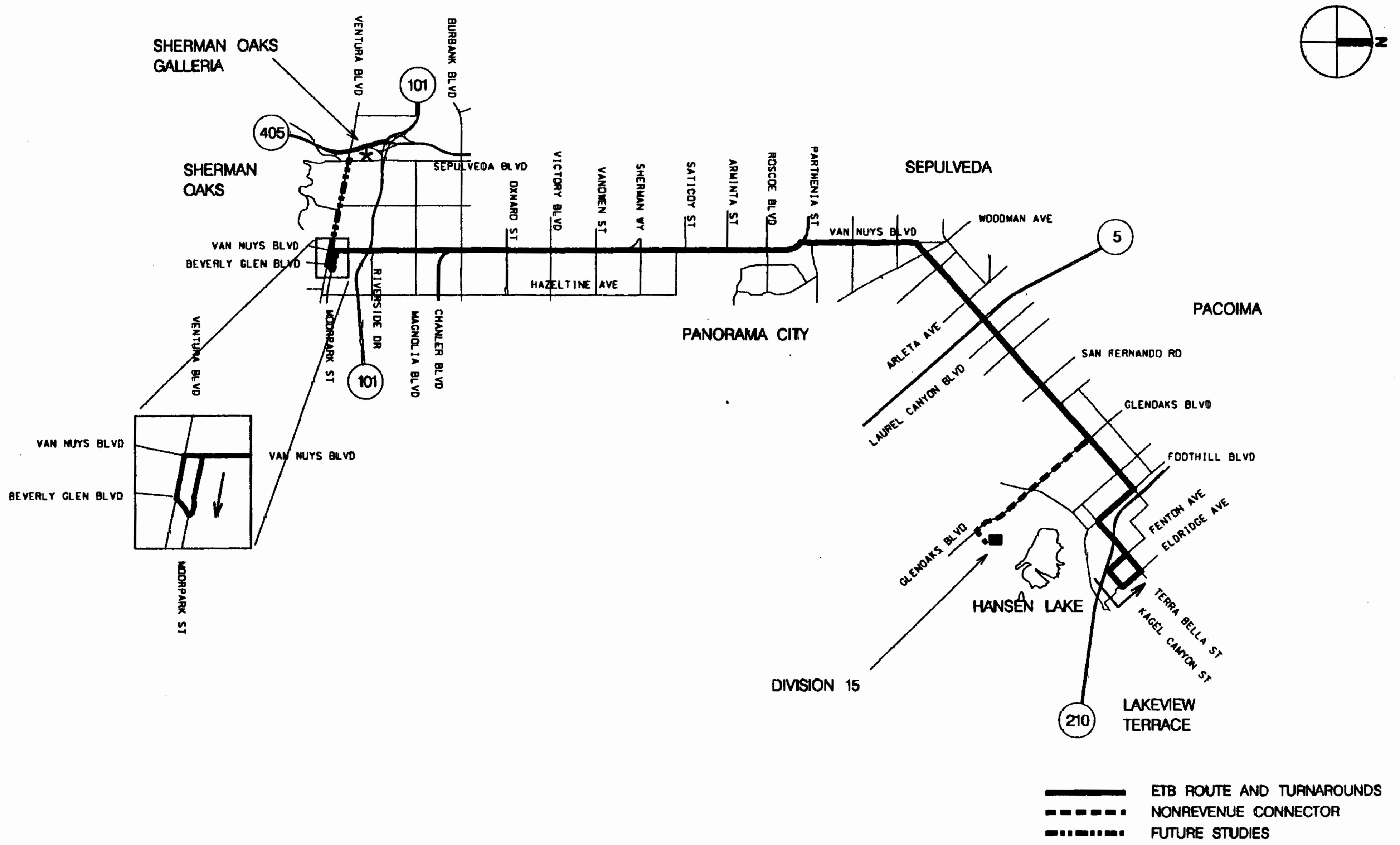

DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	FIGURE S-11	DRAWING FILE EIR\RTD560.DGN
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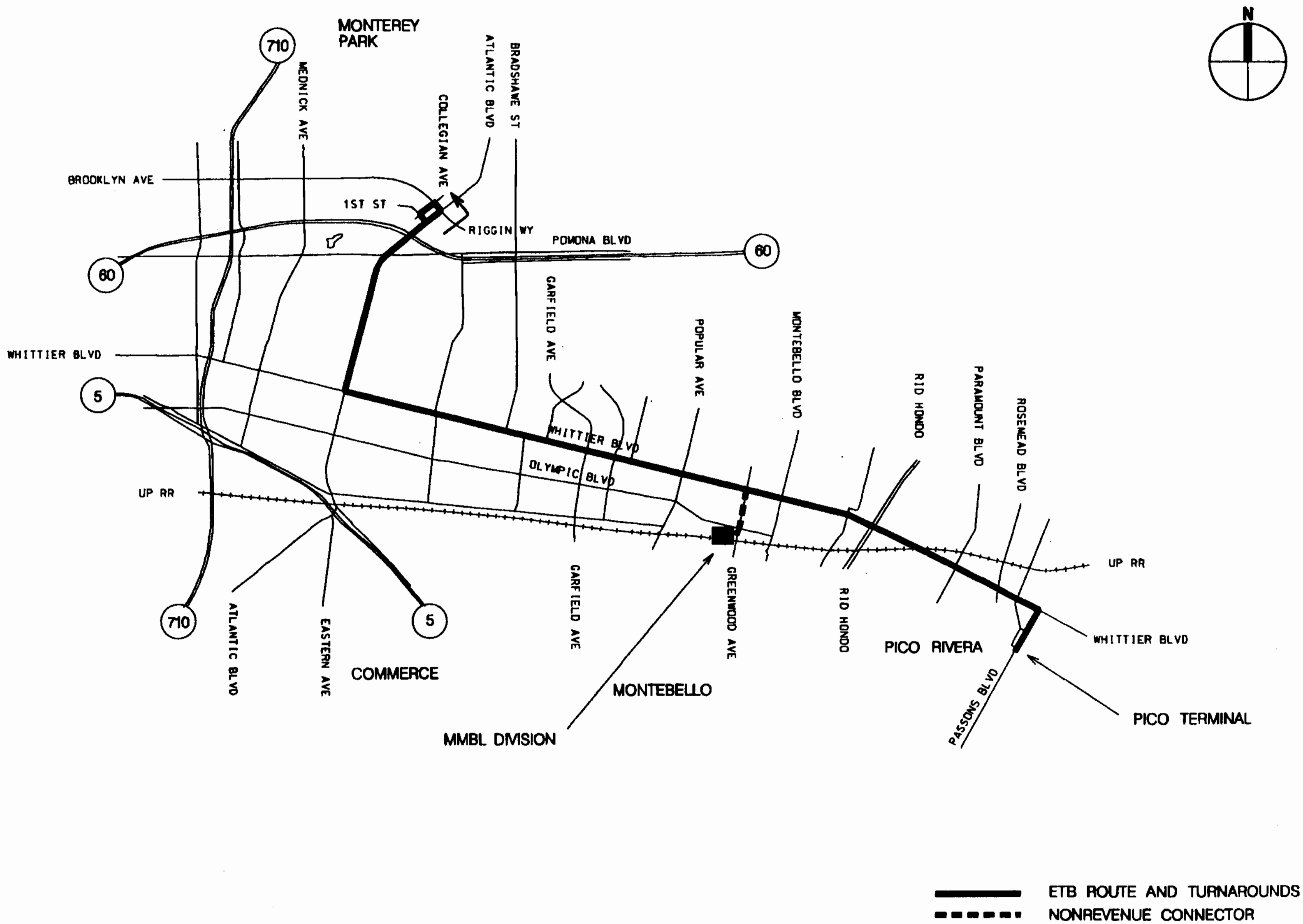

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CHECKED BY			USER NAME ACG/SVP / SCALE NTS
IN CHARGE	LACTC / RTD		
DATE 10/17/92	SUBMITTED / APPROVED		PLOT DATE 10/19/92 / SHEET NO.

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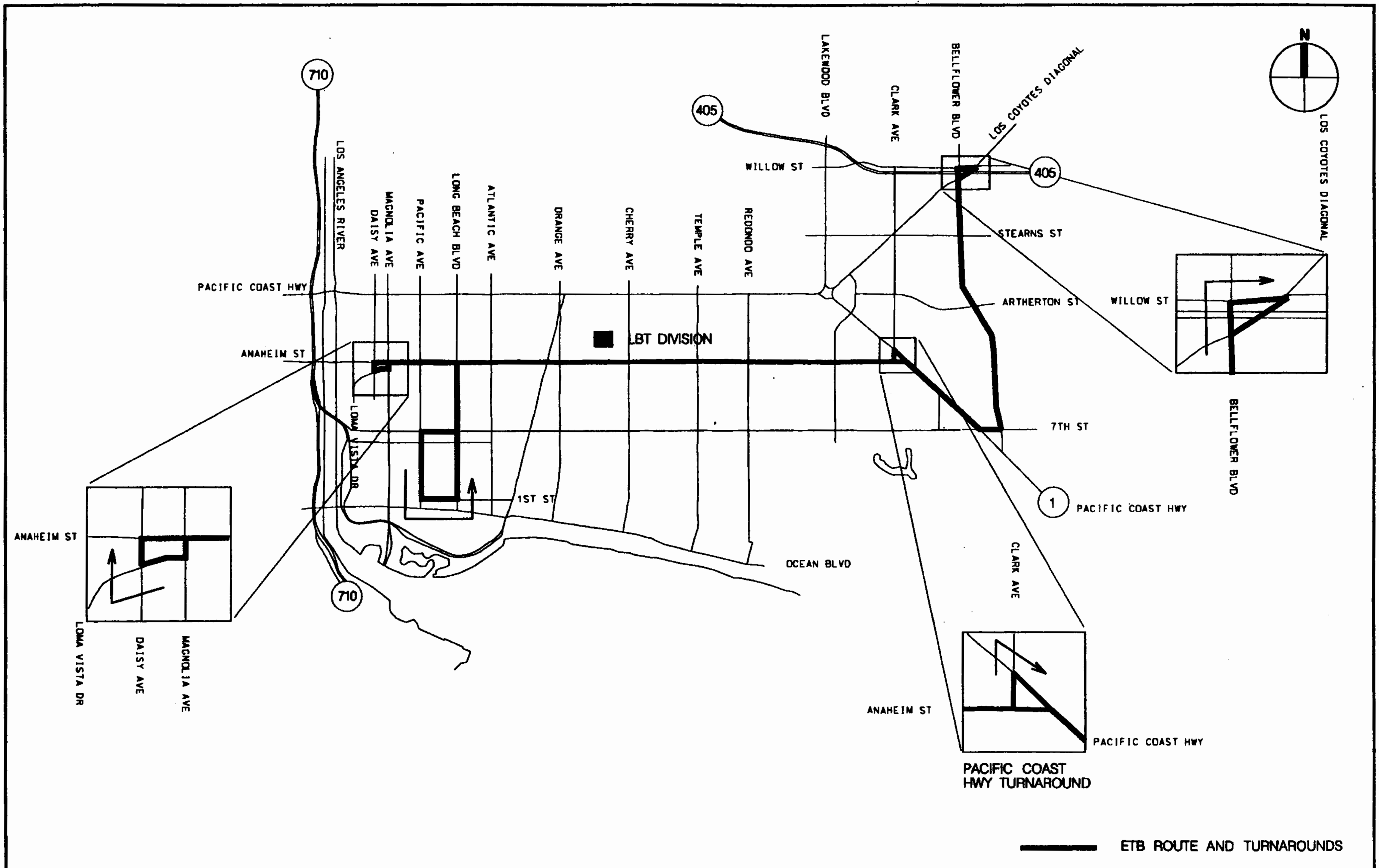

DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	FIGURE S-13	DRAWING FILE EIR\LB40.DGN / CONTRACT NO.
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CHECKED BY	A • C • G ENVIRONMENTS SUBMITTED		USER NAME ACG/SVP / SCALE NTS
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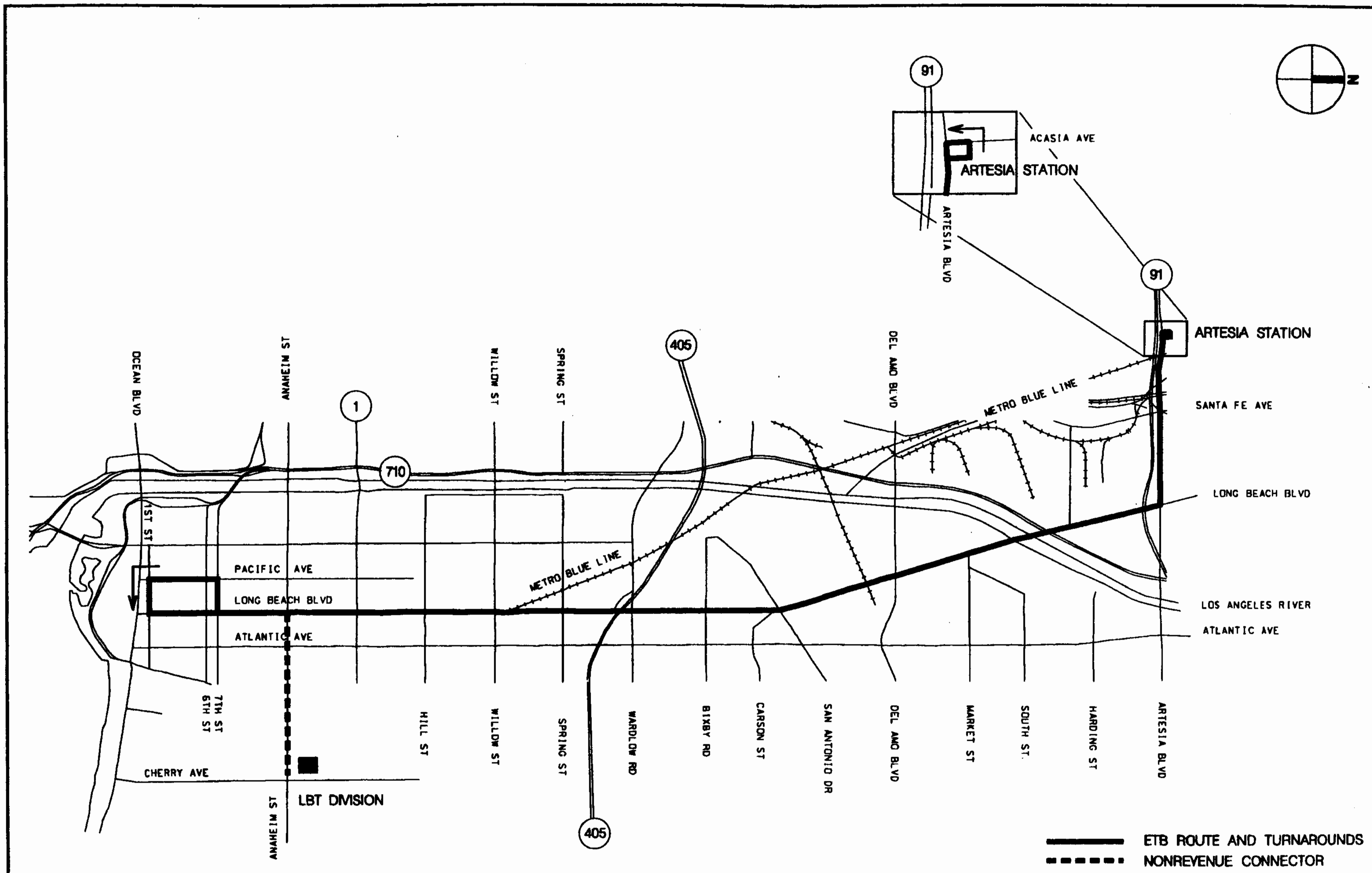
DATE 10/16/92	RTD		



DESIGNED BY	
DRAWN BY	ACG/SVP
CHECKED BY	
IN CHARGE	
DATE	10/18/92

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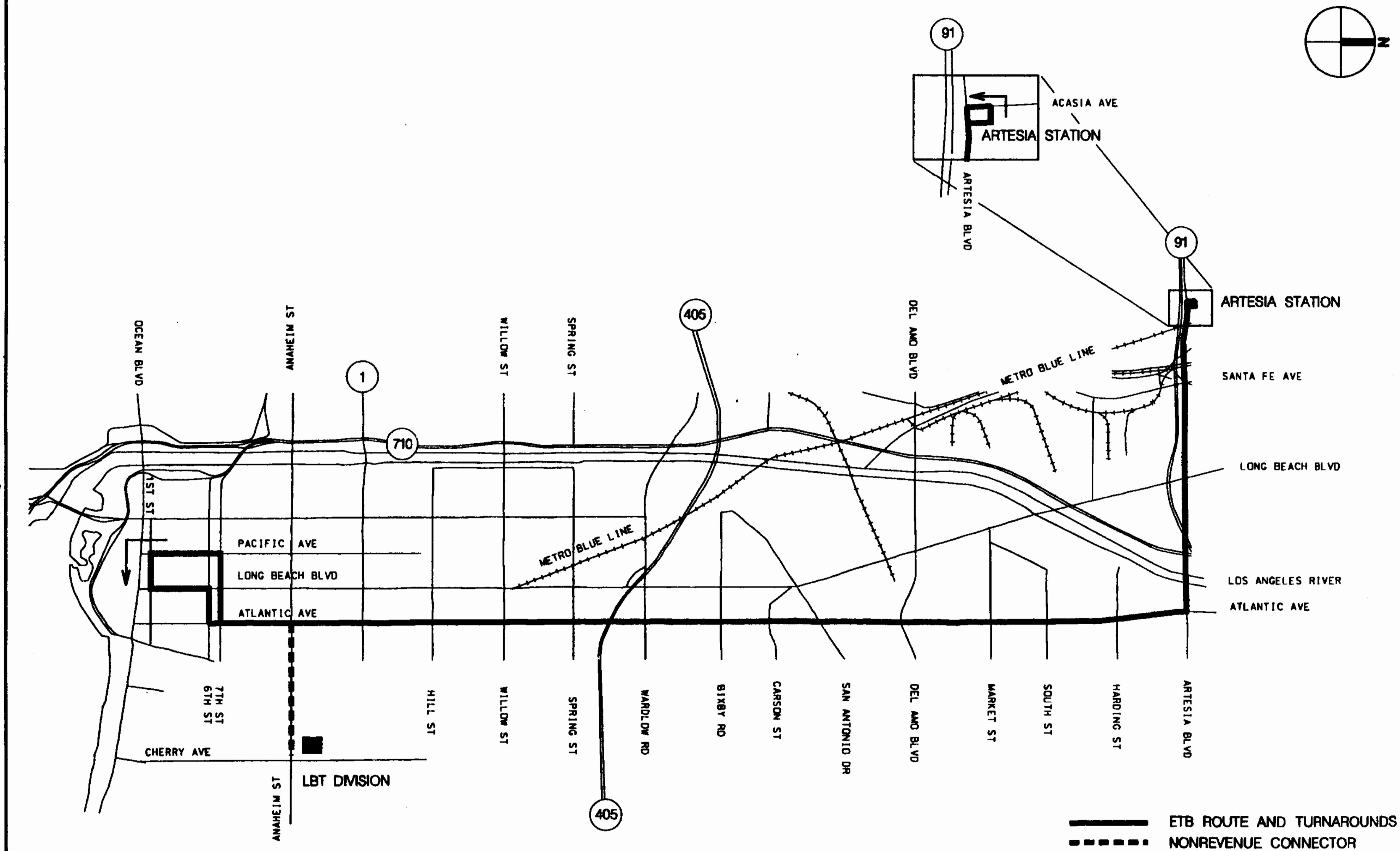
FIGURE S-14
ETB-LB50, ROUTE MAP

DRAWING FILE EIR\LB50.DGN	CONTRACT NO.	
REFERENCE FILE ETAKMAPS	DRAWING NO. ETB-LB50	REV.
USER NAME ACG/SVP	SCALE NTS	
PLOT DATE 10/18/92	SHEET NO.	



DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	FIGURE S-15	DRAWING FILE EIR\LB60.DGN
DRAWN BY ACG/SVP	LACTC	ETB-LB60, ROUTE MAP	CONTRACT NO.
CHECKED BY	A • C • G ENVIRONMENTS SUBMITTED		REFERENCE FILE ETAKMAPS
IN CHARGE	ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED		DRAWING NO. ETB-LB60 REV.
DATE 10/18/92	RTD		USER NAME ACG/SVP
			SCALE NTS
			PLOT DATE 10/18/92
			SHEET NO.

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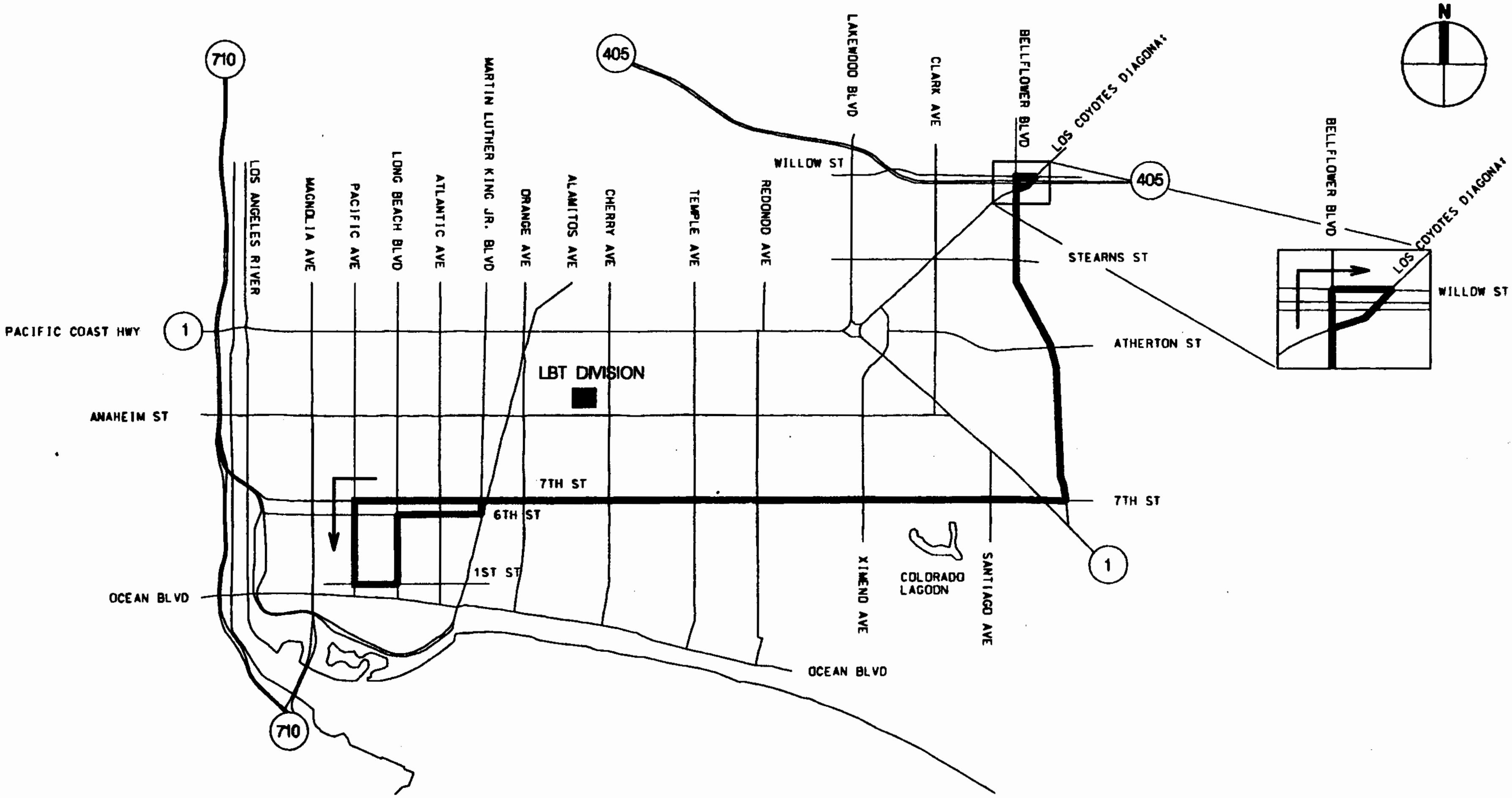


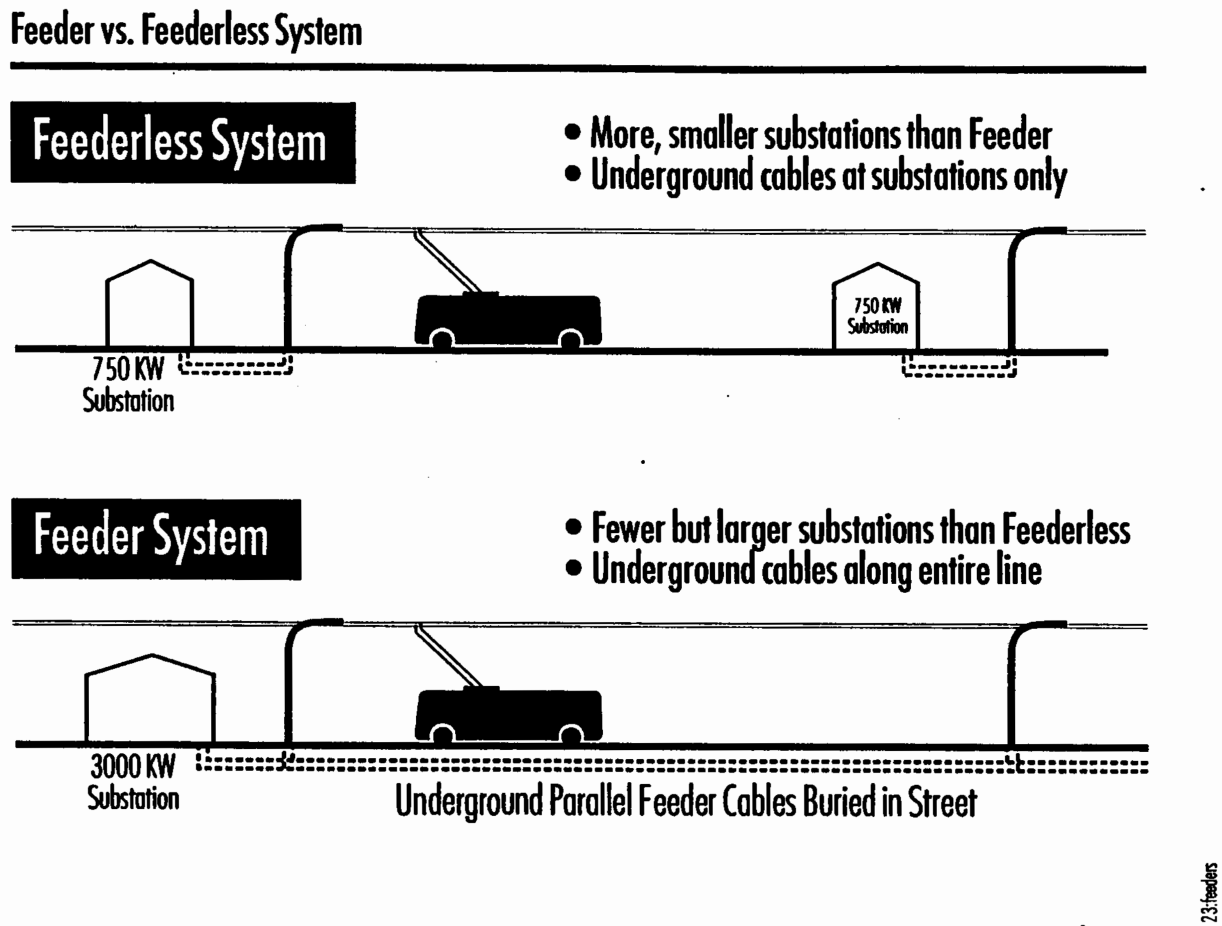
NOTE:
NON-REVENUE CONNECTION WOULD BE ALONG ANAHEIM TO 7TH, EITHER VIA PCH ON THE EASTERN END OR VIA LONG BEACH BLVD ON THE WESTERN END

ETB ROUTE AND TURNAROUNDS

DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	FIGURE S–16	DRAWING FILE EIR\LB90.DGN / CONTRACT NO.
DRAWN BY ACG/SVP	A • C • G ENVIRONMENTS / ICF KAISER ENGINEERS GENERAL CONSULTANT	ETB–LB90, ROUTE MAP	REFERENCE FILE ETAKMAPS / DRAWING NO. ETB-LB90 / REV.
CHECKED BY	LACTC	RTD	USER NAME ACG/SVP / SCALE NTS
IN CHARGE	SUBMITTED	APPROVED	PLOT DATE 10/19/92 / SHEET NO.
DATE 10/18/92			

1:500

Figure S-17: Feederless and Feeder Systems



Source: Southern California Rapid Transit District, 1992.

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Figure S-17: Feederless and Feeder Systems

Two types of PDSs are available: feederless and feeder systems, as illustrated in Figure S-17. The central difference between the two systems is that a feederless system includes many smaller substations that provide electric power to the ETBs through overhead contact wires, while the feeder system includes a few larger substations with a set of cables that run the length of the route (for the proposed project these cables would be underground), distributing electrical power to overhead contact wires. As currently planned and subject to final design, the proposed project would use the feederless system wherever feasible. Due to possible construction constraints, substation siting considerations and economics, the feeder system may be necessary in the Los Angeles Central Business District (LA CBD). For purposes of this EIR, it is assumed that the feeder system would be installed for the LA CBD portions of ETB routes.
Components of the proposed ETB system include: PDS components (electrical substations and underground cables); OCS components (poles, special hardware on poles, pole foundations, bracket arms, cross span wires, overhead contact wires and additional hardware); ETBs and ETB maintenance and storage yards; and aesthetic improvements. Unless otherwise indicated, these components would be similar for both the feederless and feeder systems.

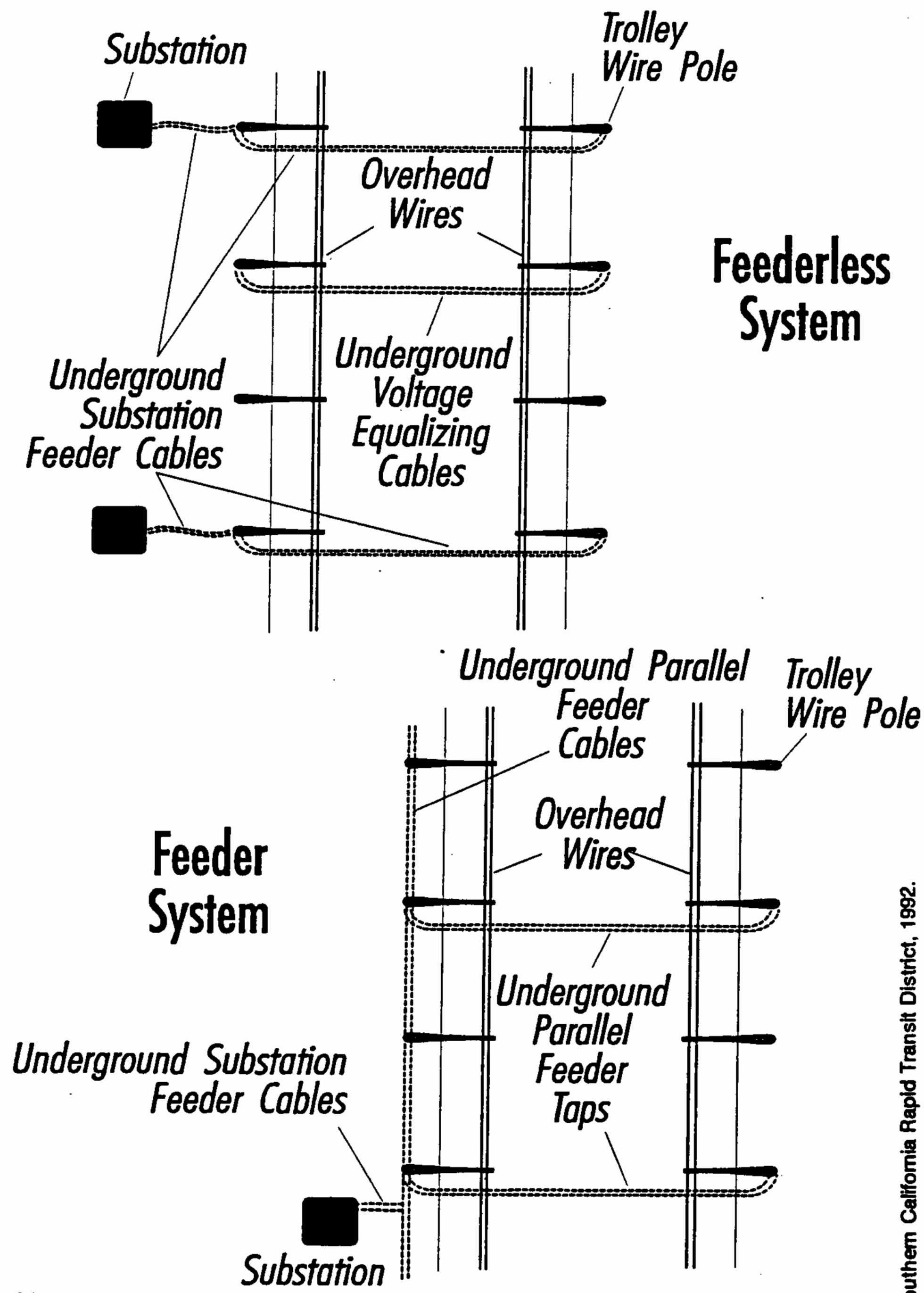
- <u>Substations</u>. Electric traction power substations (TPSSs) would convert utility-supplied alternating current (AC) power to 750-volt direct current (DC) power, which would be used by the ETBs. A total of 135 TPSSs would be required along the ETB routes, 133 for the feederless system and two for the feeder system. They would be located along the proposed routes on vacant lots, parking lots, public rights-of-way (such as streets) or utility rights-of-way. Three TPSSs would be located in maintenance yards serving the routes, bringing the system total to 138 TPSSs.

- <u>Underground Cables</u>. The need for underground cables varies for feederless and feeder systems, as shown on Figure S-18. All underground cables would be installed in conduits placed in accordance with electrical codes and local regulations. Where substation feeder cable locations are not within public rights-of-way, easements would be obtained.

- <u>Poles</u>. Poles would function as the primary support structure for the OCS wires and would generally be placed at a minimum of 75 feet apart and between 100 to 130 feet apart on average. Closer spacing may be required in certain locations because of street configurations such as curves, width of cross streets, length of blocks, location of driveways and intersections.

  In some route segments, existing structures (e.g., buildings and bridges) may be used for overhead contact wire support, depending on aesthetic considerations, the building's structural adequacy and other engineering concerns. In addition, joint use of poles for OCS support with street lights and/or traffic lights would be implemented where possible.

Figure S-18: Feederless and Feeder Systems - Plan View



Source: Southern California Rapid Transit District, 1992.

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Figure S-18: Feederless and Feeder Systems - Plan View

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- Pole Foundations. The pole foundation firmly supports the pole in the ground. The bolted base foundation that would be used for the ETB system includes threaded anchor bolts within concrete. These bolts enable the pole to be fastened into its foundation. Electrical grounding for the poles would be provided in the foundation.

- Hardware on Poles. Various types of hardware would be attached to some ETB poles. Major hardware items include disconnect switches, surge arrestors, trolley switch control boxes and trolley switch lights.

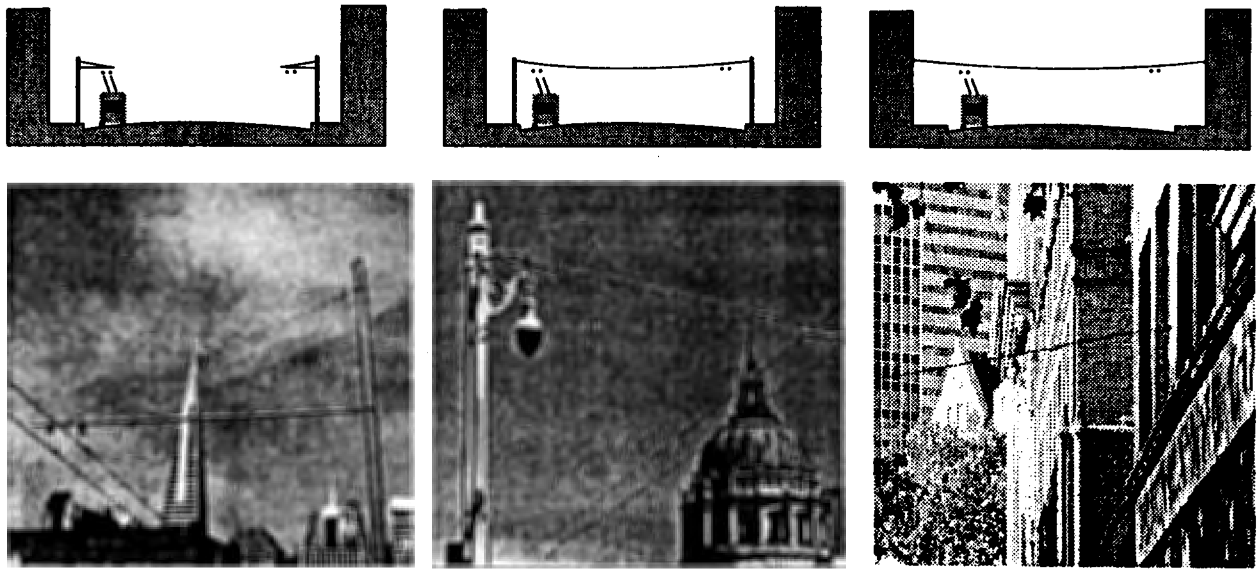
- Bracket Arms and Cross Spans. Bracket arms and cross spans hold the overhead contact wires at the required height and distance from the pole. A bracket arm is a cantilever that extends from a pole to the overhead contact wires. A cross span is a wire suspended between two support structures (either buildings or poles) over and across the street. See Figure S-19 for examples of the use of cross spans and bracket arms in other cities.

  The use of bracket arms or cross spans at various locations along each route would depend on street width, street geometry, location of existing overhead utility wires, special street uses (e.g., parade routes, house moving routes), bus movements, aesthetic considerations, local preference and cost. Cross spans would be used at most locations where two or more routes cross and where buses make turns.

- Overhead Contact Wires. Overhead contact wires, also known as overhead trolley wires, would run above ETB travel lanes supplying power to the ETBs. Two overhead contact wires, one positive and one negative, would be required for each ETB lane. The number and layout of overhead contact wires along any particular route segment would depend on the number of ETB lines along that segment and the need for turns at intersections. Examples of overhead wiring are shown in Figure S-19.

  It is proposed that overhead contact wires be supported at a height of 18 feet above the street. This height would require a variance from the California Public Utilities Commission. If this variance cannot be obtained, the overhead wire height would be 19 feet. At intersections where traffic signals are suspended on an arm into the street, the signals would have to be raised 1 to 2 feet to clear the height of the overhead wires.

- Additional Hardware and OCS Supports at Intersections. Intersections where ETB routes cross or turn require special designs and hardware including section insulators and curved segments. These hardware components are illustrated in Figure S-20. Section insulators would also be required on overhead wires at each substation location. Turns at route crossings would also require turnout switches that enable the ETBs to turn from one route onto a crossing route.



Trolley wires supported by a bracket arm

Trolley wires supported by cross-span wire suspended from a pole

Trolley wires supported by a cross-span wire suspended from a building facade

Source: Public Works Associates, 1992.

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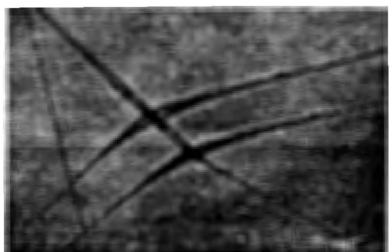
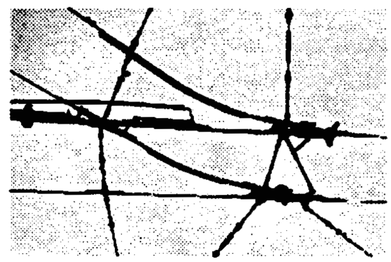
Figure S-19: Overhead Wires, Cross Spans and Bracket Arms



Close-up view of a Curved Segment

Close-up view of Insulating Hardware



Close-up view of an Electric Switch

Source: Public Works Associates 1992.

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Figure S-20: Section Insulators and Curved Segments

In addition to extra hardware at intersections where four ETB routes cross or turn, extra poles and cross span wires would be needed to support overhead wires. The number and arrangement of these components would depend on the geometry of the intersection and the overhead wiring configuration.

- ETBs. The proposed project would use standard ETBs, 40-feet long and 102-inches wide. In addition, 60-foot articulated ETBs (also 102 inches wide, but with two sections of the ETB jointed together so that they form an angle when the ETB turns) could be used. All ETBs would conform with Americans with Disabilities Act (ADA) requirements. The ETB's speed would at least equal the current operating speed of diesel buses. Headways (scheduled time between ETBs) for each route would remain the same for standard ETBs and potentially increase if articulated ETBs are deployed. ETBs would be equipped with auxiliary power units (APUs) to provide mobility in the event that electric power is lost for any reason.

- ETB Maintenance and Storage Yards. Existing bus maintenance yards for RTD Operating Divisions 1, 2, 5, 9, 10, and 15 and the Montebello and Long Beach Division yards would be used for ETB maintenance and storage. Some modifications to the equipment at these yards would be required. In addition, the Divisions 1, 2 and 10 maintenance yards would be expanded and a new satellite division yard would be located for Study Route 182 (also known as Tri-Cities route).

- Aesthetic Improvements. The urban design component of the ETB project consists of a set of design elements that will be defined specifically during final design to reflect the needs and opportunities along each segment of the ETB routes. Included in the set of elements are: trees, ETB stops and shelters, sidewalk improvements, pole enhancements, design integration of sidewalk furniture, passenger information kiosks and other passenger and pedestrian amenities.

  Communities through which the ETB routes pass will be consulted and encouraged to participate in the final selection of the urban design elements for their community. For budgeting purposes, an allowance of approximately 10 percent of the total project cost has been identified to provide for the urban design component.

  The ETB project is seen as a potential catalyst for focusing greater attention and effort on improving the quality of the urban setting along the ETB routes and for increasing the use of public transit. Agreements will be sought with local cities that provide for local city support of transit and pedestrian enhancements that complement and build upon the improvements provided by the project. These "Joint Participation Agreements" will detail arrangements for signal preemption, ETB lanes, ETB station and stop enhancements, etc. Issues such as maintenance of trees and pedestrian facilities included in the project or provided by the cities will be addressed.

S.3 ALTERNATIVES TO THE PROPOSED PROJECT

S.3.1 NO PROJECT ALTERNATIVE

Under the No Project Alternative, all bus lines in Los Angeles County would continue to be powered by internal combustion engines that comply with EPA-mandated exhaust emission standards. This alternative would not comply with the 1991 AQMP.

S.3.2 ALTERNATIVE FUELS

Alternative emission-reduction technologies include four electric-powered technologies: ETBs (the proposed alternative), battery systems, fuel cells and roadway powered vehicles; and four non-electric-powered technologies: methanol bus, compressed natural gas bus, liquefied natural gas bus and diesel bus with particulate trap system. Only the four electric-powered technologies are zero-emission technologies, as called for in the 1991 AQMP. However, only the ETB technology, which has a long history of technical development and successful operation, could be developed within the time frame specified by the 1991 AQMP. The technologies for fuel cells and batteries are still in the research and development stage, but represent a promising alternative for the future.

S.4 ISSUES TO BE RESOLVED

The following issues are yet to be resolved regarding the proposed ETB project:

- The content of joint participation agreements with other entities and jurisdictions needs to be developed, particularly with regard to the following subjects:

  - aesthetic enhancements,
  - responsibility for tree maintenance,
  - responsibility for street lighting and pole maintenance,
  - responsibility for safety training,
  - joint use of poles and
  - potential liabilities, despite the offer for RTD indemnification.

  Because elements of the ETB system involve the rearrangement or combining of public facilities along the streets with ETB components, joint participation agreements will need to be negotiated with public agencies and local jurisdictions to ensure the equitable distribution of maintenance expenditures and responsibilities.

- Construction schedules with other entities and jurisdictions regarding street and infrastructure improvement projects must be coordinated. This may require drafting standard agreements for future activities.

- The exact routing of ETB Study Route 182 through the cities of Pasadena, Glendale and Burbank needs to be determined, with particular reference to the following issues:

  - The use of the Colorado Street Bridge over the Arroyo Seco for ETB wiring,
  - The use of Colorado Boulevard and the possible effects on the Tournament of Roses Parade,
  - Extension of the route to the Hastings Ranch area,
  - The possible use of Broadway Boulevard in Glendale,
  - The possible extension of the western end of the route south along Olive Street in Burbank.

- The routing of the Long Beach ETB routes through the California State University of Long Beach campus.

- The feasibility of substantially reducing the amount, profile and visibility of the wires and hardware at turns and ETB route crossings must be determined. The potential for use of auxiliary power units and automatic dewire-wire technology for daily operation to reduce overhead wire in sensitive areas should be further defined.

- Measures to resolve house moving and ETB route conflicts have yet to be finalized, including a determination as to who would pay the costs for removing/raising the OCS for house movement.

- ETB vehicles must be tested prior to use and after undergoing major maintenance. An approximately 1.5-mile long route along city streets would be required for test runs. This route has not yet been identified; however, it is anticipated that streets in non-residential areas would be used.

- Joint use of historic lampposts is recommended in the urban design criteria and may not be recommended by historic preservationists. This will need to be addressed during the final design phase for the project.

S.5 AREAS OF CONTROVERSY

It is assumed that resolution can be found for each of the issues to be resolved identified in the previous section. With this assumption, no major areas of controversy have been identified, but the following continue as interest areas:

- Members of the City of Los Angeles staff, serving as an independent ETB Task Force, expressed a desire to review and pursue other low-emissions technologies, and the LACTC and RTD have initiated a research and development program designed to review such technologies.

- Discussions with local city officials have indicated concern about the visual effects of the overhead contact wires and hardware, particularly on those streets where utility wires have been placed underground. As described above, an urban design component has been incorporated into the ETB project to help mitigate these concerns and impacts.

S.6 PROJECT COSTS

Typically, ETB lines would replace bus lines that are currently operated with conventional motorbuses. Minor adjustments in routes may be made to accommodate special ETB requirements such as OCS configurations at layover zones, turnarounds and bus stops. No significant changes are anticipated in bus routes, revenue service hours/miles, average vehicle speed or hours of operation.

Capital cost of the system is based upon detailed estimates developed by an engineering consulting firm and experience in other cities that have built ETB and light rail systems. The cost for the project also assumes that part of the replacement vehicle cost would be borne by Federal/Local Capital Grant funds which are provided for normal periodic bus replacement. The total cost for the 12 line, Phase I project, in 1993 dollars is estimated to be about $1 billion. Ten percent of this estimate has been designated for the urban design component of the project. Cash flow projections and cost adjustments to reflect inflation are based on the construction schedule which is subject to the availability and timing of capital funds.

Operating costs are expected to be about the same as operating the lines with conventional buses. While ETB vehicles require less maintenance than conventional buses, these reductions are offset by the additional cost of maintaining the PDS and OCS. Since the RTD farebox recovery ratio (i.e, the percent of operating costs recovered via the farebox revenues) has historically been below 40 percent, increased patronage on the ETB lines, as experienced by other cities, would require additional operating subsidy dollars.

S.7 SUMMARY OF ENVIRONMENTAL EFFECTS

The following table indicates the project's potential environmental impacts, the significance of those impacts, mitigation measures and the significance of the impacts after mitigation.

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.1 AIR QUALITY				
	Routes • The proposed project would decrease air emissions from transit buses on the streets and increase emissions from electric power plants. The net effect of the project as compared with existing conditions would be to reduce reactive organic gases by 348 pounds per day (ppd) (a 99 percent decrease), reduce carbon monoxide by 1,460 ppd (a 97 percent decrease), reduce nitrogen oxides (NO_x) by 1,963 ppd (an 83 percent decrease), reduce particulates by 554 ppd (a 98 percent decrease) and to increase sulfur oxides by 20 ppd (a 285 percent increase). Although the proposed project would reduce NO_x by 83 percent, the remaining NO_x levels would exceed the SCAQMD's advisory threshold levels. The proposed project would not exceed SCAQMD's advisory threshold levels for any other pollutants.	Beneficial	• No mitigation is necessary	Beneficial
	Maintenance Yards • The proposed project would decrease air emissions from ETB bus maintenance yards. Unlike diesel buses (which are moved within the yards for fueling, washing and maintenance and which go through a start and warm-up period each morning thus creating air emissions for neighboring properties), ETBs would produce no "tail-pipe" emissions at the yards.	Beneficial	• No mitigation is necessary.	Beneficial

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.2 NOISE				
	<u>Routes</u> ● Replacing diesel buses with ETBs would reduce noise levels at adjacent uses along the routes, particularly at bus stops and intersections when the buses are accelerating.	Beneficial	● No mitigation is necessary.	Beneficial
	<u>Substations</u> ● Residences and other noise-sensitive receptors within 35 feet of substation buildings could be adversely affected by substation noise. A preliminary review has indicated that 16 substation sites may be less than 35 feet from adjacent noise sensitive properties.	Significant	● Some or all of the following measures will be implemented: o designing substation sites to maximize distance between substation and sensitive receptor; o baffling substation vents; o using quiet transformer and substation components; o placing vents on substation buildings so they are oriented away from nearby sensitive uses; o constructing sound barriers or partial enclosures.	Not Significant
	<u>Maintenance Yards</u> ● Because of high existing noise levels, activities at the expanded bus maintenance facilities would not cause a significant change in noise levels at nearby sensitive receptors. The proposed change from diesel to electric buses would reduce noise levels associated with the buses moving within the yards for fueling, washing and maintenance, going through a start and warm-up period each morning and entering and leaving the site.	Beneficial	● No mitigation is necessary	Beneficial

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.3 AESTHETICS				
	Routes • New visual elements would be added to the routes.	Not Significant	• No mitigation is necessary.	Not Significant
	• If joint use of poles cannot be implemented, the addition of poles may further pole crowding at signalized intersections.	Not Significant	• No mitigation is necessary.	Not Significant
	• Complex ETB wiring, hardware and cross span/bracket arm configurations required at certain intersections and locations with unique street conditions would result in visual impacts. These impacts would be exacerbated at signalized intersections where poles are added to the corners (should joint use of poles not occur at the intersection).	Significant	• The necessary agreements and approvals for joint use of poles will be sought. (Special consideration will be given to joint use of poles in historic areas -- see Section 3.8 below.) • Incentives will be developed to encourage innovative hardware designs that reduce its visibility. • The approval of a new type of synthetic guy strand that reduces the need for insulating hardware will be pursued.	Potentially Significant
	• Planting and and other urban design improvements proposed for ETB routes would enhance the routes' appearance.	Beneficial	• No mitigation is necessary.	Beneficial
	Substations • The project would locate 135 substations in commercial, industrial and residential areas along the proposed routes. Mitigation may be required in some locations to blend the substation into its surrounding environment.	Potentially Significant	• Substations that conflict with their visual setting will be landscaped, and consistent and appropriate treatment of substation structure facades will be provided.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.3 AESTHETICS (Cont'd.)	Maintenance Yards ● Maintenance yard expansions at Divisions 1 and 2 and development of the S-182 satellite division would replace structures that have a generally industrial character with bus maintenance yard structures of a similar appearance. The Division 10 expansion would replace a currently vacant site surrounded by freeways and industrial uses with bus parking.	Not Significant	● No mitigation is necessary.	Not Significant
3.4 VEGETATION AND WILDLIFE				
Plants	Routes ● Due to the highly urbanized nature of the project area, no significant impact is anticipated on sensitive species. Effects on street trees would be a function of size and location of the tree canopy in relation to the OCS. Trees potentially affected would be large, round-headed types (most notably deodar cedar).	Potentially significant	● Should street tree pruning be required: ○ Prune only branches in conflict with contact wires, ○ Prune trees of the same species along continuous a stretch in a similar manner. ○ Selectively prune street side for symmetrical appearance. ○ For dense canopy trees, encourage thinning to promote more upright growth.	Not significant
	● Plantings are proposed for ETB routes.	Beneficial	● No mitigation is necessary.	Beneficial
	Substations ● Construction of the proposed substations could require removal of existing landscaping and vegetation consisting mostly of weeds.	Not Significant	● Landscaping will be provided when possible at the substation sites.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.5 UTILITIES AND SERVICE SYSTEMS				
	Routes • Installation of overhead wires and underground cables could affect existing utilities, resulting in temporary disruptions of utility service.	Potentially Significant	• Design and construction activities will be coordinated with utility providers and affected property owners to minimize disruptions. Temporary connections will be put in place where necessary to provide uninterrupted service. • Initial surveys will be made to locate overhead and underground utilities and ETB overhead wires and underground cables will be located away from potentially interfering utilities, where possible.	Not Significant
	• Joint use of street pole supports (e.g., street lights, traffic lights and OCS supports) could require additional maintenance and pose additional safety hazards for city maintenance workers and private contractors. Overhead contact wires could also pose safety hazards for local street maintenance and tree maintenance personnel.	Potentially Significant	• The project will comply with state and local ordinances regarding utility location and clearances. • RTD and LACTC will work with local jurisdictions to devise solutions to unresolved issues. RTD and LACTC will continue to explore use of alternative technologies to reduce the number of poles and use of overhead wires. • RTD will work with local agencies to ensure that tree species, tree spacing and tree clearances from the electrified wires comply with all local codes and ordinances. • RTD will provide safety training programs, as needed, for RTD maintenance personnel. • For joint use poles, design measures would be identified to complement the specific area's historical and existing urban design fabric.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.6 LAND USE/ACQUISITION AND DISPLACEMENT				
Acquisition and Displacement	Substations • The 135 substations along the routes would be developed on mostly vacant land and require acquisition of both private and public property including Caltrans freeway rights-of-way. Forty-six of the substations would be located on public property. Development of the proposed substations may restrict the type and scale of future development at some of the sites.	Potentially Significant	• RTD will provide just compensation for acquired property.	Not Significant
	• Development of the substations would not displace any existing businesses or residences. However, 24 of the substations would be located in commercial and retail parking lots, displacing an estimated 96 parking spaces.	Not Significant	• RTD will provide just compensation for acquired property.	Not Significant
	Maintenance Yards • Expansion of Division 1 would require acquisition and displacement of two existing businesses and a vacant commercial building. Expansion of Division 2 would require acquisition and displacement of 3 existing businesses and a vacant industrial building.	Not Significant	• RTD will provide just compensation for acquired property and relocation services and payments in compliance with state and federal relocation regulations.	Not Significant
Consistency with Existing Zoning	Substations • Some substations would be located in areas zoned for residential and commercial uses which may not permit the operation of an electric traction power substation.	Potentially Significant	• RTD will obtain use variances as needed in order to establish substations on the proposed sites.	Not Significant
	Maintenance Yards • The proposed Division 10 expansion site would not conform to the "Open Space" designation in the Community Plan.	Potentially Significant	• RTD will obtain a conditional use permit.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.7 TRANSPORTATION/CIRCULATION & PARKING				
Traffic	Routes • Use of articulated buses could pose traffic safety hazards.	Not Significant	• Measures that could be implemented to mitigate potential safety hazards associated with articulated buses include: ○ use of articulated buses with non-steering rear wheels; ○ use of articulated buses with tapered rear ends; ○ comprehensive driver training; ○ installation of warning signs on rear of articulated vehicles.	Not Significant
	Maintenance Yards • Expansion of maintenance yards may include street vacations of portions of Industrial Street and 15th Street. These street vacations would result in the redistribution of relatively small amounts of traffic on local surface streets.	Not Significant	• No mitigation is necessary.	Not Significant
	Routes • Use of articulated buses would require expansion of bus stop zones by 20 feet, which could result in the removal of a maximum of 2 spaces per stop. An estimated 419 low-usage, 258 medium-usage and 257 high-usage parking spaces could be removed or relocated to accommodate expanded bus stops along all of the proposed routes.	Not Significant	• No mitigation is necessary	Not Significant
	• Expansion of bus layover zones to accommodate articulated buses could result in the loss of 1 or 2 parking spaces at each of 7 layover zones.	Not Significant	• No mitigation is necessary	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.8 CULTURAL RESOURCES				
Archaeological Resources	• Although unlikely, it is possible that archaeological remains could exist at the proposed division yard expansion sites, the new satellite division site, substation sites and locations where trenching for underground cables would occur. Excavation or other ground disturbing activities at these sites could affect archaeological resources if present.	Potentially Significant	• A SOPA-qualified archaeologist should be contacted immediately should archaeological remains be encountered during excavation at trenching locations and substation sites. • A SOPA-qualified archaeologist should be present during any major excavations in undisturbed areas of the maintenance yard expansion and the new satellite division sites.	Not Significant
Historic/ Architectural/ Cultural Resources	Routes • Additional poles and wires could impair views of individual historic structures.	Not Significant	• Joint poles will be used where feasible. • Poles will be placed to avoid landmark entrances, significant facades, etc., where feasible. • ETB project will be reviewed by Cultural Heritage Commission and other local reviewing agencies.	Not Significant
	• Complex ETB wiring and additional poles required at intersections where ETBs turn or cross could create significant visual intrusions. The greater the number of turns/crossings, the more significant the potential impact. Affected areas include: the Broadway Historic District, the Little Tokyo Historic District, the Spring Street Financial District and the El Pueblo Historic District.	Potentially Significant	• Incentives will be developed to encourage innovative hardware designs that reduce its visibility. • The approval of a new type of synthetic guy strand that reduces the need for insulating hardware will be pursued.	Potentially Significant
	• In districts where there is a minimal usage of modern street furniture and signage, such as the Old Pasadena Historic District and the Pasadena Civic Center Financial District, the introduction of poles, overhead wires, and hardware along the routes could be considered a substantial change to the current setting.	Potentially Significant	• See prior four mitigation measures.	Not Significant

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ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.8 CULTURAL RESOURCES (Cont'd.) *Historic/ Architectural/ Cultural Resources*	• Potential loss or alteration of historic lampposts.	Potentially Significant	• Replacement of historic poles and lampposts will be avoided where feasible. If not feasible, poles will be stored with Bureau of Street Lighting (BSL) for use as replacement and parts. Replacement poles should be compatible with Historic District. • The original appearance and placement of the poles and lampposts should be photographically documented.	Not Significant
	• Potential alterations of historic structures such as bridges for new poles and lampposts.	Potentially Significant	• Alterations will be avoided if feasible. If not feasible to avoid, alterations will be minimized, changes reviewed with Cultural Heritage Commission and other local reviewing agencies and original structure documented. • New poles will be installed in such a way as to be easily removed so that alteration is reversible.	Not Significant

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ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.9 SAFETY/RISK OF UPSET				
Electromagnetic Fields	Substations • EMF effects of AC current to human health are not known. Effects of EMI on radio and television reception are possible but rarely reported.	Not Significant	• Metal enclosures are to be used to shield TPSSs and the cables entering TPSSs.	Not Significant
Fire Fighting Operations	Routes • Overhead contact wires may be a minor hindrance or obstruction to fire fighting operations.	Not Significant	• RTD will coordinate with local fire fighting agencies to ensure fire fighting operations are not hampered by implementation of the ETB system. • Power shut-offs that can be tripped in the field or from a power control center will be supplied on a 24-hour basis for each substation. ETB personnel will also be available to attend the scene of emergencies and manually deactivate the line if necessary. • Special programs will be developed and information provided to familiarize fire fighters with the ETB system.	Not Significant
	• Buses could be a hindrance for fire fighting vehicle access.	Potentially Significant	• ETBs will be equipped with auxiliary power units to allow buses to operate independently for short distances when the electric power is shut down, thus permitting buses to move out of the way of emergency vehicles.	Not significant
Maintenance Hazards	Routes • Proximity of electrified overhead wires may pose minor additional risk of injury or death to personnel responsible for maintenance of the OCS, utilities, street lights, signals and trees/landscaping in street rights-of-way.	Not Significant	• RTD will provide safety training programs, as needed, for RTD maintenance personnel.	Not Significant

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ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.9 SAFETY/RISK OF UPSET (Cont'd.) *APU Batteries*	• Electrolytes in lead-acid and nickel-cadmium batteries are corrosive and can produce flammable hydrogen gas when they react with metals.	Potentially Significant	• Batteries are to be insulated and transmitted and stored in an upright position.	Not Significant
	• Metal used in batteries are hazardous for human exposure and should be disposed of properly.	Potentially Significant	• Smelters are to be used to reclaim and reuse metal in the batteries.	Not Significant
3.10 ENERGY				
	Routes • ETBs are more energy efficient than diesel buses.	Beneficial	• No mitigation is necessary.	Beneficial
	• ETBs would consume an estimated 250 megawatt-hours per day of electricity, which is equivalent to 2.13 billion BTUs of energy. Peak energy demand would be an estimated 52 megawatts, or less than 0.2% of current generating capacity of the five electrical utilities that serve the project area. Existing consumption of diesel fuel is about 16,000 gallons per day or 2.17 billion BTUs of energy.	Not Significant	• No mitigation is necessary. Regenerative braking is proposed to be part of the ETB specifications and should provide additional energy savings.	Not Significant
3.11 PUBLIC SERVICES				
	Substations • Development of the proposed substation sites would require acquisition of land from ten public facilities. These facilities include a hospital, 3 parks or recreational areas, 5 colleges and a site adjacent to a fire station. About 4 to 6 parking spaces would be lost at seven of the ten sites.	Not Significant	No mitigation necessary.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.12 SOILS/GEOLOGY				
Seismicity	Routes, Substations and Maintenance Yards ● The project would not substantially increase the risk from seismic events for maintenance yard employees or riders of proposed ETB lines in comparison to the risk generally experienced by the current diesel routes.	Not Significant	● The project will be designed in accordance with seismic design standards.	Not Significant
Soils	Maintenance Yards ● An Initial Site Assessment (ISA) of the Division 1 expansion site has indicated that there is a potential for soil contamination at the site. An ISA of the Division 2 expansion site indicated no evidence of significant soil contamination; however, there is a potential for soil contamination based on the history of past practices at the northeast corner of the site. An ISA for the proposed S-182 Satellite Division revealed several debris piles, 65 barrels labelled "MW-#Water Doc." and six dumpsters of soil. The ISA concluded that there is a minor potential for soil contamination, possibly from oil and grease seepage from hydraulic presses.	Potentially Significant	● Soil contamination will be remediated as necessary prior to construction. Contaminated soils encountered during construction will be excavated and disposed of in accordance with state and local laws.	Not Significant
3.13 WATER				
	Maintenance Yards ● The ISA of the Division 1 expansion site concluded that localized groundwater contamination (associated with soil contamination) was likely. There is also a potential for groundwater contamination at the Division 2 expansion site and the S-182 Satellite Division.	Potentially Significant	● Contaminated soils will be remediated as necessary prior to construction. Groundwater mitigation during construction is not anticipated. Design of yards would include oil/water separators and other pretreatment devices as needed.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.14 LIGHT AND GLARE				
	<u>Routes</u> • To accommodate ETB pole spacing and joint use of poles, some existing light sources along the proposed routes would be relocated. Geometric requirements for ETB poles may differ from those currently used for street lighting by districts and bureaus in the municipalities through which the ETB routes pass. Moreover, additional illumination may be appropriate to better illuminate bus stops and layover zones.	Potentially Significant	• Use of joint poles or additional poles for ETB wiring and the associated effects on street lighting will be evaluated during final design in conjunction with the street lighting districts and bureaus in the municipalities through which the ETB routes pass. The need for additional lighting, e.g., at bus stops and layover areas, will also be reviewed during final design.	Not Significant
	<u>Substations</u> • Security lighting would be added to each substation. In residential areas, substation lighting would be placed and focused to avoid light and glare at adjacent residences.	Not Significant	• No mitigation is necessary.	Not Significant
	<u>Maintenance Yards</u> • Light from expanded Division 1 facilities could be intrusive for residents of a hotel located midblock on Seventh Street.	Not Significant	• Lighting should be shielded and directed onto the site premises to prevent unnecessary light from adversely affecting the hotel on Seventh Street.	Not Significant
3.15 POPULATION/HOUSING				
	<u>Substations</u> • No residential acquisition would be required; however, 3 vacant parcels currently zoned residential would be acquired.	Not Significant	• No mitigation is necessary.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.16 CONSTRUCTION IMPACTS				
Air Quality	<u>Routes</u> • SCAQMD threshold criteria for emissions of NO_x may be exceeded during installation of underground cables. On a very busy day, ROGs may be emitted in greater amounts than threshold limits during installation of cables.	Potentially Significant	• Construction equipment should be shut off to reduce idling when not in direct use. • Low sulfur fuel should be used for construction equipment. • Construction activity should be discontinued during a second stage alert.	Not Significant
	<u>Maintenance Yards</u> • SCAQMD threshold criteria for emissions of NO_x may be exceeded during demolition and excavation of existing facilities to construct the expansions of Divisions 1 and 2. On a very busy day, ROGs may be emitted in greater amounts than threshold limits during construction of the maintenance facilities.	Potentially Significant	• Same as above.	Not Significant
	• Demolition of existing buildings at the maintenance yard expansion sites could cause asbestos pollution. Using SCAQMD factors, an estimated 48 pounds of asbestos would be removed from all buildings during demolition.	Not Significant	• Asbestos containing surfaces will be properly covered and removed from the site during demolition in accordance with applicable state and local (i.e., SCAQMD rule 1403) regulations.	Not Significant
Noise	<u>Routes, Substations and Maintenance Yards</u> • Potentially significant short-term construction noise impacts that could cause annoyance include pavement breaking for pole foundations and use of heavy equipment such as cranes and augers.	Potentially Significant	• Construction activities will comply with local noise ordinances and be limited to daytime hours in the vicinity of residential areas. • Contractors should use the quietest equipment possible, install temporary noise barriers, locate noisy equipment as far as possible from sensitive uses and route truck traffic away from sensitive uses.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.16 CONSTRUCTION (cont'd.) *Traffic/Circulation & Parking*	• Construction activities could require the closure of traffic or parking lanes for periods of time ranging from a few hours to about a week. Construction activities and lane closures could affect access to businesses, public facilities and residences.	Potentially Significant	• Worksite Traffic Control Plans (WTCPs) will be developed in conjunction with local jurisdictions. • Construction hours should be set as follows: o Residential areas: 7:00 AM to 6:00 PM o Commercial with on-street parking: 7:00 AM to 6:00 PM o Commercial without parking: 9:00 AM to 3:00 PM o LA CBD & perpendicular trenching (except residential areas): 8:00 PM to 5:30 AM • Construction activities that would result in a lane closure during posted peak hour stopping prohibition should be prohibited. • Access to businesses should be maintained to the best extent possible and business owners should be notified in advance of future construction in their area. • Construction activities should be coordinated with emergency service providers. • Alternative pedestrian access should be provided as needed.	Not Significant
	• Construction activities would generate employee and construction vehicle trips affecting the adjacent street system.	Not Significant	• No mitigation is necessary.	Not Significant
Safety	• Open trenches could present a safety hazard.	Potentially Significant	• Trenches will be backfilled and/or covered with a plate at the end of each working day.	Not Significant

TABLE S-1: SUMMARY OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
3.17 FISCAL IMPACTS				
Employment	• The local labor market would increase due to project construction by an estimated 18,000 person years of direct and indirect employment.	Beneficial	• No mitigation is necessary	Beneficial
Fiscal	Substations • Annual property tax revenue losses are estimated to be $51,000 (in 1991 dollars) for the substations.	Not Significant	• No mitigation is necessary	Not Significant
	Division Yards • Annual property tax revenue losses are estimated to be $198,000 (in 1991 dollars) for the expansion and development of division yards.	Not Significant	• No mitigation is necessary	Not Significant
5.1 CUMULATIVE IMPACTS				
Air Quality	• Although there would be insignificant air emissions from project construction, the project-wide air quality impacts represent an overall net decrease in South Coast Air Basin (SCAB) air emissions, even assuming that all electrical generation for the project would occur in the SCAB.	Beneficial	• No mitigation is necessary.	Beneficial
	• The project would contribute to the expeditious implementation of the adopted AQMP.	Beneficial	• No mitigation is necessary.	Beneficial
Aesthetics	• At specific locations along the routes, specialized and more complex wiring and pole configurations would occur, which considered cumulatively, may be viewed by some as an overall detriment to the regional visual setting.	Potentially Significant	• See Section 3.3, Aesthetics, above for a discussion of potential mitigation measures.	Potentially Significant
	• Portions of the ETB project should involve improvement to the visual setting through the application of ETB urban design improvements.	Beneficial	• No mitigation is necessary.	Beneficial

ENVIRONMENTAL IMPACT CATEGORY	POTENTIAL ENVIRONMENTAL IMPACTS	DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
5.1 CUMULATIVE IMPACTS (cont'd.) *Cultural Resources*	• Specialized and more complex wiring and pole configurations would occur at specific locations along the route. Within a given historic district, the cumulative impact of the number of turns and crossings in combination with the visual impacts of other projects could have an adverse impact on the historic district.	Potentially Significant	• See Section 3.8 Cultural Resources above for a discussion of potential mitigation measures.	Potentially Significant
Public Services	• Although localized impacts would occur with project implementation, the project would improve transit service that provides access to public facilities in the region.	Not Significant	• No mitigation is necessary.	Not Significant
Construction	• Construction of the project could conflict with or contribute to cumulative construction impacts associated with future infrastructure projects (related projects) undertaken by local jurisdictions and utility companies.	Potentially Significant	• RTD will work with affected jurisdictions and utilities to coordinate construction projects.	Not Significant

CHAPTER 1: INTRODUCTION

1.1 DEVELOPMENT OF THE PROPOSED PROJECT

Although pollution control efforts have contributed to substantial reductions in smog in the South Coast Air Basin over the past decade, significant air pollution problems continue to occur in the area. Federal and state Clean Air Act legislation requires further stringent air quality controls.

The South Coast Air Quality Management District's (SCAQMD's) 1991 Final Air Quality Management Plan (AQMP) requires that ozone, carbon monoxide and nitrogen dioxide levels to be reduced by 25 percent by the end of 1994, by 40 percent by the end of 1997 and by 50 percent by the end of the year 2000 from the base year of 1987. Adoption schedules for control measures have been prioritized in the 1991 AQMP. The "Zero Emission Urban Bus Implementation" control measure to reduce reactive organic gases (ROG), nitrogen oxides (NO_x), carbon monoxide (CO) and particulate matter (PM_{10}) is listed as priority 34 and Control Measure Number MG-1. Under the heading, "Proposed Method of Control," the AQMP states:

> "Because of its demonstrated commercial and technological feasibility, bus electrification appears to be the most likely compliance strategy. In particular, the proposed method of control is to install overhead trolley wires for power transmission to transit buses operating along major fixed routes. Services that run continuously along major arterials at intervals of 15 minutes or less would be candidates for conversion from diesel operation directly to electric operation." (Final AQMP, Appendix IV-C, "District's Mobile and Indirect Source Control Measures," South Coast Air Quality Management District, July 1991.)

The 1991 Final AQMP shows a proposed implementation date of 1994-2000 for the "Zero Emission Urban Bus Implementation" Control Measure (Table 7-3, pg. 7-18) and assumes that 30 percent of all vehicle miles traveled by urban buses in the SCAB would be electric (Table ES-2A, pg. ES-9). The proposed Phase I and II ETB Project would approximate this 30 percent assumption.

In August 1991, the Los Angeles County Transportation Commission (LACTC) approved a Memorandum of Understanding with the Southern California Rapid Transit District (RTD) and allocated funds for the approved work program for the development of an electric trolley bus (ETB) system. A feasibility study was conducted to examine implementation issues, costs and benefits associated with the conversion of diesel buses to electric trolley operation. Following the completion of that effort, a route selection study was undertaken to identify the routes that satisfied a number of desired criteria. The route selection process identified 12 routes for conversion to ETB service in Phase I of the project and 7 routes for Phase II. (The criteria used in the selection process are described in section 2.4.4, "PHASE II ROUTES.") In April 1992, the RTD Board of Directors and the LACTC approved the 12 selected Phase I routes for completion of preliminary engineering and environmental analysis. At the same time, the LACTC Planning & Mobility Improvement Committee authorized the drafting of a shared funding agreement with the affected cities served by the ETB routes. The selected routes were then refined to a level sufficient for preliminary engineering work, which forms the basis for the evaluation of the project in this EIR. (Project planning studies are referenced in the bibliography, Appendix A.2.)

1.2 ENVIRONMENTAL REVIEW AND PROJECT APPROVAL

This Draft Environmental Impact Report (EIR) has been prepared in conformance with the California Environmental Quality Act. The report will be circulated and available for public review for 45 days. During that 45-day review period, a public hearing will be held to receive comments on the Draft EIR. Responses to all comments received during the review period will be written and a Final EIR will be prepared including those responses.

1.3 DOCUMENT ORGANIZATION

This document is organized in five chapters. Following this introductory chapter, Chapter 2 describes the proposed project in detail, including the various system components and characteristics of the selected routes, and the No Project Alternative. It also describes the routes that were not selected for this phase but that will be considered for a subsequent phase of ETB conversion, and the criteria used in the route selection process. The full spectrum of environmental analyses conducted for the project, the conclusions of those analyses and mitigation measures for any identified significant impacts are described in Chapter 3. Chapter 4 discusses alternative emission reduction technologies. Chapter 5 provides an impact overview, including cumulative effects, unavoidable adverse impacts, etc.

1.4 USES OF THE EIR

This EIR will be used by the RTD and the LACTC to make discretionary decisions regarding approval of some or all of the Phase I routes. In addition, other transit properties and municipalities may use this document in their decision-making regarding the implementation of this project.

Permitting agencies at the state and local levels are expected to use this EIR during their review of permit compliance during implementation of the proposed ETB project.

CHAPTER 2: DESCRIPTION OF THE PROPOSED PROJECT

2.1 INTRODUCTION

The Southern California Rapid Transit District (RTD) and the Los Angeles County Transportation Commission (LACTC), in cooperation with Long Beach Public Transit and Montebello Bus Lines, propose to convert 19 existing bus lines within Los Angeles County from diesel-fueled buses to zero-emission electric trolley buses (ETBs). This Environmental Impact Report (EIR) addresses the conversion of 12 bus lines under Phase I of the project. Operators of these lines are RTD, Montebello Bus Lines and Long Beach Transit. ETBs are currently used in many North American cities, including San Francisco, Seattle, Boston, Philadelphia and Dayton; Vancouver, Toronto, Edmonton and Hamilton; and Mexico City and Guadalajara.

2.2 PROJECT OBJECTIVES

The proposed project has five primary objectives:

- to improve the quality of public transit service delivered to the rider relative to noise and vibration in order to increase the use of public transit.
- to comply with the South Coast Air Quality Managment District's 1991 Final Air Quality Management Plan and reduce air pollution in the County, particularly along heavily travelled transit routes.
- to reduce noise and thermal pollution from bus operations.
- to conserve energy and serve as a hedge against the threat of rising costs and the dwindling and insecure supplies of liquid and gaseous fuels.
- to impart an image of urban permanence to bus lines.

The project would improve the quality of transit for bus riders in the following ways:

- It would provide a more comfortable ride because acceleration would be smoother and engine vibration would be reduced.
- The use of ETBs would provide a quieter ride because of elimination of noise from diesel bus engine idling and acceleration.
- The ride would be more comfortable for passengers because ETBs have no diesel fumes which can penetrate the interior of the bus.
- The "hot seat" at the rear of the diesel bus would be eliminated because in ETBs, electric motors are located away from passengers and generate little heat.

The project would also provide a number of improvements for pedestrians and waiting passengers:

- There would be no diesel fumes drifting across bus stops, sidewalks and pedestrian areas.
- The use of quiet ETBs would eliminate noises from diesel bus engine idling and acceleration.
- The "hot wake" or path of heat from diesel bus tailpipes would be eliminated.

The South Coast Air Quality Management District's (SCAQMD's) 1991 Final Air Quality Management Plan (AQMP) requires that ozone, carbon monoxide and nitrogen dioxide levels to be reduced by 25 percent by the end of 1994, by 40 percent by the end of 1997 and by 50 percent by the end of the year 2000 from the base year of 1987. Adoption schedules for control measures have been prioritized in the 1991 AQMP. The "Zero Emission Urban Bus Implementation" control measure to reduce reactive organic gases (ROG), nitrogen oxides (NO_x), carbon monoxide (CO) and particulate matter (PM_{10}) is listed as priority 34 and Control Measure Number MG-1. Under the heading, "Proposed Method of Control," the AQMP states:

> "Because of its demonstrated commercial and technological feasibility, bus electrification appears to be the most likely compliance strategy. In particular, the proposed method of control is to install overhead trolley wires for power transmission to transit buses operating along major fixed routes. Services that run continuously along major arterials at intervals of 15 minutes or less would be candidates for conversion from diesel operation directly to electric operation." (Final AQMP, Appendix IV-C, "District's Mobile and Indirect Source Control Measures," South Coast Air Quality Management District, July 1991.)

The 1991 Final AQMP shows a proposed implementation date of 1994-2000 for the "Zero Emission Urban Bus Implementation" Control Measure (Table 7-3, pg. 7-18) and assumes that 30 percent of all vehicle miles traveled by urban buses in the SCAB would be electric (Table ES-2A, pg. ES-9). The proposed Phase I and II ETB Project would approximate this 30 percent assumption.

In addition to addressing the project's primary objectives of transit service improvement and pollution reduction, RTD and LACTC have provided design criteria for the proposed system with a secondary objective of enhancing the overall urban design and aesthetic quality of the ETB routes. The criteria provide for landscaping and other design elements that are intended to improve the quality of the public realm at ETB stops and along the sidewalks to be used by ETB riders. The support of local cities would also be sought to achieve further urban design enhancements and transit flow improvements through exclusive lanes, preferential treatment and other measures.

2.3 PROJECT LOCATION

The 12 bus lines scheduled for ETB service in Phase I include the most travelled lines in the area and are spread throughout Los Angeles County, covering downtown Los Angeles, South-Central Los Angeles, the Westside, the Eastside, the San Fernando Valley, Long Beach, the South Bay and the San Gabriel Valley. All proposed ETB routes would follow existing bus routes or portions of existing routes. The routes proposed are illustrated in Figure 2-1 and are further described below in section 2.4.3.3, "Proposed ETB Routes."

2.4 PROJECT ALTERNATIVES

2.4.1 INTRODUCTION

This section describes the No Project Alternative, in which an ETB system is not implemented, and two Build Alternatives. The first Build Alternative describes the proposed system in detail, including its structural components and the physical and operating characteristics of the 12 proposed routes. The second Build Alternative discusses seven other routes that were considered for Phase I but were instead selected for Phase II. For a discussion of other alternatives to the proposed ETB system, see Chapter 4.

2.4.2 NO PROJECT ALTERNATIVE

Under the No Project Alternative, all bus lines in Los Angeles County would continue to be powered by internal combustion engines that comply with EPA-mandated exhaust emission standards. This alternative would not comply with the AQMP's guidelines for the conversion of diesel buses to electric operation.

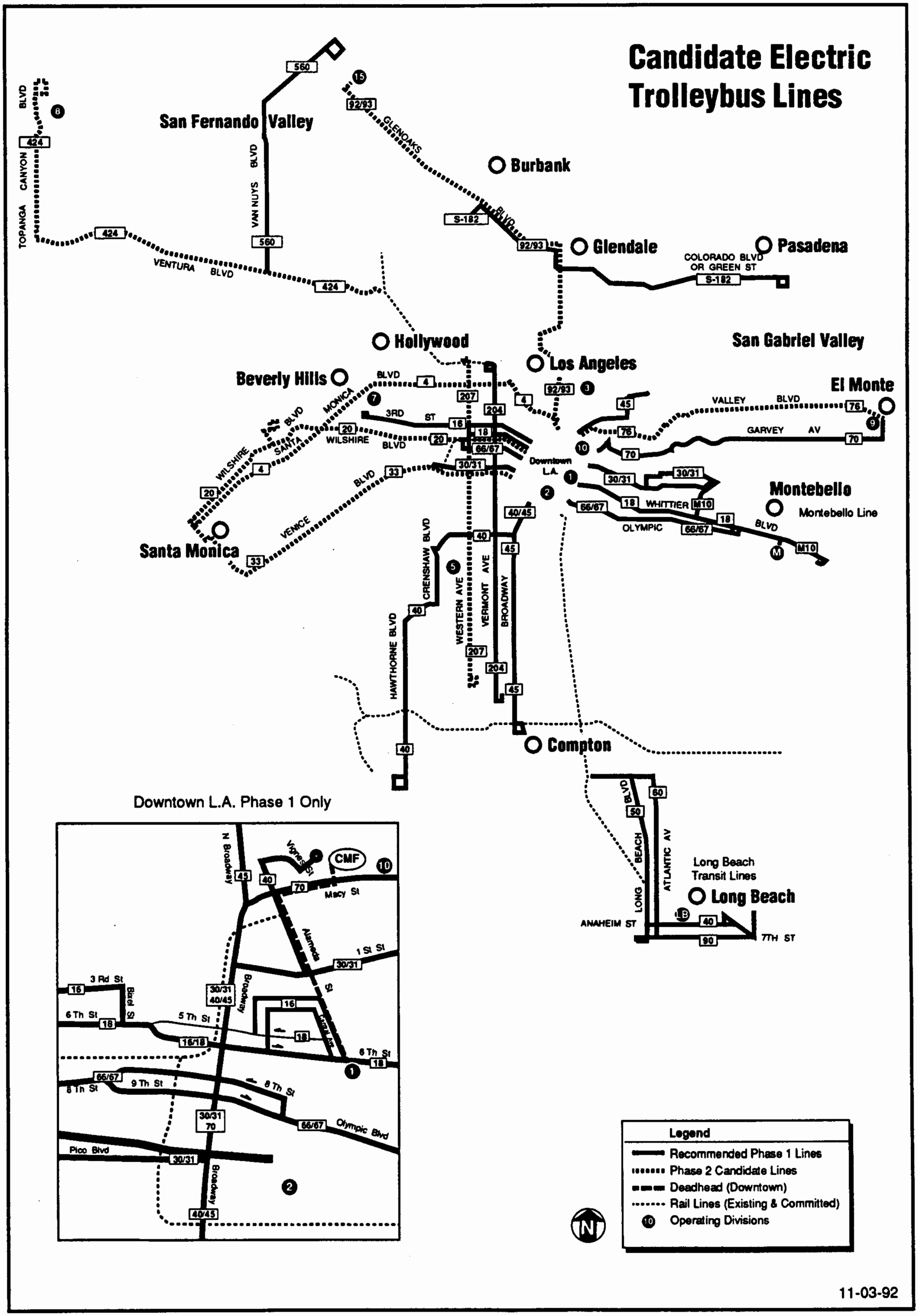
2.4.3 PROPOSED BUILD ALTERNATIVE

2.4.3.1 Introduction

In 1991, LACTC and RTD conducted a feasibility study of ETB service for the region. That study produced 19 existing candidate bus lines for further study. In March 1992, upon completion of the Route Selection Phase of the study, 12 of the 19 routes were selected for Phase I of the ETB Project. (The criteria and evaluation process used to select these routes is discussed in section 2.4.4, below.) The Proposed Build Alternative involves the construction and operation of the 12 ETB routes selected for Phase I. (See sections 2.4.4 and 2.4.5 for a discussion of Phase II routes and implementation schedule.)

Section 2.4.3.2 discusses the ETB systems and their components. Physical characteristics of the proposed routes (such as location and length) and operational characteristics (such as hours of operation and the number of buses running) are described in section 2.4.3.3 (See section 3.16.1 for a discussion of the project's construction scenario.)

Figure 2-1:



Candidate Electric Trolleybus Lines
San Fernando Valley
Burbank
Glendale
Pasadena
Hollywood
Los Angeles
San Gabriel Valley
Beverly Hills
El Monte
Santa Monica
Montebello
Montebello Line
Compton
Long Beach
Long Beach Transit Lines
TOPANGA CANYON BLVD
VAN NUYS BLVD
VENTURA BLVD
GLENOAKS BLVD
COLORADO BLVD OR GREEN ST
SANTA MONICA BLVD
WILSHIRE BLVD
3RD ST
VENICE BLVD
VALLEY BLVD
GARVEY AV
WHITTIER BLVD
OLYMPIC
CRENSHAW BLVD
HAWTHORNE BLVD
WESTERN AVE
VERMONT AVE
BROADWAY
LONG BEACH BLVD
ATLANTIC AV
ANAHEIM ST
7TH ST
Downtown L.A.
560
424
92/93
S-182
4
207
204
16
18
20
66/67
30/31
33
40
40/45
45
70
76
M10
60
90
Downtown L.A. Phase 1 Only
N Broadway
Vignes St
CMF
Macy St
Alameda St
1 St St
3 Rd St
Bixel St
6 Th St
5 Th St
Broadway
16/18
8 Th St
9 Th St
Olympic Blvd
Pico Blvd
Legend
Recommended Phase 1 Lines
Phase 2 Candidate Lines
Deadhead (Downtown)
Rail Lines (Existing & Committed)
Operating Divisions
N
11-03-92

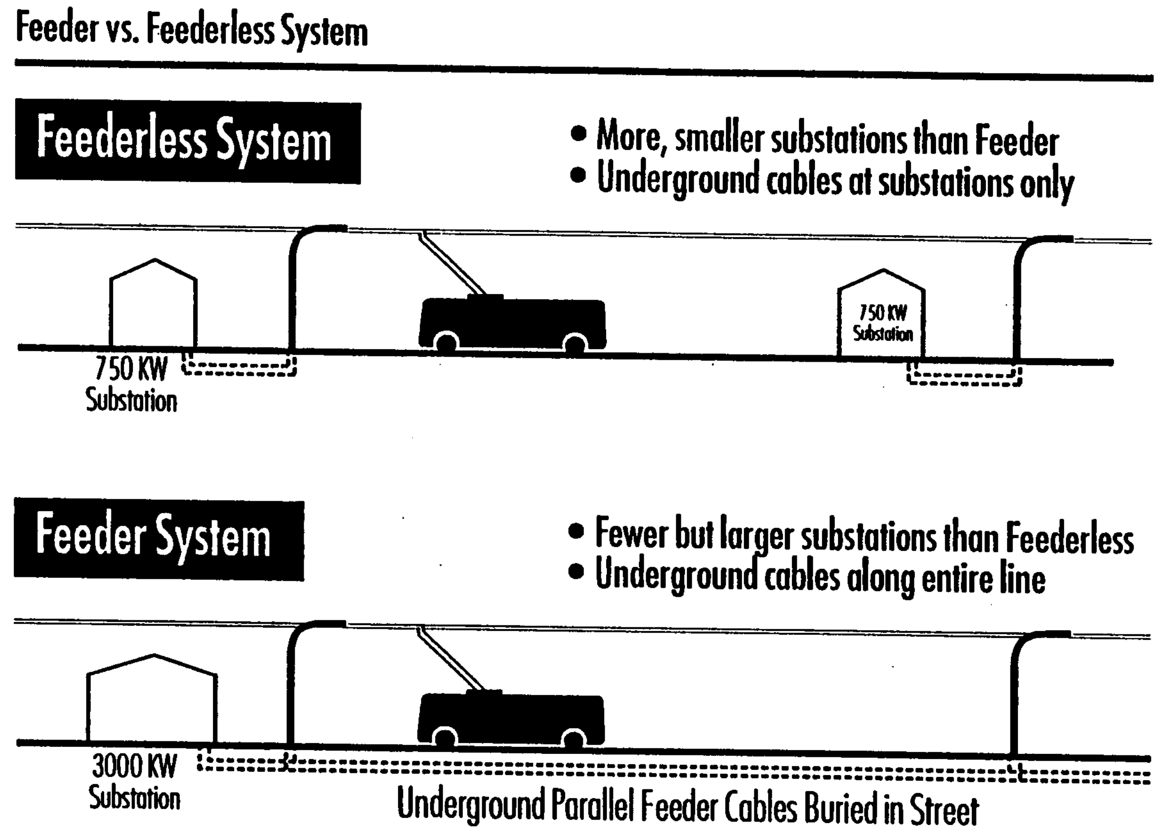
2.4.3.2 ETB Systems and Components

ETBs are propelled by electric motors that receive electrical power from overhead wires that are connected to electric traction power substations (TPSSs) along the routes. The system used to provide electrical power to the buses is subdivided into the power distribution system (PDS) and the overhead contact system (OCS). The PDS includes TPSSs and associated underground cables. The OCS includes overhead wires and the structures used to support those wires.

Two types of PDSs are available: feederless and feeder systems. As currently planned and subject to final design, the proposed project would use the feederless system wherever feasible. Due to possible construction constraints, substation siting considerations and economics, the feeder system may be necessary in the Los Angeles Central Business District (LA CBD). For purposes of this EIR, it is assumed that the feeder system would be installed for the LA CBD portions of ETB routes. An overview of these systems is provided below and on Figure 2-2 and Figure 2-3, followed by a description of each system component.

- Feederless System. With a feederless system, electrical power would be transmitted from each substation to poles on the side(s) of the street via underground cables. (For a street with one-way ETB service, street poles would be located on one side of the street. Two-way ETB service would require poles on both sides of the street.) Cables running inside the poles would conduct the power to overhead contact wires that would carry electricity along the length of the ETB route. To equalize the voltage along line segments between substations, underground cables would connect the wires at poles on each side of the street. These connections, which would occur at approximately 500-foot intervals, would require trenching across the street. The feederless system would require a greater number of substations than the feeder system, but would involve less trenching because underground feeder cables running the length of the route would not be required. The substations would be electrically operated in parallel and designed as a system to continue to operate without loss in performance with the failure or shut down of any particular substation. A means of disconnection would be provided to bypass a disabled substation and to isolate it for maintenance purposes.

- Feeder System. The feeder system would transmit electrical power from substations along the route to underground parallel feeder cables that would run lengthwise beneath the street. At about 500-foot intervals, cables (called parallel feeder taps) would connect these feeder cables to the poles on both sides of the street. Additional cables (feeder risers) would run inside the poles, connecting the underground feeder cables to overhead trolley contact wires. The feeder system would require fewer substations than the feederless system but would involve a greater amount of street trenching for the installation of conduits for feeder cables. A means of disconnection would be provided to isolate each substation and portions of the cables for safety and maintenance purposes.



Source: Southern California Rapid Transit District, 1992.

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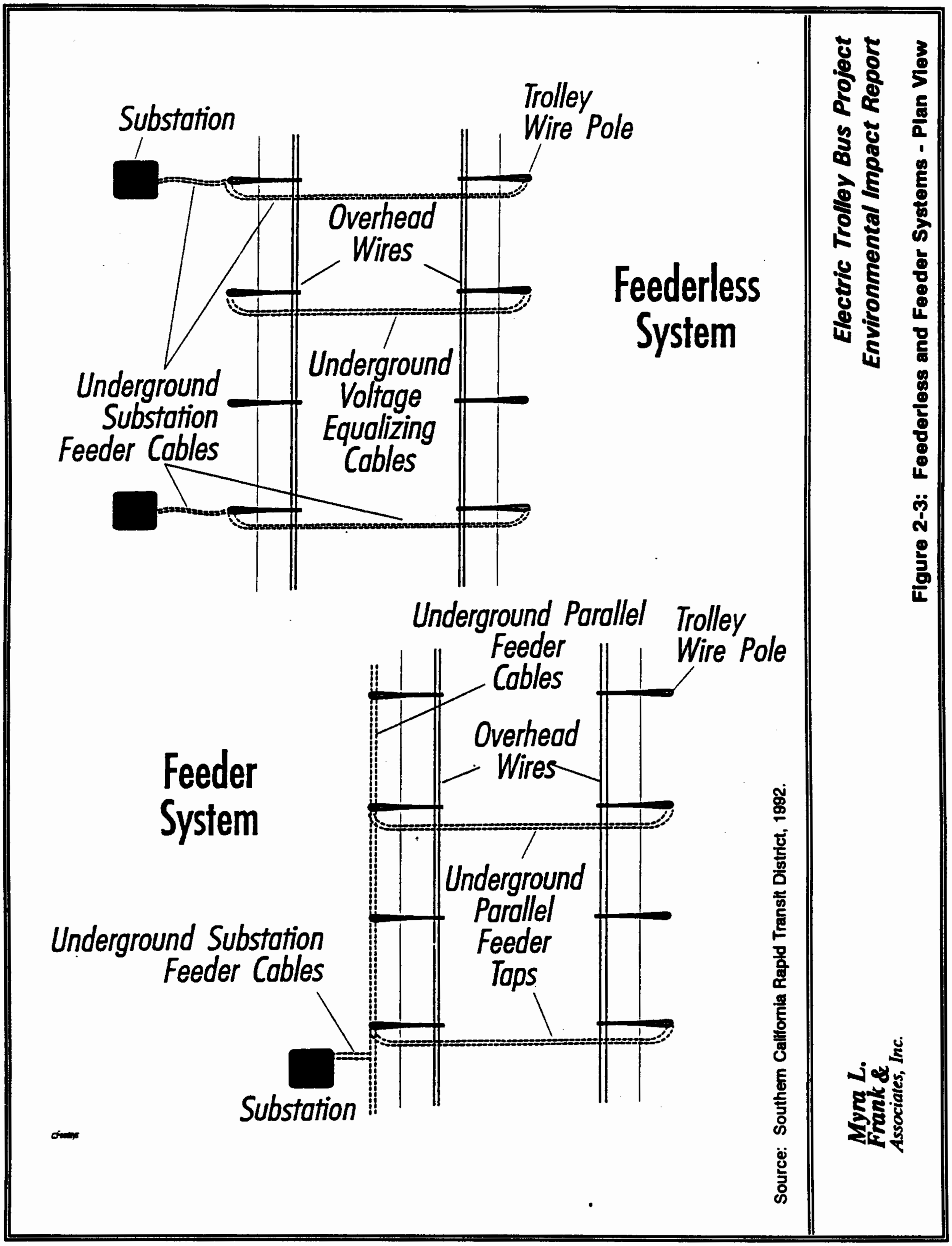
Electric Trolley Bus Project
Environmental Impact Report

Figure 2-2: Feederless and Feeder Systems

Figure 2-3: Feederless and Feeder Systems - Plan View



Components of the proposed ETB system include: PDS components (electrical substations and underground cables); OCS components (poles, special hardware on poles, pole foundations, bracket arms, cross span wires, overhead contact wires and additional hardware); buses and bus maintenance and storage yards; and aesthetic improvements. Unless otherwise indicated, these components would be similar for both the feederless and feeder systems.

o <u>Substations.</u> Electric traction power substations (TPSSs) would convert utility-supplied alternating current (AC) power to 750-volt direct current (DC) power, which would be used by the ETBs. The TPSSs would receive alternating current (AC) from utility lines, convert the AC to direct current (DC) (i.e., rectify), and reduce the voltage (i.e., transform) to serve the OCS. Equipment within TPSS structures would include AC switchgear, a transformer, a rectifier, DC switchgear and auxiliary control equipment. The substation entrance would be illuminated for security reasons, taking into account the surrounding uses.

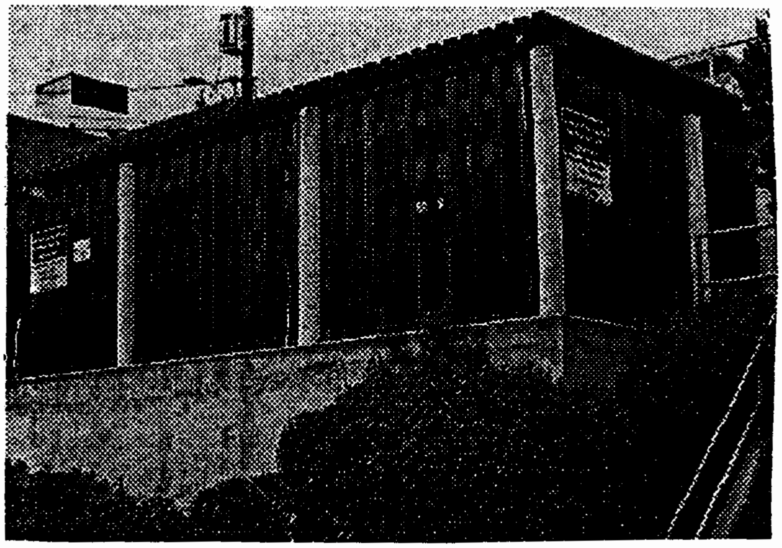
  A total of 138 TPSSs would be required for the proposed project, 135 along the ETB routes and three at division yards. Wherever possible, the substations along the routes would be located on vacant lots, parking lots, public rights-of-way (such as streets) or utility rights-of-way. In identifying potential substation locations, publicly owned and available sites located close to the proposed routes and away from residences were preferred. (See section 3.3.7 for maps and further discussion of substation locations.) New easements may be required at some locations for the underground connections from the utility system to the substations.

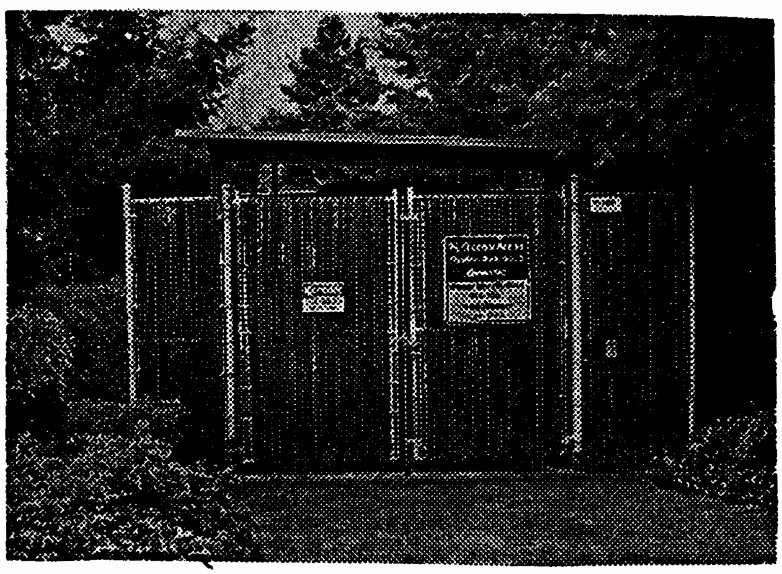
  Of the 135 TPSSs required for the routes, 133 would be provided for the feederless system and two would be provided for the feeder system. TPSSs for the feederless and feeder systems would differ as follows:

  - The feederless system would use 500 to 750 kilowatt (kW) TPSSs every 1.0 to 1.2 miles; in comparison, the feeder system would require larger (e.g. 3,000 to 4,000 kW) units centrally located in the LA CBD.

  - The feederless TPSS would be a pre-fabricated package building consisting typically of a steel frame with sheet metal exterior walls, roof and interior walls. Feeder system TPSSs would be individually designed.

  - Feederless TPSSs would be approximately 11 feet wide, 28 to 30 feet long and 10 feet high. The total land required at each TPSS site would range from 22 feet by 40 feet to 34 feet by 57 feet, depending on the need for switchgear and the need for an access road or off-street parking for maintenance staff. Figure 2-4 presents photographs of representative pre-fabricated feederless substations. Feeder system TPSSs would measure about 19 feet in width, 60 feet in length, and 10 feet in height. Substations with an access road or off-street parking for maintenance staff would require 42-foot by 88-foot parcels; without an access road or off-street parking, 30-foot by 88-foot parcels would be required. In all cases, tested





Source: Elcon Associates, Inc., 1992.

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Figure 2-4: Prefabricated Substations

design details would be installed to prevent unauthorized access to the equipment and to ensure a high level of public safety.

- Underground Cables. The need for underground cables varies for feederless and feeder systems. The feederless system requires two types of underground cables: substation feeder cables and voltage equalization cables. Substation feeder cables would connect each substation to cables on the closest pole(s), on the near side of the street for one-way routes and also on the far side of the street for two-way routes. Voltage equalization cables would be installed between poles on opposite sides of the street at approximate intervals of 500 feet. (See Figure 2-3, above.)

  Feeder systems require substation feeder cables, parallel feeder cables and feeder taps. Substation feeder cables in a feeder system would connect each substation to the parallel feeder cable. A parallel feeder cable would run underground the length of the ETB route, parallel to overhead contact wires. At about 500-foot intervals, parallel feeder taps would cross the street, connecting the parallel feeder cable to poles on both sides of the street. (See Figure 2-3, above.)

  All underground cables would be installed in conduits placed in accordance with local regulations. Where substation feeder cable locations are not within public rights-of-way, easements would be obtained.

- Poles. Poles would function as the primary support structure for the OCS wires and would be placed every 100 to 130 feet on average. Closer spacing may be required in certain locations because of street configurations such as curves, width of cross streets, length of blocks or location of driveways and intersections.

  In some route segments, existing structures (e.g., buildings and bridges) may be used to anchor span wires for overhead contact wire support, depending on aesthetic considerations, the building's structural adequacy and other engineering concerns.

  In addition, joint use of poles with street lights and traffic lights could be implemented in two ways. Where existing poles are not adequate for both the original and OCS functions, a new joint-use pole would be installed as part of the ETB project. Where existing utility poles are suitable, OCS supports could be added to the pole.

  Steel or aluminum poles, similar to those currently used by utilities for street lighting and traffic signals, would be used for OCS support. Their hollow centers would allow them to house cable for the ETB system and other utility cables.

  Alternate materials such as fiberglass, concrete or wood may be used depending on aesthetic considerations such as matching existing pole types and considerations of required pole strength.

- Pole Foundations. The pole foundation would support the pole in the ground, and electrical grounding for the pole would be provided in the foundation. Figure 2-5 illustrates the bolted base foundation that would be used for the ETB system. As shown in the figure, this foundation includes threaded anchor bolts within concrete. These bolts enable the pole to be fastened into its foundation. After the poles are anchored to the foundation, the anchor bolts would be encased by a base cover.

- Hardware on Poles. Some of the major hardware items include disconnect switches, surge arrestors, trolley switch control boxes and trolley switch lights.

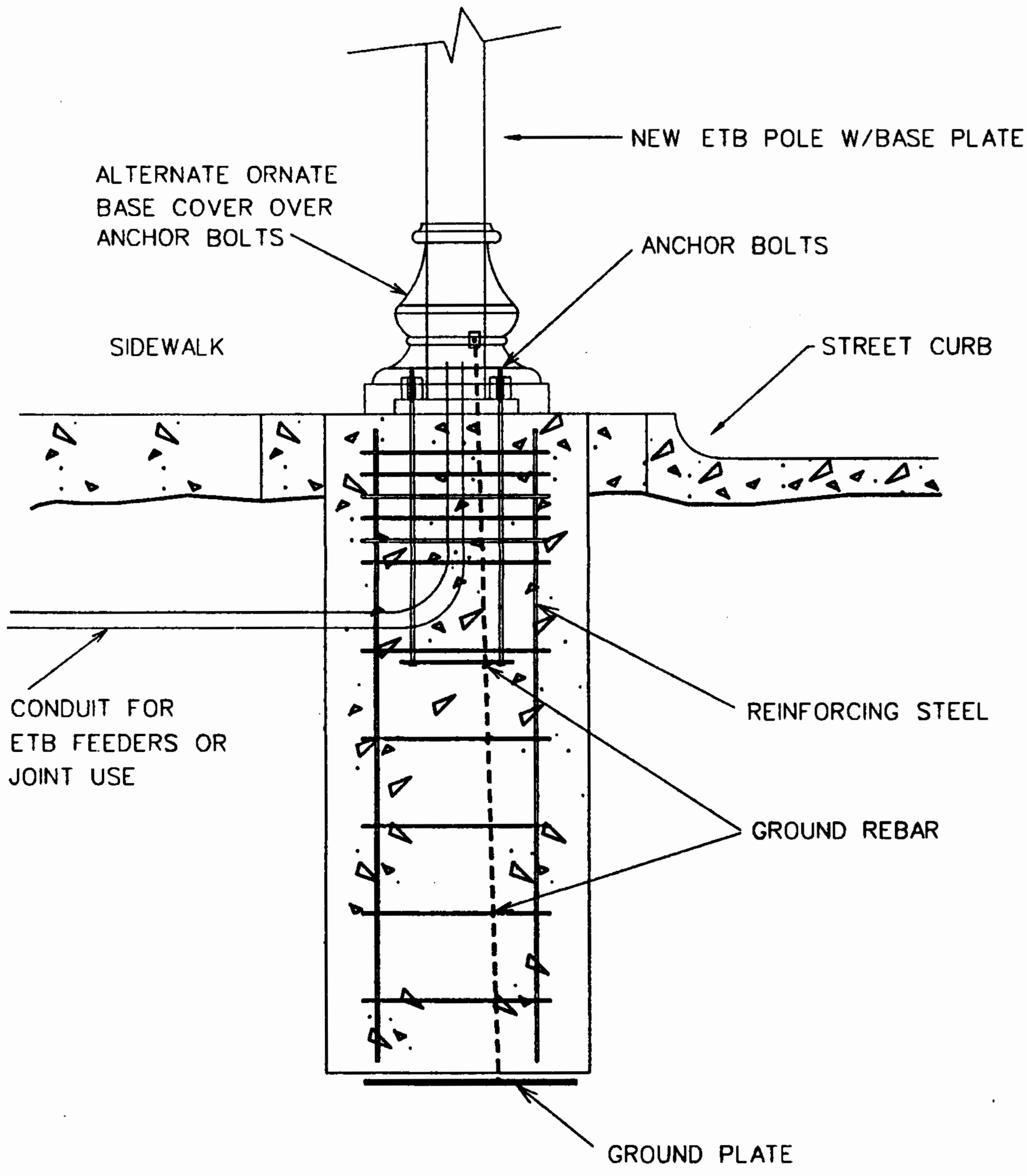
  Disconnect switches would be located at each pole where cables carrying electricity from the substation connect with the OCS. They would be used to disconnect electricity from the overhead wires for a number of purposes, including bypassing the OCS around a TPSS in cases of TPSS failure or for TPSS maintenance. Disconnect switches may also be located at other poles in order to disconnect certain areas of overhead wires for maintenance. These switches can be pole mounted or pad mounted depending on availability of space, aesthetic considerations and cost. For example, disconnect switches may be vault-mounted in locations with limited available space such as Downtown Los Angeles.

  To prevent surge currents (e.g., lightning strikes), surge arrestors would be required on each pole that has a disconnect switch.

  Switch control boxes contain contact wire switches. These switches are used only at those intersections where two or more routes cross or where ETBs have turning movement options. The switch control boxes are about 8 inches in width, 12 inches in length and 6 inches in height. They would be located at least 12 feet above ground and as close to the contact wire as possible.

  Trolley switch lights indicate the trolley control switch position. They are analogous to traffic lights and are located only on poles with switch control boxes.

- Bracket Arms and Cross Spans. Bracket arms and cross spans hold the overhead contact wires at the required height and distance from the pole. A bracket arm is a cantilever that extends from a pole to the overhead contact wires (see Figure 2-6). A cross span is a wire suspended between two support structures (either buildings or poles) over and across the street (see Figure 2-7). The use of bracket arms or cross spans at various locations along each route would depend on street width, street geometry, location of existing overhead utility wire, special street uses (e.g., parade routes, house moving routes), bus movements, aesthetic considerations, local preference and cost. Cross spans would be used at most locations where two or more routes cross and where buses make turns. See Figure 2-8 for examples of the use of cross spans and bracket arms in other compatible ETB systems.



Source: R.W. Beck and Associates, ICF Kaiser Engineers, 1992.

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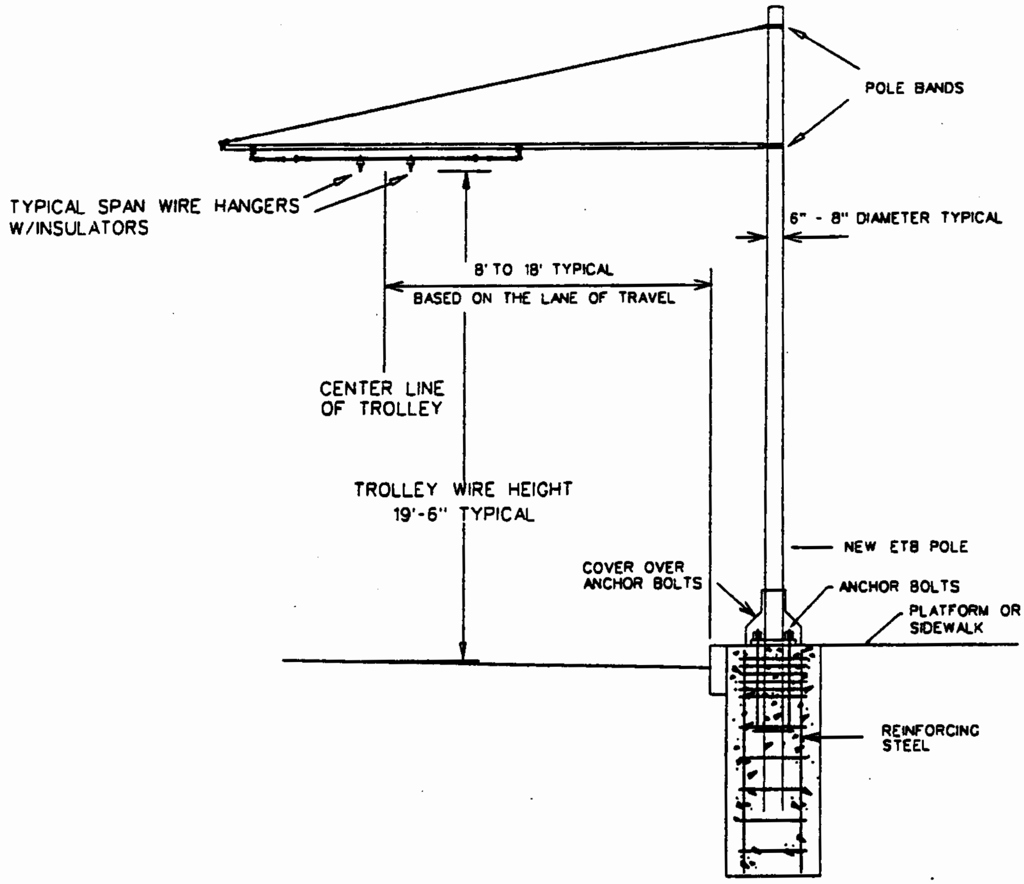
Figure 2-5: Bolted Base Pole Foundation



Source: R.W. Beck and Associates, ICF Kaiser Engineers, 1992.

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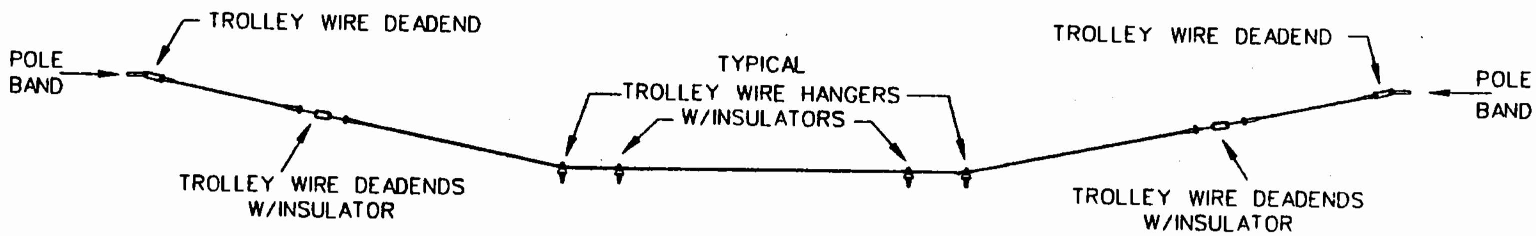
Figure 2-6: Bracket Arm Assembly



Source: R.W. Beck and Associates, ICF Kaiser Engineers, 1992.

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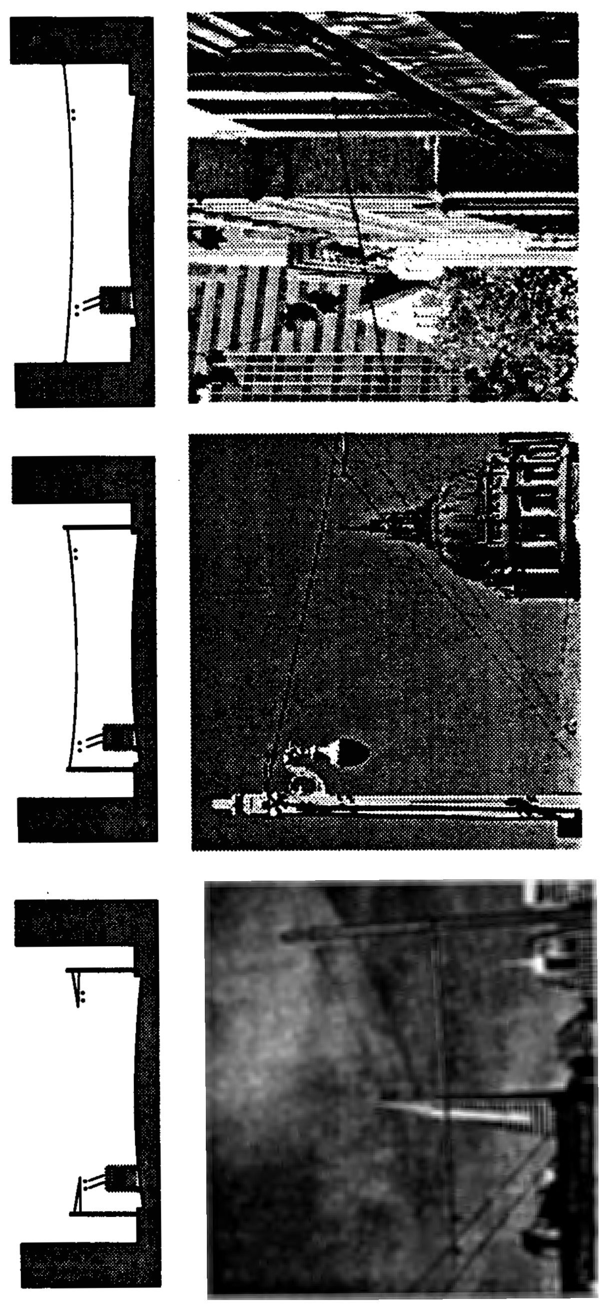
Figure 2-7: Cross Span Assemblies



Trolley wires supported by a bracket arm

Trolley wires supported by cross-span wire suspended from a pole

Trolley wires supported by a cross-span wire suspended from a building facade

Source: Public Works Associates, 1992. denhall, 1992.

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Figure 2-8: Cross Spans and Bracket Arms

- <u>Overhead Contact Wires.</u> Overhead contact wires, also known as overhead trolley wires, would run above ETB travel lanes, supplying power to the ETBs. Two overhead contact wires, one positive and one negative, would be required for each ETB lane. The number and layout of overhead contact wires along any particular route segment would depend on the number of lines along that segment and the need for turns at intersections. (Section 3.3 describes different overhead contact wire configurations and their possible locations along the proposed routes.) It is proposed that the overhead contact wires be supported at a height of 18 feet above the street. This height would require a variance from the California Public Utilities Commission. If this variance cannot be obtained, the overhead wire height would be 19 feet. At intersections where traffic signals are suspended on an arm into the street, the signal would have to be raised 1 to 2 feet to clear the height of the overhead contact wires. Photos depicting overhead wires along streets and at intersections are provided in Section 3.3.

- <u>Additional Hardware and OCS Support at Intersections.</u> Intersections where ETB routes cross or turn require special designs and hardware. Where two ETB routes cross, the positive and negative wires for each route must be brought together and insulated by a piece of hardware called a section insulator, which enables the collector poles on top of the buses to pass through the crossing. Figure 2-9 illustrates insulating hardware. The number of insulators at each route-crossing intersection varies for different types of crossings. For example, at intersections where two, two-way routes cross, overhead contact wires would cross at four places within the intersection. At each of these four crossings, five section insulators would be required. Fewer insulators would be required at intersections where two one-way routes cross. Insulators would also be required on positive overhead wires at the feed point for each substation.

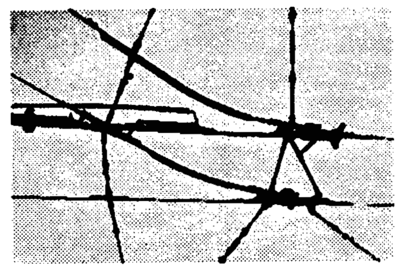
  The ETBs would have to be able to turn where the route itself turns or at route crossings. Both types of turns require hardware called curved segments, which are curved steel runners installed on the overhead wires along the turn that allow the ETBs to remain attached to the overhead wires during the turn. Turns at route crossings would also require switches that enable the ETBs to turn from one route onto a crossing route. (See Figure 2-9.)

  In addition to extra hardware at these intersections, extra poles and cross span wires would be needed to support overhead wires through these locations. The number and arrangement of these components would depend on the geometry of the intersection and the overhead wiring configuration.

- <u>ETBs</u>. The bus type that would be used for the proposed ETB system is a 40-foot standard length, 102-inch wide urban transit ETB. In addition, 60-foot articulated ETBs (also 102 inches wide, but with two sections of the ETB jointed together so that they form an angle when the ETB turns) could be used. Based on seating configurations and accessibility needs, the 40-foot coach typically carries 43 seated passengers and 20 or more standing passengers, for a total of 63 or more riders. The 60-foot articulated vehicle accommodates 60 seated

Close-up view of a Curved Segment

Close-up view of Insulating Hardware



Close-up view of an Electric Switch

Source: Public Works Associates 1992.

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Figure 2-9: Insulators, Curved Segments and Switches

passengers (with extra wheelchair space) and 30 or more standing passengers, for a total of 90 or more riders. (See Figure 2-10.) If the ETB project were implemented with an all-articulated fleet, division yard expansion beyond that discussed in this document would likely be required and, if required, would be evaluated in additional environmental documentation.

The ETBs' speed would at least equal the current speed of diesel buses, and headways (scheduled time between buses) for each route would remain the same for standard ETBs and would potentially increase if articulated buses are deployed. All ETBs would conform with Americans with Disabilities Act (ADA) requirements. They would be equipped with auxiliary power units (APUs) to provide mobility in the event that electric power is lost for any reason.

o <u>ETB Maintenance and Storage Yards.</u> Existing bus maintenance yards for RTD Operating Divisions 1, 2, 5, 9, 10 and 15 and the Montebello and Long Beach Transit yards would be used for ETB maintenance and storage. Some modifications to the equipment at these yards would be required. Physical changes involved in the partial or full conversion of existing bus yards for trolley bus operations may include the addition of:

- An overhead contact wire system, supported by poles or building eye bolts;
- A traction power substation in or very close to some of the yards;
- Modified bus-washing equipment at some yards;
- Minor specialized bus servicing and maintenance equipment; and
- Electrical and control system maintenance equipment.

The operating divisions where ETBs would be maintained must have poles and an OCS system installed. The space required for the poles alters the layout of the division and reduces the bus storage capacity by about 10 percent. This reduction in storage capacity and the increase in fleet requirements, discussed below, necessitate the expansion of RTD Divisions 1, 2 and 10.

Figure 2-11 illustrates the existing Division 1 maintenance facilities and Figure 2-12 shows the expansion plan. Division 1 is located at Alameda and 6th Streets, southeast of Downtown Los Angeles. With expansion of Division 1, most of Industrial Street between Central Avenue and Alameda Street would be permanently closed to through traffic in order to provide a connection between the proposed expansion area and the existing maintenance site. The portion of Industrial Street just east of Central Avenue would remain open for access to the property at the south corner of the street and would end in a cul-de-sac. The expansion site would be used for ETB parking.

60-Foot Articulated Bus

Source: American Public Transportation Association

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Figure 2-10: Electric Trolley Buses

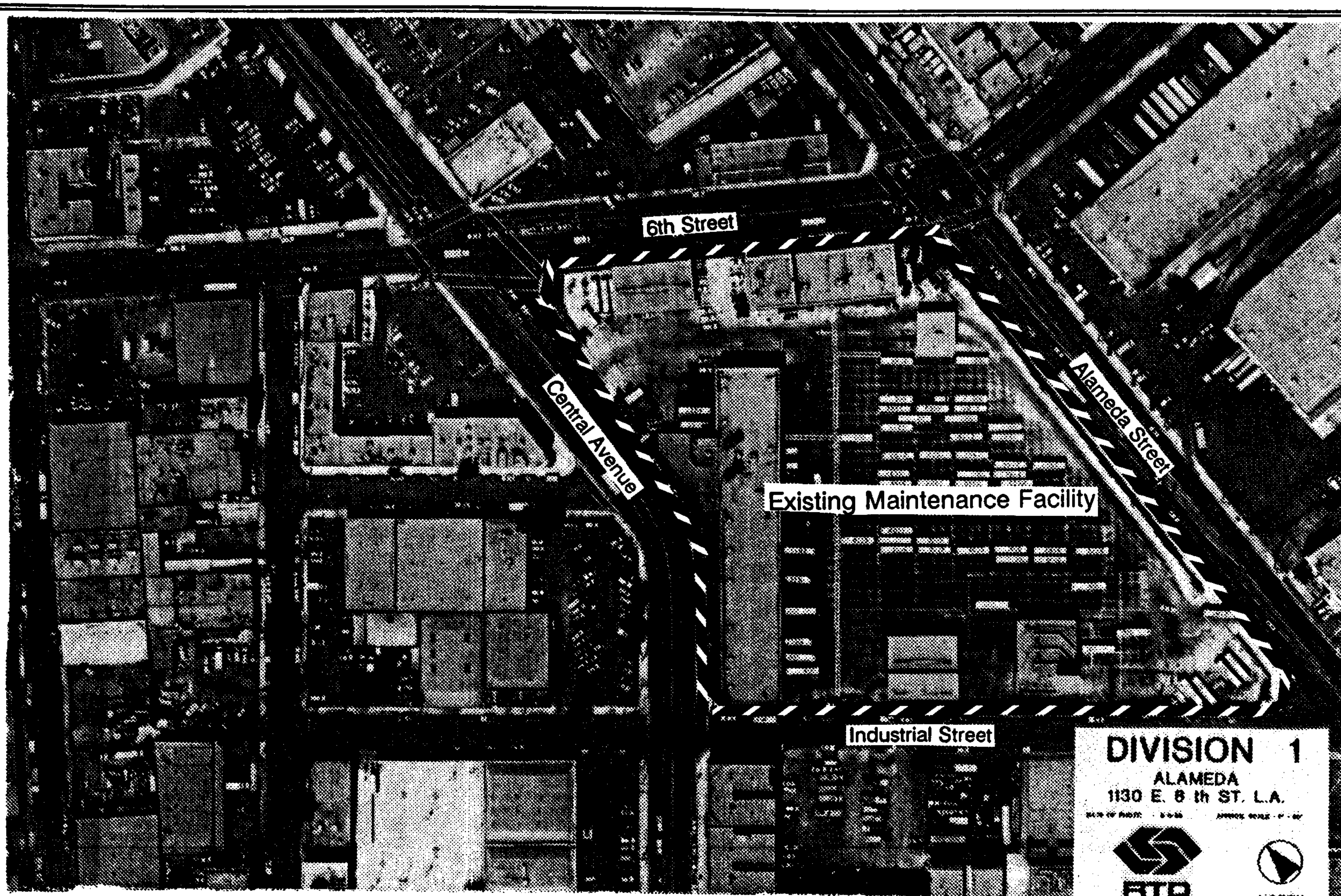

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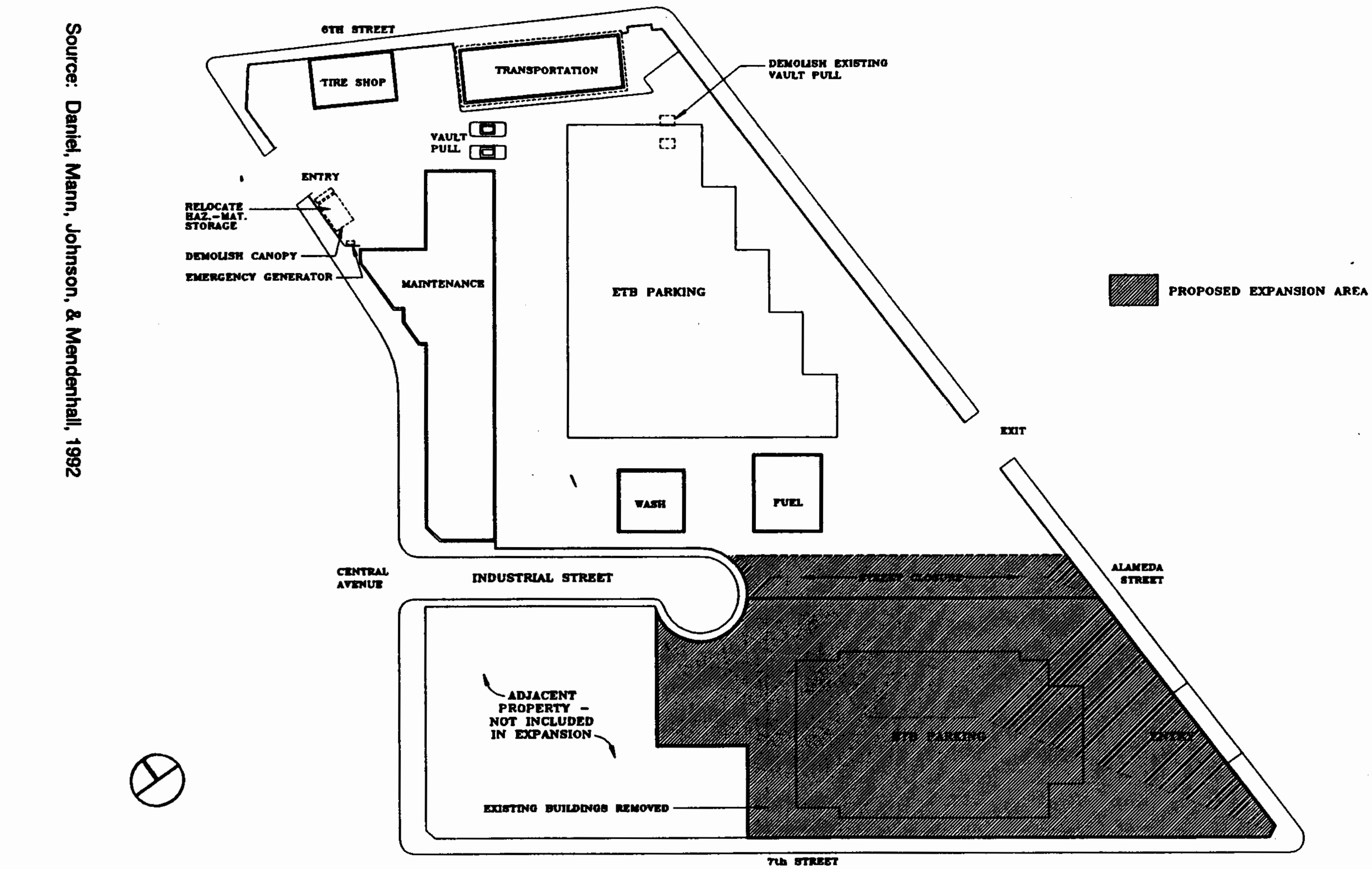
Figure 2-11: Division 1 - Existing Maintenance Yard

Source: Daniel, Mann, Johnson, & Mendenhall, 1992

Figure 2-12: Division 1 - Proposed Expansion



CONCEPTUAL SITE LAYOUT — ALTERNATE SITE EXPANSION RTD DIVISION 1 ALAMEDA

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Figure 2-12: Division 1 - Proposed Expansion

Division 2 is located between San Pedro Street, Griffith Avenue and 14th and 15th Streets just off the Santa Monica Freeway. Expansion of Division 2 would involve the addition of a portion of the block just north of the existing RTD maintenance site, as shown on Figure 2-13 and Figure 2-14. The expansion would also involve the closure of the west side of 15th Street between San Pedro Street and Griffith Avenue. The remainder of the street would remain open for access to the adjacent buildings.

The Division 10 yard is located northwest of the intersection of the Golden State Freeway and the San Bernadino Freeway. (See Figure 2-15.) The expansion site is a currently undeveloped RTD-owned parcel northeast of the existing division yard. As shown on Figure 2-16, the expansion would develop this land for bus parking.

In addition, a new satellite division yard would be developed for Study Route 182. A preliminary site has been identified for this satellite division yard, located along Front street, south of the intersection of the Golden State Freeway and Burbank Boulevard in Burbank. The site is presently occupied with vacant light industrial and commercial structures. Development of a maintenance yard at the site would involve demolition of the existing unoccupied structures and construction of bus parking, a maintenance building, bus washing facilities, a vault pull building (i.e., a small concrete building used to store collected fares) and a tire shop. Vehicles would enter and exit the site off Front Street. (See Figure 2-17.)

- <u>Aesthetic Improvements</u>. The urban design component of the ETB project consists of a set of design elements that will be defined specifically during final design to reflect the needs and opportunities along each segment of the ETB routes. Included in the set of elements are: trees, ETB stops and shelters, sidewalk improvements, pole enhancements, design integration of sidewalk furniture, passenger information kiosks and other passenger and pedestrian amenities.

  Communities through which the ETB routes pass will be consulted and encouraged to participate in the final selection of the urban design elements for their community. For budgeting purposes, an allowance of approximately 10 percent of the total project cost has been identified to provide for the urban design component.

  The ETB project is seen as a potential catalyst for focusing greater attention and effort on improving the quality of the urban setting along the ETB routes and for increasing the use of public transit. Agreements will be sought with local cities that provide for local city support of transit and pedestrian enhancements that complement and build upon the improvements provided by the project. These "Joint Participation Agreements" will detail arrangements for signal preemption, ETB lanes, ETB station and stop enhancements, etc. Issues such as maintenance of trees and pedestrian facilities included in the project or provided by the cities will be addressed.

Figure 2-13: Division 2 - Existing Maintenance Yard

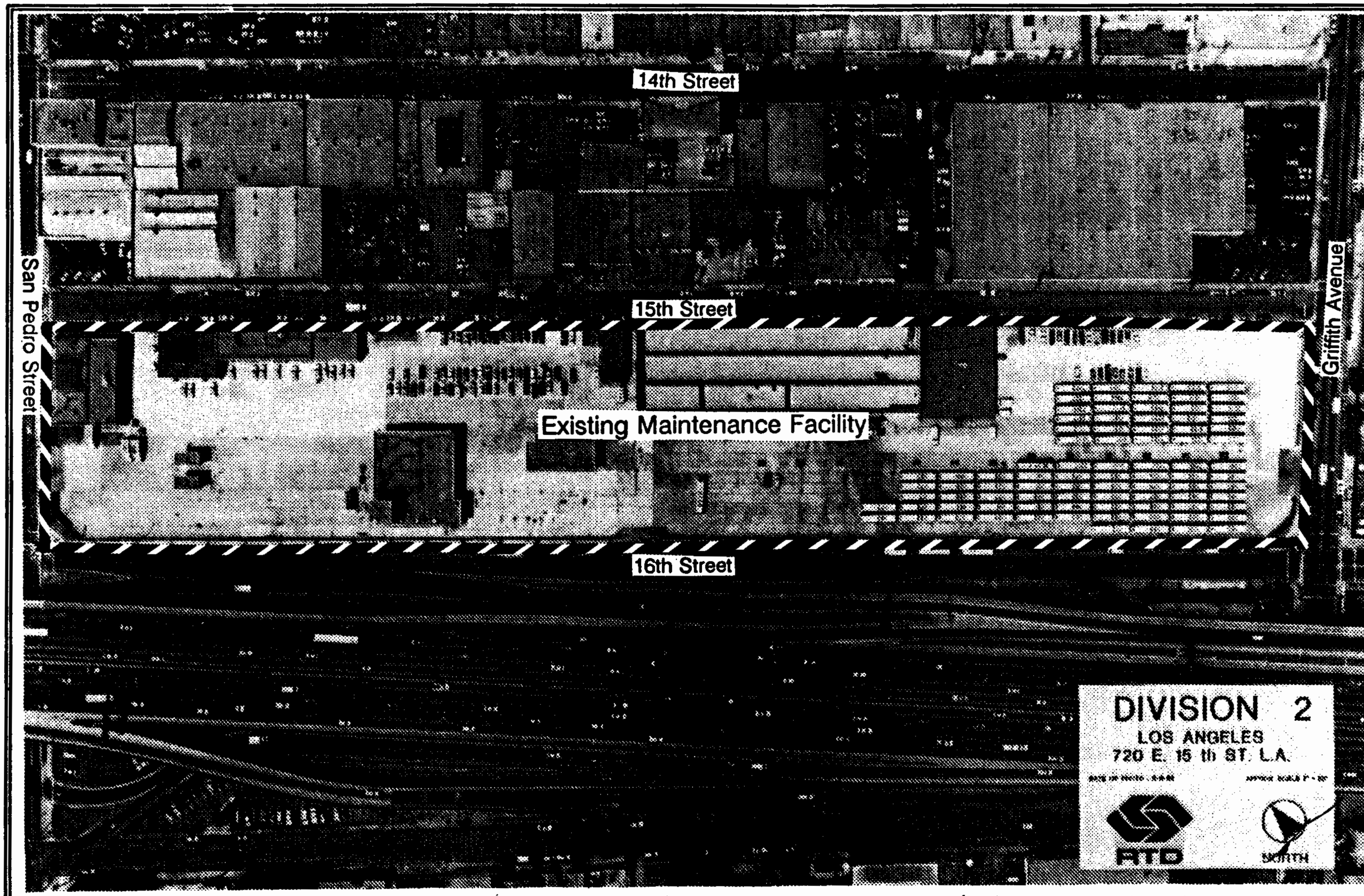

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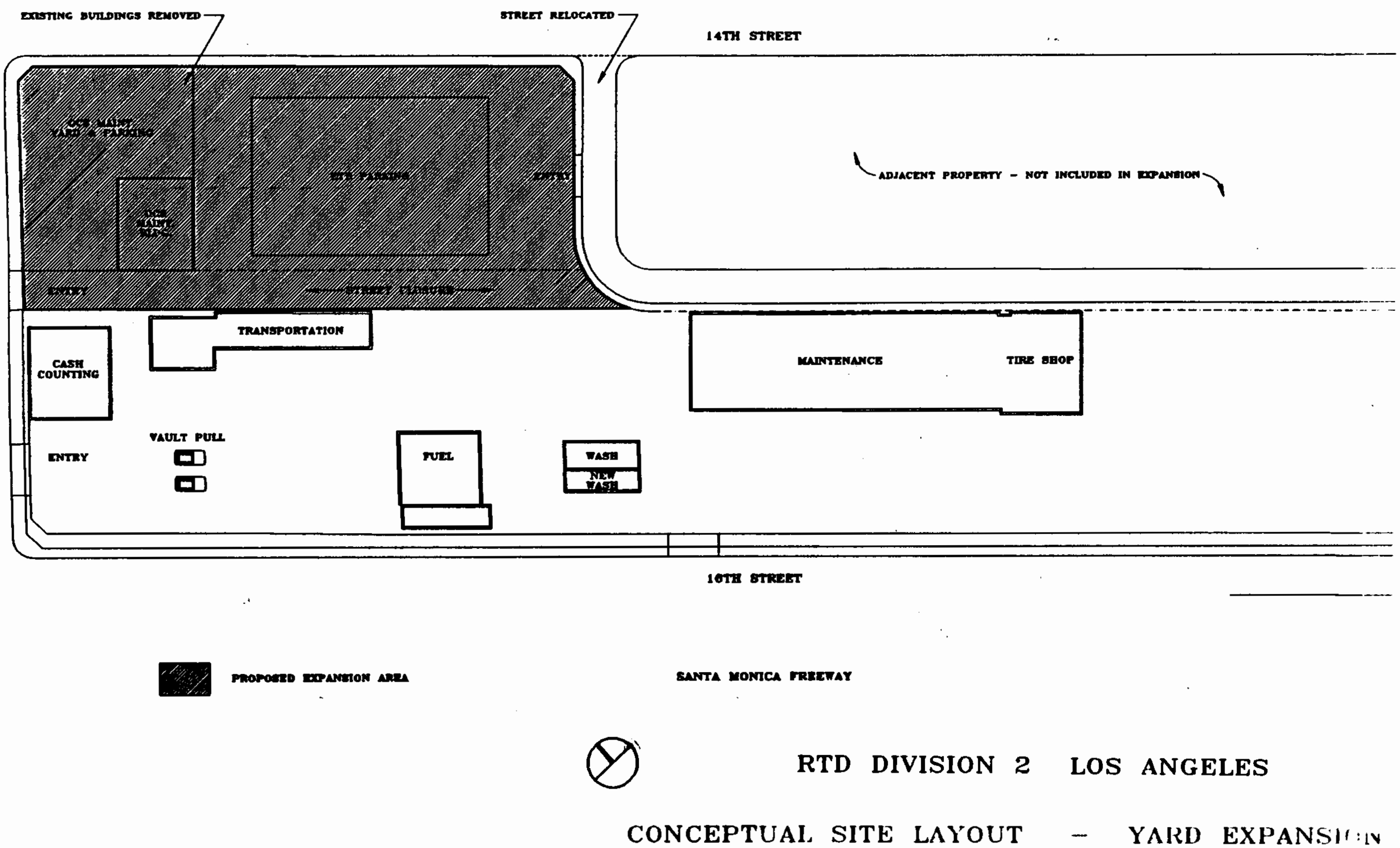
Figure 2-13: Division 2 - Existing Maintenance Yard



Source: Daniel, Mann, Johnson, & Mendenhall, 1992.

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Figure 2-14: Division 2 - Proposed Expansion

Source: Southern California Rapid Transit District, 1992.

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Figure 2-15: Division 10 - Existing Maintenance Yard

Figure 2-15: Division 10 - Existing Maintenance Yard

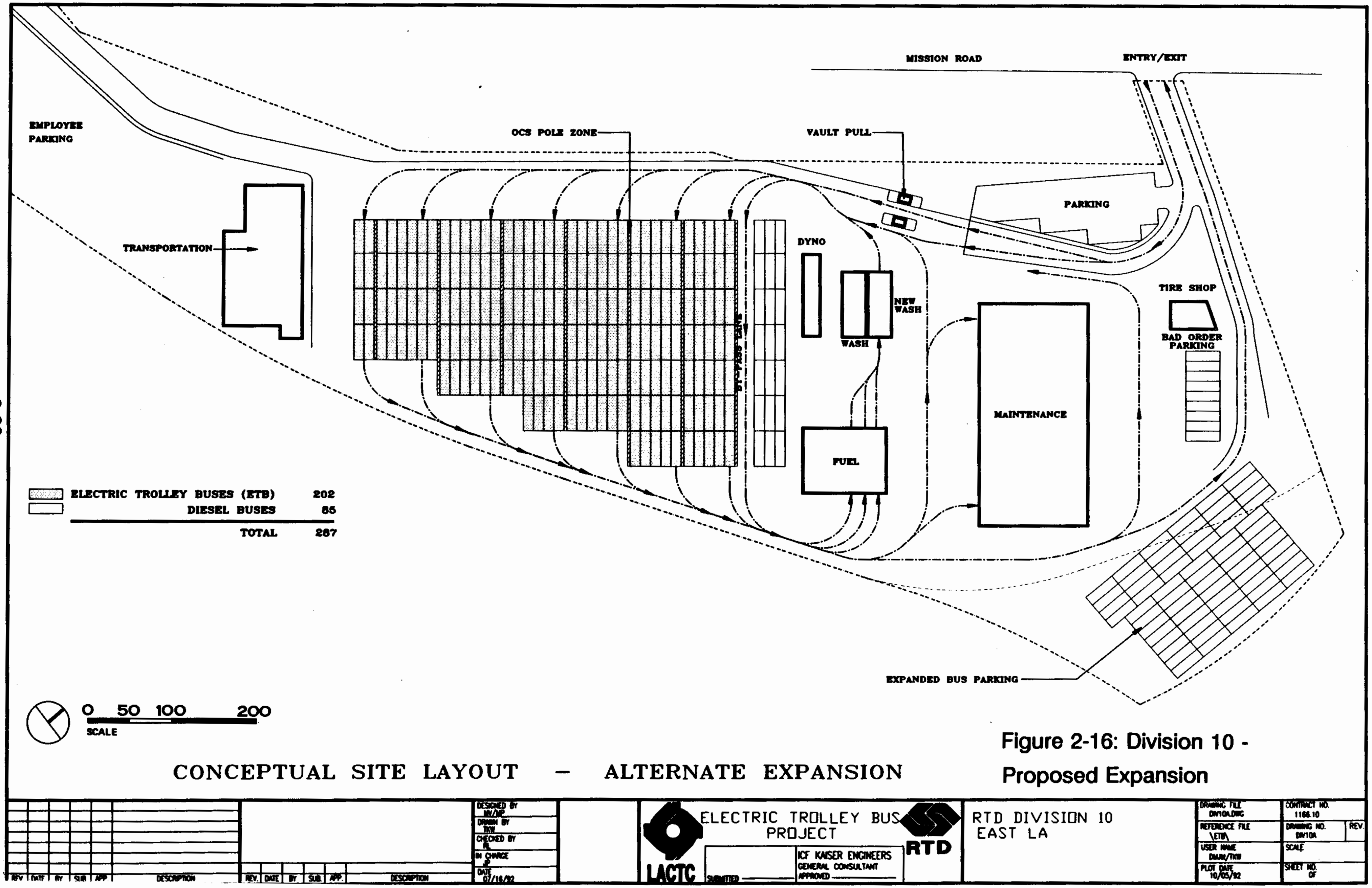
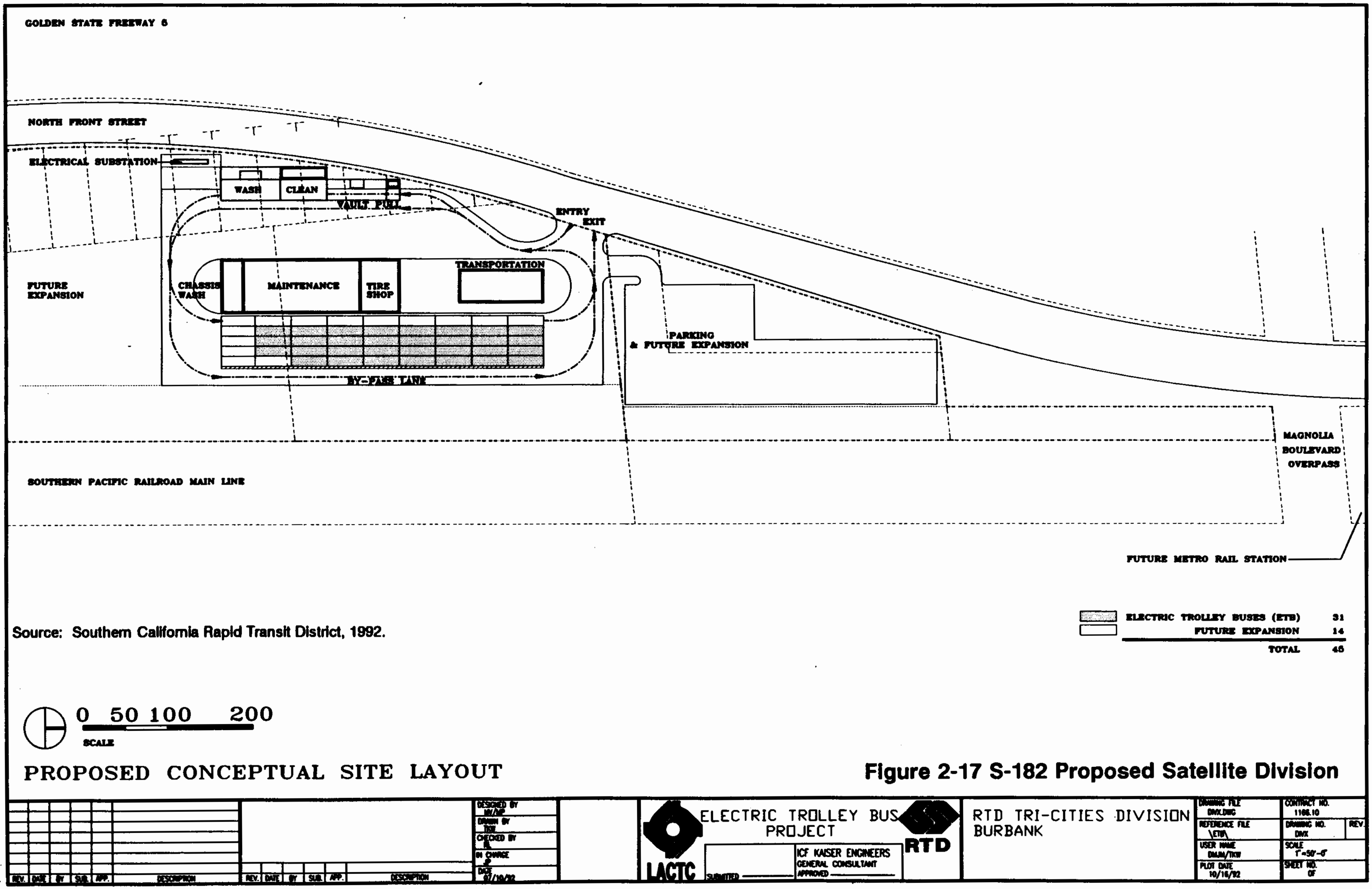


Figure 2-16: Division 10 - Proposed Expansion



Source: Southern California Rapid Transit District, 1992.

Figure 2-17 S-182 Proposed Satellite Division

2.4.3.3 Proposed ETB Routes

a. Route Locations

The Phase I ETB routes evaluated in this EIR are: RTD Route 16; RTD Route 18; RTD Route 30/31; RTD Route 40; RTD Route 45; RTD Route 66/67; RTD Route 70; RTD Study Route 182 (also referred to as Tri-Cities Route), which follows parts of existing RTD Routes 92/93 and 180/181; RTD Route 204; RTD Route 560; Montebello Bus Line Route 10; and a Long Beach Transit Route consisting of portions of Long Beach Routes 40, 50, 60, and 90. These routes typically follow existing transit bus routes or segments of existing routes. Figures 2-18 through 2-32 illustrate the location of each route.

Study Route 182 is the least defined of the Phase I Routes. For example, note that Figure 2-25 shows a possible extension of this route from Hill Street east to the Hastings Ranch area. Selection of Colorado Boulevard through the City of Pasadena is also subject to additional review by the City of Pasadena and other interested parties. The possible effects on the Rose Parade need to be reviewed in more detail if the route is ultimately located on Colorado Boulevard and/or extended to the east. An alternative route that could be considered includes use of the one-way couplet of Green and Union streets through the City of Pasadena. Based on discussions with the City of Pasadena Department of Transportation, the City has taken no position to date regarding a preferred alignment. The City has expressed support, however, for the ETB concept.

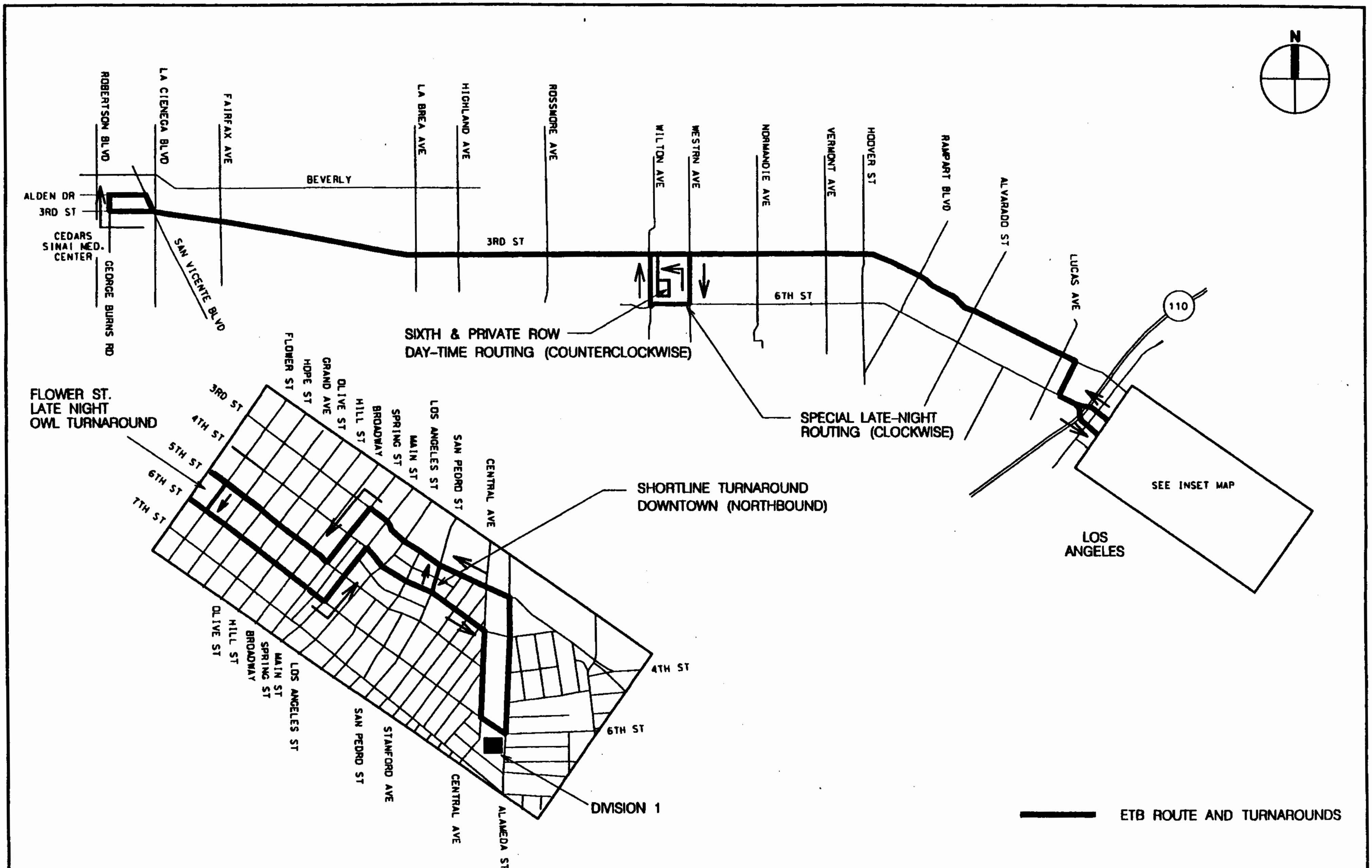
For Study Route 182, the City of Burbank has also expressed support for review of alternative routing along Broadway, as shown on Figure 2-25. Other alternatives of this route include an extension of the western terminus south along Olive Avenue and non-revenue extension to Divisions 3 and 15. It is anticipated that these alternatives will be reviewed in the future and additional environmental documentation prepared should changes be made to Study Route 182.

Other routes containing alternative route locations include: RTD Route 18 (Figure 2-19) and RTD Route 560 (Figure 2-27).

Prototype demonstration segments are proposed to be constructed as a means of developing and refining administrative, construction and operation procedures for the ETB project. Implementation of prototype lines would also allow for the various forms of mitigation measures identified in this EIR to be evaluated and refined for subsequent implementation segments.

b. Physical and Operational Characteristics

Electrification of existing bus routes would not change the majority of the routes' operational characteristics or level of service. Changes could occur over a period of time in response to changes in service demand. The project would require an expanded bus fleet in order to maintain the present level of service. The sizing of the current fleet is based on the ability to flexibly assign buses to serve on more than one bus line. It is common practice for one bus to do one or two trips on one bus line, even though it serves the rest of the day on another line. This practice is called interlining. Additionally, there are instances when a particular bus will discontinue service at the line terminus and take a freeway route back to the other end of the line. This system is used to increase service in the heaviest direction of travel. When some bus



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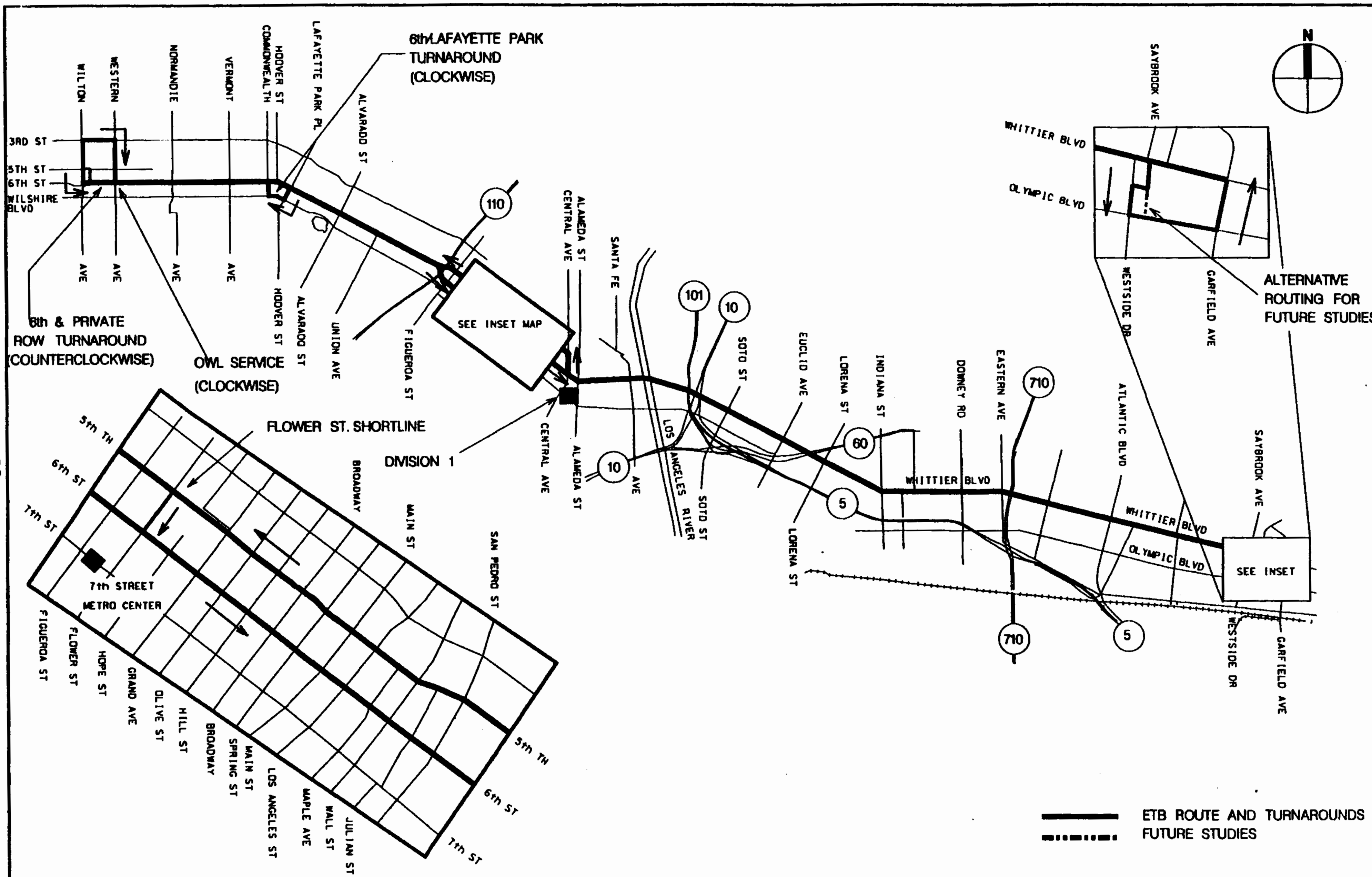
DATE 10/06/92	LACTC / RTD			



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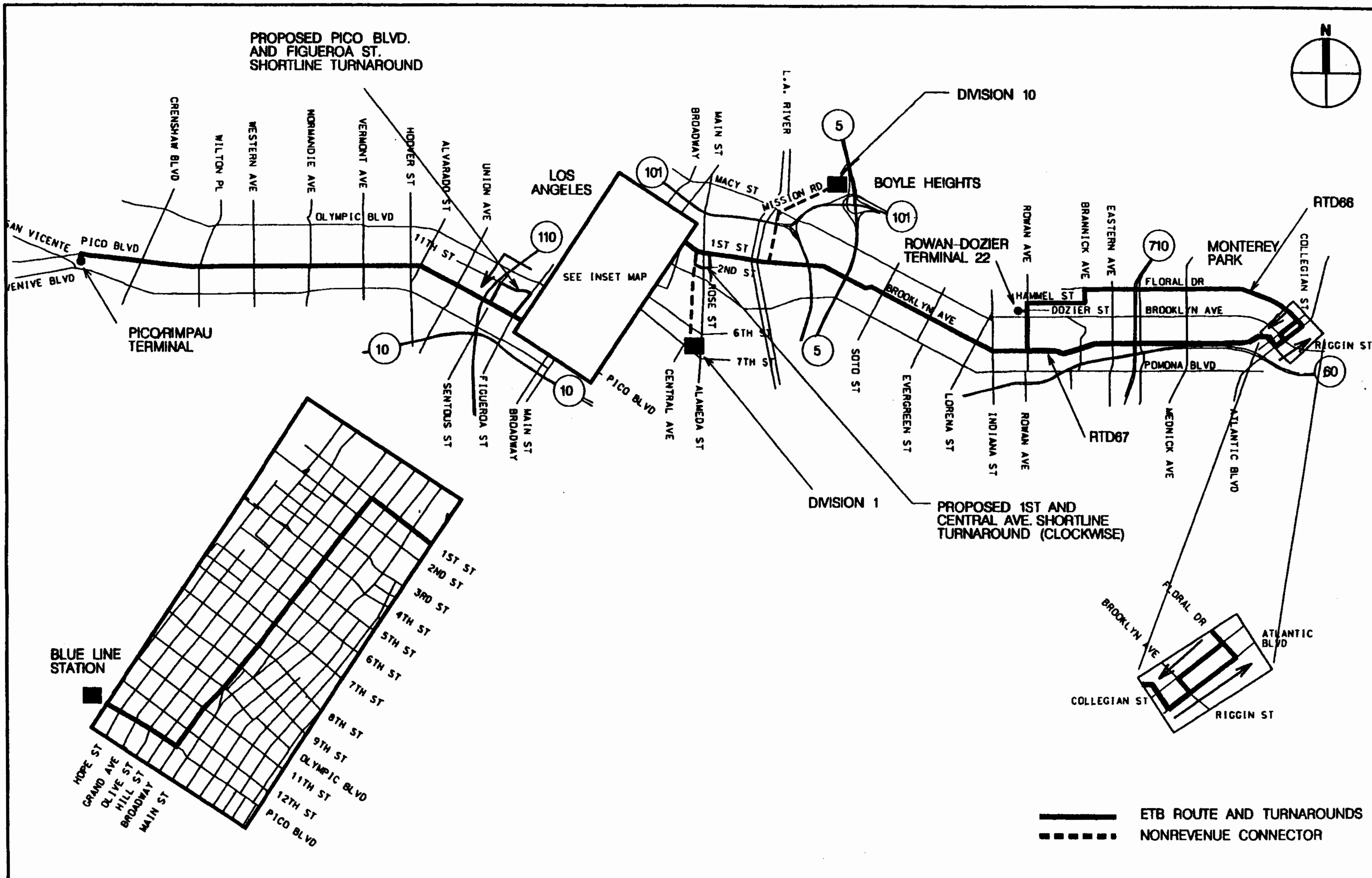

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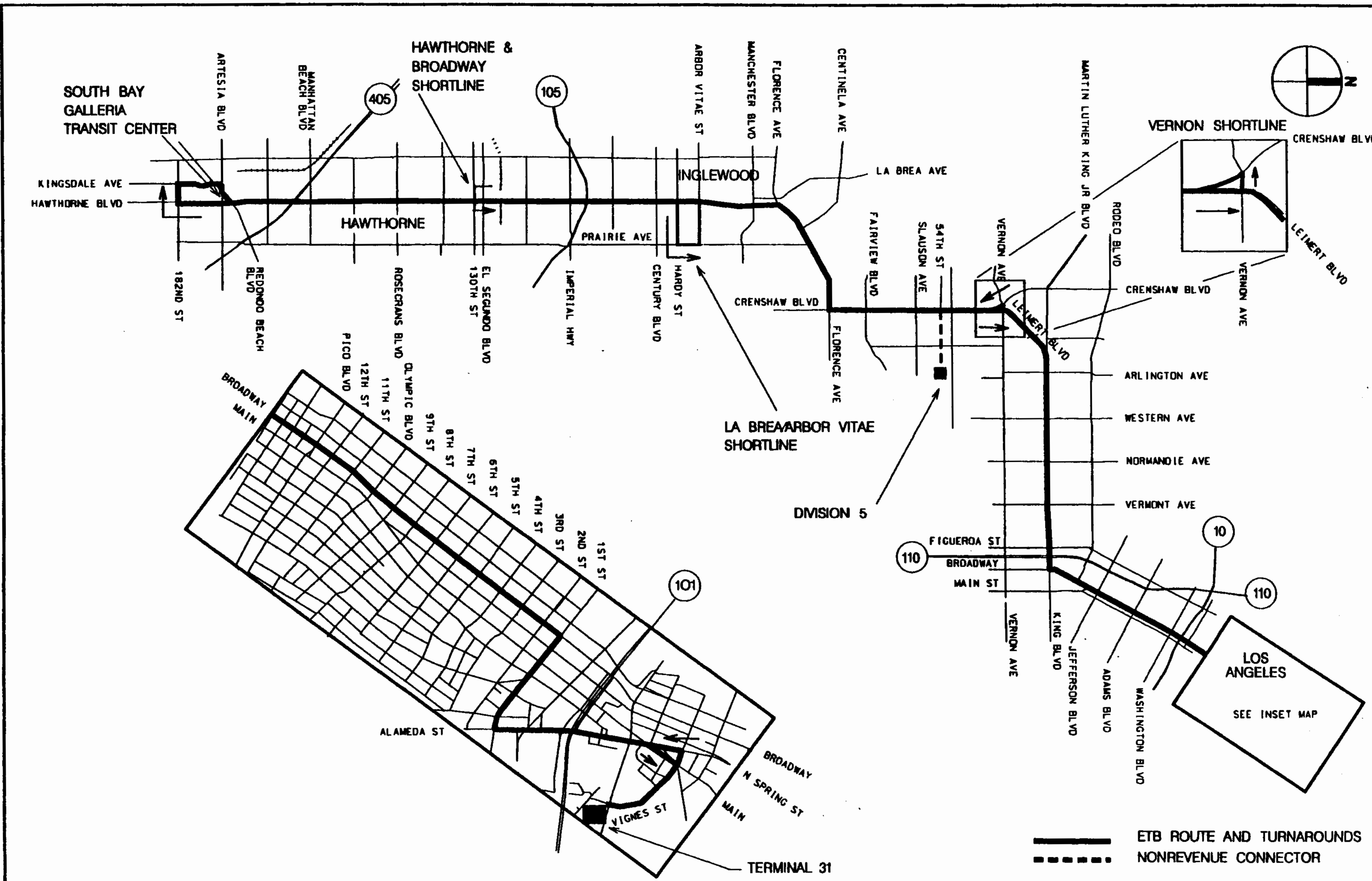

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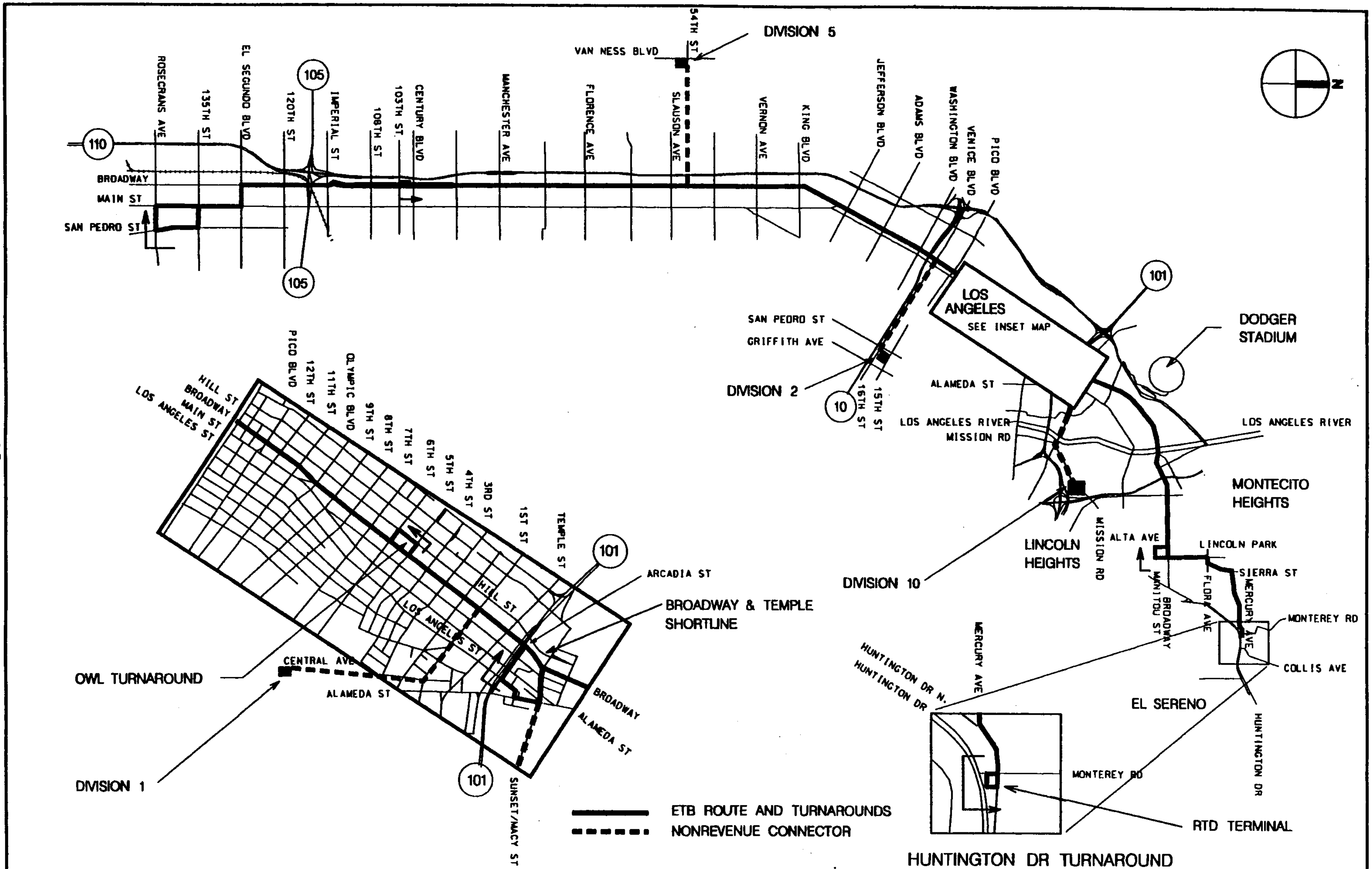
IN CHARGE	ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED	PLOT DATE 10/19/92	SHEET NO.
DATE 10/14/92	RTD		

Figure 2-21

ETB-40, ROUTE MAP



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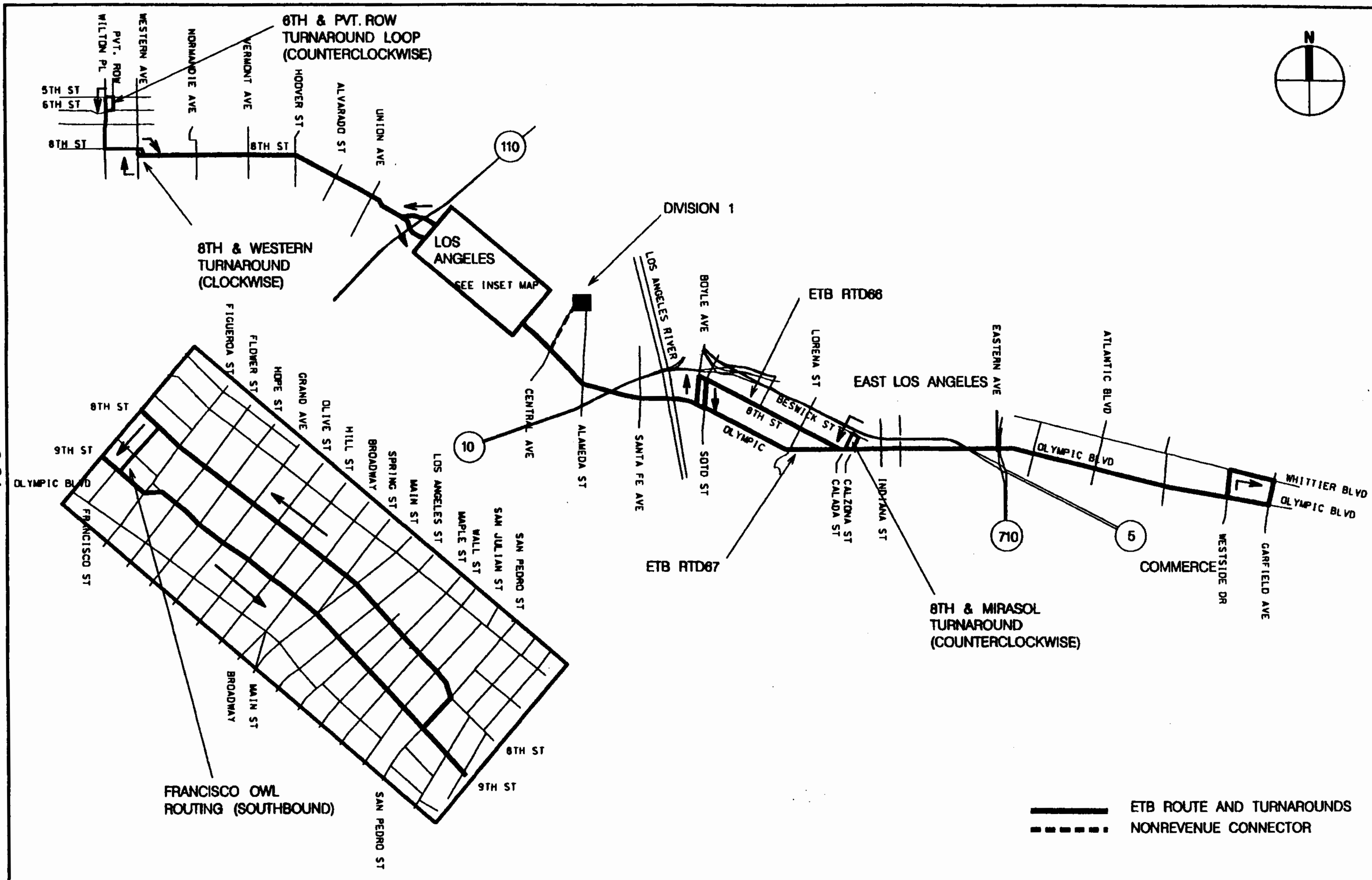
CHECKED BY	LACTC / RTD	USER NAME ACG/SVP	SCALE NTS
IN CHARGE	SUBMITTED / APPROVED	PLOT DATE 10/20/92	SHEET NO.
DATE 10/14/92			

Figure 2-22

ETB–45, ROUTE MAP



DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	Figure 2-23	DRAWING FILE EIR\RTD66.DGN / CONTRACT NO.
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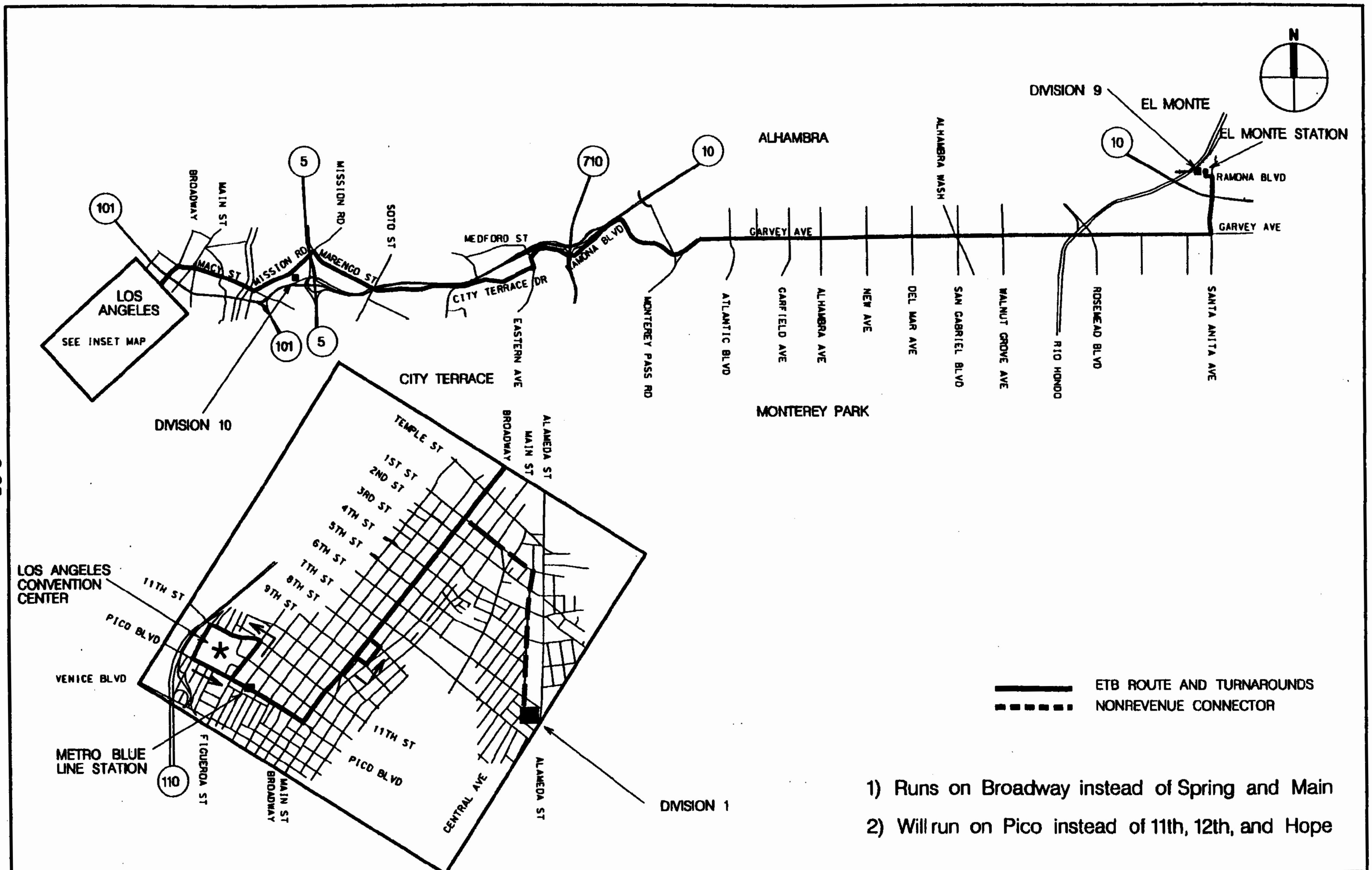
DATE 10/14/92			



1) Runs on Broadway instead of Spring and Main

2) Will run on Pico instead of 11th, 12th, and Hope

DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	Figure 2-24	DRAWING FILE EIR\RTD70.DGN
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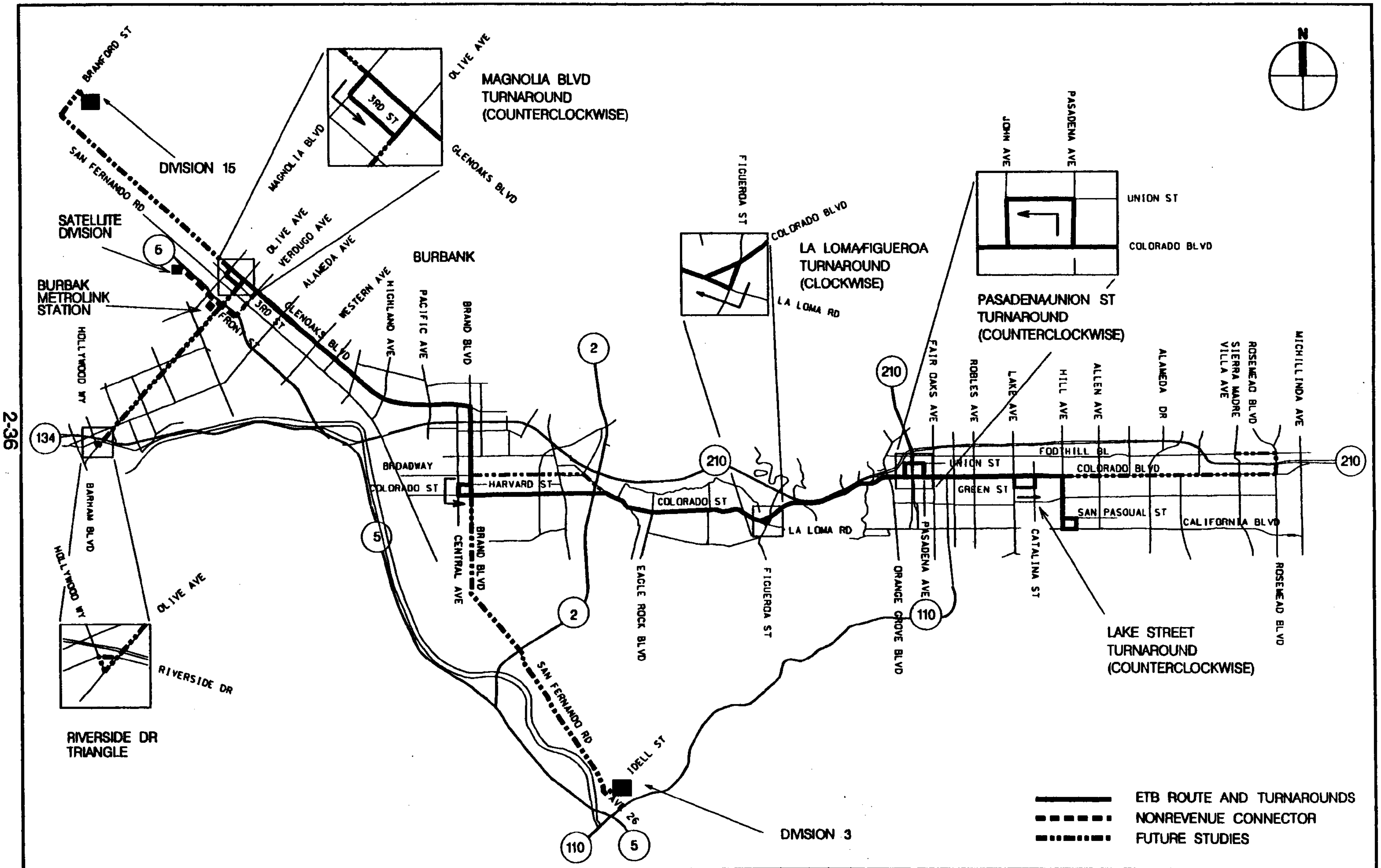

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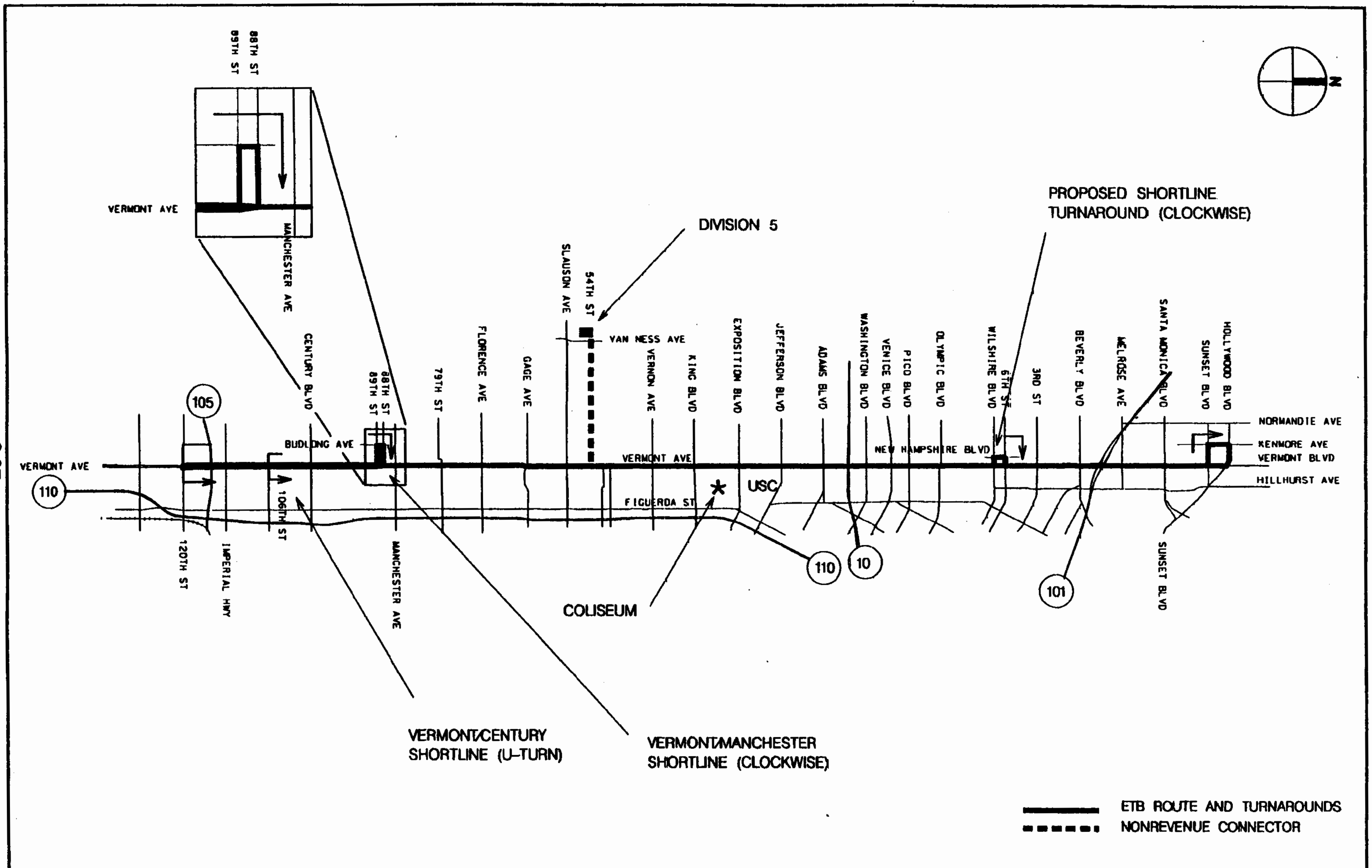

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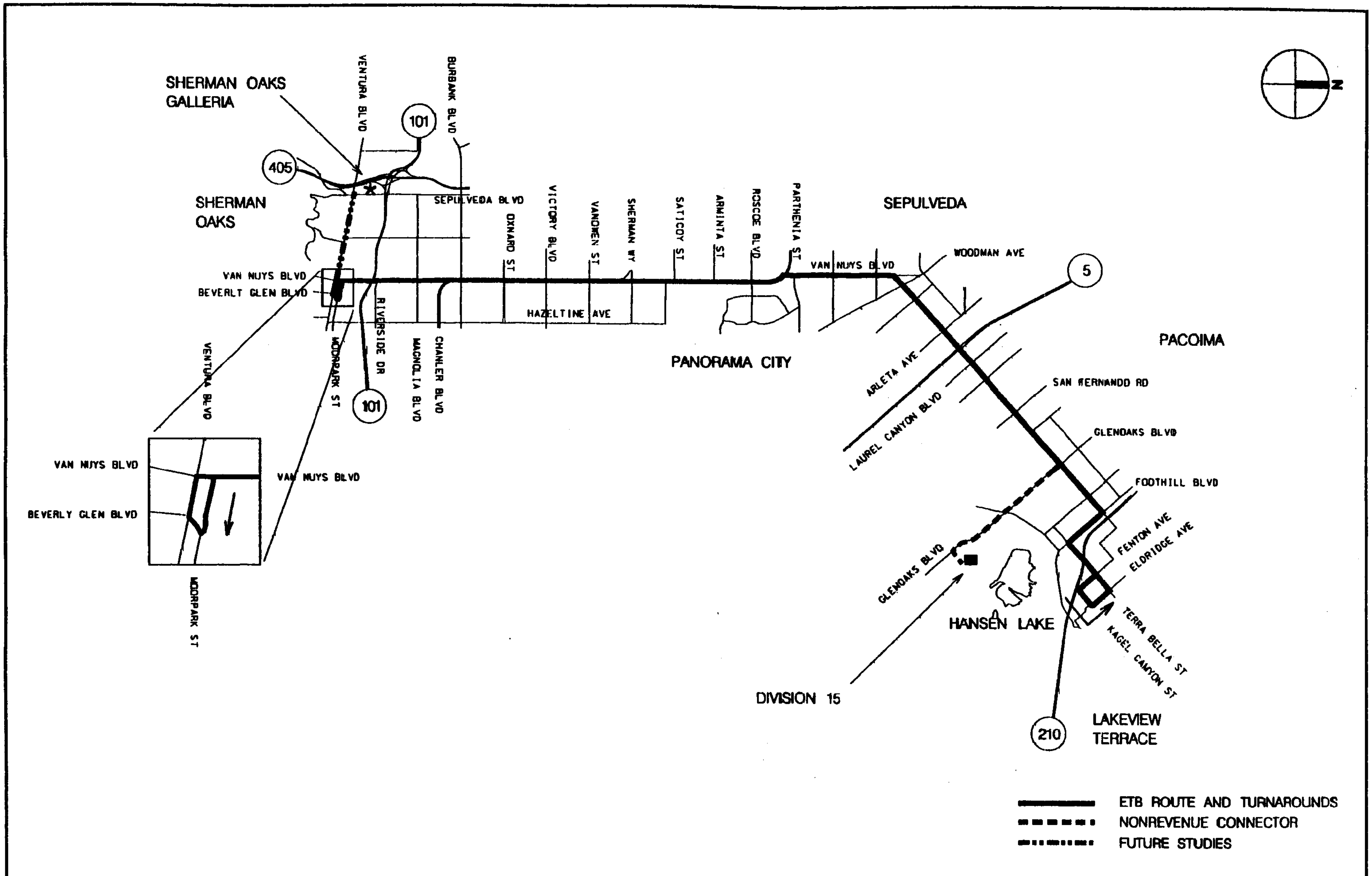
DATE 10/15/92				



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			PLOT DATE 10/19/92
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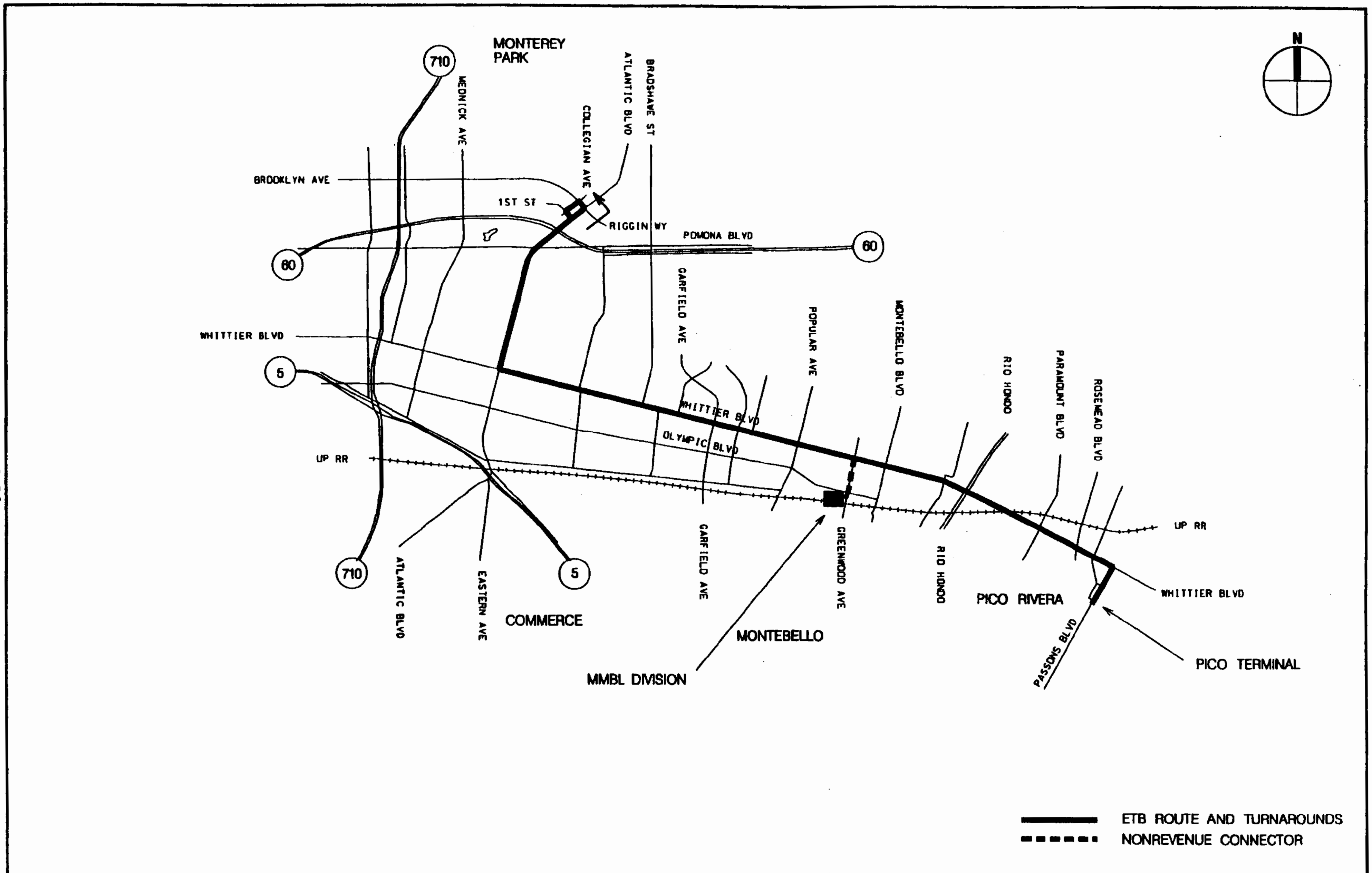

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IN CHARGE		PLOT DATE 10/19/92	SHEET NO.
DATE 10/17/92			

LACTC

ELECTRIC TROLLEYBUS PROJECT

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SUBMITTED

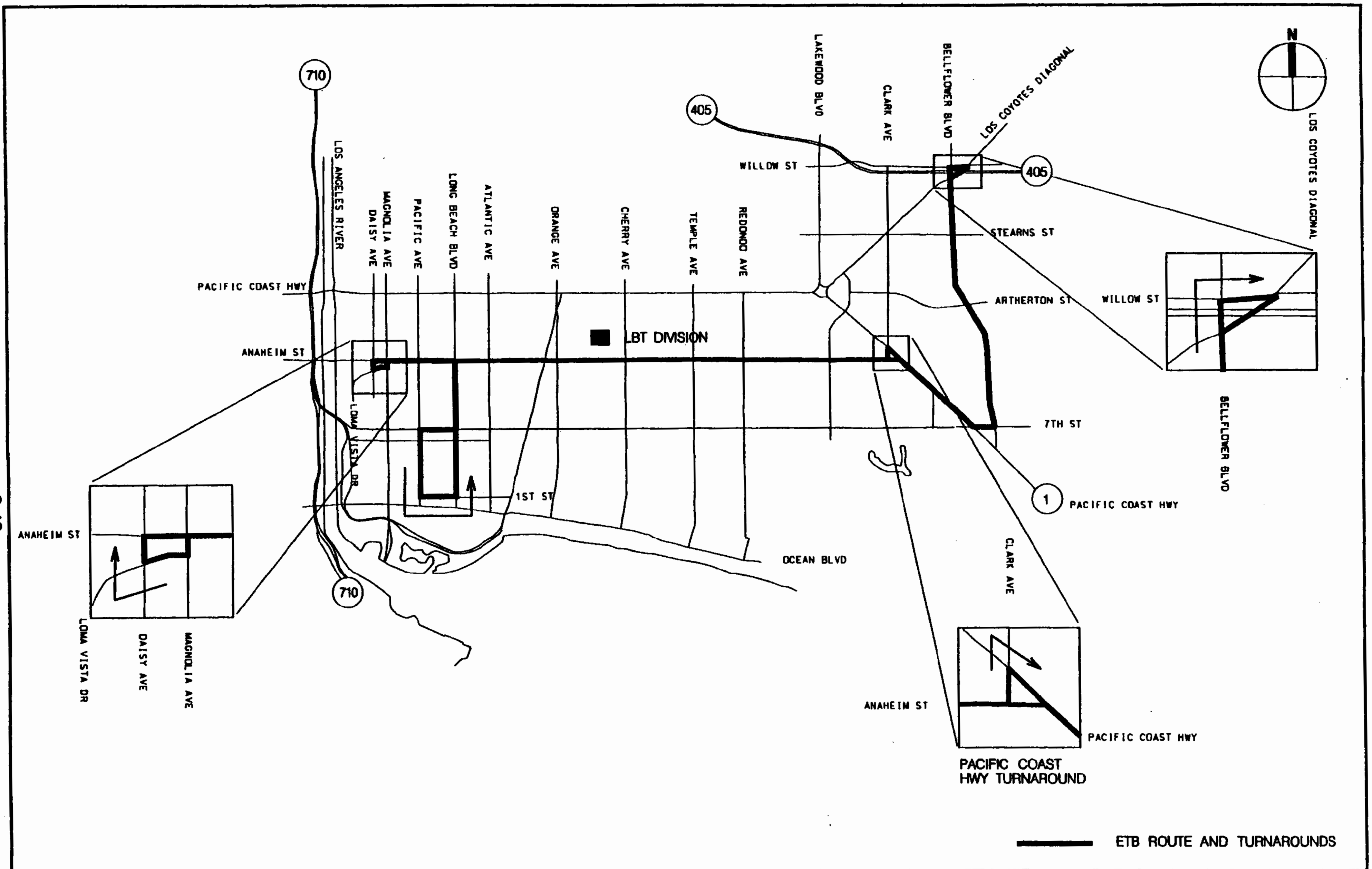
ICF KAISER ENGINEERS
GENERAL CONSULTANT

APPROVED

RTD

Figure 2-28

ETB–MMBL10, ROUTE MAP



DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	**Figure 2-29**	DRAWING FILE EIR\LB40.DGN / CONTRACT NO.
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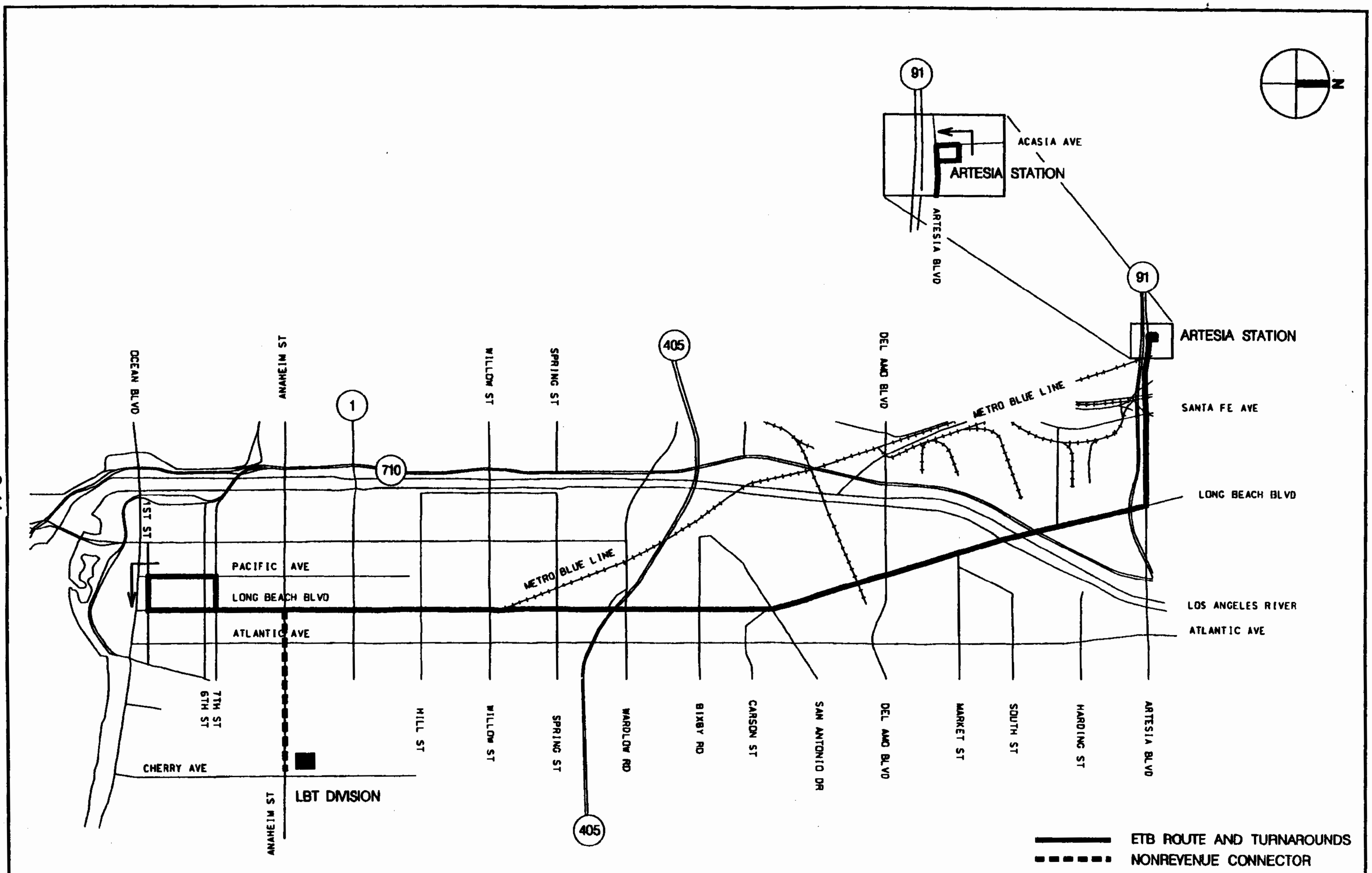
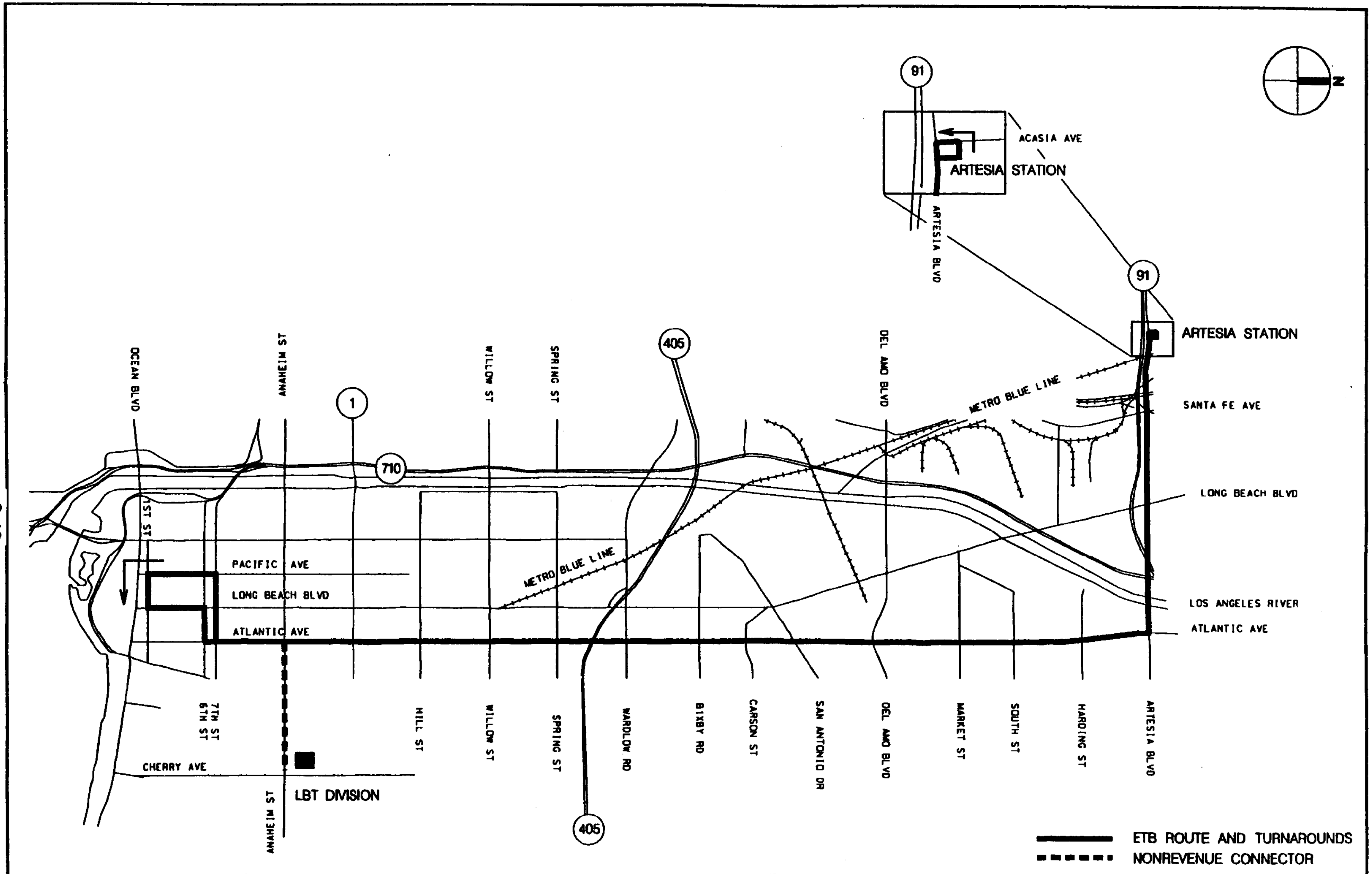
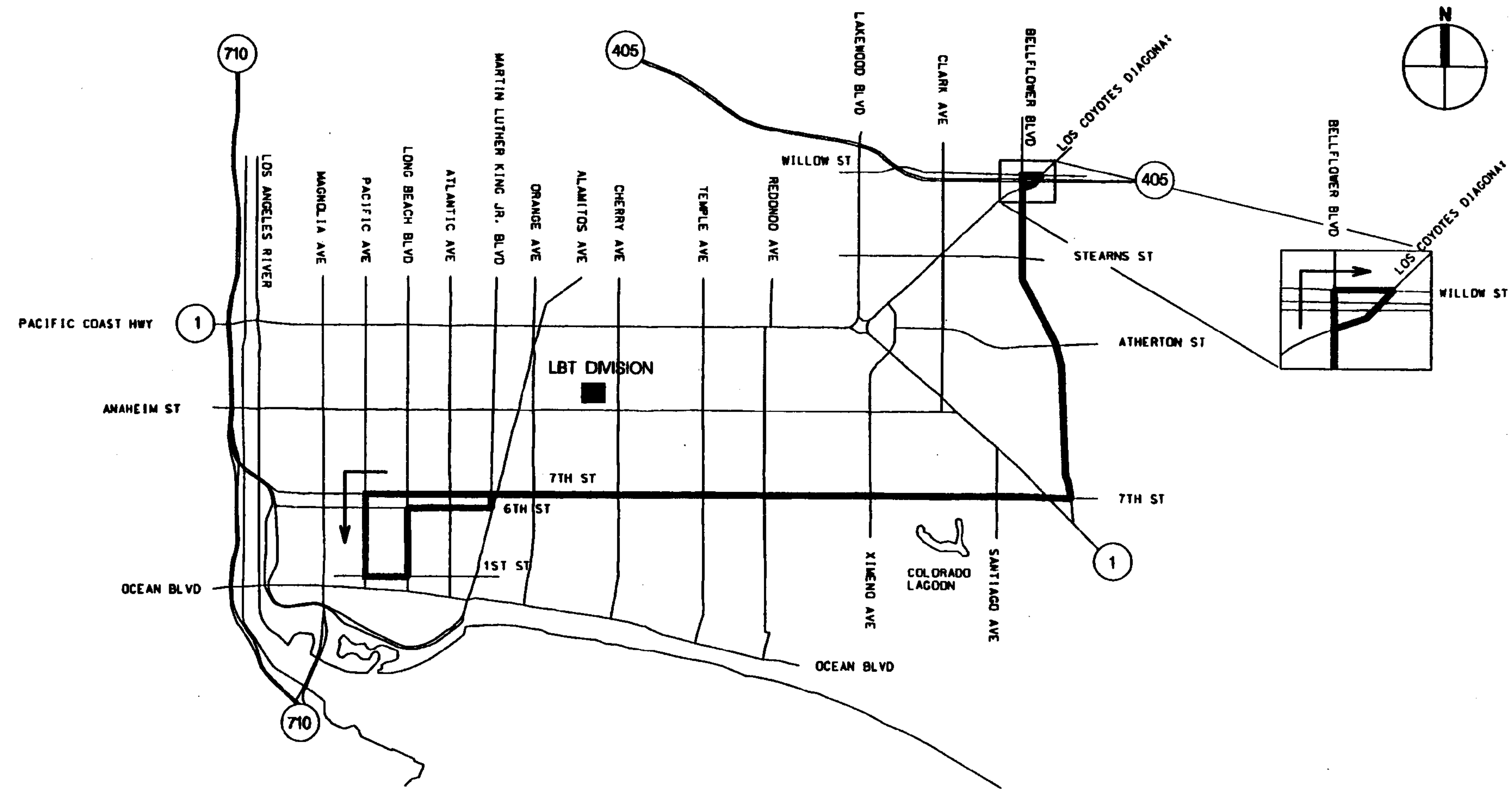
DATE 10/16/92	SUBMITTED / APPROVED	RTD	



DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	**Figure 2-30**	DRAWING FILE EIR\LB50.DGN
DRAWN BY ACG/SVP	LACTC	ETB-LB50, ROUTE MAP	CONTRACT NO.
CHECKED BY	A • C • G ENVIRONMENTS SUBMITTED		REFERENCE FILE ETAKMAPS
IN CHARGE	ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED		DRAWING NO. ETB-LB50 REV.
DATE 10/18/92	RTD		USER NAME ACG/SVP
			SCALE NTS
			PLOT DATE 10/18/92
			SHEET NO.



DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	**Figure 2-31**	DRAWING FILE EIR\LB60.DGN
DRAWN BY ACG/SVP	LACTC	ETB–LB60, ROUTE MAP	REFERENCE FILE ETAKMAPS
CHECKED BY	A•C•G ENVIRONMENTS SUBMITTED		USER NAME ACG/SVP
IN CHARGE	ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED		PLOT DATE 10/18/92
DATE 10/18/92	RTD		CONTRACT NO.
			DRAWING NO. ETB-LB60
			REV.
			SCALE NTS
			SHEET NO.



NOTE:
NON-REVENUE CONNECTION WOULD BE ALONG ANAHEIM TO 7TH, EITHER VIA PCH ON THE EASTERN END OR VIA LONG BEACH BLVD ON THE WESTERN END

ETB ROUTE AND TURNAROUNDS

DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	**Figure 2-32**	DRAWING FILE EIR\LB90.DGN
DRAWN BY ACG/SVP	LACTC	ETB-LB90, ROUTE MAP	CONTRACT NO.
CHECKED BY	A • C • G ENVIRONMENTS SUBMITTED		REFERENCE FILE ETAKMAPS
IN CHARGE	ICF KAISER ENGINEERS GENERAL CONSULTANT APPROVED		DRAWING NO. ETB-LB90 REV.
DATE 10/18/92	RTD		USER NAME ACG/SVP
			SCALE NTS
			PLOT DATE 10/19/92
			SHEET NO.

lines are converted to ETB service, the buses serving those lines would no longer be able to interline to non-electric lines, or take freeway routes to re-enter service in the direction experiencing heavier demand.

As the number of Phase I bus lines converted increases, opportunities for interlining among the ETB lines would expand. However, there would be a net system-wide decrease in the opportunities to reduce equipment requirements. This would translate to an increase in fleet size not to exceed 48 ETBs and 35 diesel buses out of a total ETB fleet of approximately 500. ETB fleet requirements for all 12 routes, including a 20 percent spare ratio, would total approximately 500 buses.

Table 2-1 and Table 2-2 describe certain existing and proposed operating and physical characteristics of the selected Phase I routes. Operating characteristics described in Table 2-1 include the following:

- o Existing Number of Bus Stops. The number of stops that currently exist along each route is presented in this column.
- o Current Daily Boardings. This figure represents an estimate of the number of people who currently ride the buses on each of the existing routes per day.
- o Current Number of Daily Buses. These figures present the total number of buses on each route during the peak hour and during the base hour. The base hour represents a typical off peak hour (off peak hours include 9:00 AM through 3:00 AM).
- o Current Headway. Headway is the scheduled time between bus arrivals at each stop along the route.
- o Current Operating Hours. These are the hours during which the buses presently operate on each route.

Table 2-1: Operating Characteristics

ROUTE		CURRENT						
		# OF BUS STOPS	DAILY BOARDINGS	# BUSES		HEADWAY (MINUTES)		OPERATING HOURS
				PEAK HOUR	BASE HOUR[1]	PEAK	BASE	
16.	3rd St	124	23,674	29	12	8	20	4:30 AM - 2:00 AM
18.	6th St	126	30,534	25	16	7	10	24 hours
30/31.	Pico	179	46,035	39	26	7	15	4:30 AM - 3:40 AM
40.	South Bay	157	33,743	51	29	9	12	24 hours
45.	Broadway	159	28,279	36	22	7	15	24 hours
66/67.	8th St	120	25,327	29	10	3	10	3:20 AM - 1:15 AM
70.	Garvey	105	14,633	25	16	10	10	24 hours
S-182		NA	NA	NA	NA	NA	NA	NA
204.	Vermont	122	57,776	37	32	6	10	24 hours
560.	Van Nuys	114[2]	14,914	22	16	10	15	4:30 AM - 1:30 AM
M10.	Whittier	68	7,797	8	7	7	10	5:00 AM - 11:30 AM
LB40.	Anaheim	36	6,131	9	5	7	15	5:00 AM - 1:00 AM
LB50.	Long Beach	51	5,479	9	9	15	15	5:00 AM - 12:30 AM
LB60.	Atlantic	57	7,885	13	8	10	15	4:40 AM - 1:10 AM
LB90.	7th St	41	6,504	16	8	5	10	5:00 AM - 1:00 AM

Legend: NA = Not Applicable
Notes: [1] The base period occurs from 9:00 AM to 3:00 PM.
[2] The number of bus stops is only for the route portion that would be electrified (i.e., north of Ventura Boulevard).

Source: Long Beach Transit, 1992; Montebello Municipal Bus Lines, 1992; Myra L. Frank & Associates, 1992; Southern California Rapid Transit District, 1992.

Table 2-1: Operating Characteristics

TABLE 2-2: PHYSICAL CHARACTERISTICS

ROUTE	MAJOR STREETS	PROPOSED LENGTH OF OVERHEAD CONTACT SYSTEM [1] (MILES)				NEW STREETS COVERED	ROUTES SHARING SEGMENTS	PROPOSED OPERATING DIVISION	PROPOSED NUMBER OF SUBSTATIONS ON ROUTE [2]	PROPOSED LOCATION OF LAYOVERS [3]
		1-WAY	2-WAY	NON-REVENUE	TOTAL WIRE					
16. 3rd St.	3rd St., 4th St., 5th St., 6th St., Main St., San Pedro St.	6.8	8.0	0.1	23.0	Wilton Ave., 6th St., Western Ave., private right of way (ROW) near Wilton Ave., 5th St., Flower St., San Pedro St.	18, 30/31, 45, 66/67, 70	1	11	On George Burns Dr. N of 3rd St., on 6th St. in front of Division 1, on private ROW N of 6th St. near Wilton Pl., on 3rd St. E. of Wilton Pl., on 3rd St. between San Pedro St. and Los Angeles St.
18. 6th St.	5th St., 6th St., Whittier Bl.	5.3	10.0	0.1	25.5	Commonwealth St., Wilshire Bl., Lafayette Park Pl., Flower St.	16, 30/31, 45, 66/67, 70, M10	1	13	On 6th St. W of Lafayette Park Pl., on 6th St. between Grand Ave. and Hope St., on Garfield Ave. between Whittier Bl. and Olympic Bl., on 3rd St. E of Wilton Pl., on private ROW N of 6th St. near Wilton Pl.
30/31. Pico	Pico Bl., Broadway, 1st St., Atlantic Bl., Floral Dr.	1.8	15.3	0.8 to Div. 1 1.0 to Div. 10	36.0	Sentous St., 11th St., Figueroa St., Central Ave., 2nd St., Rose St., Mission Rd.	16, 18, 40, 45, 70, M10	1, 10	16	On Collegian Ave. mid-block between Riggin St. and Floral Dr., Pico Bl. and Rimpau Bl. loop, Rowan Ave. and Dozier St. terminal.
40. South Bay	La Brea Ave., Hawthorne Ave., Florence Ave., Crenshaw Bl., Leimert Bl., Martin Luther King, Jr. Bl., Broadway, 1st St., Alameda St.	3.5	19.0	0.8	43.0	Hardy St., Arbor Vitae St., Prairie Ave., 54th St.	30/31, 40, 45, 70	5	19	Terminal 31, South Bay Transit Galleria, on Arbor Vitae St. E of La Brea Ave., on Hawthorne Ave. S of the railroad crossing (S of Broadway).
45. Broadway	Broadway, Huntington Dr. N, Main St.	2.8	15.5	1.3 to Div. 1 1.3 to Div. 2 2.3 to Div. 5 1.4 to Div. 10	46.4	54th St., 16th St., 5th St., 6th St., Hill St., 1st St., Central Ave., Sunset Bl., Macy St., Alameda St., Los Angeles St., Arcadia St., Mission Rd., Alta Ave., Manitou St., Lincoln Park Ave.	30/31, 40, 70, 204	1, 2, 5, 10	18	Off of Monterey Rd. N of Huntington Dr., on Broadway S of Century Bl., on San Pedro St. between 140th St. and Rosecrans Ave., on Los Angeles St. N of Arcadia St., on Broadway between 5th St. and 6th St.

(continued)

TABLE 2-2: PHYSICAL CHARACTERISTICS

ROUTE	MAJOR STREETS	PROPOSED LENGTH OF OVERHEAD CONTACT SYSTEM [1] (MILES)				NEW STREETS COVERED	ROUTES SHARING SEGMENTS	PROPOSED OPERATING DIVISION	PROPOSED NUMBER OF SUBSTATIONS ON ROUTE [2]	PROPOSED LOCATION OF LAYOVERS [3]
		1-WAY	2-WAY	NON-REVENUE	TOTAL WIRE					
66/67. 8th St.	8th St., 9th St., Olympic Bl.	5.0	11.5	0.5	29.0	Western Ave., Francisco St., Central Ave., Mirasol St., Beswick St., Calzona St.	16, 18, M10	1	15	On Garfield Ave. between Whittier Bl. and Olympic Bl., on 8th St. just E of Western Ave., on Francisco St. between 8th St. and 9th St., on private ROW N of 6th St. near Wilton Pl., on 8th St. E. of Lorena St.
70. Garvey	Pico Bl., Broadway, Macy St., Garvey Ave., Santa Anita Ave., Marengo St., City Terrace Dr.	1.2	15.5	1.3 to Div. 1 0 to Div. 9 0 to Div. 10	34.8	Broadway, 1st. St., Central Ave., 8th St., 9th St., Main St.	30/31, 40, 45	1, 9, 10	17	On 11th St. E of Georgia St., at the El Monte Busway Station, at Division 9.
S-182	Glenoaks Bl., Brand Bl., Colorado Bl., Hill Ave.	2.0	13.0	1.0	30.0	Hill Ave., Magnolia Bl, 3rd St., Olive Ave., Verdugo Ave., Front St., Harvard St., Central Ave., La Loma Rd., Figueroa St., John Ave., Union St., Pasadena Ave., Lake Ave., Green St., Catalina St., California Bl., San Pasqual St., Sierra Bonita Ave.	None	Satellite	14	Not available
204. Vermont	Vermont Ave.	1.5	12.1	1.5	28.7	88th St., 89th St., Budlong Ave., 54th St., Wilshire Bl., 6th St., New Hampshire Ave.	18, 45	5	13	On Vermont Ave. N of 120th St., on Vermont Ave. S of Century Bl., on 89th St. W of Vermont Ave., on Vermont Ave. between Hollywood Bl. and Sunset Bl.
560. Van Nuys	Van Nuys Bl., Foothill Bl., Terra Bella St.	1.5	11.2	1.7	27.3	Glenoaks Bl., Ventura Bl., Moorpark St., Beverly Glen Bl.	None	15	12	On Moorpark St. E of Van Nuys Bl., on Eldridge Ave. N of Kagel Canyon St.
M10. Whittier	Atlantic Bl., Whittier Bl., Passons Bl.	0.4	6.4	0.4	14.0	Greenwood Ave., Willow St., Los Coyotes Diagonal, Daisy Ave., Magnolia Ave., Loma Vista Dr.	18, 30/31, 66/67	Montebello Bus Lines (MBL)	7	On Collegian Ave. S of Brooklyn Ave., Pico Rivera terminal.

(continued)

TABLE 2-2: PHYSICAL CHARACTERISTICS

ROUTE	MAJOR STREETS	PROPOSED LENGTH OF OVERHEAD CONTACT SYSTEM [1] (MILES)				NEW STREETS COVERED	ROUTES SHARING SEGMENTS	PROPOSED OPERATING DIVISION	PROPOSED NUMBER OF SUBSTATIONS ON ROUTE [2]	PROPOSED LOCATION OF LAYOVERS [3]
		1-WAY	2-WAY	NON-REVENUE	TOTAL WIRE					
LB40. Anaheim	Pacific Ave., Long Beach Bl., Anaheim St., Pacific Coast Highway, Bellflower Bl.	2.4	6.6	0.0	15.6	Pacific Coast Highway, Bellflower Bl.	LB 50, LB 60, LB 90	Long Beach (LB)	6	Anaheim St. near Pacific Coast Highway, Long Beach Regional Transit Mall, Willow St. and Bellflower Bl.
LB50. Long Beach	Pacific Ave., Long Beach Bl., Artesia Bl.	1.8	8.1	1.3	20.6	Anaheim St.	LB 40, LB 60, LB 90	LB	9	Artesia Blue Line station, Long Beach Regional Transit Mall
LB60. Atlantic	Pacific Ave., Long Beach Bl., Atlantic Ave., Artesia Bl., 7th St.	2.0	9.0	1.0	22.0	Anaheim St.	LB 40, LB 50, LB 90	LB	10	Artesia Blue Line station, Long Beach Regional Transit Mall
LB90. 7th St.	Pacific Ave., Long Beach Bl., 7th St., Bellflower Bl.	2.5	5.5	2.8	19.1	Anaheim St., Pacific Coast Highway or Long Beach Bl.	LB 40, LB 50, LB 60	LB	8	Long Beach Regional Transit Mall, Willow St. and Bellflower Bl.

Notes: [1] Non-revenue miles is typically the distance between the route and the maintenance division(s). Total wire length equals the 1-way miles plus two times the 2-way miles plus two times the non-revenue miles. Portions of certain routes share overhead contact system (OCS) segments; hence, to the extent than more than one route is implemented and the routes overlap, some of the OCS lengths will be less than the numbers shown.
[2] 32 substations are shared among routes.
[3] Layovers are listed for the full route and short lines.

Sources: ICF Kaiser, 1992; Myra L. Frank & Associates, 1992; Southern California Rapid Transit District, 1992.

Physical characteristics described in Table 2-2 include the following:

- o Major Streets. The primary streets included in the proposed ETB routes are listed in this column.

- o Proposed Length of OCS. The OCS system length includes the one-way and two-way lengths of the route where passengers would ride, as well as the non-revenue wire length, which is the distance between the route and its maintenance/storage yard.

- o New Streets Covered. These streets are those that are not part of the existing bus route but would be included on the proposed ETB route.

- o Routes Sharing Segments. The routes listed in this column would overlap along certain portions of the route.

- o Proposed Operating Division. Each bus route is assigned to an operating division maintenance facility. The operating division number is listed in this column.

- o Proposed Number of Substations. This is the total number of traction power substations proposed for the entire route.

- o Proposed Number and Location of Layover Locations. Buses may wait at layover stations in order to maintain scheduled headways. These are the layover stops proposed for the ETB routes.

2.4.4 PHASE II ROUTES

As described above, 12 of the 19 candidate bus routes under consideration for the ETB project were selected for Phase I and seven were selected for Phase II. The route selection process was based on a ranking procedure that gave the highest rank to those routes with the following characteristics:

- weekday headways of 15 minutes or less;
- high vehicle hours per route mile (selecting the routes with the highest vehicle service hours would result in the removal of the maximum number of diesel vehicle-miles from the road);
- cost-effectiveness relative to air quality benefits;
- broad geographic coverage;
- favorable scheduling and operational characteristics such as suitability for ETB conversion and potential for common wiring in Downtown Los Angeles;
- least impacts on patronage (e.g., fewer forced transfers between trolley bus and non-trolley bus services);

- proximity to an operating maintenance facility (to reduce the number of off-route miles); and

- other characteristics such as compatibility with other public works, roadway or utility improvement projects and least conflict with major events.

(For additional discussion of the ranking and selection process, see Route Selection Report, ICF Kaiser Engineers, March 3, 1992.)

The seven routes that are expected to be considered for Phase II of the ETB Project are as follows:

- o <u>Route 4</u>. Santa Monica Boulevard.
- o <u>Route 20</u>. Wilshire Boulevard.
- o <u>Route 33</u>. Venice Boulevard.
- o <u>Route 76</u>. Valley Boulevard.
- o <u>Route 92/93</u>. Los Angeles -- Glendale -- Burbank -- San Fernando.
- o <u>Route 207</u>. Western Avenue.
- o <u>Route 424</u>. Warner Center -- Ventura Boulevard.

2.4.5 IMPLEMENTATION PHASING

Conversion of the proposed 12 Phase I routes to ETB service is expected to be completed by early in the 21st century. Construction is expected to occur in three phases, typically with four routes completed in each phase. The implementation and activation schedule depends upon the funding which becomes available from local, state and federal sources.

2.4.6 PROJECT COSTS

Typically, ETB lines would replace bus lines that are currently operated with conventional motorbuses. Minor adjustments in routes may be made to accommodate special ETB requirements such as OCS configurations at layover zones, turnarounds and bus stops. No significant changes are anticipated in bus routes, revenue service hours/miles, average vehicle speed or hours of operation.

Capital cost of the system is based upon detailed estimates developed by an engineering consulting firm and experience in other cities that have built ETB and light rail systems. The cost for the project also assumes that part of the replacement vehicle cost would be borne by Federal/Local Capital Grant funds which are provided for normal periodic bus replacement. The total cost for the 12 line, Phase I project, in 1993 dollars is estimated to be about $1 billion. Ten percent of this estimate has been designated for the urban design component of the project.

Cash flow projections and cost adjustments to reflect inflation are based on the construction schedule which is subject to the availability and timing of capital funds.

Operating costs are expected to be about the same as operating the lines with conventional buses. While ETB vehicles require less maintenance than conventional buses, these reductions are offset by the additional cost of maintaining the PDS and OCS. Since the RTD farebox recovery ratio (i.e, the percent of operating costs recovered via the farebox revenues) has historically been below 40 percent, increased patronage on the ETB lines, as experienced by other cities, would require additional operating subsidy dollars.

In any major capital project, tradeoffs will be required, and the implementation of the ETB project is no exception. Sufficient funds must be made available to operate the integrated bus, trolley bus and rail system, so that the anticipated benefits can be fully realized. However, to the extent that a shortfall scenario develops, implementation of any major capital project could actually reduce the transit carrying capacity anticipated for the region. ETBs are much less capital intensive than other projects programmed for implementation, but are more expensive than internal combustion engine buses or other alternative-fueled buses.

2.5 RELATED PROJECTS

A number of other projects planned at or near the ETB routes could affect or be affected by the proposed project. These projects are primarily roadway, street lighting and other infrastructure improvements; and development of public transportation facilities.

The table in Appendix 5 lists and describes 111 related projects. This table is based in part on Capital Improvement Programs and other utility/infrastructure planning documents provided by the 20 jurisdictions, the State Department of Transportation (Caltrans) and four utility service areas through which one or more Phase I ETB routes would pass. (Appendix 5 does not include transportation system management [TSM] improvements that could improve traffic flow along the proposed ETB routes.)

The 21 jurisdictions and the routes that pass through them are:

- Alhambra: RTD Route 70
- Burbank: RTD Route S-182
- Commerce: RTD Routes 18, 66/67; Montebello Municipal Bus Lines (MBL) Route 10
- Compton: Long Beach (LB) Transit Lines 50, 60
- El Monte: RTD Route 70
- Glendale: RTD Route S-182
- Hawthorne: RTD Route 40
- Inglewood: RTD Route 40
- Lawndale: RTD Route 40
- Long Beach: LD Transit Lines 40, 50, 60, 90
- Los Angeles: RTD Routes 16, 18, 30/31, 40, 45, 66/67, 70, S-182, 204, 560; MBL Route 10
- Montebello: RTD Routes 18, 66/67; MBL Route 10
- Monterey Park: RTD Routes 30/31, 70; MBL Route 10

- Pasadena: RTD Route S-182
- Pico Rivera: MBL Route 10
- Redondo Beach: RTD Route 40
- Rosemead: RTD Route 70
- South El Monte: RTD Route 40
- Torrance: RTD Route 40
- Los Angeles County: RTD Routes 18, 30/31, 40, 45, 66/67, 70, 204; MBL Route 10; LB Transit Routes 50, 60

CHAPTER 3: IMPACTS AND MITIGATION

This chapter evaluates and describes the environmental setting, impacts and mitigation measures associated with the proposed project identified in Chapter 2.

3.1 AIR QUALITY

3.1.1 INTRODUCTION

The South Coast Air Basin (SCAB) has severe pollution problems. Efforts in the past have contributed to reduction in smog. Air pollution has dropped by 50 percent in much of Southern California over the last 10 years and the dangerous peak levels have declined by more than 25 percent. Reaching a similar level of reductions in the future would require innovations and renewal efforts.[1] Although significant reductions in air pollution have been achieved in the last decade, federal and state Clean Air Acts require even more stringent controls over air quality.

The South Coast Air Quality Management District's (SCAQMD's) 1991 Final Air Quality Management Plan (AQMP) requires that ozone, carbon monoxide and nitrogen dioxide levels to be reduced by 25 percent by the end of 1994, by 40 percent by the end of 1997 and by 50 percent by the end of the year 2000 from the base year of 1987. Adoption schedules for control measures have been prioritized in the 1991 AQMP. The "Zero Emission Urban Bus Implementation" control measure to reduce reactive organic gases (ROG), nitrogen oxides (NO_x), carbon monoxide (CO) and particulate matter (PM_{10}) is listed as priority 34 and Control Measure Number MG-1. Under the heading, "Proposed Method of Control," the AQMP states:

> "Because of its demonstrated commercial and technological feasibility, bus electrification appears to be the most likely compliance strategy. In particular, the proposed method of control is to install overhead trolley wires for power transmission to transit buses operating along major fixed routes. Services that run continuously along major arterials at intervals of 15 minutes or less would be candidates for conversion from diesel operation directly to electric operation." (Final AQMP, Appendix IV-C, "District's Mobile and Indirect Source Control Measures," South Coast Air Quality Management District, July 1991.)

The 1991 Final AQMP shows a proposed implementation date of 1994-2000 for the "Zero Emission Urban Bus Implementation" Control Measure (Table 7-3, pg. 7-18) and assumes that 30 percent of all vehicle miles traveled by urban buses in the SCAB would be electric (Table ES-2A, pg. ES-9). The proposed Phase I and II ETB Project would approximate this 30 percent assumption.

Urban-bus-related pollution consists mostly of nitrogen oxides (NO_x) and particulate matter (PM_{10}). Heavy-duty diesel vehicles such as buses, while running on rough surfaces with high friction and frequent stops, cause significant air pollution. Pedestrians walking on sidewalks and

[1] Los Angeles Times, July 21, 1992.

people at adjacent businesses are major receptors of pollution. Consistent with AQMD's control measure MG-1, the Southern California Rapid Transit District (RTD), the largest operating bus service in the SCAB, has identified 12 major routes to be converted to electric trolley bus (ETB) service in Phase I.

Two alternatives have been addressed in the following air quality study: 1) Electrification of identified routes and 2) use of an alternate fuel, i.e., methanol, on the routes. Methanol is considered to be one of the most effective fuel alternatives to diesel. Introduction of methanol technology would not result in major construction or installation activities other than some modification of maintenance facilities. Since conversion of buses to ETBs is currently under consideration, this study focuses more on emissions related to implementation of the ETB alternative.

Electric power supply for the SCAB is from two major sources: 1) Los Angeles Department of Water and Power (LADWP) and 2) Southern California Edison (SCE). These two companies are expected to be the major sources of power supply for the project. The cities of Burbank, Pasadena and Glendale would provide power for those sections of the ETB routes that pass within their respective boundaries. In the SCAB, the power supply comes from various types of plants and is also purchased from outside the SCAB. LADWP generates approximately 59 percent of its supply from coal-fired steam turbine plants; SCE uses coal-fired steam turbine plants to generate 16 percent of its demand with another 24 percent produced at nuclear power plants. The amount of power to be produced from a generating plant to meet the demand is mainly a question of economics. Production of electricity varies from plant to plant according to increases or decreases in everyday demand. For a worst case air quality analysis, this study assumes that the source of electricity would be from within the SCAB region and that power would be produced from coal-fired steam turbine plants. These assumptions are made recognizing that some of the plants are non-polluting, and that a significant amount of electricity is imported from outside the SCAB and may continue to be in the future.

3.1.2 SETTING

South Coast Air Basin

The proposed project site is located within the SCAB. The SCAB consists of the non-desert portions of Los Angeles, Riverside and San Bernardino counties and all of Orange County, covering a total area of 6,600 square miles. Los Angeles County comprises approximately 40 percent of the SCAB (2,400 square miles). The SCAB is bounded on the west by the Pacific Ocean; on the north and east by the San Gabriel, San Bernardino and San Jacinto Mountains; and on the south by the San Diego County line.

Climate

The location of Southern California at the edge of Pacific High Pressure Area makes the weather pattern very stable. It is a coastal plain with connecting broad valleys and low hills. Southern California has a Mediterranean climate characterized by warm dry summers and mild winters. On most days the net wind flow is from west to east. This produces the effect of having pollutant source areas near the coast affecting receptor areas inland to the east; and this source-receptor relationship is further compounded by population density, as the majority of industries, commerce, streets and freeways are located in the principal source areas in the western portion of the SCAB.

Temperatures in the SCAB are generally mild, increasing inland from the coast. Average annual high and low temperatures measured near the project sites were 74 and 53°F respectively, over the last 30 years of record (SCAQMD, 1980).

Most of the rainfall occurs between November and April, averaging approximately 15 inches per year over the last 40 years. Total recorded rainfall varied from 5 to 33 inches per year during this period (Los Angeles Times, July 1992).

Among the four counties of the SCAB region, Los Angeles County ambient pollution concentrations are the highest. In winter months, air quality degradation is mainly due to carbon monoxide and nitrogen dioxide emissions from mobile sources, because these pollutants remain in the air for a longer period of time than other pollutants. In summer months, air quality problems result from the formation of photochemical smog as hydrocarbons and nitrogen dioxide react under strong sunlight.

3.1.3 REGULATORY AUTHORITY

The California Air Resources Board (ARB) is the State agency responsible for coordinating both the state and federal air pollution control programs. Enforcement of standards and permitting of new stationary pollution sources within the SCAB are performed by the SCAQMD. In March 1989, SCAQMD adopted an Air Quality Management Plan (AQMP) in order to attain air quality standards established by the U.S. Environmental Protection Agency (EPA) under the provisions of the Clean Air Act (CAA). The plan is subject to approval by EPA, and it was adopted by the California Air Resources Board (ARB) later in 1989. A Final 1991 AQMP revision was adopted by the SCAQMD in July 1991. The plan is designed to bring the SCAB into compliance with federal and state air quality standards. Southern California Association of Governments (SCAG) is responsible for developing regional plans for the transportation management, growth and land use portions of AQMP. Approval of the 1991 AQMP is still pending from the ARB and EPA.

The California Clean Air Act, effective January 1, 1989, divides the non-attainment areas into three categories with stringency requirements progressing from less to more stringent: moderate, serious, and severe. The SCAB is a severe non-attainment area for ozone, carbon monoxide and nitrogen dioxide. The SCAB is nearing attainment for sulfates and has met attainment goals for lead and sulfur dioxide. The California Clean Air Act does not address PM_{10}. According to the California Clean Air Act, air quality management districts containing severe non-attainment pollutant levels are required to include specified emission reduction strategies to meet milestones in implementing emission controls in their regional air quality management plans.

The 1989 AQMP established air pollution control strategies to bring the SCAB into compliance with all federal and California air quality standards. The attainment strategy identified in the AQMP consists of three tiers:

- Tier I identifies control measures that can be adopted within the next five years through technological applications and management practices that are currently available.

- Tier II measures include the use of existing technologies, as well as future technologies that require advancements expected to occur in the near future.

- Tier III programs are designed to bring about technological breakthroughs to further reduce emissions of reactive organic gases.

As a result of the passage of the California Clean Air Act, the 1989 AQMP was required to be amended to develop new strategies for the SCAB to reach the attainment of state as well as federal air quality standards. The revised 1991 AQMP, in addition to developing strategies to achieve state standards, also reflects updated data for the SCAB and recognizes air pollutant emissions reduction achievements. The 1991 AQMP requires ozone, carbon monoxide and nitrogen dioxide levels to be reduced by 25 percent by the end of 1992; by 40 percent by the end of 1997; and by 50 percent by the end of the year 2000.

Local jurisdictions are required to conform with the 1991 AQMP by adopting an Air Quality Element as part of city General Plans. Each city Air Quality Element must contain the transportation, land use and energy conservation control measures recommended in the 1991 AQMP.

Adoption schedules for Tier I control measures have been prioritized in the 1991 AQMP. The "Zero Emission Urban Bus Implementation" control measure to reduce ROG, NO_x, CO and PM_{10}, is listed as Priority number 34 and Control Measure No. MG-1 in the 1991 Final AQMP. AQMP motor vehicle miles travelled (VMT) assumes that, by the year 2010, 30 percent of urban buses in the SCAB will be operated by electricity and 70 percent on alternate fuels (methanol, liquefied petroleum gas and natural gas).

<u>Air Quality Ambient Standards for Criteria Pollutants</u>

Federal and state legislation have established ambient air quality standards to protect public health. NAAQS stands for the National Ambient Air Quality Standards and CAAQS for the California Ambient Air Quality Standards for pollutants, as shown in Table 3.1-1. State and federal standards determine the parts per million or microns per cubic meter for air quality level violations. The state standards are generally more stringent than the corresponding federal standards.

3.1.4 MAJOR POLLUTANTS AND ASSOCIATED HEALTH EFFECTS

Both the federal and state governments have established health-based ambient air quality standards for the following six pollutants: sulfur dioxide (SO_2), lead (Pb), ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO) and fine particulates of less than 10 microns in size (PM_{10}). The SCAB currently complies with the standards for both sulfur dioxide and lead but exceeds the standards for the remaining four pollutants, as discussed previously. In addition, California has set standards for ethylene, hydrogen sulfide, sulfates, visibility and vinyl chloride. All but sulfates and visibility are controlled through permit requirements. Sulfates and visibility are addressed through control programs for the five pollutants discussed below.

TABLE 3.1-1: FEDERAL AND STATE AIR QUALITY STANDARDS

POLLUTANT	AVERAGING PERIOD	CALIFORNIA STANDARD[1]	FEDERAL STANDARD[2]	
			PRIMARY[3]	SECONDARY[4]
Ozone	1 Hour	0.09 parts per million (ppm)	0.12 ppm	Same as primary
Carbon Monoxide	1 Hour	20 ppm	35 ppm	Same as primary
	8 Hours	9.0 ppm	9.0 ppm	
Nitrogen Dioxide	1 Hour	0.25 ppm	No Standard (NS)	NS
	Annual	NS	0.053 ppm	Same as primary
Sulfur Dioxide	1 Hour	0.25 ppm	NS	NS
	3 Hours	NS	NS	1300 micrograms per cubic meter ($\mu g/m^3$)
	24 Hours	0.05 ppm	365 $\mu g/m^3$	NS
	Annual	NS	80 $\mu g/m^3$	NS
Suspended Particulates	24 Hours	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as primary
	Annual Arithmetic Mean	NS	50 $\mu g/m^3$	
	Annual Geometric Mean	30 $\mu g/m^3$	NS	NS
Lead	30 days	1.5 $\mu g/m^3$	NS	NS
	Calendar Quarter	NS	1.5 $\mu g/m^3$	Same as primary
Sulfates	24 Hours	25 $\mu g/m^3$	NS	NS
Hydrogen Sulfide	1 Hour	0.03 ppm	NS	NS
Vinyl Chloride	24 Hours	0.010 ppm	NS	NS
Visibility[5]	8 Hours	Reduce visibility below 10 miles	NS	NS

Notes:

1 California standards for ozone, carbon monoxide, sulfur dioxide (1-hour), nitrogen dioxide, suspended particulate matter and visibility are values that are not to be exceeded. The sulfur dioxide (24-hour), sulfates, lead, hydrogen sulfide and vinyl chloride standards are not to be equalled or exceeded.

2 Federal standards, other than ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

3 National Primary Standards: the levels of air quality necessary to protect the public health with an adequate margin of safety.

4 National Secondary Standards: the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

5 This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range when relative humidity is less than 70 percent.

Source: California Air Resources Board, Air Quality Data - General Summary, 1989.

- Carbon Monoxide

Carbon monoxide is formed by the incomplete combustion of fossil fuels and is produced almost entirely by automobiles. Exposure to carbon monoxide can cause dizziness and fatigue and can impair central nervous system function. The number of days exceeding the carbon monoxide standards decreased substantially by the mid-1980s; however, since that time, there has been an increase in exceedances, which is probably due to increased vehicular travel. In 1990, Los Angeles County exceeded the federal carbon monoxide standard more than any other area of the United States.

- Nitrogen Dioxide

Nitrogen dioxide and nitric oxide are formed as a result of fuel combustion under high temperature or pressure. These compounds are referred to together as nitrogen oxides or NO_x. Nitrogen dioxide contributes to pollution problems such as the concentration of ozone, the formation of fine particulate matter, poor visibility and acid deposition. It also decreases lung function and may reduce resistance to infection. By 1990, the federal standard had been exceeded in only one location in Los Angeles County, and the highest concentration was four percent greater than the federal standard. Los Angeles is the only county in the United States that does not meet the federal standard.

- Ozone

Ozone is formed by photochemical reactions between NO_x and reactive organic gases (ROG). Reactive organic gases are formed from the combustion of fuels and the evaporation of organic solvents. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in children. Ozone levels in the SCAB exceed the federal standard far more frequently than anywhere else in the country.

- PM_{10}

PM_{10} refers to suspended particles that are 10 microns or less in diameter. Nitrates and sulfates, as well as dust particles, are major components. These small particles can be directly emitted as a by-product of fuel combustion, through abrasion such as wear on tires or brake linings or through wind erosion of soil. They can also be formed in the atmosphere through chemical reactions. These particles may carry carcinogens and other toxic compounds which adhere to the particle surfaces and can enter the lungs. In 1989, state PM_{10} standards were exceeded in all areas, frequently by a wide margin. The less stringent federal PM_{10} standards were also exceeded in many areas.

- Sulfur Dioxide

The combustion of sulfur-containing fossil fuel and smelting of sulfur-bearing metal ore used in industrial processes are the two major sources of sulfur dioxide (SO_2). The primary effects of SO_2 on human bodies are aggravation of respiratory diseases such as asthma and emphysema, reduction of lung function and irritation of eyes. Sulfur dioxide contributes to reduced visibility and formation of PM_{10} when it reacts with NO_2 in the atmosphere. In addition, SO_2 also causes injury to vegetation, and reacts with and deteriorates other materials such as metals, textiles, leather, finishes and coatings.

3.1.5 SOURCES OF POLLUTION

At the present time, mobile sources account for approximately 98 percent of carbon monoxide production in the SCAB. On-road mobile sources (primarily autos and trucks) account for nearly all of this production. The remaining two percent is attributable to stationary sources. Daily production of carbon monoxide in the SCAB in 1987 was 4,987 tons.

Slightly more than one-half of the reactive organic gases produced in the SCAB come from mobile sources, and nearly all of this is attributable to on-road vehicles. The balance is produced in nearly equal amounts by residential, commercial/service industry sources and the industrial/manufacturing sector. Daily production of reactive organic gases in the SCAB in 1987 was 1,375 tons.

Mobile sources account for 76 percent of daily nitrogen oxide production in the SCAB. Of this, 72 percent is attributable to on-road vehicles. Fuel combustion accounts for 91 percent of all stationary source contributions. In 1987, 1,208 tons of nitrogen oxides were produced daily in the SCAB.

In 1987, 1,075 tons per day of PM_{10} were produced in the SCAB. Stationary sources accounted for about 94 percent of the total.

3.1.6 PROJECT AREA AIR QUALITY AND METEOROLOGICAL CONDITIONS

Current Air Quality at the Los Angeles Monitoring Station

Air quality in the SCAB is monitored by the SCAQMD. Ambient air quality for criteria air contaminants is measured by a network of SCAQMD monitoring stations located throughout the SCAB. These data detail the current air quality status and progress toward attainment of federal and state air quality standards.

The project is located throughout the SCAB. For purposes of this analysis, the centrally located monitoring station, approximately one mile northeast of the Los Angeles Central Business District (LA CBD) at 1630 North Main Street, has been selected as representative of the project area. The station monitors ozone, ROG, CO, NO_2 and PM_{10}. SCAQMD data for the last three years (1989, 1990 and 1991) are given on Table 3.1-2, describing the number of exceedances of the federal and state standards in the regional project area. The ARB's recommended guidelines on AQMP design day calculations allow the elimination of extreme concentrations; and the ARB and the SCAQMD are further reviewing the data to determine if the design values should be adjusted based on this consideration.

- Carbon Monoxide (CO). In the past three years the carbon monoxide (CO) level exceeded federal 8-hour standards twice in 1989 and once in 1990. The state 8-hour standard was exceeded for the same number of days in this period. One-hour standards were not exceeded for any day.

TABLE 3.1-2: DAYS OF EXCEEDANCES OF AIR QUALITY STANDARDS – 1989, 1990, 1991 LOS ANGELES MONITORING STATION[1]				
	(Standard or Measurement)	1989	1990	1991
CARBON MONOXIDE				
Federal:	(1 Hour)	0	0	0
	(8 Hour)	2*	1	0
State:	(1 Hour)	0*	0	0
	(8 Hour)	2*	1	0
OZONE				
Federal:	(1 Hour)	34	32	23
State:	(1 Hour)	76	70	59
NITROGEN DIOXIDE				
Federal:	(% above standard)[2]	3.3	0	0
State:	(1 Hour)	1	3	5
SULFUR DIOXIDE				
Federal:	(24 Hours)	0	0	0
State:	(24 Hours)	0	0	0
VISIBILITY				
State:	(Los Angeles International Airport)	150	154	159
SUSPENDED PARTICULATE (PM_{10})				
Federal:	(24 Hours)	0	1	1
State:	(24 Hours)	33	31	31
LEAD				
Federal:	(Quarters exceeding standard)	0	0	0
State:	(Months exceeding standard)	0	0	0
SULFATE				
State:	(No. of samples exceeding standard)	0	1	0

Notes:

1 The Los Angeles monitoring station is located at 1630 N. Main Street.
2 The federal standard is an annual arithmetic mean value greater than 0.053 parts per million.
* There are less than 12 full months of data available for this pollutant and these figures may not be representative.

Source: SCAQMD - Air Quality Data Sheets, 1989-1991.

- Ozone (O_3). In 1989, 1-hour ozone concentration exceeded the state standard on 76 days. In 1991 the standard was exceeded on 59 days. The federal standard was exceeded for 34, 32 and 23 days respectively in 1989, 1990 and 1991.

- Nitrogen Dioxide (NO_2). The maximum 1-hour nitrogen dioxide concentration exceeded the state standard for 5 days in 1991, 3 days in 1990 and one day in 1989.

- Sulfur Dioxide (SO_2). Sulfur Dioxide standards (both federal and state) were not exceeded during the 1989 to 1991 period.

- Suspended Particulate (PM_{10}). The PM_{10} state standard was exceeded for 33 days in 1989, and 31 days in 1990 and 31 days in 1991. The federal standard was exceeded one day in 1990 and one day in 1991.

- Lead (Pb). Neither federal nor state standards were exceeded for lead in the past three years.

- Sulfate. The state standard was exceeded on one day in the past three years.

3.1.7 IMPACTS

3.1.7.1 Introduction

This section discusses air quality impacts associated with the operation of the proposed project. (For a discussion of air quality impacts associated with the project's construction, see section 3.16.2.) Operation of the proposed project would affect air quality by 1) reducing tailpipe emissions from transit buses and 2) generating emissions from electric power plants serving the project. The project's air quality effects on localized and regional levels are described below, followed by a discussion of conformance with SCAG's carbon monoxide guidelines for transportation projects.

3.1.7.2 Localized Air Quality Impacts (Near Routes and Maintenace Yards)

Localized air quality impacts of a project are generally assessed in terms of criteria pollutant emissions within a quarter of a mile of the project site and in terms of its effects on carbon monoxide concentrations, also known as "hot spots." The ETB project would reduce localized air quality impacts by eliminating tailpipe emissions of ROG, CO, NO_x, PM_{10} and SO_x from about 30 percent of Los Angeles County's transit bus fleet. Localized emissions from ETBs would be lower than 1) existing emissions, 2) emissions in 2010 with continued use of diesel buses and 3) emissions in 2010 if methanol is used instead of diesel.

These benefits to localized air quality conditions would be experienced at locations along and near the proposed routes and near the ETB maintenance and storage yards. Unlike diesel buses (which are moved within the maintenance and storage yards for fueling, washing and maintenance and which go through a start and warm-up period each morning thus creating air emissions for neighboring properties), ETBs would produce no "tail-pipe" emissions at the yards.

3.1.7.3 Regional Air Quality Impacts

The impact of the ETB project on regional air quality is assessed in terms of the overall criteria pollutant emission increases from electric power plants and emission reductions from the use of ETBs. Emission reductions are estimated for each route and for each of the following conditions: 1) existing conditions, 2) the future (2010) without the project, 3) the future with the methanol alternative and 4) the future (2010) with the project. Cumulative emissions, including emissions from buses along all routes in addition to emissions from electric power plants serving the project, are then totalled and compared with SCAQMD criteria.

Regional Emissions

Estimated total vehicle miles traveled (VMT) for Phase I ETBs, shown on Table 3.1.3, are 49,942 miles per day including non-revenue and deadhead miles. No changes for existing VMTs along the 12 proposed routes are assumed for either the ETB or methanol alternative. VMT estimates by route were obtained from RTD, Montebello Bus Lines and Long Beach Transit companies. VMT for Study Route 182 (also known as Tri-Cities route) was estimated based on projected number of buses in operation during peak and base hours. Table 3.1-3 lists the estimated VMT for each route.

Two types of ETBs, 40-foot standard and 60-foot articulated, are available and in operation in other North American cities. No criteria have been set for the ETB fleet mix by any of the transit companies. Articulated trolley buses carry more passengers than 40-foot trollies but they consume more electricity. It is estimated that standard ETBs consume about 3.0 kilowatt hours per mile (kWh/mile) and articulated ETBs consume about 4.5 kWh/mile at an average speed of about 10 miles per hour (mph). For the purpose of presenting a worst case air quality analysis, all the trolley buses were assumed to be articulated trolley buses with estimated total electric consumption of 250 Megawatt hours (MWhr) per day. This assumption is expected to compensate, more or less, for any future changes in the number of ETBs, the expected ETB fleet mix or the VMT.

TABLE 3.1-3: ESTIMATED ETB DAILY VEHICLE MILES TRAVELED

ETB PHASE I ROUTE NUMBERS	VEHICLE[1] MILES TRAVELED (VMT) PER DAY
RTD ROUTE 16	2,572
RTD ROUTE 18	3,698
RTD ROUTE 30/31	4,818
RTD ROUTE 40	6,920
RTD ROUTE 45	4,879
RTD ROUTE 66/67	3,693
RTD ROUTE 70	3,385
RTD ROUTE 204	5,739
RTD ROUTE 560	4,064
STUDY ROUTE 182	2,517
MONTEBELLO ROUTE 10	1,070
LONG BEACH ROUTE 40	967
LONG BEACH ROUTE 50	1,795
LONG BEACH ROUTE 60	2,412
LONG BEACH ROUTE 90	1,413
TOTAL	**49,942**

Note: [1] Includes deadhead miles.

Source: Southern California Rapid transit District, Montebello Bus Lines and Long Beach Transit.

Criteria Pollutant Emissions

Table 3.1-4 shows, for each proposed line, emissions from diesel buses (1992 and 2010), ETBs (2010) and methanol buses (2010). The ETB alternative includes emissions from power plants supplying energy for operation. Emission factors for diesel engine buses and electric power plants were obtained from SCAQMD's Draft California Environmental Quality Act (CEQA) Air Quality Analysis Handbook, 1992. Methanol fuel-related emission factors were obtained from Detroit Diesel Corporation, Certification Data, 1992. Cumulative regional emissions of criteria pollutants for each of the options considered and for existing conditions are shown in Table 3.1-5. As shown in the table, electrification of diesel-fueled buses would significantly reduce regional emissions of carbon monoxide, nitrogen oxides, particulates and reactive organic gases, but would increase sulfur oxide emissions.

TABLE 3.1-4: CRITERIA POLLUTANTS EMISSIONS BY ROUTES

PROPOSED ROUTES	VEHICLE MILES TRAVELED (VMT)[a]	ROG/HC[b]	CO	NOx	SOx	PM_{10}
		(Pounds per Day)				
RTD ROUTE 16						
Existing (Diesel, 1992)[c]	2,572	18.02	77.50	114.44	0.34	29.01
Future (Diesel, 2010)[c]		18.64	81.98	97.95	0.28	15.58
Electrification (2010)[c]		0.12	2.31	13.31	1.39	0.46
Methanol (2010)[d]		1.85	34.67	41.15	-	0.61
RTD ROUTE 18						
Existing (Diesel, 1992)	3,698	25.90	111.43	164.54	0.49	41.70
Future (Diesel, 2010)		26.80	117.86	140.83	0.41	22.40
Electrification (2010)		0.17	3.33	19.14	2.00	0.67
Methanol (2010)		2.66	49.84	59.16	-	0.88
RTD ROUTE 30/31						
Existing (Diesel, 1992)	4,818	33.75	145.18	214.37	0.64	54.34
Future (Diesel, 2010)		34.91	153.56	183.49	0.53	29.18
Electrification (2010)		0.22	4.34	24.93	2.60	0.87
Methanol (2010)		3.46	64.94	77.08	-	1.15
RTD ROUTE 40						
Existing (Diesel, 1992)	6,920	48.47	208.51	307.89	0.91	78.04
Future (Diesel, 2010)		50.15	220.56	263.54	0.76	41.92
Electrification (2010)		0.31	6.23	35.81	3.74	1.25
Methanol (2010)		4.98	93.28	110.72	-	1.66
RTD ROUTE 45						
Existing (Diesel, 1992)	4,879	34.17	147.01	217.08	0.64	55.02
Future (Diesel, 2010)		35.36	155.50	185.81	0.54	29.55
Electrification (2010)		0.22	4.39	25.25	2.63	0.88
Methanol (2010)		3.51	65.76	78.06	-	1.17
RTD ROUTE 66/67						
Existing (Diesel, 1992)	3,693	25.87	111.28	164.31	0.49	41.65
Future (Diesel, 2010)		26.76	117.70	140.64	0.41	22.37
Electrification (2010)		0.17	3.32	19.11	1.99	0.66
Methanol (2010)		2.65	49.78	59.08	-	0.88
RTD ROUTE 70						
Existing (Diesel, 1992)	3,385	23.71	102.00	150.61	0.45	38.17
Future (Diesel, 2010)		24.53	107.89	128.91	0.37	20.50
Electrification (2010)		0.15	3.05	17.52	1.83	0.61
Methanol (2010)		2.43	45.62	54.16	-	0.81
RTD ROUTE 204						
Existing (Diesel, 1992)	5,739	40.20	172.93	255.35	0.76	64.72
Future (Diesel, 2010)		41.59	182.91	218.56	0.63	34.76
Electrification (2010)		0.26	5.17	29.70	3.10	1.03
Methanol (2010)		4.13	77.36	91.82	-	1.37
RTD ROUTE 560						
Existing (Diesel, 1992)	4,064	28.47	122.46	180.82	0.54	45.83
Future (Diesel, 2010)		29.45	129.53	154.77	0.45	24.62
Electrification (2010)		0.18	3.66	21.03	2.19	0.73
Methanol (2010)		2.92	54.78	65.02	-	0.97

Contd..

TABLE 3.1-4: CRITERIA POLLUTANTS EMISSIONS BY ROUTES

PROPOSED ROUTES	VEHICLE MILES TRAVELED (VMT)[a]	ROG/HC[b]	CO	NOx	SOx	PM_{10}
		(Pounds per Day)				
STUDY ROUTE 182						
Existing (Diesel, 1992)	2,517	17.63	75.84	111.99	0.33	28.39
Future (Diesel, 2010)		18.24	80.22	95.86	0.28	15.25
Electrification (2010)		0.11	2.27	13.03	1.36	0.45
Methanol (2010)		1.81	33.92	40.27	-	0.60
MONTEBELLO ROUTE 10						
Existing (Diesel, 1992)	1,070	7.49	32.24	47.61	0.14	12.07
Future (Diesel, 2010)		7.75	34.10	40.75	0.12	6.48
Electrification (2010)		0.05	0.96	5.54	0.58	0.19
Methanol (2010)		0.77	14.42	17.12	-	0.25
LONG BEACH ROUTE 40						
Existing (Diesel, 1992)	967	6.77	29.14	43.03	0.13	10.91
Future (Diesel, 2010)		7.01	30.82	36.83	0.11	5.86
Electrification (2010)		0.04	0.87	5.00	0.52	0.17
Methanol (2010)		0.69	13.03	15.47	-	0.23
LONG BEACH ROUTE 50						
Existing (Diesel, 1992)	1795	12.57	54.09	79.87	0.24	20.24
Future (Diesel, 2010)		13.01	57.21	68.36	0.20	10.67
Electrification (2010)		0.08	1.62	9.29	0.97	0.32
Methanol (2010)		1.29	24.19	28.72	-	0.43
LONG BEACH ROUTE 60						
Existing (Diesel, 1992)	2412	16.89	72.68	107.32	0.32	27.20
Future (Diesel, 2010)		17.48	76.88	91.86	0.27	14.61
Electrification (2010)		0.11	2.17	12.48	1.30	0.43
Methanol (2010)		1.73	32.51	38.59	-	0.57
LONG BEACH ROUTE 90						
Existing (Diesel, 1992)	1413	9.90	42.58	62.87	0.19	15.94
Future (Diesel, 2010)		10.24	45.04	53.61	0.16	6.56
Electrification (2010)		0.08	1.27	7.31	0.76	0.25
Methanol (2010)		1.01	19.04	22.60	-	0.33
TOTAL						
Existing (Diesel, 1992)	49,942	349.81	1,504.86	2,222.09	6.60	563.22
Future (Diesel, 2010)		361.91	1,591.76	1,901.98	5.50	302.51
Electrification (2010)		2.25	44.95	258.45	26.97	8.99
Methanol (2010)		35.95	673.21	799.07	-	11.98

Notes:
[a] VMT are assumed to be the same for existing and future conditions.
[b] HC = hydrocarbons. ROG are listed for diesel and electrification; HC are listed for methanol. Both contribute to photochemical reactions.
[c] Emission factors were obtained from SCAQMD Draft CEQA Air Quality Analysis Handbook, May 1992.
[d] Emission factors for methanol were obtained from Detroit Diesel Corporation, Certification Data, 1992.

Source: Myra L. Frank Associates, 1992.

Table 3.1-5: Cumulative Regional Emissions (Pounds per Day)

ALTERNATIVE	CRITERIA POLLUTANTS				
	ROG/HC*	CO	NOx	PM_{10}	SOx
1. Existing from Diesel (Year 1992)	350	1,505	2,222	563	7
2. Future w/o Electrification (Year 2010)	362	1,592	1,902	302	6
3. Future with Electrification (Year 2010)	2	45	259	9	27
4. Methanol (with converter, Year 2010)	36	673	799	12	-
Net Difference between Future w/o Project and Future with Project (2 minus 3)	360	1,547	1,643	293	-21
Net Difference between Future w/o Project and Methanol (2 minus 4)	326	919	1,103	290	6
Net Reduction between Existing and Future with Project (1 minus 3)	**348**	**1,460**	**1,963**	**554**	**-20**
Percent Reduction	99%	97%	83%	98%	-285%
Net Reduction between Existing and Methanol (1 minus 4)	**314**	**832**	**1,423**	**551**	**7**
Percent Reduction	90%	55%	64%	98%	100%
SCAQMD Threshold Criteria	75	550	100	150	150
Exceeds Criteria - - Future with Electrification	NO	NO	YES	NO	NO
Exceeds Criteria - - Methanol	NO	YES	YES	NO	NO

Notes: * HC = hydrocarbons. ROG are listed for diesel and electrification; HC are listed for methanol. Both contribute to photochemical reactions.

Source: Myra L. Frank & Associates, Inc., 1992.

The methanol alternative would reduce emissions of all criteria pollutants assessed. However, the reductions in ROG, CO and NO_x that would be achieved by electrification are greater than those that would be achieved with methanol.

Although the proposed project and the methanol alternative would reduce NO_x, the resulting emissions with both alternatives would exceed the SCAQMD criteria. Carbon monoxide emissions resulting after reductions achieved by the methanol alternative would also exceed SCAQMD criteria.

In the future without electrification, some reductions in CO, NO_x, PM_{10} and SO_x would be achieved due to mandated fuel efficiency standards for diesel buses. However, even with these reductions, ROG, CO, NO_x and PM_{10} levels would exceed SCAQMD thresholds.

3.1.7.4 Carbon Monoxide Conformity

SCAG's Draft CO Conformity Guideline states that a transportation project conforms if: (1) it is included in a Regional Transportation Plan and included in a conforming Transportation Improvement Program and (2) it can reasonably be demonstrated that the project, when taken as a whole, will reduce or eliminate the number and severity of violations of the federal carbon monoxide standards in the area substantially affected by the project. An interpretation of the CO conformity guideline requirements as they relate to the proposed project is presented below:

- For areas in which there would be no carbon monoxide violations in the "no-build" scenario, the project conforms only if there will be no violations in the "build" scenario.

- For areas in which there would be carbon monoxide violations in the "no-build" scenario, the project conforms if the "build" scenario shows a reduction in the number and severity of CO violations in the area substantially affected by the project.

The "area substantially affected by the project" includes both: (a) the vicinity of the project including locations with project receptors which could be affected by carbon monoxide emissions coming from vehicles and (b) other affected streets and arterials on which traffic could be expected to change significantly as a result of the proposed project.

As previously discussed, the ETB project is an emission reduction project with projected significant reductions in regional CO, NO_x, PM_{10} and ROG emissions from current levels. The project's implementation would almost eliminate emissions of criteria pollutants generated from existing diesel-fueled buses. By criterion 2, because the ETB project reduces carbon monoxide emissions in the area affected by the project, it conforms to the requirements of the federal Clean Air Act. By the same logic, the methanol alternative would conform with the Clean Air Act.

3.1.8 MITIGATION MEASURES

Because of the nature of the proposed project and its projected beneficial effect on air quality, the ETB project itself can be considered a mitigation measure. In addition, public education programs regarding the importance of reducing vehicle miles traveled and the related air quality impacts should be employed. The community should be encouraged to use public transportation such as ETBs.

3.2 NOISE

3.2.1 ENVIRONMENTAL SETTING

This section includes definitions of acoustical terms used to describe and characterize noise, the methodology used to survey and document existing noise levels in the project area and the noise survey results.

3.2.1.1 Definitions of Acoustical Terms

A-weighted sound level (dBA): Community noise is almost always characterized in terms of the A-weighted sound level. A-weighting was designed to approximate the frequency response of human ears to sound.

Maximum sound level (L_{max}): L_{max} represents the maximum sound level caused by an event. In this report it is used to characterize the maximum noise level that occurs when diesel or electric buses pass by.

Energy Equivalent Sound Level (L_{eq}): L_{eq} is a measure of total acoustical energy over a period of time (such as one hour). Conceptually, L_{eq} may be thought of as the constant sound level over the period of interest that would contain as much sound energy as the actual time-varying sound level. L_{eq} has been found to be a fairly good measure of how humans will perceive varying sounds.

Sound Exposure Level (SEL): The SEL is the sum of changing noise levels for the duration of an event and is used as a measure of the acoustic energy caused by a noise event such as a bus passby. In addition, in noise environments dominated by identifiable single events (such as bus passbys or aircraft overflights), the SEL may be used as a "building block" to calculate the L_{eq} for a given period.

Community Noise Equivalent Level (CNEL): CNEL is a measure of total acoustic energy over a 24-hour period with weighting to account for people being more sensitive to noise in the evening and nighttime hours. The adjustment is such that one event during the evening hours is equivalent to 3 daytime events and one event during the nighttime hours is equivalent to 10 daytime events. Evening is defined as 7:00 PM to 10:00 PM and nighttime is defined as 10:00 PM to 7:00 AM.

Day Night Equivalent Level (L_{dn}): L_{dn} is the same as CNEL except that it does not include an adjustment for evening noise. Most California regulations require CNEL to be used to characterize community noise; L_{dn} is used in most other parts of the country. There is rarely more than a one-half dB difference between L_{dn} and CNEL.

Exceedance Levels (L_{nn}): An exceedance level is the sound level exceeded a percentage of the time. Typical exceedance levels used to characterize community noise include L_1, L_{10}, L_{50}, L_{90} and L_{99}, representing sound levels exceeded 1%, 10%, 50%, 90% and 99% of the time. L_1 is often used to characterize typical maximum levels and L_{90} and L_{99} are often used to characterize residual background noise.

3.2.1.2 Survey of Existing Noise

A noise survey of existing noise levels in the ETB project area was performed during the week of June 29 to July 3, 1992 and on September 22 and September 23, 1992. Because of the extensive size of the project area, it would have been impractical to perform noise measurements at every noise-sensitive site likely to be affected by the project. Instead, measurements were made at a smaller number of locations chosen as representative of the different types of noise-sensitive sites that are present throughout the project area. The measurement sites were selected to characterize existing conditions at or near the following types of noise-sensitive locations:

- low, medium, and high-density residential housing,
- schools,
- churches and
- recreational areas such as parks.

In addition to the specific type of land use, various other criteria were considered in selecting the measurement locations. Among these were:

- proximity to bus routes,
- proximity to proposed ETB substation sites,
- volume of traffic (other than buses),
- geographical diversity throughout the project area and
- terrain features (such as steep grades) that might affect bus noise emission levels.

Based upon these criteria, six sites that were judged to be representative of many other similar locations throughout the project area were selected for long-term measurements of 24 hours or greater duration. Portable noise monitors were used at each of the long-term sites to collect noise data including CNEL, hourly L_{eq} and statistical descriptors (L_x), and information on individual bus passbys (SEL and L_{max}). These monitors were programmed to run continuously and collected uninterrupted data for at least 24 hours at each long-term site. Some of the selected measurement sites were identified as being representative of more than one type of noise-sensitive land use.

Provided below are descriptions of each of the measurement sites. A summary of this information is provided in Table 3.2-1.

Site 1 was located at 4112 Mercury Avenue in the Highland Park District of Los Angeles. Continuous measurements were made at this site for twenty-four hours starting at 4:00 PM on June 29, 1992. In addition, tape recordings were made at this site between 4:00 PM and 5:00 PM on June 30. This site, at a mid-block location on the south side of the street, was selected to be representative of a quiet, low-density residential area with a majority of the single-family homes; there is no commercial land use in the immediate area. The site was also chosen to characterize the existing noise level in the vicinity of a proposed substation site in a vacant lot approximately 50 yards east of the measurement site (short-term measurements were conducted at Site 8, the proposed substation location).

Table 3.2-1: Summary of Noise Monitoring Sites

SITE/DESCRIPTION	MEAS. TYPE	REPRESENTS	EXISTING BUS ACTIVITY	BUS SPEED (mph)
1. 4112 Mercury Avenue (Highland Park), front yard of single-family home	24-hour and tape recording	quiet street, low-density residential, near substation site	mid-block, steep grade	20 - 30
2. 3044 Whittier Boulevard (Boyle Heights), front yard of multi-family home, across street from school	24-hour and tape recording	busy street, mid- to high-density residential, near school	mid-block, moderate grade	25 - 35
3. 2017 Martin Luther King Jr. Boulevard (South-Central), front yard of two-family house, adjacent to church	24-hour	busy street, medium-density residential, church	mid-block	30 - 35
4. 204 Rowan Avenue (East Los Angeles), front yard of multi-family home	24-hour and tape recording	narrow but fairly busy street, medium-density residential	adjacent to 4-way stop sign and bus stop	0 - 10
5. 5127 Via Veranda (Long Beach), back yard of multi-family home abutting Atlantic Boulevard	24-hour	low- to medium-density residential adjacent to busy street, near substation site	mid-block	30 - 35
6. 4530 Long Beach Boulevard (Long Beach), front yard of single-family home set back from Long Beach Boulevard	24-hour	low-density residential set back from busy street	mid-block, moderate grade	30 - 40
7. Scherer Park, Long Beach Boulevard (long Beach)	tape recording	park near busy street	mid-block	30 - 40
8. Mercury Avenue, sub-station site	tape recording	vacant lot in low-density residential area on quiet street	mid-block, steep grade	20 - 30
9. RTD Division 2, southeast corner	24-hour	busy street in industrial/ commercial area near residential hotel	bus refueling, washing and maintenance	
10. RTD Division 2, southwest corner	24-hour	side street in industrial/ commercial area near residential hotel	bus refueling, washing and maintenance	

Source: Harris Miller Miller & Hanson, Inc., 1992.

Mercury Avenue is a fairly narrow street (one travel and one parking lane in each direction) with many homes set back only a short distance from the street. The noise monitor at this site was positioned in the front yard of a home the same distance from the street as the facade of the house, approximately 17 feet from the curb. RTD Route 45, which presently uses Mercury Avenue, is proposed for conversion to ETB service. Service on this route currently exists on a 24-hour basis, with frequency peaking at approximately six buses per hour in each direction (twelve passbys) from approximately 5:00 PM to 8:00 PM and declining to fewer than one bus per hour between about 2:00 AM and 5:00 AM.

Site 2 was located at 3044 Whittier Boulevard in the Boyle Heights District of Los Angeles. This site was selected to be representative of medium-to-high density housing along a major street. The area is comprised mainly of multi-family homes with some low-rise apartment buildings. In addition, a school is located across the street from the measurement site and experiences similar noise exposure. Continuous measurements were conducted at this site beginning at 6:00 PM on June 29, 1992. In addition, tape recordings were conducted at this site from approximately 2:00 PM to 3:00 PM on June 30.

Whittier Boulevard in this area is a wide, busy street with two travel lanes and a parking lane in each direction. The noise monitor was located in the front yard of a home approximately 20 feet from the near curb. The measurement site, on the south side of Whittier Boulevard, was directly opposite Albertine Street. The school is located at the northwest corner of Whittier Boulevard and Albertine Street. RTD Route 18 currently serves this portion of Whittier Boulevard and is proposed for conversion to ETBs. As many as fourteen buses per hour pass this site in one direction during peak hours. Service declines to one bus per hour between approximately 10:00 PM and 5:00 AM.

Site 3 was located at 2017 Martin Luther King Jr. Boulevard near the Leimert Park area of Los Angeles. Continuous measurements were made at this site starting at 7:00 PM on June 30, 1992. The site was located on the front lawn of a two-family house on the north side of the boulevard between Van Ness Avenue and Wilton Place. This location was chosen as representative of medium-density housing on a major street. In addition, the site was located adjacent to the Pleasant Hill Baptist Church.

Martin Luther King Jr. Boulevard has two travel lanes and a parking lane in each direction. The noise monitor was located in the front yard of a house and set back the same distance from the curb (approximately 28 feet) as the facade of the church. RTD Route 40 passes this location; this bus line is proposed for conversion to ETBs. Frequency of service on this route is fairly constant during weekdays, at 5 to 6 buses per hour in each direction. Service declines to one bus per hour in each direction between approximately 12:00 AM and 5:00 AM.

Site 4 was located at 204 Rowan Avenue between Michigan Avenue and Brooklyn Avenue in East Los Angeles. Continuous measurements were made at this site for twenty-four hours starting at 8:00 PM on June 30, 1992. In addition, tape recordings were made at this site between approximately 5:30 PM and 6:30 PM on July 1. This site was selected to represent medium-density housing with a bus route on a small street. The area is characterized by single- and double-family homes with sometimes one home located behind another on the same lot. The noise monitor at this site was located 34 feet from the curb, approximately the same distance as the set-back of many of the homes on this block.

Rowan Avenue is a fairly narrow street with one travel lane and a narrow parking lane in each direction. Traffic speeds are low due to short blocks with frequent stop signs. Despite low speeds, traffic noise (particularly from accelerating traffic) dominated the background noise at this site which is one house north of Michigan Avenue on the east side of Rowan Avenue. Because of stop signs at Michigan Avenue, all southbound buses passing this site braked to a stop almost directly in front of the house and brake squeal was often clearly audible. All northbound buses were accelerating away from the stop sign as they passed the house. Rowan Avenue is currently served by RTD Route 30; this route has been proposed for conversion to ETBs. Peak service reaches a frequency of five to six buses per hour in each direction and declines to one bus per hour between about 11:00 PM and 5:00 AM.

Site 5 was located at 5127 Via Veranda in Long Beach. Continuous measurements were made at this site from 9:00 PM on July 1, 1992 until 11:00 AM on July 3. The noise monitor was located at the rear property line of the lot, adjacent to the east side of Atlantic Boulevard, 60 feet from the curb. Two residences were located on this lot with the rearmost of the two abutting the back property line near the measurement site. This residential site is located one lot south of the proposed substation site at the southeast corner of 52nd Street and Atlantic Boulevard. Although Via Veranda is a small residential street, all of the properties along this block abut Atlantic Boulevard along the rear. Atlantic Boulevard is a wide, busy street (2 travel lanes and a parking lane in each direction) with heavy automobile and truck traffic. Currently this section of Atlantic Boulevard is served by Long Beach Transit Routes 61 and 62 and RTD Route 260. Long Beach Transit buses are scheduled for service near this site between approximately 5:30 AM and 1:00 AM. The level of service fluctuates from about four to seven buses each hour in each direction.

Site 6 was located at 4530 Long Beach Boulevard. Continuous measurements were made at this site from 10:00 PM on July 1, 1992 to 10:00 AM on July 3. Long Beach Boulevard in this area consists of two travel lanes and a parking lane in each direction. In addition, there is a frontage road carrying only limited local traffic, separated from the main road on the east side by an embankment approximately 20 feet wide and 10 feet high. All of the homes in this area are located on the east side of the frontage road, facing Long Beach Boulevard. The noise monitor was positioned in the front yard of a home 70 feet from the curb of Long Beach Boulevard. Long Beach Transit Routes 51 and 52 and RTD Route 60 serve Long Beach Boulevard in this area. Long Beach Transit buses are scheduled between about 5:00 AM and 12:00 AM with peak service of four buses per hour in each direction. The Virginia Country Club is located directly across Long Beach Boulevard from this site. Short-term Site 7 was located one block north of this site.

Site 7 was located at Scherer Park on Long Beach Boulevard north of 46th Street, about one block north of Site 6. Tape recordings were made at this site between 1:00 PM and 2:00 PM on July 2, 1992. The measurement location was 50 feet from the curb on the east side of Long Beach Boulevard.

Site 8 was located at the proposed substation site on Mercury Avenue three lots to the east of Site 1. Tape recordings were made at this location between approximately 5:00 PM and 6:15 PM on July 2, 1992. The measurement location was 25 feet from the curb on the south side of Mercury Avenue.

Site 9 was located near the southeast corner of the existing RTD Division 1 maintenance yard, approximately 50 feet from the bus driveway onto Alameda Street, near the intersection of Industrial Street. This maintenance yard is proposed to be expanded to include land across Industrial Street now occupied by a truck maintenance facility and parking area. The measurement site was selected to characterize the existing noise exposure in the vicinity of a residential hotel located on Seventh Street that would border the expanded facility. The noise monitor was set up just inside the wall enclosing the maintenance yard with the microphone extending above the top of the wall. Continuous measurements were made between 5:00 PM on September 22, 1992 and 5:00 PM on September 23.

Site 10 was also at the RTD Division 1 maintenance yard. The noise monitor was positioned just inside the maintenance yard boundary near the southwest corner, on Industrial Street near Central Avenue. As with site 9, this site was selected to characterize noise exposure in the vicinity of the residential hotel near the proposed maintenance facility expansion. Continuous measurements were made between 5:00 PM on September 22, 1992 and 5:00 PM on September 23.

Table 3.2-2 summarizes the results of the noise survey. More detailed results are given in Appendix C of <u>Electric Trolley Bus Noise Impact Assessment</u>, Harris Miller Miller & Hanson, Inc., October, 1992.

As shown in Table 3.2-2, existing bus traffic is not a major contributor to CNEL at any of the measurement sites. The overall CNEL is typically 10 dBA greater than the CNEL caused by the buses. This means that at all of the measurement locations, removing all of the bus traffic would make less than a 1 dBA difference in CNEL.

The average nighttime (10:00 PM to 7:00 AM) L_{90} values are representative of residual background levels along the bus routes. The lowest community sound levels normally occur during the early morning hours when human activities are at the lowest point. The background is the sound that is still there when all local noise sources are quietest. It is usually caused by traffic on distant roads or freeways, mechanical equipment such as air conditioners that run continuously and normal human activities.

The average nighttime L_{90} values in Table 3.2-2 show that in relatively quiet residential areas, as represented by Site 1, the background noise is less than 40 dBA; whereas on a busier street, such as at Site 2, the average nighttime L_{90} is approximately 20 dBA higher at 59 dBA.

3.2.2 ENVIRONMENTAL IMPACTS

This section includes the criteria used to assess noise impacts; a description of the major noise sources resulting from the project including bus noise, substation noise and maintenance facility noise; and an assessment of the potential impacts generated by these noise sources.

3.2.2.1 <u>Noise Impact Criteria</u>

The noise impact criteria used for this project are based on the present Federal Transit Administration (FTA) noise impact criteria. The criteria, which are summarized in Table 3.2-3, are based on the amount that the transportation project changes the overall community noise

Table 3.2-2: Summary of Noise Survey Results

SITE	MEASUREMENT TYPE	MEASUREMENT RESULTS				COMMENTS
		MEAS. CNEL (dBA)	EST. BUS CNEL (dBA)	AVG. NIGHT L_{90} (dBA)	EST. BUS SEL (dBA)	
1. Mercury Avenue	24-Hour and Tape Record.	67	57	38	Near side: 81 Far side: 74	Near side is uphill; far side is downhill
2. Whittier Blvd	24-Hour and Tape Record.	74	61	59	Near side: 79 Far side: 76	Near side is downhill; far side is uphill
3. MLK Jr. Blvd	24-Hour	73	–[1]	44		
4. Rowan Ave.	24-Hour and Tape Record.	68	57	42	Near side: 77 Far side: 73	Near side is accelerating; far side is decelerating
5. Via Veranda	24-Hour	68	–[1]	43		
6. Long Beach Blvd.	24-Hour	65	–[1]	47		
7. Long Beach Blvd.(Scherer Park)	Tape Record.	65[2]	54	47[2]	Near side: 79 Far side: 79	Near side is downhill; far side is uphill
8. Mercury Ave. (sub-station site)	Tape Record.	67[3]	60	38[3]	Near side: 82 far side: 78	Near side is uphill; far side is downhill
9. RTD Maintenance yard southeast corner	24-hour	79		65		Alameda street near Industrial Rd.
10. RTD Maintenance yard southwest corner	24-hour	76		60		Industrial Road near Central Ave.

Notes:
[1] No tape recordings made of buses; existing bus noise makes insignificant contribution to overall CNEL at these sites due to high traffic volumes.
[2] No 24-hour measurement at Site 7. Noise exposure at Site 7 is similar to Site 6.
[3] No 24-hour measurement at Site 8. Noise exposure at Site 8 is similar to Site 1.

Source: Harris Miller Miller & Hanson, Inc., 1992.

environment, where the noise environment is characterized by an L_{eq}-type metric. For this project, Community Noise Equivalent Level (CNEL) was used to characterize overall community noise. CNEL is a representation of the total noise energy over a 24-hour period, with noise during the nighttime and evening hours given a weighting that accounts for people being more sensitive to noise during these periods. The weighting is such that noise from one bus during the nighttime hours (10:00 PM to 7:00 AM) is considered equivalent to ten buses during the daytime hours (7:00 AM to 7:00 PM). One bus during the evening hours (7:00 PM to 10:00 PM) is considered equivalent to three daytime buses.

Table 3.2-3: Federal Transit Administration Noise Impact Criteria

IMPACT CATEGORY	CONDITIONS	
Generally Not Significant	1.	No noise-sensitive sites in project area.
	2.	Increase of 3 dBA or less at noise sensitive sites and project does not result in violations of noise ordinances or standards.
Possibly Significant	Increases in noise levels no greater than 5 dBA.	
Generally Significant	1.	Project would cause noise standards or ordinances to be exceeded.
	2.	Project would cause 6 to 10 dBA increase in noise levels in built-up areas.
	3.	Project would cause increase in noise levels of 10 dBA or more.

Source: Harris Miller Miller & Hanson, Inc., 1992.

Referring to Table 3.2-3, it can be seen that according to the FTA criteria, community noise levels must change by at least 3 dBA before the impact is considered to be *possibly significant*. When the change is greater than 5 dBA, the impact is considered to be *generally significant*. These definitions have been used for both the noise from ETBs and noise from substations.

The FTA noise impact criteria given in Table 3.2-3 are designed for projects that will increase overall community noise levels. This project is somewhat unique since, with the exception of the immediate vicinity of the substations, community noise levels would decrease rather than increase. The interpretation of the FTA criteria for this project is that a minimum 3 dBA decrease in CNEL is required before the project is considered to have significantly improved community noise levels.

The change in CNEL is an appropriate measure of the positive and negative noise impacts of diesel and electric bus operations. However, CNEL may not give a complete picture of the potential annoyance caused by substation noise which is a continuous rather than intermittent noise. Two additional measures are used to help evaluate potential annoyance from substation noise:

1. Noise impact is considered to occur if the substation noise will increase L_{90} during the nighttime hours by 10 dBA or more.

2. Exceeding the noise limits for continuous noise from ancillary equipment included in the Los Angeles County Transportation Commission (LACTC) Performance Criteria is considered to constitute noise impact. The limits are 45 dBA for low- and medium-density residential areas and 50 dBA for high-density residential areas.

3.2.2.2 Bus Noise Impacts

The results of the noise survey were used to characterize the average noise emission characteristics of the existing diesel bus fleet in Los Angeles. One of the factors that is evident from the data and observations of bus operations is that large variations exist in the measured noise levels. Some of the noise level variation is due to differences in individual buses; however, most of the variation appears to be due to variations in the engine load. A bus cruising past with minimum engine power can be much quieter than a bus passing at the same speed under maximum acceleration. Another factor evident from the data is that SEL is not strongly dependent on speed. Even at bus stops, the SEL is approximately the same as for buses cruising past. This is because the extra noise from buses accelerating away from a bus stop creates about the same sound energy as a cruising bus.

One factor that did make a consistent difference in the measurement results is the gradient of the road. Compared to buses operating on relatively flat roads, buses going uphill consistently created more noise and buses going downhill consistently created less noise.

Noise measurements were also performed of the Seattle Metro ETB fleet in order to estimate what the noise levels of ETBs would be in Los Angeles. Appendix B of Electric Trolley Bus Noise Impact Assessment, Harris Miller Miller & Hanson, Inc., October, 1992, summarizes the measurement locations and results.

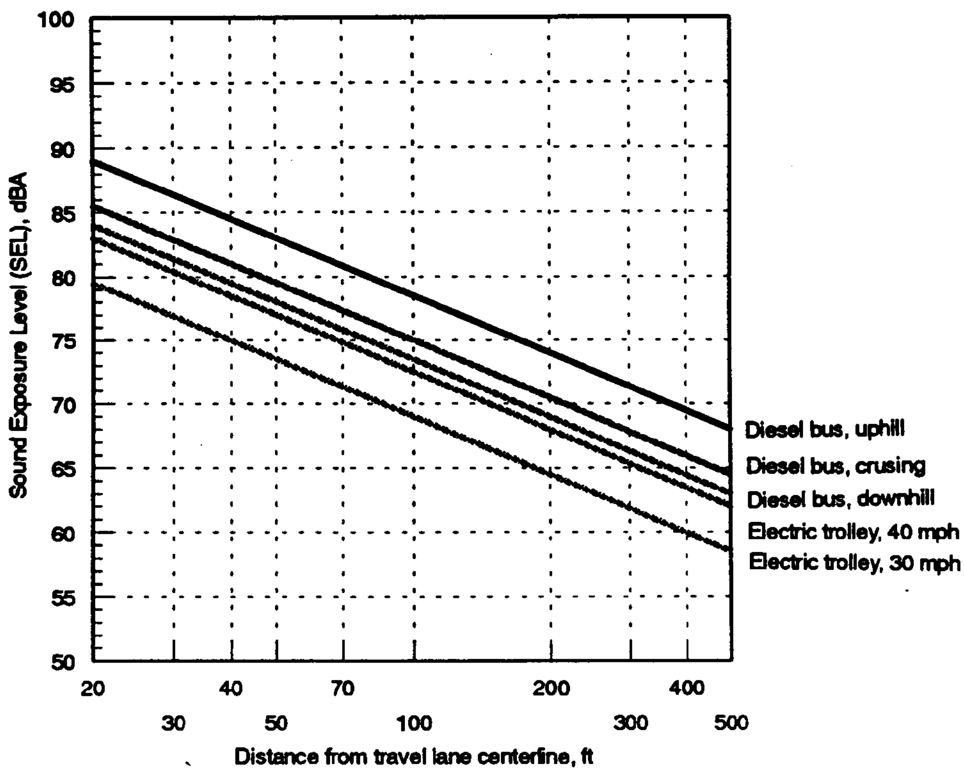
In most cases, the main source of noise from the ETBs was from the tires rolling on the pavement.

The measurement data for diesel and ETBs were used to develop models to predict bus noise as a function of distance from the road. Figure 3.2-1 is a plot showing SEL as a function of distance from the road for diesel buses and ETBs operating at 30 and 40 mph. Some factors evident in this figure are:

1. At 30 mph, an ETB creates sound levels 9 to 10 dBA lower than a diesel bus operating up a hill. This is a substantial difference.

2. For a diesel bus operating down a hill under low load conditions, an ETB will be about 4 dBA quieter. This is a noticeable but not dramatic difference.

Electric Trolley and Diesel Bus Noise
Single Event Sound Energy vs Distance



Source: Harris Miller Miller & Hanson, Inc., 1992.

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Electric Trolley Bus Environmental Impact Report

Figure 3.2-1: SEL Models for Diesel and Electric Buses

3. At 40 mph, the difference between diesel powered buses cruising and operating downhill is not very dramatic. This reflects the fact that as speed increases, tire noise increases more rapidly than engine noise. For a diesel bus operating on a flat road at 40 mph, the noise from the engine and the tires is approximately equal. At speeds much above 40 mph, the ETBs and diesel buses would create similar noise levels.

From the noise measurements summarized in the Environmental Setting section, it is evident that it is rare for noise from the existing diesel buses to be the predominant community noise source. Other traffic usually creates enough noise that CNEL would change by less than 1 dBA if all diesel bus traffic were to be eliminated. This is not to say that residents would not notice the lack of bus noise, just that the overall acoustic environment would not change significantly.

The results of the noise models shown in Figure 3.2-1 indicate that ETB noise is on average about 5 dBA lower than diesel bus noise. The difference is greatest at lower speeds and when buses are operating under high throttle conditions such as accelerating away from a bus stop. Table 3.2-4 provides a comparison of CNEL with diesel and electric buses at the three measurement sites where the diesel bus contribution to overall CNEL could be estimated. For all three of these sites the estimated diesel bus CNEL is at least 10 dBA lower than the measured CNEL. This means that removing the diesel buses would reduce overall CNEL by less than 1 dBA. Replacing the diesel buses with electric buses would reduce noise from buses by approximately 5 dBA, but would not have any measurable effect on the overall CNEL at these sites.

Table 3.2-4: Projected CNEL with Electric Trolley Buses

Site		Measured and Projected CNEL (dBA)		
		Existing	Est. Existing Diesel Buses	Projected Future ETB
1.	Mercury Ave. (quiet street, low-density residential)	67	57	52
2.	Whittier Blvd (busy street, medium- to high-density residential)	74	61	56
4.	Rowan Ave. (narrow but busy street, medium-density residential)	68	57	52

Source: Harris Miller Miller & Hanson, Inc., 1992.

Following is a summary of the procedure that was used to develop an order of magnitude estimate of how many people along the alignment would experience a significant positive impact (defined as a 3 dBA reduction in overall CNEL) as a result of replacing the diesel buses with electric buses:

1. It was estimated from census data that approximately 500,000 people live within one block of the ETB routes. The block lengths range from about 150 ft to 600 ft. Based on this, a rough estimate is that 100,000 people live within 100 feet of the bus routes. These people were assumed to be evenly distributed between 15 feet and 100 feet of the routes.

2. A typical bus schedule was estimated to consist of an average of 12 buses per hour in the daytime hours, 9 buses per hour in the evening hours, and 4 buses per hour during the nighttime hours. The number for nighttime is higher than might be expected because nighttime is defined as 10:00 PM to 7:00 AM, and daytime bus schedules start at 5:30 to 6:00 AM.

3. The distances for CNELs of 63 dBA, 65 dBA and 67 dBA were estimated using the bus schedule and the models developed for normal, uphill and downhill bus operations. A rough estimate of the percentages for each condition also was developed. Table 3.2-5 below gives the distances and the route percentages:

Table 3.2-5: Estimated Number of Persons Positively Affected

EXISTING CNEL	OPERATING CONDITIONS		
	CRUISE (80%)	UPHILL (10%)	DOWNHILL (10%)
<67 dBA	12 ft	20 ft	10 ft
<65 dBA	16 ft	26 ft	14 ft
<63 dBA	22	36 ft	18 ft
EXISTING CNEL	**APPROXIMATE NUMBER OF PEOPLE**		
	CRUISE (80%)	**UPHILL (10%)**	**DOWNHILL (10%)**
<67 dBA, 80%	0	470	0
<65 dBA, 15%	140	190	0
<63 dBA, 5%	330	120	20

Source: Harris Miller Miller & Hanson, Inc., 1992.

3.2.2.3 Substation Noise Impacts

The primary noise sources associated with substations are a humming noise caused by magnetostriction of the transformer core and noise from cooling fans. In addition, there can be noticeable noise from rectifiers and switching equipment. Transformers are designed such that their noise emission levels do not exceed the limits in the National Electrical Manufacturers Association (NEMA) Standard TR 1-1980. This standard gives maximum sound levels measured at a distance of 1 foot from the transformer for various classes of transformers. It is possible to obtain transformers that are significantly quieter than the NEMA standard. This is usually achieved by increasing the iron in the core. Reduced noise transformers usually cost about 10 percent more than normal.

Measurements of noise levels near several of the Seattle ETB system substations were performed in order to verify the noise projection models for substation noise. In addition, measurements were made at a 1 Megawatt (MW) capacity substation of the Sacramento Light Rail System. All of the substations used for the Seattle system are 500 kW capacity. Measurements were made at four substations during normal operation of the system. Table 3.2-6 summarizes the results of the noise measurements. Also included in the table are the projected noise levels using a noise model developed for this study.

Table 3.2-6: Summary of Substation Noise Measurements

SUBSTATION	MEASUREMENT SITE	DISTANCE FROM TRANSFORMER (FT)	CONDITION	SOUND LEVEL (dBA)	PROJ. LEVEL (dBA)
Substation 25 Rainier Beach	Directly in front	15 ft	Base level	52	56
			High level	56	56
		60 ft	Base Level	41	44
Substation 1 Lower Queen Anne	Off east end	15 ft	Base Level	55	56
			High Level	59	
Substation 2 North Queen Anne	Off south end	15 ft	Base Level	46	56
			High Level	52	

Source: Harris Miller Miller & Hanson, Inc., 1992.

Table 3.2-6 shows that the projected sound levels using the NEMA Standard are consistent with the levels measured near the Seattle substations. It should also be noted that the measured noise levels appear to vary among the substations, despite the fact that they are all the same type of equipment. Two factors observed during the noise measurements are:

1. Sound level will vary by 4 to 6 dBA, increasing as load increases. To some degree, at higher loads, the noise can have a more annoying quality because of rattling of panels within the transformer facility.

2. In close proximity to the substations, the sound level varies by 5 to 7 dBA depending on position. The sound level tends to be highest nearer to the transformers.

The measured sound levels of 51 dBA to 53 dBA at fifteen feet at the Sacramento substation fell within the lower end of the range of substation sound levels measured in Seattle. The dominant noise source at the Sacramento site was ventilation fan noise; transformer sound levels alone would be somewhat lower than the measured sound level. Since the draft specifications for the Los Angeles ETB system require enclosed self-ventilating units without fans, these measurements represent an upper limit of expected sound levels for the ETB substations.

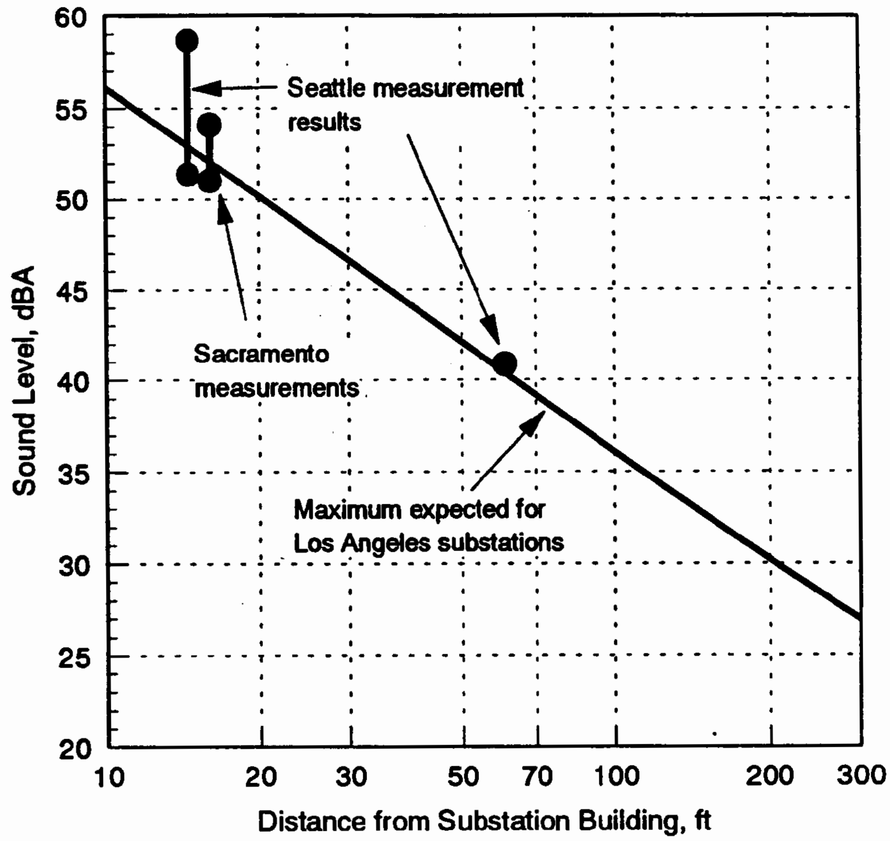
The Seattle ETB system has a total of 29 substations, a number of which are located in quiet residential areas. For example, the Rainier Substation (Substation 25) is set back approximately 80 feet from the street on what looks like a standard building lot with residences on both sides of the substation. An alley runs in back of the substation and there is a house directly across the alley. The measurements showed a baseline sound level of approximately 41 dBA at a distance of 60 feet in front of the substation. It was not possible to take sound readings at the houses; however, the estimated sound levels are 41 to 45 dBA.

The North Queen Anne facility consists of two substations (Substations 2 and 3) next to each other with single-family residences on both sides. A distance of approximately 50 feet separates the substation from the closest house. The transformer sound level is estimated to be 40 to 50 dBA at the closest residences. This is loud enough to be audible outdoors when background noise is low, but not loud enough to normally be heard indoors even with the windows open.

The noise levels that would be created by the substations for the Los Angeles ETB system would depend on the specifications used to purchase the units. The draft specifications for the substations call for fully enclosed walk-in units. The maximum noise level is to be less than 55 dBA at a distance of 8 feet away from the enclosure with the transformer-rectifier simultaneously energized at the rated input voltage and 150 percent of full load current. Because the units would be fully enclosed, the highest noise levels external to the units would be near ventilation louvers or other openings in the housing unit. A worst case can be assumed to consist of two vent or fan openings facing a noise sensitive land use, with noise radiated from each vent just meeting the limit of 55 dBA at a distance of 8 feet from the vent. Figure 3.2-2 illustrates the maximum projected sound level as a function of distance from the planned ETB substations, along with the measurements of the Seattle Metro ETB substation noise.

It should be recognized, however, that projected noise levels in Figure 3.2-2 represent a worst case. The draft substation specifications require enclosed walk-in units that are self-ventilating (that is, no fans for ventilation). The maximum allowable sound levels are 55 dBA at any point within 8 feet of the outside of the building and 70 dBA anywhere inside the building. In most cases, the sound levels should be 5 to 10 dBA lower than the levels shown in Figure 3.2-2.

According to the criteria, noise impacts would occur when the substation noise increases the L_{90} during the nighttime hours by 10 dBA or more. The lowest average nighttime L_{90} measured



Source: Harris Miller Miller & Hanson, Inc., 1992.

Myra L. Frank & Associates, Inc.

Electric Trolley Bus Environmental Impact Report

Figure 3.2-2: Projected Substation Noise vs. Distance from Substation Enclosure

during the noise survey was 38 dBA at Site 1. Therefore, according to this criterion, in typical quiet residential neighborhoods, the nighttime L_{90} would have to be increased to 48 dBA (a 10 dBA increase) by substation noise for an impact to occur. This criterion is consistent with the LACTC Design and Performance Criteria for continuous noise from ancillary equipment which specify a limit of 45 dBA for low- and medium-density residential areas. Any equipment meeting the more stringent LACTC standard will also meet the 10 dBA increase criterion.

As shown in Figure 3.2-2, a worst-case maximum sound level of 45 dBA is expected at a distance of approximately 35 feet from the substation buildings. Therefore, significant noise impacts would occur only in the worst-case situation of a residential structure in a quiet area located within 35 feet of the side of a substation building with vent openings.

A review of the proposed substation locations indicates that 16 of the substation sites are possibly within 35 feet of adjacent noise-sensitive properties. The 16 sites include 13 residences, 2 churches and the Pasadena Playhouse (a state historic building). It should be recognized, however, that this review is based on preliminary and conceptual information; in some instances the location of the substation building on the proposed site remains to be determined. As additional information becomes available, further review may reveal that some of these 16 substations would be located more than 35 feet from the nearest sensitive property and would, therefore, not result in adverse noise impacts.

3.2.2.4 Maintenance Facility Noise Impacts

The expanded maintenance yard between Alameda Street and Central Avenue at Industrial Street is expected to generate similar or slightly lower noise levels than the existing maintenance facility at that site. Although the expansion of the yard would move some bus maintenance facilities to the back of a residential hotel located on Seventh Street, the RTD facility would replace a commercial truck maintenance operation that currently generates high noise levels. Because of the high existing noise levels (measured CNEL of 75 dBA and 79 dBA at sites 9 and 10, respectively) due to local traffic and existing bus and truck maintenance operations, the expansion of the maintenance facility is not expected to cause a significant change in noise levels at the residential hotel.

Buses at the expanded facility would move primarily on power supplied by overhead wires, but some operations would occur under power from batteries or auxiliary power units. Power at the facility would be provided by a substation located within or close to the maintenance yard. The proposed change from diesel to electric buses would reduce noise levels associated with buses maneuvering within the facility and arriving to and departing from the facility. Background noise levels are high enough in the area that additional noise generated by the substation would be insignificant. Overall, the expanded facility is expected to cause noise levels similar to or slightly below those generated by the existing facility.

3.2.3 MITIGATION MEASURES

The introduction of electric trolley buses to replace existing diesel buses will result in a small reduction of overall community noise levels along the routes but, by itself does not represent a significant change in community noise levels. Therefore, no mitigation is necessary along the proposed electric trolley bus routes.

There is some potential for noise impact if substations are located very close to residences or the substation transformers or other components exceed the recommended noise limits given above. Measures which will be implemented to mitigate potential adverse noise impacts could include:

1. Designing substation sites to maximize the distance between the substation building and nearby noise-sensitive uses.

2. Baffling substation vents.

3. Using quieter transformer and substation components.

4. Placing vents on substation buildings so they are oriented away from nearby noise-sensitive uses.

5. Constructing sound barriers or partial enclosures between the substation and the receptor that will reduce noise by 5 to 15 dBA.

3.3 AESTHETICS

3.3.1 ETB ROUTES/SETTING

The aesthetic issues related to the Electric Trolley Bus (ETB) project primarily concern the visible elements of the infrastructure necessary to operate the system: the trolley wires, their supporting poles or span-wires, and the specialized electrical hardware. The aesthetic impacts are variable because of the expanse of the system, the diversity of the urban settings it traverses, the variability of the system elements themselves and the multiple factors affecting individual perception at any given location. The level of impacts are determined primarily by the degree of visibility of the elements and the extent to which given elements are considered unsightly, both individually and collectively.

An additional aesthetic impact concerns the visual appropriateness of system elements as they relate to historic structures and districts. This is discussed in Section 3.8.

Setting

The expanse of the proposed ETB system routes is regional in scale, and yet impacts and mitigations must often be addressed at very specific locations. Therefore the general setting is described as four settings, each at a different scale. They descend from the largest to the smallest, as follows:

a. Setting 1: The ETB Route System

The setting of the ETB route system is the urban landscape of Los Angeles County. The topographic character of the routes is generally flat or gently sloped.

Almost all of the land along and adjacent to the routes is urbanized. The intensity of urbanization varies, from low-density residential neighborhoods to middle-density commercial strips to high-density central business districts.

The visual settings are diverse. There are historic districts with structures up to one hundred years old, and other districts with construction that is almost entirely recent.

Trees constitute an important part of the visual setting in some areas, but are intermittant or non-existant in others. For a discussion of the impacts of the ETB project on street trees, see Section 3.4

Almost all areas of the system contain poles for streetlighting and traffic control. Some segments have poles carrying utility wires for electical and telephone service, while in other segments utility wires are located in alleys or in underground conduits.

This degree of variation makes it difficult to characterize a visual setting at the scale of the ETB system as a whole, and therefore difficult to assess potentially significant impacts or mitigation at this scale. For the purposes of this EIR, impacts and mitigation are assessed at smaller scales than the full ETB route system.

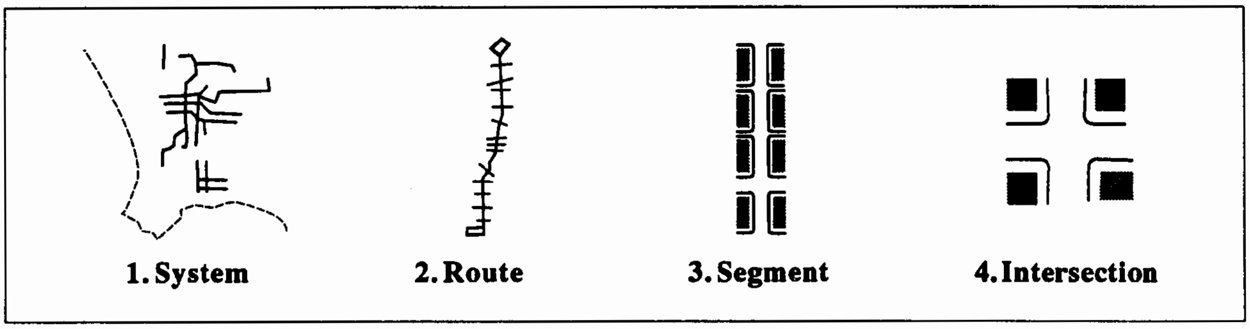


Fig. 3.3-1: Four scales of environmental setting for the proposed Electric Trolley Bus routes: 1) The entire ETB system, 2) Individual ETB routes, 3) segments of an individual route, 4) Intersections along an individual route.

b. Setting 2: Individual ETB Routes

The selection of ETB routes is based on operational criteria, such as high-volume ridership, rather than on the visual unity of the route. The visual settings of the ETB routes repeatedly change because of the diversity of the urban landscape described above. Therefore, for the purposes of this EIR, impacts and mitigation are assessed at smaller scales than individual ETB routes.

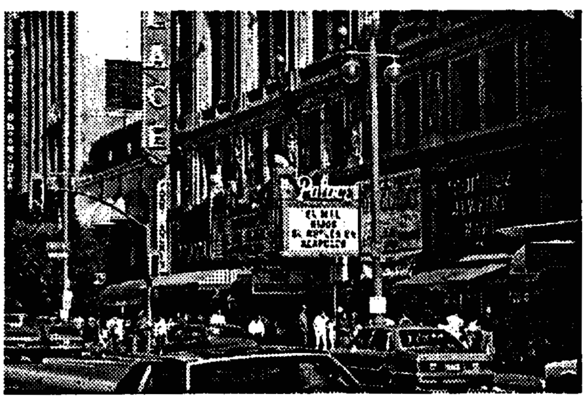
c. Setting 3: ETB Route Segments Classified According to Street-type

Visual settings can be better described according to route segments. The designation of a segment is based on one of two characteristics: (1) existence of an identifiable visual and urban character that can be classified as a type of street, or "street-type"; (2) existence of an official designation of a segment as a historic district or as part of one. For discussion of historic district segments, see Section 3.8. Street-type segments vary in length, from one or two blocks to a mile or more. The following eight street-types have been identified along the ETB routes. The definitions and characterizations have been developed specifically for the ETB project. The eight street-types cover nearly all settings found along the ETB system routes. For the specific locations of individual street-type segments on ETB routes, refer to Route Maps on pages 3.3.30 through 3.3-44.

Automobile Drive

Automobile Drives are highway-like thoroughfares, with very high automobile counts, minimal if any pedestrian activity on sidewalks, and predominance of car-oriented destinations such as car dealerships, repair shops, fast-food restaurants, warehouse-type retail outlets and regional shopping malls. Buildings are generally set well back from the street. There may be some on-street parking, but the vast majority of spaces are in surface lots located between buildings.

Extent: 15% of ETB route system (26 miles)



Downtown Avenue

Downtown Avenues are dense urban street that are part of a central business district street grid, with tall buildings, high pedestrian activity, and a variety of land uses, including retail, office, institutional, governmental and limited residential. Primary building types on these streets include dense office blocks, banks, theaters, department stores, government buildings and civic landmarks. On-street parking is usually limited or non-existant, replaced by numerous parking structures and lots.

Extent: 9% of ETB route system (16 miles)

Industrial Road

Industrial Roads are indicated by the near-total absence of retail, institutional or residential uses. There are several sub-types: 1. the low-rise warehouse and manufacturing road, 2. an older version with mid-rise manufacturing "loft" structures, 3. more suburban low-rise versions such as industrial parks and 4. the open storage, freight, and production yards of heavy industry. The dominant emphasis is on accessibility and movement, with little provision for pedestrian activity. Parking is usually both in lots and on-street.

Extent: 7% of ETB route system (12 miles)

Metropolitan Boulevard

Metropolitan Boulevards are the most pervasive street-type in the Los Angeles region. They extend for great distances and feature high automobile use, low to medium pedestrian activity, and a highly varied mix of land uses, building setbacks and building heights. Although they are often located adjacent to residential neighborhoods, the percentage of residential structures is low. Primary building types include retail storefronts, mini-malls, office towers, shopping centers, supermarkets and service stations. On-street parking may be limited to off-peak hours. Parking lots and parking structures are numerous.

Extent: 33% of ETB route system (58 miles)

Neighborhood Main Street

Neighborhood Main Streets are characterized by their low-rise buildings and retail activities oriented towards pedestrians. They usually only extend a few blocks, with entrances to the retail shops located directly on the sidewalk. In some cases, community or institutional structures such as churches, cinemas, post offices or library provide a visual focal point for the neighborhood. There is usually on-street parking, in some cases angled, with additional parking in alleys or small lots.

Extent: 7% of ETB route system (11 miles)

Parkway

Parkways are characterized by significant greenery and the domination of a single use, resulting in three sub-types: residential parkways, business parkways and recreational parkways. The single use facilitates higher-speed automobile traffic, but does not preclude pedestrian activity, particularly recreational or athletic. Apartment buildings and freestanding office buildings are the predominant building types, and are usually set well back from the street. There may be some on-street parking and some structured parking, with the majority of spaces in lots.

Extent: 21% of ETB route system (37 miles)

Residential Sidestreet

Residential sidestreets are low-speed, non-comercial streets zoned exclusively for low- to medium-density residential structures such as single-family houses and duplexes. Parking is on-street and in driveways and garages.

Extent: 2% of ETB route system (3 miles)

Viaduct

This street form is primarily characterized by the isolation of the roadbed and sidewalk from any adjacent activities, usually because of a separation from the ground plane. A viaduct may take the form of a bridge, tunnel, freeway overpass or underpass, or a causeway. In general there is no parking.

Extent: 6% of ETB route system (11 miles)

d. Setting 4: Individual Intersections Along ETB Routes

While street-type segments include both city blocks and the intersections which separate them, the intersections also need to be treated as settings. This is because of the special visual and aesthetic conditions which may occur at intersections where an ETB route turns a corner, or where two ETB routes cross.

There are approximately 2,586 intersections in the entire Phase I ETB project. They are distributed by routes as follows:

RTD 16	168
RTD 18	208
RTD 30/31	215
RTD 40	243
RTD 45	258
RTD 66/67	232
RTD 70	198
S - 182	200
RTD 204	213
RTD 560	132
M 10	81
LB 40	112
LB 50	133
LB 60	103
LB 90	90

3.3.2
VISIBLE ELEMENTS OF ELECTRIC TROLLEY BUS INFRASTRUCTURE

The following elements of the ETB system would be visible along the routes. Almost all of the elements, including poles, wires, bracket arms and hardware, currently exist along the routes for other purposes. In most cases this existing infrastructure provides electrical service, telephone service, street lighting and traffic control.

a. Wires

Two parallel trolley wires, approximately 1/2" in diameter, are required to provide power to the bus.

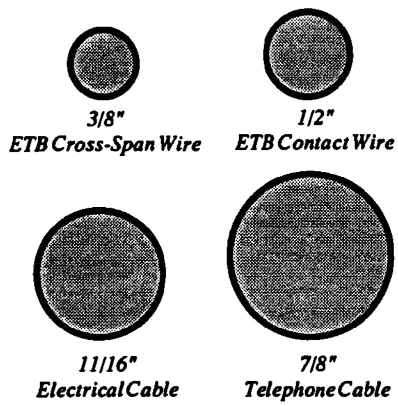


Figure 3.3-2:
Wire Comparison • The cross-section of ETB Wires is shown here at actual size, for comparison with typical overhead telephone and electric utility cables.

b. Poles

In the large majority of cases, poles will be required to support the electrified trolley wires.

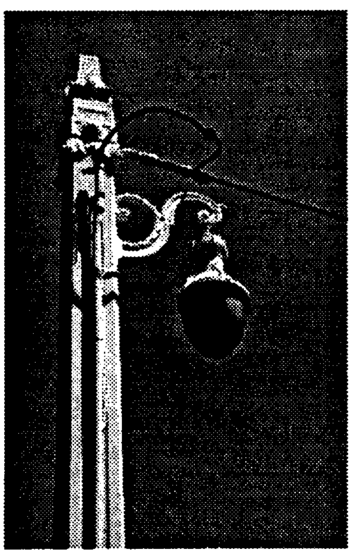


Figure 3.3-3:
Joint-use pole supporting street lighting luminaire and Electric Trolley Bus span-wire (San Francisco)

c. Bracket Arms or Cross-Span Wires

The two electrified trolley wires can be suspended from cantilever bracket arms, or suspended from additional wires known as cross-spans. Cross-spans themselves can be hung from poles or adjacent buildings.

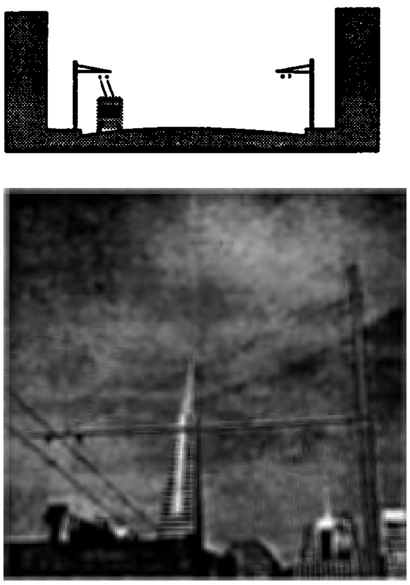


Fig.3.3-4a:
Trolley wires supported by a bracket arm

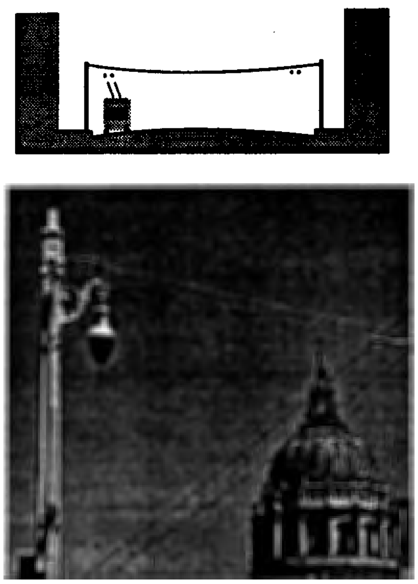


Fig.3.3-4b:
Trolley wires supported by cross-spsn wire suspended from a pole

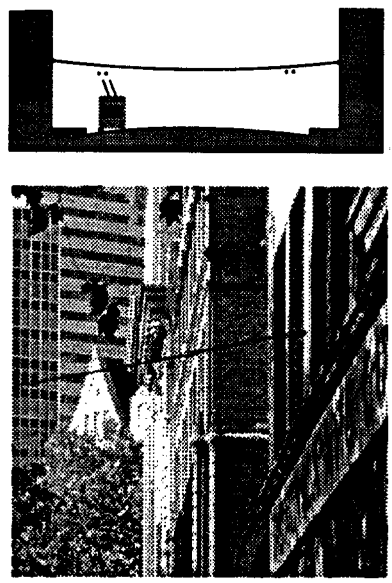


Fig.3.3-4c:
Trolley wires supported by a cross-span wire suspended from a building facade

d. Wire Hardware

A variety of hardware elements are necessary to connect, separate, curve, and insulate the wires.

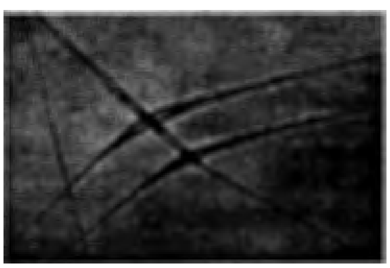


Fig.3.3-5a: Close-up View of a Curved Segment

Fig.3.3-5b: Close-up View of Insulating Hardware

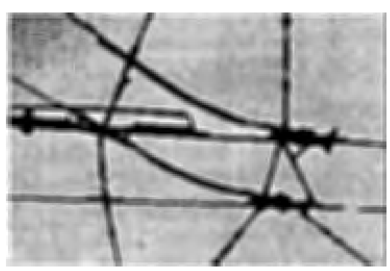


Fig.3.3-5c: Close-up View of an Electric Switch

3.3.3
FACTORS AFFECTING VISUAL IMPACTS

a. ETB Wires and Hardware

The degree of visibility of the ETB elements along the routes would vary according to a number of factors, including:

1. Form of the wire and hardware itself

The visibility of an element such as a pole, suspended wire, or suspended hardware, can be affected by the element's size, its shape, its regularity and its color.

2. Background

The visibility of an element is also affected by the background against which it is seen. Poles, wires and hardware are generally most visible when silhouetted against the sky. They may be partly or completely camouflaged when seen against a background of foliage or architecture.

Fig. 3.3-6
Two views of the same street: trolley wires, cross-spans and bracket arms visible silhouetted against the sky (upper photo); the same elements camouflaged against an architectural background when seen from a different vantage point (lower photo)

3. Light conditions

Light conditions also affect visibility. Because they are not illuminated, ETB wires and hardware are nearly invisible at night. Different atmospheric conditions, such as overcast skies versus highly contrasting sun and shade, may also affect visibility. For example, the silhouettes of hardware and wires may be less apparent if the sky is overcast.

4. Position of the observer

The visibility of ETB elements may be affected by observer position. Four types of position can be identified: **(a)** The highest visibility is for an automobile driver or front seat passenger in the roadway, and for a pedestrian in a cross-walk. From these positions, the ETB wires and hardware are most likely to be seen silhouetted against the sky. Passengers in the rear seat of a car, or bus pasengers whose views tend to be sideways, would see less. **(b)** The next highest visibility is likely to be for occupants of the second and third floors of adjacent buildings, who may see ETB wire and hardware at closer range, if the view is not screened by street trees; they will generally not see the wires and hardware silhouetted against the sky, and may benefit from camouflage effects of foliage or architecture on the opposite side of the street. **(c)** For occupants on the higher floors of adjacent buildings, the visibility of ETB wire and hardware should be reduced, because the distance between the observer and the wire and hardware is greater, and because the wires and hardware will be viewed against a backdrop of foliage, architecture, or the ground plane, rather than silhouetted against the sky. **(d)** The visibility of ETB wire and hardware should generally be lowest for pedestrians on the sidewalk (and not in the cross-walk). From that position, the proximity of trees, entrance canopies and other poles enlarge these elements in the field of vision, thus increasing the potential screening effects for ETB poles, wires and hardware. In addition, pedestrian views of the roadbed tend to be oblique, looking across the street, in which case foliage and architecture across the street are more likely to have a camouflage effect.

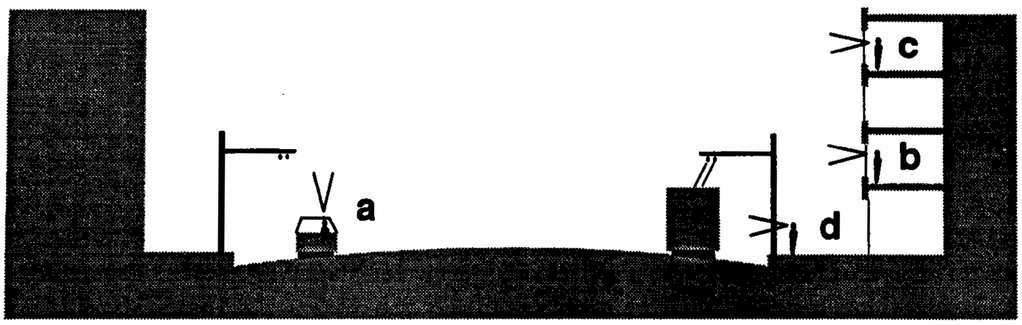


Fig. 3.3-7:
Typical street cross-section showing four vantage points from which ETB elements may be viewed

5. Movement of the observer

In addition to the position of the observer, the direction and speed of the observer can affect visibility. In general, a stationary observer who focuses on the pole, the wire, or the hardware will experience them as more visible than someone who is moving. Direction of movement can also affect visibility because it may change the background against which the ETB elements are seen.

6. Familiarity and focus of the observer

Many elements in the urban environment, particularly utilitarian ones, are unconsciously removed from visual awareness by people who are familiar with the setting. By contrast, someone unfamiliar with a given urban environment may notice features of the streetscape which have effectively disappeared for others. ETB wire and hardware may therefore appear more conspicuous to newcomers, or to inhabitants who are familiar with the setting but who make a conscious decision to focus on the wires and hardware.

b. ETB Poles

For some ETB elements, such as wire and hardware, mere visibility may be seen as an adverse impact. For poles, however, visibility alone may not be considered as adverse. Rather, poles which are generally considered unsightly in themselves or poles which contribute to a generally disordered or cluttered streetscape may be considered to have adverse impacts. The following factors are variables in determining the degree of that impact.

1. Character of the poles

Each individual pole is a visual element of the streetscape. Some poles, such as wood telephone poles, are generally considered to be eyesores, not only because of the wires they carry, but because of their design character. In contrast, the design of some poles includes shape, material, color and ornament intended to enhance the street environment.

Fig. 3.3-8:
Standard pole at RTD bus stop (above); pole with ornamental base at MUNI bus stop in San Francisco (below)

2. Number of poles

In general, fewer poles reduce visual impacts, especially when the design character of each individual pole is considered unsightly. If the design character of individual poles is considered neutral or positive, then the number of poles may have a less significant influence on visual impact.

3. Placement of the poles

Poles with locations in the street environment determined strictly according to technical or utilitarian criteria may constitute a negative impact, especially if the result is one of apparent disorder or clutter. Poles which do not appear to crowd each other, which are spaced at regular intervals, and which have an ordered relationship to poles on the other side of the street, may not produce a negative impact. If the spacing and regularity create the architectural effect of a colonnade, the poles may be viewed by some as a cumulative enhancement, especially if the design character of each individual pole is considered an enhancement.

4. Design coordination of the poles with other streetscape elements

The degree of impact of poles can also be affected by the extent of their design integration with other elements of the streetscape, such as trees, other poles, traffic and pedestrian signals, and street furniture. An apparent lack of coordination in the relative locations, forms, materials, colors and ornament of these diverse elements may lead to an effect of disorder or clutter. Conversely, design coordination of these elements may mitigate impacts, and potentially produce an enhancement.

Fig. 3.3-9:
Poles not coordinated with other streetscape elements (above); poles coordinated with landscaping and Light Rail infrastructure in Long Beach (below)

3.3.4 VISUAL IMPACTS

a. Visual Impacts at the Scale of Route Segments

By definition, route segments have a degree of visual coherence or consistency, based on the characteristics of the segment's street-type, its designation as a historic district, or both. For a discussion of impacts with respect to historic districts, see Section 3.8. Visual impacts with respect to street-type segments will be determined largely by the degree of compatibility of the visible ETB elements with the prevailing visual character of the street-type, as follows:

Automobile Drive:

Prevailing Views: The prevailing point of view along Automobile Drives is usually that of drivers and passengers rather than pedestrians.

Factors Affecting Visibility of ETB Elements: Movement is generally at higher speed, diminishing focus on streetscape elements. Because of high traffic volumes on Automobile Drives, the curb lane is often used for traffic instead of parking. In such cases, the curb lane may be available as a primary lane for electric trolley buses, which would permit the trolley wires and support system to be located closer to the curb. This tends to reduce the visibility of wires and hardware from the roadbed, since they are more likely to be seen against a backdrop of foliage or architecture rather than silhouetted against the sky. Moreover, should bracket arms be used, they would be smaller in scale because they are closer to the curb.

Compatibility of ETB Elements with the Existing Streetscape: The visual setting of the Automobile Drive street-type is often cluttered with commercial signage, billboards, inconsistent building setbacks and inconsistent building heights. Typically, there are many existing poles for lighting and traffic control. In many cases, utilities wires are above-ground and supported on poles. ETB poles and wires therefore may not be inconsistent with this setting. Should the ETB project include new landscaping, a net benefit may be achieved in terms of visual and aesthetic effects.

Potentially Significant Impacts: Potentially signficant impacts may occur at intersections where there are turns or crossings of ETB routes (see Section 3.3.4b)

Downtown Avenue:

Prevailing Views: The prevailing views along Downtown Avenues are those of pedestrians on sidewalks and cross-walks, occupants of buildings and bus passengers. Automobile drivers account for a much lower percentage of potential viewers.

Factors Affecting Visibility of ETB Elements: Because of restricted on-street parking, curb lanes are often available for buses, which may allow trolley wires and support system to be located closer to the sidewalk, reducing their visibility from the roadbed. Moreover, should bracket arms be used, they would be smaller in scale because they are closer to the curb. The predominance of mid- and high-rise buildings provides a consistent backdrop which tends to camouflage the presence of wires and hardware from most vantage points. The feasibility of supporting trolley wires with cross-spans attached to eyebolts mounted on building facades will generally be highest on Downtown Avenue segments because of the continuity of the "wall" formed by adjacent buildings. This suspension system does not require the use of poles. Other elements such as large commercial signs, banners, awnings and landscaping provide a more complex and varied backdrop against which wires and hardware may be less apparent.

Compatibility of ETB Elements with the Existing Streetscape: On Downtown Avenue street-types, there are in general many poles for lighting and traffic signals, but very few which carry above-ground utility wires, which have usually been put underground. ETB wires and associated hardware would therefore be new elements in many cases. Along some Downtown Avenue segments, trolley wires and hardware have existed previously to serve streetcar systems.

Potentially Significant Impacts: Potentially signficant impacts may occur at intersections where there are turns or crossings of ETB routes (see Section 3.3.4b)

Industrial Road:

Prevailing Views: The prevailing views along Industrial Road segments are mainly those of drivers of commercial vehicles, and drivers and passengers of through vehicular traffic. Pedestrians are few in number. Most buildings do not have many windows facing onto the street.

Factors Affecting Visibility of ETB Elements: In older industrial roads, mid-rise loft warehouses and factories may provide an architectural backdrop for ETB wire and hardware.

Compatibility of ETB Elements with the Existing Streetscape: On the Industrial Road street-type, there are generally many poles for lighting and traffic control. Utility wires are often above ground and supported on separate poles. Streetscape improvements and landscaping are less prevalent. ETB wires and poles are generally consistent with this setting. Any new landscaping produced through the ETB project would likely provide a net benefit.

Potentially Significant Impacts: Potentially signficant impacts may occur at intersections where there are turns or crossings of ETB routes (see Section 3.3.4b)

Metropolitan Boulevard:

Prevailing Views: The prevailing views along Metropolitan Boulevard segments are evenly distributed between pedestrians, drivers, passengers and building occupants.

Factors Affecting Visibility of ETB Elements: The presence of varied architectural heights and setbacks along Metropolitan Boulevard segments may result in ETB wires and hardware disappearing and reappearing into view depending on the backdrop. On some Metropolitan Boulevards there are significant and consistent rows of trees which may minimize the visibility of ETB wires and hardware. Due to the wide dimension of most Metropolitan Boulevards, bracket-arms are the likely support method, resulting in no wires crossing the entire roadbed. Most segments are long and straight, with the likely result of a straight and regularly spaced arrangement of poles and wires.

Compatibility of ETB Elements with the Existing Streetscape: Along the Metropolitan Boulevard street-type, there are typically many existing poles for lighting and traffic control. In some cases there are additional poles for above ground utility wires. Joint-use poles would generally result in no net increase in number of poles. In many cases, above-ground wires would not consititute a new or inconsistent element, since certain metropolitan boulevards have a historic precedent for above-ground transit wires and hardware.

Potentially Significant Impacts: Potentially signficant impacts may occur at intersections where there are turns or crossings of ETB routes (see Section 3.3.4b)

Neighborhood Main Street:

Prevailing Views: Because of considerable pedestrian activity along Neighborhood Main Street segments, views from sidewalks and cross-walks prevail, along with the views of drivers and passengers. In general the majority of adjacent buildings are one-story commercial structures, so that views from upper stories will generally be the exception.

Factors Affecting Visibility of ETB Elements: For the Neighborhood Main Street segment, varied street elements such as commercial signs, architectural features, awnings, newstands, and street furniture typically provide a more complex background against which ETB wires and hardware would be seen. Street trees are common and may provide additional background for ETB wire and hardware.

Compatibility of ETB Elements with the Existing Streetscape: Along Neighborhood Main Streets there are generally existing poles for street-lighting and traffic control. In some cases, utility wires have been put underground and poles removed. There are some cases with a historic precedent of aerial wires and hardware for transit.

Potentially Significant Impacts: Potentially signficant impacts may occur at intersections where there are turns or crossings of ETB routes (see Section 3.3.4b)

Parkway:

Prevailing Views: The prevailing views along Parkways tend to be those of drivers and passengers, joggers and strollers, and occupants of adjacent mid-rise and low-rise buildings.

Factors Affecting Visibility of ETB Elements: The presence of significant landscaping along Parkway segments provides background which may camouflage ETB wires and hardware. Along Residential Parkways, bracket arms may be camouflaged by existing trees. Along Business Parkways, buildings are usually set back from the boulevard, so that in general views from these buildings would not be significantly affected. Because of the setback, buildings are less likely to provide an architectural background for drivers and passengers. Along Recreational Parkways, the views from within recreational park areas may be camouflaged by trees.

Compatibility of ETB Elements with the Existing Streetscape: Along Parkways, poles generally exist for street-lighting and traffic control. Above-ground utility wires are the exception. ETB wire and hardware would generally constitute new elements, although in some cases there may be a historic precedent for them.

Potentially Significant Impacts: Potentially signficant impacts may occur at intersections where there are turns or crossings of ETB routes (see Section 3.3.4b)

Residential Sidestreet:

Prevailing Views: Prevailing views along Residential Sidestreet segments would be balanced among drivers, passengers, pedestrians and occupants of adjacent houses and apartment buildings.

Factors Affecting Visibility of ETB Elements: Existing trees may help to camouflage wire and hardware, which may be supported by short bracket arms, since streets are usually a narrower residential width.

Compatibility of ETB Elements with the Existing Streetscape: On Residential Sidestreets, there may be some existing poles for street lighting, and occasionally above-ground utility wires and poles. In most cases ETB poles, wires and hardware would constitute new elements.

Potentially Significant Impacts: Potentially signficant impacts may occur at intersections where there are turns or crossings of ETB routes (see Section 3.3.4b)

Viaduct:

Prevailing Views: Along Viaduct segments, views are generally those of drivers and passengers. The number of pedestrians is limited and there are generally no adjacent buildings. There may also be views from considerable distances, particularly for bridges.

Factors Affecting Visibility of ETB Elements: The typical lack of adjacent buildings or landscaping may result in high visibility of ETB elements. In some cases there is historic precedent for aerial transport wires, hardware and supporting poles.

Compatibility of ETB Elements with the Existing Streetscape: Along Viaduct street-types, poles for lighting and traffic control typically exist; in some cases there also above-ground utility wires.

Potentially Significant Impacts: Potentially signficant impacts may occur at intersections where freeway on-ramps or off-ramps merge with Viaduct segments. (see Section 3.3.4b)

Specialized Segment Conditions:

In general, ETB route segments are defined by the street-type characteristics, and impacts have been assessed accordingly. There are two specialized forms of route segment which are coincidant with street-type segments.

• Curved Segments

When any ETB route segment curves more than 2 degrees, special hardware is required to guide the trolley wires around the curve. This additional hardware and its associated support structure may increase the visibility of ETB elements. For discussion of impacts related to this curve hardware, see Impact Level B on page 3.3-20.

• Light Rail Rights-of-Way

When any ETB route segment is coincidant with a Light Rail right-of-way, additional hardware may be needed to separate and insulate the wires of the two systems. This additional hardware and its associated support structure may increase the visibility of ETB elements. For discussion of impacts related to this curve hardware, see Impact Level D on page 3.3-22.

b. Visual Impacts at the Scale of Intersections

Certain intersections along the proposed Electric Trolley Bus (ETB) routes are the most likely locations for significant visual impacts. This is due to the probable visibility and concentration of ETB poles, wires and hardware at intersections where ETB routes make a turn, cross other ETB routes and/or merge with other ETB routes. These will be referred to hereinafter as "complex intersections".

1. Visibility of ETB Elements

The likelihood of higher visibility at intersections is due to their spatial characteristics. When two streets cross, the result is generally greater spatial openness than along straight segments of either street. This spatial openness is often increased by the set-back or absence of buildings at corners.

The result of spatial openness is a broader canopy of sky. This increases the size of the zone in which ETB elements would be silhouetted against the sky and therefore most highly visible.

2. Cluttering of ETB Elements

In addition, the probability of cluttering of ETB elements, particularly poles, is increased at the intersections of major streets. This is due not only to the engineering and operational requirements of the ETB project, but also to the increased amount of traffic control equipment necessary at major intersections. In many cases cluttering may already exist because of such equipment. ETB elements may increase such cluttering if it is not possible to achieve joint use of poles for traffic control, street lighting and/or ETB. Even if joint use is achieved and no new poles are added, the likely visibility of ETB wires and hardware may increase the impression of cluttering.

3. Variable Factors in Determining Impacts

Along the proposed ETB routes, there are approximately 25 different types of intersection conditions related to ETB operations. These operations include making a turn, either left hand, right hand or both. They also include two or more ETB routes which cross, merge or separate. Each intersection condition has three aspects whose potentially significant impacts vary:

- **The location of the trolley wires along the route.** The location of the trolley wires is the least variable of the aspects, because they must align closely with predetermined bus movements which are known in advance and typical across the system. Trolley wire locations for all 25 intersection conditions are shown in diagrams on pages 3.3-50 through 3.3-54. These diagrams do not include hardware and support structures, which are discussed below.

- **The additional hardware necessary to accommodate the turn, crossing, merger and/or separation** includes section insulators, curved segments and switches. The types of hardware for different operating conditions are known in advance. For example, routes which separate into two routes require a switch, while routes which turn require curved segment hardware. While the types are predictable, their location is not. This must be determined on a cases by case basis. In general, the specific location of hardware will vary according to the width and configuration of the street and the crossing street.

- **The support structure necessary to hold up the trolley wires and hardware** includes poles, bracket arms, guy support wires and system leveling guy wires. The types of support structures available to suspend ETB trolley wires and hardware are known in advance. However the specific type of support structures, their locations and their quantity are the most variable factor of all three aspects. They will change on a case by case basis according to:
  - the use of bracket arms or cross-spans
  - the availability of joint-use poles
  - the availability of eyebolts for suspending from adjacent buildings,
  - the amount of additional weight from hardware
  - the width of the roadbed and sidewalk of the street and the cross street

4. Assessing Impacts by Complex Intersection Types

In order to assess impacts at the 25 complex intersection types, they have been organized into five groups (A through E) according to their probable level of impact. Category A represents the minimum probable impact; Category E represents the maximum probable impact. While potentially significant visual impacts could occur at each of these intersection types, the probability and level of significance are likely to increase from A to E. The basis for the categories is explained in the table below:

Table 3.3-1:
Levels of Visual Impact at Intersections

Impact Level	Description	* Intersection Types
A *(min.)*	Crossing Only (No turns)	1,2,3
B	Single Turn Only	4,5
C	Turnout or Converging Lines	6,7,8,9,10,11
D	Crossing + Turn (or Turnout)	12,13,14,15
	2-way Turn, or Turn + Turnout	16,17,18,19
E *(max.)*	Crossing, Turn + Turnout Combination	20,21,22,23,24,25

** For diagrams of intersections types 1-25, see pages 3.3-50 through 3.3-54*

Crossing: Condition where two or more ETB routes cross at an intersection, for either 1-way or 2-way movement along either street. No turns onto cross streets occur here.

Single Turn: Condition where an ETB route must turn onto a cross street. This can occur either as a left turn or right turn movement through the intersection.

Turnout or Converging Lines: Condition where a route turns out onto a cross street or turns left onto a cross street. A route can turnout of a 1-way or 2-way route, or can converge into a 1-way or 2-way route. No crossings occur in this condition. In order to execute a turnout a switch is required in order to establish which diverging line a bus will follow.

Crossing + Turn (or Turnout) Combination: Condition where an ETB route must turn onto a cross street. This can occur either as a left turn or right turn movement through the intersection and requires a single crossing over another ETB route.

2-way Turn: Condition where 2-way movement turns through an intersection.

Turn + Turnout Combination: Condition where both a turn movement and a turnout onto a cross street are required.

Crossing, Turn + Turnout Combination: Condition where a crossing, turn and turnout onto a cross street are required.

5. Examples of Each Complex Intersection Type

On the following pages (3.3-19 through 3.3-24), examples of each category from A through E have been selected to explain the variables for each complex intersection type and to describe the typical level of impact for that category. There is one example for Categories A, B, C, and E, and two examples for Category D.

For each example, information is given about all three variable factors discussed previously in Subsection 3. The location of the trolley wires is shown first. This is followed by an engineering schematic indicating one possible version of the support structure. Finally a list of required hardware is given. The quantity and location of hardware is not shown.

For each example, a photograph is shown of a similar intersection condition in San Francisco, Seattle or Vancouver, cities that already have ETB systems in place. These should be considered worst case examples, since in general these systems are not recent and in general were not subject to environmental review.

Following these examples, two tables are presented which indicate the extent of complex intersections as a percentage of all intersections, both system-wide and on a route by route basis (page 3.3-25).

Impact Level A
(Complex Intersection Type 3)

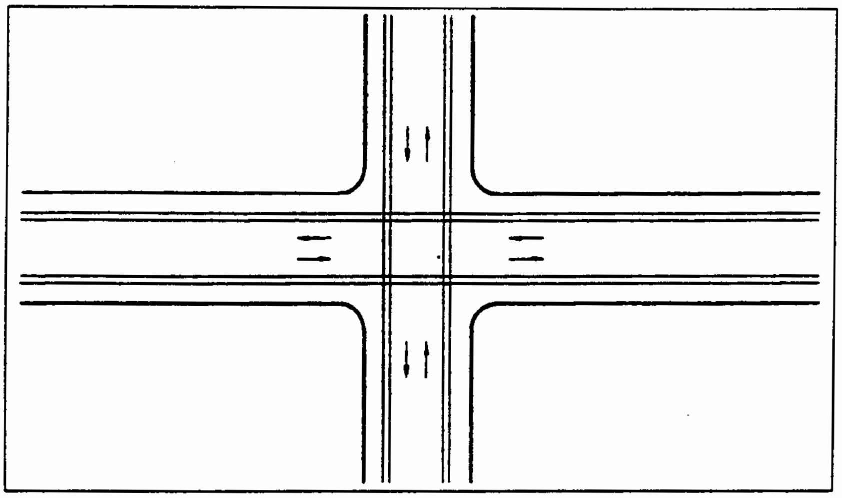


Fig. 3.3-10:
Trolley Wire Diagram

This condition is representative of intersections where no turns are required. Contact wires are required to cross so insulators will be necessary.

Required Hardware:
- ***Insulators***
- ***Crossing Castings***

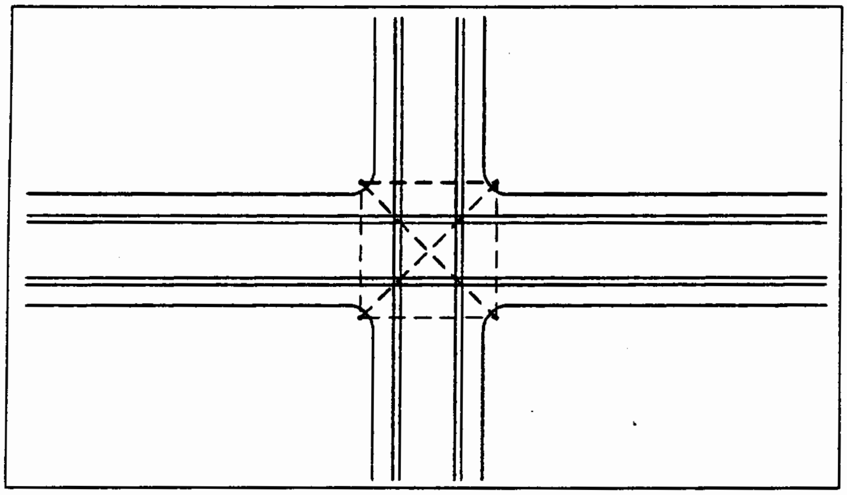


Fig. 3.3-11:
Support System Diagram

This schematic diagram shows a generic engineering solution for supporting trolley wires in the configuration shown above. Actual solutions will be specific to each intersection because of variables such as roadbed and sidewalk width, the use of cross spans or bracket arms and the selection of hardware manufacturer.

Fig. 3.3-12:
Two routes crossing (only one direction is visible)
(Vancouver)

Impact Level B
(Complex Intersection Type 4)

Fig. 3.3-13:
Trolley Wire Diagram

This condition is representative of an intersection where a turning motion is required onto a cross street. The contact wires are required to following a turning radius through the intersection so a more complex support system is required than at a crossing.

Required Hardware:
- ***Curve segments***

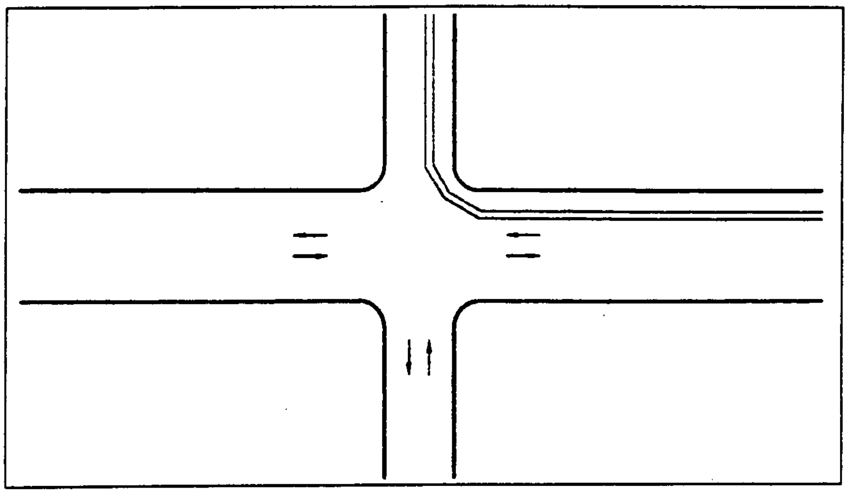


Fig. 3.3-14:
Support System Diagram

This schematic diagram shows a generic engineering solution for supporting trolley wires in the configuration shown above. Actual solutions will be specific to each intersection because of variables such as roadbed and sidewalk width, the use of cross-spans or bracket arms and the selection of hardware manufacturer.

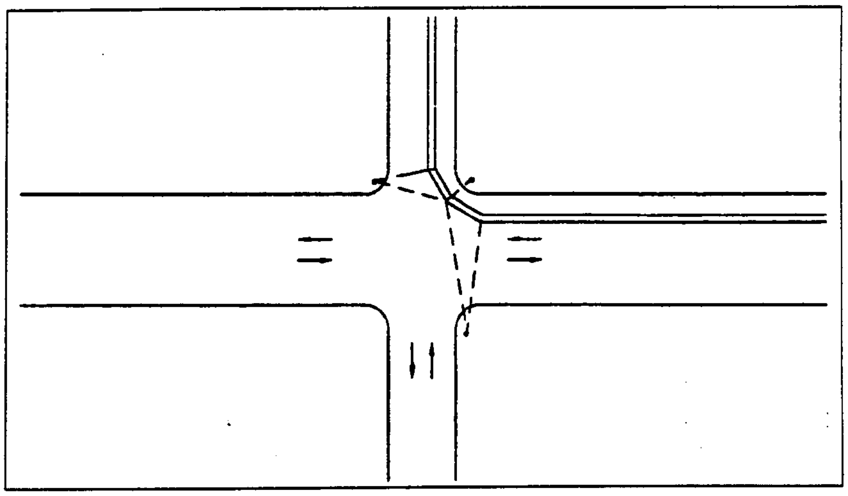


Fig. 3.3-15:
One-way right turn (Vancouver)

Impact Level C
(Complex Intersection Type 8)

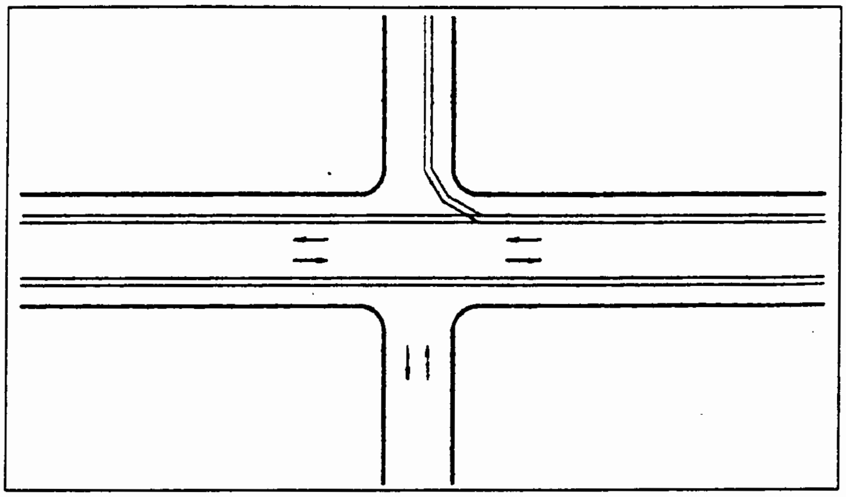


Fig. 3.3-16:
Trolley Wire Diagram

This condition is representative of intersections where turnouts or converging lines occur. Where diverging lines occur, a switch is required to perform the necessary movements.

Required Hardware:
- ***Insulators***
- ***Switch***
- ***Curve segments***
- ***Wire Frogs***
- ***Crossing Castings***

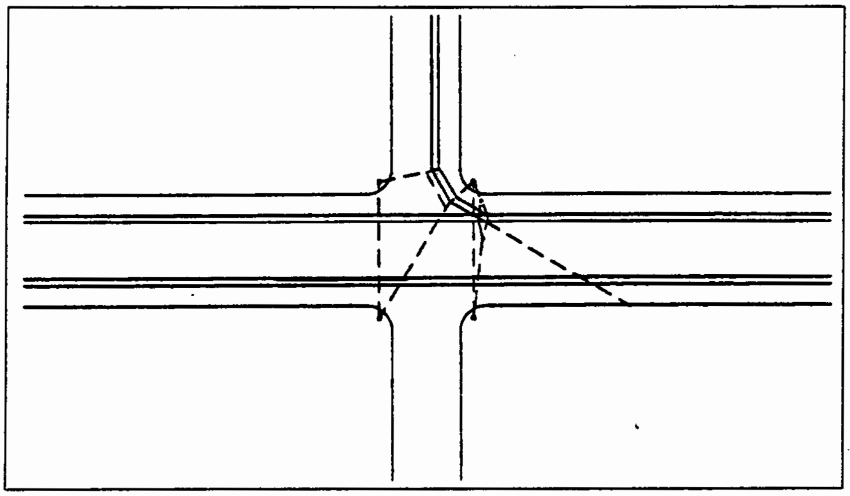


Fig. 3.3-17:
Support System Diagram

This schematic diagram shows a generic engineering solution for supporting trolley wires in the configuration shown above. Actual solutions will be specific to each intersection because of variables such as roadbed and sidewalk width, the use of cross-spans or bracket arms and the selection of hardware manufacturer.

Fig. 3.3-18:
One-way right turn onto two-way street
(Vancouver)

Impact Level D
(Complex Intersection Type 14)

Fig. 3.3-19:
Trolley Wire Diagram

This condition is representative of an intersection where a combination of crossing routes and and a turn (or turnout) movement are required.

Required Hardware:
- ***Insulators***
- ***Curved segments***

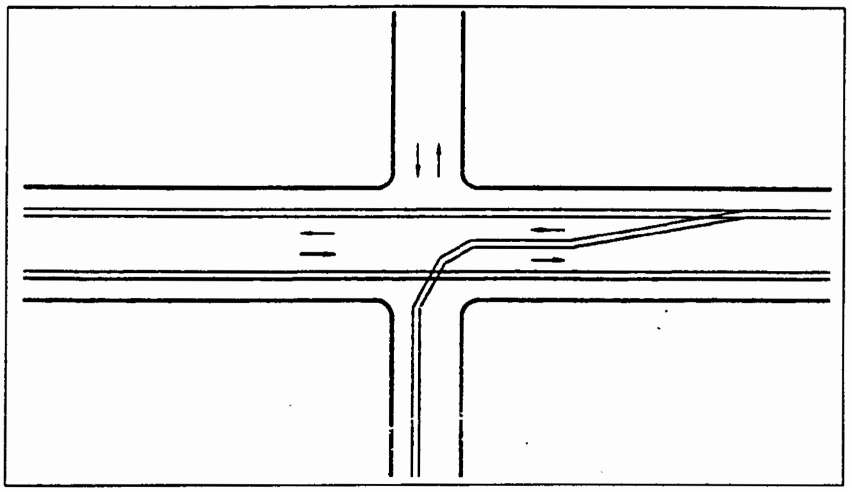
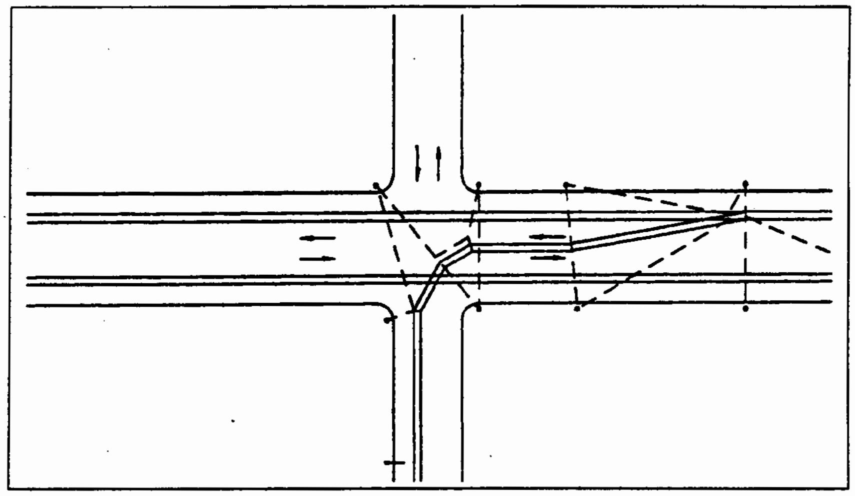


Fig. 3.3-20:
Support System Diagram

This schematic diagram shows a generic engineering solution for supporting trolley wires in the configuration shown above. Actual solutions will be specific to each intersection because of variables such as roadbed and sidewalk width, the use of cross-spans or bracket arms and the selection of hardware manufacturer.



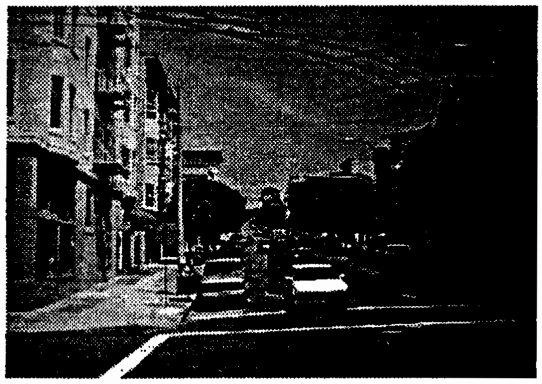


Fig. 3.3-21:
One-way left turn from two-way street with through movement

Impact Level D
(Complex Intersection Type 16)

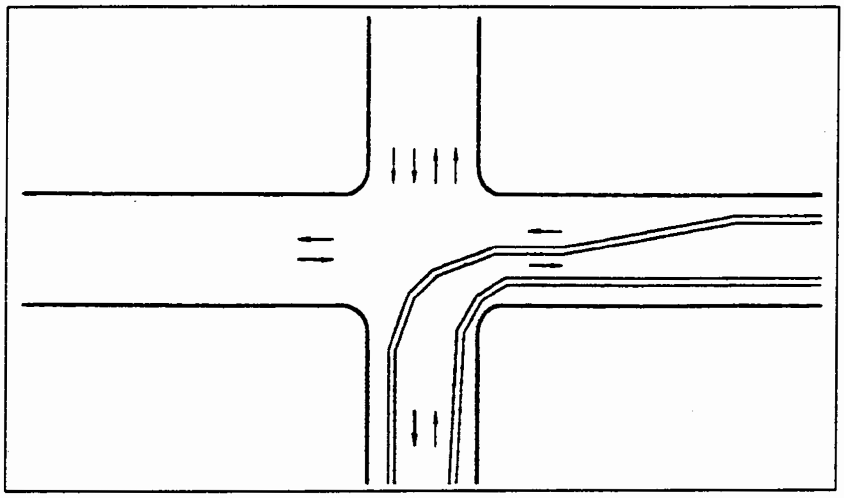


Fig. 3.3-22:
Trolley Wire Diagram

This condition is representative of an intersection where either a 2-way turn through an intersection, or a combination of turn and turnout are required. At a turnout, where diverging lines occur a switch is required to perform the necessary movements.

Required Hardware:
- ***Curved segments***
- ***Switch***

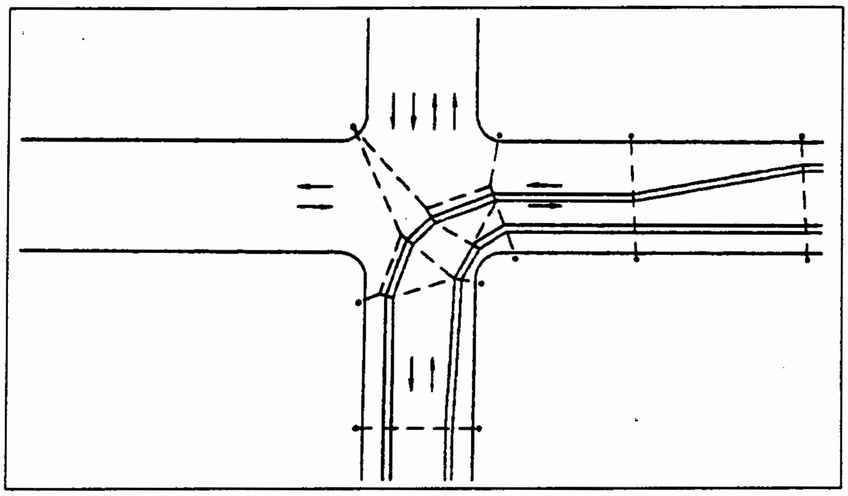


Fig. 3.3-23:
Support System Diagram

This schematic diagram shows a generic engineering solution for supporting trolley wires in the configuration shown above. Actual solutions will be specific to each intersection because of variables such as roadbed and sidewalk width, the use of cross-spans or bracket arms and the selection of hardware manufacturer.

Impact Level E
(Complex Intersection Type 21)

Fig. 3.3-24:
Trolley Wire Diagram

This condition is representative of an intersection where a combination of crossing routes, turn and turnout movement are required. Where diverging lines occur, a switch is required to perform the necessary movements.

Required Hardware:
- ***Insulators***
- ***Switch***
- ***Curved segments***

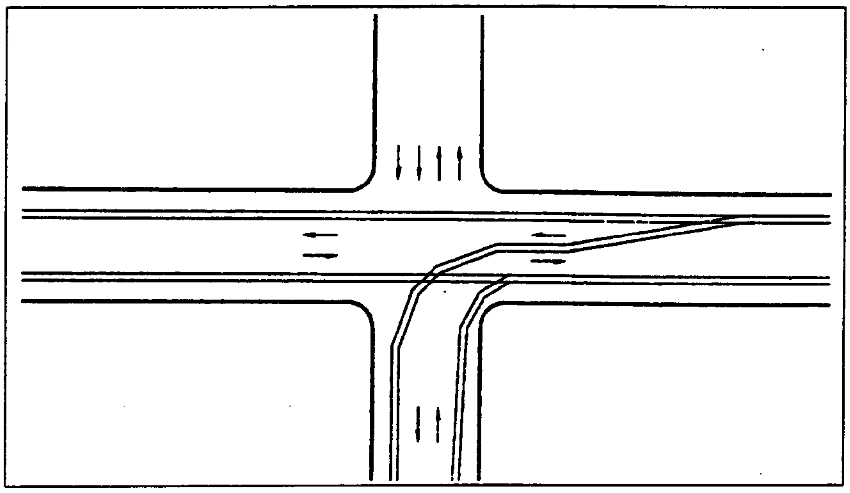


Fig. 3.3-25:
Support System Diagram

This schematic diagram shows a generic engineering solution for supporting trolley wires in the configuration shown above. Actual solutions will be specific to each intersection because of variables such as roadbed and sidewalk width, the use of cross-spans or bracket arms and the selection of hardware manufacturer.

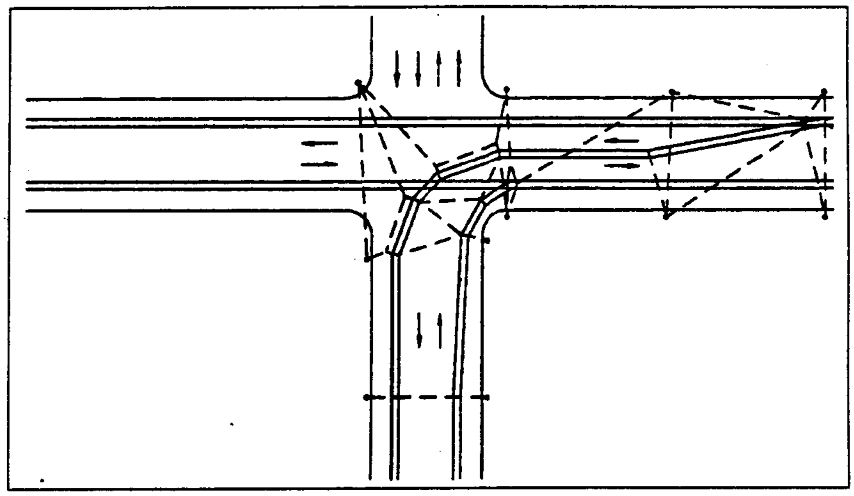


Fig. 3.3-26:
Two-way 90° right turn
(San Francisco)

Table 3.3-2:
Summary of Complex Intersections System-Wide

Impact Level	Total No. in ETB System	Percentage of Type Relative to All Complex Intersections	Percentage of Type Relative to All ETB intersections
A	12	5%	0.5 %
B	75	33%	2.9 %
C	27	12%	1.0 %
D	72	32%	2.8 %
E	39	17%	1.5 %
Total	225	100%	8.7 %

Table 3.3-3:
Summary of Complex Intersections by Route

Route Number	Total No. of Intersections	Total No. of Complex Intersections	Complex Intersections as Percentage of all Intersections
RTD 16	168	25	15 %
RTD 18	208	14	7 %
RTD 30/31	215	26	12 %
RTD 40	243	23	9 %
RTD 45	258	26	10 %
RTD 66/67	232	22	10 %
RTD 70	198	7	4 %
S-182	200	25	12 %
RTD 204	213	14	7 %
RTD 560	132	11	8 %
M 10	81	4	5 %
LB 40	112	14	13 %
LB 50	133	4	3 %
LB 60	103	2	2 %
LB 90	90	8	9 %
Total	2586	225	9 %

3.3.5 Mitigation (Visual)

The potentially significant visual impacts of the proposed Electric Trolley Bus (ETB) system occur at complex intersections where ETB routes make a turn, where they cross other ETB routes, or both. The potential for significant impact is increased if the intersection occurs in a historic district, or is occupied by a historic structure (see Section 3.8).

There are three types of possible mitigations at such intersections: 1) the reduction of the visibility of ETB wires and hardware, 2) the reduction of pole cluttering and 3) the improvement of the appearance of the ETB pole and its attachments. These are discussed below.

The effects of mitigation may be increased if combined with a program of streetscape enhancements. This is discussed below.

---

a. Mitigation of Potentially Significant Impacts

1. Reduce Visibility of ETB Wires and Hardware

At complex intersections, trolley wires, electrical hardware and supporting structures such as guy wires or bracket arms will be visible from many vantage points. They will often be silhouetted against the sky, which makes them especially apparent. It may be possible to reduce the size and number of suspended ETB elements. It may also be possible to reduce the number of vantage points from which they are visible. However, their presence cannot be completely mitigated.

- **Encourage Innovative Hardware Design**

Incentives for research and development of innovative hardware designs that reduce volume and weight, and use materials that can vary in color would help mitigate the visual impact created by suspended hardware required at complex intersections where ETB routes make a turn, cross another ETB route, or both. A reduction in volume or change in the shape would help to reduce the profile of the hardware when silhouetted against the sky. A reduction in hardware weight would reduce the number and/or density of cross-span support wires required at those locations. Materials that allow for variations in color could help to reduce the visibility of the hardware through camouflage effects.

- **Use Synthetic Wire**

The use of a new type of synthetic strand wire that has the equivalent strength of steel and also functions as a partial insulator would reduce the amount of necessary insulating hardware on trolley wires. With reduced hardware requirements, fewer cross-spans and guy wires would be required at complex intersections. This material is currently used in San Francisco but would require approval from the California Public Utilities Commission for use in the proposed project. The approval would be pursued for this project.

- **Use Insulated Intersection Crossings**

The use of an insulated intersection design avoids the need for special hardware above complex intersections. There is an additional cost associated with the installation of duct banks, conduits and cables under the streets adjacent to the intersection.

- **Plant Trees**

The planting of street trees may be effective in reducing the visibility of ETB wires and hardware. From certain vantage points, such as that of a motorist, the trees may provide a backdrop that camouflages the elements. From other vantage points, such as that of a pedestrian on the sidewalk, the trees may completely screen the view of the wire and hardware. However, such camouflage and screening effects may be difficult to achieve at complex intersections, especially where two major streets cross, because the open space of the intersection in general cannot be completely screened even by large trees. Furthermore, a complex intersection that also has narrow sidewalks makes mitigation more difficult, because there may not be adequate room for trees to mature into a full canopy.

Fig. 3.3-27:
ETB pole, bracket arm and trolley wires partly obscured by tree canopy at intersection

2. Reduce Pole Cluttering

- **Encourage the Joint Use of Poles**

The implementation of joint use of poles is contingent on obtaining agreements with other agencies. To present a worst case analysis, the impacts identified in the previous section assume that these agreements cannot be obtained and that joint use of poles cannot be implemented. If the necessary agreements can be obtained, joint use of poles would mitigate the significant impacts related to pole cluttering at complex intersections where ETB routes make a turn, cross another ETB route or both.

- **Seek Regular Pole Spacing**

The impression of pole cluttering may be reduced when poles are spaced at regular intervals with respect to each other and to poles on the opposite side of the street. Where engineering and other technical requirements permit a range of spacing options, regular and rhythmic spacing may mitigate the presence of the poles by imparting a sense of order to the streetscape.

Fig. 3.3-28:
Regular pole spacing (Long Beach)

3. Improve Pole Appearance

From certain vantage points, such as that of the motorist, poles are seen as groupings. From other vantage points, such as that of the pedestrian on the sidewalk, each pole may be viewed as an independent object on the sidewalk. An enhanced design for the ETB pole, through its color, texture, base and attachments (such as sidewalk lighting and decorative banners) may mitigate the appearance of the pole or constitute a net benefit, particularly if it jointly serves the needs of ETB, street lighting and traffic control. Toward this end, guidelines have been written for the development and manufacture of a new trolley pole with built-in adaptability for a wide array of joint-use applications such as roadway and sidewalk lighting, traffic signal suspension, street signs and decorative banners. The pole design is capable of variation according to the street type or historic character of a given segment.

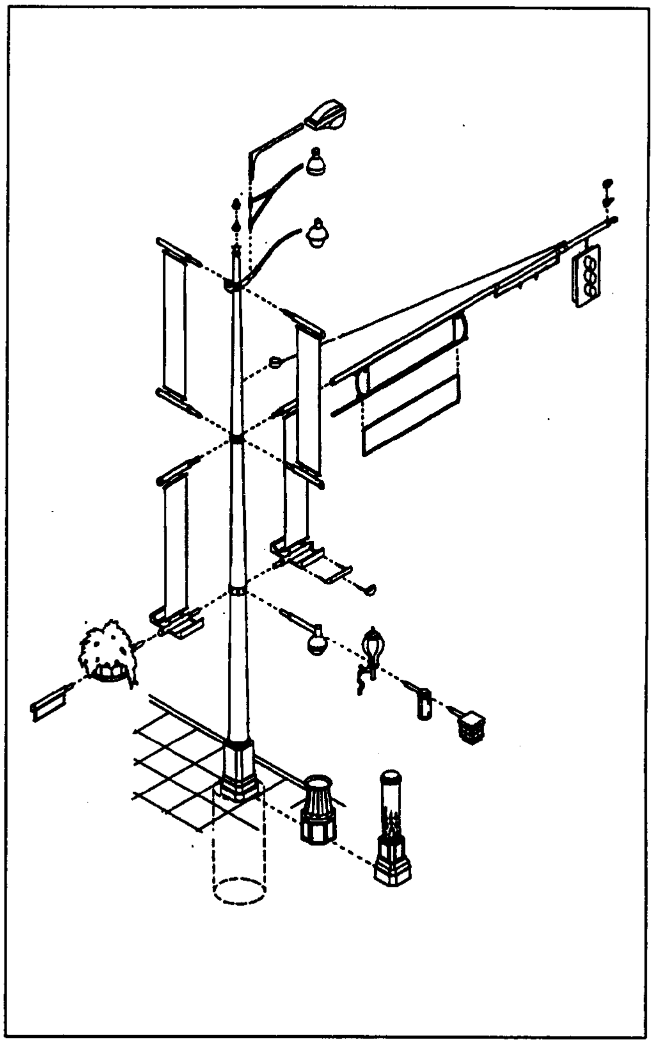


Fig. 3.3-29:
ETB "Flexipole" capable of variable attachments according to urban and community setting

b. System-Wide Streetscape Enhancements

The urban design component of the ETB project consists of a set of design elements that will be defined specifically during final design to reflect the needs and opportunities along each segment of the ETB routes. Included in the set of elements are: trees, ETB stops and shelters, sidewalk improvements, pole enhancements, design integration of sidewalk furniture, passenger information kiosks and other passenger and pedestrian amenities.

Communities through which the ETB routes pass will be consulted and encouraged to participate in the final selection of the urban design elements for their community. For budgeting purposes, an allowance of approximately 10 percent of the total project cost has been identified to provide for the urban design component.

The ETB project is seen as a potential catalyst for focusing greater attention and effort on improving the quality of the urban setting along the ETB routes and for increasing the use of public transit. Agreements will be sought with local cities that provide for local city support of transit and pedestrian enhancements that complement and build upon the improvements provided by the ETB project. These "Joint Participation Agreements" will detail arrangements for signal preemption, ETB lanes, ETB stop and shelter enhancements, etc. Issues such as maintenance of trees and pedestrian facilities included in the project or provided by the cities will be addressed in these agreements.

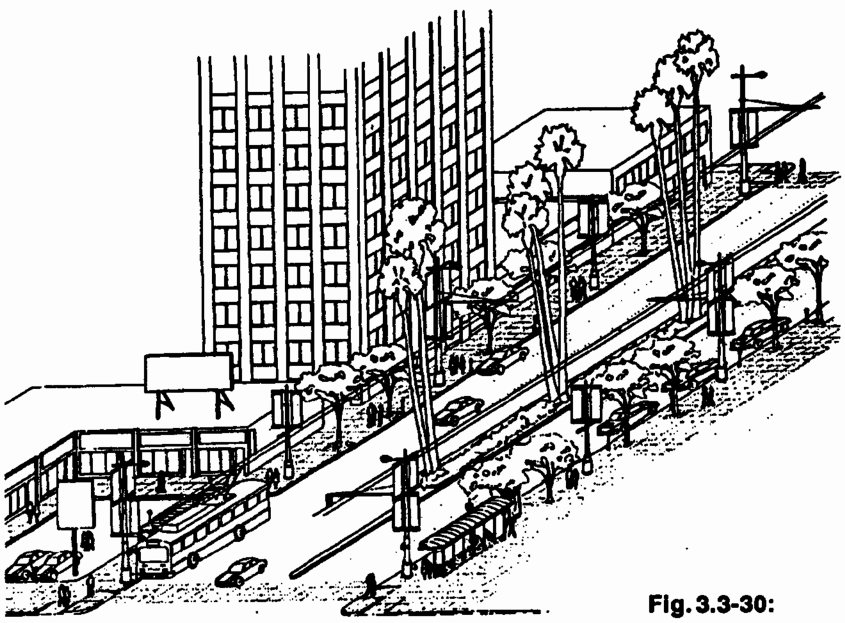
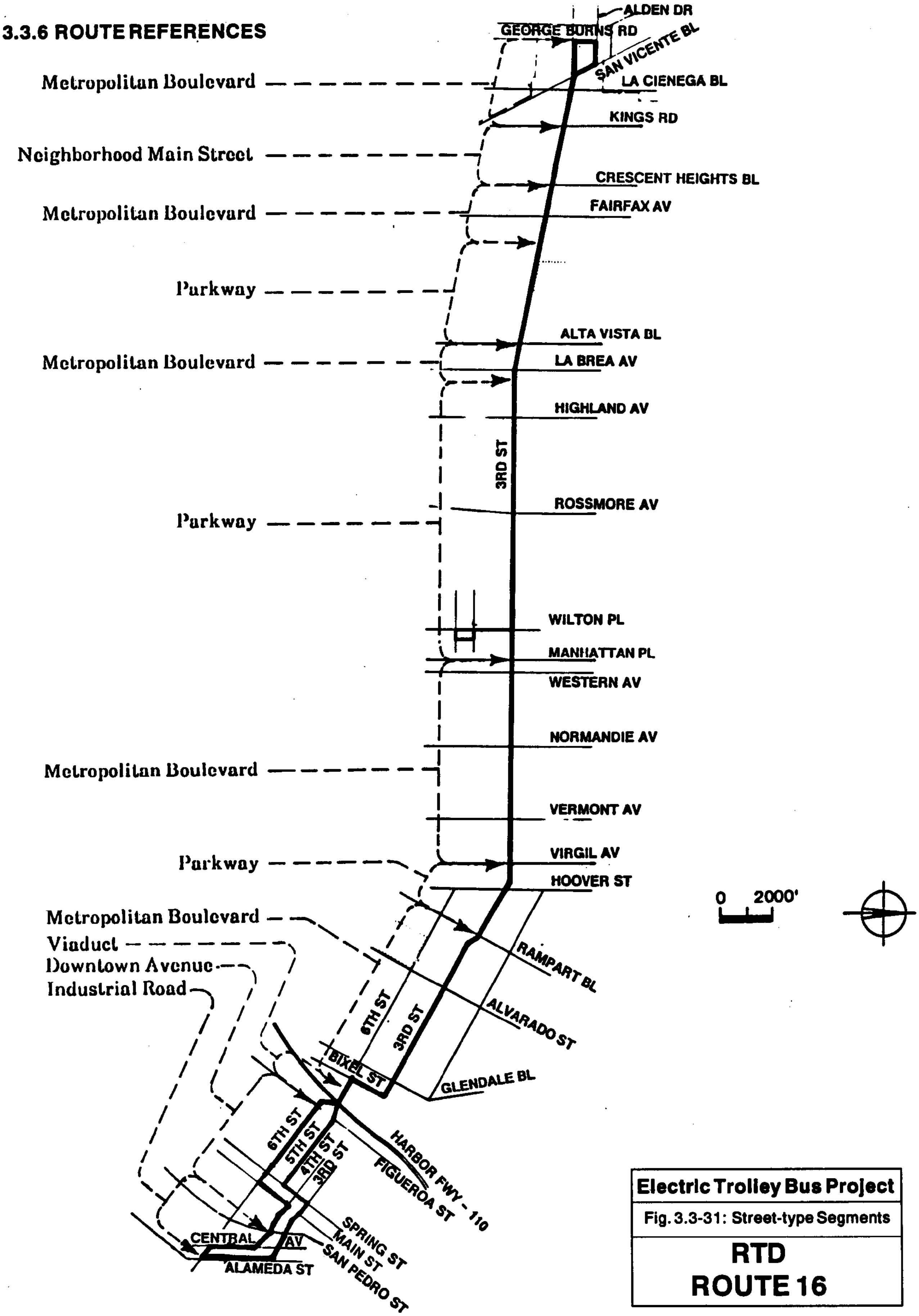


Fig. 3.3-30:
Metropolitan Boulevard setting showing ETB elements and streetscape enhancements based on a joint participation agreement between transit agency and communities

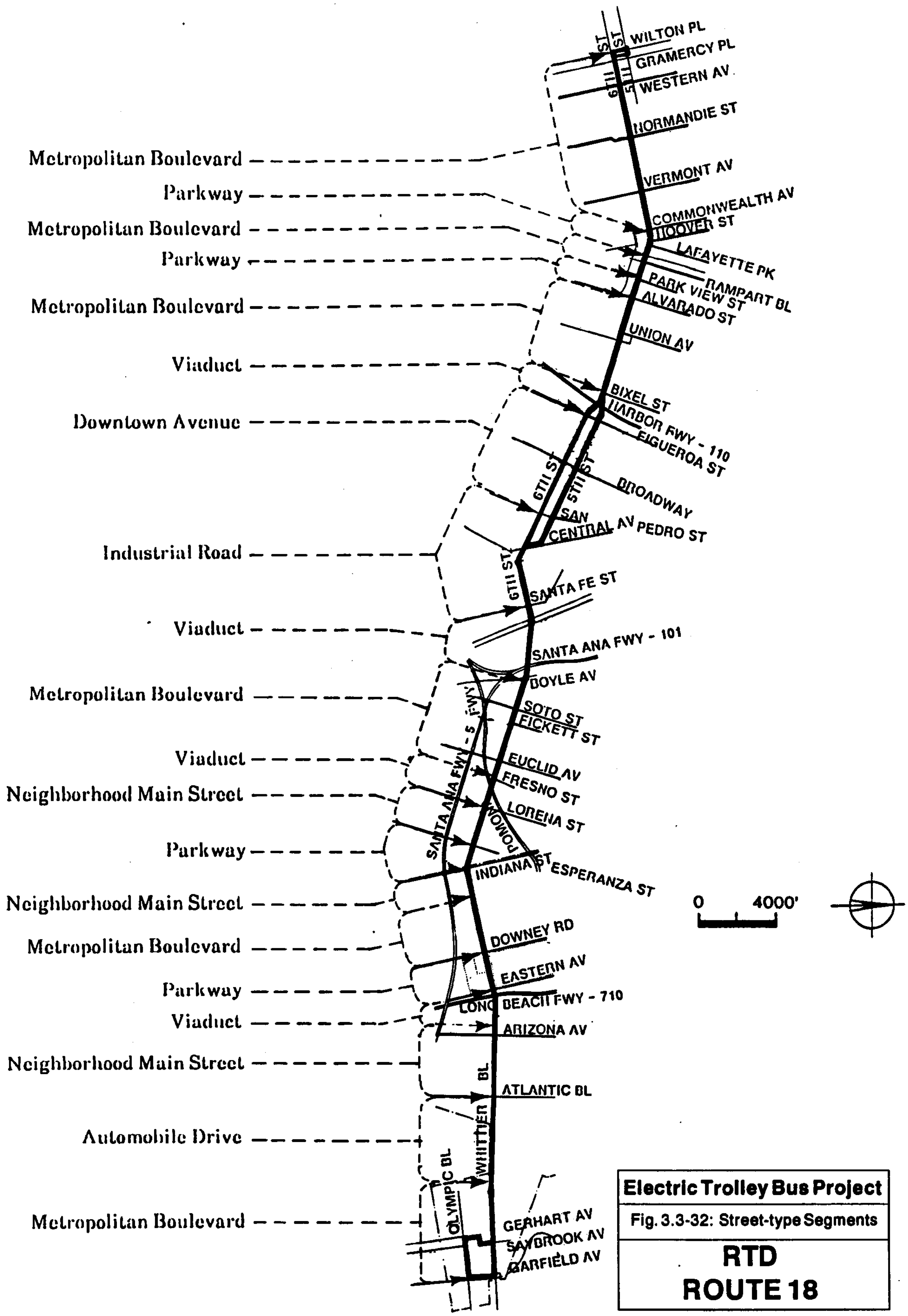
3.3.6 ROUTE REFERENCES



Electric Trolley Bus Project

Fig. 3.3-31: Street-type Segments

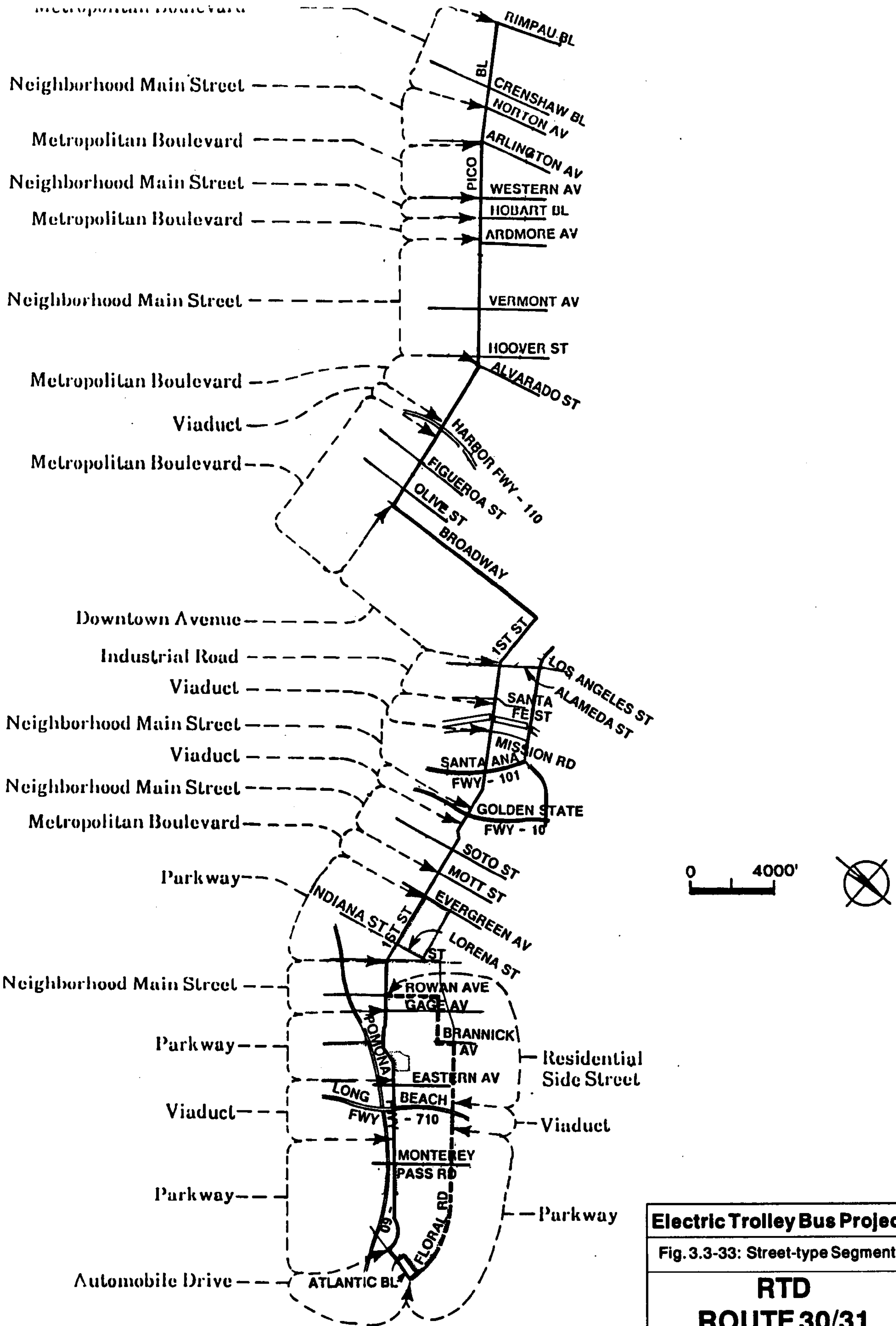
RTD ROUTE 16



Electric Trolley Bus Project

Fig. 3.3-32: Street-type Segments

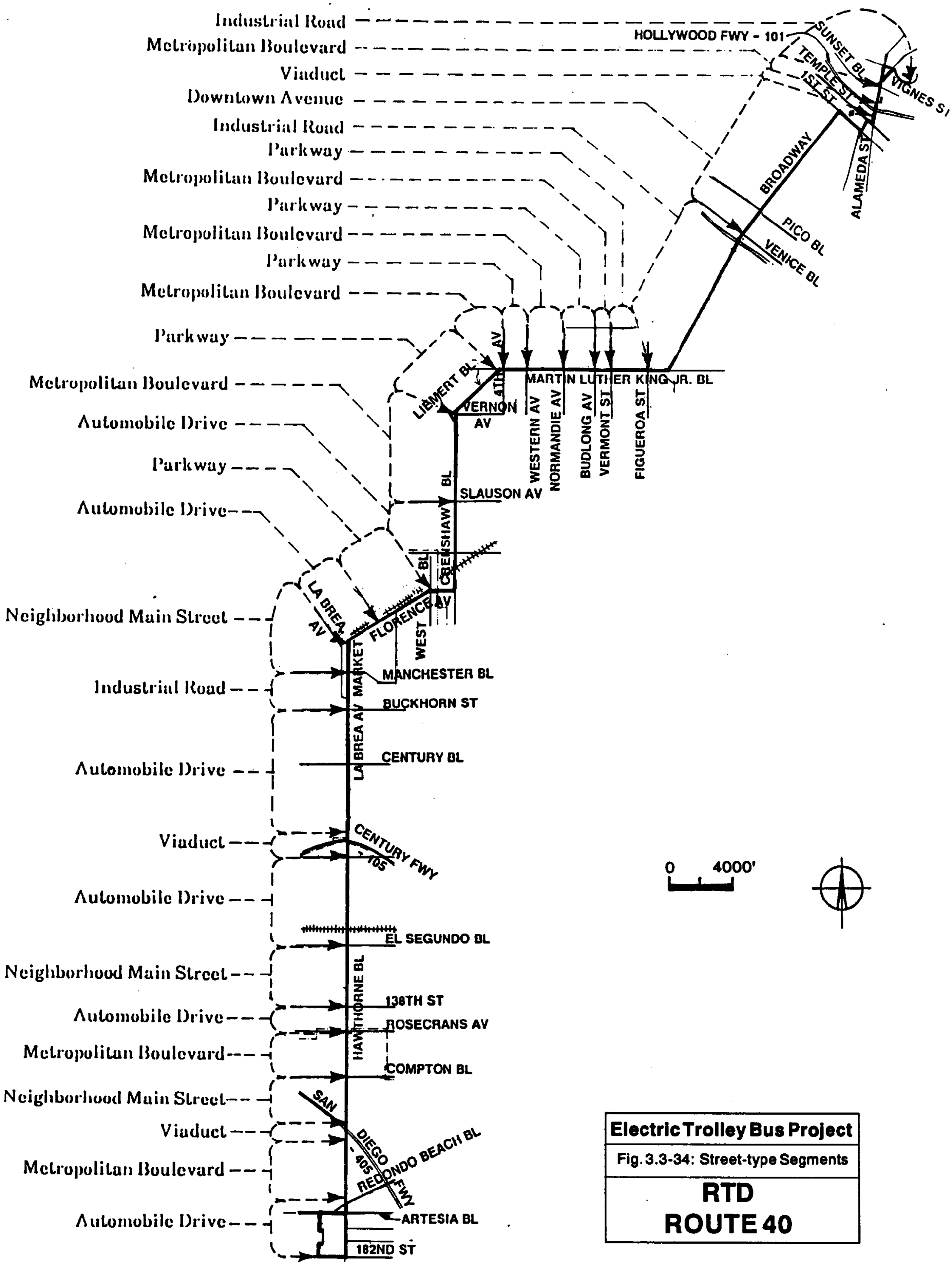
RTD ROUTE 18



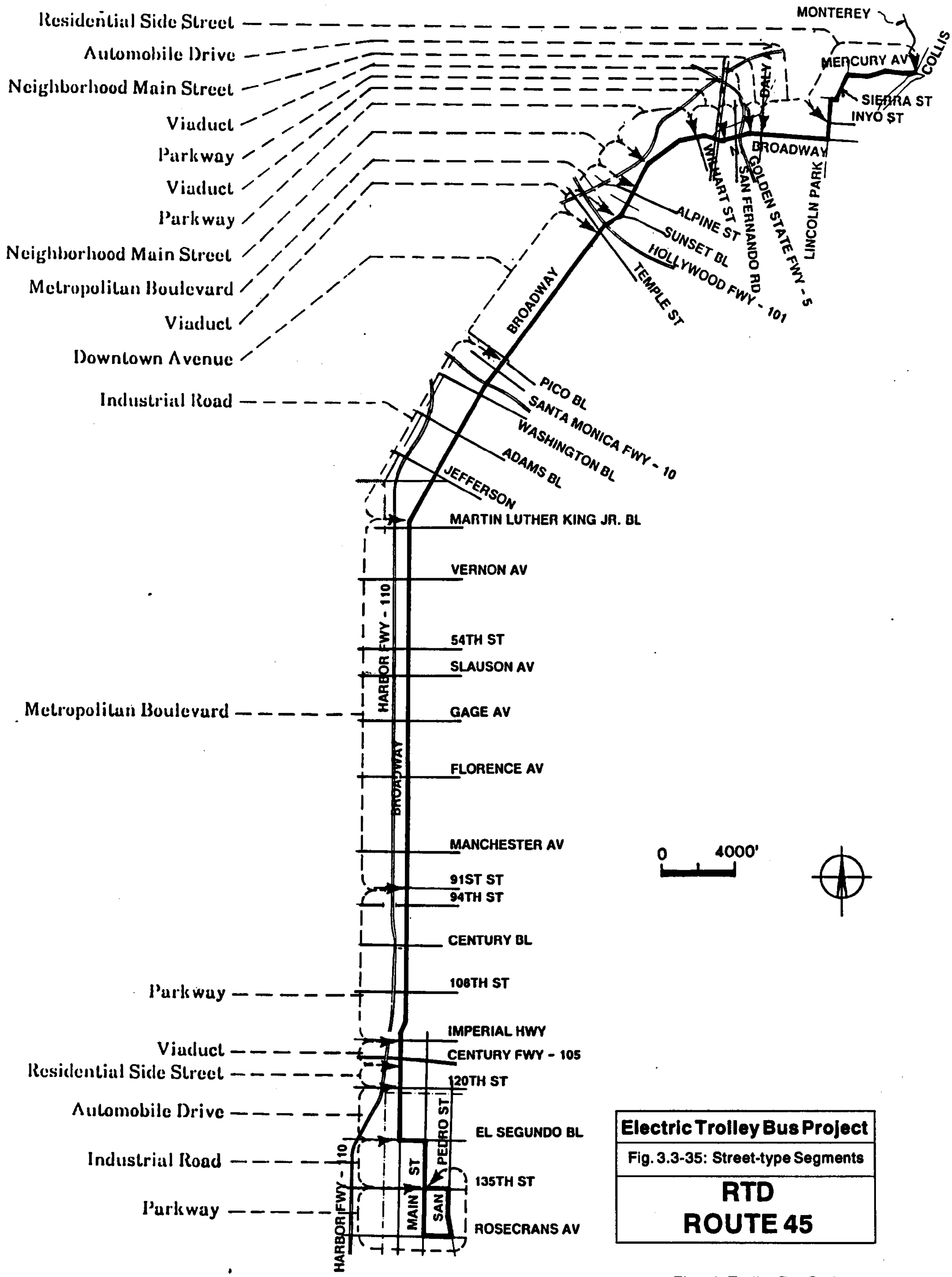
Electric Trolley Bus Project

Fig. 3.3-33: Street-type Segments

RTD
ROUTE 30/31



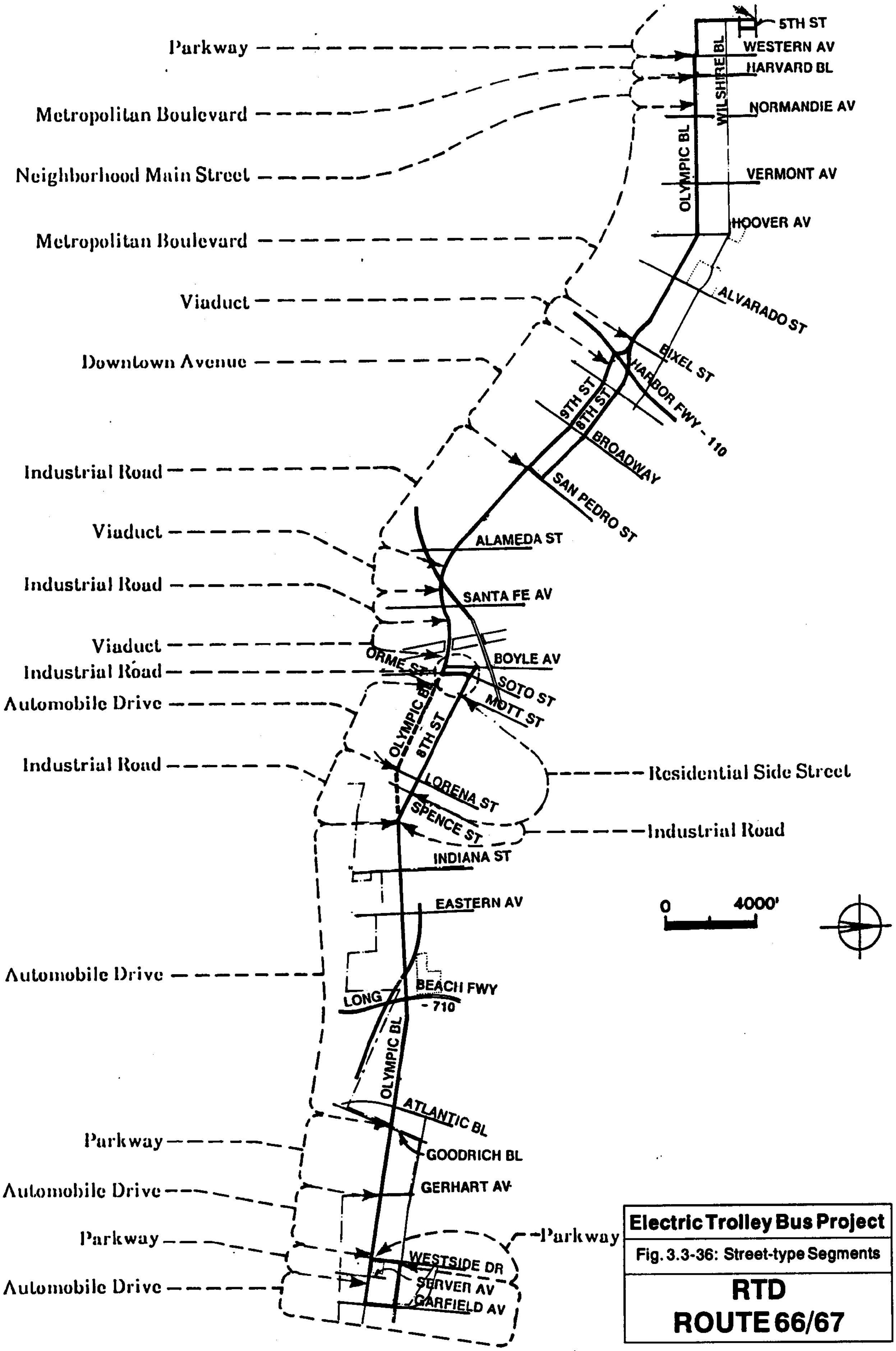
Electric Trolley Bus Project
Fig. 3.3-34: Street-type Segments
RTD ROUTE 40



Electric Trolley Bus Project

Fig. 3.3-35: Street-type Segments

RTD ROUTE 45



Electric Trolley Bus Project

Fig. 3.3-36: Street-type Segments

RTD
ROUTE 66/67

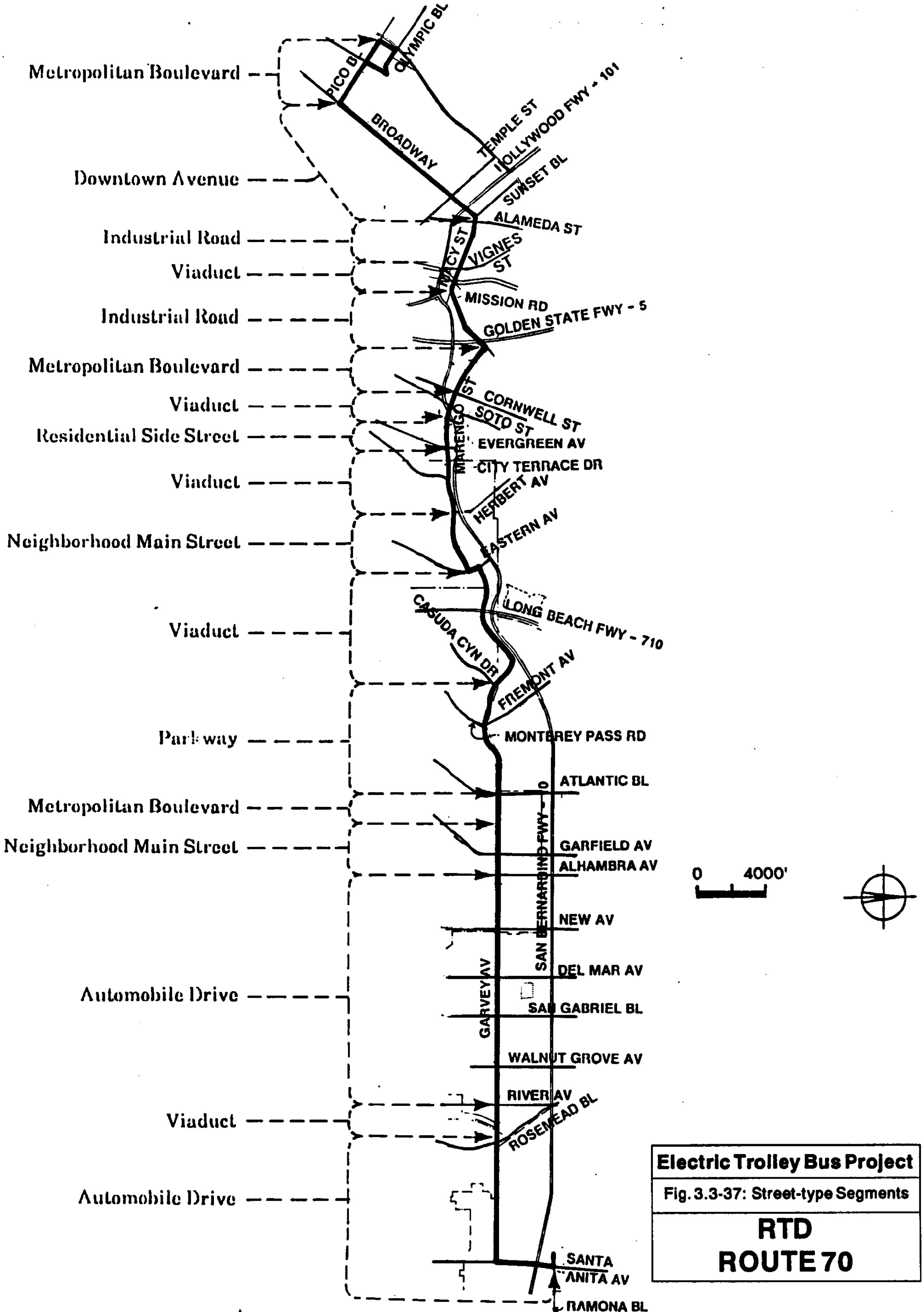


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Fig. 3.3-37: Street-type Segments

RTD ROUTE 70

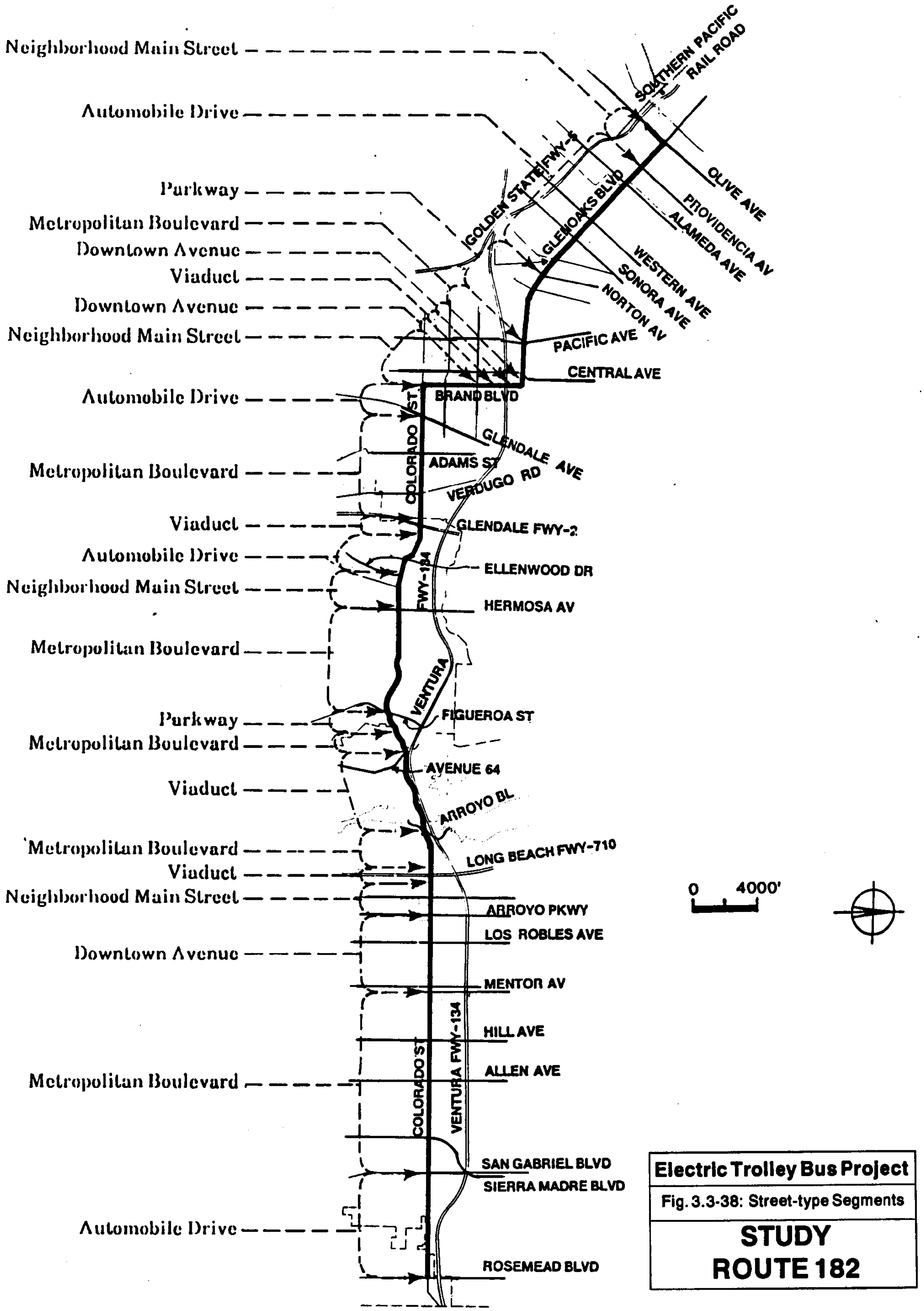

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Fig. 3.3-38: Street-type Segments

STUDY ROUTE 182

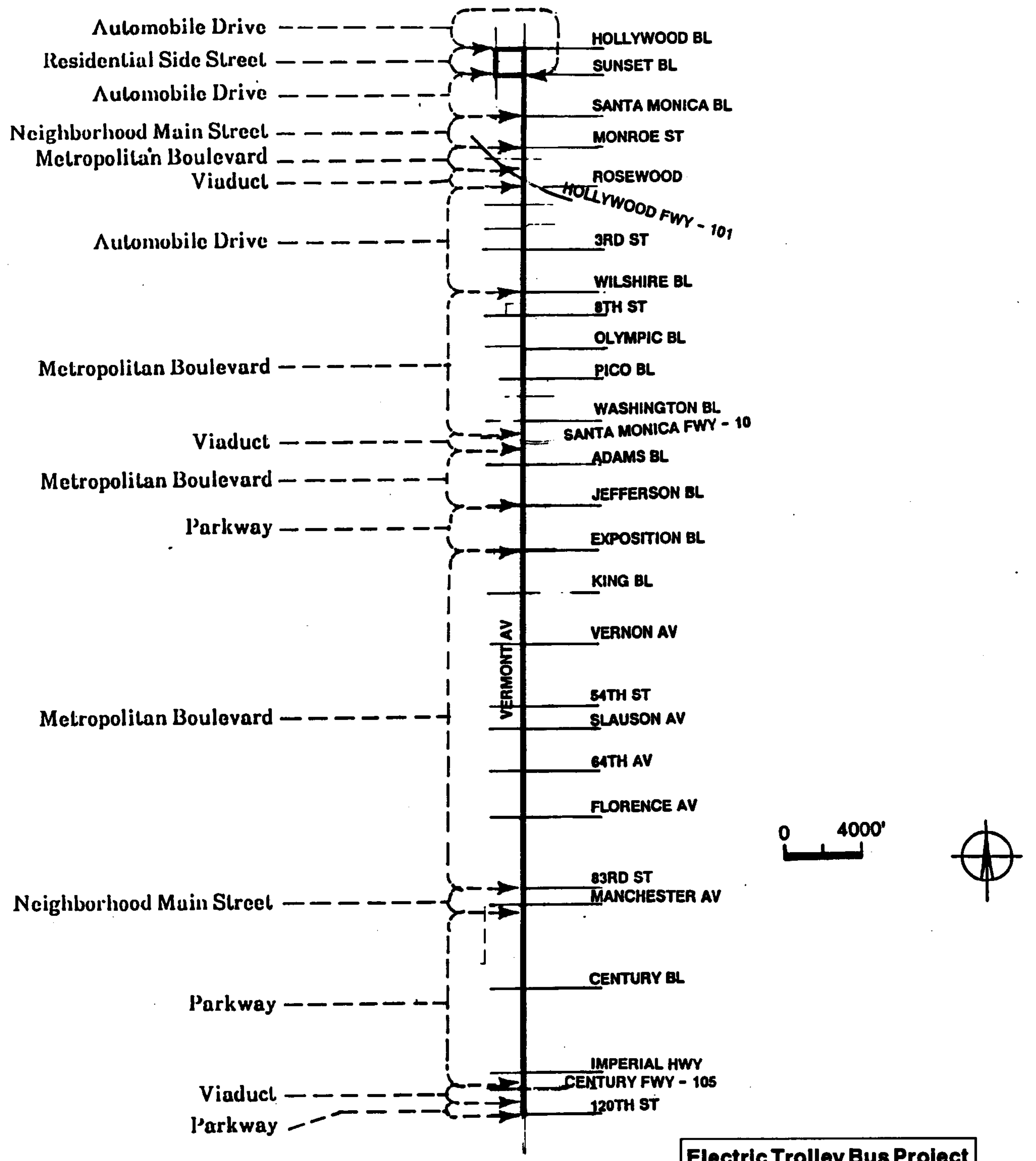

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Fig. 3.3-39: Street-type Segments

RTD ROUTE 204

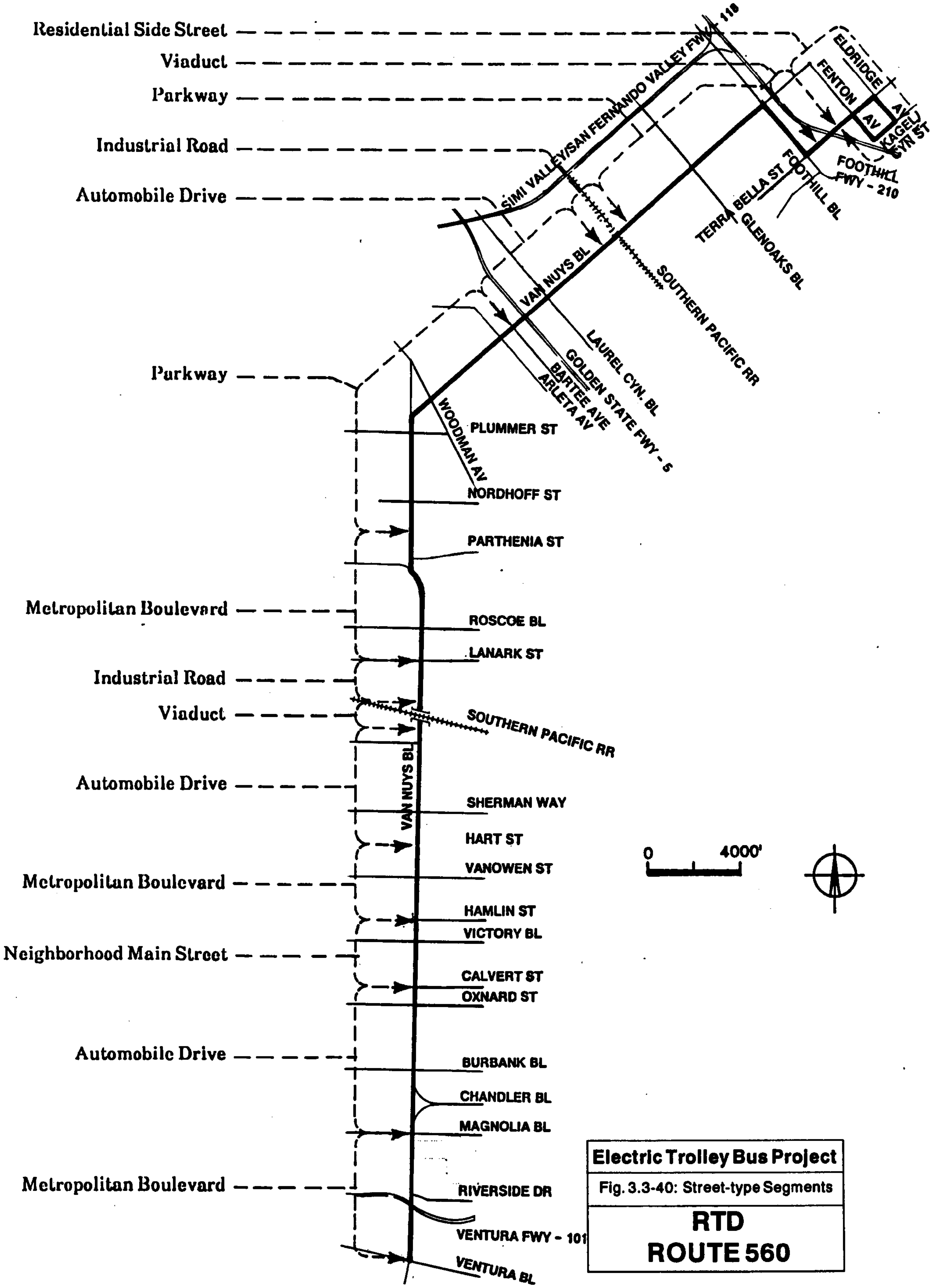

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Fig. 3.3-40: Street-type Segments

RTD ROUTE 560

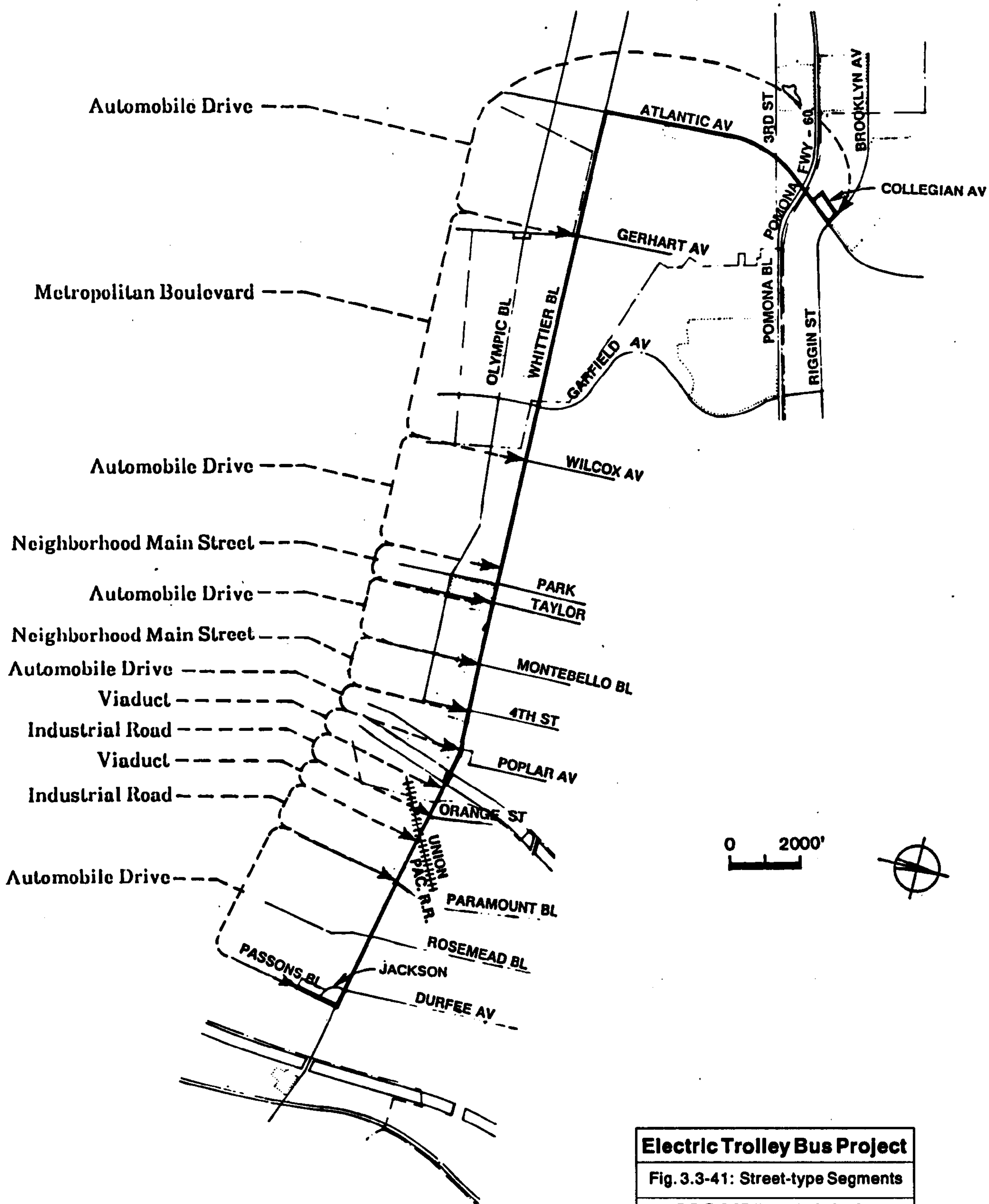

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Fig. 3.3-41: Street-type Segments

MONTEBELLO
ROUTE 10

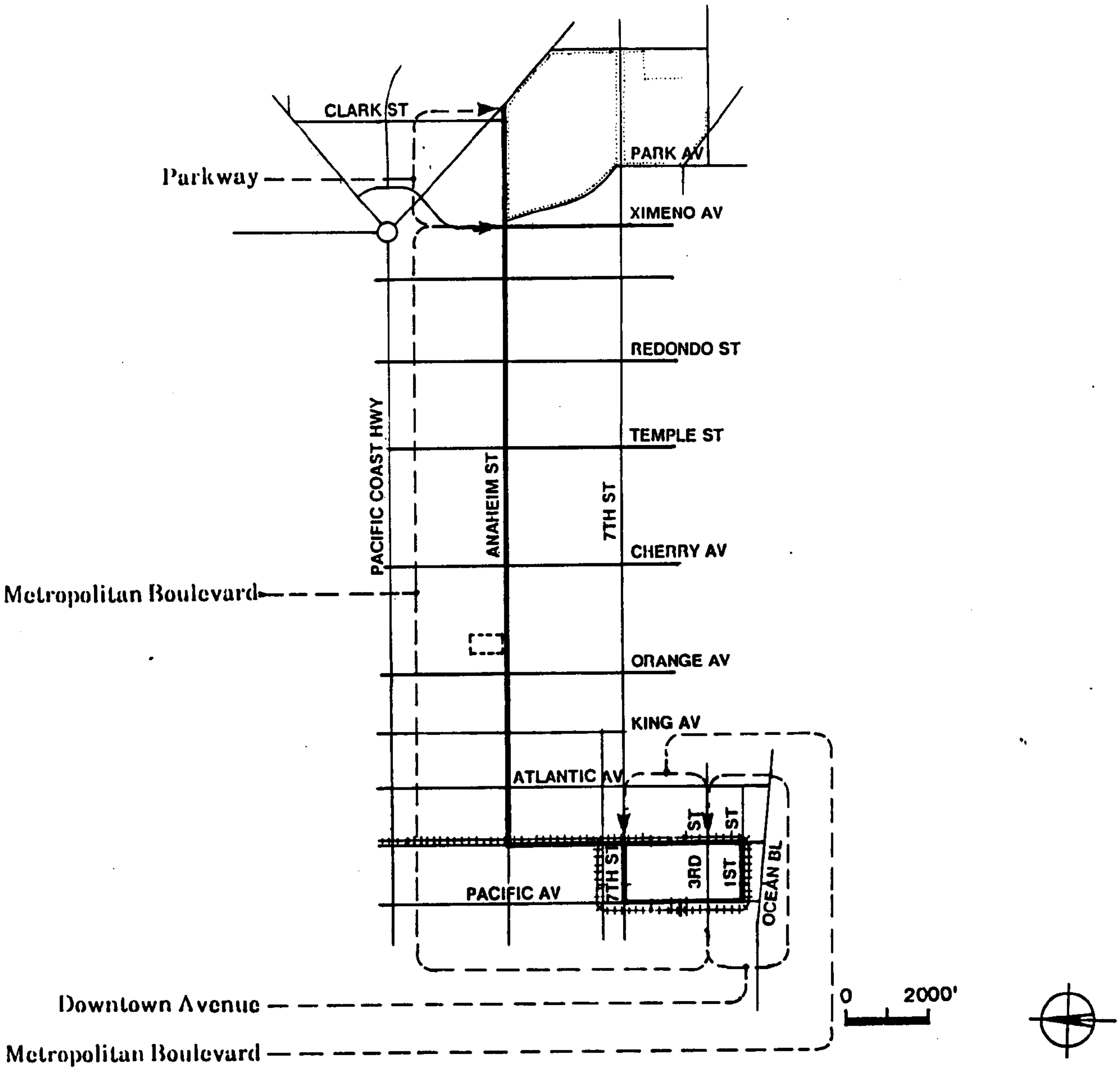

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Fig. 3.3-42: Street-type Segments

LONG BEACH ROUTE 40

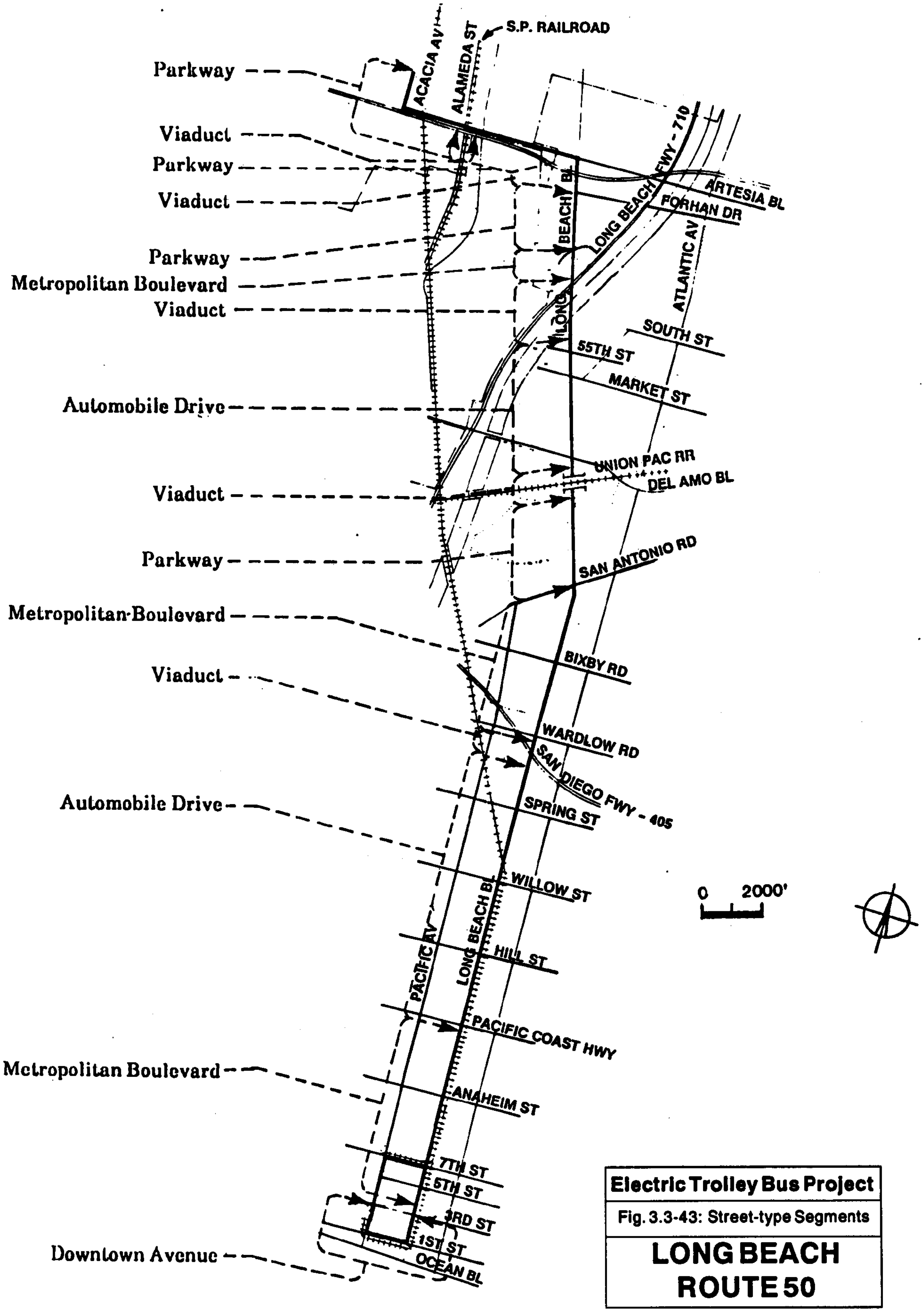

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Fig. 3.3-43: Street-type Segments

LONG BEACH ROUTE 50

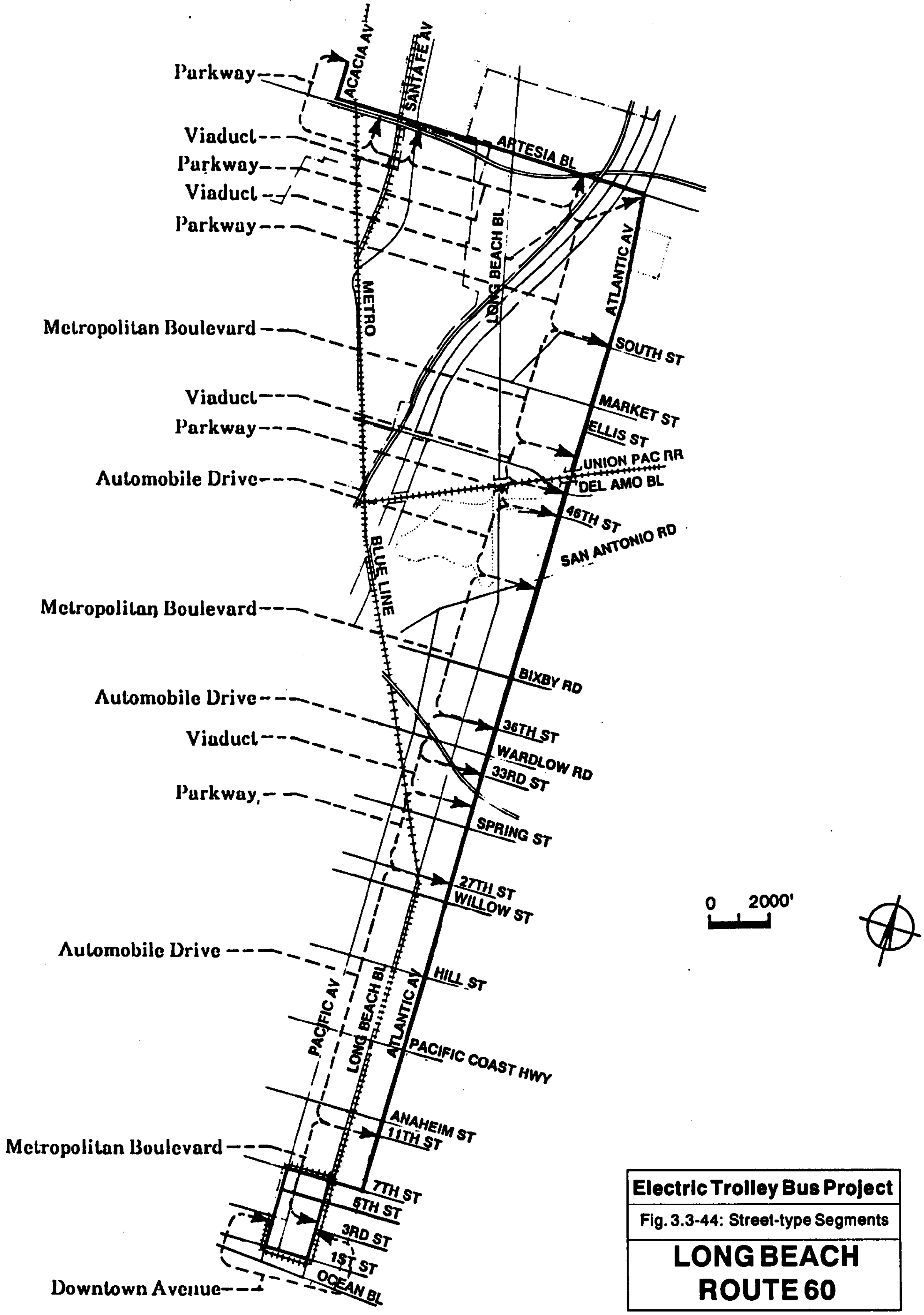

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Fig. 3.3-44: Street-type Segments

LONG BEACH ROUTE 60

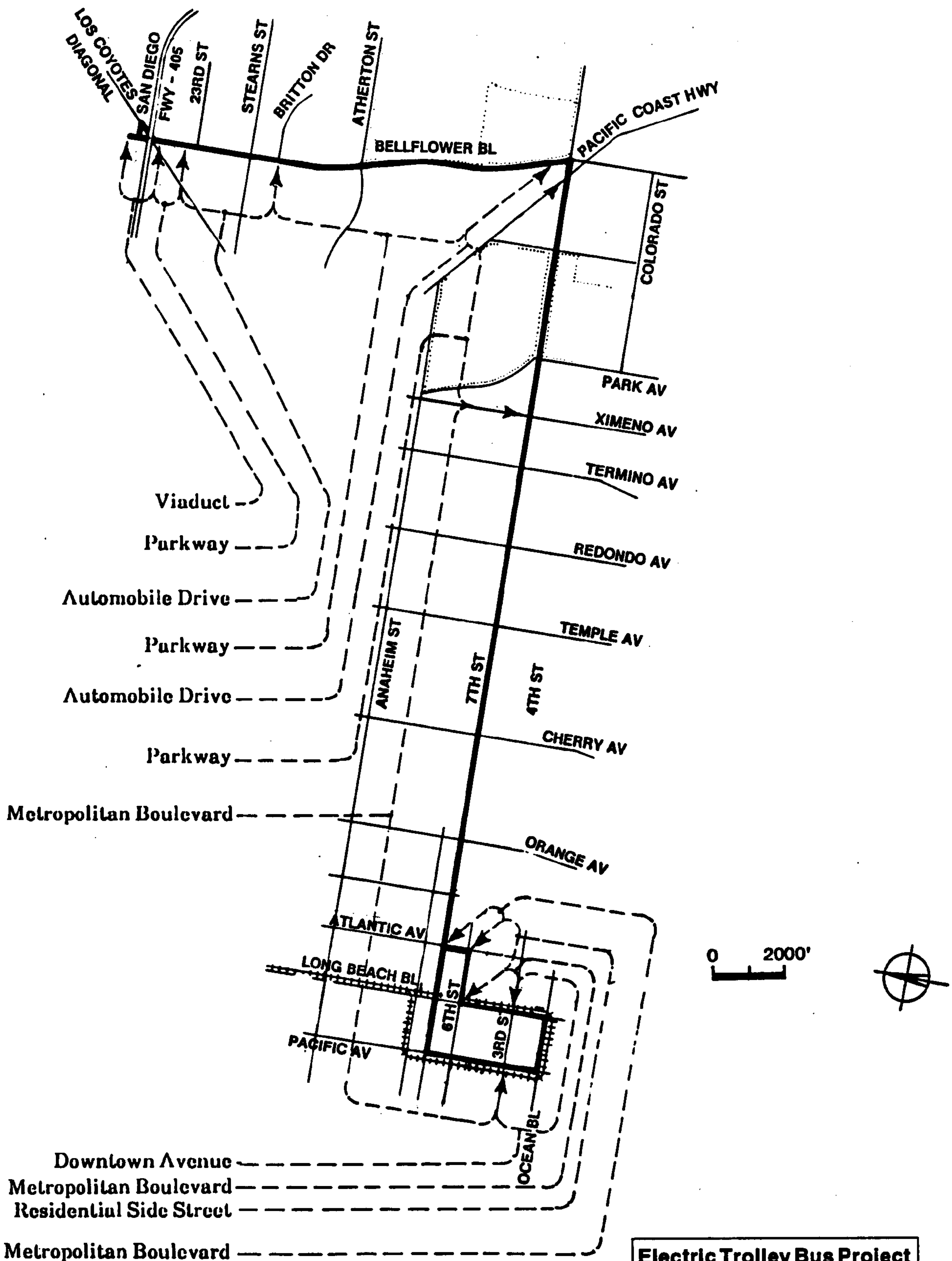

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Fig. 3.3-45: Street-type Segments

LONG BEACH ROUTE 90

Table 3.3-4
Intersections with Potentially Significant Impacts

Route	Street	Cross-Street	Condition	Impact Level	Type
RTD 16	3rd St.	George Burns	1-way right turn	B	4
	George Burns	Alden	1-way right turn	B	4
	Alden	San Vicente	1-way right turn	B	4
	San Vicente	3rd	1-way left turn into 2-way street	D	12
	3rd St.	Wilton	2-way 90° left turn	E	21
	3rd St.	Western	2-way 90° right turn	E	20
	6ht St.	Western	2-way 90° left turn	E	21
	3rd St.	Vermont	2-way 90° crossing, no turns	A	3
	3rd St.	Bixel	2-way turn	D	16
	Bixel St.	6th	Full Y-intersection	E	25
	6th St.	Broadway	2-way/1-way 90° crossing, no turns	A	2
	6th St.	Main	1-way left turn from 1-way or 2-way street	C	10
	Main St.	5th	1-way/1-way 90° crossing, no turns	A	1
	Main St.	4th	1-way right turn	B	4
	4th St.	San Pedro	1-way left turn from 1-way or 2-way street	C	10
	4th St.	Central	1-way to 2-way movement transition	D	18
	Central Ave.	5th	1-way left turn from 2-way street	D	13
	Central	6th	Full 'Y' 1-way thru movement & 1-way right turn	E	S
	6th St.	Alameda	1-way left turn from 2-way street with through movement	D	14
	Alameda	3rd	1-way left turn from 1-way or 2-way street	C	10
	3rd St.	Central	1-way/1-way 90° crossing, no turns	A	1
	3rd St.	San Pedro	1-way left turn into 1-way or 2-way street	C	11
	3rd St.	Spring	1-way left turn	B	5
	Spring St.	5th	1-way right turn into 1-way or 2-way street	C	7
	5th St.	Broadway	2-way/1-way 90° crossing, no turns	A	2
RTD 18	Whittier Blvd.	Garfield	2-way 90° right turn	E	20
	Garfield Ave.	Olympic	2-way turn	D	16
	Olympic Blvd.	Westside	Two 1-way left turns & 1-way thru movement	D	S
	Westside Dr.	Northside	1-way left turn into 2-way street	D	12
	Northside Dr.	Saybrook	1-way right turn	B	4
	Saybrook	Whittier	1-way right turnfrom 2-way street	C	8
	6th St.	Layfayette	1-way left turn from 2-way street with through movement	D	14
	Layfayette	Wilshire	1-way right turn	B	4
	Wilshire	Commonwealth	1-way right turn	B	4
	Commonwealth	6th St.	1-way right turn into 2-way street	C	9
	Vermont Ave.	6th	2-way 90° crossing with left turn	D	S
	RTD R.O.W.	6th	1-way right turn into 1-way or 2-way street	D	18
	6th St.	Wilton	Half Y-intersection - out of 1-way movement	E	22
	Wilton	5th	Half Y-intersection - into 1-way movement	E	23
RTD 30/31	Pico Blvd.	Rimpau	2-way turn	D	16
	Pico Blvd.	Vermont	2-way 90° crossing, no turns	A	3
	Pico Blvd.	Sentous	Half Y-intersection - into 1-way movement	E	23
	Pico Blvd.	Figueroa	Half Y-intersection - out of 1-way movement	E	22
	Figueroa	11th	1-way left turn	B	5
	11th St.	Sentous	1-way left turn	B	5

Route	Street	Cross-Street	Condition	Impact Level	Type
RTD	Pico Blvd.	Flower	Blue Line crossing	E	S
30/31	Pico Blvd.	Broadway	Full 'Y' intersection	E	25
Cont.	Broadway	9th	2-way/1-way 90° crossing, no turn	A	2
	Broadway	8th	2-way/1-way 90° crossing, no turn	A	2
	Broadway	1st	2-way 90° right turn	E	20
	1st	Central	Half Y-intersection - out of 1-way movement	E	22
	1st	Alameda	2-way left turn and half 'Y'	E	S
	Central Ave.	Traction	1-way left turn from 1-way or 2-way street	C	10
	Traction Ave.	Alameda	1-way left turn into 1-way or 2-way street	C	11
	1st	Mission	Full 'Y' intersection	E	25
	1st	Rowan	2-way 90° left turn	E	21
	Rowan	Dozier	1-way right turn from 2-way street	C	8
	Rowan	Hammel	2-way turn	D	16
	Hammel	Brannick	2-way turn	D	16
	Brannick	Floral	2-way turn	D	16
	Floral	Collegian	1-way to 2-way movement transition	D	18
	Collegian	Roggin	1-way left turn	B	5
	Roggin	Atlantic	2-way to 1-way movement transition	D	19
	Atlantic	Floral	1-way left turn	B	5
	1st	Atlantic	2-way 90° right turn	E	20
RTD	Hawthorne	182nd	1-way right turn	B	4
40	182nd	Kingsdale	1-way right turn	B	4
	Kingsdale Ave.	Artesia	1-way right turn	B	4
	Artesia Blvd.	Hawthorne	1-way left turn into 2-way street	D	12
	Hawthorne	Broadway	U-turn through median	D	17
	La Brea	Hardy	1-way left turn into 2-way street w/ thru movement	D	15
	Hardy	Prairie	1-way left turn	B	5
	Prairie	Arbor Vitae	1-way left turn	B	5
	Arlar Vitae	La Brea	1-way right turn from 2-way street	C	8
	La Brea	Florence	2-way turn	D	16
	Florence	Crenshaw	2-way turn	D	16
	Crenshaw	54th	2-way 90° right turn	E	20
	54th	Div. 5	'Y' intersection - without straight leg	E	24
	Crenshaw	Vernon	1-way left turn	B	5
	Liemert	43rd Pl.	1-way right turn	B	4
	Liemert	MLK Jr. Way	2-way turn	D	16
	MLK Jr. Way	Vermont	2-way 90° crossing, no turns	A	3
	MLK Jr. Way	Broadway	2-way 90° right turn	E	20
	Broadway	Washington	2-way crossing - light rail across ETB	E	S
	Los Angeles	Alameda	1-way right turn from 2-way street	C	8
	Alameda	Sunset	2-way crossing & 1-way right turn	D	S
	N. Main	Vignes	1-way right turn	B	4
	Vignes	Alameda	1-way left turn	B	5
RTD	135th	San Pedro	1-way right turn	B	4
45	San Pedro	Rosecrans	1-way right turn	B	4
	Rosecrans	Main	1-way right turn	B	4
	Main St.	135th	1-way left turn from 2-way street	D	13

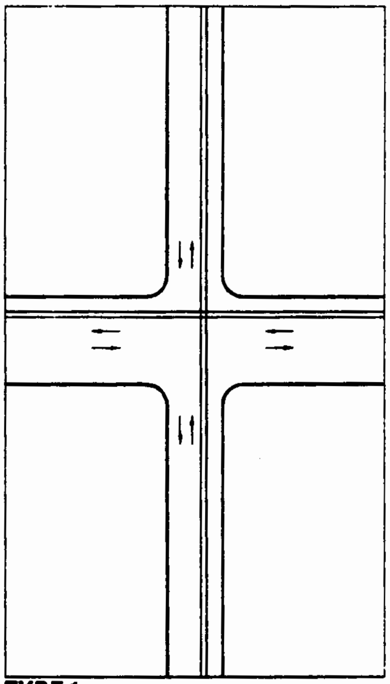
Route	Street	Cross-Street	Condition	Impact Level	Type
	Main St.	El Segundo	2-way turn	D	16
	El Segundo	Broadway	2-way turn	D	16
	Broadway	113th	1-way right turn from 2-way street	C	8
	113th	Main	1-way right turn	B	4
	111th	Main	1-way right turn	B	4
	Broadway	111th	1-way left turn into 2-way street w/ thru movement	D	15
	Broadway	94th	U-turn through median	D	17
	Broadway	54th	Full 'Y' intersection	E	25
	Broadway	Arcadia	1-way left turn into 2-way street w/ thru movement	D	15
	Broadway	Sunset	2-way 90° right turn	E	20
	N. Broadway	N. Spring	2-way turn	D	16
	Broadway	Alta	1-way left turn into 2-way street w/ thru movement	D	15
	Broadway	Lincoln Park	3/4 'Y' intersection w/out straight leg	B	S
	Lincoln	Manitou	1-way right turn	B	4
	Manitou	Alta	1-way right turn	B	4
	Lincoln	Flora	2-way turn	D	16
	Flora	Sierra	2-way turn	D	16
	Sierra Terr.	Mercury	2-way turn	D	16
	Mercury	Collis	1-way right turn	B	4
	Collis	Twining	1-way left turn	B	5
	Twining	Eastern	1-way left turn	B	5
	Eastern	Huntington	1-way left turn	B	5
RTD	Westside Dr.	Whittier	1-way right turn into 2-way street	C	9
66/67	Garfield Ave.	Olympic	2-way turn	D	16
	Olympic	Atlantic	1-way right turn into 2-way street	C	9
	Atlantic	Verona	1-way right turn	B	4
	Verona	Woods	1-way right turn	B	4
	Woods	Olympic	1-way left turn from 2-way st. w/ thru movement	D	14
	Olympic	Calada	1-way left turn from 2-way st. w/ thru movement	D	14
	Calada	Beswick	1-way right turn	B	4
	Beswick	Calzona	1-way right turn	B	4
	Calzona	Olympic	1-way right turn into 2-way street	C	9
	Olympic	Mirasol	2-way 90° right turn	E	20
	8th St.	Boyle	1-way left turn	B	5
	8th St.	Soto	2-way to 1-way movement transition	D	S
	Soto	Olympic	1-way left turn from 2-way street w/ thru movement	D	14
	Olympic	Boyle	1-way right turn into 2-way street	C	9
	Olympic	Central	Full 'Y' intersection	E	25
	Central	Industrial	2-way / 1-way transition	D	S
	Olympic	San Pedro	1-way right turn from 2-way st, no thru movement	B	4
	8th St.	San Pedro	1-way left turn	B	5
	8th St.	Vermont	1-way left turn	A	3
	8th St.	Oxford	2-way 90° crossing, no turns	D	14
	8th St.	Western	1-way right turn into 2-way street	C	9
RTD	Santa Anita	Ramona	2-way turn	D	16
70	Santa Anita	Garvey	2-way turn	D	16
	Garvey	Eastern	2-way turn	D	16
	Eastern	City Terrace	2-way turn	D	16

Route	Street	Cross-Street	Condition	Impact Level	Type
RTD	Marengo St.	Mission	2-way turn	D	16
70	Mission Rd.	Div. 10	Full 'Y' intersection	E	25
Cont.	Mission Rd.	Macy	2-way 90° right turn	E	20
Study	Glen Oaks	Magnolia	1-way left turn from 2-way st. w/ thru movement	D	14
Route	Magnolia	3rd	1-way left turn	B	5
182	3rd	Olive	1-way left turn	B	5
	Olive	Glenoaks	1-way right turn into 2-way street	C	9
	Glenoaks	Brand	2-way turn	D	16
	Brand	Harvard	1-way right turn from 2-way street	C	8
	Harvard	Central	1-way left turn	B	5
	Central	Colorado	1-way left turn	B	5
	Brand	Colorado	2-way turn	D	16
	Colorado	La Loma	2-way/1-way 90° crossing, no turn	A	2
	La Loma	Figueroa	1-way right turn	B	4
	Figueroa	Colorado	1-way right turn from 2-way street	C	8
	Colorado	Pasadena	1-way left turn from 2-way st. w/ thru movement	D	14
	Pasadena	Union	1-way left turn	B	5
	Union	John	1-way left turn	B	5
	John	Colorado	1-way right turn into 2-way street	C	9
	Colorado	Lake	1-way right turn from 2-way street	C	8
	Lake	Green	1-way left turn	B	5
	Green	Catalina	1-way left turn	B	5
	Catalina	Colorado	1-way left turn into 2-way st. w/ thru movement	D	15
	Colorado	Hill	2-way turn	D	16
	Hill	San Pasqual	2-way turn	D	16
	San Pasqual	Sierra Bonita	1-way right turn	B	4
	Sierra Bonita	California	1-way right turn	B	4
	California	Hill	1-way right turn	B	4
RTD	Sunset	Kenmore	1-way right turn	B	4
204	Kenmore	Hollywood	1-way right turn	B	4
	Hollywood	Vermont	1-way right turn	B	4
	Vermont	Sunset	1-way left turn from 2-way street	D	13
	Vermont	Wilshire	1-way left turn from 2-way st. w/ thru movement	D	14
	Wilshire	Nw.Hampshire	1-way right turn	B	4
	Nw.Hampshire	6th St.	1-way right turn	B	4
	Vermont	54th	Half Grand Union	E	S
	Vermont	89th	1-way right turn from 2-way street	C	8
	89th	Budlong	1-way right turn	B	4
	Budlong	88th	1-way right turn	B	4
	88th	Vermont	1-way left turn into 2-way street w/ thru movement	D	15
	Vermont	Century	U-turn through median	D	17
	Vermont	120th	U-turn through median	D	17
RTD	Ventura	Van Nuys	1-way right turn	B	4
560	Beverly Glen	Ventura	1-way right turn	B	4
	Moorpark	Beverly Glen	1-way right turn	B	4
	Van Nuys	Moorpark	2-way turn	D	16
	Glenoaks	Div. 15	2-way turn	D	16

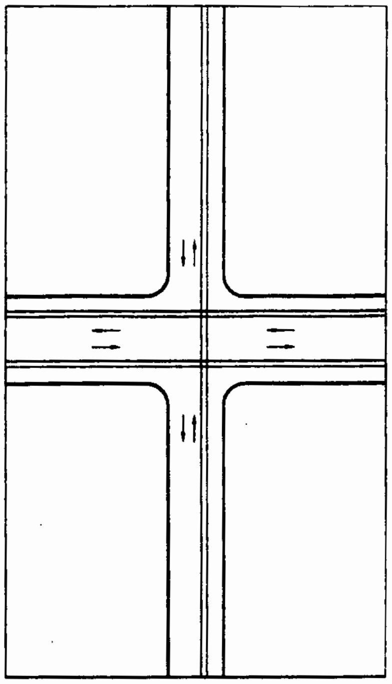
Route	Street	Cross-Street	Condition	Impact Level	Type
	Van Nuys	Glenoaks	Full 'Y' intersection	E	25
	Van Nuys	Foothill	2-way turn	D	16
	Foothill	Terrra Bella	2-way turn	D	16
	Terra Bella	Fenton	1-way right turn	B	4
	Terra Bella	Eldridge	1-way left turn	B	5
	Eldridge	Kagel Canyon	1-way left turn	B	5
	Kagel Canyon	Fenton	1-way left turn	B	5
M	Passons	Jackson	2-way turn	D	16
10	Whittier Blvd.	Passons	2-way turn	D	16
	Whittier Blvd.	Greenwood	2-way 90° left turn	E	21
	Whittier Blvd.	Atlantic	2-way 90° right turn	E	20
LB	Clark	PCH	1-way right turn	B	4
40	PCH	Anaheim	3/4 'Y' intersection w/out straight leg	B	S
	Anaheim	Clark	1-way left turn from 2-way st. w/ thru movement	D	14
	Anahiem	Gardena	Full 'Y' intersection	E	25
	Anaheim	Atlantic	2-way crossing & 2-way turn	E	S
	Anahiem	Long Beach	2-way crossing, 2-way turn with light rail OCS	E	S
	Anaheim	Magnolia	1-way left turn from 2-way street	D	13
	Magnolia	Loma Vista	1-way right turn	B	4
	Loma Vista	Daisy	1-way right turn	B	4
	Daisy	Anaheim	1-way right turn	B	4
	7th	Pacific	1-way left turn	B	5
	Pacific	1st	1-way left turn	B	5
	1st	Long Beach	1-way left turn	B	5
	Long Beach	7th	1-way crossing, 1-way right turn with light rail OCS	D	S
LB	Acacia Ave.	Acacia Ct.	2-way turn	D	16
50	Acacia	Artesia	2-way turn	D	16
	Artesia	Long Beach	2-way 90° right turn	E	20
	Long Beach	6th	1-way right turn into 1-way or 2-way street	C	7
LB	Artesia Blvd.	Atlantic	2-way turn	D	16
60	Atlantic	7th	1-way crossing and 1-way right turn	C	S
LB	Bellflower Bl.	Willow	1-way right turn	B	4
90	Willow	Los Coyotes	1-way right turn	B	4
	Los Coyotes	Bellflower	1-way left turn into 2-way street	D	12
	Bellflower	7th	2-way turn	D	16
	Atlantic	6th	1-way \left turn from 1-way or 2-way street	C	10
	7th	PCH	2-way 90° right turn	E	20
	King	7th	1-way right turn	B	4
	6th St.	King	1-way left turn	B	5

Note:
Type 'S' denotes a Special condition unique to the particular interesection. This type does not fall within Types 1-25 on pages 3.3-50 to 3.3-54.

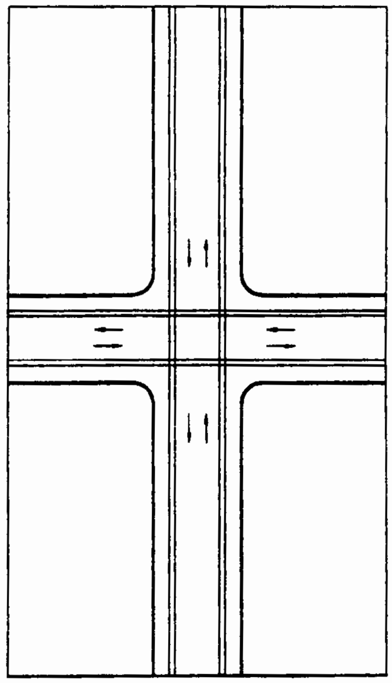
Complex Intersection Types



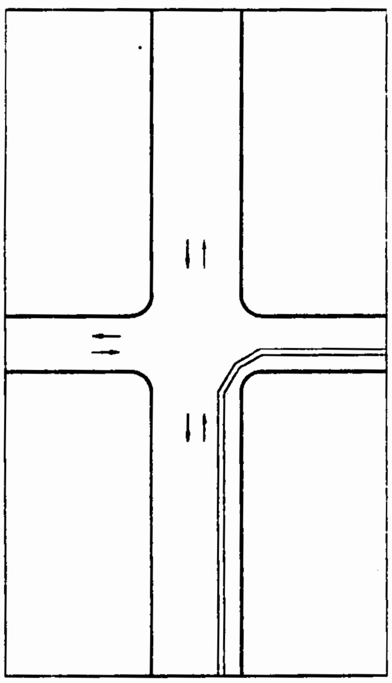
TYPE 1
1-way/1-way 90° crossing, no turns



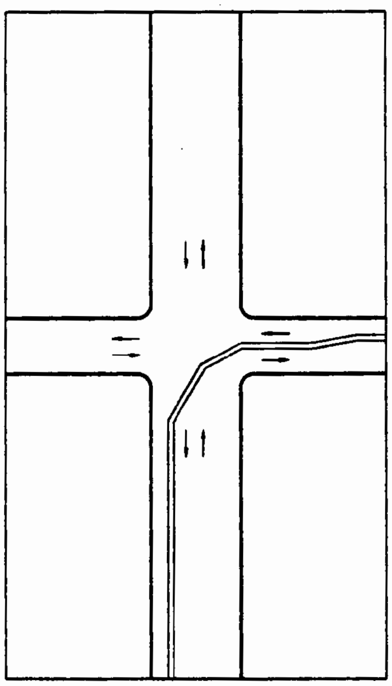
TYPE 2
2-way/1-way 90° crossing, no turns



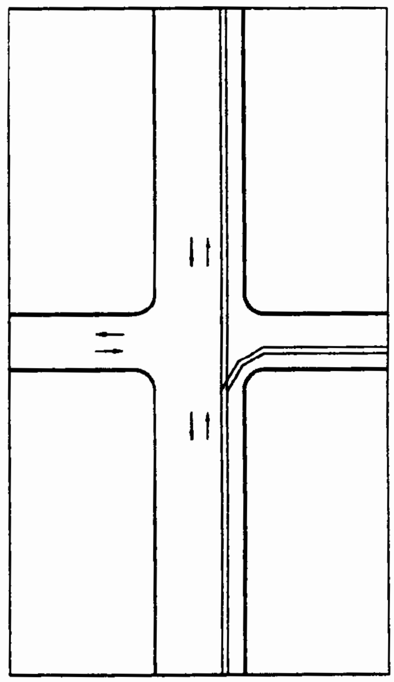
TYPE 3
2-way 90° crossing, no turns



TYPE 4
1-way right turn

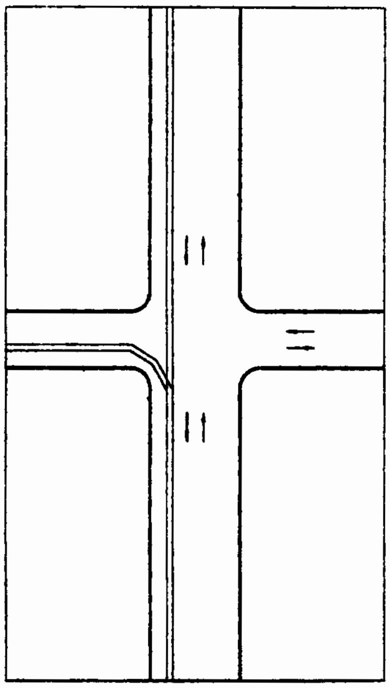


TYPE 5
1-way left turn

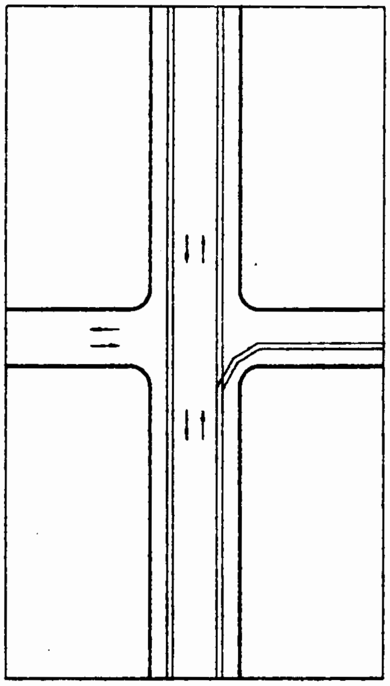


TYPE 6
1-way right turn from 1-way or 2-way street

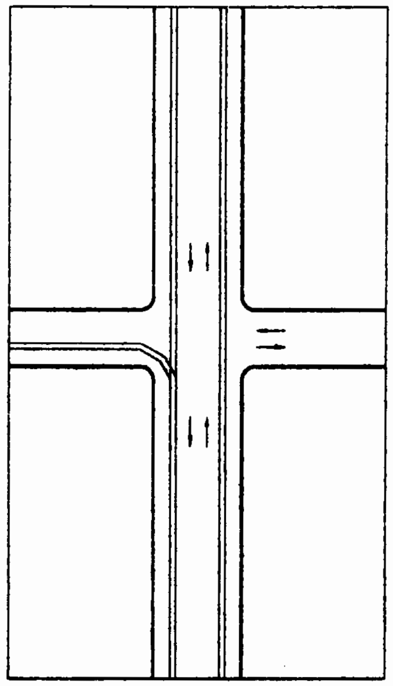
Complex Intersection Types



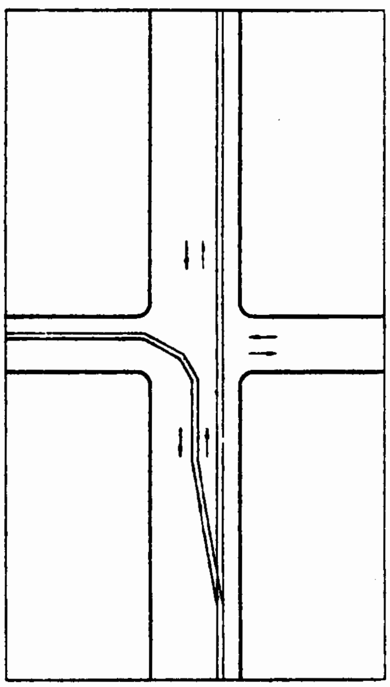
TYPE 7
1-way right turn into 1-way or 2-way street



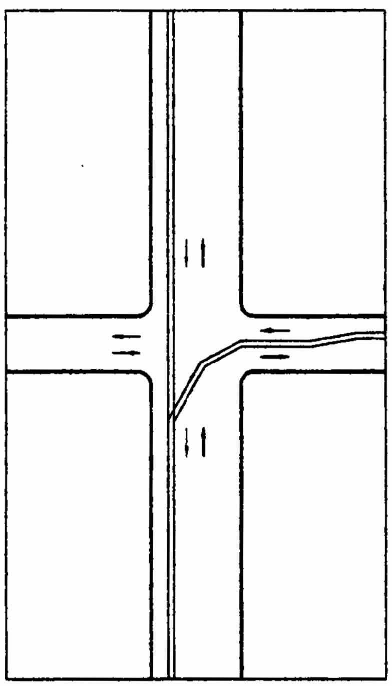
TYPE 8
1-way right turn from 2-way street



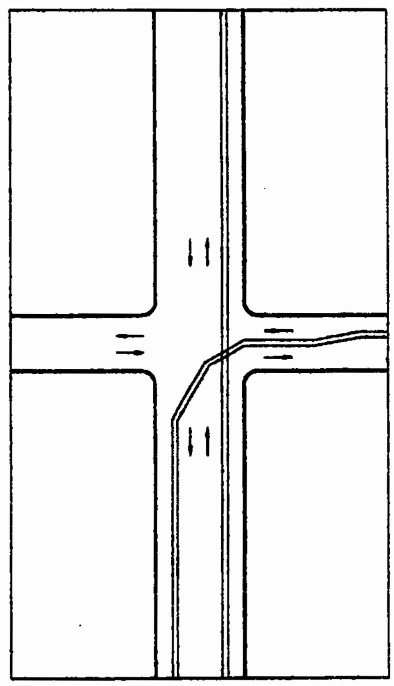
TYPE 9
1-way right turn into 2-way street



TYPE 10
1-way left turn from 1-way or 2-way street

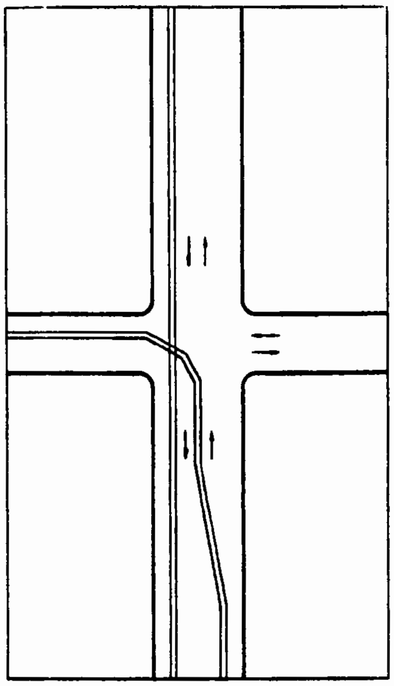


TYPE 11
1-way left turn into 1-way or 2-way street

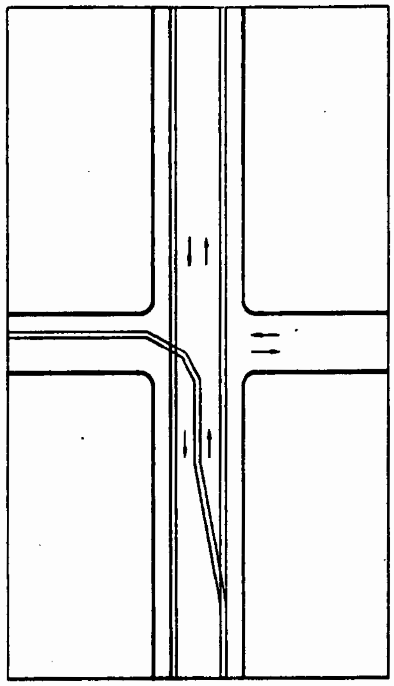


TYPE 12
1-way left turn into 2-way street

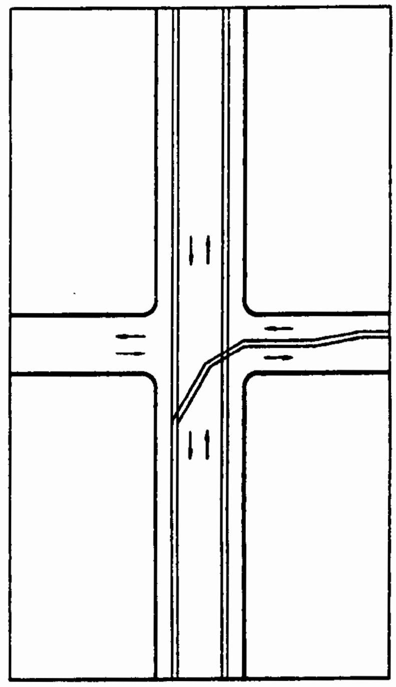
Complex Intersection Types



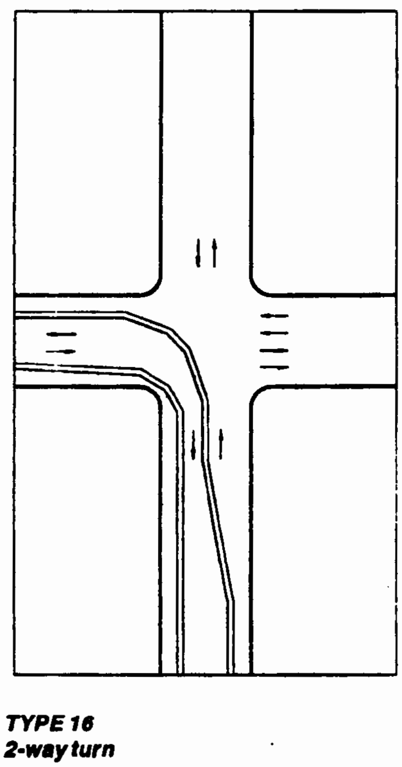
TYPE 13
1-way left turn from 2-way street



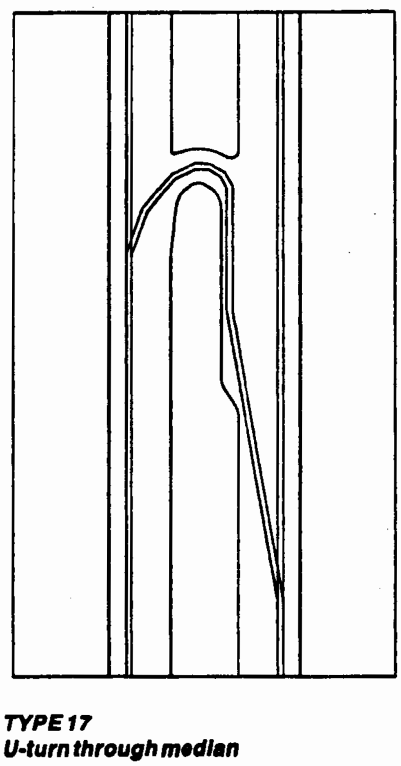
TYPE 14
1-way left turn from 2-way street with through movement



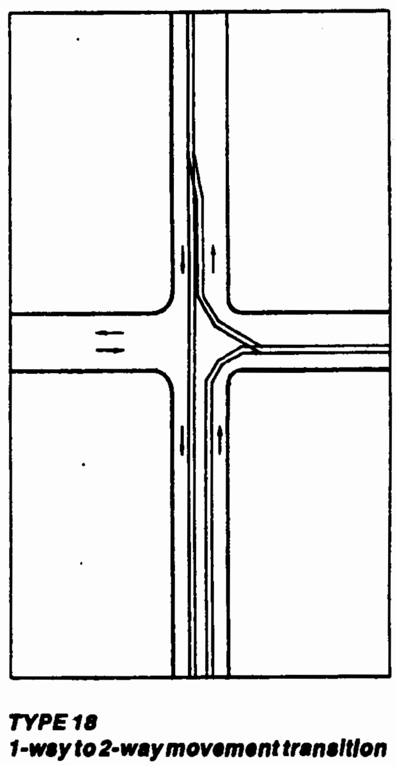
TYPE 15
1-way left turn into 2-way street with through movement



TYPE 16
2-way turn

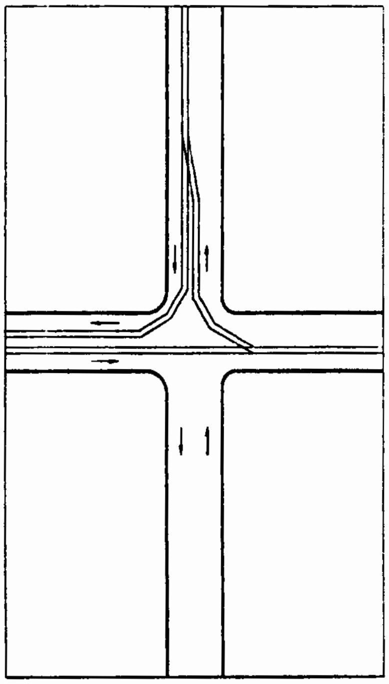


TYPE 17
U-turn through median

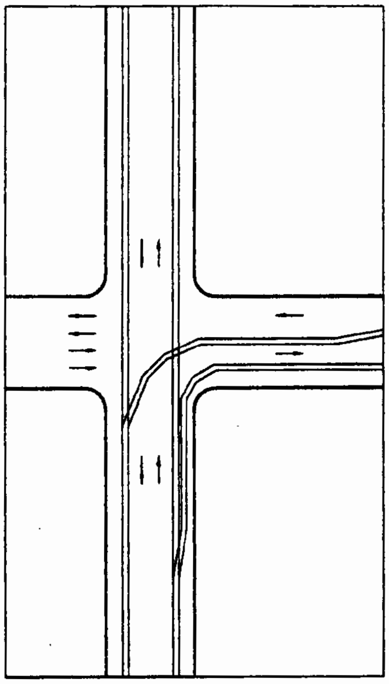


TYPE 18
1-way to 2-way movement transition

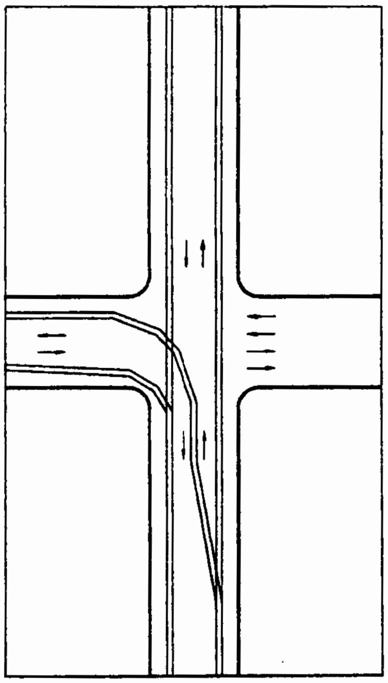
Complex Intersection Types



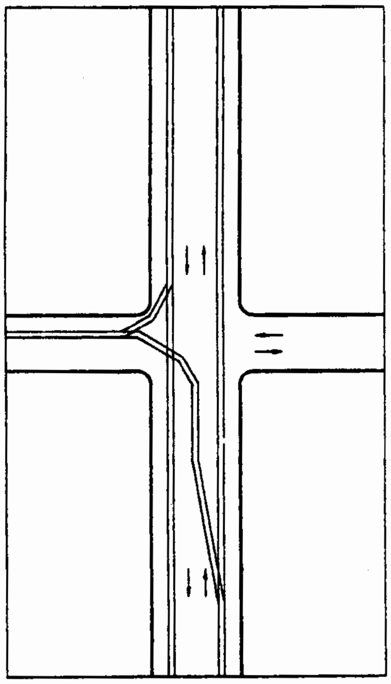
TYPE 19
2-way to 1-way movement transition



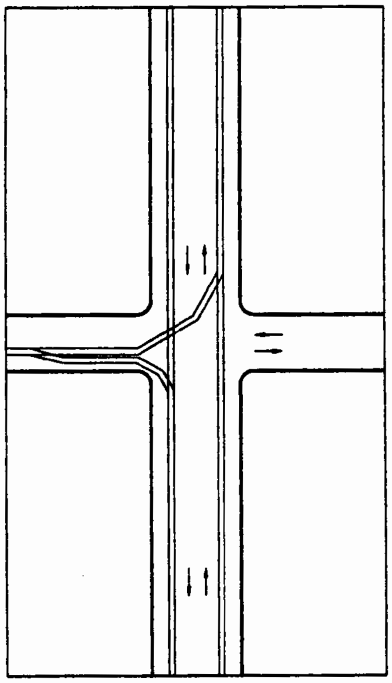
TYPE 20
2-way 90° right turn



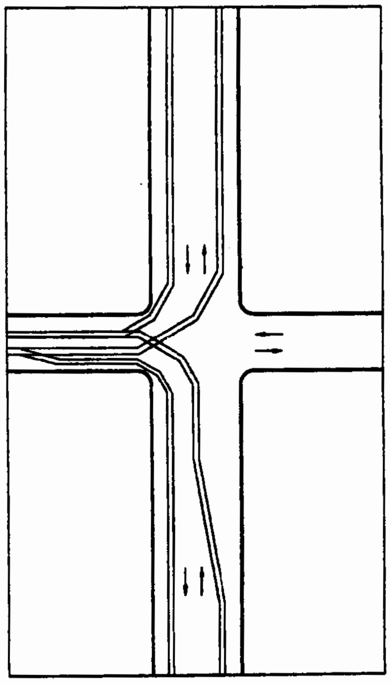
TYPE 21
2-way 90° left turn



TYPE 22
Half 'Y' Intersection - out of 1-way movement

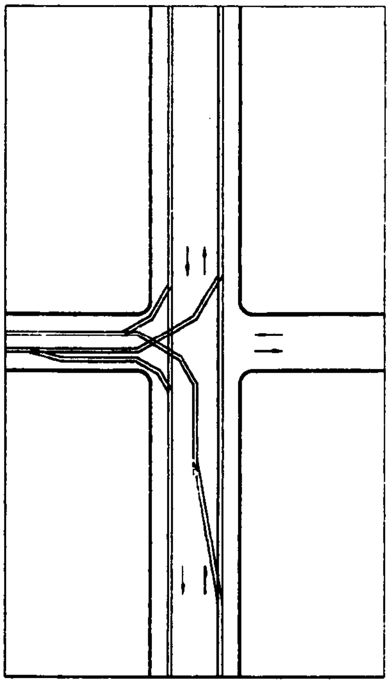


TYPE 23
Half 'Y' Intersection - into 1-way movement



TYPE 24
'Y' Intersection - without straight leg

Complex Intersection Types



TYPE 25:
Full 'Y' Intersection

3.3.7 SUBSTATIONS

3.3.7.1 Setting

The proposed substation sites are located in the predominantly urban settings of the ETB routes. Many of these sites are surrounded by commercial or industrial routes; however, a portion of the sites are in residential areas.

3.3.7.2 Impacts

Two types of substations of different dimensions would be located along the ETB routes: feederless and feeder substations. Of the 138 substations required for the project, 135 would be located along the routes and three would be located at division yards. Most of the substations along the routes (133 out of 135) and the substations at division yards would be part of the feederless system. In general, a feederless substation would measure 11 feet wide, 28 to 30 feet long and 10 feet high. A typical substation site would range from 22 feet by 40 feet to 34 feet by 57 feet, depending upon the size of the substation structure and the need for an access road or off-street parking for maintenance staff.

Feeder substations are larger in size, measuring 19 feet in width, 60 feet in length and 10 feet in height. A substation with an access road would require a 42-foot by 88-foot parcel; without an access road, a 30-foot width would be necessary. The basic structure of a feederless substation would be a prefabricated building made of a steel frame with sheet metal exterior walls, roof and interior walls. All feederless substations would be located outside the downtown area and each would be individually designed with landscaping appropriate for its setting. Two feeder substations would be used in the downtown Los Angeles area. Both the feederless and feeder substations would be designed to prevent unauthorized access to the equipment and to ensure public safety.

The majority of substations would be located on vacant or parking lots and public rights-of-way, in predominately commercial or industrial areas. Sixty-three substations would be located in residential areas -- either across the street from, adjacent to, or in close proximity of a residential building. Although for the most part the proposed substations would not be considered visually intrusive within their settings, the potential exists for some substations to be inconsistent with surrounding visual characteristics and therefore result in significant visual impacts.

3.3.7.3 Mitigation

Appropriate treatment of the substations, such as erection of fences, choice of materials used for building facades and landscaping, will mitigate potentially significant visual impacts of substations.

3.3.8 DIVISION YARDS

3.3.8.1 Setting

As part of the ETB project, existing RTD Operating Divisions 1, 2 and 10 maintenance yards would be expanded and a new satellite division yard would be developed. Division 1 is currently located between Alameda Street and Central Avenue, south of 6th Street and north of Industrial Street in the City of Los Angeles. The site, which is surrounded by a one-story fence, contains a maintenance facility, bus parking, tire shop, car wash and fuel station. The site would expand south, incorporating the eastern half the block between Industrial Street and Seventh Street, between Alameda Street and Central Avenue. Currently a truck wash and gas station occupy that area. The eastern section of Industrial Street would be closed off and incorporated into the new site. The properties adjacent to the expanded site are industrial or commercial except for a vacant residential building on the northeast corner of Central Avenue and Seventh Street and a hotel on Seventh Street. The hotel would be adjacent to the expanded Division site.

Division 2 is located between San Pedro Street and Griffith Avenue, between 15th and 16th Streets in the City of Los Angeles. The existing site includes a cash counting facility, fuel station, bus wash, maintenance and tire facility and transportation building. The adjacent land uses to the site are industrial, commercial and office uses. The existing site is also surrounded by a fence. The expanded site would include the western half of the property directly north of the Division 2 site and would house the ETB parking lot, maintenance yard and maintenance building. The western half of 15th Street would be closed and incorporated into the bus parking yard.

Division 10 is located northwest of the intersection of the Golden State Freeway and the San Bernadino Freeway. The expansion site is an undeveloped parcel between the division yard and the freeways. The existing division yard and the expansion site are surrounded by industrial uses.

The new satellite division yard is located along Front Street, south of the intersection of the Golden State Freeway and Burbank Boulevard in Burbank. The site is currently occupied by warehouse structures and is surrounded by industrial uses.

3.3.8.2 Impacts

Expansion of the Division 1 maintenance yard would not produce a significant visual impact. Introduction of the ETB parking lot on a site now used as truck wash and gas station would not be significantly different from a visual perspective. The only occupied residential use in the area is the hotel, which would not likely experience any visual intrusion from expansion of the maintenance yard. The surrounding uses are industrial or commercial and would not be visually sensitive to the yard expansion.

Because no visually sensitive sites exist near the Divisions 2 and 3 expansion sites and the satellite division site, development of bus maintenance facilities at these sites would produce no significant impacts.

3.3.8.3 Mitigation

No significant visual impacts would result from the proposed division yard expansions, and therefore, no mitigation is proposed.

3.4 VEGETATION AND WILDLIFE

3.4.1 INTRODUCTION

This section analyzes potential impacts to plant and animal life associated with the proposed Electric Trolley Bus (ETB) project. The analysis is based on information obtained from the California Natural Diversity Data Base (CNDDB) species account records and a review of photographs taken at the proposed substation locations.

3.4.2 SETTING

The Los Angeles region is primarily urban and dominated by paved surfaces and landscaping. Typical of a Mediterranean climate, precipitation is highly seasonal and occurs primarily in winter. Native plant communities have been largely replaced by urban landscaping. Intrusive exotic species have also displaced native vegetation, although remnants of the native vegetation of the Los Angeles Coastal Plain occur on some hillsides. In undeveloped but disturbed urban areas, flora consist of native and non-native species that are tolerant of disturbance and urban environments. Typical species found include eucalyptus, palms, oleander, iceplant and intrusive annual grasses. This is true of the proposed substation locations that are not paved.

Wildlife in the area also include species adapted to a disturbed environment. Examples include pigeons, gulls, mockingbirds, scrub jays, house mice, opossums and Norway rats.

Applicable Rules and Regulations

The federal Endangered Species Act of 1973 (as amended), the State of California's endangered species legislation of 1970 (California Administrative Code, Title 14) and the California Fish and Game Code require the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) to list all species threatened with extinction. The USFWS lists species in the Federal Register and the CDFG lists species in California Administrative Code Title 14. In addition, the California Department of Fish and Game Natural Diversity Data Base (CNDDB) lists species considered sensitive by the scientific community, though this listing offers no legal protection. The CNDDB identifies the location and status of a species by recording observations.

Sensitive habitats are also identified by the USFWS and CDFG. The California Coastal Act of 1976 defines a sensitive habitat as an area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem, and which would be disturbed or degraded by human activities and development.

Sensitive Species

Based on a review of the CNDDB, no sensitive species are known to inhabit the proposed substation locations. However, several sensitive species are known to occur in habitats neighboring the proposed bus routes (see Table 3.4-1). None of the species listed is expected to inhabit proposed substation or maintenance yard expansion sites because of the disturbed nature of these sites.

TABLE 3.4-1: RARE, THREATENED OR ENDANGERED SPECIES HAVING BEEN LISTED NEAREST THE PROPOSED ROUTES

Taxa[1]	Status (State/Fed)[2]	Notes[3]	Location[4]
PLANTS			
Nevin's barberry (*Mahonia nevinii*)	E/C1	Occurs in sandy and gravelly locations within chaparral and coastal sagebrush below 2,000 feet. Flowers March through April.	Was seen in 1932 in the San Fernando Valley near Van Nuys Boulevard east of Pacoima School. It is listed as possibly extirpated from the site.
Davidson's bush mallow (*Malacothamnus davidsonii*)	/C2	Found in coastal sagebrush, riparian woodland and sandy washes. Flowers June through September.	The CNDDB lists two occurrences of this species in the San Fernando Valley near San Fernando Road. The observations were made in 1931 and 1932 and are presumed extant.
ANIMALS			
Southwestern pond turtle (*Clemmys marmorata pallida*)	/C2	Inhabits permanent or nearly permanent bodies of water in many habitat types. Requires basking sites such as vegetation mats and mud banks. Habitat onsite is unsuitable.	This species was observed in Lower Coyote Creek in Los Alamitos. Listed as possibly extirpated.
California least tern (*Sterna antillarum browni*)	E/E	A colonial breeder on bare or sparsely vegetated, flat substrates. Prefers undisturbed nest sites on open, sandy or gravelly shores near shallow-water feeding areas.	Has been observed in the Long Beach area at Belmont Shores Beach, Terminal Island and Harbor Lake. All three occurrences are presumed extant.
San Diego horned lizard (*Phrynosoma coranatum blainvillii*)	/C2	Inhabits coastal sagebrush and chaparral. Habitat on the surrounding hillsides is suitable.	In the vicinity of the project, this species has been observed in the Pacoima Wash, Monterey Hills and in the City of Long Beach. The CNDDB lists the occurrences as possibly extirpated

[1] Source: California Natural Diversity Data Base.

[2] State: California Endangered Species Act (1984), Native Plant Protection Act (1977), and the California Environmental Quality Act, as amended June, 1986.

E = Endangered. Seriously in danger of becoming extinct.

Federal: Federal Endangered Species Act of 1973, as amended.
E = Taxa formally listed as Endangered.
C1 = Candidate taxa for which there is enough information to support the biological appropriateness of proposing to list as Threatened or Endangered.
C2 = Candidate taxa for which there is biological information that indicates that proposing to list the taxa as Threatened or Endangered is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) is not currently known or on file to support the immediate listing.

[3] Notes: Smith, Jr., James P. and Berg, Ken (eds.), *Inventory of Rare and Endangered Vascular Plants of California*, California Native Plant Society Special Publication No. 1 (4th ed.), 1988.
Munz, Philip A., *A Flora of Southern California*, University of California Press, Los Angeles, California, 1974.
Animal Species of Concern Taken from the California Natural Diversity Data Base.

[4] California Natural Diversity Data Base

Street Trees

There are approximately 174 miles of street trees along the 348 miles of the Phase I routes of the ETB system. Species vary throughout the system and include ornamental figs, jacaranda, various species of palm trees, pines, eucalyptus, deodar cedar, sycamores, crape myrtle, sweet gum, magnolia, fern pine, glossy privet, oak trees, carrotwood, ash trees and others. There is a significant variety of sizes, shapes and growth habits, both between and within species. Within a given species, this variety is a function of both the immediate urban environment (area for root growth, irrigation practices, soil conditions) and the regional environment (air quality, wind, presence of pests, diseases, etc.).

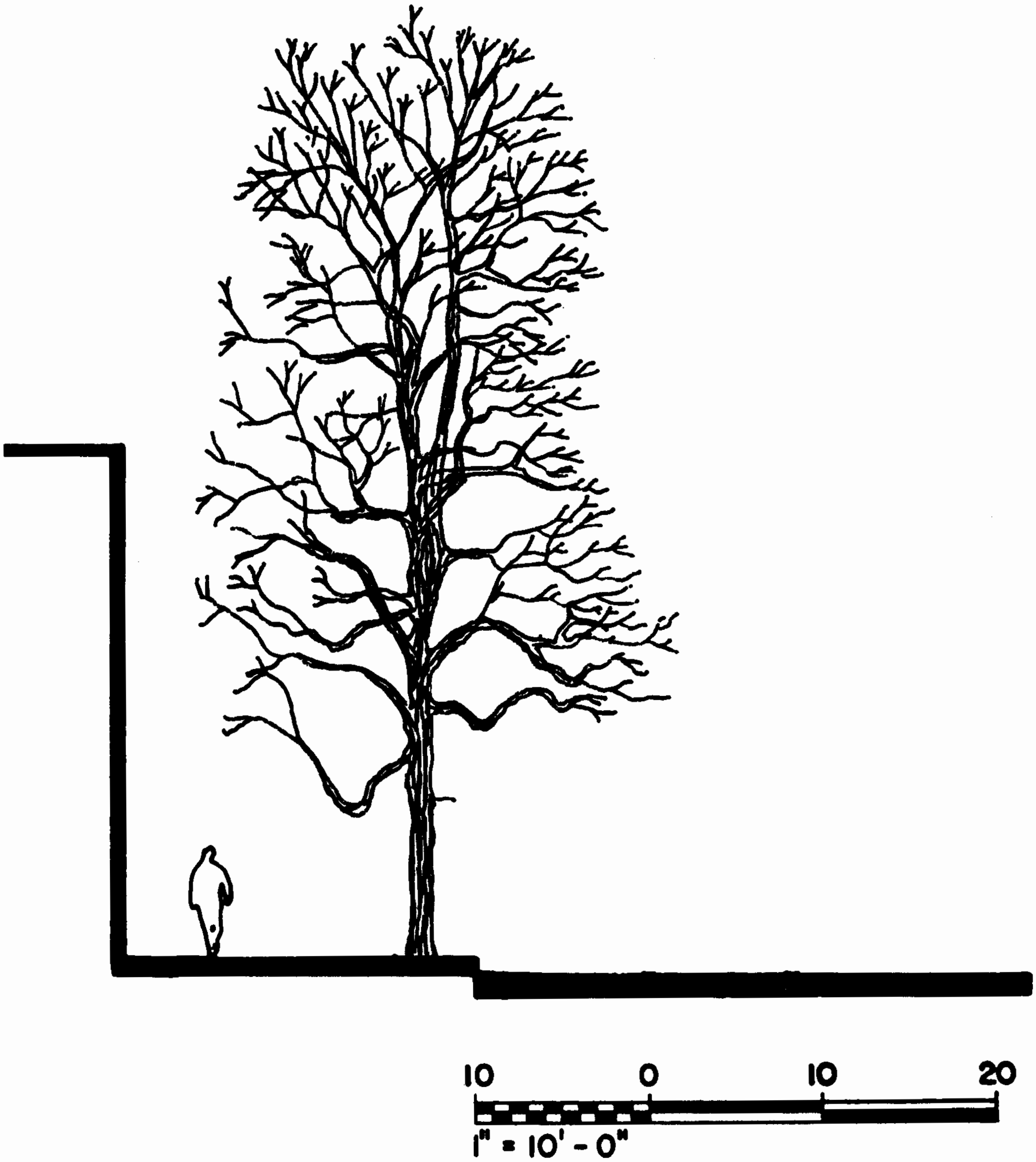
Maintenance practices, particularly pruning, greatly affect the appearance of these street trees. Many of the trees along the route are subject to pruning that substantially reduces their height and spread. Trees are typically pruned at least 13 feet above traffic lanes to provide clearance for trucks and buses. Nevertheless, there are areas where favorable conditions and sound maintenance practices have resulted in large mature trees.

3.4.3 IMPACTS

Since the proposed bus routes would follow existing streets and the maintenance yard expansion sites are paved or developed with buildings, there would not be significant impacts to vegetation and wildlife from these two elements of the project. Impacts would be limited to the removal of existing landscaping and weedy vegetation during construction of the proposed substations. Because habitat provided by such vegetation is common throughout the Los Angeles region and no native plant communities would be disturbed as a result of the project, the construction of substations would not result in significant impacts on vegetation and wildlife.

Due to the highly urban nature of the project area and the lack of suitable habitat, the proposed project is not expected to have an impact on sensitive species.

The effects of the ETB system on street trees would be a function of the size and location of the existing tree canopy in relation to the overhead contact wires. In most places there will be two wires located 13 feet and 15 feet, respectively, from the face of the curb, at a height of 18 feet above the street, with the bracket arm or cross span support wire another 6 inches higher. Any existing tree branches that encroach in this zone would be pruned back. Figures 3.4-1 through 3.4-6 illustrate in section the degree of pruning that might be required for trees of various shapes. Assuming that most street trees are planted 3 feet back from the face of the curb, and assuming a 1-foot minimum clearance from the wire, it would be necessary for a tree to reach 15 feet into the street corridor to conflict with the contact wires. (Such a tree would have a total diameter of approximately 30 feet.) Most urban trees planted along commercial boulevards do not attain a 30-foot total spread due either to existing maintenance practices such as heavy pruning, or a relatively poor growing environment (poor air quality, lack of adequate water, poor soil conditions typical in sidewalk plantings, too much shade as in downtown areas or wind tunnel effects in downtown areas). The natural shape of the tree is also a factor. many trees are either columnar or upright in form (liquidamber, eucalyptus, sycamore) or conical in form (pines, for example) and have spreads typically less than 30 feet at maturity.



Source: DMJM, 1992.

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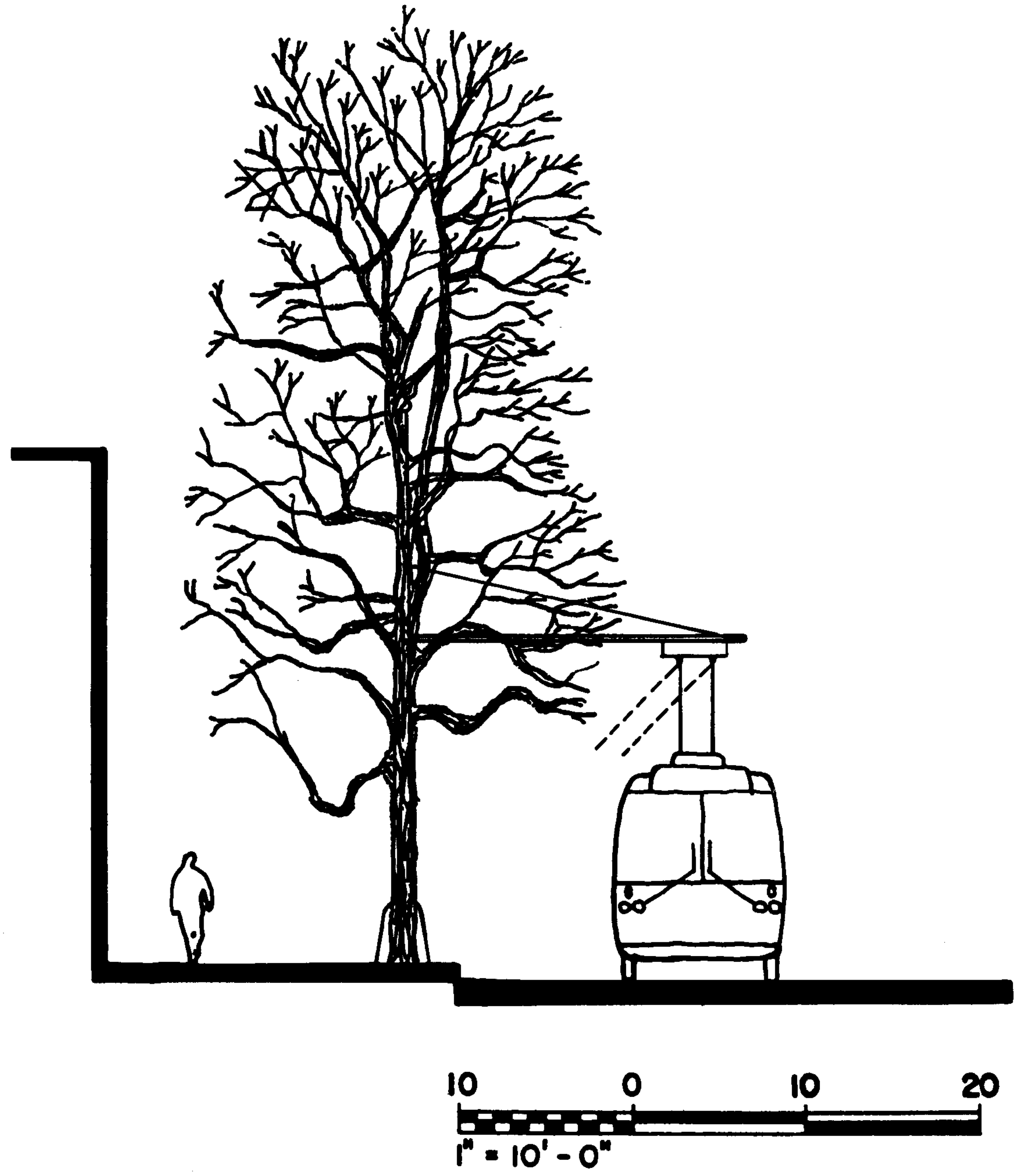
Environmental Impact Report

Figure 3.4-1 : Typical Mature Columnar Shaped Canopy Tree Before ETB



Source: DMJM, 1992.

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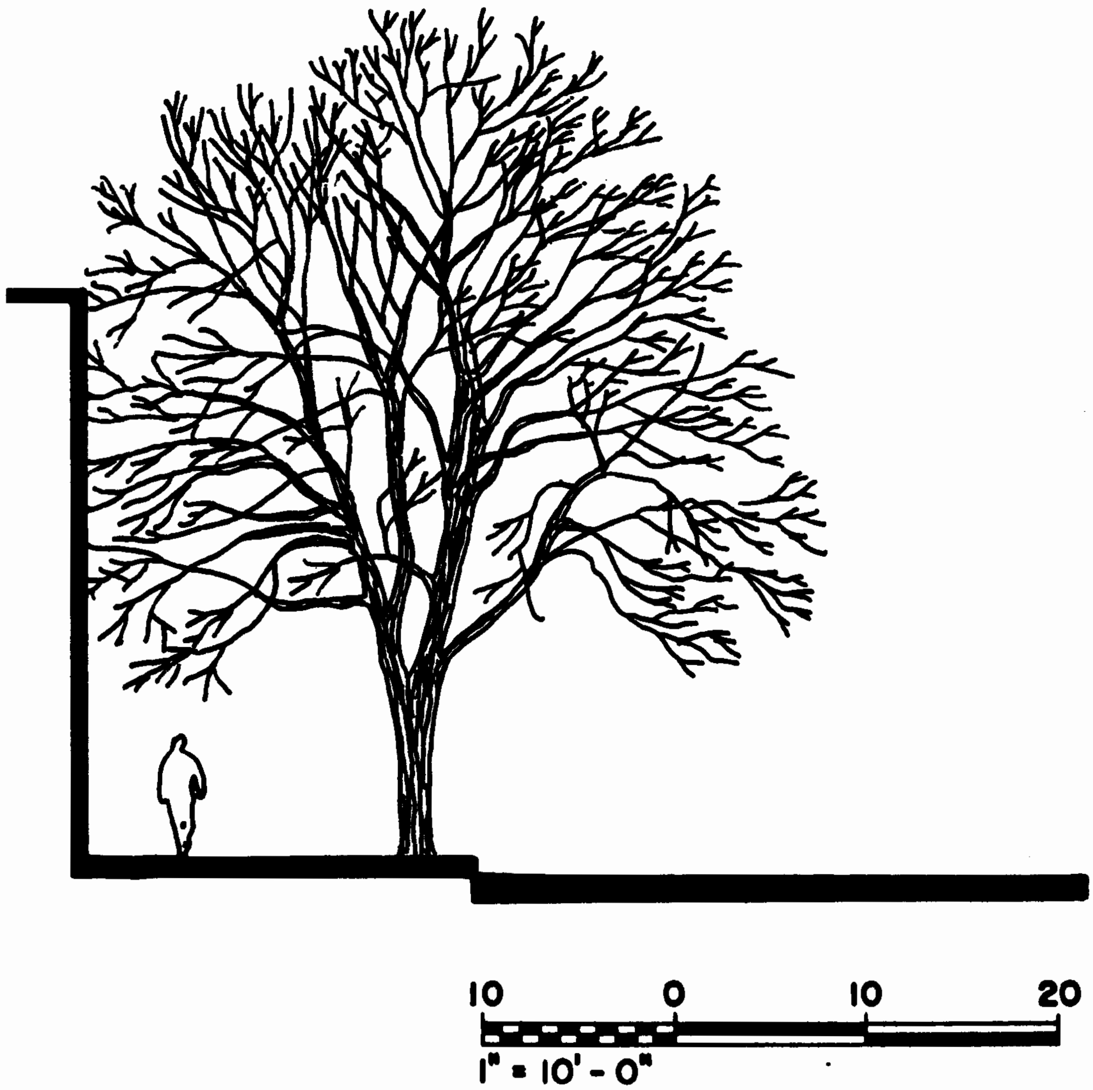
Figure 3.4-2 Columnar Shaped Tree Selectively Pruned To Accommodate ETB



Source: DMJM, 1992.

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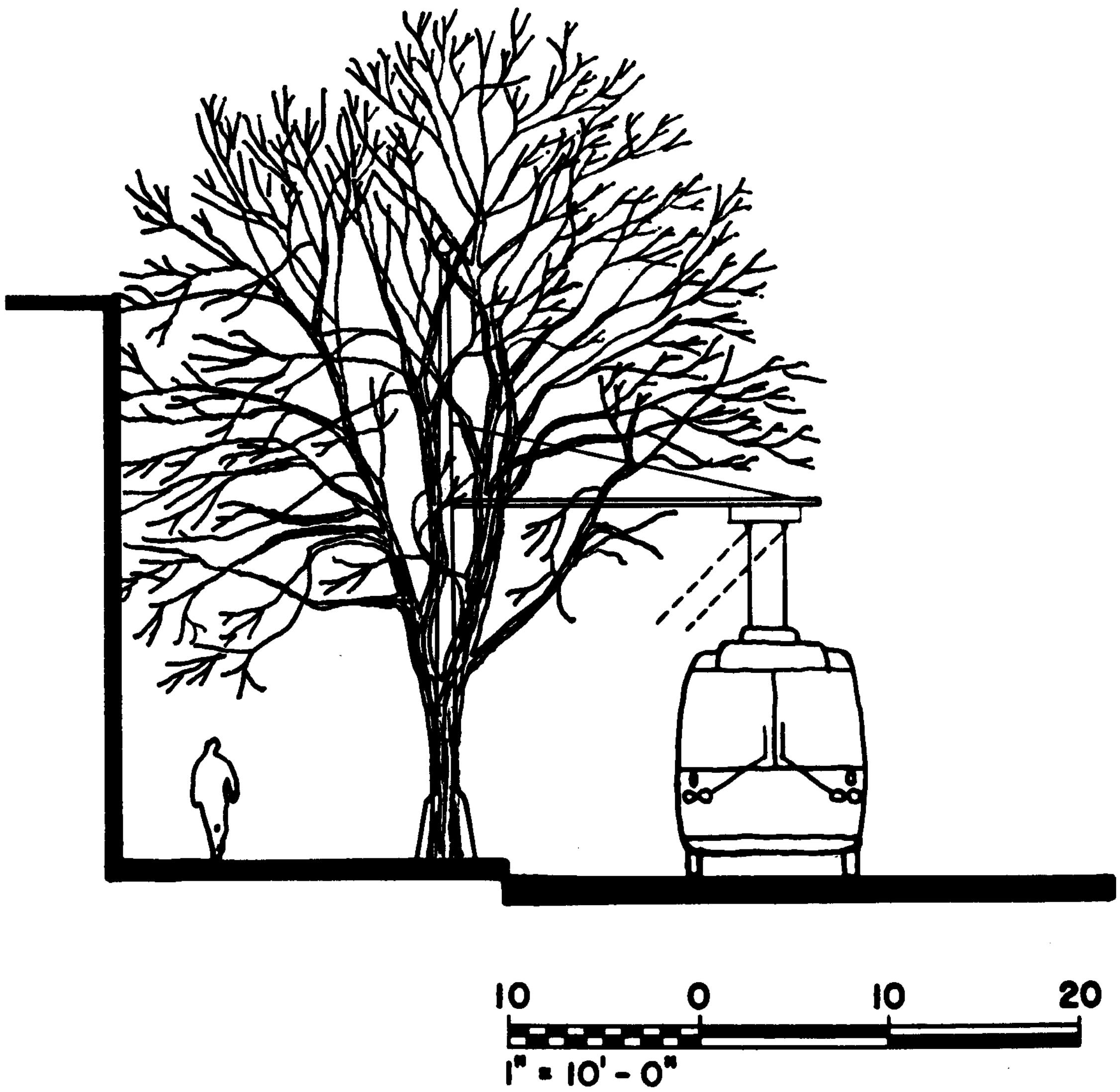
Figure 3.4-3 : Typical Mature Broad-Canopied Tree Before ETB



Source: DMJM, 1992.

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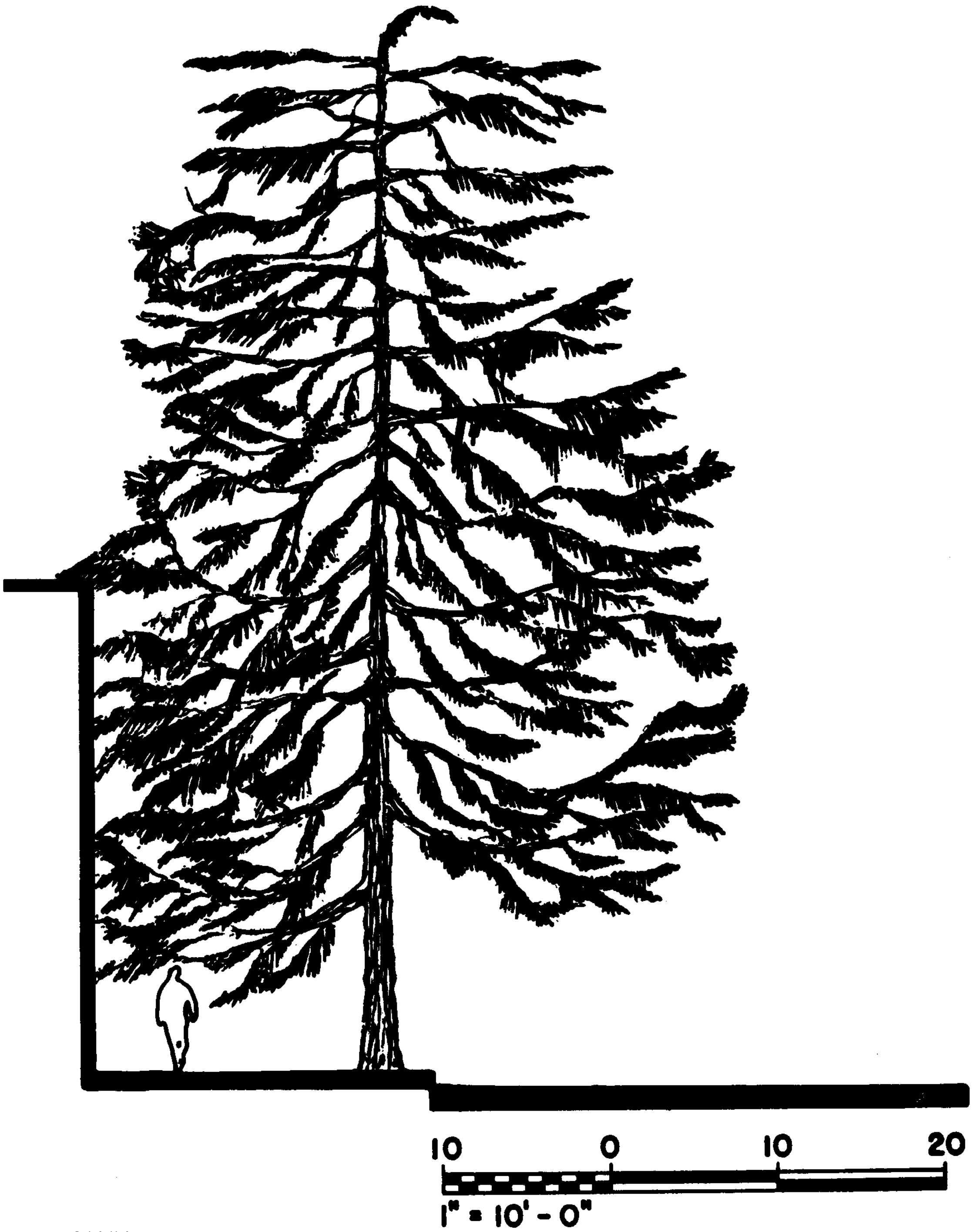
Figure 3.4-4 : Broad-Canopied Tree Selectively Pruned to Accommodate ETB



Source: DMJM, 1992.

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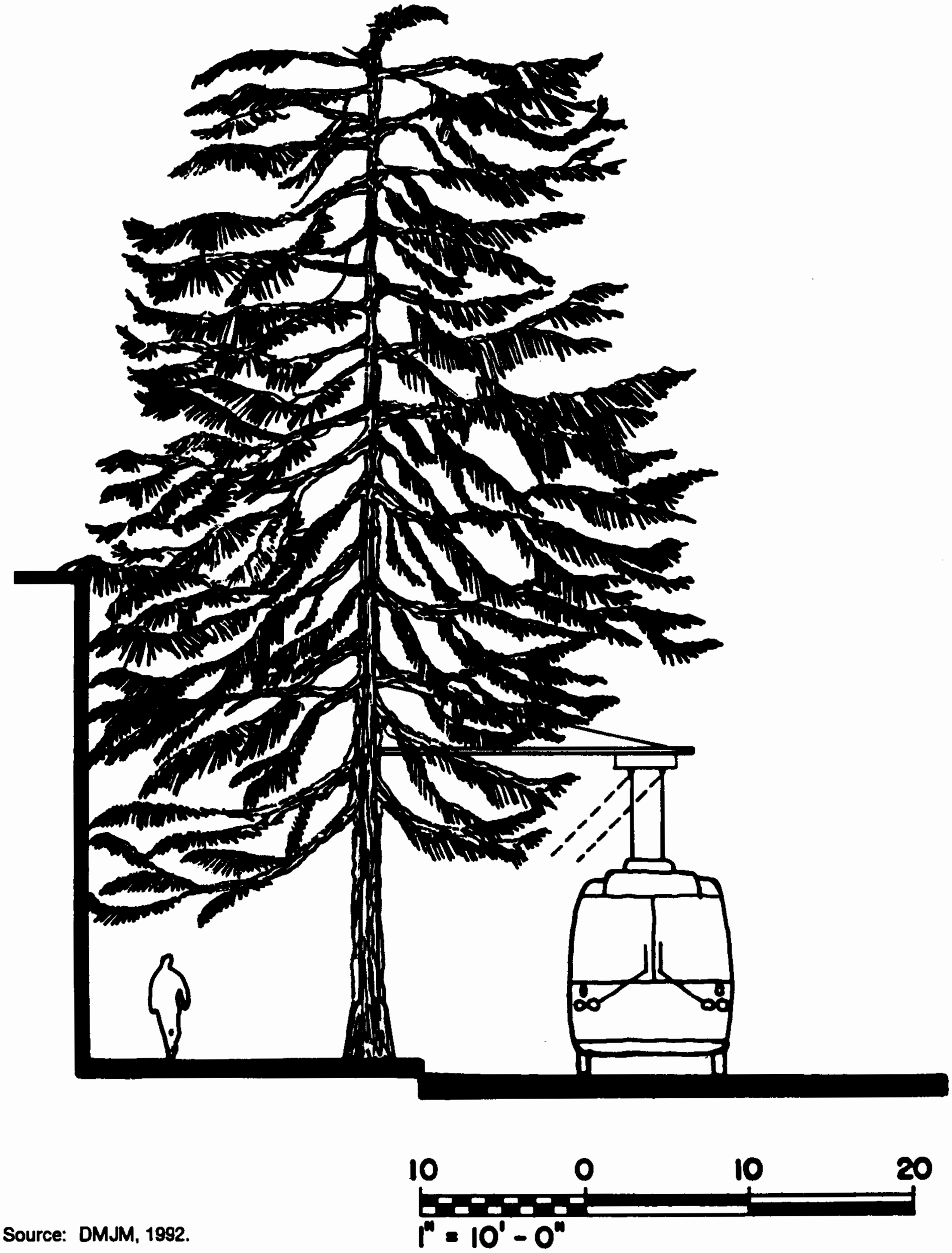
Figure 3.4-5: Low-Branching, Spreading Mature Cedar Before ETB



Source: DMJM, 1992.

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Figure 3.4-6: Cedar Selectively Pruned To Accommodate ETB

Trees expected to be potentially affected the most are large, round-headed types or occasionally conifers with wide low-branching habits (most notably, deodar cedar). Figures 3.4-3 through 3.4-6 illustrate views of such trees before and after ETB installation. Since most trees are already pruned to a height of 13 feet above the street, it would be necessary to remove foliage from about 13 to 21 feet to clear the ETB wires at an angle as shown in the diagrams. For a discussion of the possible introduction of new trees along the ETB routes, see section 3.3, Aesthetics.

3.4.4 MITIGATION

No adverse impacts are anticipated and no mitigation is required. Landscaping would be provided when possible along the proposed routes and at the substation sites.

In the event that pruning is required, there are a number of mitigation measures which can be taken:

1. Selectively prune only those branches that are in conflict with the contact wires. This means that if it is not necessary to trim a branch back to the main trunk of the tree then it should not be done. Care should be taken to make the cuts such that they are obscured by remaining foliage.

2. Selectively prune each tree of the same species in a single continuous stretch in a similar manner to maintain a consistent appearance from one tree to the next.

3. Selectively prune trees on the side away from the street to create a more symmetrical appearance with the street side. It is not necessary to prune as high on the sidewalk side as on the street side, but the two sides should be in proportion (see Figures 3.4-5 and 3.4-6).

4. Where dense canopy trees require pruning, encourage thinning to promote more upright growth in order to balance the lower growth that has been trimmed away from the contact wires.

3.5 UTILITIES AND SERVICE SYSTEMS

Phase I of the Electric Trolley Bus (ETB) project would cover 12 bus routes spread throughout Los Angeles County. These streets have a variety of utilities and service systems that could be affected by the construction and operation of the ETB project. These services include cable television, electricity, petroleum distribution, natural gas, street lighting, street maintenance, telephone, water, sewer and other miscellaneous services. The setting, impacts and mitigation measures for this subject area are presented below.

3.5.1 SETTING

The ETB routes would pass through the jurisdictions of 20 municipalities. A majority of the routes would be located within the City of Los Angeles. More than 40 utilities and service systems providers (comprised of local governments, oil companies and utility companies) currently service the project area. These providers include a large number of street lighting assessment districts through which the bus routes pass.

The general placement of the utilities and service systems are as follows: sanitary and storm sewers are located underneath the streets; natural gas and water lines are generally underground and on one or both sides of the streets; telephone and cable television lines are co-located on poles and underground and to one or both sides of the streets; electricity is distributed either by the use of overhead wires on poles or underground cables; street lights are found on poles and powered by underground lines on one or both sides of the streets; and petroleum distribution lines are in underground pipelines which can be located underneath or on the sides of the streets.

The Los Angeles City Task Force was established in November 1991 to help to ensure coordination between the Southern California Rapid Transit District (RTD) and the service systems agencies in the City of Los Angeles. Representatives of the task force include the following: the Mayor's Office; the City Council offices for Districts 1, 4, 10, 11 and 15; the Los Angeles Department of Transportation; the Los Angeles Department of Water and Power; the Cultural Affairs Commission; the Police and Fire Departments; the Community Redevelopment Agency; the Bureau of Engineering; the Los Angeles Bureau of Street Lighting (BSL); and the Bureau of Street Maintenance (BSM). In addition, representatives of Southern California Edison (SCE), RTD and their consultant, and the Los Angeles County Transportation Commission (LACTC) also attended task force meetings.

The task force issued two reports, one dealing with ETB issues and the other providing recommendations. The task force discussed a number of concerns. The most common issues were related to the overhead power wires, safety, compliance with government codes and standards, liabilities, participation in decision-making and the cost impacts on various city departments. (Sections 3.5.2 and 3.5.3 discuss the specific concerns of the task force regarding potential impacts of the ETB system on utilities and service systems and mitigation measures.)

3.5.2 IMPACTS

Four types of potential impacts on utilities and service systems are discussed in this section. They are (1) effects of joint use of poles, (2) tree maintenance worker safety, (3) high and wide load movement, (e.g., house moving) and (4) street damage. Underground utility line breakage impacts are discussed in Section 3.16. Electrical utilities would need to provide additional power to accommodate the ETB Project. Section 3.10 addresses potential energy consumption impacts.

3.5.2.1 Effects of Joint Use of Poles

Above ground poles would function as the primary support structure for the overhead contact system (OCS) wires and would generally be placed every 100 to 130 feet. Both existing and new poles would be a part of the ETB project. Spacing less than 100 feet may be required in certain locations because of street configurations such as curves, width of cross streets, length of blocks, locations of driveways and intersections and locations of streetlights (joint use considerations).

In some route segments, existing structures (e.g. buildings and bridges) may be used for overhead contact wire support, depending on aesthetic considerations, the building's structural adequacy and other engineering concerns. In addition, common or joint use of poles with street lights, traffic lights and OCS supports could occur. Joint use with electric utility poles is also being considered. Joint use of poles would be implemented in two ways. Where existing poles are not adequate for both functions, a new dual-use pole would be installed as part of the ETB project. Where existing utility poles are suitable, support functions could be added to the pole.

Joint use of street pole supports, which would be implemented wherever feasible, would reduce the street density of poles.

The majority of the LA City Task Force members have expressed support for joint use where possible. However, the BSL has concerns about the joint use of street lighting poles. They are concerned about the safety of personnel from the BSL, Department of Water and Power (DWP) and private contractor crews having to work near overhead contact wires. They have indicated that power feeders for ETB lines should not be placed within poles that are also streetlight supports, and that clearances of 10 feet between equipment and overhead contact wires (required by California Occupational Safety and Health Administration [OSHA]) should be observed. The BSL is also concerned about aesthetics and the potential for liability to the city (despite RTD indemnification) due to negligence, unforeseen circumstances, and other reasons. They also believe that the existing street light poles cannot structurally support the bracket support and wires required for the ETB system; the BSL also believes that repair and maintenance costs will increase if joint poles are used. They are concerned about higher costs due to the need for additional work, special equipment, special training for possible additional hazards and the need for overtime work (i.e., work at night to avoid impact on ETB service).

While joint use poles is a desirable feature of the ETB project from an aesthetic standpoint, it would not be mandatory. The RTD has indicated to the city that it is prepared to erect separate ETB poles in the event that an agreement cannot be reached with the City of Los Angeles concerning joint use.

The impacts of the joint use of poles could be potentially significant unless the following measures are implemented: strategies are formulated to minimize the risks of accidents to maintenance personnel; associated higher maintenance costs to other utilities, etc., are compensated; state and local codes and ordinances requiring utility clearances are observed; and liability and aesthetic issues are resolved. Sections 3.3 and 3.9 discuss aesthetics and safety issues in greater detail. Section 3.5.3 discusses mitigation strategies for these other concerns.

With regard to aesthetics, both the Community Redevelopment Agency and the Cultural Affairs Commission's major concern is that the OCS would be unsightly and, further, that in areas with historical significance or special lighting hardware (e.g., Hancock Park), measures should be taken to complement the specific area's historical and existing urban design fabric. Aesthetic and historic impacts are discussed in detail in sections 3.3 and 3.8, respectively.

3.5.2.2 Tree Maintenance Worker Safety

The OCS may increase the danger to tree maintenance workers. Tree maintenance personnel would need to be trained in working around the electrically charged overhead contact wires. Safety precautions should be followed for the branch pruning required in the vicinity of the overhead wires. The overhead wires are double-insulated from the bracket arms, span wires and support poles, where periodic trimming of nearby trees may be required. Contact with these grounded supports is not normally a hazard. The major hazard to tree maintenance personnel is from other road traffic, particularly when working around overhead wires that are 8 to 18 feet into the street from the curb line. Normal traffic safety measures should be followed.

While some trolley bus operators engage the services of tree maintenance specialists, the limited trimming in the vicinity of energized conductors can often be carried out by the transit authority's overhead line crews. ETB currents do not track or conduct well through branches, even when wet. While it is good practice to maintain clearance between trees and the overhead contact wires, the main concern is to remove any weak tree branches that might fall on or entangle and damage the overhead wires in high winds. Although it is unlikely that an accident involving maintenance personnel would occur, the impacts of an accident would be potentially significant. Measures need to be taken to minimize the risk to the maximum possible extent.

3.5.2.3 Oversize Load Movement

Several of the ETB routes cross or are coincident with streets that are used for house moving or other oversized loads. These routes have been recognized by the cities, and permits are issued for the moves. About three to four permits per week are presently issued by the City of Los Angeles for oversized loads. In addition to houses, other oversized loads such as aircraft assemblies are moved. The industrial loads are less frequent and involve movements over fixed routes between factories and transhipment points for a different mode such as rail or ship.

House moving has existed for half a century or more. Movements then and now have been restricted by the number and location of overhead obstructions, such as wires, bridges and trees. Overhead wire from the previous red and yellow car trolley systems lasted until 1963. The ability to move objects taller than 19 feet was limited to areas without wires. Since 1963 the industry has developed routes to move taller items and has paid to have wires permanently raised in some cases.

Based on current technology and the desire for operating reliability, overhead wires for the ETB project are proposed to be installed at a minimum height of 18 feet. As the height of the wires increases, the side-to-side maneuverability and the maximum tracking speed of the bus contact poles are reduced. The practical height limit is about 22.5 feet, the height required to clear railroad tracks by California Public Utilities Commission. At this height, an ETB would need to be directly under the wires to improve operations.

Implementation of the ETB project would not prevent house moving but would greatly restrict the routes along which and the areas to which structures could be moved. This would be applicable primarily to movement of two-story houses and apartments. Most single-story houses would fit under the ETB wires. To the extent the house moving cannot be accommodated, some structures that can presently be moved would have to be demolished and hauled to landfills.

The Los Angeles City Task Force reports contain a request from the Los Angeles Bureau of Street Maintenance to place ETB wires at 24 feet or to have the RTD pay the cost of wire removal to accommodate the house movements. The reports also suggest that the RTD establish an active research program to eliminate wire at intersections and eventually, all wires. Raising the wires to 24 feet is neither economically nor operationally feasible.

The house moving industry has stated its preference to have house moving routes cleared beforehand to avoid delays during their nighttime permit time window.

3.5.2.4 Street Damage

The bus wheel loads could potentially damage city streets. The City of Los Angeles' Bureau of Engineering has indicated that ETB wheel loads should be kept within code limits in order to prevent damage to city streets and that the proper spacing of ETB power lines and other utilities be maintained. RTD staff are in the process of developing vehicle specifications. The code limits of wheel loads are within the specifications. No significant adverse impacts are expected.

3.5.3 MITIGATION MEASURES

In order to mitigate impacts on utilities and service systems, the measures presented below would be incorporated into the ETB project. Implementation of these measures would reduce potential adverse impacts to a level of insignificance. The mitigation measures are grouped by the four potential impact areas discussed in the previous section.

3.5.3.1 Effects of Joint Use of Poles

a. With regard to the street lighting assessment districts, all required procedures will be taken prior to installation of new or modifications to the existing street lighting systems for the ETB system. These procedures require the property owner's input, a public hearing, and a decision by the city council regarding the project and any levy assessments. The Bureau of Street Lighting and the Cultural Affairs Commission must also approve the lighting plans in the City of Los Angeles. Similar procedures would apply in other jurisdictions. Design measures would be identified to complement the specific area's historical and existing urban design fabric.

Once the lighting system is installed, there is another hearing process, with full notification of all property owners, and a council hearing to confirm and levy the assessments and order the maintenance and operation of the system.

b. Where agreements can be reached with the property owners of the special lighting assessment districts, and with BSL, the existing poles would be replaced with poles identical in appearance but with certain important structural and electrical modifications. The new poles would be supplied by RTD; their design would be coordinated with and approved by BSL's Department of Engineering and property owner groups. It is most likely that in order to preserve the character of the neighborhoods and to maintain the original street lighting poles' design, a number of joint-use pole configurations would be used.

c. The RTD and LACTC intend to work with all municipalities along the ETB routes to establish master cooperative and joint use agreements.

3.5.3.2 Tree Maintenance Worker Safety

a. The RTD will work with the BSM and the tree trimming departments in other jurisdictions to ensure that tree species, tree spacing and tree clearances from the electrified wires will comply with all local codes and ordinances. Providing proper tree spacing to avoid canopy growth (which makes tree trimming difficult) and provision of sufficient clearance from the electrified wires will be emphasized to ensure safe tree maintenance. BSM's concurrence with these design parameters will be actively pursued.

b. Additional information on safety mitigation measures can be found in Section 3.9.3.

3.5.3.3 Movement of High and Wide Loads

Measures that can be implemented are as follows:

- Install removable sections of wire where a designated house moving route enters or crosses an ETB route. This would be only for intersections with straight wire and not intersections where ETB routes cross or turn. These locations can be raised 1 to 2 feet by platform maintenance trucks but would be impossible to remove and reinstall in any reasonable length of time without being disruptive to transit operations.

- Use bracket arm supports on sections of routes that don't turn or cross another route and that are coincident with house moving routes. This will provide a clear area in the center of the street provided the curb to curb width is at least about 70 feet.

- Reconstruct traffic signal arms to provide clearance eliminated by the addition of trolley wire. This would require approval from various local agencies.

- Locate non-revenue routes to maintenance facilities on streets that avoid moving routes.

The following are measures that can be tested as potential mitigations. These measures must be tested with a conventional wire system in place to ensure operating reliability:

- Test the limit of the APU to see how much offwire capability is available.

- Test high energy density batteries to extend the range of the APU.

- Test longer bus poles to improve operation for higher wire.

- Test how high wire can be placed without affecting operation.

- Test automatic pole rewiring systems under a variety of operating conditions.

- Test the use of new materials to provide a lighter bus needed for a longer range APU without exceeding weight limitations.

3.5.3.4 Street Damage

The project will comply with all state and local codes and ordinances regarding utility location and clearances and vehicle wheel load limits.

3.5.3.5 Miscellaneous

The RTD and LACTC will continue to work with the members of the City of Los Angeles ETB Task Force to devise solutions to unresolved issues and to formulate a joint agreement with the task force on the implementation of ETB Project. The agreement would also contain provisions for the equitable assumption of maintenance costs by RTD where specific ETB maintenance is concerned, and appropriate sharing of costs where RTD and city equipment are involved in joint use. The agreement would also discuss potential liability issues among all the parties involved.

3.6 LAND USE, ACQUISITION AND DISPLACEMENT

This section discusses the land use and acquisition and displacement impacts associated with the three components of the proposed Electric Trolley Bus (ETB) system: 1) the construction and operation of the ETB routes, 2) the establishment of ETB traction power substations and 3) the expansion of RTD Divisions 1, 2 and 10 maintenance facilities and the development of a new satellite division. For each component of the project, the section discusses existing land uses, describes and assesses the potential significance of impacts arising from project implementation and prescribes appropriate mitigation measures where required.

3.6.1 ENVIRONMENTAL SETTING

3.6.1.1 Routes

Classification of route segments into street-types representing generalized land use and other street characteristics is provided in section 3.3. Maps of these street-type segments are provided in section 3.3. Following is a discussion of general land uses along the ETB routes.

a. RTD Route 16

Retail, institutional/commercial and office uses constitute the bulk of land uses along Route 16 from the downtown area west to Western Avenue. In the Hancock Park area, land uses change from retail to residential. At the western end of the route between Fairfax Avenue and the route terminus, land uses represent a mix of retail, residential institutional/commercial and office uses.

b. RTD Route 18

Land use patterns along Route 18 differ among three segments of the route: the west end of the route contains small lots with a variety of uses, including retail, residential, office and minimal open space. Larger lots of transit, mixed use office and retail, and industrial uses are found along the downtown portion of the route west of the Los Angeles River. Retail land uses dominate the route east of downtown, with some residential uses, limited open space and two transit locations.

c. RTD Route 30/31

Land uses throughout the western portion of route 30/31 are almost exclusively retail. In the downtown segment of the route land use changes slightly, incorporating a mix of institutional/commercial and office uses while still maintaining a strong retail element. East of the Los Angeles River in the community of Boyle Heights, land uses are largely comprised of small lots dedicated to a variety of uses, including retail, residential and open space. In the unincorporated portion of East Los Angeles, land uses are primarily residential with some retail, institutional/commercial and office uses.

d. RTD Route 40

Land uses at the northern end of Route 40 along Broadway Avenue are comprised predominately of industrial, institutional/commercial and office activities. Along the remainder of the route, land uses consist of retail with pockets of residential areas.

e. RTD Route 45

Land uses in the northern portion of the route are comprised mainly of residential and retail activities with some small portions dedicated to open space and transit uses. Immediately south of the downtown area land uses are primarily industrial, transitioning to mostly retail uses for the remainder of the route.

f. RTD Route 66/67

Land uses vary substantially along the route. The western portion of the route contains a mix of retail, residential, institutional/commercial and office uses while the downtown area is primarily comprised of institutional/commercial and office land uses. East of Alameda Street land uses are primarily comprised of industrial with some retail apparent. East of the Los Angeles River land uses are almost entirely retail, with some industrial and residential uses located near the terminus of the route.

g. RTD Route 70

Retail and industrial land uses dominate the western segment of route 70 approaching the Golden State Freeway (I-5). In the Boyle Heights and City Terrace communities, land uses are primarily residential with some retail uses existing. East from Fremont Avenue to the route terminus land uses are almost exclusively retail.

h. RTD Study Route 182

Land uses along Study Route 182 (also known as Tri-Cities Route) are primarily retail, institutional/commercial and office, incorporating some small portions of residential.

i. RTD Route 204

Retail land uses comprise approximately 90 percent of route 204 with the remainder divided among residential, open space, institutional/commercial and office uses.

j. RTD Route 560

The northern portion of route 560 from Elridge Avenue south to Parthenia Street is largely comprised of residential and retail uses. South of Parthenia Street to approximately Sherman Way land uses vary among residential, industrial, commercial and office uses. In the southern portion of the route located in the communities of Van Nuys and Sherman Oaks, land uses are almost exclusively retail.

k. Montebello Bus Lines Route 10

The western portion of Montebello Bus Lines route 10 from Atlantic Boulevard east to the Rio Hondo River is comprised almost entirely of retail land uses. East of the Rio Hondo River, land uses transition briefly to industrial and then back again to retail in the City of Pico Rivera.

l. Long Beach Transit Route 40

Land uses along Route 40 are comprised predominately of retail activities with small portions of institutional/commercial, office, open space and residential areas located in the eastern segment of the route.

m. Long Beach Transit Route 50

Land uses along route 50 are dominated by retail uses periodically broken by small portions of industrial, public space and residential uses.

n. Long Beach Transit Route 60

Land uses along route 60 vary considerably. The southern portion of the route from approximately San Antonio Drive south consists primarily of retail land uses with substantial amounts of institutional/commercial and office uses. The northern portion of the route, from San Antonio north to the route terminus, is predominately retail with small bands of residential, institutional, commercial and office uses.

o. Long Beach Transit Route 90

Land use from Pacific Avenue east to Bellflower Boulevard is equally divided between retail and residential uses. The eastern portion of the route contains a variety of uses comprised of institutional/commercial, office, retail and residential.

p. Broadway-Downtown Los Angeles Portion of Routes

Land uses along Broadway Avenue are comprised almost entirely of retail, institutional/commercial and office uses.

3.6.1.2 Substations

135 traction power substations (TPSSs) would be spread out along the 12 bus routes throughout the county and three substations would be developed at maintenance yards. TPSSs would convert utility-supplied alternating current (AC) to 750 volt direct current (DC).

Equipment within TPSS structures would include AC switchgear, a transformer, a rectifier, DC switchgear and auxiliary control equipment. TPSS structures are approximately ten feet high and would be placed on a concrete pad. If adequate surrounding land space is available, the TPSS unit would typically include an access road slot directly adjacent to the TPSS structure, with a chain link fence enclosing both.

The area needed to accommodate a TPSS would depend on three factors: the utility company servicing the area, the TPSS power capacity and whether an access road or off-street parking for maintenance staff would be provided. The plot size needed to accommodate feederless (750 kilowatt [kW]) and feeder (3,000 kW) TPSSs are shown on Table 3.6-1. As shown on the table, the land required for each feederless substation would range from 22 feet by 40 feet to 34 feet by 57 feet. Feeder substations with an access road would require a 42-foot by 88-foot site; without an access road, a 30-foot by 88-foot site would be required.

TABLE 3.6-1: APPROXIMATE SUBSTATION BUILDING SIZE AND SUBSTATION SITE DIMENSIONS

FEEDER/FEEDERLESS	UTILITY	SUBSTATION BUILDING SIZE	SITE DIMENSIONS	
			WITH ACCESS ROAD OR OFF-STREET PARKING	WITHOUT ACCESS ROAD OR OFF-STREET PARKING
Feederless	Los Angeles Department of Water and Power	11' X 30'	34' X 57'	22' X 57'[1]
Feederless	Southern California Edison	11' X 28'	34' X 40'	22' X 40'
Feederless	Pasadena Water and Power Department	11' X 28'	34' X 40'	22' X 40'
Feederless	Glendale Public Service Department	11' X 28'	34' X 40'	22' X 40'
Feederless	Burbank Public Service Department	11' X 28'	34' X 40'	22' X 40'
Feeder	Los Angeles Department of Water and Power	19' X 60'	42' X 88'[1]	30' X 88'[1]

Notes: [1] Site size includes area for Los Angeles Department of Water and Power switchgear.

Source: Elcon Associates, Inc.

The TPSSs would be sited preliminarily on land near the roadways on which the ETBs would travel. The preliminary site selection process included the following factors:

- Distance from the bus route. The objective was to minimize the amount of trenching for the underground electrical cables for reasons of cost and construction disruption. In general, the TPSSs were located within one block of the route.

- Distance between TPSSs. The electrical requirements of the ETB system require that the TPSSs be located approximately 1.0 to 1.2 miles apart for the feederless system.

- Size of the TPSS footprint. The area needed to accommodate a TPSS with an access road depends on the electricity source and TPSS power capacity, as described in section 2.4.3.2.

- Ability to serve more than one ETB route. Locations that could serve more than one nearby route were selected rather than choosing separate locations for each route.

- Ownership of property. Ease of acquisition was considered, and preference was given to publicly-owned land.

- Location of sensitive land uses. Sensitive uses include churches, hospitals, parks, residences and schools. The main concerns are potential noise and visual impacts. An attempt was made to locate the TPSSs at sites with compatible land uses, such as commercial and industrial, and away from sensitive land uses.

The TPSS selection process produced 72 units within DWP territory. Two of the 72 would be the larger feeder type. The remaining 63 of the 135 units would be sited in other utility company areas. The total land area that would be required for the ETB substations would be 8.6 acres. In addition, utility easements would be required for the underground electrical cables connecting the TPSSs to the utility system and the overhead contact system (OCS).

Figures 3.6-1 through 3.6-12 graphically illustrate substation locations along each of the proposed routes. Table 3.6-2 provides the TPSS identification number, associated ETB Route number(s), the preliminary site location including the tax identifier (Los Angeles County Assessor map book, page and parcel number), the preliminary location of the TPSS on the parcel and the existing land use on each site and the surrounding vicinity. Distances to sensitive land uses are also provided.

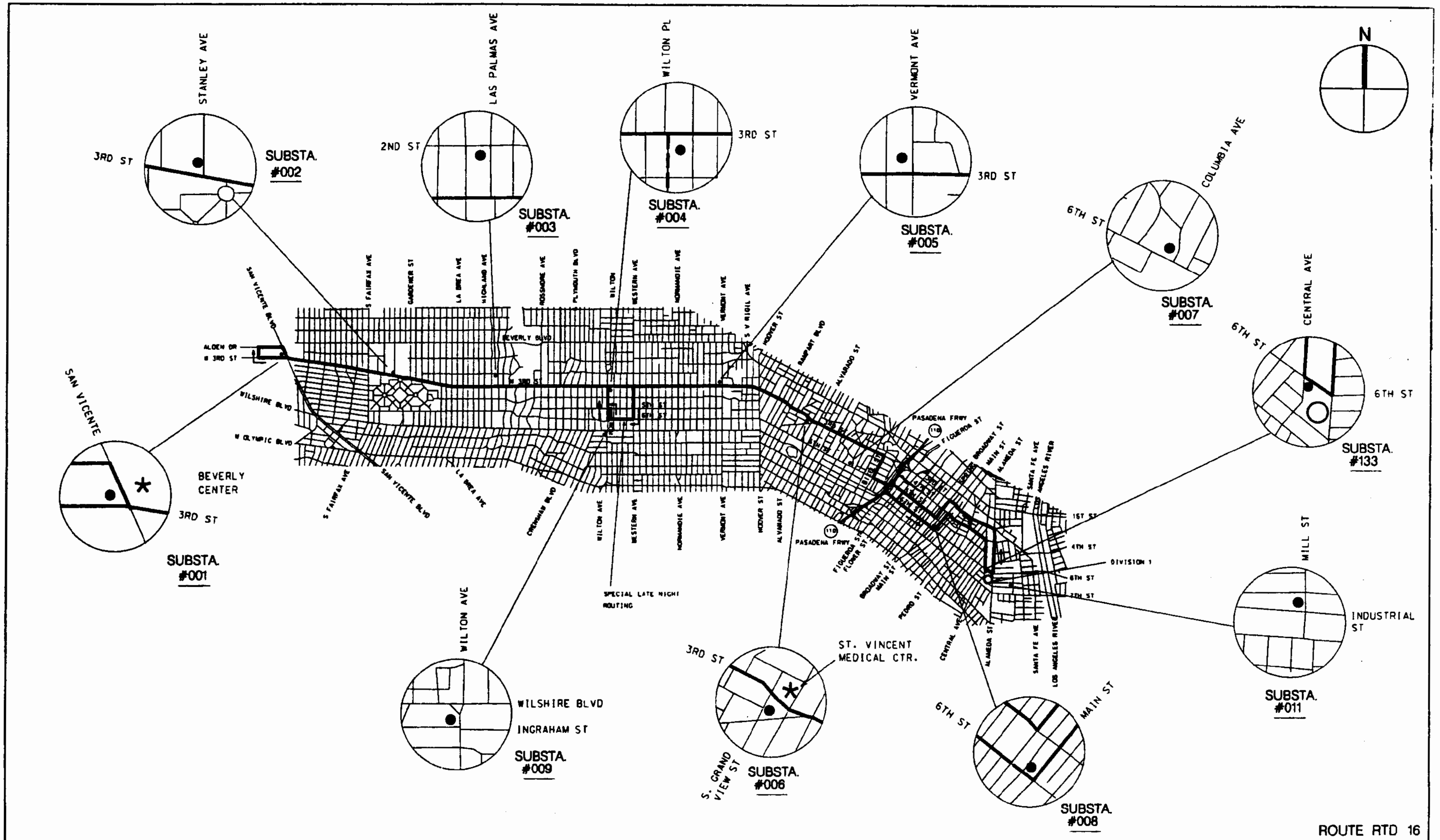

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FIGURE 3.6-1
ETB ROUTE RTD 16

DRAWING FILE RTD16.DGN	CONTRACT NO.
REFERENCE FILE ETAKMAPS	DRAWING NO. RTD16 / REV. 1
USER NAME ACG/SVP	SCALE 1"=1 MILE
PLOT DATE 10/30/92	SHEET NO.

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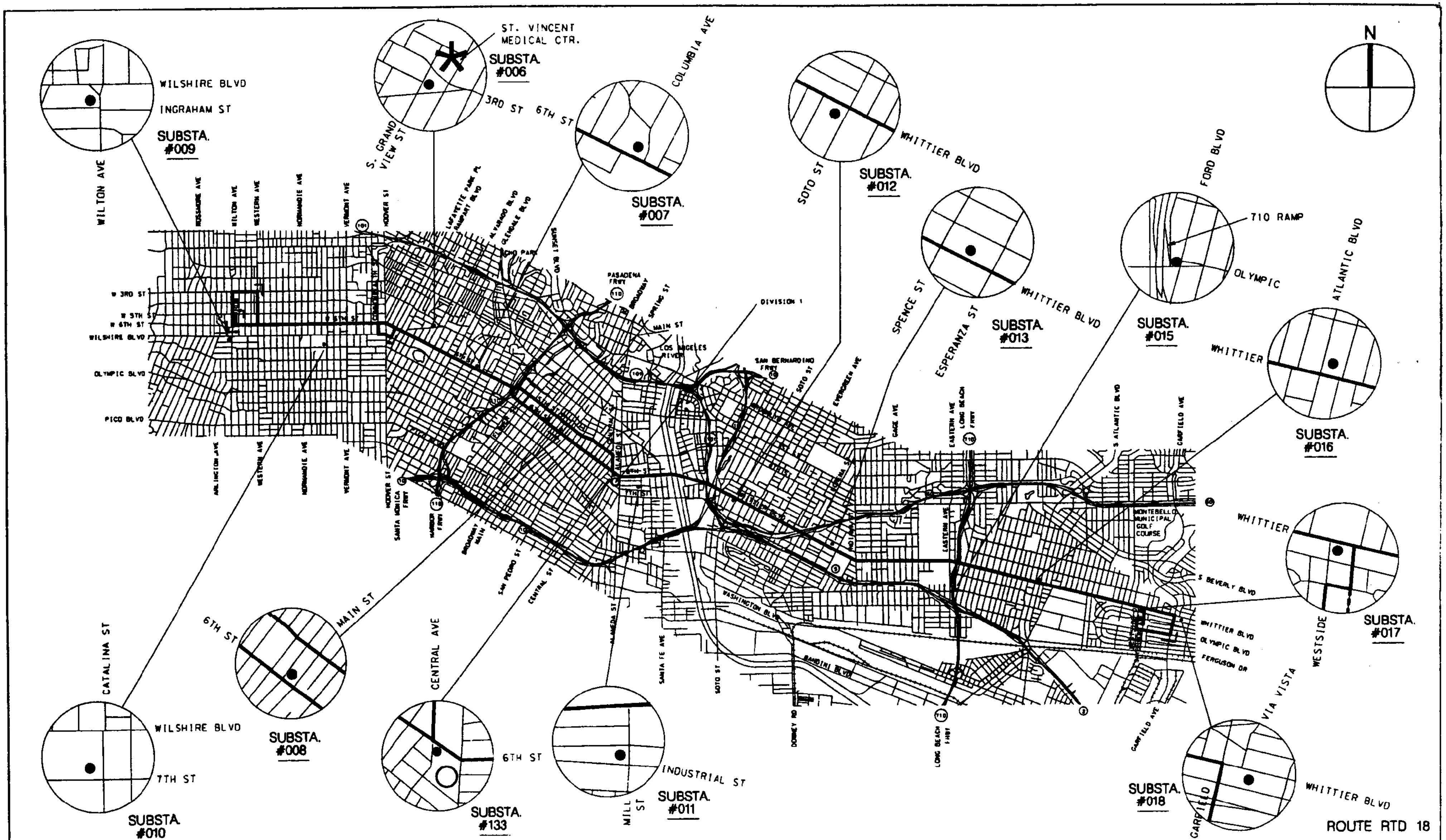

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FIGURE 3.6-2
ETB ROUTE RTD 18

DRAWING FILE RTD18.DGN
REFERENCE FILE ETAKMAPS
USER NAME ACG/SVP
PLOT DATE 10/30/92
CONTRACT NO.
DRAWING NO. RTD18
REV. 1
SCALE 1"=1 MILE
SHEET NO.

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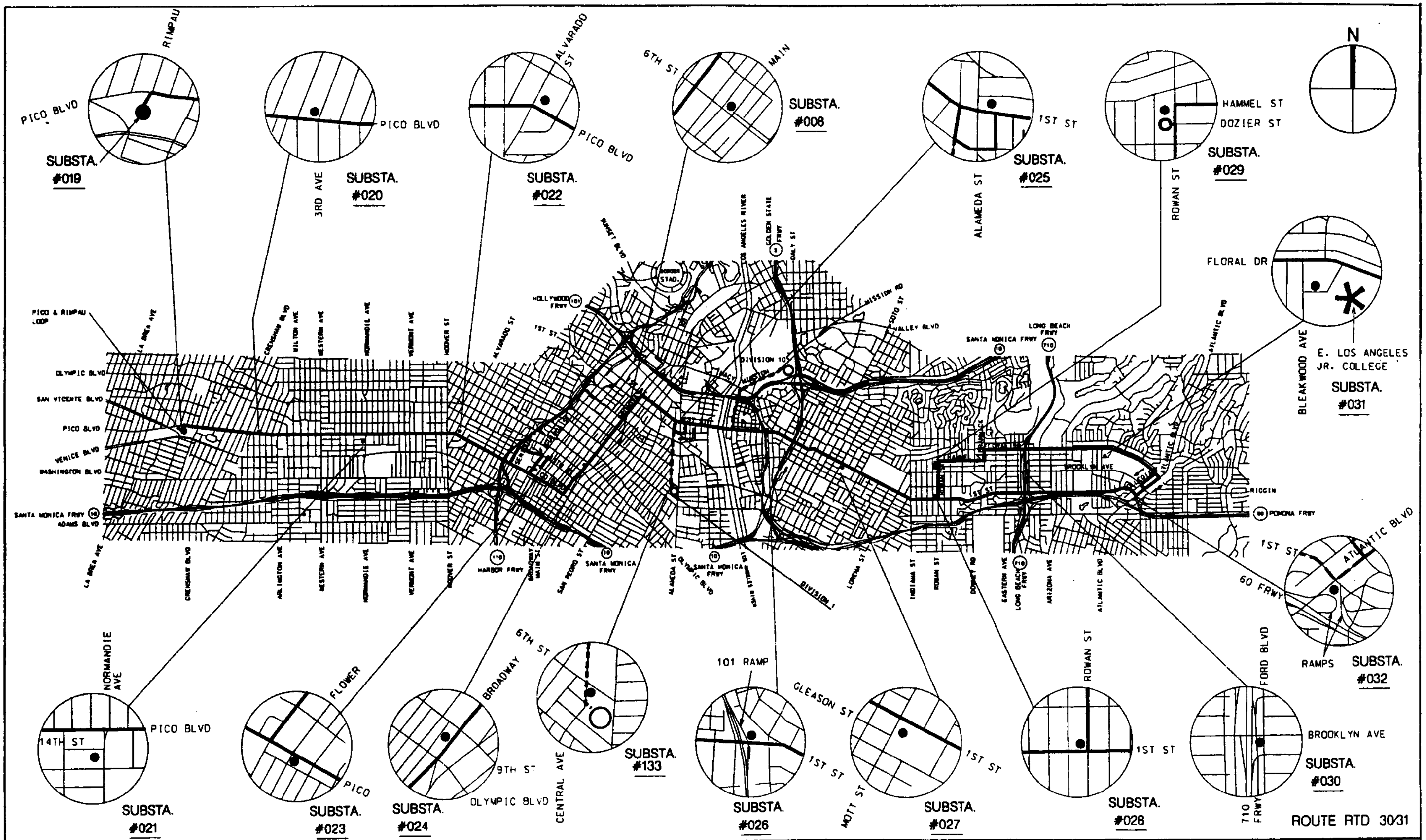

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FIGURE 3.6-3
ETB ROUTE RTD 30/31

DRAWING FILE RTD30.DGN	CONTRACT NO.
REFERENCE FILE ETAKMAPS	DRAWING NO. RTD30 — REV. 1
USER NAME ACG/SVP	SCALE 1"=1 MILE
PLOT DATE 10/30/92	SHEET NO.

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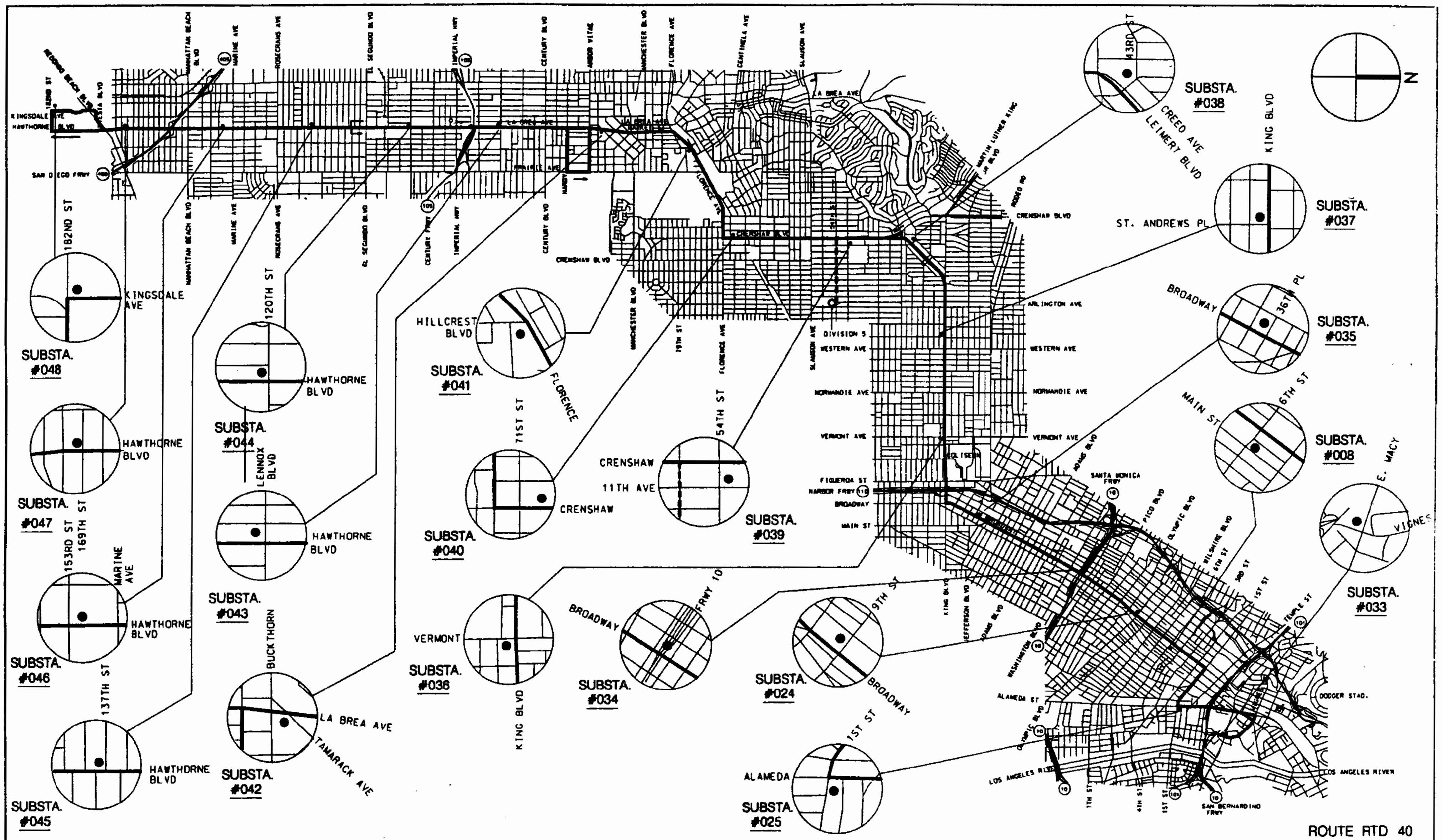

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FIGURE 3.6-4
ETB ROUTE RTD 40

DRAWING FILE RTD40.DGN	CONTRACT NO.
REFERENCE FILE ETAKMAPS	DRAWING NO. RTD40 REV.
USER NAME ACG/SVP	SCALE 1"=1 MILE
PLOT DATE 10/30/92	SHEET NO.

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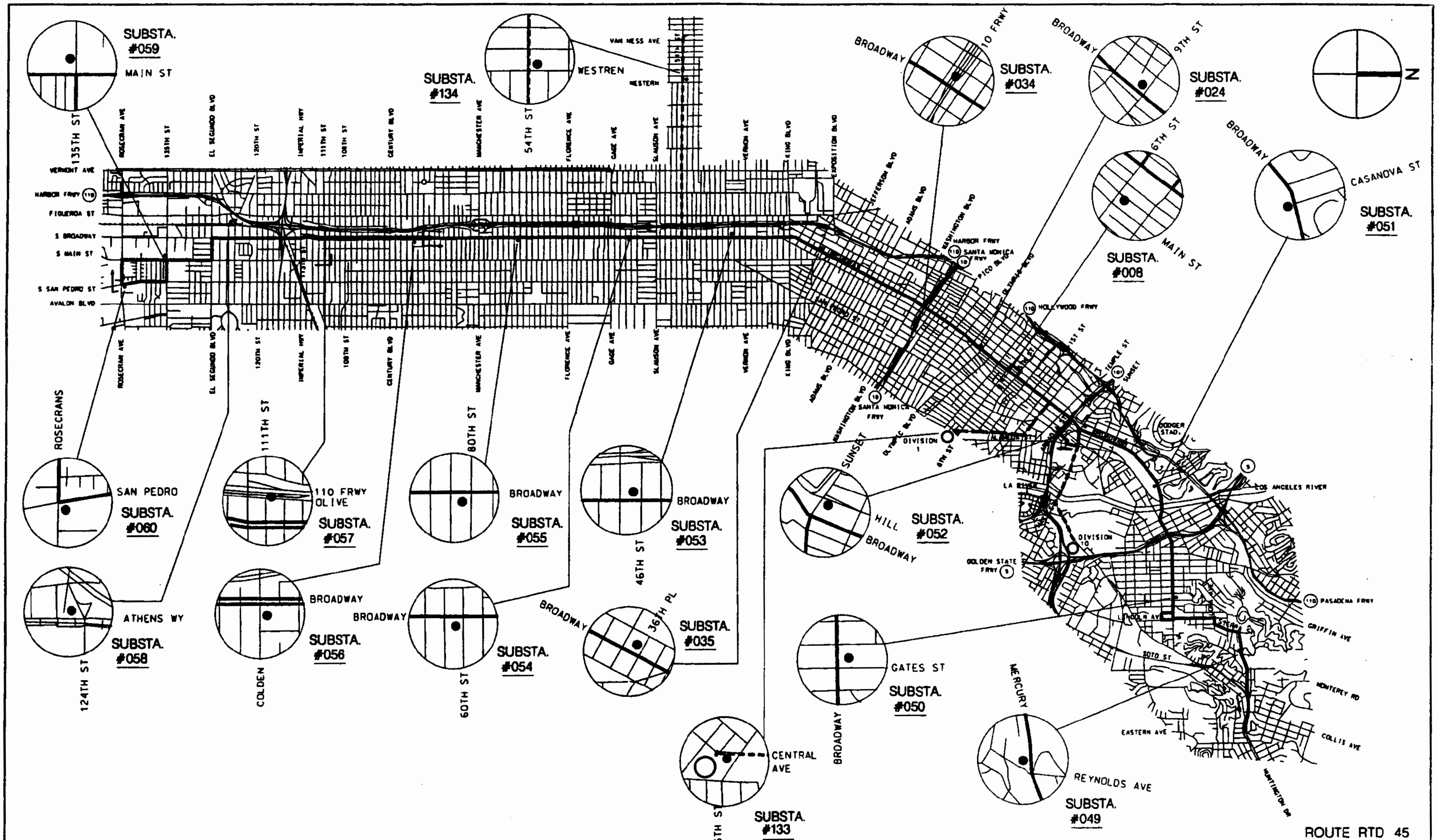

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FIGURE 3.6-5
ETB ROUTE RTD 45

DRAWING FILE RTD45.DGN	CONTRACT NO.
REFERENCE FILE ETAKMAPS	DRAWING NO. RTD45 — REV. 1
USER NAME ACG/SVP	SCALE 1"=1 MILE
PLOT DATE 10/30/92	SHEET NO.

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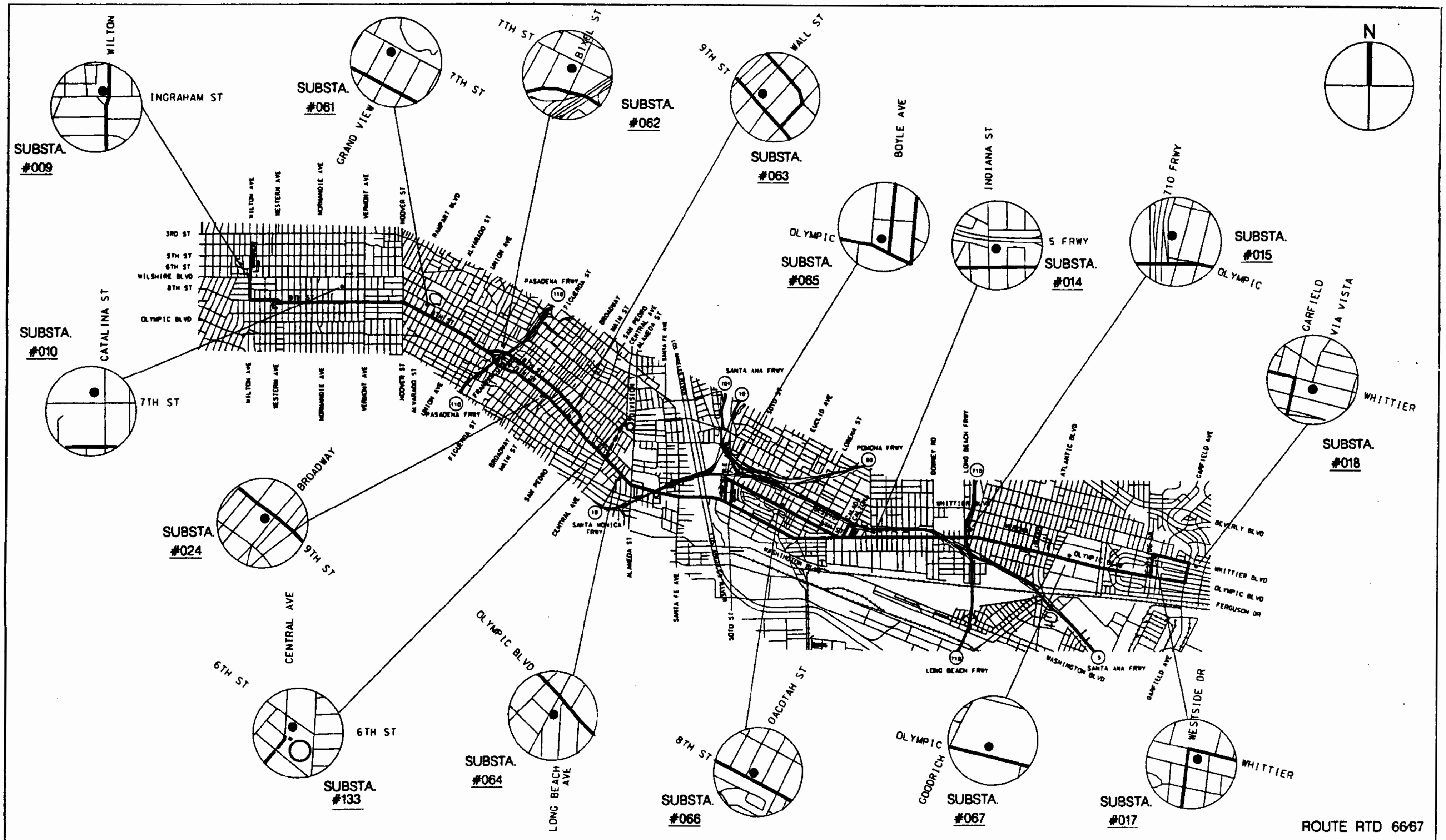

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FIGURE 3.6-6
ETB ROUTE RTD 66/67

DRAWING FILE RTD66.DGN	CONTRACT NO.
REFERENCE FILE	DRAWING NO. RTD66 — REV. 1
USER NAME ACG/SVP	SCALE 1"=1 MILE
PLOT DATE 10/30/92	SHEET NO.

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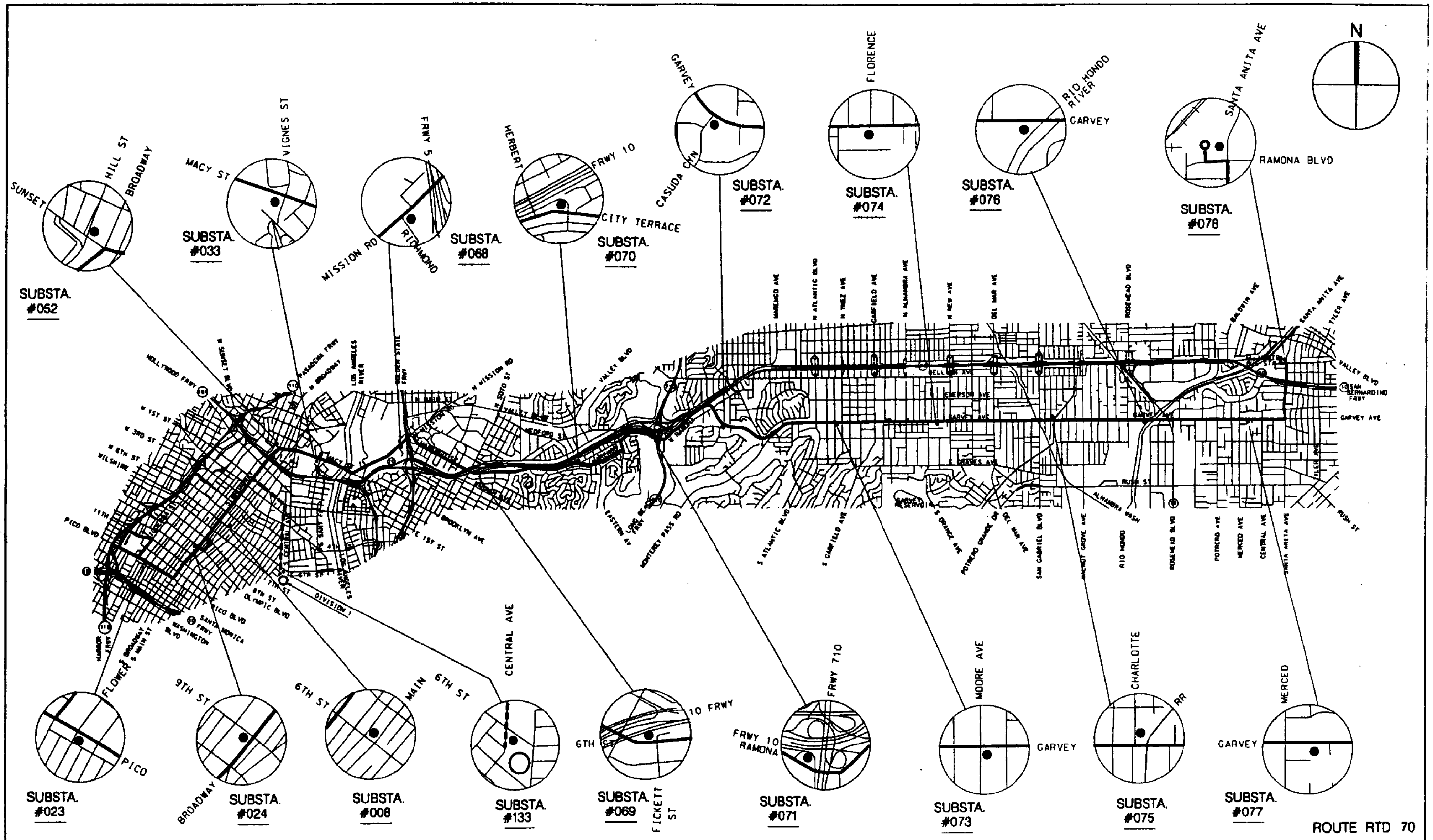

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FIGURE 3.6-7
ETB ROUTE RTD 70

DRAWING FILE: RTD70.DGN	CONTRACT NO.
REFERENCE FILE: ETAKMAPS	DRAWING NO.: RTD70 — REV. 1
USER NAME: ACG/SVP	SCALE: 1"=1 MILE
PLOT DATE: 10/30/92	SHEET NO.

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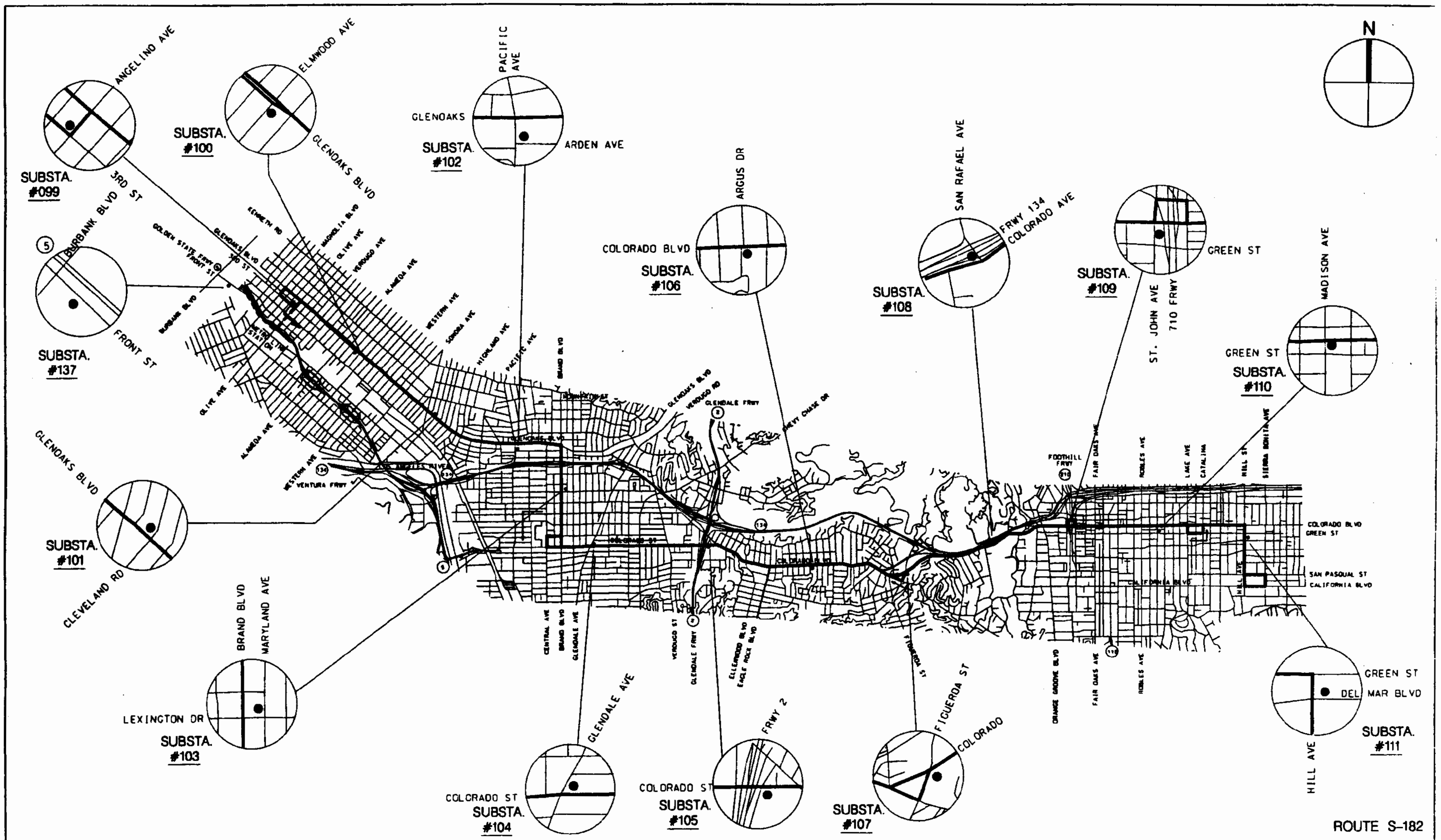

1	6.92	SVP			ROUTE MODIFICATION						DESIGNED BY	ELECTRIC TROLLEYBUS PROJECT	FIGURE 3.6-8 ETB STUDY ROUTE 182	DRAWING FILE TRICITY.DGN	CONTRACT NO.	
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					DESCRIPTION						CHECKED BY	LACTC SUBMITTED		USER NAME ACG/SVP	SCALE 1"=1 MILE	
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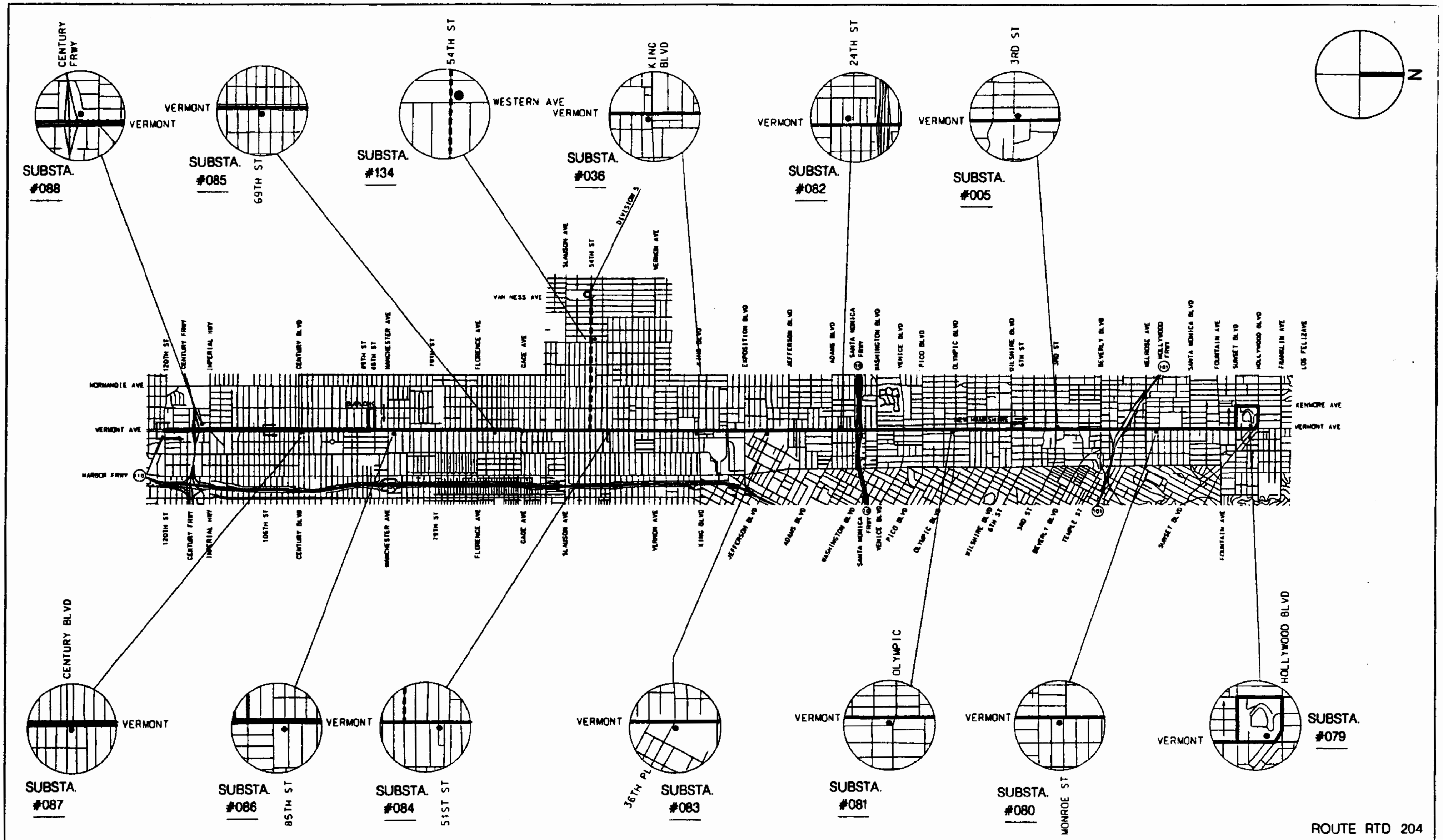

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FIGURE 3.6-9
ETB ROUTE RTD 204

DRAWING FILE RTD204.DGN
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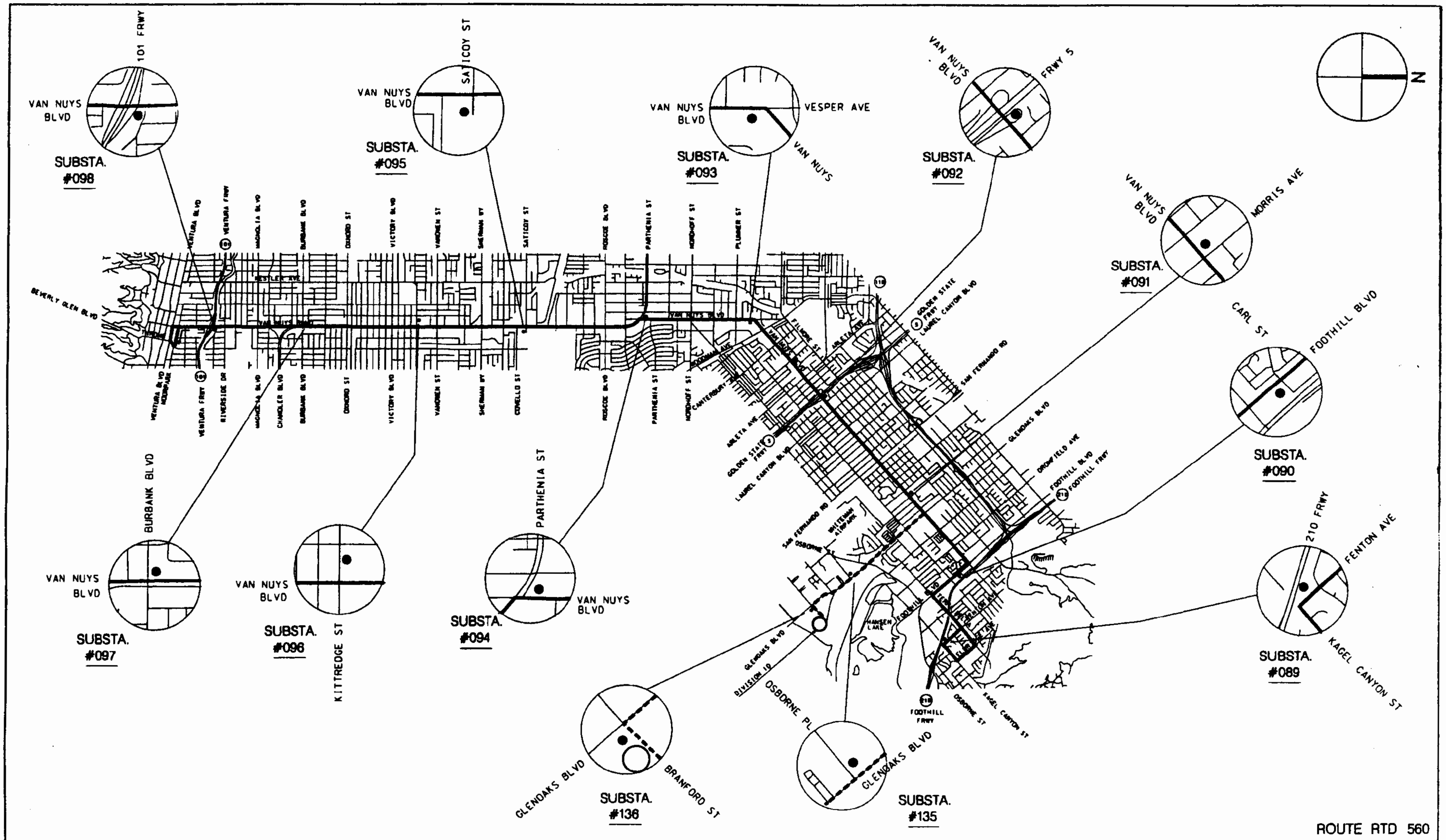

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FIGURE 3.6-10
ETB ROUTE RTD 560

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PLOT DATE 10/30/92	SHEET NO.

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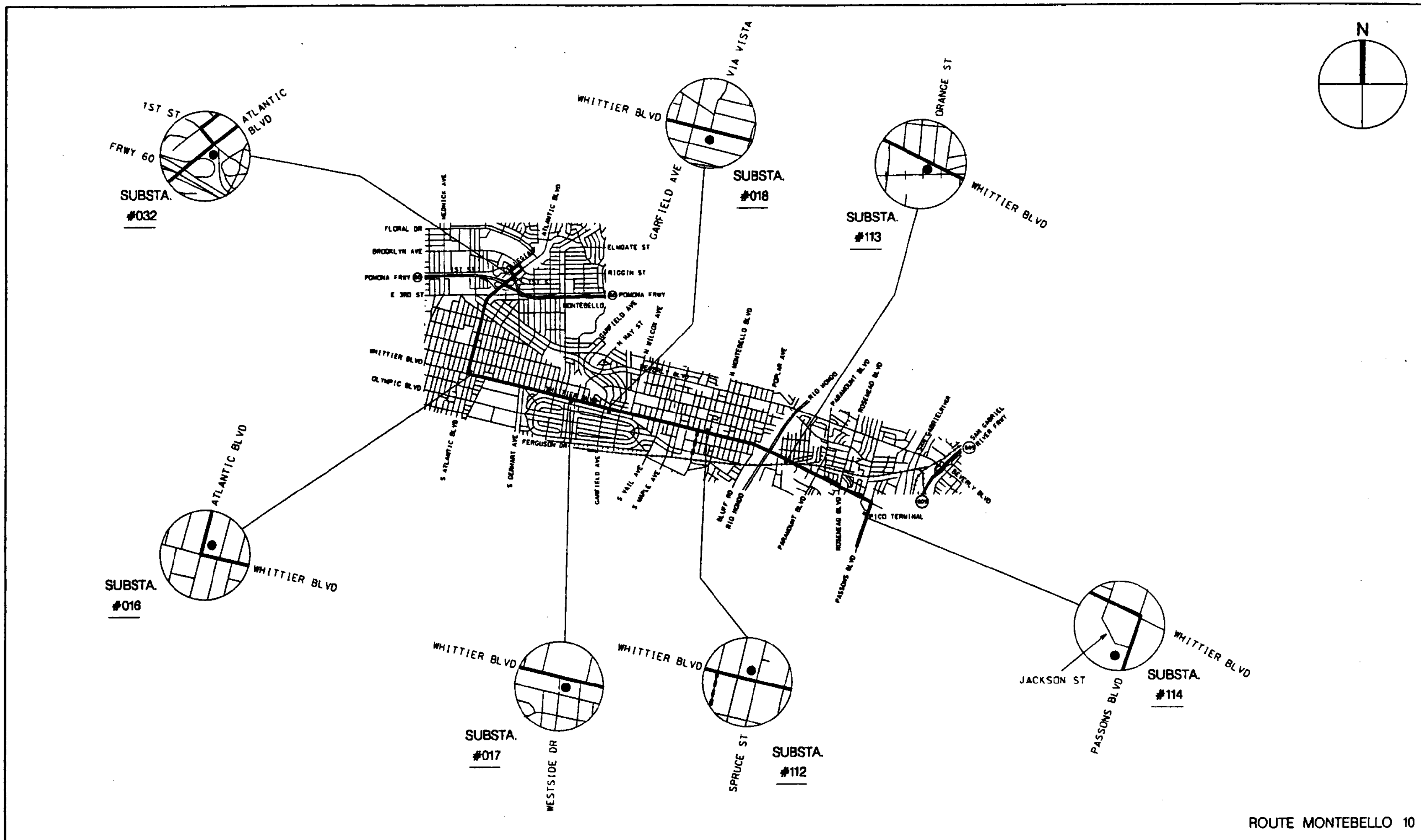

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FIGURE 3.6-11
ETB ROUTE
MONTEBELLO 10

DRAWING FILE MB10.DGN	CONTRACT NO.
REFERENCE FILE ETAKMAPS	DRAWING NO. MB10
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PLOT DATE 10/30/92	SHEET NO.

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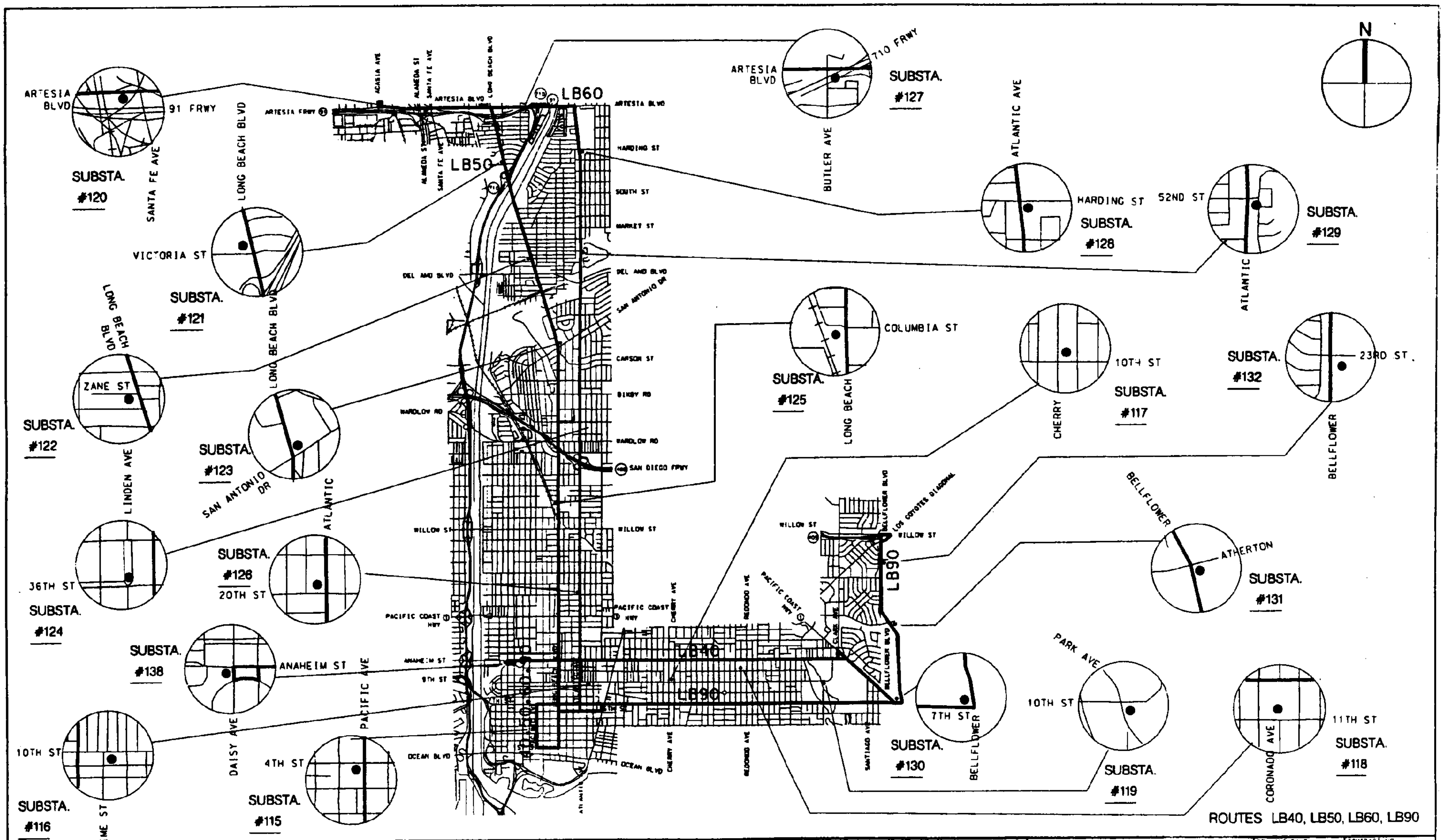

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FIGURE 3.6-12
ETB ROUTES LB40, LB50, LB60, LB90

DRAWING FILE LBLINES.DGN
REFERENCE FILE ETAKMAPS
USER NAME ACG/SVP
PLOT DATE 10/30/92
CONTRACT NO.
DRAWING NO. LBLINES
REV.
SCALE 1"=1 MILE
SHEET NO.

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TABLE 3.6-2: PRELIMINARY SUBSTATION SITE CHARACTERISTICS[a]

TPSS #	ROUTE	PRELIMINARY SITE LOCATION	SITE ASSESSOR PARCEL NUMBER	PRELIMINARY SITE ORIENTATION	SITE USE	SURROUNDING USES
136	RTD 560	GLENOAKS BL + BRANFORD ST, NE CORNER	2528-08-907	N END OF DIVISION NEAR PULL VAULT	DIVISION 15	DIVISION TO S + E + W. PARKING LOT TO N.
137	S-182	BETWEEN BURBANK BL + MAGNOLIA BL, S OF FRONT STREET	2449-37-011	ON N CENTER EDGE OF SITE NEAR FRONT ST.	VACANT WAREHOUSE/ INDUSTRIAL AREA	FRONT ST + GOLDEN STATE FREEWAY TO NE, OFFICE BUILDING TO NW, RAILROAD RIGHT-OF-WAY TO SW, WAREHOUSE AND INDUSTRIAL TO SE.
138	LB 40	ANAHEIM ST + DAISY AVE, SW CORNER	7271-05-007	SW SIDE OF LOT AGAINST WALL	PARKING LOT	RESTAURANT TO N, UNIFORM RENTAL FACILITY TO W, DIRT TRAIL TO S, RESIDENTIAL TO E. RESIDENTIAL >70 FEET.

NOTE:
[a] All sites are subject to change during final design.

Sources: Daniel, Mann, Johnson & Mendenhall, 1992; Elcon Associates, Inc., 1992; Myra L. Frank & Associates, Inc., 1992.

3.6.1.3 Division Yards

a. Division 1 Expansion Site

The proposed Division 1 expansion site is located on a 2.4-acre parcel at the east end of the block bounded by Industrial Street, Alameda Street, East 7th Street and Central Avenue, immediately south of the existing Division 1 expansion site. Land uses at and surrounding the site are shown in Figure 3.6-13. The site is currently occupied by a private truck fueling and wash station and a refrigeration unit repair facility. An active hotel with ground floor retail, a parking lot and a vacant commercial building border the western corner of the expansion site. At the west end of the block, along Central Avenue and East 7th Street, are three-story buildings comprised of vacant residential units and ground floor retail that is approximately 80 to 90 percent vacant. The Division 1 expansion site is bordered to the south by a wholesale fruit and vegetable distribution center comprising the full block south of East 7th Street and between Alameda Street and Central Avenue. East of the expansion site are light industrial uses, in addition to a Greyhound bus terminal and depot yard.

The Division 1 expansion site is designated Light Industrial in the Central City Community Plan and is zoned M2 (Light Industrial).

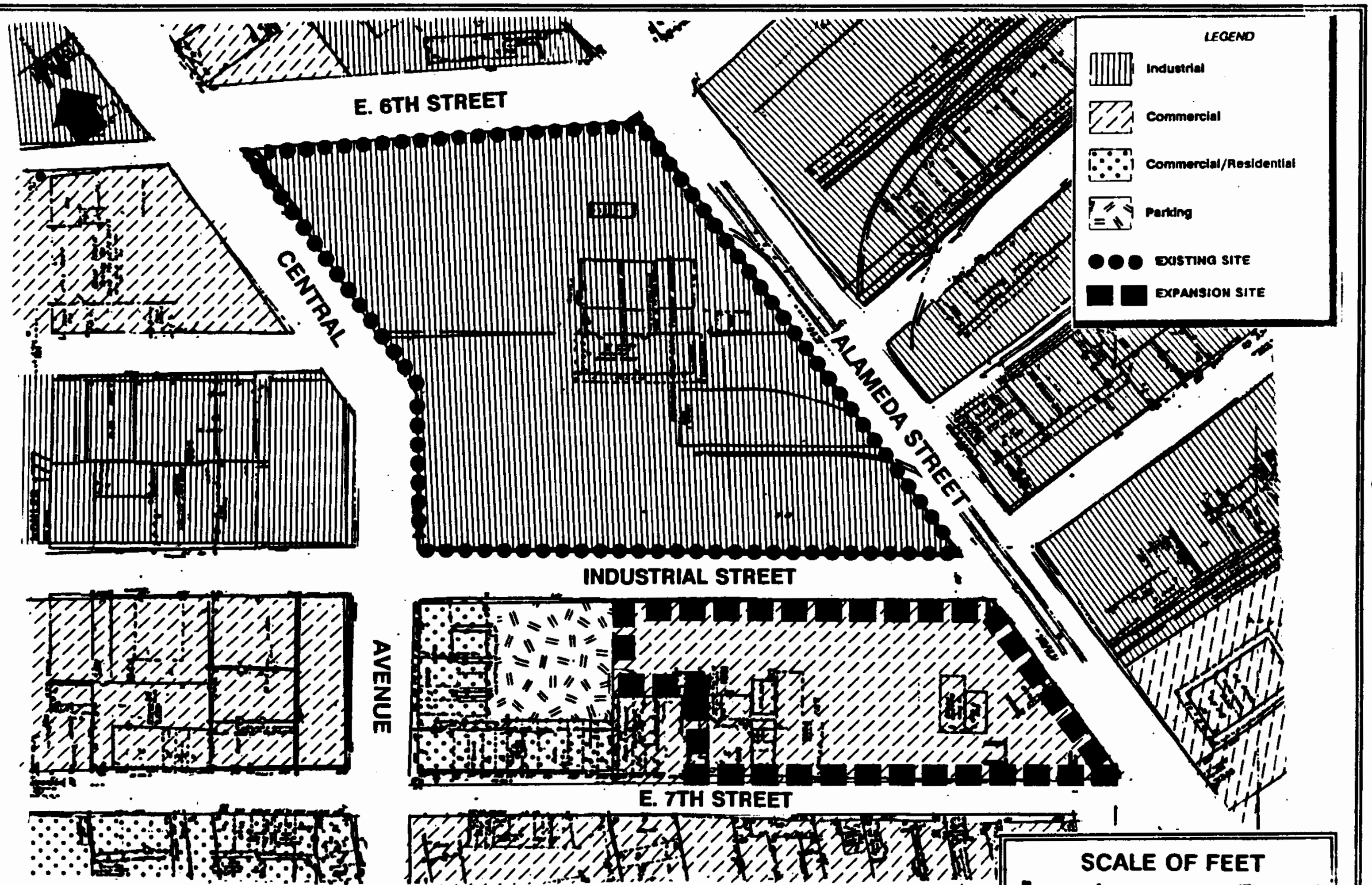
b. Division 2 Expansion Site

The Division 2 expansion site encompasses an approximately 2.8-acre parcel situated at the westerly end of the block bounded by 14th Place to the north, 15th Street to the south, Griffith Avenue to the east and San Pedro Avenue to the west, immediately north of the existing Division 2 yard. The proposed Division 2 expansion site is currently occupied by large-lot light industrial uses and associated parking areas. Figure 3.6-14 indicates existing land uses at the proposed Division 2 expansion site and immediate vicinity. The predominant use of the site is comprised of the Keystone Engineering Company, a manufacturer of aircraft bearings. Other uses on the Division 2 expansion site include a wire basket manufacturing facility and a textile wholesaler. The basket manufacturer is presently expanding operations onto an adjacent parcel west of the existing facility. The entire Division 2 expansion site is designated Light Industrial in the Central City Community Plan and is zoned M2 (Light Industrial).

Light industrial uses border the Division 2 expansion site to the east. The site is bordered to the north and west by office space, parking areas and maintenance facilities associated with a Los Angeles Unified School District Annex; and to the south by the existing Division 2 maintenance yard.

c. Division 10 Expansion Site

The Division 10 Expansion Site consists of approximately 6,000 square feet of hilly vacant land located adjacent to the southeastern end of the existing Division 10 maintenance facility at the northwest juncture of the I-5 Golden State and the I-10 San Bernadino Freeways in the Boyle Heights community of Los Angeles. The site, which is bounded to the north by a light industrial use, to the west by the Division 10 yard, to the south by the I-10 San Bernadino Freeway, and to the east by the I-5 Golden State Freeway; is zoned M2 (Light Industrial) and is designated Open Space, Public/Quasi-Public in the Boyle Heights Plan, a part of the City of Los Angeles



Source: Myra L. Frank & Associates, Inc., 1992.

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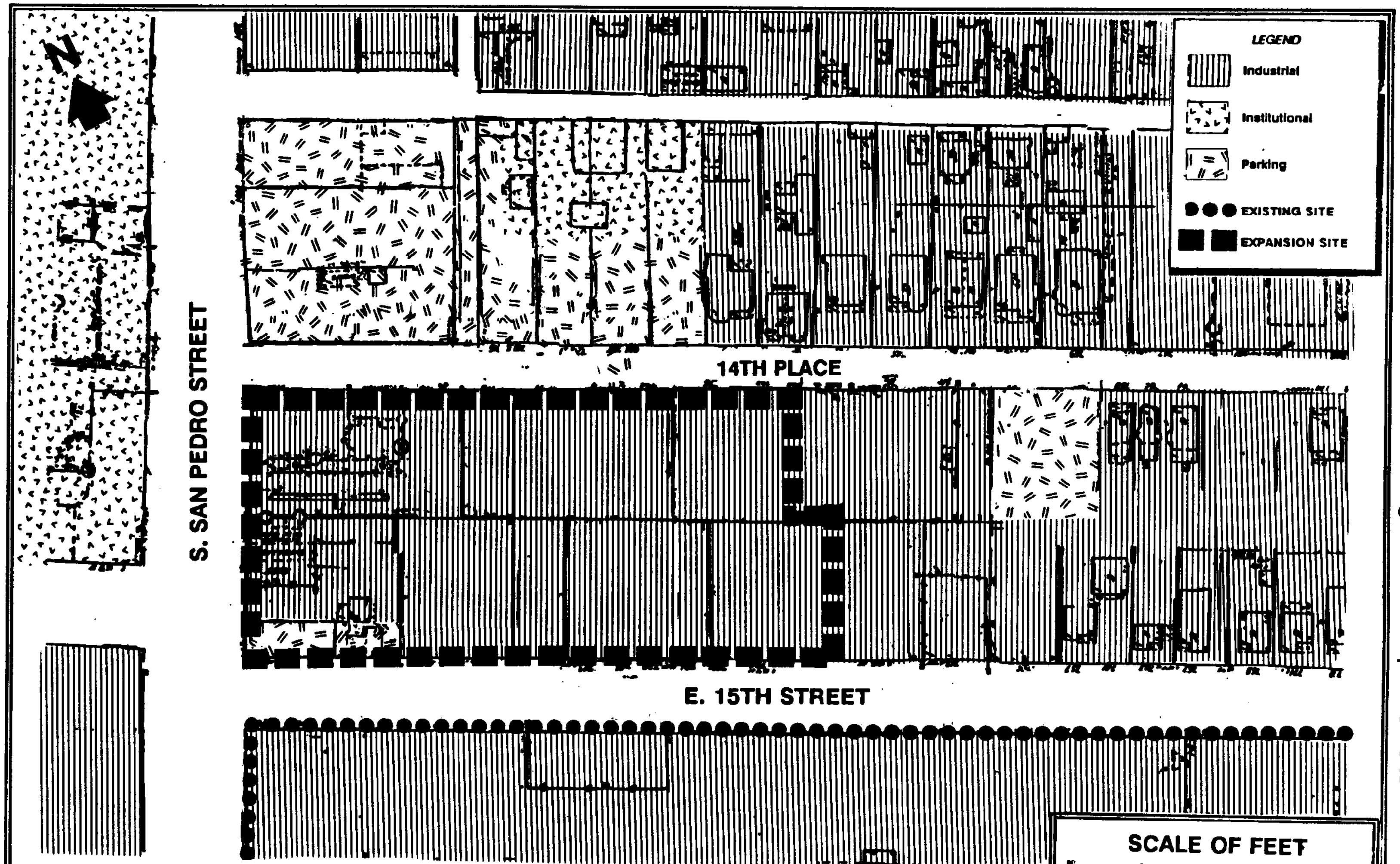
3.6-13: Land Uses at and Surrounding the Division 1 Site



Source: Myra L. Frank & Associates, Inc., 1992.

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3.6-14: Existing Land Uses at the Existing Division 2 Expansion Site

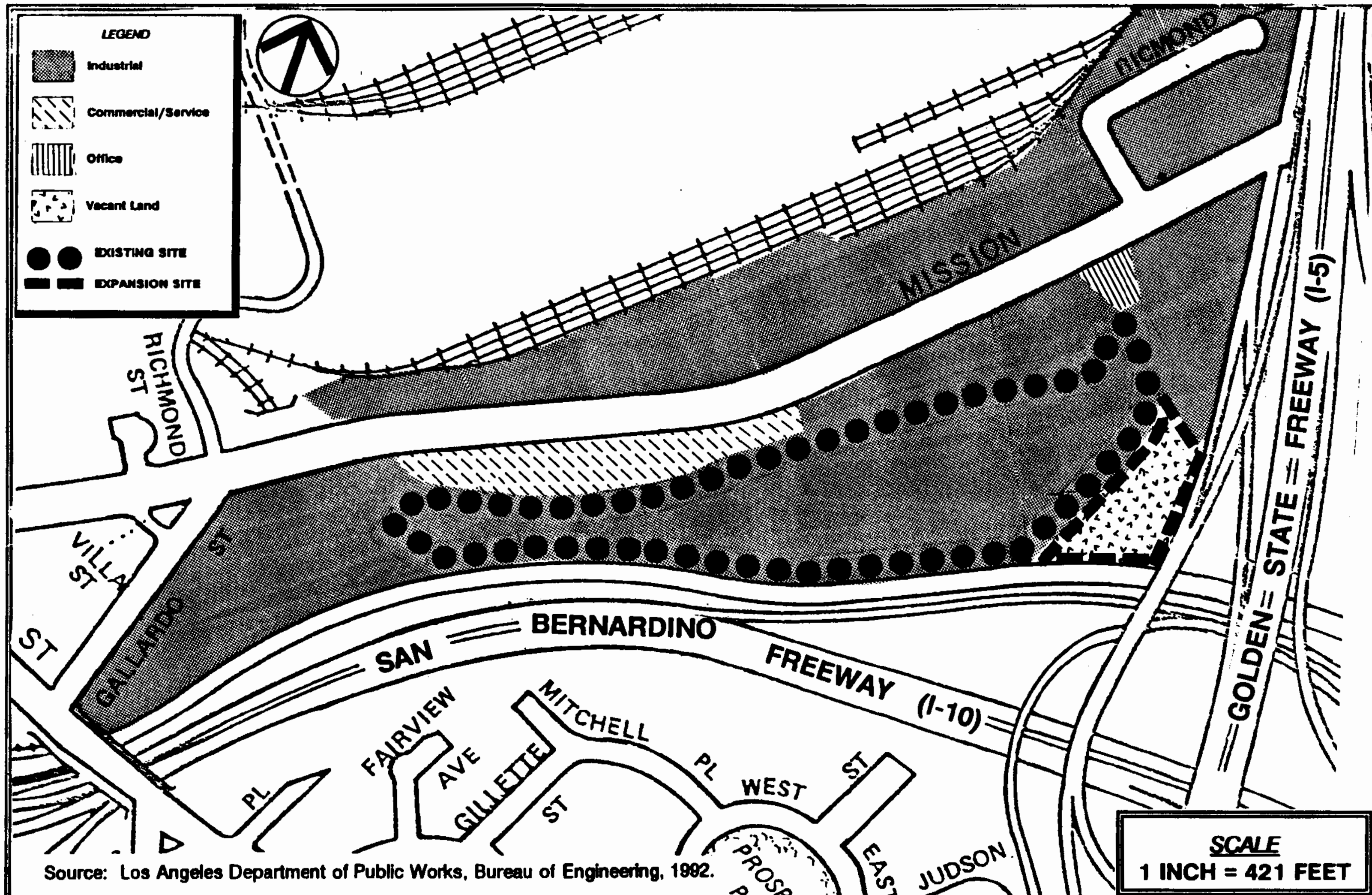
General Plan. Figure 3.6-15 shows exiting land uses at the Division 10 Expansion site and surrounding vicinity. In the Boyle Heights Community Plan, a footnote to the Open Space, Public/Quasi-Public land use designation states:

> "Quasi-Public land designations on this map indicate existing uses which are anticipated to remain. The plan does not propose public acquisition of the designated lands.
>
> When the use of property designated as "open space" (e.g., recreation, environmental protection, public school site) is proposed to be discontinued, the proposed use shall be approved by the appropriate decision-makers through a procedure similar to a conditional use. The decision-makers shall find that the proposed use is consistent with the elements and objectives of the General Plan and may impose additional restrictions on the existing zoning as deemed necessary to assure that the proposed land use will be compatible with the land uses, zoning, or other restrictions of adjacent surrounding properties, and consistent with the General plan." (Boyle Heights Community Plan, *Notes*)

d. Satellite Division

The proposed satellite division site for Route S-182 is located on an 8.2-acre parcel in the City of Burbank. Bounded to the northwest by Burbank Boulevard, the Magnolia Boulevard Overpass to the southeast, Front Street to the northeast and Southern Pacific railroad tracks to the southwest, the parcel on which the proposed site is situated currently contains a vacant manufacturing facility (777 Front Street), a vacant 4-story office building, a vacant maintenance shed and a vacant commercial storage facility (215 front Street). Figure 3.6-16 shows existing land uses at the satellite division site and in the surrounding vicinity. The proposed site is zoned M2 (Light Industrial) and is designated for general industrial uses in the City of Burbank General Plan. Light industrial uses comprised of privately owned lumber yards and a City of Burbank water reclamation plant are southwest of the proposed satellite division site across the Southern Pacific railroad tracks.

Figure 3.6-15: Existing Land Uses at the Division 10 Expansion Site



Source: Los Angeles Department of Public Works, Bureau of Engineering, 1992.

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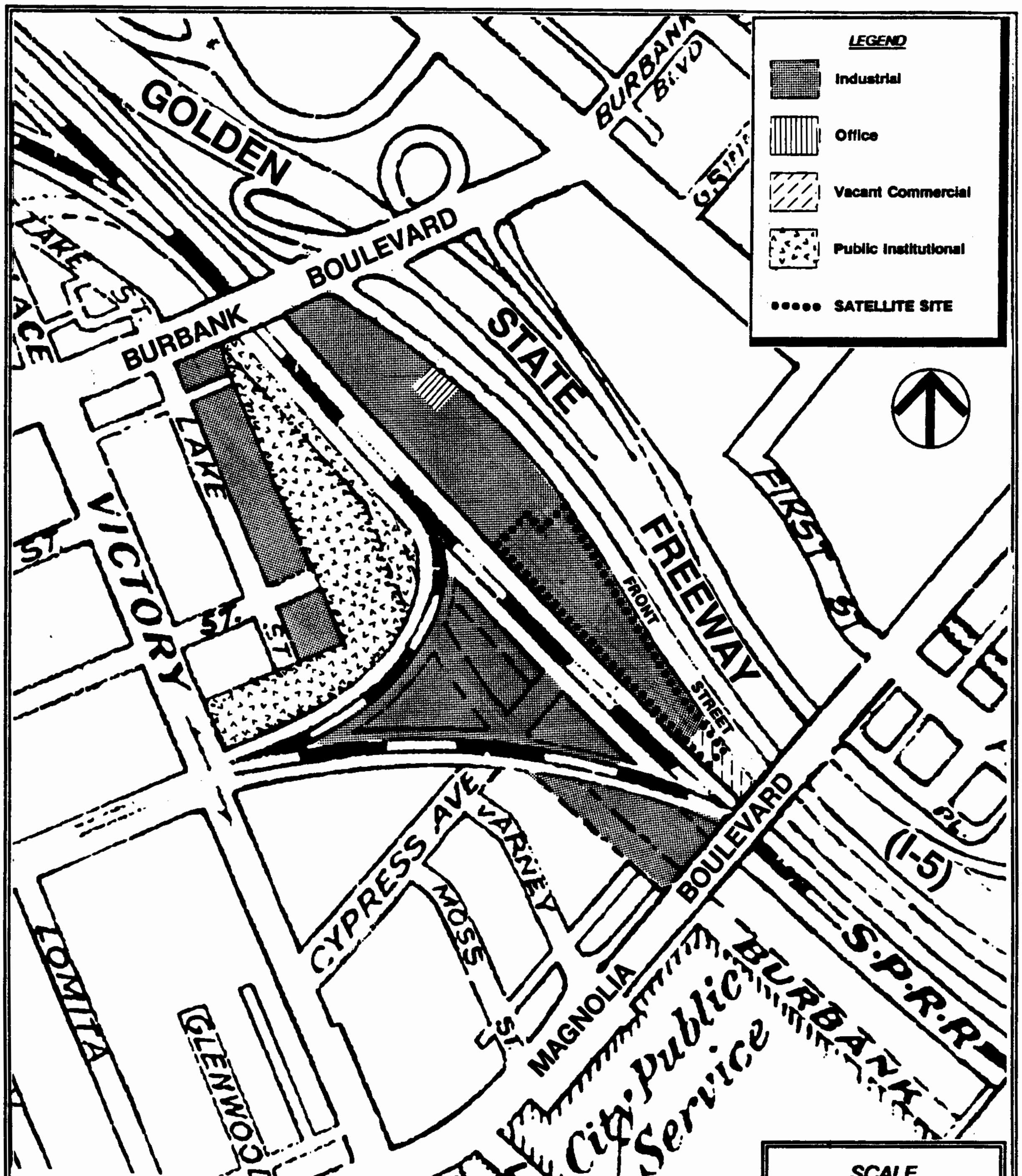
3.6-15: Existing Land Uses at the Division 10 Expansion Site



Source: City of Burbank, Department of Public Works, 1992.

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Figure 3.6-16: Existing Land Uses at the Satellite Division Site

3.6.2 IMPACTS

3.6.2.1 Routes

No significant land use, acquisition or displacement impacts are anticipated as a result of the construction and operation of the ETB routes.

3.6.2.2 Substations

Land use impacts associated with the establishment of traction power substations would consist of 1) acquisition or displacement of real property and the resultant effects on potential future development; 2) inconsistencies between the TPSS and underlying zoning; and 3) substation siting near sensitive uses, which are defined as residences, schools, hospitals or community facilities.

a. Acquisition and Displacement and Effects on Potential Future Development

Table 3.6-3 indicates that approximately 70 percent of the TPSSs would be placed on land that is currently vacant lots or parking lots.

TABLE 3.6-3: LAND USES AT SUBSTATION SITES

SITE USE	# OF SUBSTATIONS
1. Vacant lot	53
2. Parking lot	42
a. Commercial and retail	24
b. Municipal	4
c. College or university	5
d. Other (except RTD)	9
3. Caltrans property	16
4. Utility property	9
5. Storage lot	6
6. Abandoned building	5
7. RTD property	6
8. Montebello Bus Lines property	1
TOTAL	138

Source: Myra L. Frank & Associates, Inc., 1992

The 53 vacant lots contain no buildings, do not appear to have any current use and are predominantly unimproved. The 16 Caltrans properties form part of the right-of-way for state freeways. The nine utility properties include easements, a DWP maintenance facility, a pump station, a cable crossing enclosure and a flood control property. Storage lots are categorized as vacant lots that are currently used to store various materials. Of the 138 substations, 46 are located on publicly-owned land. Project effects on public services are discussed in Section 3.11.

Of the 42 affected parking lots, more than half are associated with commercial and retail uses. Assuming that each TPPS would displace four parking space slots, a total of 96 commercial and retail parking spaces would be removed as a result of the project.

The establishment of TPPSs could alter the future type and scale of development at those sites. Properties for which the TPSS would virtually prohibit future use have been identified as full property takes (see Section 3.17). For the remaining properties, future use of the property appears to still be feasible, although potentially more limited.

b. Consistency with Zoning

Some TPPSs would be located in areas zoned for residential and commercial uses which may not permit the operation of an electric traction power substation.

c. Proximity to Sensitive Land Uses

A summary of land uses surrounding the proposed TPSS parcels is provided in Table 3.6-4.

TABLE 3.6-4: LAND USES SURROUNDING SUBSTATION PARCELS

SURROUNDING USE	# OF SUBSTATIONS[1]
1. Residential	63
2. Church	7
3. School	3
4. Park	2
5. Miscellaneous sensitive (historic building and day care facility)	2
6. Hospital	1
Not sensitive use	70

Note: [1] This column does not total 138 because substations have more than one type of surrounding use.

Source: Myra L. Frank & Associates, Inc., 1992.

Of the 138 TPSSs, 70 have surrounding land uses that are not classified as sensitive. Vacant lots, parking lots, commercial and industrial uses are included in this category. The remaining surrounding land uses are potentially sensitive. Table 3.6-5 tabulates TPPSs that would be located near sensitive land uses by estimated distance from such sensitive uses. Distances between TPPSs and nearby sensitive land uses vary substantially. The distances only represent estimates since they were measured as the number of linear feet from the TPPS to the property line of the nearest sensitive use, and the final location of the substation on the property may change during final design.

TABLE 3.6-5: SUBSTATION DISTANCE FROM SENSITIVE LAND USES	
SUBSTATION PROPERTY LINE	NUMBER OF SUBSTATIONS
0 - 25 FEET	12
26 - 50 FEET	6
51 - 75 FEET	19
76 - 100 FEET	20
101 - 150 FEET	13
151+ FEET	8
TOTAL	**78**

Source: Myra L. Frank & Associates, Inc., 1992.

Development of the proposed substations would not result in significant land use compatibility impacts. Noise and visual impacts associated with the establishment of TPPSs near sensitive land uses are addressed in sections 3.2 and 3.3, respectively.

3.6.2.3 Division Yards

a. Division 1 Expansion Site

Construction of the Division 1 expansion site would result in the full acquisition of a private truck washing and fueling service station, including a vacant commercial building. A list of property acquisitions associated with the proposed Division 1 site is shown in Table 3.6-6. Mitigation measures for the land use acquisitions are provided in Section 3.6.3.3. Acquisition and displacement impacts are deemed insignificant after application of the mitigation measures. The noise/vibration and traffic impacts produced by the Division 1 expansion site are addressed in sections 3.2 and 3.7, respectively.

The RTD Division 1 expansion site would be consistent with uses permitted within the current M2 zone classification and would conform to an area designated in the Los Angeles General Plan for light industrial uses.

b. Division 2 Expansion Site

Expansion of the Division 2 site would result in the full acquisition of light industrial uses and associated parking areas. A list of property acquisitions associated with the proposed Division 2 site is shown in Table 3.6-6. Mitigation measures for land use acquisitions are provided in Section 3.6.3.3. Acquisition and displacement impacts are deemed insignificant after application of the mitigation measures.

Expansion of the proposed Division 2 site would not cause a significant adverse land use impact because it represents a continuation and upgrading of current industrial uses that is consistent with uses permitted within an M2 zone and would conform to an area designated in the Los Angeles General Plan for light industrial uses.

TABLE 3.6-6: PROPERTY ACQUISITIONS FOR DIVISION YARD EXPANSION SITES

TYPE OF PROPERTY	LOCATION/ADDRESS	FULL/PARTIAL TAKE
DIVISION 1 SITE		
Perez Truck Wash	NW corner, E. 7th Street and Alameda Street	Full
Texaco truck refueling station	1345 E. 7th Street	Full
Vacant commercial building	1339 E. 7th Street	Full
DIVISION 2 SITE		
Keystone Engineering Co.	1444 S. San Pedro Street	Full
Di Paolo Wire and Steel Craft Co.	755 E. 15th Street	Full
Vacant industrial building	738 14th Place	Full
Chez Company	744 14th Place	Full

Source: Myra L. Frank & Associates, Inc., 1992.

c. Division 10 Expansion Site

Expansion of the Division 10 yard would develop approximately 6,000 square feet of vacant land immediately adjacent to the eastern corner of the existing maintenance facility with bus parking areas. In the absence of mitigation measures, land use impacts associated with the acquisition of the Division 10 expansion site are judged to be potentially significant, since the proposed expansion yard would not conform to the category of uses permitted under the city's designation of Open Space, Public/Quasi-Public.

d. Satellite Division Site

Construction of the proposed satellite division for Route S-182 would require acquisition of approximately 40 percent of a vacant industrial manufacturing building (777 Front street), the full taking of a vacant maintenance shed and the full acquisition of a vacant commercial storage facility (215 Front Street). Land use impacts associated with the satellite division are judged not to be significant, since construction would not result in the displacement of any active businesses or employees. The proposed site would be consistent with uses permitted within the current M2 zone classification and would conform to the general industrial uses designated for the site in the Burbank General Plan.

3.6.3 MITIGATION MEASURES

3.6.3.1 <u>Routes</u>

No significant land use impacts are anticipated as a result of the construction and operation of the ETB routes, therefore no mitigation measures are necessary.

3.6.3.2 Substations

In the event that the establishment of a TPPS is not consistent with the underlying zoning on a given parcel, RTD would obtain a use variance from the City of Los Angeles Planning Department to establish a substation at that site (Sec. 12.27[B][1] of the Los Angeles Municipal Code). Acquisition of the proposed TPSS properties would involve full or partial takes and may involve easements, at times. The acquisitions would conform with the applicable state and federal laws as discussed in the next section.

No significant land use compatibility impacts would result from the proposed substations. (Noise and visual impacts associated with the establishment of TPPSs are addressed in sections 3.2 and 3.3, respectively.)

3.6.3.3 Division Expansion Sites

a. Land Acquisition

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat.1894), as amended by the Uniform Relocation Act Amendments of 1987, Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17, 101 Stat.246-256, mandates that certain relocation services and payments by RTD be made available to eligible residents, businesses and nonprofit organizations displaced by construction and operation of RTD transit-related projects. The Act provides for uniform and equitable treatment of persons displaced from their homes, businesses or farms by federal and federally assisted programs; and establishes uniform and equitable land acquisition policies. The State of California's revised Government Code Section 7260, et seq. brings the California Relocation Act into conformity with the Federal Uniform Relocation Act. In the acquisition of real property by a public agency, both the federal and state acts seek to 1) ensure consistent and fair treatment for owners of real property; 2) encourage and expedite acquisition by agreement in order to avoid litigation and relieve congestion in the courts; and 3) to promote confidence in public land acquisition.

A requirement of the legislation is that owners of private property have federal and state constitutional guarantees that their property will not be taken or damaged for public use unless they first receive just compensation. Just compensation is measured by the "fair market value" of the property taken, where "fair market value" is considered to be the:

> "...highest price on the date of valuation that would be agreed to by a seller, being willing to sell, but under no particular or urgent necessity for so doing, nor obliged to sell; and a buyer, being ready, willing and able to buy but under no particular necessity for so doing, each dealing with the other with the full knowledge of all the uses and purposes for which the property is reasonably adaptable and available." (Code of Civil Procedure Section 1263.320a.)

Where acquisition and relocation are unavoidable, RTD would follow the provisions of the Uniform Act and the 1987 Amendments as implemented by the Uniform Relocation Assistance and Real Property Acquisition Regulations for Federal and Federally Assisted Programs adopted by the Department of Transportation dated March 2, 1989. RTD has adopted acquisition and relocation policies which assure compliance with the Uniform Act and Amendments.

As soon as feasible, owners and occupants of properties affected by the project would be given notice of RTD's acquisition policies and relocation program. The acquisition and relocation program would be administered by the RTD Real Estate Section to assure compliance with all regulations.

All real property acquired by RTD would be appraised to determine its fair market value. An offer of just compensation, which shall not be less than the approved appraisal, would be made to each property owner. Each person or business displaced because of the project would be given at least 90 days advance notice of displacement and would be informed of the eligibility requirements for relocation assistance and payments.

b. Consistency With Local Plans

Since construction of the Division 10 expansion site would discontinue the use for which the site is currently designated in the Community Plan, a conditional use permit would be required. Obtaining this permit would mitigate land use conformance designation impacts.

3.7 TRANSPORTATION/CIRCULATION & PARKING

3.7.1 ENVIRONMENTAL SETTING

The information presented in this section is based on extensive field observations and analysis of existing conditions data. The 12 bus lines scheduled for electric trolley bus (ETB) service in Phase I follow surface streets spread throughout Los Angeles County. All of the proposed ETB routes would follow existing bus routes or portions of existing routes. Provided below are general descriptions of the surface streets along these routes and in the vicinity of the proposed expansions of the maintenance yards at Divisions 1 and 2. (The Division 10 expansion and the new satellite division would not change surrounding street configurations and therefore are not discussed below.) Detailed data on the number of lanes, median control, parking conditions, intersection control for left-turns (left-turn lanes and signal phasing) and traffic volumes for all routes are provided in Tables 1, 2 and 3 in Appendix 9 of this EIR.

General Street Descriptions

a. Downtown Los Angeles

The major streets for those ETB routes serving the Los Angeles Central Business District (LA CBD) include Broadway, Pico Boulevard, 1st Street, 5th Street, 6th Street, 8th Street and 9th Street. Fifth Street, 6th Street, 8th Street and 9th Street are one-way streets providing between three and five lanes. The remaining streets generally provide two to three lanes in each direction. The type of on-street parking varies throughout the downtown area. However, metered, peak period restricted parking predominates. A striped double yellow median is most common along these streets. The predominant land use along these streets is commercial.

b. South of Downtown Los Angeles

The major streets for those ETB routes serving areas south of the downtown LA CBD (i.e., RTD Routes 40, 45, and 204) include Broadway, Martin Luther King Jr. Boulevard, Crenshaw Boulevard, Hawthorne Boulevard and Vermont Avenue. These streets generally provide three travel lanes (during peak hours) in each direction, although in some locations only two lanes are provided in each direction. On-street parking is generally prohibited during peak hours along these streets in this area, while parking during off-peak periods is generally unrestricted. Raised medians are common along Vermont Avenue and Hawthorne Boulevard. The land uses along these streets are generally commercial and residential.

c. West of Downtown Los Angeles

The major streets for those ETB routes serving areas west of the LA CBD (i.e., RTD Routes 16, 30/31 and 66/67) include 3rd Street, 6th Street, 8th Street and Pico Boulevard. These streets generally provide two lanes in each direction. On-street parking is generally prohibited during peak hours along these streets in this area, while parking during off-peak periods is generally unrestricted. Continuous left-turn lanes and striped, double yellow medians are most common along these streets. The land uses along these streets are generally commercial and residential.

d. East of Downtown Los Angeles

The major streets for those ETB routes serving areas east of the LA CBD (i.e., RTD Routes 18, 30/31, 66/67, 70, Study Route 182 [also known as Tri-Cities] and M 10) include 1st Street, Garvey Avenue, Olympic Boulevard, Whittier Boulevard and Colorado Street. These streets generally provide two lanes in each direction. Unrestricted on-street parking is permitted along most segments of Garvey Avenue, Whittier Boulevard and Colorado Street. For the remaining streets, on-street parking is generally prohibited during peak hours, while parking during off-peak periods is generally unrestricted. A striped, double yellow median is most common along these streets. The land uses along these streets generally consist of a mixture of commercial, industrial and residential uses.

e. Maintenance Yard Expansions at Divisions 1 and 2

Brief descriptions of the streets within the vicinity of Divisions 1 and 2 are provided below:

- 6th Street - 6th Street is a six-lane, east-west street. Metered parking is available during non-peak hours.
- Industrial Street - Industrial Street is a two-lane street serving east/west traffic. On-street parking is not permitted on the north side, while unrestricted parking is available on the south side. Industrial Street is located south of the existing RTD Division 1 site and is proposed to be vacated as part of the ETB program.
- 7th Street - 7th Street is a four-lane, east-west street. Restricted (i.e., No Stopping from 7:00 to 9:00 AM and 4:00 to 6:00 PM) parking is available on both sides of the street.
- Central Avenue - Central Avenue is a four-lane, north-south street. Restricted parking is available on both sides of the street.
- Alameda Street - Alameda Street is a north-south street providing two lanes of traffic in each direction plus a continuous left-turn lane. Unrestricted parking is permitted.
- 14th Place - 14th Place is a two-lane, east-west street providing unrestricted parking. The eastern terminus of 14th Place is at Central Avenue while the western terminus is at San Pedro Street.
- 15th Street - 15th Street is a narrow, two-lane, east-west street. Unrestricted parking is provided on both sides of the street. This street is proposed to be vacated as part of the ETB program.
- 16th Street - Between Griffith Avenue and San Pedro Street, 16th Street is a one-way, two-lane street in the westbound direction. Parking is permitted on the north side of the street and prohibited on the south side. The existing RTD Division 2 site is located on the north side of the street.

- <u>San Pedro Street</u> - San Pedro Street is a six-lane north-south street. On-street parking is permitted during non-peak hours.

- <u>Griffith Avenue</u> - Griffith Avenue provides two northbound lanes and one southbound lane. On-street parking is available. The northern terminus of Griffith Avenue is at 14th Street.

Figure 3.7-1 illustrates the existing daily traffic volumes adjacent to both Divisions. As illustrated, 6th Street (between Central Avenue and Alameda Street) currently carries about 16,360 vehicles per day (vpd), Industrial Avenue carries about 2,505 vpd, 7th Street carries about 26,130 vpd, 14th Place (between San Pedro Street and Griffith Avenue) carries 1,765 vpd, 15th Street carries 650 vpd and 16th Street carries about 13,975 vpd.

3.7.2 ENVIRONMENTAL IMPACTS

The assessment of operational impacts focuses on the following key issues:

- Planned roadway improvements associated with the ETB project (new turnouts, new bus routings, expansions of Divisions 1 and 2)
- Street system operations and intersection levels of service
- Safety of articulated coaches
- Parking impacts associated with articulated coaches (See section 3.11 Public Services for a discussion of parking space losses resulting from substation development.)

(For a discussion of traffic impacts during construction, see section 3.16.4.)

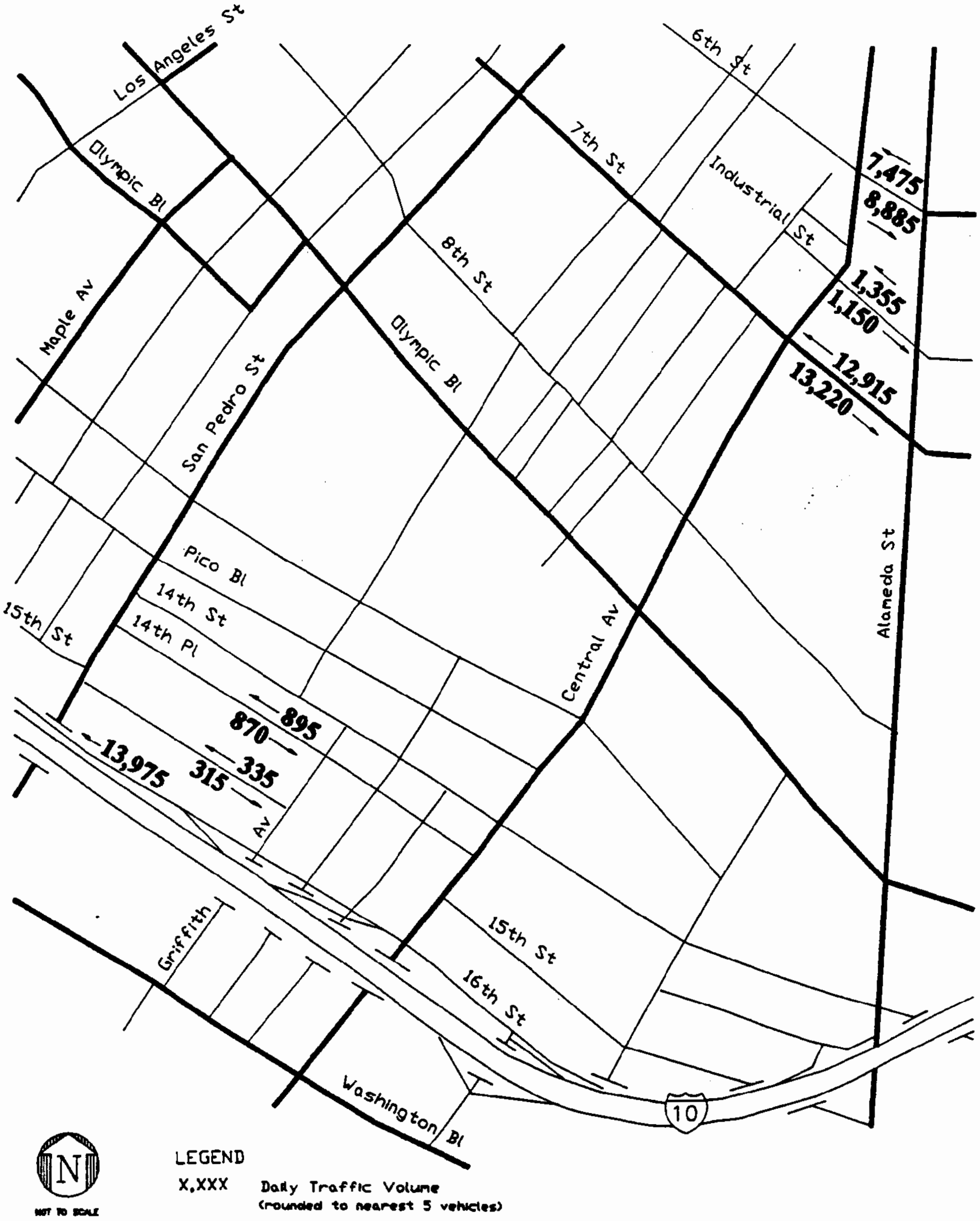
3.7.2.1 <u>Project Roadway Improvements</u>

The roadway improvements associated with the ETB project which could have traffic-related impacts are part of the expansions/modifications of Operating Divisions 1 and 2. Figure 3.7-2 shows the locations of Divisions 1 and 2 and the properties being considered for acquisition within the context of the surrounding street network.

Division 1 is currently bordered by 6th Street to the north, Industrial Street to the south, Central Avenue to the west and Alameda Street to the east. The property adjacent to Division 1 being considered for acquisition is located between Industrial Street, 7th Street, Central Avenue and Alameda Street. The total size of this lot is approximately 2.4 acres.

Division 2 is bordered by 15th Street to the north, 16th Street to the south, San Pedro Street to the west and Griffith Avenue to the east. The property to be acquired is an approximately 2.8-acre site just north of the Division 2 site on the west end of the block bounded by 14th Place, 15th Street, Griffith Avenue and San Pedro Avenue.

In conjunction with the property acquisition, an option being considered is the feasibility of obtaining street vacations on the adjoining streets between the existing division and the property



Source: Kaku Associates, Inc., 1992.

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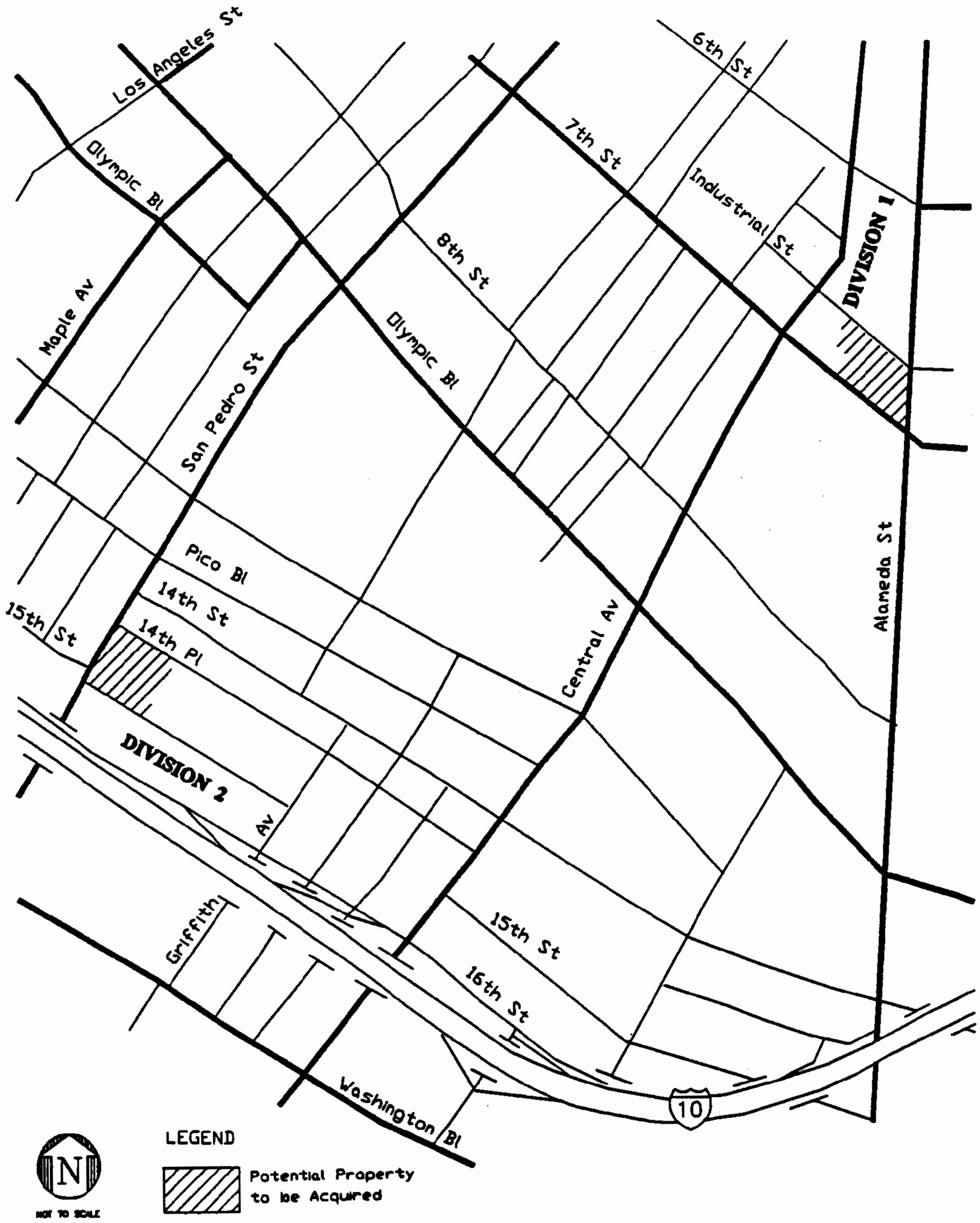
Figure 3.7-1: Existing Daily Traffic Volumes in the Vicinity of Divisions 1 and 2



Source: Kaku Associates, Inc., 1992.

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Figure 3.7-2: Location of Potential Property to be Acquired in the Vicinity of Divisions 1 and 2

to be acquired (portions of Industrial Street and 15th Street). The street vacation process would take two to three years and would require coordination with the Board of Public Works' Bureau of Engineering.

On the block adjacent to Division 1 (south of Industrial Street) a portion of the existing land uses would remain. The western end of the block, which contains ground floor retail and residential units, is not part of the parcel being considered for acquisition. Thus, Industrial Street would have to be vacated east of this particular parcel to maintain local access to the western end of the block.

For the Division 2 expansion, 15th Street would be vacated between San Pedro Street and the east end of this parcel. However, 15th Street would be realigned to the north and intersect with 14th Street, thereby still allowing access for the existing land uses (along 15th Street) to the east of the proposed property acquisition.

If Industrial Street were to be vacated, the existing traffic on this street would be redistributed. It should be noted that in this analysis a conservative approach was used in redistributing existing traffic. <u>All</u> existing traffic along vacated streets were redistributed onto adjacent streets. However, a portion of this existing traffic would be removed entirely since some of the existing parcels that now generate some of the existing traffic would be demolished and/or relocated. For those vehicles currently utilizing Industrial Street, alternate routes would be 6th and 7th Streets. Based on existing land uses, it was assumed that approximately 50 percent of the existing traffic currently utilizing Industrial Street would shift to 6th Street and the remaining 50 percent would use 7th Street.

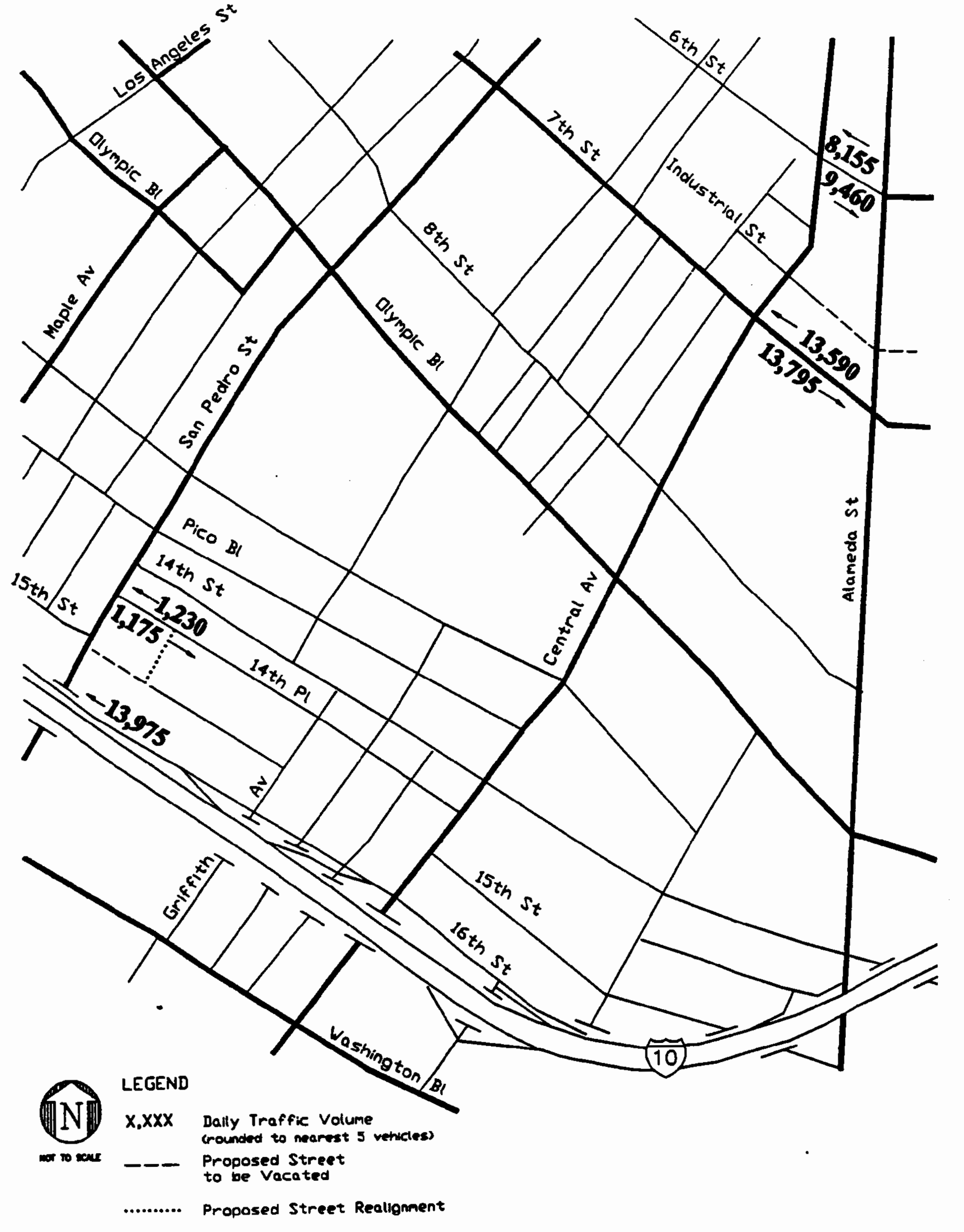
For the vacation of 15th Street, the analysis assumed that all of the traffic currently using 15th Street would use 14th Place instead.

The resulting volumes, with the vacated streets at Divisions 1 and 2, are illustrated on Figure 3.7-3.

As can be seen, the amount of traffic being redistributed is relatively small. This can be explained by the fact that both Industrial Street and 15th Street are discontinuous routes. Thus, most traffic currently utilizing these two streets results from local trips associated with nearby land uses. Because of the small amount of traffic being redistributed: approximately 1,255 daily vehicles on 6th Street, 1,255 on 7th Street and 650 on 14th Place; significant traffic impacts are not anticipated due to the proposed street vacations.

3.7.2.2 <u>Street System Operations</u>

Based upon previous studies, it has been determined that the operational characteristics (acceleration, maneuverability, maximum attainable speeds) of an ETB do not vary significantly from those of a diesel- or methanol-powered bus. It is assumed that the ETB headways would not change for the various routes; therefore the hourly traffic volumes would not change. Thus, the implementation of the ETB would not change existing traffic flow conditions, i.e., street/intersection capacities and hourly volumes would remain the same after the implementation of the project. More importantly, peak hour traffic flow conditions would not change and thus the ETB project would not result in any significant traffic impacts.



Source: Kaku Associates, Inc., 1992.

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Figure 3.7-3: Existing Daily Traffic Volumes with Street Vacations in the Vicinity of Divisions 1 and 2

Based upon experience in other cities, the maximum obtainable speed of an ETB has generally been less than that obtainable with a diesel bus. However, this is not a constraining factor since these maximum speeds would rarely be achieved on any of the ETB routes because of vehicle operational constraints, prevailing traffic conditions or legal speed limits. Pertaining to the operational constraints, maximum speeds for ETBs have been restrained by rigid overhead wires (OCS), the rear-end gear ratio and, in the past, the lack of both desire and need for faster operation. The following summarizes ETB experience in other North American cities as contained in The Trolley Coach Development & State of the Art (U.S. Department of Transportation, Urban Mass Transportation Administration, October, 1979):

- Edmonton, Canada - Edmonton Transit System could not determine any distinct operational differences between diesel and electric coaches; they are considered to be interchangeable from an operational perspective.

- Vancouver, Canada - Vancouver reports similar findings to those in Edmonton.

- Seattle - METRO temporarily converted all ETB service to diesel in order to facilitate the rebuilding and expansion. The results of the evaluation do not favor either vehicle type.

Variances in running time (1 to 2 minutes), are within scheduled layover times and these small variances would not be perceptible to bus passengers.

The conversion from diesel-fueled buses to ETBs would not significantly affect street system operations.

3.7.2.3 Safety of Articulated Coaches

As stated in the project description, articulated ETBs could be used for the proposed ETB system. Based upon previous RTD experience, the replacement ratio (articulated for standard buses) would most likely be between 3:4 and 1:1. The major concern regarding the use of articulated coaches is safety.

Based upon experiences in Los Angeles and other cities, diesel articulated buses tend to have a higher accident rate for accidents associated with the following bus maneuvers: pulling in or out of bus zones and right-turns. The primary cause for those reported accidents associated with right-turns was due to "swing-out" of the trailers which had steerable rear axles. The following summarizes historical accident data for the previous use of articulated buses in Los Angeles:

- In the six month period from October 1983 to March 1984, conventional 40-foot buses in similar service to the articulated buses (congested city streets) experienced 5.7 accidents per 100,000 miles while articulated buses experienced 15.04 accidents per 100,000 miles.

- Liability cost per mile was twice as high for articulated buses as for conventional buses in the same type of service, with 80 percent of the cost difference due to accidents with the rear of the bus during turning movements.

In summary, operational experience in Los Angeles indicates that the use of articulated buses with steerable rear axles could potentially have adverse safety impacts. It should be noted that the current technology for articulated buses significantly improves the turning radius of the bus as compared to the older model diesel buses previously operated by RTD. This improved technology should reduce accidents. Presently, RTD might lease or borrow a small number of articulated buses for testing and demonstration purposes during initial ETB operations. This experience could provide the necessary evaluation of safety and reliability to decide if articulated ETBs will be part of a future purchase.

3.7.2.4 Parking Impacts of Articulated Coaches

Use of articulated coaches may or may not require intersection geometric modifications; however, the exact required turning radius of articulated buses should be evaluated in the engineering/design stage of the project. In conjunction with the discussion of bus stops, most of the current bus stop zones on the Phase I ETB routes would need to be expanded in length by about 20 feet if articulated ETBs are used. This would result in the removal of a maximum of two parking spaces per stop. A qualitative assessment of parking conditions was conducted to evaluate the effect of articulated ETB coaches. Parking spaces that would potentially require removal were qualitatively evaluated based on the apparent demand for these spaces; i.e., they were categorized as either low-, medium-, or high-usage spaces, depending upon the adjacent land use and field observations of parking patterns. The following briefly defines the three types of parking spaces:

- Low: A low-usage space is a space along a zone where on-street parking is not being utilized or is utilized at a low rate. These spaces would likely be found along streets where adequate off-street parking was available.
- Medium: A medium-usage space is a space along a zone where some parking spaces are being utilized but others nearby are not being utilized.
- High: A high-usage space is a space along a zone where all or a large majority of on-street spaces are being utilized. Many of these spaces are metered and usually occur in commercial areas.

Removal of one or two low- and medium-usage spaces would not result in a significant impact. Removal of high-usage spaces could, however, have adverse impacts.

Although it has not yet been determined which routes, if any, would have articulated buses, for the purpose of this EIR, the potential use of articulated ETBs on each route was assessed for potential parking impacts (see Table 3.7-1 for a summary).

- RTD Route 45. Along Route 45 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. Based on the qualitative assessment described above, it was determined that approximately 38 low-, 25 medium- and 14 high-usage spaces would require removal to accommodate

Table 3.7-1: Parking Impacts - Articulated Coaches

ROUTE #	PARKING SPACES REQUIRING REMOVAL OR RELOCATION[1]					
	LOW USAGE		MEDIUM USAGE		HIGH USAGE	
	# OF SPACES	SPACES /MILE	# OF SPACES	SPACES /MILE	# OF SPACES	SPACES /MILE
RTD Route 45	40	2.3	28	1.6	16	0.9
RTD Route 70	19	1.2	15	0.9	15	0.9
RTD Route 204	54	3.2	33	1.9	14	0.8
RTD Route 560	39	3.2	28	2.3	14	1.1
RTD Route 16	15	1.6	10	1.1	20	2.2
RTD Route 18	24	1.7	9	0.6	26	1.8
RTD Route 30/31	41	3.1	29	2.2	26	2.0
RTD Route 40	52	2.6	19	1.0	12	0.6
RTD Route 66/67	26	1.9	18	1.3	28	2.1
RTD Study Route 182	27	1.9	23	1.6	31	2.2
Montebello Bus Line Route 10	10	1.5	7	1.0	4	0.6
Long Beach Transit Routes 40/50/60/90	72	2.1	39	1.1	51	1.5

Notes: [1] Includes indirect loss of parking spaces from relocation of existing loading spaces due to bus stop expansion.

Source: Kaku Associates, Inc., 1992.

articulated coaches. In addition, 7 loading spaces (outside of the LA CBD) would potentially require removal or relocation. If these loading spaces need to be maintained, removal of adjacent parking spaces would be required. Removal of the adjacent parking spaces in order to relocate the loading spaces would result in the loss of 2 low-, 3 medium- and 2 high-usage spaces.

- RTD Route 70 - Along Route 70 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. Along the entire length of Route 70, it was determined that approximately 19 low-, 14 medium- and

13 high-usage spaces would require removal to accommodate articulated coaches. In addition, 2 loading spaces (outside of the LA CBD) would require removal. If these loading spaces need to be maintained, removal of adjacent parking spaces would be required. Removal of the adjacent parking spaces in order to relocate the loading spaces would result in the loss of 1 medium- and 2 high-usage spaces.

- RTD Route 204 - Along Route 204 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require any removal of parking to accommodate articulated coaches. Along the entire route, it was determined that approximately 53 low-, 32 medium- and 14 high-usage spaces would require removal to accommodate articulated coaches. In addition, 2 loading spaces would require removal. If these loading spaces need to be maintained, removal of adjacent parking spaces would be required. Removal of the adjacent parking spaces in order to relocate the loading spaces would result in the loss of 1 low- and 1 medium-usage space.

- RTD Route 560 - Along Route 560 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. It was determined that approximately 39 low-, 28 medium- and 14 high-usage spaces would require removal.

- RTD Route 16 - Parking along Route 16 is primarily restricted (no parking during one or both peak hours). Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. It was determined that approximately 15 low-, 10 medium- and 20 high-usage spaces would require removal.

- RTD Route 18 - Along Route 18 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. Along Route 18, it was determined that approximately 23 low-, 9 medium- and 23 high-usage spaces would require removal. In addition, 4 loading spaces would require removal. If these loading spaces need to be maintained, removal of adjacent parking spaces would be required. Removal of the adjacent parking spaces in order to relocate the loading spaces would result in the loss of 1 low- and 3 high-usage spaces.

- RTD Route 30/31 - Along Route 30/31 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. Along Route 30/31, it was determined that approximately 41 low-, 25 medium- and 23 high-usage spaces would require removal. In addition, 7 loading spaces would require removal. If these loading spaces need to be maintained, removal of adjacent parking spaces would be required. Removal of the adjacent parking spaces in order to relocate the loading spaces would result in the loss of 4 medium- and 3 high-usage spaces.

- RTD Route 40 - Along Route 40 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. It should be noted that there are some unique parking conditions along Route 40. Parking in the median along Hawthorne Boulevard between Redondo Beach Boulevard and El Segundo Boulevard would not be affected by articulated coaches. Also, similar to Route 204, a frontage road with parking exists along Crenshaw Boulevard between Vernon Avenue and Slauson Avenue. Along Route 40, it was determined that approximately 52 low-, 19 medium- and 12 high-usage spaces would require removal.

- RTD Route 66/67 - Along Route 66/67 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. Along Route 66/67, it was determined that approximately 25 low-, 16 medium- and 24 high-usage spaces require removal. In addition, 6 loading spaces and 1 taxi space would require removal. If these loading and taxi spaces need to be maintained, removal of adjacent parking spaces would be required. Removal of the adjacent parking spaces in order to relocate the loading and taxi spaces would result in the loss of 1 low-, 2 medium- and 4 high-usage spaces.

- RTD Study Route 182 - Along this route there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. It was determined that approximately 27 low-, 21 medium- and 30 high-usage spaces would require removal. In addition, 3 loading spaces would require removal. If these loading spaces need to be maintained, removal of adjacent parking spaces would be required. Removal of the adjacent parking spaces in order to relocate the loading spaces would result in the loss of 2 medium- and 1 high-usage spaces.

- Montebello Bus Line 10 - Along M10 there exists a mixture of restricted and unrestricted parking. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. It was determined that approximately 10 low-, 6 medium- and 4 high-usage spaces require removal. In addition, 1 loading space would require removal. If this loading space needs to be maintained, removal of 1 medium-usage adjacent parking space would be required.

- Long Beach Transit Lines 40/50/60/90 - Parking along the Long Beach Lines consists primarily of unrestricted parking or no parking zones. Because of large red curb zones, locations of driveways, no parking zones or a combination of these conditions, expansion of some bus stop zones would not require removal of parking to accommodate articulated coaches. Along the Long Beach routes, it was determined that approximately 72 low-, 36 medium- and 48 high-usage spaces would require removal. In addition, 6 loading spaces would require removal. If these loading spaces need to be maintained, removal of adjacent parking spaces would be required. Removal of the adjacent parking spaces in order to relocate the loading spaces would result in the loss of 3 medium- and 3 high-usage spaces.

As indicated in Table 3.7-1, the use of articulated buses on all routes combined would require the removal of 419 low-, 258 medium- and 257 high-usage spaces. As stated previously, removal of only the high-usage spaces might have potential adverse impacts. Also indicated in the table is a "density" factor (number of spaces requiring removal per route mile), which is an important factor. As shown, the average number of high-usage spaces requiring removal per route mile for all of the lines is 1.4. This equates to about 1 space every 9 blocks. Removal of parking spaces could potentially affect local merchants and businesses. Given the minimal amount of spaces requiring removal, the use of articulated coaches would not have significant impacts on parking.

3.7.2.5 Impacts of Articulated Coaches at Layover Zones

Parking impacts at bus layover zones could occur from the possible use of articulated coaches along the proposed ETB routes. Analysis of these impacts included a survey of existing layover zones identified by RTD along the proposed ETB routes. To evaluate the worst case potential impacts, it was assumed that each standard bus would be replaced by an articulated coach as part of the ETB program. Field surveys were conducted to determine how many buses currently use existing layover zones, and the length that each existing layover zone would need to be extended to accommodate articulated coaches. The required length of the layover zone was determined using RTD standards. The feasibility of extending layover zones was assessed based on several factors, such as the number of proposed articulated coaches that would utilize the zone; the location of the zone (i.e., farside, nearside or midblock); the size of existing layover zone; and the location of driveways. When layover zones are insufficient for articulated buses and they cannot be expanded, new layover locations would need to be designated. The precise impacts of these new layover zones would not be known till locations are identified; however, the potential impacts are not expected to be significant. At those locations where articulated coaches could feasibly be accommodated, impacts on adjacent on-street parking were evaluated.

Table 3.7-2 and the following summarize the results of this assessment by ETB route:

- RTD Route 16 - Along Route 16, a total of five layover zones were evaluated. Two layover zones could feasibly accommodate articulated ETBs. Extension of the zone located on Sixth Street (adjacent to Division 1) would require the removal of one parking space, while two parking spaces would need to be removed at the zone on Third Street between San Pedro and Los Angeles Streets.

TABLE 3.7-2: RTD ROUTE LAYOVER ZONES

LINE NO.	LAYOVER ZONE (L.Z.) LOCATION DESCRIPTION	EXISTING # OF BUSES AT L.Z.	LENGTH L.Z. WILL NEED TO BE EXTENDED	# OF PARKING SPACES LOST	SPACE AVAILABLE FOR EXPANSION
RTD 16	On George Burns Drive just after right turn off of San Vicente	3	54	--	NO
	On Sixth Street next to Division 1 where it is red curbed	2	5	1	YES
	On Third Street just east of Wilton Place (existing bus stop)	2	30	--	NO
	On Third Street between San Pedro and Los Angeles Streets	2	40	2	YES
RTD 18	On Third Street just east of Wilton Place	2	30	--	NO
	On Sixth Street at the existing bus zone just west of Lafayette Park	2	31	2	YES
	On Sixth Street at the existing bus stop, midblock between Grand and Hope (Owl layover)	2	20	0	YES
	On Garfield Avenue between Olympic and Whittier Boulevards in the midblock red zone	2	53	--	NO
RTD 30/31	At the Pico and Rimpau Loop.	4	80	--	NO
	At the Rowan - Dozier Terminal	4	80	0	NO
	In the large red curb zone on Collegian Avenue north of Riggin Street	3	60	0	MAYBE
RTD 40	At Loading Bays 2 and 3 at the South Bay Galleria Transit Center	(a)	20	--	NO
	Zone just south of railroad crossing on Hawthorne Boulevard east of roadway	2	3	0	YES
RTD 45	At the existing bus terminal just east of Monterey Road and north of Huntington Drive North	2	40	--	NO
	On Los Angeles Street at Arcadia	5	90	--	NO
	On Broadway between Fifth and Sixth Streets (Owl layover)	2	20	0	YES
	Bus zone on Broadway south of Century	1	0	0	YES
	In bus zone on San Pedro between 140th and Rosecrans	2	22	2	YES
RTD 66/67	Bus zone on 8th Street just east of Western	3	60	--	NO
	At existing red curbing on west side of San Francisco Street	2	45	0	YES
	At bus zone on north side of 8th Street, just east of Lorena Street	1	47	2	YES
	At long red curb on west side of Garfield Avenue between Whittier and Olympic Boulevards	2	53	--	NO

TABLE 3.7-2: RTD ROUTE LAYOVER ZONES

LINE NO.	LAYOVER ZONE (L.Z.) LOCATION DESCRIPTION	EXISTING # OF BUSES AT L.Z.	LENGTH L.Z. WILL NEED TO BE EXTENDED	# OF PARKING SPACES LOST	SPACE AVAILABLE FOR EXPANSION
RTD 70	Buses layover in El Monte Station if layovers are six minutes or less; if they are longer then they go to Division 9	(b)	N/A	N/A	N/A
	On 11th Street and georgia Street; this zone is used by other lines in the PM and is used to the maximum	6	100	–	NO
RTD 204	On Vermont north of 120th Street	5	220	0	YES
	Bus zone on Vermont Avenue south of Century Boulevard and right hand turn pocket	1	20	–	NO
	On 89th Street just west of Vermont Avenue	1	46	–	NO
	On west side of Vermont south of driveway of shopping center (south of Hollywood Boulevard)	6	103	–	NO
RTD 560	Bus zone on Moorpark after left turn from Van Nuys Boulevard	2	30	2	YES
	Bus zone on Eldridge after left turn from Kagel Canyon Street	4	80	–	NO
RTD 16, 18, 66/67	6th Street and private right-of-way	6	120	–	NO

Notes:
(a) Use of articulated buses would require modification of existing loading bays.
(b) Use of articulated buses would require rebuilding of El Monte Station (lose 2 berths).

Source: Kaku Associates, Inc., 1992.

- RTD Route 18 - Along Route 18, a total of five layover zones were evaluated. Two layover zones could feasibly accommodate articulated ETBs. Extension of the layover zone located on Sixth Street (west of Lafayette Park) would require the removal of two parking spaces. The zone on Sixth Street (between Grand Avenue and Hope Street) would not require the removal of parking.

- RTD Routes 30/31 - Along Routes 30/31, a total of three layover zones were evaluated. Only one layover zone (Collegian Avenue north of Riggin Street) could potentially accommodate articulated ETBs. Extension of this zone would not require the removal of on-street parking. At the other two layover zones, which are located off-street, (Pico Boulevard/Rimpau Boulevard Terminal and the Rowan Avenue/Dozier Street Terminal), accommodating articulated ETBs was considered infeasible.

- RTD Route 40 - Along Route 40, two layover zones were evaluated. The layover zone at the South Bay Galleria Transit Center would require modification to the existing loading bays, which would not be feasible. The layover zone on Hawthorne Boulevard (south of the railroad crossing) could feasibly accommodate articulated ETBs. Extension of this zone would not require the removal of parking.

- RTD Route 45 - Along Route 45, a total of five layover zones were evaluated. Three layover zones could feasibly accommodate articulated ETBs. Extension of the layover zones on Broadway (between Fifth and Sixth Streets and south of Century Boulevard) would not require the removal of parking. However, extending the layover zone on San Pedro Street (between 140th Street and Rosecrans Avenue) would require the removal of two on-street parking spaces.

- RTD Routes 66/67 - Along Routes 66/67, a total of five layover zones were evaluated. Two layover zones could feasibly accommodate articulated ETBs. Extension of the zone on Francisco Street would not require the removal of on-street parking spaces, while extending the zone on 8th Street (east of Lorena Street) would require the removal of two parking spaces.

- RTD Route 70 - Along Route 70, a total of two layover zones were evaluated. In order to accommodate articulated ETBs at the layover zone located in the El Monte Station, rebuilding of the station would be required, resulting in the loss of two berths. The zone located on 11th Street would not feasibly accommodate articulated ETBs.

- RTD Route 204 - Along Route 204, a total of four layover zones were evaluated. Only one layover zone (Vermont Avenue north of 120th Street) could feasibly accommodate articulated ETBs. Extension of this zone would not require the removal of on-street parking.

- RTD Route 560 - Along Route 560, a total of two layover zones were evaluated. One layover zone (Moorpark Street) could feasibly accommodate articulated ETBs. Extension of this zone would require the removal of two on-street parking spaces.

- Montebello Line 10 - Along Montebello Line 10, a total of two layover zones were evaluated. The layover zone near East Los Angeles College (Collegian Avenue north of Riggin Street) could potentially accommodate articulated ETBs. Extension of this zone would not require the removal of on-street parking. The other zone (Pico Rivera Terminal) is an off-street facility and thus would not require the removal of on-street parking.

- Long Beach Transit Routes 40, 50, 60, and 90 - All of the Long Beach Lines would have layover zones at the Long Beach transit Mall. This facility is designed specifically for buses and would impact on-street parking. One layover zone (Anaheim Street west of P.C.H.) along Route 40 could feasibly accommodate articulated ETBs. Extension of this zone would require the relocation (to the west) of a loading zone and the removal of two on-street parking spaces. Lines 50 and 60 would have a layover zone at the Artesia Blue Line Station. This layover zone is located off-street and thus would not require the removal of on-street parking. Along Line 90, a layover zone is proposed at Bellflower Boulevard, south of Coyotes Diagonal. Due to the close proximity of adjacent driveways, this zone could not feasibly accommodate articulated ETBs.

3.7.3 MITIGATION MEASURES

The primary impacts due to project operations are the additional safety hazards posed by use of articulated buses. Measures that could be implemented to mitigate these hazards include:

- Comprehensive driver training.

- Use of articulated buses with non-steering rear wheels to reduce the potential for collisions between the rear of the bus and street furniture and parked/moving cars.

- Use of articulated buses with tapered rear ends. Typically, tapering the rear end from 102 inches to 93 inches can reduce the swing-out from 34 inches to 25.

- Installation of warning signs with messages such as, "Caution: Bus swings out on turns," posted on the rear of the vehicle.

It should also be recognized that improvements in articulated bus technology have significantly reduced the potential for accidents.

3.8 CULTURAL RESOURCES

3.8.1 ENVIRONMENTAL SETTING

3.8.1.1 Applicable Legislation

The following section identifies cultural resources, including both archaeological and historic/cultural/architectural resources, and describes the potential effects of the proposed project on these resources. The purpose of this discussion is to comply with California Environmental Quality Act (CEQA) regulations in regard to cultural resources.

To conform with applicable federal legislation, including the National Historic Preservation Act of 1966 (NHPA), National Environmental Policy Act of 1969 (NEPA) and Department of Transportation Act of 1966 (DOTA), documentation which would include an identification and assessment of potential effects on cultural resources would vary significantly from the methodology used for this section.

Only compliance with CEQA regulations regarding cultural resources is discussed in this EIR. CEQA states that "A project will normally have a significant effect on the environment if it will:... (j) Disrupt or adversely affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group; or a paleontological site except as a part of a scientific study." [CEQA, Appendix G]

a. CEQA Compliance-Archaeological Resources

"For the purposes of CEQA, an 'important archaeological resource' is one which:

A. Is associated with an event or person of:
   1. Recognized significance in California or American history, or
   2. Recognized scientific importance in prehistory;

B. Can provide useful information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions;

C. Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind;

D. Is at least 100 years old and possesses substantial stratigraphic integrity; or

E. Involves important research questions that historical research has shown can be answered only with archaeological methods." [CEQA, Appendix K]

Avoidance of archaeological resources is the most preferential option. If an identified archaeological resource is found to be an important archaeological resource and avoidance is not feasible, CEQA requires the lead agency to include an excavation plan for mitigating the effect of the project on the qualities which make the resource important. Depending on the extent of the resource, execution of the excavation plan may cause some temporary schedule delays.

If an identified archaeological resource is not an important archaeological resource, CEQA requires that both the resource and the effect on it be noted in the EIR but need not be considered further in the process.

b. CEQA Compliance - Historic and Cultural Resources

While CEQA is quite explicit with regard to what constitutes an important archaeological site, it is not as clear as to what constitutes "a property of historic or cultural significance to a community or ethnic or social group." Architectural resources are not specifically governed under CEQA but are generally identified as exhibiting cultural significance on behalf of the surrounding community. Acceptable CEQA documentation for historic or cultural resources generally may be limited to a documentation search of properties already having some national, state, or local landmark designation. Generally what may constitute a disruption or adverse effect on a historic resource includes such effects as significant visual obstruction to or from the resource, increase of noise levels, increase of vibration, settlement of ground under or near a structure, alteration of a structure, acquisition of property or demolition of a structure. The level of significance for an effect is dependent upon the existing integrity and nature of contributing elements to its historic or cultural significance, and the sensitivity of the current or historic use of the resource. Once the nature of the potential effect is established, mitigation measures should be incorporated as part of the project to minimize disruption of or adverse effects on these resources.

3.8.1.2 Setting

a. Archaeological Resources

An archaeological setting is described in this section in terms of the potential for archaeological resources at sites that are not already disturbed and would be disturbed as a result of the project.

The construction scenario for the proposed project (see section 3.16) indicates that for the most part, no major ground disturbance would be required for the proposed routes. Trenching activities would be necessary near substations for utility line placement and along the routes for underground cable placement. Grading and foundation excavation would be necessary at substation sites.

Site disturbance at the Divisions 1 and 2 expansion sites and the satellite division yard would include grading and foundation excavation. Although these sites are located in a heavily disturbed urban environment and portions of the sites are developed with structures, their construction could result in disturbance of underlying cultural resources. At the Division 10 expansion site, grading would be required for the development of parking areas at the site. The result of preliminary archaeological research for these sites is described below.

In order to identify previously recorded archaeological resources at the three expansion sites involving site disturbance (Divisions 1, 2 and 10) and at the satellite division yard, an archival search was requested for areas located within one mile of proposed sites by the University of California at Los Angeles (UCLA) Archaeological Information Center. The results of two UCLA records searches, which were completed on September 17 and October 20, 1992, indicate that no prehistoric or historic sites have been identified within a mile of the expansion sites at Divisions 1 and 2 and at the satellite division site. However, the record search for the Division 10 expansion site indicated that four historic archaeological sites are contained at El Pueblo State Historic park, over 4,000 feet from the site.

b. Historical/Architectural/Cultural Resources

In order to identify potentially significant historic, architectural or cultural resources, previously documented resources for each of the affected jurisdictions were reviewed and compiled from a variety of sources. The complete inventory reviewed included over 17,000 entries in Los Angeles County originating from various sources at national, state and local levels.

- Historic resource lists, designations or organizations consulted included:

  The National Register of Historic Places;
  California Historical Landmarks;
  California Points of Historical Interest;
  California Historic Parks;
  State Office of Historic Preservation Statewide Database;
  Alhambra Historic and Cultural Resources Survey 1984 - 1985;
  Burbank Historical Society;
  City of El Monte;
  City of Gardena List of Historical Properties;
  City of Glendale Planning Division Historic Preservation Element;
  City of Long Beach Historic Landmarks;
  City of Los Angeles Historic-Cultural Monuments;
  City of Montebello List of Masonry Buildings over 45 years of age;
  Historical Society of Monterey Park, Inc.;
  City of Pasadena Cultural Heritage Landmarks;
  City of Rosemead Graffiti Removal Program Historical Documentation;
  San Fernando Historical Society;
  City of San Gabriel; and
  City of West Hollywood - Potential and Designated Cultural Resources.

- Previously documented historic/architectural surveys included:

  Gebhard & Winter 1985;
  City of Beverly Hills Historic Resources Survey 1985-1986;
  The Adams Normandie 4321 Redevelopment Area Architectural/ Historical Survey Report prepared for the City of Los Angeles, Community Redevelopment Agency (July 1980);
  City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of a portion of Adams Boulevard in Los Angeles (1982);
  The Angelino Heights Historic Preservation Overlay Zone Cultural Resource Documentation Report completed for the City of Los Angeles Cultural Heritage Board and Department of City Planning (January 1982);
  The Boyle Heights I Revitalization Area (Mt. Pleasant) Architectural/Historical Survey Report prepared for the City of Los Angeles, Community Redevelopment Agency (1980);
  The Boyle Heights I Revitalization Area Determination of Eligibility Report prepared for the City of Los Angeles, Community Redevelopment Agency (1981);

The Expanded Portion of the Boyle Heights I Revitalization Area Architectural/Historical Survey Report prepared for the City of Los Angeles, Community Redevelopment Agency (1985);

The Boyle Heights II Revitalization Area Architectural/ Historical Survey Report prepared for the City of Los Angeles, Community Redevelopment Agency (1981);

The Expanded Portion of the Boyle Heights II Revitalization Area Architectural/Historical Survey Report prepared for the City of Los Angeles, Community Redevelopment Agency (1985);

City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of a portion of Boyle Heights (1981-1982);

City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of the Crenshaw area of the City of Los Angeles (1983);

City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of a portion of Echo Park (1981);

The Architectural Survey Report of the Elderly Housing and Pep Boys Expansion Project prepared for the City of Los Angeles, Community Redevelopment Agency (April 1979);

City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of the Florence/Avalon area (1981);

The North Hollywood Redevelopment Area Determination of Eligibility Report prepared for the City of Los Angeles, Community Redevelopment Agency (1981);

The Expanded Hoover Redevelopment Area Cultural Resources Documentation Report prepared for the City of Los Angeles, Community Redevelopment Agency (August 1985);

The Lincoln Heights I Revitalization Area Architectural/ Historical Survey Report prepared for the City of Los Angeles, Community Redevelopment Agency (1981);

The Lincoln Heights I Revitalization Area Determination of Eligibility Report prepared for the City of Los Angeles, Community Redevelopment Agency (1981-1982);

The Lincoln Heights I Expanded Revitalization Area Historic Resources Inventory Report prepared for the City of Los Angeles, Community Redevelopment Agency (1985);

The Lincoln Heights II Revitalization Area Architectural/Historical Survey Report prepared for the City of Los Angeles, Community Redevelopment Agency (1982);

The Historical/Architectural Resources (Part B) Report prepared for the Southern California Rapid Transit District Metro Rail Project (January 1983).

The Normandie 5 Redevelopment Area Architectural/Historical Survey Report prepared for the City of Los Angeles, Community Redevelopment Agency (January 1980);

City of Los Angeles, Department of Public Works "Historic Property Survey Report" of the North Outfall Relief Sewer;

City of Los Angeles, Department of Planning Historic Resources Final Report for the Northeast Los Angeles District Plan Area (August 1990);

City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of the Olympic-Normandie East, South, and West areas (1984-85);

City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of a portion of Pacoima (1983);

The City of Los Angeles, Department of Planning Historic Resources Final Report for the Southeast Los Angeles District Plan Area (June 1991);

City of Los Angeles, Department of Planning Survey of Southeast Los Angeles (1991);
City of Los Angeles Bureau of Engineering "Historical and Cultural Resources Survey" of a portion of Sun Valley (1981);
City of Los Angeles Department of Planning Historic Resources Final Report for the Sylmar Community Plan Area (July 1990, Rev. February 1991);
City of Los Angeles Bureau of Engineering "Historical and Cultural Resources Survey" of a portion of Sylmar (1982);
The Highland Park and Mount Washington Historic Resources Survey prepared by the Community Research Group of The East Los Angeles Community Union (TELACU) (1981);
City of Los Angeles, Bureau of Engineering "Historic and Cultural Survey Report" of a portion of Venice (1981);
The Ventura/Cahuenga Boulevard Specific Plan Cultural Resources Survey Report prepared for The City of Los Angeles, Planning Commission (1988);
City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of the Vermont/Slauson area (1983);
City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of the Vernon/Central area (1984);
City of Los Angeles, Department of Public Works "Historic Property Survey Report" of the Wastewater Facilities Plan Update;
City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of the Watts area (1983);
City of Los Angeles, Bureau of Engineering "Historical and Cultural Resources Survey" of a portion of the West Adams area of Los Angeles (1982);
City of Los Angeles, Department of Planning Historic Resources Final Report for the West Adams - Baldwin Hills - Leimert District Plan Area (June 1991);
City of Los Angeles, Department of Planning Community Plan Revision Program Historic Resources Studies Survey (1989); and
City of Redondo Beach Historic Resources Survey 1986.

The area of inquiry for the documentation was limited to a single block distance along either side of the proposed ETB routes. This distance may vary slightly according to the depth of adjacent blocks, but is considered to be a more than adequate zone of potentially significant effect.

Within the study area, a total of 1,465 resources were identified as having been previously documented. Of these, 1,243 would be considered significant under CEQA as properties "of historic or cultural significance to a community or ethnic or social group." The remaining 221 resources are no longer considered significant because of demolition or loss of integrity.

The table in Appendix 6 shows the results of the documentation search and indicates the adjacent route. This table also includes an "evaluation" column which may be used to rank the resources according to their designated level of significance. Resources listed in Appendix 6 with level of evaluation values between one and four indicate resources (1) listed on, (2) determined eligible for inclusion in, (3) appearing eligible for inclusion in or (4) potentially eligible for inclusion in the National Register of Historic Places. A ranking of "5" indicates resources of local or regional significance. A letter "D" following the evaluation numeral indicates that the resource is significant as a contributing part of a district including other resources.

c. Colorado Street Bridge

The Colorado Street Bridge over the Arroyo Seco in Pasadena was built in 1913. The bridge is listed on the National Register of Historic Places and is also a City of Pasadena Cultural Heritage Landmark. Currently the bridge is undergoing extensive restoration and reconstruction.

d. Tournament of Roses Parade

The annual Tournament of Roses Parade held on the New Year's day in Pasadena is an internationally recognized event. Numerous local residents and world tourists visit the Los Angeles region during the new year holiday for this Parade. Television broadcasts of the Parade are made throughout the nation and world.

The parade includes marching bands, floats decorated with fresh flowers and other attractions. The routing of the parade starts on Orange Grove Avenue south of California Boulevard, travels northbound along Orange Grove and turns east on Colorado Boulevard (where grandstands, judges and a majority of TV cameras are located). While on Colorado Boulevard, the Parade proceeds eastbound to Sierra Madre Boulevard, where it turns north. The Parade proceeds northbound on Sierra Madre to Victory Park in Pasadena.

A blue "honor line" is painted on the street along each side of the parade route for crowd control. Each blue honor line takes up approximately one traffic lane from the curb. Colorado Boulevard is generally 70 feet wide from curb to curb. Within the two blue honor lines, 50 feet of the pavement is generally cleared for the Parade.

Some traffic and streetlight poles in the vicinity of Colorado and Orange Grove Boulevard are removed prior to the Parade to facilitate the movements of the floats and visibility in the areas where the TV cameras are located. These poles are reinstalled immediately after the parade.

3.8.2 IMPACTS

3.8.2.1 Archaeological Resources

Since a majority of the substation locations and areas to be excavated for trenching are located in a heavily developed urban environment, there is only a remote potential for disruption of buried prehistoric and/or historic archaeological resources.

Although the UCLA records search indicates no identified archaeological sites within 4,000 feet of the division yard expansion sites and the satellite division site, there exists the potential for archaeological remains at the site.

3.8.2.2 <u>Historic, Architectural and Cultural Resources</u>

a. Construction Impacts

The types of impacts on historic, architectural or cultural resources anticipated for this project are as follows: For most elements of the construction phase, no significant effects are anticipated. Typical potential construction effects such as demolition, property acquisition, temporary loss of access and vibration may be considered negligible for the majority of this project. The only properties to be acquired would be for the substations, maintenance facility expansion and satellite division sites. Since the substation sites are presently undeveloped and the documentation search proved negative for the maintenance facility sites, no historic buildings would be affected by right-of-way acquisition or demolition. Loss of access during electrical conduit placement under the street right-of-way would be temporary. Construction vibration would be limited to vehicle movement associated with substation and maintenance facility construction and jack-hammering in the street right-of-way for electrical conduit placement; and would be well below the standard Federal Transit Administration threshold for damage to fragile historic buildings (95 dB).

The only potentially significant construction impacts could occur in cases involving the actual physical use of the historic resource for the project. One of the project options includes using cross span wires which may be attached to poles or could require eyelets in building facades. The latter was a common method of fixation for historic trolley bus systems and some eyelets still exist in historic buildings in Los Angeles. ETB project designers have indicated that eyelets would be placed on building facades only if a structural analysis indicates that such placement would not compromise the structural integrity of the building.

The architectural integrity of structures which had poles originally constructed for the same purpose, such as bridges, could also be significantly affected if the original poles require replacement or are damaged during construction. Eight historic bridges, all of which have been determined eligible for inclusion in the National Register of Historic Places, may have to be altered for project use. Some of the bridges were originally equipped with ETB poles to attach overhead wires, but the structural condition of these poles has yet not been fully evaluated. If the poles could be reused without major alteration to their existing appearance, there would be no adverse effect. If the placement of the poles or their current structural strength is not appropriate for the project, the resulting alterations to the present poles or construction of new poles could create a significant alteration to the architectural design of the structure.

The historic bridges include the Sixth Street/Whittier Boulevard Bridge (RTD Route 18), Macy Street Viaduct (RTD Route 70), Olympic Boulevard/ Ninth Street Bridge (RTD Route 66/67), North Broadway (RTD Route 45), First Street (RTD Route 30/31) and Pasadena Colorado Street Bridge (RTD S-182). If the bridges in question have already been altered by the addition of non-historic utility poles, joint use or replacement of the non-historic poles would not be a significant adverse impact.

b. Operational Impacts

Operation of the ETBs would be less noisy and would create less atmospheric pollution than the existing diesel buses. However, there would be a change in the current visual setting of the ETB routes because of the introduction or reintroduction of poles and wires into the streetscape.

The introduction of trolley bus electrical wires parallel to or across public rights-of-way could significantly affect views to or of historic architectural resources and districts. Many of the routes that would be traversed by ETBs were historically trolley routes. The development of many of the districts discussed below occurred with or were spurred by the presence of transit. Early trolley and utility lines added to the number of poles and overhead wires that characterized urban streets in the early 20th century. Historic trolley bus and Pacific Electric Red Car lines were removed in the early 1960s. Their removal and the general trend toward undergrounding utilities helped to reduce the visual clutter of urban streets. Reintroducing ETBs raises concerns about reintroducing visual clutter, obscuring views of historic structures and districts and altering the integrity of setting for historic resources.

The number of cross span wires, poles, overhead contact wires and section insulators would vary according to system configuration. Generally these would be minimal where there are no route crossings, but would increase where two one-way routes cross, and increase again where two, two-way routes cross. In addition, extra poles and cross span wires would be necessary to accommodate these intersections of increasing system complexity. The degree of visual intrusion upon historic and architectural resources would vary in direct proportion to the system configuration. (See Section 3.3, Aesthetics, for a discussion of various pole and overhead contact system configurations particularly related to special cases such as route crossings and turns.)

Historic and architectural resources with significant architectural elevations that face away from the project would undergo the least visual impact. Individual historic resources (outside of historic districts) located mid-block would be slightly exposed to poles and associated overhead contact wires, but these are probably not dense enough to be considered as a significant visual disruption in a heavily developed urban environment. Views of individual resources located at ETB route turns or ETB route crossings are more likely to be affected. Individual resources located at system turns or crossings would be exposed to the greatest density of poles, hardware and wires.

Historic districts would generally be exposed to the greatest overall visual impact because current streetscape views would undergo a cumulative change, street furniture such as historic lampposts could be altered and the overall integrity of the current setting would be changed. However, it is also important to note that the density of poles and wires would seldom approach historic levels and that a number of urban design criteria have already been incorporated into the project to reduce the impact of system components in sensitive areas, particularly historic resources (see Section 3.3).

In the following sections, the potential impacts of the ETB routes on historic districts are assessed from several perspectives. Generally, if there is one ETB route with no turns or crossings with other routes, the impact on the district should be minimal. Where there are turns or route crossings, the assessment of impact is based on the complexity of the crossing and its proximity to historic resources.

- **Historic Districts**

The following National Register Districts are located on or intersect with at least one of the project alternatives. They are presented in alphabetical order.

o Alvarado Terrace Historic District, City of Los Angeles

The Alvarado Terrace Historic District is located at Alvarado Terrace, Bonnie Brae Avenue and 14th Streets in Los Angeles, and was listed in the National Register of Historic Places on May 17, 1984. RTD Route 30/31 runs along Pico Boulevard, immediately north of and perpendicular to the Alvarado Terrace entrance of this district. No significant views to or from the district would be affected by the ETB project along this route.

o The Broadway Theater and Commercial District, City of Los Angeles

The Broadway Theater and Commercial District was listed on the National Register on May 9, 1979. It is located in the heart of the Los Angeles Central Business District (LA CBD), from 300 to 849 South Broadway. Seven routes would run along this portion of Broadway or intersect the district. RTD Routes 30/31, 40, 45 and 70 run along Broadway the entire length of the district. RTD Routes 16 and 18 each intersect the center of the district at both 5th and 6th Streets, and RTD Route 66/67 intersects the southern end of the district at 8th and 9th Streets.

The combined use of Broadway by four routes would not increase the number of poles and wires that would be required by the system and would not change the frequency of transit vehicles on the street. Broadway is currently very congested, particularly in peak hours. This condition would not change significantly with ETBs in service. Of more concern is the crossing of four of its six intersections by three other ETB routes; significant visual intrusions resulting from complex arrangements of poles, cross span wires and section insulators are anticipated. These would disrupt views to and from the Broadway District at 5th, 6th, 8th and 9th Streets, a significant portion of the district.

It should be noted that historic views of Broadway show even greater concentrations of poles, wires and insulators than are being proposed for this project. The proposed ETB installation would introduce far less clutter than its historic counterparts. Figure 3.8-1 is a historic view of Broadway and Seventh Street in 1930.

o Little Tokyo Historic District, City of Los Angeles

The Little Tokyo Historic District was listed on the National Register on August 22, 1986. It is located near the intersection of 1st and San Pedro Streets in downtown Los Angeles. Two ETB routes run in the proximity of this district. RTD Route 30/31 runs through the heart of the district along the 300 Block of East 1st Street. There are no complex curves along this portion of the route, however it does intersect with RTD Route 40 at 1st and

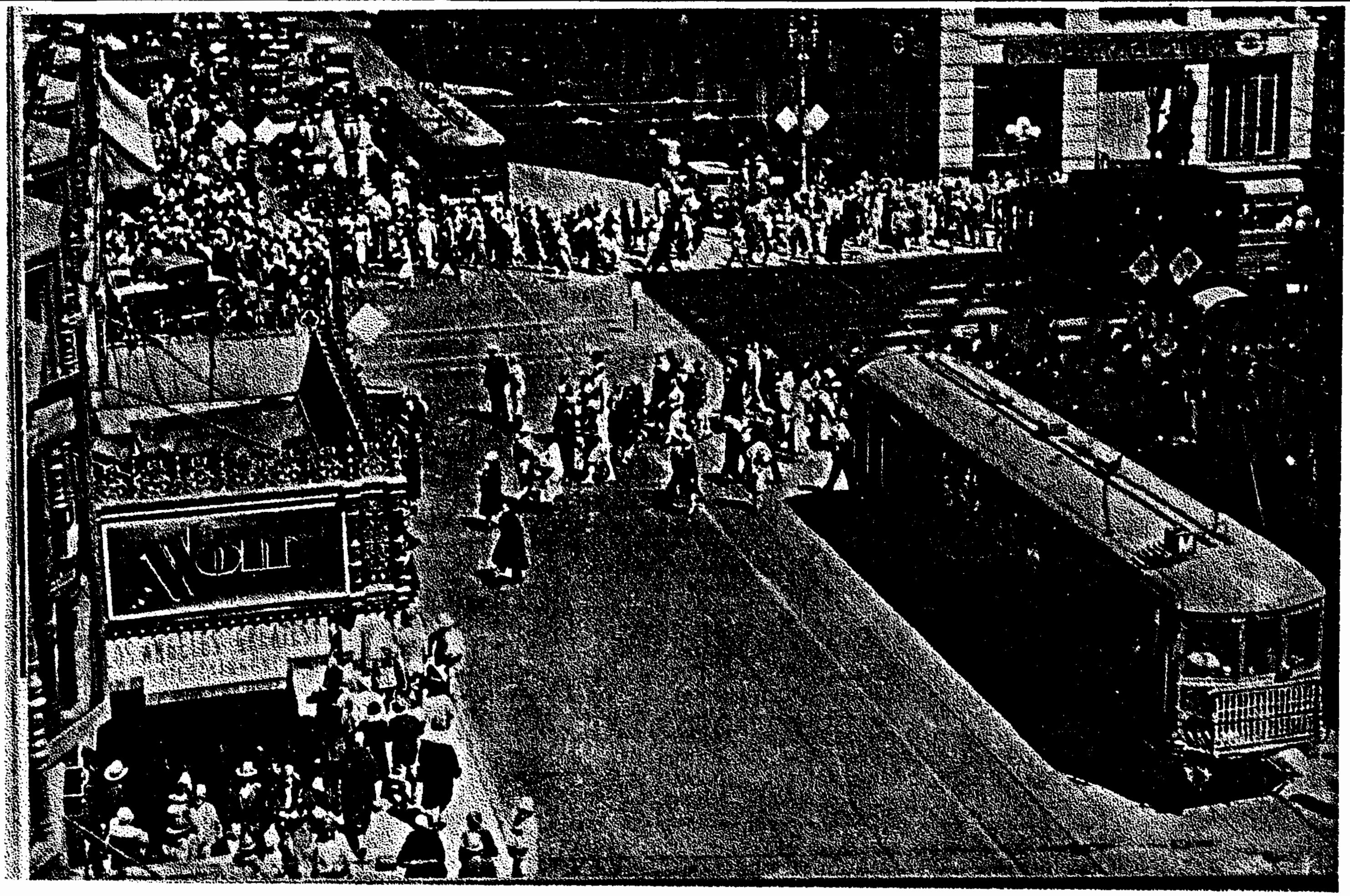
San Pedro, the district center. RTD Route 40 bisects the district along 1st Street west of San Pedro and San Pedro north of 1st Street. The system turn is identified as a left turn, right turn with no crossing which would require a complex wiring configuration (as discussed in Section 3.3, Aesthetics). Because of the location of two routes intersecting at the heart of the district, potentially significant visual intrusions resulting from a complex arrangement of poles, cross span wires and section insulators could affect the integrity of the district's current setting.

First and San Pedro Streets were also historic trolley streets. Although introduction of these ETB components would alter the current setting, it is not out of keeping with the historic condition.

- Los Angeles Plaza Historic District (El Pueblo), City of Los Angeles

The Los Angeles Plaza Historic District was listed on the National Register on September 13, 1978. The site also serves as El Pueblo de Los Angeles State Historic Park. Its boundaries are roughly defined by Spring, Macy, Alameda and Arcadia Streets in downtown Los Angeles. The period of significance of El Pueblo dates back to the early 1800s, well before any historic condition of electric passenger vehicles. However, freight trains served industries along Alameda Street and ran adjacent to El Pueblo in the early 20th century. RTD Route 40 runs along the eastern boundary of the district, along Alameda Street; and RTD Route 70 runs along the northern boundary, Macy Street. The two routes intersect at Alameda and Macy. RTD Route 40 would turn using a left turn, right turn, no crossing configuration; while RTD Route 70 would turn using a left turn into a one-way ETB against a one-way opposing ETB configuration. (See section 3.3, Aesthetics, for a discussion of the wiring configurations required for these types of turns.) Immediately across Alameda Street on either side of Macy are two more National Register properties, Union Station (listed November 13, 1980) and the U. S. Post Office-Los Angeles Terminal Annex (listed January 11, 1985).

Figure 3.8-1: Historic Trolley Lines Setting: Broadway and 7th Street (1930)



Source: An Album: Henry Huntington and the Pacific Electric, by Spencer Chump, 1978.

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Figure 3.8-1: Historic Trolley Lines Setting: Broadway and 7th Street (1930)

Because of the location of the routes along two of the historic district boundaries, their intersection at a corner of the district and their proximity to two more National Register resources, there is a potential for visual effects resulting from a complex arrangement of poles, cross span wires and section insulators. This potential is reduced by the substantial auto and truck congestion that exists at this corner and by the fact that areas of significant pedestrian activity at El Pueblo are south and west of this intersection. Structures at El Pueblo are oriented to the shopping area and the plaza, with much less orientation to the Macy/Alameda intersection. Entrances to both Union Station and Terminal Annex are set well back from the intersection and screened to some extent by parking lots.

- Menlo Avenue-West 29th Street Historic District, City of Los Angeles

The Menlo Avenue-West 29th Street Historic District is bounded by Adams Boulevard, Ellendale, 30th and Vermont Avenues in Los Angeles. RTD Route 204 runs along Vermont Avenue, which forms the western boundary of the district. There are no complex turns, intersections or system crossings along this section of the route. Because the system configuration is relatively simple along the district boundary and Vermont is a major commercial street, no significant visual effects on this district are anticipated.

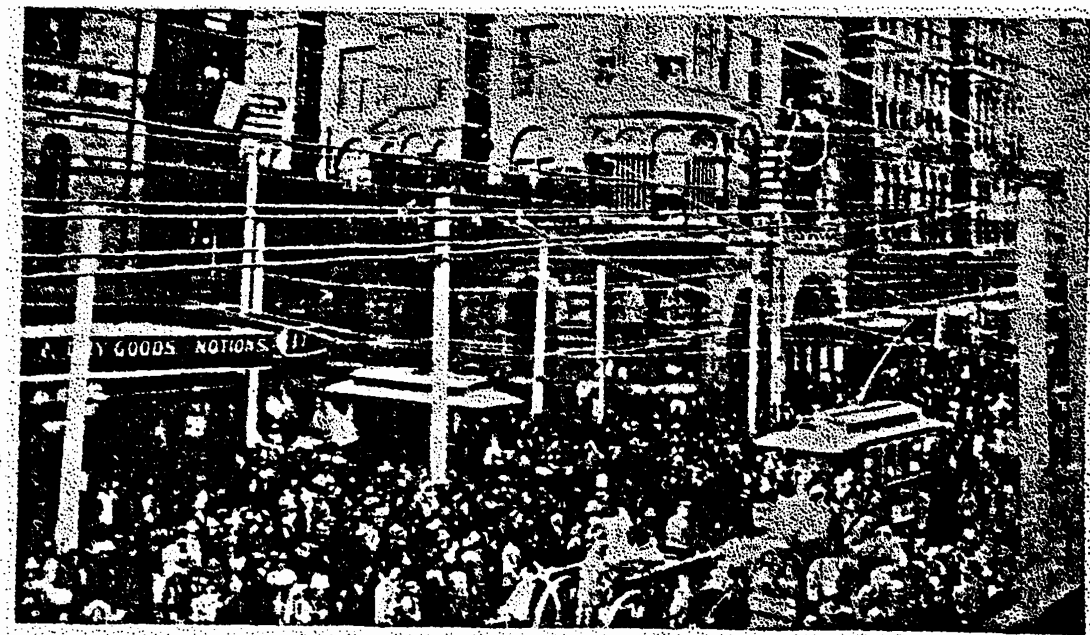
- The Spring Street Financial District, City of Los Angeles

The Spring Street Financial District was listed on the National Register on August 10, 1979. It is located immediately east of and parallel to the Broadway District, from 354 to 704 South Spring Street. RTD Route 16 enters the district at the north end of Spring Street, and then proceeds through two blocks of the district until turning west onto 5th Street. RTD Route 18 would cross the district at two of its four intersections, 5th and 6th Streets. RTD Routes 16 and 18 would thus intersect at Spring and 5th Streets, and then proceed in combined use out of the district to the west, along 5th Street. The combination of the turn of one ETB route and its intersection and joining with another in the heart of the district would probably result in significant visual intrusions due to its complex arrangements of poles, cross span wires and section insulators.

Spring Street is also a historic trolley street. Figure 3.8-2 illustrates Spring Street in 1892 when trolleys were first introduced into Los Angeles.

- The Wilton Historic District, City of Los Angeles

The Wilton Historic District was listed in the National Register on July 24, 1979. It is located along South Wilton Drive, South Wilton Place and Ridgewood Place, from about 1st Street to 3rd Street. RTD Route 16 runs along 3rd Street, immediately adjacent and perpendicular to the southern entrance to this district. No significant views to or from the district would be affected by this ETB route.



Celebrating the 400th anniversary of the discovery of America on Columbus Day, 1892. Electric cars began running regularly that year for the first time. Scene, Second and Spring Streets.

Source: La Reina: Los Angeles in Three Centuries, by Laurance L. Hill, (1929).

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Figure 3.8-2: Historic Trolley Lines: Spring St.(1892)

- Old Pasadena Historic District, City of Pasadena

The Old Pasadena Historic District was listed on the National Register on September 15, 1983. It includes the area bounded by Pasadena Avenue, Fair Oaks Avenue, Raymond Avenue, Arroyo Parkway and Colorado Boulevard. Study Route 182 (also known as Tri-Cities route) would traverse the entire length of the district via the Colorado Boulevard right-of-way. Buildings contributing to this district have undergone extensive restoration in the past fifteen years. The restored condition of this district has stressed a minimal usage of modern street furniture and signage. Figure 3.8-3, which shows the intersection of Colorado Boulevard and Fair Oaks Avenue in the early 1900s, illustrates the clutter that existed historically. However, the re-introduction of poles, overhead wires and hardware, although much less intrusive than the historic condition, could be considered a disruption of the current visual setting.

- Pasadena Civic Center District

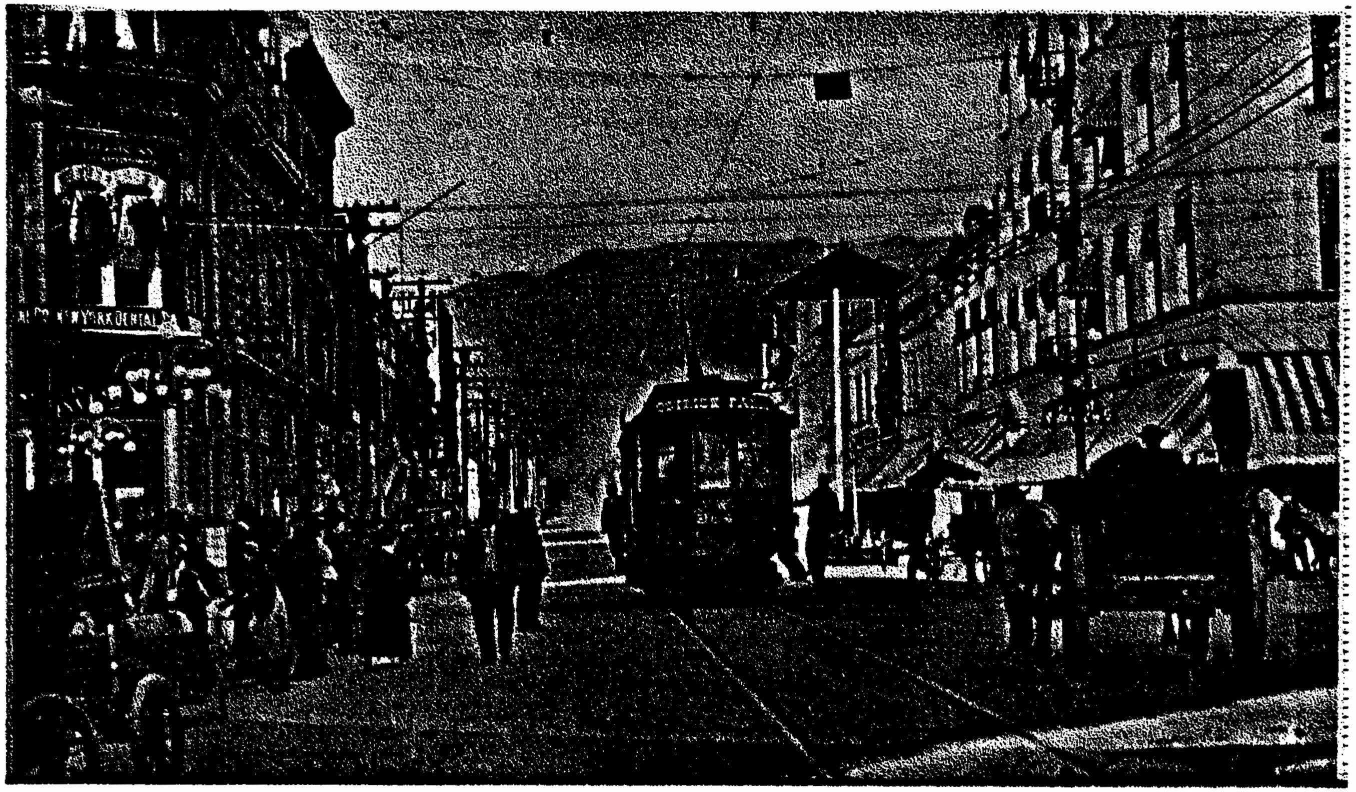
The Pasadena Civic Center District was listed on the National Register on July 28, 1980. It includes the area roughly bounded by Walnut Street, Green Streets, Raymond Avenue and Euclid Avenue. It is located immediately to the east of the Old Pasadena Historic District. As in the case of the other historic districts in Pasadena, Study Route 182 would traverse the district via the Colorado Boulevard right-of-way.

Buildings contributing to this district include several outstanding examples of public architecture with well maintained landscape features and often dramatic setbacks. This is especially true in the vicinity of Pasadena City Hall, over a block north of Colorado Boulevard. The introduction of poles, overhead wires and hardware into this district setting could be considered insignificant since the major contributing structures in this district do not face onto Colorado Boulevard and there are no ETB turns or route crossings within the District.

- Pasadena Civic Center Financial District, City of Pasadena

The Pasadena Civic Center Financial District was listed on the National Register on October 29, 1982. It is located at the intersection of Colorado Boulevard and Marengo Avenue in downtown Pasadena. Study Route 182 would occupy the Colorado Boulevard right-of-way through the center of this district. Colorado Boulevard was also a historic trolley route. Since the current condition of this district has been maintained with a minimal amount of urban streetscape clutter and signage, the introduction of poles, overhead wires, and hardware could be considered a substantial change to the current setting.

Figure 3.8-3: Historic Trolley Lines Setting: Colorado and Fairoaks (c.1900)



Source: An Album; Henry Huntington and the Pacific Electric, by Spencer Chump, 1978.

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Figure 3.8-3: Historic Trolley Lines Setting: Colorado and Fairoaks (c.1900)

- **Fire Safety**

The issue of fire safety and fire fighting operations is also a concern with respect to historic resources. The introduction of new utility lines to substations, plus cross span and overhead wires, has not been a fire hazard in the past in other cities with similar systems such as Vancouver, San Francisco and Seattle. However, a large majority of historic buildings are lost to fire, and any increase in the possibility of fire, no matter how slight, should be viewed as an additional risk to their long-term survival. The potential for additional risk because of fires related to earthquake activity is also a matter of some concern because many historic buildings were built prior to the adoption of modern fire codes.

Section 3.9 addresses fire and safety issues associated with the presence of overhead wires and procedures to be followed by firefighters. Each of the items in that section is particularly relevant for the protection of historic structures.

- **Comparison of Proposed Routes**

In order to establish the relative density of historic resources along each route, Table 3.8-1 has been assembled. Design of system configurations for routes which pass by large numbers of historic resources should attempt to minimize visual disruption. Table 3.8-1 summarizes the results of the documentation search according to the national, state or local designation of significance of each significant resource within a block of each route.

3.8.2.3 Colorado Street Bridge

The Pasadena Department of Transportation has stated that it would not accept ETB wiring on the Colorado Street Bridge for Route S-182. Currently, RTD is considering three alternatives:

- Use the 134 Freeway (SR 134) east and west to bypass the bridge,
- Use automatic pole retrieval/replacement technology, and
- Wire the bridge for ETB operations, which is the RTD preferred alternative.

The impacts associated with each of these options is discussed below.

TABLE 3.8-1: LEVEL OF SIGNIFICANCE OF HISTORIC RESOURCES FOR EACH ROUTE

LEVEL OF SIGNIFICANCE		Alternative Route															
		RTD 16	RTD 18	RTD 30/31	RTD 40	RTD 45	RTD 66/67	RTD 70	RTD 204	RTD 560	LB 40	LB 50	LB 60	LB 90	M 10	S-182	Total[1]
Level 1 -	Listed on the National Register	40	33	62	82	71	14	72	7	0	1	3	2	2	0	7	127
Level 2 -	Determined Eligible to the National Register	5	10	12	5	6	4	5	0	0	0	0	0	0	2	1	33
Level 3 -	Appears Eligible for the National Register	19	26	115	25	24	53	26	23	1	0	0	0	0	0	1	224
Level 4 -	Potentially Eligible for the National Register	10	21	84	12	12	6	8	8	0	0	0	0	0	0	1	129
Level 5 -	Listed on or eligible for state, county, or city landmark status	16	34	53	195	196	18	65	44	0	7	8	9	10	0	164	746
Total -	Significant Cultural Resources	90	124	319	316	305	95	176	82	1	8	11	11	12	2	173	1244
City of Los Angeles Historic-Cultural Monuments		26	28	25	23	25	19	21	4	1	–	–	–	–	0	4	89
City of Pasadena - Cultural Heritage Monuments		–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
City of Long Beach Historical Landmarks		–	–	–	–	–	–	–	–	–	7	8	10	11	–	–	15
Rosemead Graffiti Removal Program Historical Documentation		–	–	–	–	–	–	51	–	–	–	–	–	–	–	–	51

Note: [1] Some resources would be affected by more than one route and are counted only once in the total.

Source: Myra L. Frank & Associates, Inc., 1992.

a. Option 1 – Use the 134 Freeway

Option 1 would involve wiring and routing the ETBs along the 134 Freeway both east and west between Orange Grove and San Rafael Avenues. Westbound ETBs would enter the freeway using the Orange Grove on ramp and exit at the San Rafael off ramp. Eastbound ETBs would enter the freeway at the San Rafael on ramp and exit at the Orange Grove off ramp. Use of ETBs on freeways has not been done before, and such an approach would require the review and approval of the California Department of Transportation (Caltrans).

Option 1 would result in a slight increase in route length for Route S-182, and the routing would create additional turning movements through a series of closely-spaced intersections. See Section 3.3 for a discussion of visual impacts associated with various types of intersections.

In terms of traffic impacts, the Westbound Orange Grove on ramp has a high occupancy vehicle (HOV) bypass lane adjacent to a mixed flow metered lane. No significant delay would be anticipated for ETB buses, nor would the introduction of the ETB route to this ramp be expected to cause any delay to automobile or other HOV traffic.

Westbound ETBs would have to merge into the mainline freeway lane for a short distance prior to reaching the westbound exit ramp to San Rafael. This merge has the potential to adversely affect freeway flow and ETB performance.

In the eastbound direction, there is a full auxiliary lane between the San Rafael on ramp and the Orange Grove off ramp. Should this lane be wired and used only by ETBs, the eastbound ETB operations should not affect freeway mainline traffic nor vice versa. Approval for freeway use and the geometric designs for such an ETB operation would need to be reviewed and approved by Caltrans.

Unlike the westbound Orange Grove on ramp, the eastbound on ramp at San Rafael does not have an HOV bypass lane. It only has one metered lane. The ETB service could therefore face some delay in entering the freeway. Correspondingly, the ETBs could cause some delay to auto and truck traffic entering the freeway at this ramp, but the probable Route S-182 ETB headways should not be at levels likely to cause delays.

A critical issue is the engineering feasibility to provide adequate speed capability in the ETB system (vehicles and OCS) and to minimize the probability of dewirement. Adequate speed capability in the vehicles would require specifications regarding appropriate motor and control equipment. A 50 mph speed capability is not a problem for current technology, although it is somewhat higher than is normally specified. Similarly, this speed level is feasible for contact wire, but higher than normal wire tension (3,000-3,500 pounds) may be needed. To minimize dewirements, maintenance of both OCS and trolley poles and shoes would need to meet high standards, including frequent testing and adjustment of wire and trolley pole spring tension. In addition, it would be necessary to have adequate APU capacity and reliable high speed retrievers so that an ETB could be moved off the freeway before the operator needs to rewire in the event of dewirement or loss of OCS power.

b. Option 2 – Automatic Pole Retrieval/Replacement

Option 2 preserves the shortest route and would not involve wiring the bridge. For this option, the ETB would retrieve the trolley pole as it approached the bridge and replace the trolley pole on the OCS after exiting the bridge using "automatic pole retrieval/replacement" hardware.

For this option, space would be required out of traffic at either end of the bridge for the ETB to stop during the pole retrieval/replacement functions. In addition, structures would be needed near the ends of the bridge to anchor the OCS.

The automatic pole retrieval/replacement approach is not a new approach and was used in the 1930s by New Jersey Public Service. Seattle Metro currently uses this technology for its dual powered buses for switching between electric and diesel operation.

The technology applies a pneumatic system to accomplish automatic raising and lowering of trolley poles. Operators are required to line up the bus steering column with a strip painted on the pavement. Fore and aft placement of the bus is guided by a second marker painted on the curb. When the pneumatic system is invoked, the trolley pole rises to meet an inverted funnel attached to the trolley wires. The inverted funnel is attached to the trolley wire and is electrified. The funnel extends one foot on the outside of both wires, hence giving the operators some leeway - plus or minus one foot in lateral alignment - in lining up the steering column with the strip.

Since the funnel is electrified, the bus is able to move forward upon shoe contact, even if the shoe is not exactly on the wire. The shoe might be crosswise to the wire at this point, but as the bus moves forward, the funnel narrows and the shoe's attitude is oriented to the wire. By the time the shoe reaches the end of the funnel, the trolley pole is retrieved and normal operations resume.

It should be noted that the road must be level side-to-side (no camber or crown) in order for the automatic pole retrieval/replacement to occur successfully. As long as the road is absolutely flat, estimated time to retrieve/replace the trolley pole is less than 30 seconds. However, the criteria for a flat road means challenging drainage problems. Also, there may be objections to the visual impact of the inverted funnels that would need to be installed near the ends of the Bridge.

For this option, when crossing the bridge, the trolley bus would operate on an auxiliary power unit (APU). The experience of Vancouver B.C. Transit on APU's has indicated that a fully charged APU on a flat road allows the ETB to travel at five miles per hour for slightly more than a mile. A fully-loaded bus and/or an uphill grade would reduce the capability of APU's. Crossing the Colorado Street Bridge at a speed as low as 5 miles per hour would present a traffic impact.

c. Option 3 -- Wire the Bridge

RTD prefers the option of wiring the bridge, which would produce the most desirable ETB operation for Route S-182 in this area, should S-182 be implemented. This option would have the shortest route and running time and the smallest number of turns.

Such wiring would, however, create a significant alteration to the bridge and could diminish its architectural integrity. Views of and from the bridge would be altered, and such a change could be incompatible with the bridge's historic character, since it has not been wired in the past.

This option could present potentially significant historic impacts, pending review of optional wiring designs and their compatibility with the historic character inherent in the current restoration plans for the bridge.

3.8.2.4 Tournament of Roses Parade

The Pasadena portion of the proposed ETB Route S-182 includes an east-west segment on Colorado Boulevard from Glendale to Hill Avenue, and a north-south segment on Hill Avenue from Colorado Boulevard to California Boulevard. The wires and poles of the overhead contact system (OCS) of the proposed S-182 line may affect the Tournament of Roses Parade in two ways. First, the OCS wires may interfere with the movements of the floats. Second, the OCS wires and poles may intrude on the sight of the audience at the Parade.

It is likely that the ETB OCS bracket arms would be used along Colorado Boulevard positioning the wire between the first and second traffic lane from the curb. This would generally be a few feet beyond the blue honor line. The remaining distances between these bracket arms would be less than the remaining distance between existing traffic signal bracket arms presently located on Colorado Boulevard. Since these traffic signal bracket arms are not relocated for the Tournament of Roses Parade, the ETB OCS arms would not interfere with the Parade either.

The interference between the OCS wires and the Parade could occur at the intersection of Orange Grove and Colorado Boulevard where the Parade floats turn east from Orange Grove to Colorado. The OCS wires on the south side of Colorado Boulevard cross the right turning movement of the Parade. These wires would need to be taken down to allow for passage of the floats. Moreover, the poles would need to be removed in this area for the parade so that they would not interfere with parade television broadcasts.

Interference with the wires would also occur at the intersection of Hill Avenue and Colorado Boulevard. The OCS wires on the east side of this intersection, which provide left turning capacity for the ETBs turning from Hill Avenue to Colorado Boulevard, would cross the eastbound movement of the Parade on Colorado Boulevard. Thus, this section of the OCS wires would also have to be taken down for the Parade.

The wires would also prevent the removal of floats over 18 feet in height from the parade route via side streets should they become disabled.

Visual impacts on the Parade are considered in two areas: 1) the visibility along the route and 2) the visibility from the grandstands. Along the route, it is intended that the ETB Project would include joint-use of poles (i.e. common poles for ETB OCS support as well as traffic signals and streetlights). Joint use of poles should minimize the need for additional poles along the street that could contribute to pole clutter and the interference with views of the Parade. Visual effects along the routes would nonetheless result from the 0.5-inch diameter OCS contact wires and additional bracket arms that could partially interfere with views of the Parade for people sitting on high grandstand seats along the routes.

At the intersection of Orange Grove Boulevard and Colorado Boulevard, where the television cameras and the major grandstands are located, some traffic and streetlight poles are currently removed and reinstalled in each year. Similar treatment would need to occur for OCS poles and wires in this area.

3.8.3 MITIGATION

3.8.3.1 Archaeological Resources

A SOPA-qualified archaeologist should be contacted immediately should archaeological remains be encountered during excavation of trenches and excavation for substation foundations. A SOPA-qualified archaeologist should also be present during any major

excavations in undisturbed areas of the maintenance facility expansion sites and the satellite division yard.

The archaeologist will be empowered to stop construction if any cultural resource remains are encountered in order to evaluate the materials. Procedural recommendations will be made following the evaluation of the remains.

Should burials be encountered, construction will halt, and procedures according to Appendix K of the California Environmental Quality Act will be followed, beginning with the immediate contact of the County Coroner. These procedures and additional guidelines will be made a part of the project's construction specifications.

3.8.3.2 Historic and Architectural Resources

The following measures will be implemented to mitigate potential impacts of the ETB project on historic and architectural resources. Mitigation measures are presented for impacts relating to visual effects on historic structures and districts; and alterations of historic poles, lampposts and bridges.

To mitigate the potential impact of poles and overhead wire on views of historic structures, joint use of poles will be used where feasible and poles will be placed to avoid landmark entrances and significant facades where feasible. In addition, the project will be reviewed by the Cultural Heritage Commission and other local reviewing agencies.

Visual impacts on historic structures and/or districts (the Broadway Historic District, Little Tokyo Historic District, Spring Street Financial District, and the El Pueblo Historic District) would result from complex wiring and hardware configurations at intersections where ETB routes cross or turn and at unique street configurations. To mitigate these impacts, incentives will be developed to encourage: 1) innovative hardware designs that will reduce its visibility and 2) the approval of a new type of synthetic guy strand that reduces the need for insulating hardware will be pursued.

In districts where there is minimal use of modern street furniture and signage, such as the Old Pasadena Historic District and the Pasadena Civic Center Financial District, the introduction of poles, overhead wires and hardware along the ETB routes could be considered a substantial change to the existing setting. The mitigation measures described above will mitigate this type of visual impact.

Changes to or replacements of historic trolley poles or lampposts and alterations of historic bridges for new poles and lampposts would affect these historic resources. Replacement of historic poles and lampposts will be avoided where feasible. If not feasible, poles will be stored with the Bureau of Street Lighting for future use as replacements and parts, and their original appearance and placement should be photographically documented. ETB poles replacing historic poles and lampposts should be designed as replicas or be compatible in design with the remaining historic poles and the historic setting of the streetscape. The use of replicas does not diminish the effect of removal or alteration of the original historic character of the structure. Alterations to historic bridges will be avoided where feasible. Where they cannot be avoided, alterations to historic bridges will be minimized and reviewed by the Cultural Heritage Commission and other local reviewing agencies. New poles will be installed in such a way as to be easily removed so that alteration is considered a long-term reversible alteration. In addition, the existing condition of the bridge should be photographically documented prior to any alteration.

Although these measures would mitigate the project's impacts on historic resources to some degree, there remains the potential for significant impacts on historic districts with multiple locations requiring complex ETB wiring and hardware configurations.

3.8.3.3 Fire Safety

As is proposed for the system as a whole, an automatic shut-off system for power in the event of a wire disconnect will be installed to eliminate a fire hazard. In conjunction with the Los Angeles Fire Department and other local fire departments, special programs to familiarize fire fighting personnel with the system and any special equipment needed for emergencies will be developed.

3.8.3.4 Colorado Street Bridge

Each of the three options discussed in the previous section has its own operational, visual and traffic impacts. RTD will work with Caltrans and the City of Pasadena on the evaluation of and selection among these options.

3.8.3.5 Tournament of Roses Parade

The following measures will be implemented to mitigate potential impacts of the ETB project on the Tournament of Roses Parade:

- Annually remove those sections of ETB wire that would interfere with the Parade route, i.e., at Orange Grove and Colorado and at Colorado and Hill.
- Annually remove poles and wire in the Orange Grove/Colorado Boulevard intersection's, grandstand and television camera area.
- Prior to the event, de-energize the OCS and operate non-ETB bus service.

3.9 SAFETY/RISK OF UPSET

The Electric Trolley Bus (ETB) project would have a number of electrical and physical components that may pose increased risk to the general public. These risks may be chronic or occur during accidents and emergencies. The five main areas of this issue are (1) fire fighting, (2) electromagnetic fields and electromagnetic interference, (3) hazards associated with dewirements and failures of the electrification system, (4) hazards associated with maintenance activities near the overhead wires and (5) hazardous materials associated with batteries used in auxiliary power units. The setting, impacts and mitigation measures for safety/risk of upset issues are presented below.

3.9.1 SETTING

3.9.1.1 Fire Fighting

Fire fighting operations in cities with ETB systems (e.g., Vancouver, San Francisco, Seattle) have faced no special problems due to the ETB systems. There have been few incidents with the overhead contact wires. Even during the 1990 San Francisco earthquake, overhead contact wires did not hinder the fire fighting and rescue work, and trolley bus service was rapidly restored. The low number of incidents with overhead wires is attributable primarily to a good training program and the availability of special equipment and tools. The current fire fighting practices in Vancouver provide insight with regard to this issue.

British Columbia (BC) Transit and the Vancouver Fire Department (VFD) have found that the great majority of fires along trolley bus routes do not require any special action and can be fought without being in close proximity to the wires. The preferred minimum working distance from the wires is three feet, although the voltage of ETB wiring is safe at closer distances -- up to four inches -- where fire fighters may need to venture in extreme or life-threatening circumstances. In the vast majority of fires, power is left on, and ETB service is maintained. If the street is partially blocked by fire fighting equipment, the ETBs can operate on their auxiliary battery power supply on the clear side of the street or around the block.

The VFD makes every attempt to allow ETB service to continue and, even when a street is closed to other traffic, will use hose jumpers to allow ETB service to continue. Occasionally, where fire fighting must be close to overhead contact wires, the VFD will request the transit authority to turn power off on the affected section. In Vancouver, this must be carried out manually at a specific substation. In Los Angeles, remote controls could be provided, allowing power to be immediately disconnected on any section of overhead wire with a telephone call from an authorized person. Additionally, a local emergency shut-off switch would be available to the fire department to deenergize each substation.

About once or twice every ten years on the 150-mile Vancouver system, a major fire on an ETB route will damage or require the removal of overhead wires. In Vancouver, the Fire Department relies on a transit authority line crew to cut and remove the affected wires. In multi-alarm blazes, both a British Columbia Transit line crew and an electric company line crew may be called to the scene of the fire. The traditional approach of having fire department personnel trained as required with tools to cut the wires is not regarded as good practice and no longer applies in Vancouver.

3.9.1.2 Electromagnetic Fields and Electromagnetic Interference

Electromagnetic fields (EMFs) and electromagnetic interference (EMI) are two issues that concern the public. Concerns over EMFs are related to human health; concerns over EMI are related to electrical reception of modern day devices (e.g., television sets).

Whenever electricity is conducted, two types of fields are produced: electric and magnetic. Electric fields arise from the presence of electrical charges. Magnetic fields arise from the motion of these electrical charges. These two types of fields are referred to as EMFs. EMFs are invisible, non-ionizing, low frequency radiation that are discharged from electrical power facilities and electrical appliances. Common sources of EMFs include power lines, video display terminals (VDTs), electric blankets and numerous other electrical appliances.

EMFs are receiving some attention presently. There is a general concern that EMFs generated by power overhead lines are harmful to humans. Most of the attention has been directed at the public utility industry and low frequency magnetic fields (AC current). DC currents carried over the ETB overhead contact system (OCS) wires are not known to have any of the side effects of AC currents.

Even though results from research remain inconclusive at this time, the electromagnetic field issue will continue to be active as the results of more studies become available.

EMI consists of strong electrical or magnetic fields that produce unwanted currents or voltages in electronic equipment. (Generally, strong electrical fields are caused by high voltages and strong magnetic fields are caused by the movement of large currents in wires.) EMI can be caused by high frequency communication transmissions and from radio and television broadcasting that overlaps into electronic equipment frequency bandwidths, causing "crosstalk." EMI may also be caused by harmonic currents in very low frequency alternating current (AC) power distribution grids. Modern cities are quite "noisy" electromagnetic environments, and very sensitive electronic equipment located in cities may require shielding to ensure freedom from outside electronic interference.

3.9.1.3 Hazards Associated With Dewirements and Failure of the Electrification System

ETBs can pose hazards associated with dewirement of the buses or the interruption of electric current flow through the overhead wires. The ETB project's buses would be equipped with auxiliary power units (APUs) which would allow the ETBs, under infrequent dewirement circumstances, to move out of the way of traffic to avoid traffic jams. Experience in Vancouver, B.C. has shown that about two thirds of the dewirements are due to operator error, and the rest are due to circumstances outside operator control (e.g., the ETB may need to avoid a traffic accident by sharply braking or swerving away).

One consequence of dewirements can be damage to the overhead contact system (OCS). Vancouver's BC Transit reports that, in rare cases, wire breakage can occur and live wires may fall into the street. Overhead can also be damaged and fall due to over-height loads, or more commonly due to dump trucks operating with their hopper in a raised position. Fallen wires usually contact an electrical ground and will automatically be de-energized by the substation's fault protection equipment. However, wires are considered "live" or energized until confirmed otherwise. There is the potential for a fire to start in the unlikely event that circuit breakers do not interrupt properly. Bus operators, transit supervisors, police and fire departments in Vancouver are trained to deal with this situation, which is comparable to but less hazardous than the electric distribution system circuit breaks because the voltage is lower. Transit staff have been trained to handle traffic in these circumstances until emergency services arrive.

3.9.1.4 Hazards Associated With Maintenance Activities Near Overhead Wires

Personnel involved in maintenance of the ETB wires, and in maintenance of the other utilities, street lighting and traffic signals in close proximity to the ETB overhead could potentially be at risk of injury, or even death, due to the risk from the nearby overhead wires. In addition, persons trimming or cutting down trees in the vicinity of the wires could also be at risk.

BC Transit reports that the Workmen's Compensation Board of British Columbia, under the Industrial Health and Safety Regulations, Sections 22 and 24, defines voltages of 750 volts (the voltage for ETB overhead wires) and below as low. Work is permitted in close proximity -- with certain safety precautions. It is considered good practice to keep three feet away from the wire, and/or to use rubber blankets and gloves for protection unless specifically trained to work on or close to live ETB overhead wires.

Traffic safety during ETB overhead maintenance activities is also a concern. Most overhead utility circuits are located at the side of the street. However, ETB overhead wires are usually about 8 to 18 feet in from the curb. BC Transit has indicated that maintenance often requires line trucks to be positioned away from the curb, often in the second lane, where the ETB conductors are most frequently located. Two-person maintenance crews are typical, and a third flag person is required in many circumstances. Line trucks use high visibility electric arrows to direct traffic to either or both sides of the truck. The flag person's job also entails removing and replacing the ETB collector poles where this is necessary for the ETB to pass the work site. Buses use their APUs for this maneuver.

3.9.1.5 Auxiliary Power Unit and TPSS Batteries

Two types of batteries are being considered for the trolley bus Auxiliary Power Unit (APU): lead-acid and nickel-cadmium batteries. The battery system in each bus would contain approximately 192 cells (approximately 1400 pounds). Each battery cell is expected to last 1 to 3 miles between charges, assuming the bus is driving on a flat surface no faster than 5 to 10 miles per hour. Nickel-cadmium batteries are expected to last 15 years if the batteries are not allowed to discharge below 30 percent charge. Lead-acid batteries are expected to last from one to five years if the batteries are not over charged.

TPSSs would contain lead-acid batteries similar to those found in current buses and automobiles.

3.9.2 IMPACTS

3.9.2.1 Fire Fighting

Although overhead wires have the potential to interfere with fire fighting, they rarely present problems to fire fighters, who are already trained to deal with the more hazardous high voltage electric utility circuits. ETB wires are located away from the curb, allowing the Fire Department to access buildings without being in close proximity to the wires. In rare cases, where there is the need for fire fighting close to the wires, power can be quickly disconnected. In certain cases, high buildings can be reached from ladder trucks in the center of the street -- between the two sets of ETB wires.

It is important to note that, in the past, many major streets in Los Angeles County had streetcar or ETB overhead wires. The fire fighting practices used until the demise of streetcars and trolley buses in 1963 were reintroduced to Los Angeles when the light rail transit Blue Line opened in 1990.

There is little difference in the safety practices and training required for streetcar or ETB overhead wires. Both transit modes use wire at the same height and voltage. Streetcar wires are usually in the center of a street, while ETB wires are typically 8 to 18 feet in from the curb. Fire fighting routines in the vicinity of such transit wires are similar to existing practices for the more hazardous electric utility wires.

Although the likelihood of overhead ETB wires hampering fire fighting operations is not great, significant impacts are possible if measures are not taken to reduce risk to the maximum possible extent.

3.9.2.2 Electromagnetic Fields and Electromagnetic Interference

Because ETB overhead wires would carry DC current, which is not known to have any of the EMF effects of AC current, the project is not expected to result in significant impacts from EMF.

EMI has not been found to be significant in electric rail transportation systems that have been studied. Scientific studies conducted for projects such as the Dade County Metro Rail in Florida, the Chicago O'Hare Airport Peoplemover Project and the Los Angeles/Norwalk/El Segundo Rail Project have identified no adverse EMI effects. Results are forthcoming from an Environmental Protection Agency (EPA) study of EMI caused by proposed magnetically levitated transportation systems and electric commuter rail systems. Results of the above studies also apply to the proposed ETB project, as the components of the ETB system are similar to many public rail transit systems.

The San Francisco Municipal Railway (SF Muni) staff currently operates a system very similar to the proposed ETB system. Discussions with the Muni reveal that ETB systems do receive reports of EMI caused by their operations. Most reports note interference to car radios in vehicles driven next to ETBs. Such reports most frequently occur at turns where buses run through special overhead contact wire sections and there is arcing between the overhead contact wire and the bus poles that collect electrical current from the overhead contact wire. Arcing produces harmonic current components which can be of the same frequency as radio broadcasts. It is a problem largely for AM radio, although EMI to FM radio is theoretically possible.

Complaints of random EMI to television and radio reception in buildings along bus routes are rare, and there are no reports of electrified transit systems causing interference to recording studios, television studios, telephone or other commercial communication circuits or airports.

Examination of the information currently available with regard to effects of EMI indicates that the ETB project should have no significant adverse effects. Although no adverse impacts have been identified, Section 3.9.3 discusses potential mitigation measures which would further reduce the potential for EMI impacts.

3.9.2.3 Hazards Associated With Dewirements and Failure of the Electrification System

No significant impacts related to bus dewirement and failure of the electrification system would be expected assuming the ETBs would have APUs that would allow the ETBs to move out of the way of traffic to avoid traffic jams. The ETB system's circuit breakers would interrupt properly to avoid a fire, and staff are trained to deal with these events. The potential for circuit breakers not interrupting properly could be resolved by providing protective primary and secondary backup devices at all TPSSs.

The feederless substation system is designed to continue to operate satisfactorily independently of every other substation. Means to isolate any substation which has failed or is shut down for maintenance purposes would be provided.

3.9.2.4 Hazards Associated With Maintenance Activities Near Overhead Wires

Safety impacts from accidental contact with energized overhead ETB or light rail overhead wires is potentially significant though probably infrequent.

Traffic safety during trolley bus overhead wire maintenance activities would also probably not be significantly compromised. As described in the setting section, the activities could be performed in such a manner that the hazards to maintenance personnel are lessened.

Accidents to maintenance personnel could occur in rare circumstances. In these situations, the potential for significant adverse impacts may be significant unless measures are taken to reduce the risk of accidents to the maximum possible extent.

3.9.2.5 Hazards Associated With Auxiliary Power Unit and TPSS Batteries

The current bus fleet uses 12-volt lead-acid batteries. New batteries are stored at the maintenance yard up to two weeks prior to installation in a bus. The lifetime of these batteries ranges from 11 to 30 months, depending on the roughness of the road and the charge maintenance (e.g., a battery that is over charged will have a shorter lifetime). Spent batteries are sent to smelters for lead recovery. Prior to shipment to the smelter, batteries are stored at the Non-Revenue Repair facility in Downey (at the Division 4 yard, 7878 Telegraph Road). Spent batteries are stored outdoors, one layer high on pallets and secured with shrink wrap to prevent tipping and spilling of electrolyte. The batteries for the electric trolley buses and TPSSs would be handled at the same facilities in a similar manner. The current facilities are estimated to be large enough to handle the increased number of batteries required.

The hazards associated with wet-cell batteries (both lead-acid and nickel-cadmium batteries) include the following: The electrolytes in lead-acid and nickel-cadmium batteries are very corrosive and can react with metals to produce flammable hydrogen gas. Metal tools which contact the terminals may cause sparking, which can cause an explosion if hydrogen gas is present. The mixing of water with the electrolyte solutions can generate large amounts of heat and cause splattering of the electrolyte. In addition, the metals used in both types of batteries (lead, nickel, cadmium) are hazardous to humans and the environment.

3.9.3 MITIGATION MEASURES

The RTD and the Los Angeles County Transportation Commission (LACTC) intend to implement the mitigation measures discussed below to enhance the safety/risk of upset aspects of the ETB system. Implementation of these measures would reduce the level of potential adverse impacts to insignificance. The measures are grouped by the four impact types discussed in the previous section.

3.9.3.1 Fire Fighting

The ETB overhead wires have the potential to interfere with fire fighting along the bus routes. As a member of the ETB Task Force, the Los Angeles Fire Department (LAFD), has expressed concerns about this issue. The LAFD has made the following six suggestions:

1. Trolley wires should appear on only one side of a street.
2. The number of cross-span supports and trolley power lines should be minimized.
3. The LAFD should have the ability to locally de-energize the ETB power lines.
4. The ETBs should have the ability to operate "off-wire."
5. The LAFD should provide input regarding site selection, installation and connection of traction power substations (TPSSs).
6. Special programs should be developed for LAFD personnel to familiarize them with the system and with the special equipment needed for emergencies.

The LAFD's suggestion to locate wires on only one side of the street would only be practical on one-way streets.

The following measures would mitigate potential impacts on fire fighting.

a. Coordination between the ETB project sponsors and the local fire departments would ensure that fire fighting operations are not hampered by the implementation of the ETB system.

b. The design of the ETB system would minimize the numbers of cross-span supports and ETB power lines where feasible.

c. The RTD would follow all proper legal steps in defining the TPSS sites, in securing their use for the ETB project and in obtaining the necessary permits. The RTD would invite the LAFD and any other interested fire department in the area to participate in the site selection process.

d. In response to requests from local fire departments, power shut-offs for each TPSS would be commanded from a 24-hour RTD power control center. Radio or phone contact with the center would be possible. Emergency switches to deactivate substations will also be provided outside each substation in a box with a padlock, and fire departments would be given access to these boxes. It is normal ETB practice to have personnel available at the scene of any emergency, and such personel will be provided by the RTD.

e. Special programs would be developed to familiarize fire fighting personnel with the ETB system and the special equipment needed for emergencies. RTD is prepared to arrange for on-site visits by LAFD personnel to cities now served by ETB systems in order to promote the transfer of information which would facilitate the LAFD's familiarization with the successful fire fighting practices developed in other cities. The Vancouver Fire Department also has training videos of fire fighting in the vicinity of ETB overhead wires that could be made available to local fire departments.

f. RTD would advise fire departments on the location of ETB electrical equipment and the procedures for de-energizing the buses and safely evacuating passengers.

g. ETBs will be equipped with auxiliary power units to allow for some limited levels of "off wire" movement.

3.9.3.2 Electromagnetic Fields and Electromagnetic Interference

No significant EMF or EMI impacts have been identified. However, should it prove desirable, measures limiting EMI from the ETB system at specific, sensitive locations are possible, as follows:

Cables will enter TPSSs through underground ducts and will thereby be shielded. Remaining substation sources of EMI are transformers, rectifiers and circuit breakers. For indoor and outdoor TPSSs, equipment causing the most EMI will be located in metal enclosures which shield surrounding areas. The external structure of a pre-fabricated metal type substation offers an additional measure of shielding. Locating substations away from potentially sensitive locations would also mitigate the possible effects of EMI.

Utility company requirements would be followed to limit the conduction of harmonics to power distribution lines. The system would also comply with applicable IEEE standards. Mitigation measures may include, as required, 12 pulse rectification and special filtering.

3.9.3.3 Hazards Associated With Dewirements and Failure of the Electrification System

a. The ETBs will be equipped with auxiliary power units (APUs) to enable them to operate "off-wire" if necessary. The buses will be able to operate independently for short distances when the electric power is shut down, thus permitting them to move out of the way to avoid traffic jams and the possible hindrance of fire fighting operations.

b. The ETB drivers will be trained in avoiding dewirements and responding properly should they occur.

c. The ETB substations will be equipped with special protective devices to prevent the unlikely occurrence of circuit breakers not interrupting properly, in case of breakage of the OCS, thus preventing a possible fire hazard. The feederless substation is designed to continue to operate with failure of any individual substation or with the failure of one-half of a feeder substation.

3.9.3.4 Hazards Associated With Maintenance Activities Near Overhead Wires

a. As part of the start-up of the project, RTD will provide safety training programs for RTD maintenance personnel. The RTD will also acquire specialized maintenance equipment (if necessary to supplement currently available equipment).

b. The ETB system will be designed to comply with all applicable codes and ordinances regarding clearance distances between utilities.

3.9.3.5 Hazards Associated With Auxiliary Power Unit and TPSS Batteries

Securing wet-cell batteries in an upright position during storage will minimize the risk of leaks. Storing batteries on pallets in a bermed area will provide for easy detection of leaks and contain any leaks that may occur. Batteries should be protected from rain and other water. Non-insulated metal tools should not be used on or near batteries.

During transportation, wet-cell batteries should be secured in an upright position to prevent spillage. Batteries must be properly labeled with DOT designation (e.g., "Corrosive") and documentation during transport.

The metals in both lead-acid and nickel-cadmium batteries are recyclable. Smelters can reclaim and reuse the metals. Recycling of batteries will decrease the potential for toxic metals to enter the environment. The RTD, Montebello Municipal Bus Lines and Long Beach Transit are each responsible for the proper handling of the batteries by the smelter. Therefore, to minimize the bus operators' liability, the smelter facility should be inspected periodically to ensure that the facility is handling the materials in accordance with regulations.

3.10 ENERGY

3.10.1 SETTING

Currently, most buses in Los Angeles County run on diesel fuel. Table 3.10-1 shows estimated cumulative diesel consumption in recent years and projections of those figures to the years 2010 and 2020 for the Southern California Association of Governments (SCAG) and the South Coast Air Basin (SCAB) areas. Projections were estimated on the basis of 1 percent annual growth.

TABLE 3.10-1: ESTIMATED DIESEL CONSUMPTION* (GALLONS)

AREA	1980	2010	2020
SCAG REGION	530 million	690 million	740 million
SOUTH COAST AIR BASIN	470 million	610 million	660 million
Notes: * Includes all diesel vehicles.			

Source: Southern California Association of Governments, 1984.

Since the bus is a major form of public transportation, its average fuel economy is a critical determinant of transportation energy consumption in the region. The table indicates projected increases in diesel fuel consumption from the year 1980 to 2010 to 2020. In the future, use of high performance diesel engines is expected to help reduce fossil fuel consumption. Conversion of diesel buses to electric trolley buses (ETBs) would be a significant additional step in this direction.

Electricity for the ETB project would be supplied by the Los Angeles Department of Water and Power (LADWP), Southern California Edison (SCE), City of Pasadena Water and Power Department (City of Pasadena), City of Glendale Public Service Department (City of Glendale) and City of Burbank Public Service Department (City of Burbank). For LADWP, electric power comes from the hydroelectric facilities and thermal generating plants that are expected to be the main source of electric power in the future. Principal power system facilities are located throughout much of the western states. A substantial portion of LADWP electricity is supplied by steam generating plants in the South Coast Basin. SCE is an investor-owned, regulated utility providing electric service to a 50,000 square mile area of central and southern California. The company supplies electricity from nine energy sources. In 1987, 47 generating plants which burned oil or natural gas met about 37 percent of the demand. Nuclear plants generated about 20 percent of the supply, 14 percent came from coal powered plants, 5 percent from hydro-electric sources and 24 percent of electricity was purchased from other utilities or power producers.

3.10.2 IMPACTS

Energy consumption by ETBs would be in the form of electricity. This would result in an approximate reduction in consumption of 16,000 gallons of diesel fuel per day. Electric consumption by a typical 40-foot ETB and a 60-foot articulated ETB is estimated to be 3.0 kilowatt-hours per mile (Kwh/mile) and 4.5 Kwh/mile, respectively.[1] For this section, all ETBs are considered to be articulated ETBs to project maximum possible energy consumption. The total system demand for the peak period has been estimated at 52 mega-watts (Mw). If 40-foot buses are used, the requirements could be reduced to about 35 Mw. Table 3.10-2 shows the direct consumption relationship in British Thermal Units (BTUs). In the year 2010, total energy consumption by ETBs is estimated to be 2.13 billion BTUs compared to diesel bus consumption of 2.17 billion BTUs.

TABLE 3.10-2: ESTIMATED ENERGY CONSUMPTION PER DAY

	EXISTING (Year 1992)	FUTURE W/O PROJECT (Year 2010)	FUTURE WITH PROJECT (Year 2010)
Bus Miles	49,942	49,942	49,942
Consumption Rate	3.15[1]	3.15[1]	4.5[2]
Diesel Fuel Consumed by Buses (gallons)	15,855	15,855	
Electricity Consumed by Buses (Kwh)			249,710
Fossil Fuel (oil, gas and coal) Consumption in BTUs	2.17 billion	2.17 billion	2.13 billion[3]

Notes:
[1] Miles/gallon
[2] Kwh/mile
[3] Power plant fossil fuel consumption in BTUs is based on the following assumptions:
a. A line loss of 10 percent, which would require production of 249,710 Kwh of electricity at power plants.
b. Power plant efficiencies of 40 percent.

Source: Southern California Rapid Transit District and Myra L. Frank Associates, Inc., 1992.

The five utilities are expected to provide electricity in the following proportions:

Utility	Estimated Percent of System Demand Generated
LADWP	53%
SCE	39%
City of Pasadena	3%
City of Glendale	4%
City of Burbank	1%
Total	100%

[1] Source: Final Report, Part A, Electric Trolley Bus Study for RTD and the LACTC, Booz-Allen & Hamilton, Inc., 1991.

The RTD and LACTC have discussed electrical requirements with the five utilities and all have indicated that they have sufficient power to supply the system. Whether the 40-foot or 60-foot ETBs are used, no additional generating capacity would be necessary. The Los Angeles Environmental Affairs Department supports this conclusion and estimates that the peak demand of the ETB system would not exceed 0.2 percent of the current electric generating capacity of the five electrical utilities that serve the project area. Therefore, no significant adverse impacts are anticipated.

3.10.3 MITIGATION

Because no significant impacts are anticipated, no mitigation measures are proposed. Regenerative braking is proposed to be part of the ETB specifications and should provide additional energy savings.

3.11 PUBLIC SERVICES

Public services in the vicinity of the Electric Trolley Bus (ETB) project include fire protection, law enforcement, libraries, medical service, parks, road maintenance, schools and miscellaneous services. These services are vital to maintaining the health and welfare of the public in the project area.

3.11.1 SETTING

The ETB project's bus routes are spread throughout Los Angeles County. As befits this highly urbanized area, the types of public services mentioned above are likewise spread out along and near the project routes.

Some land would be acquired along the bus routes to accommodate traction power substations (TPSSs), expanded bus maintenance divisions and the new satellite division yard. Of the 138 TPSSs required, ten occur on or adjacent to public facilities. The expansions of Divisions 1, 2 and 10 and the satellite division would not occupy land presently used by public service facilities.

3.11.2 IMPACTS

No significant impacts on public services are expected from the operation of the ETB project. The project would not create a need for new or altered services. The project in large part only changes the buses' power source.

The ten acquisitions of land parcels for TPSSs would also not produce significant impacts for the public service facilities. Table 3.11-1 lists the ten sites by the type of facility, current site use, and the impact of the TPSS on the service. Seven of the 10 sites are on parking lots. There would be a slight decrease in the amount of available parking spaces at the seven sites. Between four and six spaces could be lost at each site. Other minor impacts from the land acquisitions include slightly reduced recreational land space and slightly increased noise levels.

ETB construction activities may produce temporary public service impacts. Construction activity, such as installing poles or stringing the overhead contact system (OCS), may require street detours or lane closures that diminish access to public services and facilities. For example, emergency vehicles may be delayed in responding to incidents.

3.11.3 MITIGATION

No significant impacts from the operation of the project or the acquisition of land for the TPSSs are anticipated. Hence, no mitigation is required.

Any construction impacts would be temporary. Nevertheless potential impacts will be mitigated in two ways. First, any street undergoing construction work will maintain at least one lane open for emergency vehicle access. Second, where full street closure is necessary (e.g., trenching across intersections), activity will be scheduled during off-peak hours, preferably at night. Such scheduling will mitigate potential impacts since traffic at night would be considerably less and the frequency of emergency response would be lower.

TABLE 3.11-1: SUBSTATION SITES ON PUBLIC SERVICE FACILITIES[1]

SS #	ROUTE	PRELIMINARY SITE LOCATION	TYPE OF PUBLIC SERVICE FACILITY	SITE USE	IMPACT OF SUBSTATION ON SERVICE
001	RTD Route 16	San Vicente + 3rd St, NW corner	Hospital	Parking lot	Not significant. The facility would have slightly less parking space (approximately 6 less spaces).[2]
002	RTD Route 16	3rd St + Ogden, N side of 3rd at Ogden, next to Pan Pacific Park	Park	Vacant land in park	Not significant. The facility would have slightly less park land available.
003	RTD Route 30/31	Las Palmas + 2nd St, SW corner, Whittier College parking lot	College	Parking lot	Not significant. The facility would have slightly less parking space (approximately 6 less spaces).[2]
031	RTD Route 30/31	Brooklyn + Bleakwood, NE corner, East L.A. Jr. College	Junior college	Parking lot	Not significant. The facility would have slightly less parking space (approximately 4 less spaces).[2]
075	RTD Route 70	Garvey + Charlotte, NE corner, Zapopan Park	Park	Park on utility property	Not significant. The facility would have slightly less park land available.
080	RTD Route 204	Vermont + Monroe, SE corner	Junior college	Parking lot	Not significant. The facility would have slightly less parking space (approximately 6 less spaces).[2]
083	RTD Route 204	Vermont between Exposition + Jefferson, E side of Vermont at 36th Place	University	Parking lot	Not significant. The facility would have slightly less parking space (approximately 6 less spaces).[2]
091	RTD Route 560	Van Nuys between Lehigh + Norris, NW side of Van Nuys, next to fire station	Fire protection (on adjacent land)	Vacant lot	Not significant. The adjacent fire station may experience slightly higher noise levels due to the substation.
111	Study Route 182 (also known as Tri-Cities)	Hill + Del Mar, NE corner	Junior college	Parking lot	Not significant. The facility would have slightly less parking space (approximately 4 less spaces).[2]
119	LB Route 40 LB Route 90	Park + 10th St, E side of park at 10th, entrance to Blair Field	Park	Parking lot	Not significant. The facility would have slightly less parking space (approximately 4 less spaces).[2]

Notes: (1) All sites are subject to change during final design.
(2) It was assumed that a typical parking space is nine feet wide by 20 feet long.

Source: Myra L. Frank & Associates, Inc., 1992.

3.12 SOILS AND GEOLOGY

3.12.1 SETTING

The proposed electric trolley bus (ETB) routes extend throughout the Los Angeles area from the San Fernando Valley to Long Beach and from the Westside to the San Gabriel Valley. The project would involve only minor localized construction activity (such as trenching for underground cables and excavation for pole and substation foundations), with the exception of Divisions 1 and 2 maintenance yard expansions and the construction of a new satellite division yard. Expansion of the Division 10 yard would only involve development of a bus parking lot. The following descriptions therefore address the project area in general and the maintenance yard sites in more detail.

3.12.1.1 Regional

The Los Angeles area encompasses the Los Angeles Basin, the San Fernando Valley and the San Gabriel Valley; and the mountain ranges separating them, including the Santa Monica Mountains and the San Gabriel Mountains. Other major geologic features are the Palos Verdes Peninsula, the Baldwin Hills and the Santa Monica Bight. The Los Angeles Basin and adjacent valleys are filled with sediments, including marine sediments resting on basement plutonic, igneous and metamorphic rocks. The overlying sediments and alluvium range in age from the Miocene period to Recent.

Seismic activity in the Los Angeles area is well known, but can also be seen in the uplifting and compression of various geologic formations to form the local mountains. Several major active (Holocene) faults are present within 50 miles of downtown Los Angeles. These include the Newport Inglewood Fault Zone, Palos Verdes Fault, Santa Monica/Raymond Fault, Whittier Fault and the San Andreas Fault. There exist, in addition, several smaller faults, and information on the geology of the area is constantly updated. Alquist-Priolo Special Study Zones have been defined for active faults by the State Geologist.

Liquefaction during seismic events can occur in areas of unconsolidated sediments and high groundwater levels. Known areas with high potential for liquefaction include the northern San Fernando Valley (Sylmar), Marina del Rey and the Los Angeles/Long Beach Harbors.

The urban area traversed by the proposed ETB routes is highly developed, with few areas of open soil or exposed geologic features.

3.12.1.2 Division 1 Expansion Site

This expansion site is not in an Alquist Priolo zone or a known liquefaction area. The underlying geology consists of Holocene stream channel and alluvial fan deposits of fine-to-medium coarse grained size. The site is entirely paved with asphalt and has been for many years.

An Initial Site Assessment (ISA) revealed that the proposed expansion site has been used as a private truck fueling station and a wash and refrigeration unit repair facility for at least 40 years. Fuel pumps; above and below ground storage tanks for diesel, kerosene and antifreeze; and automobile waste products were present on site. Used oil, batteries, and refuse were stored on site prior to recycling or disposal. The ISA states that there is substantial potential for soil contamination of this site; servicing pits are covered in oil and grease and there was no evidence of traps or other protective measures to keep pollutants from the soil or the storm drain system.

3.12.1.3 Division 2 Expansion Site

This expansion site is not in an Alquist Priolo zone or a known liquefaction area. The underlying geology consists of Holocene stream channel and alluvial fan deposits of fine to medium coarse grained size. The site is also fully developed.

An ISA revealed that the proposed expansion site has been used for industrial purposes, primarily by a manufacturer of aircraft bearings. Past occupants of the site include a wood furniture manufacturer who was cited by the Fire Department for code violations related to improper storage and use of flammable and hazardous materials. The ISA states that although no evidence of significant soil contamination was found on the parcel, there is a potential for soil contamination from past practices in the northeast portion of the property. No known underground storage tanks are present.

3.12.1.4 Satellite Division Yard

This site is not in an Alquist-Priolo zone but is in a potentially liquefiable area. The underlying geology consists of Holocene stream channel and alluvial fan depositis of fine to medium-coarse grained size. The site is fully developed. An ISA revealed several debris piles, 65 barrels labelled "MW - #Water Doc." and six dumpsters full of soil. There is a minor potential for soil contamination, possibly from oil or grease seepage from hydraulic presses.

A closure plan submitted to the City of Burbank Fire Department states that all hazardous materials were removed from the site.

3.12.2 IMPACTS

3.12.2.1 Regional

No significant impacts are anticipated. Operation of the ETB system is not anticipated to have any effect on soils or geology of the region.

All transit users in Southern California are potentially exposed to groundshaking and seismic disruption. Certain of the proposed ETB routes (RTD Route 40 and Long Beach Routes 40 and 50) cross the Alquist Priolo Special Study Zone of the Newport-Inglewood Fault Zone, but the project would not substantially increase the risk to riders of these lines over the risk generally experienced in the area or the risk experienced by the current diesel routes.

Poles, their foundations, substations, and other structures would be constructed in accordance with seismic design standards. Construction in areas of high liquefaction potential or in Alquist-Priolo zones may require special attention during design and construction.

Construction impacts of the ETB system are also anticipated to be insignificant. No excavation, other than minor grading and leveling, is anticipated for the substation locations. Excavation of the pole foundations (8-12 feet), trenches for the feeder system and necessary relocation of utilities would be generally shallow and within already disturbed depths. Although approximately 17,000 to 20,000 poles would required for the project, these would be located in urban areas, already disturbed by past street and building construction. Dust production from construction is addressed in the Section 3.1, "Air Quality."

No cumulative impacts are anticipated because of the disturbed nature of the region.

3.12.2.2 Division 1 Expansion

Construction on the expansion site would first require remediation of soil contamination. Excavation and disposal of contaminated soils would be required in accordance with state and local laws to preclude any significant impact. No other adverse impacts to soils and geology are anticipated.

3.12.2.3 Division 2 Expansion

Prior to construction at the expansion site, the potential for soil contamination would be identified and remediated, as required. Operation of the maintenance yard expansion facility would not result in any soil contamination at the site and therefore no significant impacts to soils or geology are anticipated at this site.

3.12.2.4 Satellite Division Yard

Prior to construction at the site, the potential for soil contamination would be fully identified and remediated as necessary.

Design and construction of structures at the yard would consider the potential for liquefaction. No other adverse impacts are anticipated.

3.12.3 MITIGATION

No significant impacts are anticipated and no mitigation is proposed. Construction would follow regulated hazardous waste remediation requirements if necessary.

3.13 WATER

3.13.1 SETTING

The proposed electric trolley bus (ETB) routes extend throughout the Los Angeles area, from the San Fernando Valley to Long Beach and from the Westside to the San Gabriel Valley. The project would involve only minor localized construction activity (such as trenching for underground cables and excavation for pole and substation foundations) with the exception of the Divisions 1 and 2 maintenance yard expansions and the construction of a new satellite division yard. Expansion of the Division 10 yard would only involve development of a bus parking lot. The following descriptions therefore address the project area in general and the maintenance yard sites in more detail.

3.13.1.1 Groundwater

Due to the urban nature of Los Angeles, much of the area is paved and groundwater recharge is principally limited to defined recharge areas and spreading grounds. The area is underlain by several groundwater basins, including the San Fernando Basin in the San Fernando Valley, the Main San Gabriel and Puente Basins in the San Gabriel Valley and the Central and West Coast Basins in the Los Angeles Basin. Groundwater from the San Fernando Basin tends to flow south and east through the Los Angeles Narrows into the Central Basin, which drains to the Pacific Ocean. Similarly, the San Gabriel Basin drains through the Whittier Narrows, and ultimately to the Pacific Ocean. The depth to groundwater varies but is not particularly shallow (less than 10 feet) at the maintenance yard locations.

Potable water in the Los Angeles Basin is provided in part from production wells typically located at the upper reaches of the groundwater basins. This water is tested and treated as necessary before distribution to residential, commercial and industrial users. Localized groundwater contamination has been found throughout the region. A National Priority List site is present in Glendale, for example, where trichloroethylene and tetrachloroethylene have been found in the groundwater.

The proposed expansion sites for the Division 1 and 2 yards and the site for the satellite division yard were the subjects of Initial Site Assessment (ISAs). The ISAs concluded that localized groundwater contamination (associated with soil contamination) was likely at the Division 1 site due to the grease, oil and other waste products present on the site. Contaminated soils, and therefore the potential for groundwater contamination, may also be present at the Division 2 site. The satellite division yard is located in an area of relatively shallow groundwater (30 to 50 feet). A preliminary determination is that the groundwater is probably contaminated, as is that of the region. Contamination may be attributable to the Zero Corporation, a former tenant of this site.

3.13.1.2 Surface Water

The Los Angeles area is highly urbanized, with few natural rivers or streambeds. Runoff from paved areas is directed to storm drains and surface drainages are channelized and controlled. The 100 year floodplains are generally contained within these channels. The area drains to the Pacific Ocean via the Los Angeles, San Gabriel and Rio Hondo rivers, as well as Ballona Creek. The Los Angeles and Whittier Narrows connect the Los Angeles Basin to the San Fernando

Valley and San Gabriel Valley, respectively. The climate of Los Angeles is arid, with rain generally occurring from November to April.

3.13.2 IMPACTS

3.13.2.1 Groundwater

There would be no significant impacts from the project on groundwater resources.

Some of the proposed ETB routes may cross areas of contaminated groundwater or recharge areas but all would do so on existing bridges and streets with new construction occurring at very shallow depths. None of the construction in anticipated to intercept existing aquifers and operation of the ETB system would not affect groundwater quality or flow. Drainage would continue to flow to existing storm sewers.

Construction on the Division 1 expansion site would require site remediation and cleanup prior to yard expansion to preclude significant impacts to ground and surface waters should contaminated soils or groundwater be encountered. Similarly, the Division 2 expansion site may require remediation for soil contamination (and potentially groundwater contamination) in the northeastern portion of the site. Resolution of the groundwater issues at the Satellite Division Yard would be required prior to construction. Remediation may be required and the existing monitoring wells would have to remain accessible.

Operation of the maintenance yards would not affect groundwater quality because the yards would be completely paved, with drainage directed to oil/water separators and the sanitary or storm sewer as appropriate.

3.13.2.2 Surface Water

There would be no significant impacts from the project on surface water resources.

Some of the proposed ETB routes cross the Los Angeles River (RTD Routes 70, 30/31, 18, 66/67 and 45; and Long Beach Routes 50 and 60), the Rio Hondo (RTD Route 70 and Montebello Route 10), Arroyo Seco (Tri City Route) and Tujunga Wash (Tri City Route), but all would do so on existing bridges and streets. No new construction in the waterways would occur. Construction debris would be hauled from the site and not disposed of in the rivers. None of the substation construction would substantially increase the surface water runoff from the sites and operation of the ETB system would not interfere with street or property drainage.

Expansion of the maintenance yards and construction of the new satellite division site would follow testing and remediation of potentially contaminated areas. Effects on surface water from construction would thereby be precluded or prevented through normal construction techniques such as drainage control.

No impacts from yard operations are anticipated. The bus washing and maintenance facilities would incorporate oil/water separators and other devices to direct drainage to the appropriate sewer or storm drains. No cumulative impacts are anticipated.

3.13.3 MITIGATION

No significant impacts are anticipated and no mitigation is proposed. Site remediation would occur prior to development of the maintenance yard expansions. Design of the yards would include oil/water separators and other pretreatment devices as needed.

3.14 LIGHT AND GLARE

3.14.1 SETTING

3.14.1.1 Routes

Current sources of light and glare along existing bus routes include street lights, bus stop lighting and light from residential and commercial uses along the street.

3.14.1.2 Substations

Along the proposed routes, 135 electric traction power substations (TPSSs) would be developed on vacant lots, parking lots and public rights-of-way, of which 63 would be located adjacent to or across the street from residences. The majority of these existing sites currently do not contain sources of light and glare. Three TPSSs would be developed at division yard sites, which currently do contain light sources.

3.14.1.3 Division Maintenance Yards

The proposed Division 1 expansion site is located just south of the Division 1 yard at the east end of the block bounded by Industrial Street, Alameda Street, East 7th Street and Central Avenue. The site is surrounded mostly by industrial, commercial, parking and retail uses. However, an active hotel borders the western corner of the site. Existing light sources at the expansion site are those associated with the truck fueling and wash station and the refrigeration repair facility that currently occupy the site.

The proposed Division 2 expansion site is located at the west end of the block bounded by 14th Place, 15th Street, Griffith Avenue and San Pedro Avenue, just north of the existing Division 2 yard. The site is surrounded by light industrial facilities, office buildings and parking lots. Lighting at the site's industrial uses and parking lots contribute to light and glare at and near the site.

The Division 10 expansion site is a currently undeveloped site surrounded by the existing maintenance yard, other industrial uses and freeways. There are presently no light sources at the expansion site.

The proposed satellite division site is located in Burbank, along Front Street near the Golden State Freeway and southeast of Burbank Boulevard. The site is currently occupies by vacant light industrial and office buildings and is surrounded by light industrial uses.

3.14.2 IMPACTS

3.14.2.1 Construction

Most construction activities for installation of the substations, poles, overhead wires and cables would occur during the daytime for all residential areas. Light and glare impacts, therefore, would be avoided. In some limited cases, where full street closure is required, construction may occur at night.

3.14.2.2 Operation

a. Routes

The electric trolley bus (ETB) project would involve some relocation of existing lighting sources along the routes to accommodate ETB pole spacing and joint use of poles. Geometric requirements for ETB poles may differ from those currently used for street lighting by districts and bureaus in the municipalities through which the ETB routes pass. Moreover, additional illumination may be appropriate to better illuminate bus stops and layover zones.

b. Substations

Each substation would include security lighting. Substation lighting in residential areas would be placed and focused to avoid light and glare at adjacent residences.

c. Division Yard Expansions

The Division 1 maintenance yard would be expanded to include the truck washing facility and gas station located in the eastern half of the block between Industrial Street and Seventh Street, and between Central Avenue and Alameda Street. Glare and light from the division expansion could be intrusive for residents of a hotel located midblock on Seventh Street, adjacent to the expanded site. With proper mitigation, the potential light and glare impacts of the Division 1 expansion are judged not to be significant.

Expansion of the Division 2 maintenance yard would involve the addition of the block just north of the existing site. Industrial uses, parking and offices surround the addition, so no light or glare impacts are anticipated.

Expansion of the Division 10 maintenance yard would develop a parcel of land surrounded by freeways and the existing division yard. There would be significant impacts on the uses from any additional light sources at the expansion site.

Because the satellite division site is surrounded by industrial uses, there would be no significant impacts from new light sources at the division yard.

3.14.3 MITIGATION

3.14.3.1 Construction

Construction would occur during the daytime in all residential areas; therefore, light and glare impacts would not be experienced. No mitigation would be required.

3.14.3.2 Operation

Use of joint poles or additional poles for ETB wiring and the associated effects on street lighting will be evaluated during final design in conjunction with the street lighting districts and bureaus in the municipalities through which the ETB routes pass. The need for additional lighting, e.g., at bus stops and layover areas, will also be reviewed during final design.

Lighting at the Division 1 expansion site will be shielded and directed onto the site premises to prevent the unnecessary intrusion of light to the hotel on Seventh Street.

No light-sensitive receptors have been identified near the Divisions 1, 2 and 10 maintenance yard expansion sites or the satellite division site; hence, no mitigation measures for light and glare impacts are proposed.

3.15 POPULATION/HOUSING/GROWTH INDUCEMENT

3.15.1 SETTING

In 1990, over 8.8 million persons lived in Los Angeles County and over 3.2 million housing units existed, according to the U.S. Census of Population and Housing. By the year 2010, an estimated 10.2 million people will inhabit the county and the number of housing units will grow to 3.9 million, according to the Southern California Association of Governments (SCAG) 1989 Regional Growth Management Plan.

From 1990 Census data, it was estimated that approximately 150,000 people live within 100 feet of the proposed electric trolley bus (ETB) routes, and approximately 500,000 people live within one block (150 to 600 feet) of the routes.

3.15.2 IMPACTS

3.15.2.1 Construction

Construction would produce temporary disruptions to existing residential areas located near the proposed substations and along the designated bus routes. (See Section 3.6 for a designation of general land uses along the proposed routes.) Minor construction impacts consist of increased levels of noise, dust and traffic disruption. Sixty-three substations would be placed adjacent to or across from residences. At the substation sites, grounding systems, underground conduits, foundations, landscaping and protective features would be installed. Along the streets of the designated bus routes, construction would entail the installation of poles, overhead wires and underground cables. In both substation and route construction, temporarily closures of some intersections and traffic or parking lanes would be necessary. (For further discussion, see Sections 3.2: Noise and Vibration, 3.7: Transportation/Circulation and 3.16: Construction Impacts.)

3.15.2.2 Operation

The ETB project is not expected to alter the location, distribution or growth rate of the Los Angeles region population or the populations of the communities along the bus routes.

Operation of the project is not expected to affect housing or create a demand for additional housing in either the region or local communities. No residential acquisition would be required for placement of substations, although three vacant parcels currently zoned residential would be acquired. The three parcels, located near the southwest corner of Mercury Avenue and Reynolds Avenue along RTD Route 45, are situated between two residences; the substation would be approximately 20 feet from either residential property. The effect of substation noise upon residences is not considered significant.

3.15.3 MITIGATION MEASURES

The ETB project would result in minor construction impacts affecting population and housing in the areas of noise, dust, impaired access and traffic. These topics are discussed in other sections and the reader is referred to those sections for a discussion of appropriate mitigation measures.

3.16 CONSTRUCTION IMPACTS

3.16.1 CONSTRUCTION SCENARIO

The major elements of the electric trolley bus (ETB) system construction process would include:

- Site surveys;
- Excavation and installation of pole foundations;
- Installation of poles;
- Installation of pole bracket arms or cross-span wires, and various overhead contact wire support hardware;
- Installation of guy cables at overhead contact system (OCS) terminations and at turns, merges and intersections;
- Installation of overhead contact wires and associated auxiliary hardware;
- Excavation and construction of foundations, housing and fencing (if required) for traction power substations (TPSS);
- Excavation of trenches for underground electrical conduits connecting the TPSSs with the overhead contact wires;
- Relocation of overhead or underground utilities at sites where geometric conflicts are encountered with the overhead or underground elements of the ETB system;
- Installation, connection and testing of TPSSs;
- Landscaping;
- Grading, paving, fencing, electrification, access road modifications and various interior modifications at existing maintenance facilities;
- Demolition of exiting structures at the Divisions 1 and 2 expansion sites and at the proposed satellite division site; and construction of some bus maintenance facilities at the Divisions 1, 2 and 10 expansion sites and at the proposed satellite division site.

Each of the stages of construction described above would require a different extent of site occupation and deployment of construction forces. The site survey activity would require only localized site occupation, much of the work would be performed ahead of time and only a brief field operation would be required. However, the other items all require extensive site occupation and their durations would be affected by a number of factors:

- Lane, street or intersection closure availabilities and durations allowed by the local jurisdictions;

- The street length or number of blocks that may be occupied simultaneously;
- Traffic density during lane closure or partial intersection closure;
- Whether streets are divided or undivided;
- The block length where the work site is located;
- Street and lane widths where the work site is located;
- Other active construction in the vicinity of the work.

A further description of each construction element is given below.

3.16.1.1 Pole Foundations

Pole foundations would be 2 to 3 feet in diameter and about 8 to 12 feet deep. Most footings would be of the smaller size. Poles would be located on the sidewalk on each side of the street (for two-way ETB traffic) or only one side on one-way streets. Poles would be spaced at a minimum of 75 feet apart and between 100 to 130 feet on average. Installation of pole foundations would require heavy equipment such as a ground auger or back hoe for excavation, dump trucks for soil removal, flatbed trucks for reinforcement and foundation bolt assemblies, a 10- or 15-ton crane, at least two 500 cubic feet per minute (CFM) compressors per site for pavement breaking and concrete placement vibrator operations (vibrator operations adjust the amount of air in the concrete) and concrete mix delivery trucks for foundation concrete. The average time for constructing a pole foundation is about 1-1/2 hours, or typically 240 hours per route mile.

3.16.1.2 Pole Installation

Poles are the primary support structures for the OCS. The pole type proposed for this project is a tapered steel pole that is bolted onto a concrete foundation. These poles would be about 8 to 10 inches in diameter and at least 20 feet tall. Pole installation would require a 10-to 15-ton crane with a 45-foot jib, a flatbed truck with a 40-foot trailer and a bucket truck with a 45-foot reach. The average rate for installing poles is approximately 45 minutes per pole, or typically 112 hours per route mile.

3.16.1.3 Guy Wire Installation

Guy wire installation would require minimal heavy equipment on site: a bucket truck or a ladder in some cases, and a pick-up truck for material delivery. A single guy installation could be performed in an hour in even the most complex cases.

3.16.1.4 Bracket Arms and Cross-Span Support Wires

Although cross-spans and bracket arms would be installed by somewhat different methods, in both cases, similar heavy equipment would be used: two buckets or platform trucks and a pick-up truck for material delivery. Installation of a cross-span or a bracket arm takes about 45 minutes. For the joint use of poles, traffic signals and street lights could also need to be installed.

3.16.1.5 Installation of Overhead Wire Supports on Structures

At locations where support assemblies would be connected to existing overpasses or other structures, heavier equipment, more extensive lane closures and a longer construction period may be required. Equipment would include:

- Platform or bucket truck,
- 500 CFM compressor for concrete drilling,
- Two 5-kilowatt generators for welding and lighting.

Site occupation generally lasts 8 to 12 hours per bridge installation and 1 hour for a building.

3.16.1.6 OCS Installations at Turns, Intersections, and Merges

At locations where ETB routes make turns, merge or cross, additional hardware would be required to change the geometrics of the OCS alignment, to provide for switching on and off and to bring together and insulate the intersecting overhead wires. Hardware components including switches, frogs, crossing blocks, insulators, etc., would have to be installed. Installations at ETB route intersections would involve a variety of platform and bucket trucks, depending on the layout of the intersection.

This operation may entail a total of 60 to 100 hours in site occupation time per installation. The site occupation time demand per installation is a function of the complexity of the intersections, turns or merges. A simple (non-complex) typical intersection may require a total of only 60 hours in site occupation (closing), while a more complex intersection, with turnouts and crossings, may require a total of 100 hours or more of site occupation. In addition to the intersection area itself, an adjacent street may be required to stable the array of support equipment and materials which are required at the work site during the installation process. The installation is usually staged in a series of shorter periods to enable the contractor to prepare special assemblies and materials which must be site customized.

3.16.1.7 Installation of Overhead Contact Wire and Associated Hardware

This work would require highly specialized heavy equipment:

- A drum carrier/tensioner truck, travelling at about 1 mph.
- A platform or bucket truck following at an approximate distance of 50 feet.
- A brake drum unit fixed at the beginning of the pull to provide emergency backup if the contact wire fails.

Periodically, some equipment has to work in the reverse direction to adjust temporary supports. At the speed of the drum carrier, it would take 4 to 5 minutes to string wire over a 400-foot section of route.

Installation of OCS wire includes related activities such as clip-ins, adjustment of the overhead contact wires onto the support hardware and installation of in-span assemblies, such as sectioning insulators. Site occupation for the OCS wire clipping-in and adjustment process is basically similar to the wire running, except that the drum carrier is replaced by an additional platform or bucket truck. The break drum unit is not required in this process.

In-span assemblies are installed using two platform or bucket trucks. The installation operation mainly occupies street intersections and their approaches. Each assembly installation takes about 2 to 6 hours, depending upon the complexity of the particular assembly installation.

3.16.1.8 Construction of Substation Housing Facilities

Each traction power substation (TPSS) would require field installation of an electrical grounding system (a grid of bare copper wire beneath the TPSS building), underground conduits for incoming AC service and outgoing DC feeder cables, and a foundation. The pre-fabricated TPSS assembly would be delivered to the project site ready to be bolted down to a foundation slab. An access road would be required in most cases for operation and maintenance of the TPSS. An enclosure would be erected around the TPSS equipment and unauthorized access to the facility would be precluded by fencing in the area or other means.

Excavation for the grounding system, underground cable conduits and foundation would require a backhoe. Site grading would require a bulldozer. Flatbed trucks would haul materials to the site for installation of foundation forms (which support the foundation slab) and underground conduits. These components would be installed by hand. A 9-yard concrete truck would deliver concrete for the slab and for conduits.

Installation of a TPSS would require a crane with a 50-ton capacity, a lifting height of 40 to 50 feet and a reach of 50 to 60 feet. The TPSS would be delivered to the site on a tractor rig with a 40-foot trailer. The crane and tractor trailer would vacate the site after the TPSS is placed on the slab. The TPSS would be bolted to the slab with hand tools.

Installation of electrical cable would require the use of a truck fitted for cable hauling and assisting in reel unwinding. Final connections to the TPSS equipment would be done by hand.

Installation and testing of a TPSS would take a total of 12 weeks. Two weeks would be required for underground work, five weeks for foundation slab placement and curing time, two days for installation of the TPSS building, one to two weeks for the installation and termination of the cables and two to three weeks for checking and testing the electrical equipment.

3.16.1.9 Excavation of Trenches and Installation of Underground Cables

The ETB project would require installation of underground electrical cables in concrete ducts to connect the TPSS with the OCS for either the feederless or feeder-type power distribution design. Ducts would be placed in trenches located in the curbside lane. For the feederless design, trenches 1.5-feet wide by about 4 feet deep would be required from the TPSS to the nearest set of poles on either side of the street. Trenches requiring shoring (greater than 5 feet deep) would be avoided. These trenches could be up to 5 street blocks in length, depending on the location of the TPSS relative to the ETB route. In general, the typical TPSS was placed within one block of the ETB route. Feederless TPSS installation would be spaced from 1.0 to 1.2 miles apart. Each TPSS would require one duct trench of a length as described.

Trenches running traverse to the street to connect the feederless power distribution system with the parallel OCS set of wires for reverse traffic flow (on two-way streets) would be smaller, about 1.5 feet wide and about 8 feet deep. Trenches requiring shoring (greater than 5 feet deep) would be avoided. The power would be conveyed to the OCS approximately every 800 feet. Manholes would be provided at these locations to permit connection of the main power duct to taps running through poles located nearby. The manholes would be small, about 2 feet square and 2 to 4 feet deep.

Equipment required for excavation would include saws for cutting concrete, jack hammers and a backhoe/skiploader to cut asphalt or concrete pavements. Certain locations with utility crossings would require hand excavation (e.g., shoveling) rather than backhoe excavation. Dump trucks would remove asphalt, concrete and any other spoils removed during trench excavation. In addition, compressors (500 CFM) would be used to prepare pilot lines through the concrete. Cable reel carriers and power pullers would pull cables through the conduits to connect with the power distribution system. A bucket truck would be used to thread cables through poles to overhead assemblies.

Trenching within each 550-foot or city block segment for feeder cables would occur over two days. During the first day, the trenches would be excavated and the concrete-encased conduits would be placed during an eight hour work day. The trenches would be barricaded and left open overnight and backfilled and prepared for street repair the next day. Placement of underground feeder cables in each track mile would take about three weeks.

Excavation and placement of feeder taps and voltage equalization cables across the streets would require about 24 hours of construction.

3.16.1.10 Testing and Interconnections of the Traction Power System

The electrical system would be tested and connected to the traction power system.

3.16.1.11 Utilities Relocation

Initial surveys would be made to locate utilities and the data would be used to design the ETB system's power cable duct and overhead system locations away from utilities. The most common occurrence would be relocation of traffic signals and/or lighting fixtures to different heights in order to achieve separation of conductive wires and cables. Relocation would be achieved by replacement of poles with redesigned configurations. The necessity for utility relocation would thus be drastically curtailed. When conflicts with underground utilities are encountered, they would be resolved by lowering or raising the ETB power cable ducts away from the utility conduits or pipes. Enlarged excavations may be required to complete the work. Temporary connections would be put in place for water, gas and power utilities, to provide uninterrupted service to residences and businesses.

3.16.1.12 Landscaping

Landscaping would require minimal excavation for planting of trees and/or shrubbery. Minimal restrictions to pedestrian movement would result from this activity. In some locations, major resurfacing of the pavement could be undertaken by local governments in conjunction with the ongoing ETB installation.

3.16.1.13 Modifications to Bus Maintenance Yards

Bus maintenance and storage yards would be used for vehicle maintenance and cleaning, fare collection and storage. Construction would be required for retrofitting existing facilities and for expansion of maintenance sites.

Facility retrofits may involve on-site development of new ETB washdown facilities; relocation of existing wash facilities (at Division 5 only), vault buildings (concrete buildings where fares are collected and held) and storage facilities; removal of a bus washer at the Long Beach Division only; installation of other fixed and mobile maintenance equipment; reconfiguration of parking areas; and modifications to the site's vehicular access. If required, relocation of the vault building would involve demolition of the existing structure and construction of a new building. In addition to these activities, a TPSS could be constructed at the division maintenance yard and the ETB OCS would extend into the sites. Construction of these facilities would be as described above. All facility retrofit activities would occur entirely on site.

Equipment required for maintenance yard retrofits includes a backhoe or clamshell for excavation for the washer foundation; a rotary or chain ditch cutter for drainage and conduit trenches; a dump truck for soil disposal; a flatbed truck for delivery of materials and equipment; concrete delivery trucks for the wash facility's foundation; portable mixers for concrete, mortar and plaster; and jackhammers and compressors (at least one CFM compressor per site) for demolition of the existing vault building, pavement breaking and concrete placement vibrator operations.

Ninety days would be required for development of bus washers, 120 days for demolition and construction of a new vault building, 30 days for relocating storage facilities and 30 days for relocating parking facilities.

Maintenance yard expansions at Divisions 1 and 2 would involve demolition of existing buildings, as would development of the proposed satellite division site. Construction of some bus maintenance facilities at the Divisions 1, 2 and 10 expansion sites and at the proposed satellite division site would also be required.

Expansion of the Division 1 site would require demolition of all existing buildings on the expansion parcel, including a truck stop service station and a 7,000 square-foot building. A number of one-and two-story buildings would be demolished on the Division 2 expansion site.

In addition to the facilities required for all maintenance yards (as described in the previous section):

- an inspection facility with two or three vehicle inspection bays equipped with either bus lifts or inspection pits would be installed at both Divisions 1 and 2. The facility would cover an area with approximate dimensions of 45 feet by 130 feet.

- a 14,500 square foot central OCS maintenance building with a 20,000 square-foot pole storage yard would be constructed at Division 2 only. Covered parking would be provided within a canopy structure for at least 13 bays of mobile maintenance equipment and vehicles. Each bay would be about 12 feet wide and 35 feet long.

The inspection and maintenance buildings would consist of concrete foundations and slab-on grade, with a steel frame structure and concrete or metal siding wall surfaces.

Demolition of existing structures would require the use of a crane and ball, crawlers and excavators, hydraulic breaking tools and dump trucks.

Major equipment used for construction of new facilities would include a backhoe or clamshell for foundation excavation, flatbed trucks for the delivery of materials and equipment and concrete delivery trucks and dump trucks for soil disposal.

All construction activities would occur within the expansion sites and therefore would not involve street lane closures.

At each expansion site, demolition would occur over a four-month period, followed by eight months of new facility construction.

3.16.2 AIR QUALITY IMPACTS DURING CONSTRUCTION

3.16.2.1 Setting

The phasing of construction for installing overhead connectors, wire lines and poles is unique in its nature from other transportation related projects. Unlike many other projects, ETB installation of feeder lines is not likely to cause major traffic movement problems such as street closing for a number of days or traffic diversions for longer periods of time. Overall, streets may have to be closed or traffic may have to be diverted for more than a couple of days in a row only infrequently.

3.16.2.2 Impacts

Heavy duty machinery is not expected to be in use at any one location for more than 3 to 4 hours during a day. Tables 3.16-1 and 3.16-2 identify the type, number and hours of operation of construction equipment used to install the system. Table 3.16-2 represents the construction

TABLE 3.16-1: CONSTRUCTION EQUIPMENT IN USE DURING MAJOR PHASES

Construction Equipment	Quantity	Hours of[1] Operation
POLE FOUNDATION		
Ground Auger	2	6
Dump Trucks	2	6
Flatbed Truck	1	4
Crane	1	4
Compressor	2	3
Concrete Trucks	2	8
Other Vehicle[2]	15	NA
INSTALLATION OF FEEDER CABLES AND UNDERGROUND CABLES		
Concrete Saws	2	6
Jack Hammer	2	6
Backhoe	1	4
Dump Trucks	2	4
Compressors	1	2
Asphalt Truck	1	3
Other Vehicle[2]	15	NA

Notes: [1] Maximum estimated hours of operation per day.
[2] Includes automobiles of construction workers and supervisors.
NA Not Applicable.

Source: Myra L. Frank Associates, 1992.

equipment and duration of use for the probable worst-case air emissions during each construction phase.

The installation of the ETB feeder and underground cable system would require multi-stage construction at different times at the same location. For the purpose of air quality analysis, two major phases of construction along the routes were identified as the most polluting phases among various installation procedures. These are: 1) Pole foundation construction and 2) Installation of feeder cables and underground cables. For these phases, construction activity-related emissions were calculated for a typical one-block stretch. At times construction activity would occur on more than one block in a day depending on the size of the block. A worst-case scenario has been considered and criteria pollutant emissions are compared with SCAQMD threshold criteria in Table 3.16-3. A busy day is considered to be the worst day for construction-related air pollution. SCAQMD's Draft CEQA Air Quality Analysis Handbook, 1992, estimates an average work trip length to be 9.5 miles in 1992 and 10.8 miles in 2010 for Los Angeles county. These trip lengths were considered to estimate vehicle miles travelled (VMT) to calculate exhaust and evaporative emissions from construction workers' travel trips. All equipment was assumed to be diesel powered and in operation for maximum possible hours during the day.

TABLE 3.16-2: CONSTRUCTION EQUIPMENT IN USE - MAINTENANCE FACILITY CONSTRUCTION

Construction Equipment	DIVISIONS 1 & 2[1]		DIVISION 10		SATELLITE DIVISION	
	Quantity	Hours of[2] Operation	Quantity	Hours of[2] Operation	Quantity	Hours of[2] Operation
Demolition						
Crane & Ball	1	6	-	-	1	6
Crawler/Excavator	1	4	-	-	1	4
Crawler Loader	1	5	-	-	2	5
Hydraulic Breaking Tool	1	5	-	-	1	5
Dump Trucks	2	4	-	-	3	4
Other Vehicle[3]	8	NA	-	-	10	NA
Grading						
Grader (rough)	1	8	2	8	2	8
Other Vehicle[3]	2	NA	4	NA	5	NA
Paving						
Asphalt Paver	-	-	1	8	-	-
Rollers	-	-	2	8	-	-
Trucks	-	-	2	4	-	-
Other Vehicle[3]	-	-	6	NA	-	-
Excavation						
Excavator	1	8	-	-	1	8
Crawler Loader	1	8	-	-	1	8
Dump Truck	2	4	-	-	2	4
Other Vehicle[3]	6	NA	-	-	6	NA
Construction						
Concrete Truck/Mixer	1	8	-	-	1	8
Front End Loader	1	4	-	-	1	4
Backhoe	1	4	-	-	-	-
Delivery Trucks	1	3	-	-	1	3
Hauling Truck	1	3	-	-	1	3
Other Vehicle[3]	12	NA	-	-	12	NA

Notes:
[1] Construction of Divisions 1 & 2 is expected to occur at the same time.
[2] Maximum estimated hours of operation per day.
[3] Includes automobiles of construction workers and supervisors.
NA Not Applicable.

Source: Myra L. Frank Associates, Inc., 1992.

Table 3.16-3 shows total pounds per day of emissions generated during each major phase of construction. During any of the installation procedures, CO emission is not expected to exceed SCAQMD threshold criteria. Emission of nitrogen oxides (NO_x) is likely to exceed the threshold during installation of feeder and underground cables and also during the demolition and excavation of existing facilities to construct an extension of the maintenance facility. On a very busy day, reactive organic gases (ROGs) are likely to be emitted in greater amounts than threshold limits during installation of cables and construction of the maintenance facility. Other criteria pollutants are not expected to affect air quality significantly.

Asbestos Emission

Expansion of Divisions 1 and 2 and construction of the proposed Satellite Division would involve the demolition of on-site structures. For Division 1, a truck stop service station and a light industrial building would be demolished. The Division 2 expansion area has a number of old office and industrial buildings. The largest building on site is 82 years old and other buildings are about 40 years old.[1] Buildings on the Satellite Division site include a small warehouse, a small manufacturing structure and a four-story office building.

Demolition of buildings, mainly for expansion of Division 2 and construction of the proposed Satellite Division, is likely to cause asbestos pollution. It is assumed that asbestos is mostly present in ceilings and to a negligible degree in other elements of existing buildings. Based on this assumption, asbestos emission was quantified using methodology suggested in SCAQMD's Draft CEQA Air Quality Handbook. The CEQA handbook refers to SCAQMD's Rule 1403 staff report and in its typical example (Table 9-10-A, CEQA Handbook, May 1992), calculates 0.00006 pounds of asbestos per cubic foot of structure demolished. Total estimated building area of Division 1 and Division 2 is 67,000 square feet, with a volume of 804,000 cubic feet. Buildings on the proposed Satellite Division site measure 29,750 square feet with a volume of 916,800 cubic feet. Using the CEQA rule of thumb, a total of 48 pounds and 55 pounds of asbestos is predicted to be removed from buildings during the demolition stage for the construction of Divisions 1 and 2 and the Satellite Division, respectively. There is no criteria set by SCAQMD to determine the asbestos level of significance. However, the district requires that the District Rule 1403 permit be obtained before any demolition activities.

---

[1] Source: Coldwell Banker Commercial Real Estate Services, Los Angeles, CA.

TABLE 3.16-3: CONSTRUCTION EMISSIONS

Pollutants (Pounds per Day)	ROG	CO	NO_x	PM10	SO_x	Asbestos (Tot. Lb.)
SCAQMD THRESHOLD CRITERIA	75	550	100	150	150	-
CONSTRUCTION PHASES						
Pole Foundation	61	76	82	43	26	-
Exceeds Criteria	No	No	No	No	No	-
Installation of Feeder & Underground Cables	81	136	126	48	31	-
Exceeds Criteria	Yes	No	Yes	No	No	-
Maintenance Facility Construction - Divisions 1 & 2, L.A.						
Demolition	71	90	141	53	32	48
Exceeds Criteria	No	No	Yes	No	No	-
Grading	17	17	29	32	7	-
Exceeds Criteria	No	No	No	No	No	-
Excavation	55	80	128	42	26	-
Exceeds Criteria	No	No	Yes	No	No	-
Construction	102	117	43	63	35	-
Exceeds Criteria	Yes	No	No	No	No	-
Maintenance Facility Construction - Division 10, East L.A.						
Grading	35	34	58	24	15	-
Exceeds Criteria	No	No	No	No	No	-
Paving	46	74	170	49	27	-
Exceeds Criteria	No	No	Yes	No	No	-
Maintenance Facility Construction - Satellite Division, Burbank						
Demolition	90	117	191	67	41	55
Exceeds Criteria	Yes	No	Yes	No	No	-
Grading	42	38	59	29	17	-
Exceeds Criteria	No	No	No	No	No	-
Excavation	55	80	128	42	26	-
Exceeds Criteria	No	No	Yes	No	No	-
Construction	100	112	36	62	34	-
Exceeds Criteria	Yes	No	No	No	No	-

Notes: Emission factors obtained from SCAQMD Draft CEQA Air Quality Analysis Handbook, 1992.

Source: Myra L. Frank Associates, Inc., 1992.

3.16.2.3 Mitigation Measures

Short-term impacts of the construction equipment will be minimized by the following measures. These measures will be established as conditions of project approval and contained in all applicable contracts between the project sponsor and contractors.

Trenches would be backfilled and/or covered with plates at the end of each working day.

A fugitive dust control program consistent with the provisions of SCAQMD Rule 403 for any grading or earthwork activities will be employed. These measure include:

- Watering all active project sites with multiple daily applications to assure proper dust control.
- Utilizing street sweeping equipment on all adjacent streets used by haul trucks or vehicles that have been on-site.
- Sweeping streets after construction activity is over.
- Covering stockpiles of soil, sand and similar materials.
- Requiring all trucks hauling dirt, sand, soil or other loose substances and building materials to be covered, or to maintain a minimum freeboard of two feet between the top of the load and the top of the truck bed sides.
- Prohibiting parking on untreated land.
- Properly covering asbestos-containing surfaces and removing asbestos-containing materials from the site instantly during the demolition phase. In addition, all measures and precautions suggested in the District Rule 1403 will be implemented before removing asbestos from buildings.
- Shutting off construction equipment to reduce idling when not in direct use.
- Using low sulfur fuel for construction equipment.
- Discontinuing construction activity during second stage alert. (Second stage alert is declared when ozone concentrations equal or exceed 0.35 ppm. Stage 2 episodes did not occur during 1990 or 1991. However, the District requires industry to take prompt actions to reduce emissions at those times.[2])

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[2] SCAQMD Final Draft CEQA Handbook, 1992.

3.16.3 NOISE IMPACTS DURING CONSTRUCTION

3.16.3.1 Setting

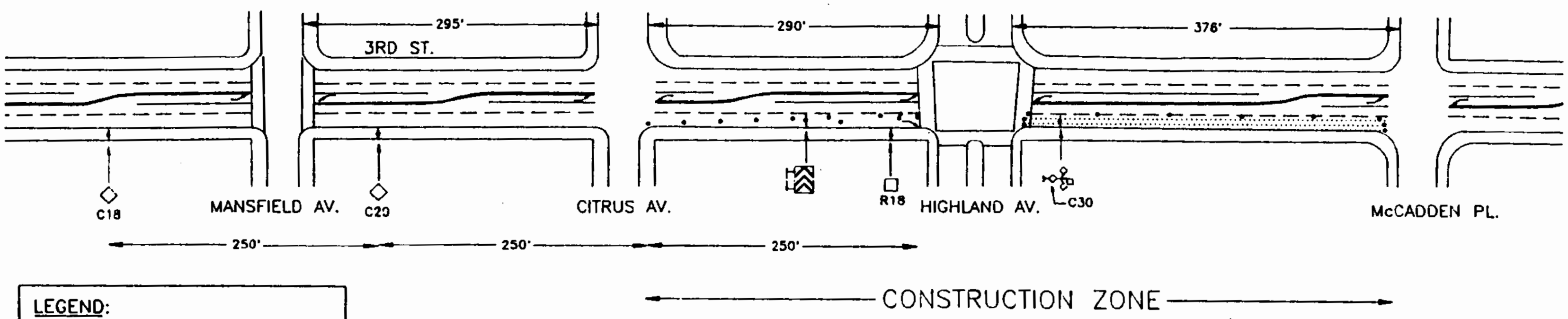
Construction noise varies greatly depending on the construction process, type and condition of equipment used and layout of the construction site. Many of these decisions are traditionally left to the contractor's discretion, which makes it difficult to estimate levels of construction noise accurately. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment, and the dominant source of noise from most construction equipment is the engine, which is usually diesel, often without sufficient muffling. For special construction processes such as impact pile driving and pavement breaking, noise generated by the actual process dominates.

3.16.3.2 Impacts

Table 3.16-4 summarizes typical construction equipment noise emission levels for some of the equipment that could be used in construction of the ETB system. Projection of construction noise requires developing a construction scenario of equipment to be used and the average utilization factors or duty cycles, i.e., the percentage of time during operating hours that the equipment operates under full power during each phase. Using typical sound emission characteristics, it is then possible to estimate L_{eq} or CNEL at various distances from the construction site.

Table 3.16-5 below illustrates the noise calculations for installation of pole foundations. The equipment utilization factors, which indicate the percentage of total construction time during which each type of equipment would actually be operating, assume that four pole foundations would be installed in one 8-hour shift. In addition, we have assumed that any one receptor would experience noise from installation of two pole foundations. Table 3.16-4 shows the typical equipment to be used for pole foundations, the full-power equipment noise emission levels at 50 feet, assumed duty cycles, and the resulting L_{eq} for the period required to install one foundation. The bottom line in the table gives the equivalent 8-hour L_{eq} assuming a receptor is equally affected by installation of two pole foundations and there are no other construction activities in the same day. Similar projections have been made for other construction processes likely to cause intrusive noise.

Construction of the ETB system would involve a number of activities that create sufficient noise to be disturbing in residential areas. Some of the activities most likely to cause annoyance are pavement breaking for pole foundations and use of heavy equipment such as cranes and augers. At any one site, most construction processes would be completed within one or two days and would be limited to daytime hours. This means that there should not be any long-term noise impact from construction activities, although there may still be significant short-term impact. Estimates of the noise exposure that would be created in residential communities for each of the major construction activities are summarized in Table 3.16-6. The noise estimates in Table 3.16-6 are based on the typical construction noise levels given above.



LEGEND:

C18	Road Construction Ahead
C20	Right Lane Closed Ahead
C30	Lane Closed
R18	Right Lane MUST Turn Right
o	Delineator

Source: Work Area Traffic Control Handbook, 7th edition, 1990

SCALE UNKNOWN

REV.	DATE	BY	SUB.	APP.	DESCRIPTION	REV.	DATE	BY	SUB.	APP.	DESCRIPTION

DESIGNED BY
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IN CHARGE
DATE

LACTC

ELECTRIC TROLLEYBUS PROJECT

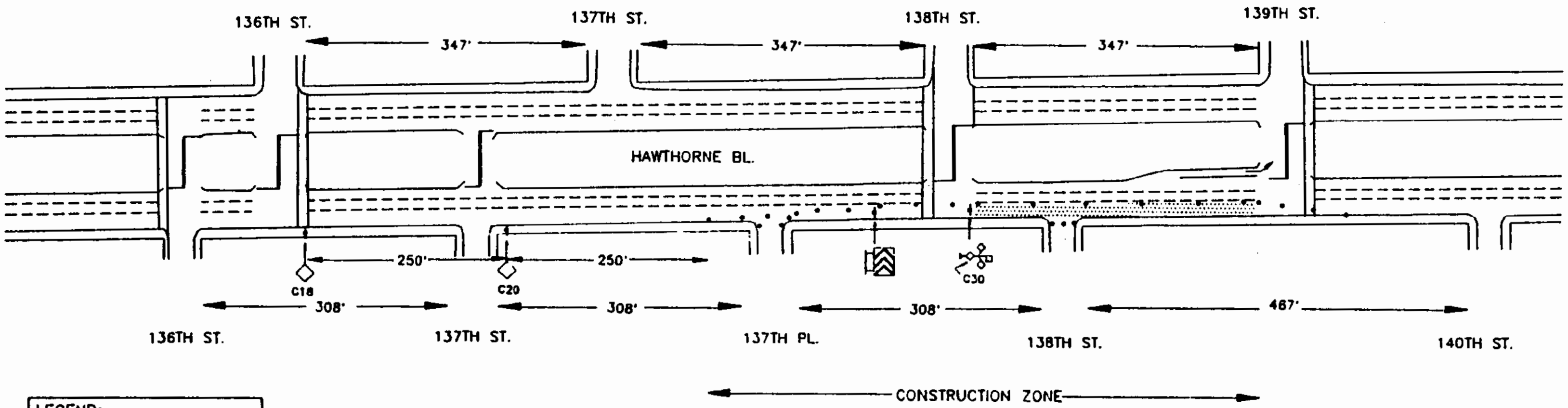
KAKU ASSOCIATES — SUBMITTED

ICF KAISER ENGINEERS — GENERAL CONSULTANT — APPROVED

RTD

Figure 3.16-1
CONCEPTUAL CONSTRUCTION ZONE ALONG THIRD STREET

DRAWING FILE
REFERENCE FILE
USER NAME
PLOT DATE
CONTRACT NO.
DRAWING NO.
REV.
SCALE
SHEET NO.



LEGEND:

C18	Road Construction Ahead
C20	Right Lane Closed Ahead
C30	Lane Closed
o	Delineator

Source: Work Area Control Handbook, 7th Edition, 1990.

SCALE UNKNOWN

REV.	DATE	BY	SUB.	APP.	DESCRIPTION	REV.	DATE	BY	SUB.	APP.	DESCRIPTION

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ICF KAISER ENGINEERS
GENERAL CONSULTANT
SUBMITTED
APPROVED

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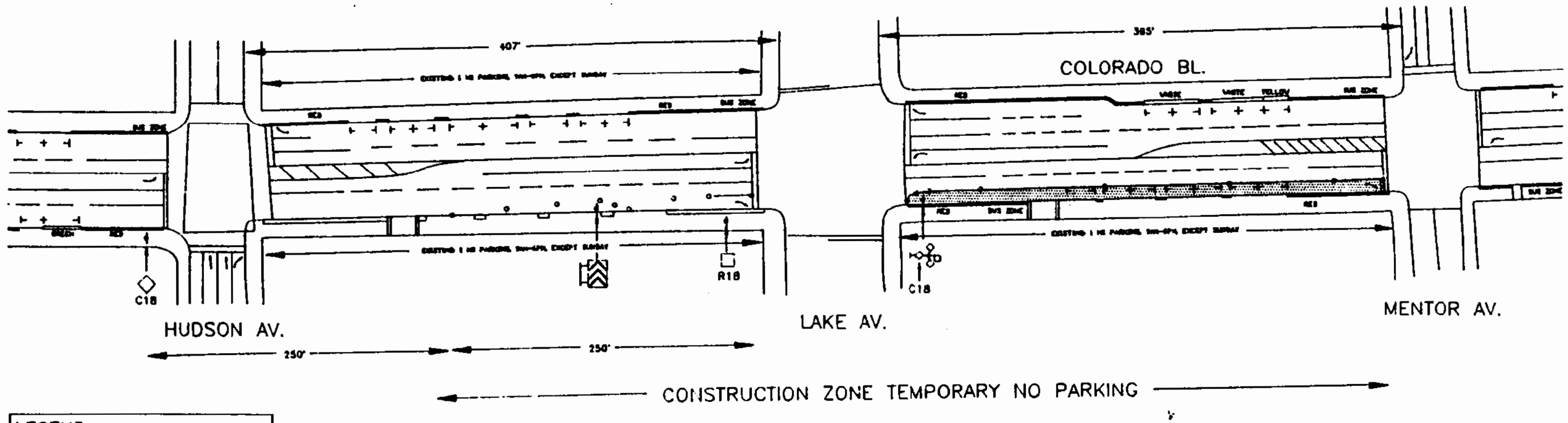
Figure 3.16-2
CONCEPTUAL CONSTRUCTION ZONE ALONG HAWTHORNE BOULEVARD

DRAWING FILE
CONTRACT NO.
REFERENCE FILE
DRAWING NO.
REV.
USER NAME
SCALE
PLOT DATE
SHEET NO.



LEGEND:

C18	Road Construction Ahead
R18	Right Lane MUST Turn Right
•	Delineator

Source: Work Area Traffic Control Handbook, 7th Edition, 1990.

SCALE UNKNOWN

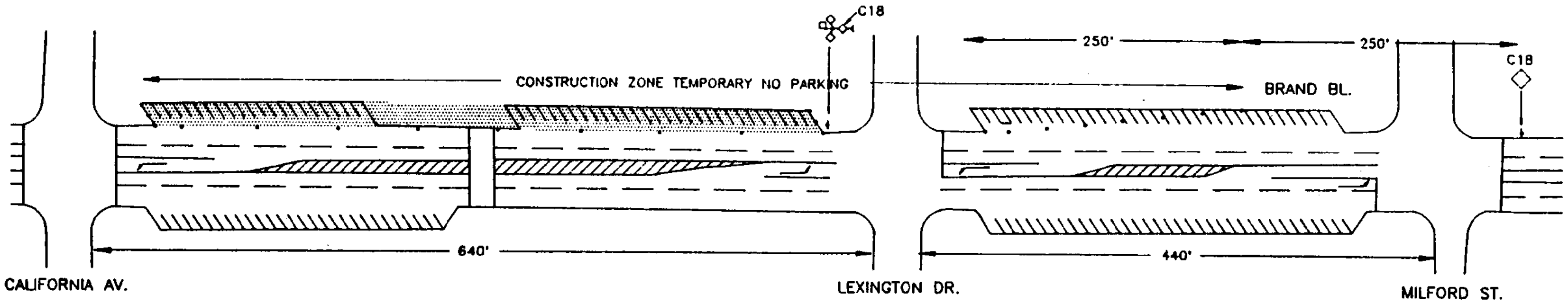
REV.	DATE	BY	SUB.	APP.	DESCRIPTION	REV.	DATE	BY	SUB.	APP.	DESCRIPTION	DESIGNED BY / DRAWN BY / CHECKED BY / IN CHARGE / DATE

LACTC — ELECTRIC TROLLEYBUS PROJECT — KAKU ASSOCIATES — ICF KAISER ENGINEERS GENERAL CONSULTANT — SUBMITTED — APPROVED — RTD

Figure 3.16-3

CONCEPTUAL CONSTRUCTION ZONE ALONG COLORADO BOULEVARD

DRAWING FILE	CONTRACT NO.
REFERENCE FILE	DRAWING NO. / REV.
USER NAME	SCALE
PLOT DATE	SHEET NO.



LEGEND:

C18	Road Construction Ahead
o	Delineator

Source: Work Area Traffic Control Handbook, 7th Edition, 1990.

SCALE UNKNOWN

REV.	DATE	BY	SUB.	APP.	DESCRIPTION	REV.	DATE	BY	SUB.	APP.	DESCRIPTION

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DRAWN BY
CHECKED BY
IN CHARGE
DATE

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ELECTRIC TROLLEYBUS PROJECT

KAKU ASSOCIATES

ICF KAISER ENGINEERS
GENERAL CONSULTANT

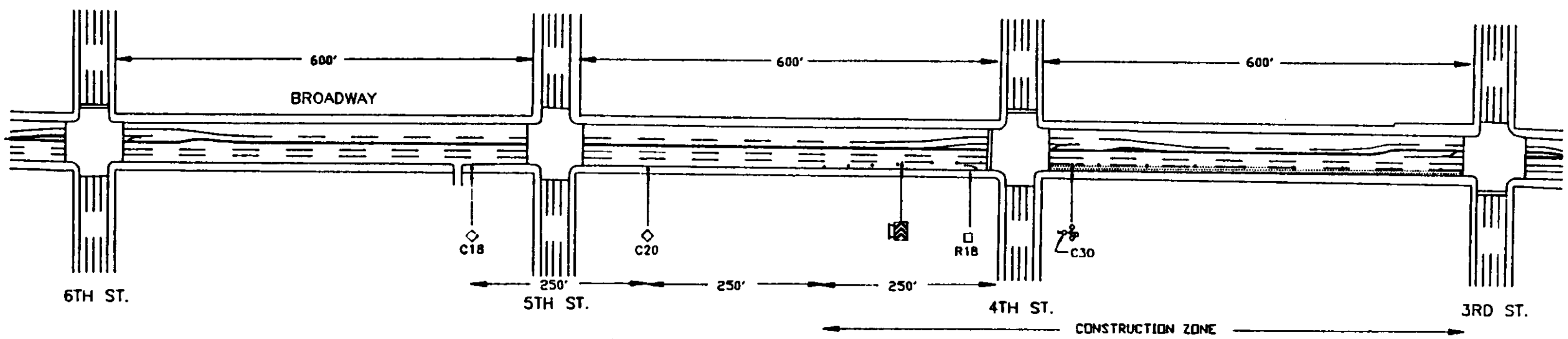
SUBMITTED

APPROVED

RTD

Figure 3.16-4
CONCEPTUAL CONSTRUCTION ZONE
ALONG BRAND BOULEVARD

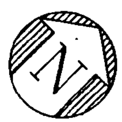
DRAWING FILE
REFERENCE FILE
USER NAME
PLOT DATE
CONTRACT NO.
DRAWING NO.
REV.
SCALE
SHEET NO.



LEGEND:

C18	Road Construction Ahead
C20	Right Lane Closed Ahead
C30	Lane Closed
R18	Right Lane MUST Turn Right
•	Delineator

Source: Work Area Traffic Control Handbook, 7th edition, 1990



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ICF KAISER ENGINEERS — GENERAL CONSULTANT — APPROVED

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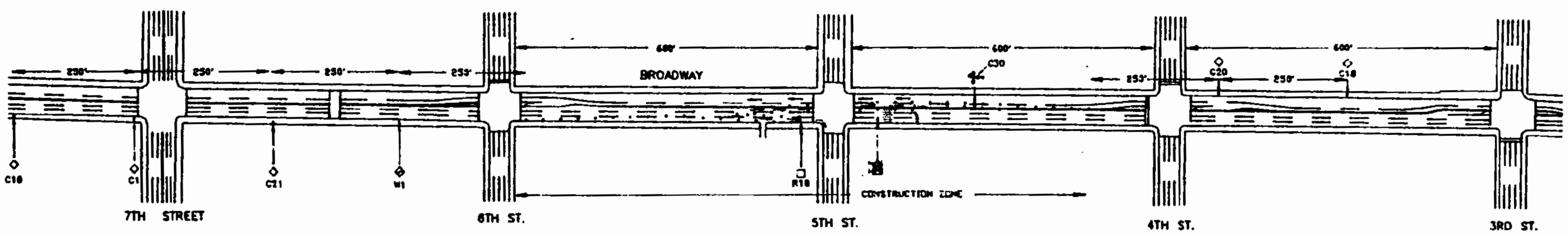
Figure 3.16-5
CONCEPTUAL CONSTRUCTION ZONE
ALONG BROADWAY

DRAWING FILE
REFERENCE FILE
USER NAME
PLOT DATE
CONTRACT NO.
DRAWING NO.
REV.
SCALE
SHEET NO.



LEGEND:

C1	Detour Ahead
C18	Road Construction Ahead
C20	Left Lane Closed Ahead
C21	Single Lane Ahead
C30	Lane Closed
R18	Right Lane MUST Turn Right
•	Delineator

Source: Work Area Traffic Control Handbook, 7th edition, 1990

NOT TO SCALE

REV.	DATE	BY	SUB.	APP.	DESCRIPTION	REV.	DATE	BY	SUB.	APP.	DESCRIPTION

DESIGNED BY
DRAWN BY
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ELECTRIC TROLLEYBUS PROJECT

KAKU ASSOCIATES

ICF KAISER ENGINEERS
GENERAL CONSULTANT

SUBMITTED ______ APPROVED ______

RTD

Figure 3.16-6
CONCEPTUAL CONSTRUCTION ZONE
ALONG BROADWAY
(CROSS STREET TRENCHING)

DRAWING FILE	CONTRACT NO.
REFERENCE FILE	DRAWING NO. REV.
USER NAME	SCALE
PLOT DATE	SHEET NO.

construction day, 8 to 9 poles/assemblies could be installed per day, encompassing 1.5 to 2.0 blocks along the ETB route. This component would require closure of one parking or traffic lane adjacent to the curb.

Where support assemblies would be connected to existing bridges or buildings, more time and lane closures would be required. For construction on bridges, two lanes would be closed for 8 to 12 hours for the installation of one assembly. Where buildings are used for overhead contact wire support, one lane would be closed for one hour for the installation of each assembly.

About 10 to 14 vehicle trips would be generated per day by heavy equipment and construction workers.

3. Overhead Contact Wire System (OCS) (Trolley Wires): Once all the poles and support assemblies have been installed, the overhead trolley wires would be installed along the entire ETB route. The tension truck used for installing such wires travels at 1 mph. It would take 5-6 minutes to run each set of wires across a 550-foot section of the route. One lane would be closed for a minimal distance leading and lagging the tension truck. On a typical 8-hour construction day, wire would be installed over a distance of 7 to 8 miles. At locations where two ETB routes cross, additional work would be required to bring together and insulate the intersecting overhead wires. This procedure, which would have a total duration of about 60 to 100 hours, would require closure of the entire intersection and possibly an adjacent street. However, the process would be staged in a series of shorter periods due to construction logistics and to minimize traffic impacts. About 8 to 10 vehicle trips would be generated per day for this special procedure.

4. Feeder Cables and Other Underground Cables: After the installation of the OCS, excavation for and placement of cables would be carried out. As discussed in detail in previous sections of this EIR, two types of systems are proposed for construction: a feeder system in downtown Los Angeles (Broadway) and a feederless system.

The feeder system would be constructed in segments of about 550 feet in length. For each segment, two days would be required for trenching and placement of conduits. This would require closure of a traffic or parking lane adjacent to the curb.

For the feederless system, voltage equalization cables would be installed perpendicular to the street every 500 feet. For the trenching, about half of the street would be closed for a period of two days at a time, requiring re-striping of the entire street to provide two-way traffic.

About 8 to 10 vehicle trips would be generated per day for this special procedure.

5. Electric Substations: The extent of lane closures would vary at each trolley power substation site (TPSS) site, depending on the site's setback from the road and the sidewalk. If the sidewalk setback is at least 20 feet, a one-time, single-lane closure of four hours would be required to move the truck carrying the TPSS into place and to set the TPSS on its foundation. Assuming a worst case scenario (if the TPSS is located just behind the sidewalk), installation of the foundation, including form work and placement of concrete, would require a lane closure for one week. While the concrete is curing, which takes about 28 days, the TPSS would be protected

by a fence. The installation of this fence would require a lane closure for three days. Installing the cables would require another lane closure for three to five days. About 15-20 vehicle trips would be generated per day for this special procedure.

6. Bus Maintenance, Storage Yards and Bus Shelters: Because construction activities required for facility retrofits would occur completely within the Division sites, no lane closures would be required. Construction traffic at the Division sites is expected to be small and sporadic enough so as not to cause any significant traffic impacts.

3.16.4.2 Impacts

a. Impacts of Project-Generated Traffic on Area Streets

Project-related construction traffic would be generated by: construction workers, construction equipment/vehicles and trucks transporting cut/fill. As described in the various construction components above, the maximum traffic generation due to construction would be about 20 vehicles per day. This amount, which would be short-term in duration, would not have a significant impact on any ETB street or intersection.

b. Traffic Flow On Adjacent Streets

The greatest project-related construction impact on traffic flow would occur as a result of the temporary closure of street lanes (described above) parallel and perpendicular to the ETB route streets. These lane closures could have adverse impacts during peak periods. It should be emphasized that where parking lanes exist, the construction of the ETB would have minimal impacts on traffic flow.

c. Parking and Local Access to Business

During construction, on-street parking along the curb lane may have to be temporarily prohibited. This could potentially have adverse affects on local businesses, but as stated in the mitigation measures, business owners would be notified in advance of parking prohibitions and efforts would be made to find alternate parking areas. Access to the business would be maintained to the greatest extent possible.

3.16.4.3 Traffic Construction Mitigation Measures

As mentioned, the lane closures associated with the construction of the ETB project could have potential adverse traffic impacts, even though these impacts would be temporary. To mitigate potential impacts, Worksite Traffic Control Plans (WTCPs) will be developed in conjunction with local jurisdictions. The following summarizes additional measures that should be implemented to eliminate or alleviate construction impacts:

- Set construction hours as follows:
  - Residential areas: 7:00 AM. to 6:00 PM
  - Commercial with on-street parking: 7:00 AM to 6:00 PM
  - Commercial without parking: 9:00 AM to 3:00 PM

- Los Angeles Central Business District (LA CBD) & perpendicular trenching (except residential areas): 8:00 PM to 5:30 AM

- Prohibit construction activities that would result in a lane closure during posted peak hour stopping prohibitions (i.e. 7:00 to 9:00 AM, 3:00 to 6:00 PM).
- Maintain access to businesses to the best extent possible and notify business owners in advance of the future construction in their area.
- Coordinate with emergency service providers.
- Provide alternative pedestrian access where needed.
- Coordinate access with adjacent property owners and tenants.
- Notify in advance and where appropriate, replace temporary parking prohibitions.

Construction impacts along some portions of RTD Routes 40 and 70 could be minimized due to the presence of a residential frontage road. Between Vernon Avenue and 46th Street, there exists a two-way residential frontage road adjacent to the northbound side of Leimert Boulevard. Parking is permitted on both sides of the frontage road, which is about 28 feet wide and is separated from the main traffic flow by a 5-foot raised median. Between Slauson Avenue and 46th Street, there exists a frontage road on both sides of Crenshaw Boulevard. Parking is permitted on both sides of the southbound-side frontage road, which is about 28 feet wide and is separated from the main traffic flow by a 5-foot raised median. Parking is only permitted on the east side of the northbound side frontage road which is about 18 feet wide and is separated from the main traffic flow by a 5 foot raised median. Between Gage Avenue and a point just south of 88th Street, there exists a residential frontage road on both sides of Vermont Avenue. The frontage roads are 28 feet wide and separated from the main travel lanes by 5 foot raised medians. Thus, most or all construction impacts could be avoided by the use of these frontage roads. However, parking would have to be temporarily prohibited on one side of the frontage road. The impacts associated with this temporary removal of parking would be insignificant since the daytime demand for these spaces is normally low as they front residential uses.

3.16.5 ENERGY IMPACTS

3.16.5.1 Construction Impacts

Construction of the proposed project would result in the consumption of fossil fuels associated with the operation of construction equipment. Table 3.16-7 provides estimated fuel consumption associated with construction equipment. As compared with regional daily fuel consumption, these amounts are considered insignificant.

3.16.5.2 Mitigation Measures

To maximize fuel economy and conserve energy, mitigation measures indicated in the air quality section should be adopted.

In the interest of promoting energy efficiency, the following construction mitigation measures are suggested:

- Recycle asphalt taken up from roadways, if practical and cost-effective.
- Maintain construction equipment in good working condition.

TABLE 3.16-7: CONSTRUCTION EQUIPMENT FUEL CONSUMPTION DURING MAJOR PHASES

Construction Equipment	Quantity	Fuel Consumption (Gallons per day)
POLE FOUNDATION		
Ground Auger	2	150
Dump Trucks	2	50
Flatbed Truck	1	25
Crane	1	100
Compressor	2	38
Concrete Trucks	2	150
Total	10	513
INSTALLATION OF FEEDER CABLES AND UNDERGROUND CABLES		
Concrete Saws	2	25
Jack Hammer	2	12
Backhoe	1	75
Dump Trucks	2	50
Compressors	1	38
Asphalt Truck	1	25
Total	9	225
MAINTENANCE FACILITY CONSTRUCTION		
Demolition		
Crane & Ball	2	200
Crawler/Excavator	2	150
Crawler Loader	3	90
Hydraulic Breaking Tool	2	40
Dump Trucks	5	125
Total	14	605
Grading		
Grader (rough)	3	300
Paving		
Asphalt Paver	1	40
Rollers	2	80
Trucks	2	50
Total	5	170
Excavation		
Excavator	2	150
Crawler Loader	2	60
Dump Truck	4	100
Total	8	310
Construction		
Concrete Truck/Mixer	2	40
Front End Loader	2	60
Backhoe	1	40
Delivery Trucks	2	50
Hauling Truck	2	50
Total	9	240

Source: Myra L. Frank Associates, Inc., 1992.

- Promote car-pooling, perhaps involving the use of project vans, among construction workers.
- Schedule construction operations to result in the most efficient use of construction equipment practical.

3.16.6 UTILITIES

3.16.6.1 Impacts

Installation of underground electrical cables (part of the ETB project's power distribution system [PDS]) to run the ETB system would be in areas where other underground utilities exist. The underground utility impacts from the PDS trenching could be significant unless coordination is undertaken with the proper utility providers to determine the locations of existing utilities and strategies are devised to avoid disruption of utility service.

3.16.6.2 Mitigation

RTD contributes to an organization called Underground Services Alert (referred to as U.S.A. or "Dig Alert") with whom coordination is undertaken to avoid disruptions in utility service due to excavation. Coordination between the project's sponsoring agencies and all the underground utility providers present would continue from the design phase through construction. This effort would help identify potential conflicts and provide opportunities for resolution prior to and during construction.

Initial surveys would be made to locate utilities and the data would be used to design the ETB Project's underground ducting and overhead wiring locations away from the potentially interfering utilities, where possible. If possible, ETB power cable ducts would be lowered or raised away from the utility conduits or wires to keep utility relocations to a minimum.

Coordination with the proper utility providers would continue during construction to minimize disruption of utility services to adjacent property owners. Temporary connections would be put in place where necessary to provide uninterrupted service to residences and businesses.

3.17 ECONOMIC/FISCAL IMPACTS

3.17.1 SETTING

Over the last 20 years, Southern California's economy has experienced dynamic growth. The region's jobs increased from 4.3 million in 1972 to an estimated 6.5 million in 1987, reflecting an annual employment growth rate of 3.4 percent, according to the Southern California Association of Governments (SCAG) 1989 Regional Growth Management Plan. (SCAG's employment data assume implementation of SCAG's Growth Management Plan.) Through the year 2010, it is anticipated that the region's growth rate will decline. By 2010, nine million jobs are expected, with an anticipated annual growth rate of two percent a year, or 1.2 percent less than the growth which occurred between 1972 and 1984.

Los Angeles County is expected to resemble the Southern California region in terms of economic growth. By the year 2010, 5.4 million jobs, or 60 percent of all jobs in the Southern California region, will be in Los Angeles County. This percentage, however, represents a decline in the share of jobs located in Los Angeles County: in 1984, the County sustained 68 percent of all jobs in the Southern California region. The addition of 1.3 million jobs (from base year 1984 to the year 2010) represents a 1.3 percent annual increase in employment.

3.17.2 IMPACTS

3.17.2.1 Employment

Benefits to the economy during the construction phase of the electric trolley bus (ETB) project could occur in the form of increased production of materials, services and labor. In addition to the construction of the system (i.e., the installation of overhead wires, poles, underground cables, substations, etc.), the production of the ETB vehicles would provide benefits to the economy. These benefits would be short-term and would last for the length of the construction period (10 years) and the manufacturing period (3 years).

Both direct and indirect employment benefits would accrue. Direct employment includes the initial effects of transit expenditures directly on industries whose goods and services are purchased. In addition, for each full-time equivalent job created through direct investment, 1.4 jobs would be created or supported indirectly as the initial investment is spent and re-spent throughout the economy. The 1.4 multiplier is reasonable and has been used in other areas to estimate the indirect effect for transit projects. For instance, a 1983 American Public Transit Association (APTA) study estimated the multiplier to be 1.365 for new rail projects. In the 1992 Draft Alternatives Analysis/Environmental Impact Statement for the BART - San Francisco International Airport Extension, a 1.44 multiplier was selected based on a local multiplier used for highway and public utilities construction.

Estimated employment generated as a result of the ETB project is presented in Table 3.17-1. Employment from construction labor would benefit the local market: a total of 18,088 person-years of employment (direct and indirect) would be produced. The local labor market would benefit further if the engineering/management aspects of construction and the manufacturing of buses occur locally.

Table 3.17-1: PROJECTED EMPLOYMENT LEVELS RELATED TO ETB PROJECT	
Type of Employment	**Projected Employment Levels**
Direct Employment	
Engineering/Managerial	1,436 person-years or 144 full-time equivalent jobs per year for 10 years
Construction Labor	7,537 person-years or 754 full-time equivalent jobs per year for 10 years
Total Direct Construction	**8,974 person-years or 897 full-time equivalent jobs per year for 10 years**
Bus Manufacturing	675 person-years or 225 full-time equivalent jobs per year for 3 years
Total Direct Construction and Bus Manufacturing	**9,649 person-years**
Indirect Employment	
Employment Generated by Engineering Management	2,010 person-years or 201 full-time equivalent jobs per year for 10 years
Employment Generated by Construction Labor	10,551 person-years or 1,055 full-time equivalent jobs per year for 10 years
Employment Generated by Bus Manufacturing	945 person-years or 315 full-time equivalent jobs per year for 3 years
Total Indirect Construction and Bus Manufacturing	**13,509 person-years**
Total Employment	
Direct and Indirect Construction	21,538 person-years or 2,154 full-time equivalent jobs per year for 10 years
Direct and Indirect Bus Manufacturing	1,620 person-years or 540 full-time equivalent jobs per year for 3 years
Total Direct and Indirect	**23,158 person-years**

Source: ICF Kaiser Engineers, 1992.

3.17.2.2 Fiscal Impacts

a. Substations

Land acquisitions related to the placement of the 135 traction power substations (TPSSs) along the routes would total 8.6 acres and reduce annual property tax revenue by $51,000 (in 1991 dollars). The three TPSSs at Division yards are included in the analysis of fiscal impacts from land acquisition for Division yards in section 3.17.2.2b, below. Table 3.17-2 lists by bus route the amount of land that would be taken and the expected annual property tax loss. Property tax levies are based on the total assessed value of privately owned property (publicly owned properties pay no tax). Although there is some variation by jurisdiction, the levy is roughly one percent of the assessed value.

TABLE 3.17-2: PROPERTY TAX LOSS FROM SUBSTATION LAND ACQUISITIONS

ROUTE	# OF SUBSTATIONS[1]	TOTAL LAND AREA OF TAKE[2] (SF)	PROJECTED ANNUAL PROPERTY TAX LOSS ($, 1991)
16. 3rd Street	11	28,772	1,737
18. 6th Street	13	35,487	4,266
30/31. Pico	16	40,226	8,406
40. South Bay	19	49,196	9,036
45. Broadway	18	79,582	9,305
66/67. 8th Street	14	39,601	8,483
70. Garvey	17	34,170	8,286
S-182	14	31,247	6,975
204. Vermont	13	35,705	3,475
560. Van Nuys	12	36,322	9,196
M10. Whittier	7	13,855	1,499
LB40. Anaheim	6	15,146	1,479
LB50. Long Beach	9	36,292	2,698
LB60. Atlantic	10	37,652	2,660
LB90. 7th Street	8	18,578	1,811

Note: (1) 32 substations would be shared among routes. The columns in this table therefore cannot be totaled.
(2) One acre equals 43,560 square feet (sf).

Source: Myra L. Frank & Associates, Inc., 1992.

Property taxes paid for each private parcel in 1991 were obtained from the Los Angeles County Assessor's office. Forty-six of the 132 TPSSs sites are on publicly owned land (16 of which are owned by Caltrans), and hence paid no yearly property tax.

The majority of the sites would require partial versus full property takes (103 versus 32). In the case of partial takes, a straight linear assumption was made in calculating the tax loss. For example, if one-fourth of a property would have to be taken to site a TPSS, it was assumed that one-fourth of the property tax paid in 1991 would be lost.

b. Division Yards

Privately owned land would be acquired for the expansion of Divisions 1 and 2. The Division 1 expansion would result in an annual property tax loss of $10,000 (in 1991 dollars) and the Division 2 expansion would result in a $49,000 loss in yearly property tax revenue.

The creation of a satellite division for Study Route 182 would require the acquisition of land for public purposes. The yearly property tax loss would be $88,000. Division 10 would expand on property already owned by the RTD; hence there would be no property tax loss.

TPSSs would be placed at Divisions 1 and 15, as well as at the satellite division. The TPSSs at Divisions 1 and 15 would produce no property tax loss since both sites are publicly owned. The small tax loss from the TPSS at the satellite division is already included in the land acquisition calculation shown above.

The total annual property tax loss for the ETB project, resulting from acquisition of land for division yard expansions and substations, would be $198,000 (in 1991 dollars).

The fiscal impacts of the project from both land acquisition for substations and division yards are not considered significant.

CHAPTER 4: ALTERNATIVES

4.1 INTRODUCTION

In March 1989, SCAQMD adopted an Air Quality Management Plan (AQMP) in order to attain air quality standards established by the U.S. Environmental Protection Agency (EPA) under the provisions of the Clean Air Act (CAA). The plan is subject to approval by EPA, and it was adopted by the California Air Resources Board (CARB) later in 1989. A Draft 1991 AQMP revision was adopted by the SCAQMD in July 1991. The plan is designed to bring the South Coast Air Basin (SCAB) into compliance with federal and state air quality standards. Southern California Association of Governments (SCAG) is responsible for developing regional plans for the transportation management, growth and land use portions of AQMP. Approval of the 1991 AQMP is still pending from the CARB and EPA.

The California Clean Air Act, effective January 1, 1989, divides the non-attainment areas into three categories with stringency requirements progressing from less to more stringent: moderate, serious, and severe. The SCAB is a severe non-attainment area for ozone, carbon monoxide and nitrogen dioxide. The Basin is nearing attainment for sulfates and has met attainment goals for lead and sulfur dioxide. The California Clean Air Act does not address PM_{10}. According to the California Clean Air Act, air quality management districts containing severe non-attainment pollutants are required to include specified emission reduction strategies to meet milestones in implementing emission controls into regional air quality management plans.

As a result of the passage of the California Clean Air Act, the 1989 AQMP was required to be amended to develop new strategies for the South Coast Air Basin to reach the attainment of state as well as federal air quality standards. The South Coast Air Quality Management District's (SCAQMD's) 1991 Final Air Quality Management Plan (AQMP) requires that ozone, carbon monoxide and nitrogen dioxide levels to be reduced by 25 percent by the end of 1994, by 40 percent by the end of 1997 and by 50 percent by the end of the year 2000 from the base year of 1987. Adoption schedules for control measures have been prioritized in the 1991 AQMP. The "Zero Emission Urban Bus Implementation" control measure to reduce reactive organic gases (ROG), nitrogen oxides (NO_x), carbon monoxide (CO) and particulate matter (PM_{10}) is listed as priority 34 and Control Measure Number MG-1. Under the heading, "Proposed Method of Control," the AQMP states:

> "Because of its demonstrated commercial and technological feasibility, bus electrification appears to be the most likely compliance strategy. In particular, the proposed method of control is to install overhead trolley wires for power transmission to transit buses operating along major fixed routes. Services that run continuously along major arterials at intervals of 15 minutes or less would be candidates for conversion from diesel operation directly to electric operation." (Final AQMP, Appendix IV-C, "District's Mobile and Indirect Source Control Measures," South Coast Air Quality Management District, July 1991.)

The 1991 Final AQMP shows a proposed implementation date of 1994-2000 for the "Zero Emission Urban Bus Implementation" Control Measure (Table 7-3, pg. 7-18) and assumes that 30 percent of all vehicle miles traveled by urban buses in the SCAB would be electric

(Table ES-2A, pg. ES-9). The proposed Phase I and II ETB Project would approximate this 30 percent assumption.

The ability of the following eight alternate fuel technologies to meet the 1991 AQMP goals is reviewed in this chapter. The technologies considered as potential candidates for replacement of diesel buses in meeting the 1991 AQMP goals are:

- Electric trolley bus (ETB)
- Battery powered bus
- Fuel cell powered bus
- Roadway powered bus
- Methanol bus
- Compressed natural gas (CNG) bus
- Liquefied natural gas (LNG) bus
- Particulate trap diesel (PTD) bus

The first four technologies are electric-powered technologies, which are potentially applicable to the 30 percent replacement assumption of urban buses. While the emissions from power plants that provide energy for the vehicles must be accounted for, these technologies permit buses to produce virtually no emissions on the road. These are referred to as "zero-emission" technologies. The last four alternate fuel technologies are not based on electric power, and would not enable compliance with the 30 percent assumption of the 1991 AQMP goals. These are low-emission (but not zero-emission) technologies. Although only the first four electric-powered technologies would enable compliance with 1991 AQMP goals, this chapter provides an overview for all of these technologies.

RTD has a major role in the development of some of these emerging technologies and has implemented one of the most comprehensive testing programs in North America. The following shows the current number of buses using alternative fuels and the current test mileage accumulated by RTD:

	Current Number of Buses	**Miles to Date (Approximate)**
Methanol	30	1,100,000
Methanol/Avocet	8	70,000
CNG buses	9	15,000
PTD buses	11	95,000

SCAQMD is a cosponsor of the U.S. Department of Energy's (DOE's) program to develop and demonstrate small (27-foot) fuel cell/battery hybrid transit buses. These zero-emission buses (ZEB) will be the first of their kind to be demonstrated in the United States. One of the three ZEBs to be developed from the program will be delivered to SCAQMD in 1994. It is expected that after an initial "shakedown" testing by SCAQMD, the ZEB will be turned over to RTD for long range comprehensive testing.

4.2 ZERO-EMISSION ALTERNATIVE TECHNOLOGIES

4.2.1 ELECTRIC TROLLEY BUSES

Electric trolley buses (ETBs) were operated in many U.S. cities from the late 1920's into the 1950's, including Los Angeles. By the early 1960's, when the larger and more powerful diesel engine was introduced to the bus industry, the majority of trolley buses were replaced by diesel due to the low diesel fuel prices in the 1950's.

Currently only 10 cities in North America operate trolley coaches. These include San Francisco, Seattle, Vancouver, Philadelphia, Boston, Toronto, Hamilton, Edmonton, Mexico City and Dayton. Because of concerns over air quality, fuel prices, vehicle reliability and costs associated with the emerging alternative fuels, several cities have renewed their interests in ETBs. These include Sacramento, Dallas, Orange County, New York and Los Angeles.

The ETB system has a long history of technical developments and successful operation. It is the only proven technology among the eight alternate fuels listed in Section 4.1. This document extensively reviews the environmental implications of the application of this technology in Los Angeles County.

4.2.2 BATTERY SYSTEMS

Silent and nearly pollution-free battery-powered electric-vehicles (EV) have advanced far beyond the "golf cart" type vehicle application. Due to advancements in battery and vehicle technology, EV's are being offered in the marketplace for transit and truck fleets. Most impressive of these new offerings are the small transit vehicles available from two companies in Southern California: Clean Air Transit (CAT) and Electric Vehicle Marketing Corporation (EVMC). This section reviews the characteristics and potential application to transit of these vehicles. More detailed information on battery-powered vehicles can be found in: Electric Trolley Bus Study, Part B: Advanced Transit Bus Propulsion Technologies, by Booz-Allen & Hamilton, Inc., for RTD, December 1991.

4.2.2.1 Clean Air Transit

The vehicle made by CAT of Santa Barbara, California was designed in partnership with Southern California Edison and Santa Barbara Transit district as a battery-powered shuttle vehicle for Santa Barbara's downtown waterfront shuttle system. The vehicle has been in Santa Barbara approximately one year, and seven additional vehicles have been delivered to a number of other transit operators and utilities (including Sacramento Municipal Utility District) for use in similar shuttle applications.

The CAT shuttle vehicle is 22 feet long and offers capacity for 22 seated and seven standing passengers. The shuttle is powered by tubular lead(Pb)/acid batteries. The on-board battery pack contains 108 battery cells. Total battery weight is estimated at 4,101 pounds (lbs), with the total gross vehicle weight being 15,000 lbs. The battery pack has a 70.2 kilowatt-hour (kWh) nominal capacity with a 5-hour discharge rate at a nominal voltage of 216 volts.

The vehicle in Santa Barbara can operate up to 10 hours between recharges. The manufacturer estimates the vehicle range to be 74 miles per charge. The shuttle's top speed is given as 40 miles per hour (mph), although local shuttle operations rarely require speeds in excess of 20 mph.

The CAT shuttle vehicle is currently being manufactured under contract by Coach Specialty Company in Downey, California. Its current price is estimated at between $150,000 and $180,000.

4.2.2.2 Electric Vehicle Marketing Corporation

EVMC is the newest entry into the electric transit vehicle market. EVMC offers a total of five variations on two vehicle sizes, 22 feet and 26 feet. The 22-foot model is available as an antique trolley look-alike, a shuttle model similar to the CAT shuttle and a fully enclosed transit bus. The 26-foot model is available as both a shuttle-style vehicle and a fully enclosed transit bus.

Like the CAT vehicles, the EVMC vehicles are powered by Pb/acid batteries, which are easily charged overnight using a 220-V three-phase electric line. The EVMC vehicles differ from the CAT by featuring rear-wheel drive, increased passenger capacity and slightly better battery life. At present, EVMC vehicles are not yet operating in any transit applications.

The physical characteristics of the 22-foot EVMC vehicle are quite similar to those of the CAT shuttle, with the exception of the rear wheel drive, which provides additional usable interior room. The larger 26-foot vehicle seats 26 passengers, with up to seven standing passengers. Its gross vehicle weight is estimated to be 20,000 pounds.

The battery technology in the EVMC models is identical to that used in the CAT vehicle. In fact, the batteries used by both companies are built by Chloride EV systems. EVMC offers a unique program that allows transit operators to lease battery life, similar to programs in place that allow operators to lease tire life. This eliminates the regular high cost of battery replacement, which must otherwise be predicted and budgeted by the operator. The lease program will also allow current users to replace their batteries with future-generation battery technology as it becomes available.

As with CAT vehicles, the EVMC vehicles also make use of regenerative braking to add battery range. Their range is estimated to be 75 to 100 miles with a top speed of 40 mph. EVMC vehicles range in price from a base of $140,000 for the smallest trolley-type vehicle, to nearly $200,000 for the 26-foot transit bus.

4.2.2.3 Heavy-Duty Bus Applications

Both the EVMC and CAT vehicles offer an existing proven technology for a battery-powered transit vehicle. However, as these vehicles are limited in capacity and somewhat limited in range, they are suitable as downtown circulators or employee shuttles; no manufacturer has been identified for large heavy-duty transit bus applications. In fact, most transit agencies operate few vehicles under 30 feet in length, with the exception of areas that operate smaller, body-on-chassis type vehicles, costing generally less than half the estimated price of these vehicles. Without further improvements in technology, increases in production and decreases in price, these vehicles will likely remain in a specialty niche in the alternative-fuel transit vehicle market.

4.2.3 FUEL CELL TECHNOLOGY

Fuel cells were innovations of the U.S. space program, beginning in the mid-1950's. Development of civilian applications is underway. In the simplest terms, a fuel cell is a container in which hydrogen and oxygen are passed over an electrode to create a chemical reaction that produces water and electrical energy.

A fuel cell can be configured in a variety of ways and can use a variety of fuels, some of which require special processing. For example, natural gas can be used as a fuel and converted to hydrogen in an on-board reformer.

The heart of the fuel cell is the fuel cell stack, in which hydrogen is converted electrochemically to water by means of a platinum catalyst, producing direct current (DC) electricity and heat as by-products. The stack operates on pure hydrogen and emits no NO_x, SO_x or particulates.

In this section an overview of the types and ongoing research and development issues of fuel cell technology is presented. The report, <u>Status of Fuel Cell Technology for Transit Applications</u>, by Edgar, Dunn & Co. and ICF Kaiser Engineers for SCRTD, June 29, 1992 contains detailed information on fuel cell technology.

4.2.3.1 <u>Types of Fuel Cells and Hybrid Technologies</u>

Two fuel cell technologies are currently being evaluated in public transit applications. These are the Phosphoric Acid Fuel Cell and the Solid Polymer Electrolyte Fuel Cell. These are briefly described below.

a. Phosphoric Acid Fuel Cell (PAFC)

Presently employed in the Department of Energy's (DOE's) bus demonstration program, the PAFC is the most developed of the fuel cell technologies. It is being commercialized for stationary applications by several organizations. The PAFC operates at approximately 200° Celsius. However, because of the tradeoffs of power density, "footprint" and cost; and other operational limitations, such as poor cold-start capability, etc., the outlook for the PAFC in transportation applications is doubtful.

b. Solid Polymer Electrolyte or Proton Exchange Membrane (SPE or PEM)

PEM technology has improved substantially in recent years and is now the most promising fuel cell technology for transportation applications. It operates at temperatures between 50° and 90° Celsius. Ballard Corporation is under contract to the British Columbian and Canadian governments for a bus demonstration program. A second program is the DOE vehicle development program contracted to a team led by General Motors. PEM technology appears very promising for bus applications for several reasons, including moderate operating temperature, higher current densities, power compliance and durability.

c. Combined Fuel Cell and Battery — Hybrid Technology

The combination of fuel cells plus batteries is being considered as a part of fuel cell systems for transit vehicles. This concept has been developed, but a prototypical or demonstration model has not been developed. The use of fuel cells in transportation applications is almost certainly going to involve hybrids which employ batteries or other components as part of the power system. There has been considerable evaluation of the current status of battery technology and its use in hybrid systems.

The combined use of fuel cells and conventional storage batteries provides more efficient energy utilization as a power source for transit vehicles. The power source on transit vehicles is required to meet two conditions: a) the system should be capable of supplying power corresponding to a wide range of propulsion power demands, and b) the system should be capable of absorbing the kinematic energy of the vehicle as it is re-converted to electric power during braking.

The fuel cell package provides clean and stable electric power and is ideal in applications for constant or slowly changing loads, such as in a utility. The combined use of storage batteries and the fuel cell package will provide the power for variable loads on transit vehicles.

The fuel cell package itself does not have the capability to store energy regenerated in braking. The combined use of storage batteries and a fuel cell package will make this storage possible.

4.2.3.2 Fuel Cell Applicability to Transit

With regard to applicability to transit, the U.S. Department of Energy is presently sponsoring two demonstration projects involving fuel cells. Ballard Power Systems in Vancouver, Canada, appears to be making the fastest progress. A number of programs are also underway in the private sector. The DOE demonstration program uses the PAFC while Ballard Power Systems' program uses PEM. Both programs are currently underway but will require considerably more time and effort before commercial feasibility will be established.

a. DOE Program (1987)

The DOE has an ongoing program to study and demonstrate fuel cell transportation applications. The program was prepared by the Office of Transportation Technologies (OTT), Electric and Hybrid Propulsion Division, with contributions from EA Engineering, Science and Technology; Argonne National Laboratory; Georgetown University; and the National Renewable Energy Laboratory.

The intent of this DOE program is to support industry in the development and demonstration of fuel cell technologies for their commercialization by industry after the year 2000.

According to the Multi-Year National Program Plan For Fuel Cells and Transportation, U.S. DOE, Washington, D.C., 1992, the DOE program has the following objectives:

- "By the year 1995, complete the initial demonstration of fuel cells in urban transit buses."

- "By the year 1998, establish the feasibility of different vehicle concepts and fabricate and demonstrate prototypes."

- "By the year 2000, establish the commercial viability of producing several small fleets of 50 to 200 vehicles."

- "By the year 2005, provide first-generation commercial fuel cell vehicles (10,000 units)."

- "By the year 2007, begin sales of fully competitive vehicles (more than 100,000)."

DOE states that these goals are based on policy objectives, not market forecasts. Further, the vehicle penetration numbers shown above in parentheses are only light-duty highway vehicles; the market may include buses, trucks and rail vehicles.

DOE further acknowledges that a number of technical and economic hurdles must be overcome in order to demonstrate the potential of fuel cell technology in transit buses. These hurdles include the development of the fuel cell itself as well as the cost-effectiveness and availability of the fuel cell vehicle and required infrastructure.

In 1987, the PAFC was chosen as the fuel cell technology for the program. (If the selection were made today, it is likely that the PEM would have been selected because of recent improvements in PEM fuel cell stacks.) In addition, methanol was selected as the fuel, requiring on-board reforming. Three 27-foot urban buses with a PAFC/battery propulsion system are planned. The demonstration is scheduled to be evaluated starting in 1994, after initial test-bed evaluations have been completed. The RTD will receive one of the prototype buses for demonstration use in Los Angeles.

There are criticisms of this DOE project involving the selection of the fuel cell technology, the slow pace of the project, and other issues. Nevertheless, a great deal can be learned from this program regardless of whether or not it leads directly to commercialization of a fuel cell bus. This is the foundation of the federal Government's research and development investment in fuel cell development for transit vehicles.

b. DOE Program (1991)

After several early feasibility studies spanning several years, the DOE initiated a six-year fuel cell development effort for automobile applications in 1991. General Motors is the lead contractor, with several other contractors providing key technology. The fuel cell technology employed in the program is PEM, and it incorporates (at least initially) an on-board methanol reforming concept to provide hydrogen to the fuel cell stack. This effort is just beginning and is currently without funding. A prototype "Green Car" should be available for testing soon.

c. Ballard Power Systems

BC Transit in Vancouver, Canada, may be the first transit property in the world to have a prototype fuel cell bus on the street for demonstration. Ballard Power Systems in Vancouver is currently in the process of converting an existing 30-foot diesel bus to an electric bus powered with their solid polymer electrolyte (PEM) fuel cell system. This $4.84 million demonstration program is sponsored by the Province of British Columbia and the Canadian federal government. Service testing is to begin in the Fall of 1992, with revenue service beginning in the Spring of 1993. Ballard Power Systems, the lead developer in this project, plans to step up to a standard 40-foot bus in 1998, and to have commercially developed the vehicle by 2003.

The entire development project requires $52 million. Funding for development beyond the 30-foot bus is uncertain. The cost of the present phase of work is estimated at $15 million. LACTC and RTD have been asked to sponsor a portion of the program.

At this time, several issues must be resolved before the PEM fuel cell can be commercially available for the transit industry:

- Development of an alternative catalyst material or a significant reduction in the amount of platinum that is required, in order to reduce costs.
- Higher power density to meet required energy output and efficiency.
- Weight and size reduction.
- Development of stable hydrogen supply sources.
- Safety assurances for the use of high pressure hydrogen.
- Systems integration and durability testing.

Representatives of LACTC and RTD recently visited Ballard Power Systems. The consensus was that the status of fuel cell development indicates a high probability of success. However, because of a number of critical hurdles still to be overcome, it is too early to know whether this system will be commercially available by 1998, or at all.

d. Private Sector

Many private sector companies are engaged in fuel cell research. Industry analysts believe that several of these firms are far ahead of the DOE's programs. Some of the companies engaged in fuel cell research in North America include Northrop, General Motors, Dow Chemical, United Technologies and Ballard Power Systems, among others. Similar research is thought to be well advanced in other countries including Japan, England, Russia, the Netherlands and Italy, among others.

4.2.3.3 Key Issues in Fuel Cell Development

There is virtually no experience base with fuel cell transit applications, and therefore limited data are available with which to rigorously assess or evaluate alternatives. Nevertheless, there are several issues that are important in this regard, and these are summarized below:

a. Technology

The technology issue includes system configuration and systems integration.

System configuration involves the choice of fuel and the associated hardware. An example: on-board hydrogen stored as gas, liquid or anhydride; or, an on-board fuel such as methanol converted to gaseous hydrogen in a reformer (a small on-board refinery).

Systems integration involves designing and packaging components and controls. This is a less critical issue at this point in the development process, but it will become increasingly important as engineers work to develop the systems for commercial markets.

b. Safety

The safety of fuel cells in public transit applications depends on the type of fuel chosen, the electrolyte and the operating temperature.

The primary safety issue involving hydrogen is not combustion but its harmfulness when in contact with the human body. Hydrogen can be effectively stored on-board in a gaseous, liquid or solid state. However, there is always the risk of a leak, which could result in severe burns if the hydrogen comes in contact with the human body. Carrying liquid hydrogen on-board is inherently hazardous and will require a great deal of caution until sufficient experience is gained. An alternative is to carry less harmful fuels such as methanol, which can be converted to hydrogen as needed in a reformer.

The acid in the Phosphoric Acid Fuel Cell is also inherently hazardous, although most experts regard the risk to be acceptably small, maintaining that the acid is well-contained and unlikely to leak or spill.

c. Reliability

The fuel cell is considered to be more reliable than the internal combustion engine because of its mechanical simplicity and, in the case of the Solid Polymer Fuel Cell, its lower operating temperature.

However, the reliability of new materials and process applications is uncertain at this time. For instance, will the fuel cell stacks survive 40,000 hours (a design rule-of-thumb for transit vehicles).

Expectations regarding the fuel cell may be confirmed only after many thousands of hours of operation. Until that confirmation is achieved, the reliability of the fuel cell is speculative.

d. Economics

The economics issue derives from the lack of data on which to base manufacturing and operating cost projections. The Phosphoric Acid Fuel Cell has sufficient history to support preliminary estimates that suggest cost competitiveness with internal combustion engines. The Solid Polymer Fuel Cell may be even more competitive. Much more will be learned from experience with prototypes.

e. Infrastructure

The infrastructure issue involves supporting the fuel cell vehicles in the field. A new technical and administrative infrastructure will be needed. For example, a higher level of vehicle maintenance and electrochemical engineering will be necessary, particularly during the early years of introduction into the transit fleet. Fuel delivery, storage and handling facilities will be required. A reliable supplier of the fuel will need to be developed and public policies will need to be formulated for dealing with the risks of this new technology.

4.2.3.4 Conclusions

Two fuel cell technologies have been selected for development in transit buses, the PAFC and the PEM fuel cell. These may develop as hybrids with batteries.

Several development programs for fuel cell buses are underway. The DOE began a PAFC program in 1987 that should yield a demonstration prototype soon, though it now appears that this fuel cell is not appropriate for public transit applications. An objective of this program is to support commercialization by private industry after the year 2000. The DOE began another demonstration program in 1991 to build a fuel cell bus based on a PEM fuel cell. Funding for this program is uncertain at this time.

The Canadian government sponsored Ballard Power Systems' development of a series of PEM based transit buses for demonstration. Numerous other research and development programs are said to be underway in the private sector; however, little information is available on any of these programs.

Numerous uncertainties affect the development of a successful fuel cell bus. The technical uncertainties include *system configuration*, such as fuel selection and on-board treatment; and *systems integration*, such as physical packaging and controls. Safety uncertainties relate primarily to the hazards implicit with the fuel and the operating temperatures. The reliability uncertainties relate to the lack of any operating history. The economic uncertainties cannot be easily evaluated yet as there is not much empirical data regarding manufacturing and operating costs. The infrastructure uncertainties relate to the need for support facilities, especially those relating to fuel storage and handling. These uncertainties impact our ability to understand and predict when fuel cell buses may become available for fleet service, or if they will become available at all.

Fuel cell buses are years away from fleet service, even if we assume that the technology exists and will be successfully developed. Many steps remain in the commercialization process: building demonstration prototypes, developing pre-production prototypes and then producing commercial buses that meet operating requirements, including economics.

Those close to the DOE projects do not expect demonstration prototypes before 2000, or first generation commercial vehicles before 2005. Some other experts believe these dates to be overly optimistic and related more to public policy objectives than reality.

A few experts and entrepreneurs are much more optimistic. They believe that commercialization will occur much more rapidly. No available data support this conclusion and one is left to speculate about the basis for this optimism.

Given adequate funding and technical success, the earliest date for the first generation of commercial transit vehicles would be late in the next decade. Without the funding, which is problematic at this time, the date would be later.

Federally funded research is a major factor in the development of demonstration prototypes. Some experts believe that the cost will be as high as $500 million. Others talk in terms of billions. Moreover, it is generally acknowledged in the transit industry that current federal funding in this area is not likely to meet expectations.

Private investment is a major factor in the development of pre-production prototypes and production models. The prospects here are not encouraging either because of the small size of the market, the long development cycle, the lack of available capital in the industry and the "low bidder" nature of the procurement process.

It appears reasonable to conclude that fuel cell buses will not be commercially available until at least 2007, and very possibly not until much later, unless a massive infusion of financial support is made available. Planning and procurement cycles would suggest an even later date for fleet service (as evidenced by the lengthy testing of methanol fuel buses in Los Angeles). Accordingly, fuel cell buses may not be available for fleet service for another 15 years.

Fuel cell buses, when and if available, will fit in well with the overall public transit plan by providing another zero-emission vehicle that could be added to the RTD fleet.

4.2.4 ROADWAY POWERED VEHICLES

The roadway power concept was developed nearly a century ago and is based on inductive energy transfer technology. The primary inductor is a cable system buried beneath the pavement which creates a large magnetic flux field. A secondary inductor, located on the vehicle, couples to the system and effects energy transfer. The advantages to this technology include no exhaust emissions from the vehicle, no overhead contact wires networked throughout city streets and the possibility of concurrent use of the roadbed by other types of vehicles.

In comparison to battery and fuel cell power sources, the inductive coupler concept yields a relatively low weight of energy storage on board the vehicle, thereby increasing range, performance and payload capacity. The roadway power system is being tested by the University of California at Berkeley on a unique test track at the Richmond, California facility. The roadway power technology possesses some inherent advantages, yet it has a substantial disadvantage in its maturity level. The technology has only reached the proof-of-feasibility stage. Economic assessments have not been accomplished and some technical development requirements remain.

The costs for installation of the inductive coupler in the roadway are substantial and energy efficiency transfer appears to be poor unless precise control of the alignment between the vehicle pick-up inductor and the roadway inductor is maintained. To maintain such precise control would require a fixed tack vehicle and hence drive the costs up even higher. Essentially, the commercial application of roadway powered vehicles appears to require significant technology breakthroughs and is therefore outside a reasonable planning horizon.

4.2.5 ELECTRIC POWERED VEHICLES — CONCLUSIONS

This section has reviewed the status of four electric powered vehicle technologies: ETBs, battery systems, fuel cells and roadway powered buses. The ETB concept and overhead contact system (OCS) technology have operated successfully in North America for many years. Although ETB systems require extensive capital construction, the vehicles are commercially available and a great deal of experience exists with the systems. Furthermore, performance and reliability of trolley buses are the same or better than for diesel-powered vehicles.

Battery-powered vehicles presently are only applicable to transit services of short range and low riderships, e.g. downtown circulators and local employment distributors. Primarily because of excessive weight, battery systems do not offer the capacity or range necessary for heavy-duty vehicle applications. Battery systems will likely be used in combination with ETBs (as auxiliary power units), fuel cells or other energy storage means to satisfy power requirements for heavy-duty vehicles. At the present technology level, a battery-powered 40-foot transit bus is not feasible and is not expected to be feasible in time to comply with AQMP guidelines.

The present state of development of fuel cells indicates that these systems potentially offer outstanding characteristics such as a heavy duty vehicle electric power source. However, the system cannot individually provide sufficient power to a heavy duty transit vehicle because of high peak power requirements demanded during acceleration of a transit coach. It is difficult to predict when this technology will be competitive with trolley buses, but since there are no in-service demonstration data available, it is reasonable to estimate that fuel cells are likely to be 10 to 15 years away from commercial production.

In conclusion, the ETB concept is at this time the only viable electric power technology suitable for transit applications. As a consequence of this, overhead wires are unavoidable. Future developments in battery, fuel cell or inductive coupling technology usage may render overhead wires unnecessary, but such a development will take 10 to 15 years to mature. The only alternative that would meet the goals of the AQMP is the ETB technology. This decision does not negate the possibility that buses constructed in the early 21st century might be powered by alternative sources.

4.3 LOW- (BUT NON-ZERO) EMISSION ALTERNATE FUEL TECHNOLOGIES

In this section, the characteristics of the four low-emission alternate fuel technologies are reviewed. Since these are not zero-emission technologies, they cannot be applied to the "Zero Emission Urban Bus Implementation" control measure as described in the 1991 AQMP. However, if the developments of fuel cell buses are delayed substantially, these low-emission buses may be considered for replacing the remaining 70 percent of the diesel-powered buses in the region.

4.3.1 METHANOL POWERED BUSES

Methanol is the most highly developed alternative fuel technology available for transit use. Two major types of methanol-fueled buses are currently being tested: neat methanol and methanol/avocet. DDC is the major company developing neat methanol propelled buses. This type has undergone more widespread testing than the methanol/avocet type. DDC's efforts have focused on modifying the 6V-92 diesel engine for methanol operation. The major changes to the diesel 6V-92 for methanol operation include higher compression ratio, modified blower and control system, higher flow injectors and addition of glow plugs and solid state glow plug controller for starting and warming-up. Today there are 58 DDC methanol-powered coaches operating at 8 transit properties in the U.S. and Canada and, of this total, RTD is currently operating the majority, or 32 buses. RTD has the largest methanol bus demonstration program in the United States. As of March 1991, DDC methanol demonstration engines in the U.S. and Canada had accumulated over 3 million vehicle miles, a third of which was by RTD.

The Cummins methanol L-10 engine development program is pursuing the use of an octane-enhancing fuel additive, AVOCET, to achieve stable ignition. The objective of the Cummins methanol L-10 engine program is to demonstrate the viability of a methanol engine while minimizing the engine hardware modifications. A methanol L-10 engine underwent field testing in Vancouver, B.C., and several excessive wear areas were identified. Cummins is continuing development of this technology in the laboratory but does not plan to produce any methanol L-10 engines at this time. Cummins believes that other technologies, such as diesel particulate trap and natural gas, offer more promise than methanol, so they are now concentrating their development efforts in these areas. However, two Cummins L-10 methanol engines installed on Gillig buses have been operating at Orange County Transit since July 1990.

Fuel economies reported by the three transit operators with the highest number of in-service DDC methanol buses (RTD, Denver RTD, and Triboro) indicate that methanol fleet fuel economies are roughly one-third those of the diesel fleets. Their results support the conclusion that methanol engines experience more of a fuel economy penalty than diesel engines when going from high speed constant load operations to central business district operation. Methanol powered buses experience an approximate 15% fuel efficiency penalty when compared to diesel buses.

With regard to methanol engine emissions, data reported by DDC for 6V-92 engines equipped with an oxidation catalyst indicate NO_x emission rates at one-half of the current standard, and particulate rates below the 1991 California standard of 0.10 g/bhphr. Although the engine is marginally capable of meeting the OMHCE standard without a catalytic converter, DDC has applied for certification with a platinum catalyst to assure in-use compliance with the standard. Note however, that as wear on the engine increases over time, there is an increase in OMHCE, CO, and particulate emission rates, and a lower NO_x rate. Laboratory tests conducted on the Cummins methanol L-10 engine at steady state conditions show that engine-out particulate emission levels are significantly below those of diesel.

Vehicle maintenance costs are higher for methanol vehicles as compared to diesel, due to the more rigorous maintenance schedules proposed by the engine manufacturers. This is mostly due to the shorter change-out intervals for fuel filters, glow plugs and injectors. As the reliability of the glow plug and injectors improve, the replacement schedule may become less aggressive.

Safety has been a major concern with methanol for use as a motor vehicle fuel. Methanol is highly toxic and, unlike petroleum products, is readily absorbed through the skin. Chronic exposure at concentrations above 200 ppm has produced symptoms such as dizziness, nausea and blurred vision. A recent review of methanol health effects completed by the Health Effects Institute in 1987 indicated that continued exposure to low levels of methanol may result in effects similar to those caused by acute exposure.

In ventilated areas, the ignitability of neat methanol is between that of gasoline and diesel fuel. In enclosed spaces, methanol's vapor pressure is such that an ignitable fuel/air mixture will form over a wide temperature range. Gasoline, in contrast, has a vapor pressure high enough at room temperature that the fuel/air mixture in a tank is above the rich flammability limit. The vapor pressure of diesel oil is very low; accordingly, the fuel/air mixture in a diesel tank is below the lean flammability limit. Relative to gasoline or diesel fires, methanol fires are more controlled and burn cooler because of their lower heat of combustion and higher heat of vaporization. However, a major problem is that methanol fires are invisible in the daylight. Existing fire prevention codes and recommendations include precautions to maintain storage temperature below the flammability range and limit ignition sources near the fuel. The most effective fire extinguishers for methanol are dry chemicals, CO_2 and alcohol-resistant foam concentrates. Also, unlike petroleum buses, methanol fires can be extinguished with water.

4.3.2 COMPRESSED NATURAL GAS POWERED BUSES

In terms of design maturity, compressed natural gas (CNG) engines are one to two years behind the methanol 6V-92 demonstration program. Both Cummins and DDC are developing natural gas versions of their transit engines. Cummins is currently testing 12 CNG vehicles equipped with L-10 engines at seven transit facilities. RTD is now testing four of these buses. Cummins plans to increase the number of buses to be tested to 104 buses at 14 different transit facilities. Cummins intends to offer a certified CNG L-10 for sale by Model Year 1993. Another L-10 CNG engine is being developed by Southwest Research Institute with funding provided by Southern California Gas Company. Six buses equipped with these engines are being demonstrated in revenue service at RTD.

There are some critical technical issues which must be addressed in regard to on-board storage of CNG. The biggest drawback of CNG use is the weight, size and number of the on-board storage tanks. The CNG which powers the L-10 Flexible buses is stored in six aluminum composite fiberglass-wrapped cylinders underneath the floor. The cylinders hold up to 16,000 standard cubic feet of natural gas. This volume allows the vehicle to travel for 350 miles without refueling, which is approximately the range of a diesel bus equipped with a 125-gallon fuel tank. The addition of six CNG storage tanks increases the weight of the vehicle by a minimum of 2,520 pounds.

Little information is available with regard to fuel economy. However, both Columbus, Ohio and Toronto, Canada have reported fuel consumption by CNG coaches as equivalent diesel miles per gallon, based on heats of combustion. A comparison of MPG ratios may provide insight into how well the CNG buses are operating. Fuel economy ratios for the vehicles at both facilities are reported as 1.22, indicating that diesel coaches are achieving 22 percent higher fuel utilization efficiencies.

Relatively few emissions data exist for CNG transit engines. Cummins has tested a laboratory version of the lean burn CNG L-10. This engine shows good HC, CO and particulate performance and its NO_x emissions are less than 50 percent of its diesel counterpart. However, current research indicates that natural gas engines should be capable of achieving much lower NO_x emissions in the future.

Natural gas vehicles have not yet matched diesel reliability levels. Displacement of air by gaseous fuel reduces volumetric efficiency and hence, power. Engine developers have attempted to compensate for this effect by increasing turbocharger boost pressures. With homogeneous mixtures of natural gas and air, boost pressure is limited by the onset of knock. Similarly, overall compression ratio in natural gas engines (boost ratio times cylinder ratio) is knock limited to lower numbers than those used in diesel engines. Therefore, attempting to match the power densities of highly rated diesel engines results in higher exhaust temperatures, since the expansion ratio cannot be as high, and causes premature exhaust valve and turbocharger failure. Exhaust gas temperatures can be reduced by shifting to very lean combustion, either by using direct injection or lean homogenous mixtures, which should allow natural gas engines to match or exceed the reliability and durability of diesel engines, but with some penalty in specific power output.

The health risks associated with natural gas are small since methane is non-toxic. However, methane in sufficient quantities acts as a simple asphyxiant by displacing the air. Therefore, storage and fueling facilities must be sufficiently ventilated to prevent displacement. Fuel leaks can lead to accumulation of a combustible mixture in a fueling or storage area. However, the release of small quantities is not hazardous, provided the gas is dispersed before its concentration reaches the lower flammability limit of 5 percent natural gas by volume.

4.3.3 LIQUEFIED NATURAL GAS POWERED BUSES

There is very little data available regarding liquefied natural gas (LNG) as a motor fuel in general, and as a replacement for diesel fuel in particular. At present, LNG is not produced or aggressively marketed for the transportation industry. Its vehicular use is largely limited to LNG ocean tankers. Investigations to date indicate that LNG has the potential to become an extremely viable competitor to methanol and CNG as an alternative fuel.

A relatively new refrigeration technique allows LNG to be made at a very low cost, which may increase LNG's future viability as a transportation fuel. Its energy content per pound is greater than that of diesel or gasoline. Packaging LNG tanks in vehicles can be very similar to diesel fuel, generally out of harm's way. Fuel transfer is quick and straightforward, like any other liquid.

Transit demonstrations of LNG buses are just beginning. Houston Metro Transit District has announced its intention to completely convert its fleet to LNG. In 1991, the District had been in possession of its two LNG demonstration buses for 5 months, but neither had been in operation because of a malfunctioning solenoid which is supposed to switch from vapor to liquid fuel when the tank pressure falls to 20 psi. As delivered, these 18-passenger, 25-foot Marco Polo coaches are based on a John Deere chassis, and are powered by a Ford 460 cubic inch displacement (cid) gasoline engine converted to operate on LNG. Houston is also operating two Ford Crown Victoria sedans converted to LNG. The Crown Victoria's fuel system is manufactured by

Cryogenic Fuels, Inc. Baltimore MTA is also beginning an LNG demonstration project. Ten 40-foot coaches powered by the DDC diesel pilot-ignited natural gas engine will be used.

The efficiency of a natural gas engine will be unaffected whether the fuel is CNG or LNG. However, Booze-Allen & Hamilton estimates the fuel tank weight penalty for the CNG bus to be approximately 2,000 pounds over that of an LNG bus. They also estimate that this weight penalty will result in a 2.5 percent decrease in fuel economy for a CNG powered bus as compared to an LNG propelled bus.

The discussion of CNG engine emissions is relevant to LNG engines, since the fuels are very similar from an engine's perspective. However, LNG fuel quality will be extremely consistent, potentially allowing lower emissions than from CNG engines via more precise calibration. Exhaust hydrocarbon reactivity should be somewhat lower as well, since the fuel's non-methane hydrocarbon content is lower. In addition, preliminary calculations indicate that if LNG's heat of vaporization were utilized by an intercooler/vaporizer, about 50 degrees Fahrenheit (F) of intake charge cooling could be realized, resulting in lower NO_x rates and higher volumetric efficiency. An empty LNG coach will be about 10 percent lighter, resulting in somewhat lower load factors and emissions per mile. A potential drawback of LNG is that gas could vent from the tanks of LNG vehicles parked for more than six to seven days, while CNG fuel systems remain sealed. Although methane does not contribute to ozone formation, it is a powerful greenhouse gas.

LNG shares several of the advantages of CNG while avoiding the hazards associated with high pressure gas storage systems, such as violent rupturing of fittings and lines and rapid leakage. LNG is non-toxic. Spilled fuel quickly evaporates and disperses since it has a very low boiling point and is lighter than air. Invisible puddling of flammable vapors that can occur with methanol is not possible.

LNG in puddles is difficult to ignite. If ignited in an open area, the rapidly evaporating gas creates a region where the mixture is above the rich ignition limit, so combustion is confined to the surface of this region. Meanwhile, buoyant forces cause the gas to rise rapidly, which disperses the heat of combustion. These effects tend to prevent the explosive ignition that can occur with gasoline and LPG.

A significant disadvantage of LNG is the hazard to operators of receiving cryogenic burns through mishandling or accidents. Even more so than with methanol, refueling station operators would have to be carefully trained in safety procedures. If a large spill occurred in an enclosed space, personnel could be asphyxiated by methane vapor displacing air. Also, explosive combustible mixtures can form when LNG is released and evaporates into an enclosed space. Slumps and drainage systems for controlling the flow of LNG spills and venting of the resulting vapor are important safety features for LNG fueling facilities.

4.3.4 DIESEL BUSES WITH PARTICULATE TRAP SYSTEM

Many transit operators are hoping to utilize clean diesel in conjunction with a particulate trap system to meet the 0.1 g/bhphr particulate standard. Several particulate trap technologies are currently being demonstrated. Six transit operators are currently involved in demonstration programs; RTD now has in service a total of 11 buses using 2 different particulate trap technologies.

The New York City Transit Authority (NYCTA) has also been testing this trap. No major problems have yet been encountered, although, as of 1991, a maximum of only 38,000 miles had been accumulated on any system. NYCTA considers the particulate trap to be a viable near-term particulate control technique and has placed an order for 400 buses equipped with DDC 6V-92 engines fitted with trap oxidizers supplied by Donaldson and engineered by Ortech International.

The primary concern with all of the trap systems is the long-term durability of ceramic filters. Regeneration takes place at temperatures in excess of 1,100 degrees F. At this high temperature, the ceramic elements are susceptible to cracking. Accumulation of non-combustible ash is also a long term problem, but may be controllable by using low-sulfur fuel oil and low-ash lubricating oil.

Conventional diesel buses cannot now meet the 1992 California standard for particulate unless equipped with a particulate trap. Even with a particulate trap, it is doubtful that diesel fueled buses will be able to meet federal regulations for 1998 and beyond. The California Air Resources Board is also scheduled to establish new state standards for heavy duty vehicles in 1992 (which will take effect in the 1996 to 1998 time frame). It is probable that the state standards will be even more stringent than federal requirements.

CHAPTER 5: IMPACT OVERVIEW

This chapter provides an overview of impacts, including cumulative impacts, unavoidable significant adverse impacts, impacts found not to be significant, and the environmentally superior alternative.

5.1 CUMULATIVE IMPACTS

5.1.1 CUMULATIVE AIR QUALITY IMPACTS

Projected future emission rates (from the California Air Resources Board) were used in the air quality analysis in Chapter 3, Section 3.1. As discussed in Section 3.1 and Section 3.16.4 (Construction Air Quality), although there would be insignificant air emissions from project construction, the project-wide air quality impacts represent an overall net decrease in South Coast Air Basin (SCAB) air emissions, even assuming that all of the electrical generation for the project would occur in the SCAB. Power generation for the project would actually occur both within and outside of the SCAB; therefore, the cumulative air quality impacts for the SCAB would be even more beneficial than those identified in Section 3.1. The project contributes to the expeditious implementation of the adopted AQMP.

5.1.2 CUMULATIVE NOISE IMPACTS

Ambient measurements were taken for the noise analysis. With the implementation of ETBs, project-related noise impacts would represent an overall net reduction in noise levels along the routes. As urban growth occurs along the ETB routes, ambient levels would be expected to increase slightly, due in part to an increase in traffic, which is the primary component of urban noise levels. Because it takes a 100 percent increase in traffic volume to make a noticeable increase in noise, the anticipated increase in noise level from this growth probably would not be noticeable. Moreover, implementation of the ETB project would reduce this anticipated noise level increase along these routes in the future. Some potential localized noise impacts are described in the Noise Section 3.2 for 16 of the project's traction power substations.

5.1.3 CUMULATIVE AESTHETIC IMPACTS

Implementation of the ETB project would have both potentially beneficial and potentially adverse visual effects on the regional urban landscape. As discussed in Chapter 3, Section 3.3, Aesthetics, at specific locations along the routes, specialized and more complex wiring and pole configurations would occur which, considered cumulatively, may be viewed by some as an overall detriment to the regional visual setting. On the other hand, major portions of the ETB project would involve improvement to the visual setting through the application of the design guidelines identified in Chapter 3, Section 3.3.

Along a given ETB route or within a given geographic area, the frequency and proximity of the more complex wiring and pole configurations, as identified and discussed in Section 3.3, would affect the cumulative nature of the visual impacts for that area or route.

The overall cumulative visual effects in Los Angeles County could be viewed by some as adverse, while others may view the overall visual impacts as beneficial, particularly in light of the other beneficial aspects of the project.

5.1.4 CUMULATIVE BIOTA IMPACTS

Due to the anticipated additional landscaping and planting along segments of the ETB routes, the overall cumulative impacts to the region's biology are deemed to be beneficial and insignificant.

5.1.5 CUMULATIVE UTILITIES IMPACTS

The utilities impacts discussed in Section 3.5 and Section 3.16 are cumulative in nature.

5.1.6 CUMULATIVE LAND USE IMPACTS

The land use impacts discussed in Chapter 3, Section 3.6 are cumulative in nature.

5.1.7 CUMULATIVE TRANSPORTATION IMPACTS

The transportation impacts discussed in Chapter 3, Section 3.7 are cumulative in nature.

5.1.8 CUMULATIVE CULTURAL RESOURCES IMPACTS

As noted in Section 5.1.3, implementation of the ETB project would have overall beneficial and potentially adverse effects on the regional urban landscape. At specific locations along the routes, specialized and more complex wiring and pole configurations would occur. These locations are reviewed on the basis of their cumulative impacts, particularly for historic districts, in Chapter 3, Section 3.8. As discussed in Section 3.8, within a given historic district, the greater the number of turns/crossings, the more significant the impact.

5.1.9 CUMULATIVE SAFETY IMPACTS

The safety impacts discussed in Chapter 3, Section 3.9 are cumulative in nature.

5.1.10 CUMULATIVE ENERGY IMPACTS

The energy impacts discussed in Chapter 3, Section 3.10 are cumulative in nature.

5.1.11 CUMULATIVE PUBLIC SERVICES IMPACTS

Overall impacts to public services in the region should be beneficial from the improved transit service that would be afforded by the ETB project. A summary of impacts to all public services in Los Angeles County that would be directly affected by the project is provided in Chapter 3, Section 3.11. Both individually and cumulatively, these impacts are deemed insignificant.

5.1.12 CUMULATIVE SOILS/GEOLOGY IMPACTS

No cumulative impacts are anticipated to soils and geology from the project.

5.1.13 CUMULATIVE IMPACTS ON WATER RESOURCES

No cumulative impacts are anticipated to water resources from the project.

5.1.14 CUMULATIVE LIGHT AND GLARE IMPACTS

No cumulative light and glare impacts are anticipated from the project.

5.1.15 CUMULATIVE POPULATION/HOUSING IMPACTS

No cumulative population and housing impacts are anticipated. Individual effects on various aspects of the population and housing are provided in Chapter 3, particularly Section 3.2, Noise, and Section 3.6, Land Use.

5.1.16 CUMULATIVE CONSTRUCTION IMPACTS

Related Projects

a. Setting

The proposed ET bus routes would travel through jurisdictions that have various planned projects related to capital improvement, street/utility maintenance or other infrastructure improvement. An inventory of related projects was compiled to account for potential conflicts. Letters and maps of the proposed ET bus routes passing through jurisdictions were sent to the 20 municipalities and four utility companies that may be affected. The letters requested a copy of Capital Improvement Programs (CIPs) or other documents relating to street/utility or other infrastructure projects that may be affected by the ETB Project. Responses were received from all 24 entities.

The inventory of related projects is tabulated in Chapter 2, Table 2-3. Projects are listed alphabetically by jurisdiction with the following descriptive information: (1) project type and description, (2) location (e.g., street segment), (3) bus routes affected, (4) projected year of implementation and (5) miscellaneous. The types of projects listed include street widening and resurfacing, water or sewer line replacement, development of public transportation facilities and streetscape improvement.

Many of the proposed projects do not have designated years for implementation. Construction phasing for the twelve ETB lines is also not well defined at this point. Due to the uncertain nature of the project phasing for both the ETB project and the related projects shown on the table, it cannot be precisely stated at this time which infrastructure improvement projects would conflict with the ETB Project and visa-versa. Table 2-3 nevertheless presents the range of possibilities.

b. Impacts

The potential exists for the ETB Project to conflict with future infrastructure projects undertaken by municipalities and utility companies. Construction schedules may be juxtaposed, creating an unworkable arrangement. An uncoordinated effort may result in duplicated efforts (e.g., erecting overhead wires only to be taken down by a subsequent street widening project, therefore requiring the reinstallation of wires) with additional expenditures of time and costs.

c. Mitigation

In instances of potential construction impacts, several mitigation strategies are possible. The ETB Project could be postponed until the municipality or utility completes its scheduled project; the entity could an be asked by the RTD to expedite its project construction to prevent a delay in ETB implementation; or in instances of unavoidable project conflicts, certain routes or segments of ETB routes could be built with temporary features (with the understanding that they would be replaced with permanent ETB components following the entity's construction project).

This third mitigation strategy may be used, for example, where ETB construction would occur shortly before the commencement of a municipality's street renovation project involving resurfacing and widening. Under this scenario, street trenching to construct duct banks for cable associated with the traction power substations (TPSSs) could take place with subsequent temporary street and sidewalk covering made up of asphalt or a lean concrete mix. In addition, the overhead contact system (OCS) wires could be supported by temporary wood poles or attached to existing poles with brackets, if the poles offer adequate support. Planned ETB Project streetscaping work could be delayed.

If the engineering design work of the municipality or utility is sufficiently detailed and complete, it is possible in some cases that the ETB construction could avoid the need for temporary components. The ETB Project could be designed and permanently constructed so that it would be physically compatible with the other project. For example, if street widening were planned, the OCS poles could be installed farther back from the street in advance of the widening.

5.2 UNAVOIDABLE ADVERSE IMPACTS

The following environmental impacts may still be significant after mitigation:

- Aesthetics: Complex ETB wiring, hardware and cross span/bracket arm configurations required at certain intersections and locations with unique street conditions would result in visual impacts. These impacts would be exacerbated at signalized intersections where poles are added to the corners (should joint use of poles not occur at the intersection).

- Cultural resources: Complex ETB wiring and additional poles required at intersections where ETBs turn or cross could create significant visual intrusions. The greater the number of turns/crossings the more significant the potential impact. Affected areas include: the Broadway Historic District, the Little Tokyo Historic District, the Spring Street Financial District and the El Pueblo Historic District.

- Aesthetics (cumulative): At specific locations along the routes, specialized and more complex wiring and pole configurations would occur, which considered cumulatively, may be viewed by some as an overall detriment to the regional visual setting.

- Cultural resources (cumulative): Specialized and more complex wiring and pole configurations would occur at specific locations along the route. Within a given historic district, the cumulative impact of the number of turns and crossings in combination with the visual impacts of other projects could have an adverse impact on the historic district.

5.3 IMPACTS DETERMINED NOT TO BE SIGNIFICANT

The following environmental impacts can be mitigated to a level of insignificance:

- Air quality (beneficial)
- Noise (beneficial)
- Vegetation and wildlife
- Utilities and service systems
- Land use/acquisition and displacement
- Transportation/circulation & parking
- Safety/risk of upset
- Energy
- Public services
- Soils/geology
- Water
- Light and glare
- Population/housing
- Construction
- Fiscal

5.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The Phase I "build alternatives" identified in Chapter 2, Section 2.4.3.2, represent the environmentally superior alternative, because they would contribute to significant air quality improvements for the South Coast Air Basin. The proposed project is the only one that would meet the goals and implementation measures in the Air Quality Management Plan. These ETB routes have been selected as the highest priority routes for electrification, due in part to their heavy usage. In addition, implementation of these priority routes would reduce noise levels along the proposed routes and also enhance segments of the routes through landscaping and other design measures.

APPENDIX A.1 -
ELECTRIC TROLLEY BUS PROJECT
GLOSSARY OF TERMS

APN:	Assessor Parcel Number
APTA:	American Public Transit Association
APU:	auxiliary power unit
AQMD:	Air Quality Management District
AQMP:	Air Quality Management Plan; in March 1989, Southern California Air Quality Management District adopted an Air Quality Management Plan in order to attain air quality standards set by the U.S. Environmental Protection Agency, under the provisions of the Clean Air Act (CAA). The Air Quality Management Plan established air pollution control strategies designed to bring the South Coast Air Basin into compliance with federal and state air quality standards.
ARB:	Air Resources Board (see also CARB)
articulated trolley bus:	a trolley bus with two sections of the bus jointed together so as to allow for easier turning movements. An articulated trolley is 60 feet long and 102 inches wide.
BART:	Bay Area Rapid Transit
bracket arm:	part of the overhead contact system for ETBs; a bracket arm is a cantilever (a projecting beam supported at only one end) that extends from a pole to the overhead contact system wires. Bracket arms, in conjunction with cross spans, hold the overhead contact wires at the required height and distance from the pole.
BSL:	Bureau of Street Lighting
BSM:	Bureau of Street Maintenance
BTU:	British Thermal Unit
CAA:	Clean Air Act; as a result of the passage of the California Clean Air Act, the 1989 Air Quality Management Plan was required to be amended to develop new strategies for the South Coast Air Basin to reach attainment of federal and state air quality standards.

CAAQS: California Ambient Air Quality Standards

CARB: California Air Resources Board; the State agency responsible for coordinating both the state and federal air pollution control programs.

CBD: central business district; refers to the downtown metropolitan section or heart of a city

CDFG: California Department of Fish and Game

CEQA: California Environmental Quality Act

CFM: cubic feet per minute

cid: cubic inch displacement; a descriptor of engine size

CIP: capital improvement program

CNDDB: California Natural Diversity Data Base

CNEL: Community Noise Equivalent Level; an energy average of sound levels occurring over a 24-hour period, with 5- and 10-decibel adjustments applied to noise levels occurring during the evening (7:00 PM to 10:00 PM) and nighttime hours (10:00 PM to 7:00 AM), respectively.

CNG: compressed natural gas; under research and development as an alternative to diesel fuel for buses

conduit: a pipe, channel or sheath in which electrical cables are placed for their protection and consolidation, prior to placing them in structures or underground trenches.

cross spans: also cross span assembly; part of the overhead contact system for ETBs; a cross span is a wire supported between two support structures (either buildings or poles) over and across the street. Cross spans, in conjunction with bracket arms, hold the overhead contact system wires at the required height and distance from the pole.

curved segment: a type of special hardware required at intersections where ETB routes cross or turn.

dB: decibel; a degree of loudness; a unit for expressing the relative intensity of sounds on a scale from zero, for the average least perceptible sound, to about 130, for the average pain level.

dBA: A-weighted decibel sound level; the A-scale more closely approximates the range of sensitivity of the human ear to sounds of different frequencies.

DOTA: Department of Transportation Act

DWP: Department of Water and Power

EIR: Environmental Impact Report

EMF: electromagnetic field; results from the presence and motion of electrical charges.

EMI: electromagnetic interference; strong electrical or magnetic fields that produce unwanted currents or voltages (interference) in electronic equipment such as radios and televisions.

EPA: Environmental Protection Agency; a federal agency which monitors and sets standards for the protection of air, water, soil and biological resources.

ETB: electric trolley bus; a bus run by electric motors that receives power from substations and overhead wires.

EV: electric vehicle; refers to one of several types of electric vehicles under research and development for replacement of a portion of urban diesel-powered buses.

Feeder: Refers to a type of power distribution system used for ETBs in which electrical power is transmitted from substations (see TPSS) along the route to underground parallel feeder cables that run lengthwise beneath the street.

Feederless: Refers to a type of power distribution system used for ETBs in which electrical power is transmitted from each substation (see TPSS) to the overhead contact system (described below under OCS).

FTA: Federal Transit Administration (formerly Urban Mass Transportation Administration (UMTA).

gauss: a unit of measurement used to express the field strength of magnetic fields.

gaussmeter: an instrument used to detect magnetic fields, a component of electromagnetic fields. The gaussmeter expresses field strength in gauss (G) or milligauss (mG), 1/1,000 of a gauss.

HC: hydrocarbons; they react with nitrogen dioxide under strong sunlight to form photochemical smog.

headway: the scheduled time between bus arrivals at each stop along the route.

ISA: initial site assessment; a study of a site proposed for construction to determine the current environmental status as well as the potential for environmental impact resulting from the proposed construction.

joint use: refers to use of poles for the ETB overhead contact system in conjunction with existing utility poles, street lights or traffic signals.

Kv: kilo volt; one thousand volts, a unit of electrical potential difference and electromotive force.

Kw: kilo watt; one thousand watts, a unit of power equal to that used to represent the output of power plants, for example.

Kwh: kilo watt-hour; a unit of energy equivalent to the power of one kilo watt operating for one hour.

LA CBD: Los Angeles Central Business District

LACTC: Los Angeles County Transportation Commission

LADOT: Los Angeles Department of Transportation

LADWP: Los Angeles Department of Water and Power; a major electrical utility company serving the South Coast Basin.

LAFD: Los Angeles Fire Department

layover: the amount of time a bus waits at a layover station.

layover station: a location where a bus may wait before proceeding to the next bus stop in order to keep an evenly scheduled distribution of buses along the route.

L_{dn}: day night equivalent sound level; an energy average of sound levels occurring over a 24-hour period, with a 10 decibel adjustment applied to noise occurring during the nighttime hours (10:00 pm to 7:00 am).

L_{eq}: energy equivalent sound level; the value of a steady sound level that represents the same energy as the time-varying sound over the time period.

L_{max}: maximum sound level caused by an event.

L_{nn}: sound exceedance level; the sound level exceeded a certain percentage of the time.

L_{90}: indicates the sound level exceeded 90 percent of the time

LNG:	liquefied natural gas
LRT:	light rail transit
MBL:	Montebello Bus Lines
methanol:	an alternative fuel type under consideration by AQMP to achieve targets for reduction of emission from mobile sources. It is made from organic material such as plants. At present, methanol has proven to be an effective emission reduction fuel alternative.
mG:	milligauss; one thousandth of a gauss. The unit of measurement used to express the field strength of magnetic fields is the milligauss. Magnetic fields are a component of EMFs (electromagnetic fields).
mitigation:	the action that will be taken to eliminate or reduce potential impacts to the environmental setting that could occur if the proposed project is implemented.
MTA:	Metropolitan Transit Authority
MWD:	Metropolitan Water District
NAAQS:	National Ambient Air Quality Standards
NEMA:	National Electrical Manufacturer's Association
NEPA:	National Environmental Policy Act
NHPA:	National Historic Preservation Act
NOP:	Notice of Preparation [of an environmental impact report (EIR)]; the NOP is addressed to agencies which would be affected by a proposed project and requests input from those agencies regarding the scope and content of the environmental information which is related to that agency's statutory responsibilities in connection with the proposed project.
No Project Alternative:	Under the No Project Alternative, all bus lines in Los Angeles County would continue to be powered by internal combustion engines that comply with EPA-mandated exhaust emission standards.
NO_x:	nitrogen oxides; pollutants; refers to nitrogen dioxide and nitrogen oxide together, which are formed as a result of fuel combustion under high temperature and pressure.
NS:	No Standard; refers to a particular pollutant for which no legal emission standard has been set.

NYCTA: New York City Transit Authority

OCS: overhead contact system; refers to the overhead wires (and the structures used to support those wires) used to transmit electricity from the power distribution system to ETBs.

OSHA: Occupational Safety and Health Administration; both federal and state agencies whose function it is to determine potential hazards in the workplace, set standards, dispense information regarding prevention of hazards and monitor compliance.

OTT: Office of Transportation Technologies

PAFC: phosphoric acid fuel cell

PDS: power distribution system; refers to the system used to transmit electricity from the electric utility system to the overhead contact system for ETBs, including substations and associated underground cables.

PEM: proton exchange membrane; a fuel cell technology for bus applications.

PM_{10}: particulate matter; refers to particles suspended in air which are 10 microns or less in diameter, of which nitrates, sulfates and dust particles are major components. PM_{10} may be emitted as a by-product of fuel combustion, through abrasion (such as wear on tires or brake linings) or through wind erosion of soil.

ppd: pounds per day

ppm: parts per million

PTD: particulate trap diesel; a technology used in conjunction with diesel buses utilizing a ceramic oxidizer muffler to collect particulates.

related projects: roadway, street lighting and other infrastructure improvements; historic preservation activities; and development of public transportation facilities planned in municipalities through which the proposed ETB project would pass, and which may affect or be affected by the proposed project.

RF: radio frequency

ROG: reactive organic gases; ROG are formed from the combustion of fuels and the evaporation of organic solvents. Ozone is formed by photochemical reactions between NO_x and ROG.

RTD: Rapid Transit District

SCAB: South Coast Air Basin; consists of the non-desert portions of Los Angeles, Riverside and San Bernadino Counties and all of Orange County, covering a total area of 6,600 square miles.

SCAQMD: Southern California Air Quality Management District; enforces standards and regulates permission for new stationary pollution sources within the South Coast Air Basin (SCAB).

SCE: Southern California Edison; a major electrical utility company serving the South Coast Basin.

section insulator: a type of special hardware required on overhead wires at intersections where ETB routes cross or turn, and at substations.

SEL: sound exposure level; that constant sound level which has the same amount of energy in one second as the original noise event.

SFMR: San Francisco Municipal Railway

SOPA: Society of Professional Archaeologists

South Coast Air Basin: also known as SCAB; consists of the non-desert portions of Los Angeles, Riverside and San Bernadino Counties and all of Orange County, covering a total area of 6,600 square miles. This area has the most severe air pollution problem in the United States.

SO_2: sulfur dioxide; a major component of pollution in industrial areas. SO_2 contributes to reduced visibility and formation of PM_{10} when reacted with NO_2 in the atmosphere.

SO_x: sulfates; the chemical designation for compounds containing sulfur and oxygen found in the atmosphere in the form of particulate matter. A California State Air Quality Standard has been established for sulfates. Sulfates are formed mainly by the oxidation of sulfur dioxide in the atmosphere.

SPE: solid polymer electrolyte; a fuel cell technology for bus applications.

SRO: single room occupancy

standard trolley bus: a non-articulated trolley; typically 40 feet long and 102 inches wide.

substation: see TPSS; traction power substation

TPSS: traction power substation; a structure containing electrical equipment that converts utility-supplied alternating current (AC) power to 750-volt direct current (DC) power, for use by ETBs.

TSM: transportation system management

turnout switches: a type of special hardware that allows electric trolley buses (ETBs) to turn from one route onto a crossing route.

UCLA: University of California at Los Angeles

UMTA: Urban Mass Transportation Administration (now called the FTA)

USFWS: U.S. Fish and Wildlife Service

VDT: video display terminals; also known as computer terminals and television sets

VFD: Vancouver Fire Department

VMT: vehicle miles travelled; used in the Air Quality Management Plan to delineate the number of miles travelled by motor vehicles. For example, Air Quality Management Plan motor vehicle VMT penetration assumes that by the year 2010, 30 percent of urban buses will be operated by electricity and 70 percent on alternate fuels. VMT is also used to estimate emissions from mobile sources.

vpd: vehicles per day; used to describe the traffic flow in a given area in numbers of vehicles on a given day.

ZEB: zero-emission bus; i.e., buses which produce no tailpipe emissions.

APPENDIX A.2 - BIBLIOGRAPHY

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APPENDIX A.3 - PERSONS AND ORGANIZATIONS CONSULTED

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APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Burbank	Street improvement	On 3rd Street from Magnolia Boulevard to Verdugo Avenue (excluding the Magnolia, Olive Street and Verdugo intersections).	Study Route 182	Unscheduled	
Commerce	Water line installation: A new line will be put in.	The part of the water line running along Olympic Boulevard would extend from the Long Beach Freeway (Highway 710) to Montebello Boulevard. The portion running through the city of Commerce extends from Goodrich Boulevard to Gerhart Avenue.	66/67	1993-1994	This project is being undertaken by the Central Basin Metropolitan Water District.
El Monte	Street widening (the extent of widening is not known at this time).	On Santa Anita Avenue between Mildred Street and Garvey Avenue.	70	Not known at this time.	
El Monte	Soundwall installation	At the intersection of state Highway 10 and Santa Anita Avenue.	70	Not known at this time.	This is a Caltrans project.
Glendale	Street widening: The project will provide a consistent width of 46 feet (it presently varies between 40 and 46 feet).	On Wilson Avenue between Glendale Avenue and San Fernando Road.	Study Route 182	1995-1996	
Glendale	Street improvement: Brand Street will be reconstructed and resurfaced.	On Brand between Milford Street and Colorado Boulevard.	Study Route 182	1995-1996	
Glendale	Street widening: Colorado Street will be widened from 56 to 64 feet, providing an 8-foot parkway on each side.	On Colorado between Brand and the eastern city limits (near the Glendale Freeway [Highway 2]).	Study Route 182	1994-1995	

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Glendale	Streetscape improvement: The South Brand Boulevard area would be improved consistent with the area's new use plan.	On Brand between Colorado and San Fernando Road.	Study Route 182	1991-1996	
Glendale	Bus shelter installations	On Glenoaks Avenue and Colorado.	Study Route 182	1991-1993	
Glendale	Streetscape improvement: The project would widen curbs, gutters, bus stop lanes, as well as install trees, pedestrian lighting, benches and banners.	On Brand between Milford and Colorado.	Study Route 182	1992-1995	
Glendale	High occupany vehicle lane installation.	At the intersection of state Highway 134 and Brand Boulevard.	Study Route 182	Not known at this time.	This is a Caltrans project.
Hawthorne	Street reconfiguration	On Hawthorne Boulevard between 137th Street and 139th Street.	40	1992-1994	
Inglewood	Master Plan: A plan will be completed to aid the city in its efforts to revitalize the downtown commercial area.	Market Street area bounded by Florence Avenue and Kelso Avenue.	40	It will be completed in 1992-1993.	Inglewood CIP Project #23.
Inglewood	Redevelopment project: Residential units will be built in-town.	The corner of La Brea Avenue, Florence, and Market.	40	Begins in 1992-1993.	Inglewood CIP Project #30.
Inglewood	Sewer replacement: Deteriorating sewers will be replaced.	La Brea at Hardy Street and 96th Street. The sewer lines are perpendicular to La Brea but touch the street at Hardy and 96th.	40	Occurs in 1993-1994 and 1992-1993, respectively.	Inglewood CIP Project #41.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Inglewood	Street improvement: Downtown part of Market Street will be revitalized.	On Market Street in the Central Business District (CBD).	40	1992-1993	Inglewood CIP Project #66.
Inglewood	Area improvement: The CBD will be improved by revising the circulation, landscape and hardscape of the area.	On La Brea Avenue and Market Street from Florence to the intersection of Spruce Avenue and La Brea Drive.	40	Design begins in 1993-1994, and construction begins in 1994-1995.	Inglewood CIP Project #70.
Inglewood	Utility undergrounding: Overhead utilities will be placed below ground.	On Florence Avenue from Manchester Boulevard to the east city limits (near West Boulevard).	40	Starts in 1993-1994; it will take several years to complete.	Inglewood CIP Project #71.
Lawndale	Specific Plan: The Hawthorne Boulevard Specific Plan covers the part of Hawthorne Boulevard that passes through the city. Planned improvements include the following: relocating the median strip and center parking bays to the outside portions of the boulevard, new transit stops, implementation of a uniform lighting and landscaping program and undergrounding of utilities.	On Hawthorne Boulevard between the northern (Rosecrans Avenue) and southern (Redondo Beach Boulevard) city limits.	40	1992-1997.	Lawndale residents will vote on the Specific Plan in November of 1992.
Long Beach	Utility undergrounding: Overhead utilities will be placed below ground.	On Anaheim Street from Orange Avenue to Pacific Coast Highway.	LB 40	1993 (concurrent and in coordination with the ETB Project's demonstration line).	
Long Beach	Street widening	On Alamitos Avenue from Pacific Coast Highway to Ocean Boulevard.	LB 40, LB 90	1996-2000	

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Long Beach	Street resurfacing and reconstruction: The bridge will undergo seismic retrofit.	Long Beach Boulevard Bridge over the Los Angeles River.	LB 50	1992-1993	
Long Beach	Street resurfacing and reconstruction	On Artesia Boulevard between Harbor Avenue and the Los Angeles River.	LB 50, LB 60	1992-1993	
Long Beach	Street resurfacing and reconstruction: The bridge will undergo seismic retrofit.	Artesia Boulevard Bridge over the Los Angeles River.	LB 60	1992-1993	
Long Beach	Street resurfacing and reconstruction	On Atlantic Avenue between Harding Street and 52nd Street.	LB 60	1993-1994	
Long Beach	Street resurfacing and reconstruction	On Atlantic Avenue between 7th Street and Ocean Boulevard.	LB 60	1996-1998	
Long Beach	Seismic retrofit	At the undercrossing intersection of state Highway 405 and Long Beach Boulevard.	LB 50	Not known at this time.	This is a Caltrans project.
Los Angeles	Street improvement: The project will resurface the roadway, including minor base repair and installation of bus pads.	On 3rd Street from Alvarado Street to Boylston Street.	16	Construction was scheduled to start in 1991.	Los Angeles CIP Project #7759.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street conversion: Two streets would be converted into a one-way couplet.	On 6th and 7th Streets in the downtown area.	16,18	No scheduled date.	This project was suggested in 1990 by the Los Angeles Department of Transportation's (LADOT's) One-Way Street Proposal in the Urban Core. The proposed improvement has not yet been funded.
Los Angeles	Bus mall: A Central Bus Mall will be built.	In the general vicinity of Bixel Street. The mall will run north-south.	16, 18	Unknown	This project is proposed in the Central City West Specific Plan.
Los Angeles	Street widening: The project will widen streets in the vicinity of the Central Library. Improvements will include asphalt concrete pavement, curbs, gutters and sidewalks, relocating a catch basin, street lights, and traffic signals. Base failure on 5th Street will be repaired.	The streets surrounding the Central Library: the south side of 5th Street, east side of Flower Street, and west side of Grand Avenue.	16, 18	Construction will start in 1993.	Los Angeles CIP Project #7830.
Los Angeles	Street improvement: The project will overlay the existing asphalt concrete pavement with a minimum of two-inch asphalt concrete pavement and construct bus pads at bus stop locations.	On Figueroa Street between 2nd Street and 6th Street.	16, 18	Construction will start in 1994.	Los Angeles CIP Project #8154.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street widening: The project will widen a street segment by the construction of asphalt concrete pavement, concrete curb and gutter, concrete sidewalk, catch basins, sewers, traffic signals, street lights and street trees. Additional rights-of-way will be required.	On Figueroa Street between 6th Street and 7th Street.	16, 18	Construction will start on 01/10/93.	Los Angeles CIP Project #T0019.
Los Angeles	Street improvement: The project will reconstruct the street with asphalt concrete pavement over a new base. Concrete gutters, bus pads and access ramps will be constructed.	On 6th Street from Figueroa Street to Grand Avenue.	16, 18	Construction will start in 1994.	Los Angeles CIP Project #7673.
Los Angeles	Electrical line upgrade: This project will add underground cables to existing conduit to increase electrical capacity. The street trenching work should take less than 3 to 4 months.	In the general vicinity of the intersection of 4th Street and Alameda Street.	16, 18; deadhead for routes 30/31, 40 and 45	1997	This is a LADWP project. The new cables will rebuild Distribution Station #37.
Los Angeles	Street improvement: The project will repair base failures, resurface pavement with two-inch asphalt concrete and construct bus pads and access ramps.	On 6th Street from Grand Avenue to Wall Street.	16, 18, 30/31, 40, 45, 70	Construction will start in 1993.	Los Angeles CIP Project #7614.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street improvement: The project will reconstruct the street and include the removal of existing curb and gutter, pavement, bus pads and base. New construction will include base material where needed, asphalt concrete pavement, concrete bus pads, concrete curbs and gutters, storm drains and sewer work.	On Spring Street from 1st Street to 9th Street.	16, 18, 30/31, 40, 66/67	Construction was scheduled to start on 07/15/91.	Los Angeles CIP Project #7420.
Los Angeles	Street improvement: The project will reconstruct the concrete curbs and gutters, sidewalks, buspads and asphalt concrete pavement. It will also replace the existing obsolete sanitary sewers and relocate catch basins and traffic signals.	On Alvarado Street from 3rd Street to 8th Street.	16, 18, 66/67	Construction will start in 1994.	Los Angeles CIP Project #8057.
Los Angeles	Street improvement: The project will completely reconstruct the roadway and base material. Construction will include a new asphalt concrete roadway, concrete curbs and gutters, concrete bus pads and access ramps all over new base material.	On 3rd Street from Hill Street to San Pedro Street.	16, 30/31, 40, 45, 70	Construction will start after 1995.	Los Angeles CIP Project #7845.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street improvement: The project will widen the street and include improvements such as asphalt concrete pavement, concrete curbs and gutters, concrete sidewalks, storm drains, sanitary sewers, street lighting, traffic signals and trees. Additional rights-of-way will be required.	On 6th Street from Oxford Avenue to Kingsley Drive.	18	Construction was scheduled to start on 01/02/92.	Los Angeles CIP Project #5025.
Los Angeles	Street improvement: The project will resurface and reconstruct the street. The improvements will include an asphalt surface of variable thickness, base failure repair, bus pads and access ramps.	On 6th Street from Alvarado Street to Witmer Street.	18	Construction will start after 1995.	Los Angeles CIP Project #7866.
Los Angeles	Bridge retrofit: This historic bridge will undergo seismic retrofit.	On Whittier Boulevard over the Los Angeles River.	18	Undetermined	
Los Angeles	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Soto Street and Whittier Boulevard.	18	This line is projected to open in 2001.	The station is a part of Alternatives 7 and 8.
Los Angeles	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Lorena Street and Whittier Boulevard.	18	This line is projected to open in 2001.	The station is a part of Alternatives 7 and 8.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street widening: The project will widen street sections, including asphalt concrete pavement, curbs, gutters, concrete sidewalks, access ramps, catch basins, street lights, traffic signals and bus pads. Additional rights-of-way will be required.	On Arlington Avenue between Pico Boulevard to 17th Street.	30/31	Construction will start in 1995.	Los Angeles CIP Project #7159.
Los Angeles	Street improvement: The project will reconstruct and widen the existing roadway and construct a new intersection alignment. The improvements will include asphalt concrete pavement, concrete curbs and gutters, concrete sidewalks and bus pads; and relocation of street lights, sewers, catch basins, access ramps and some utilities.	On Normandie Avenue between Olympic Boulevard and Pico Boulevard.	30/31	Construction was scheduled to start on 07/01/92.	Los Angeles CIP Project #1441.
Los Angeles	Street intersection improvement: The project will align an intersection by constructing asphalt concrete pavement, concrete curbs and gutters, sewers, catch basins, street lighting, concrete bus pads and access ramps. The traffic island will be removed. Additional rights-of-way will be required.	The intersection of Normandie Avenue and Pico Boulevard.	30/31	Construction will start after 1995.	Los Angeles CIP Project #7937.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street improvement: The project will resurface the roadway including minor base repair and installation of bus pads.	On Pico Boulevard from La Brea Avenue to Muirfield Road.	30/31	Construction was scheduled to start on 05/01/92.	Los Angeles CIP Project #7758.
Los Angeles	Viaduct improvement: The project will replace the existing railing, reconstruct and seal the 14 existing expansion joints, repair spalls and seal cracks by epoxy injection.	On 1st Street (viaduct over the Los Angeles River) between Vignes Street to Mission Road.	30/31	Construction will start in 1993.	Los Angeles CIP Project #7751.
Los Angeles	Bridge retrofit: This historic bridge will undergo seismic retrofit.	On 1st Street over the Los Angeles River.	30/31	Undetermined	
Los Angeles	Heavy rail transit: A Metro Red Line station will be constructed.	Near the intersection of Pico Boulevard, San Vicente Boulevard and Rimpau Boulevard.	30/31	This line is projected to open in 2001.	
Los Angeles	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Boyle Avenue and 1st Street.	30/31	This line is projected to open in 2001.	The station is a part of Alternatives 5 and 9.
Los Angeles	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of State Street and 1st Street.	30/31	This line is projected to open in 2001.	The station is a part of Alternatives 5 and 6.
Los Angeles	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Soto Street and 1st Street.	30/31	This line is projected to open in 2001.	The station is a part of Alternatives 5 and 6.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Lorena Street and 1st Street.	30/31	This line is projected to open in 2001.	The station is a part of Alternatives 5 and 6.
Los Angeles	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Indiana Street and 1st Street.	30/31	This line is projected to open in 2001.	The station is a part of Alternatives 3, 5, 6, 9 and 10.
Los Angeles	Street improvement: The project will reconstruct the existing asphalt concrete pavement, concrete gutters, bus pads and sanitary sewers.	On 7th Street from Hope Street to Maple Street.	30/31, 40, 45, 70	Construction will start after 1995.	Los Angeles CIP Project #8073.
Los Angeles	Street improvement: The project will construct asphalt concrete pavement, bus pads, curbs and gutters.	On North Broadway between Aliso Street and 1st Street.	30/31, 40, 45, 70	Construction will start after 1995.	Los Angeles CIP Project #8159.
Los Angeles	Street improvement: The project will repair base failure, resurface with asphalt concrete pavement and construct bus pads.	On Alvarado Street from 8th Street to Pico Boulevard.	30/31, 66/67	Construction will start in 1994.	Los Angeles CIP Project #8068.
Los Angeles	Street reconstruction: The project will completely reconstruct the street within the existing roadway. The improvements will include asphalt concrete pavement, base material, concrete curbs and gutters as required, access ramps and bus pads.	On Hill Street between 9th Street and 17th Street.	30/31, 66/67, 70	Construction will start in 1994.	Los Angeles CIP Project #7962.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street improvement: The project will widen and reconstruct the streets around the Convention Center of Central Los Angeles. The improvements will also include the construction of a new street adjacent to a freeway off-ramp and relocation of sewer and storm drain lines outside the proposed expansion site.	On Figueroa Street between Pico Boulevard and Venice Boulevard; on Pico between Figueroa and Sentous Street; on Venice between Figueroa and DeLong Street; on the on-ramp to the Harbor Freeway at Blaine Street and 11th Street.	30/31, 70	Construction was scheduled to start on 04/15/91.	Los Angeles CIP Project #8011.
Los Angeles	Street improvement: The project will reconstruct the roadway; improvements will include asphalt concrete pavement, integral curbs and gutters, and sidewalk.	On Commercial Street from Alameda Street to Center Street.	40	Construction will start in 1995.	Los Angeles CIP Project #7842.
Los Angeles	Storm drain installation.	On 3rd Avenue from Martin Luther King Jr. Boulevard to 41st Drive; on 41st Drive from 3rd Avenue to Arlington Avenue.	40	Construction was scheduled to start on 08/15/91.	Los Angeles CIP Project #5790.
Los Angeles	Street improvement: The project will reconstruct several streets; the improvements will include asphalt concrete pavement, storm drains, sewers, street lighting, traffic signals, trees and landscaping. Rights-of-way will be required at several intersecting corners.	On Alameda Street and North Spring Street, between El Myra Street and Arcadia Street.	40, 70	Construction will start on 07/01/93.	Los Angeles CIP Project #6580.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street improvement: The project will completely reconstruct the roadway, base and gutter, install access ramps, and relocate signals and light posts. Street car rails and wood ties will be removed.	On North Broadway between College Street and Sunset Boulevard.	45	Construction will start after 1995.	Los Angeles CIP Project #7281.
Los Angeles	Street improvement: The project will resurface the roadway with asphalt concrete pavement over fabric; repair base failure, as required; reconstruct concrete curbs and gutters; and construct bus pads and access ramps.	On North Broadway between the Los Angeles River and College Street.	45	Construction will start after 1995.	Los Angeles CIP Project #7934.
Los Angeles	Bridge retrofit: This historic bridge will undergo seismic retrofit.	On Broadway over the Los Angeles River.	45	Undetermined	
Los Angeles	Park and ride lot construction	At the intersections of state highways 105 and 110.	45	Not known at this time.	This is a Caltrans project.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street improvement: The project will remove and replace asphalt concrete pavement, as well as improve the concrete curbs and gutters, concrete sidewalks, storm drains, traffic signals, street trees and street lighting. Additional rights-of-way will be required for purposes of street lighting, subsurface retaining wall footing, underground drainage, slopes and construction.	On Alameda Street from Olympic Boulevard to 25th Street.	66/67	Construction starts in 1995.	Los Angeles CIP Project #4520.
Los Angeles	Street improvement: The project will reconstruct and seal expansion joints, repair spalls, seal cracks by epoxy injection, repair sidewalk and paint railing.	On the Olympic Boulevard Bridge (over the Los Angeles River) from Santa Fe Avenue to Rio Vista Avenue.	66/67	Construction will start in 1994.	Los Angeles CIP Project #7753.
Los Angeles	Bridge retrofit: This historic bridge will undergo seismic retrofit.	On Olympic Boulevard over the Los Angeles River.	66/67	Undetermined	
Los Angeles	Street improvement: The project will construct asphalt concrete pavement, curbs and gutters. Existing sanitary sewers within the project limits will also be replaced.	On Santa Fe Avenue from Hunter Street to 25th Street.	66/67	Construction will start after 1995.	Los Angeles CIP Project #8112.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street improvement: The project will replace obsolete sewer lines with appurtenant facilities in the street. Improvements include asphalt concrete pavement, replacement of damaged curbs, construction of bus pads and access ramps and repair of base failure as required.	On 8th Street from Lorena Street to Olympic Boulevard.	66/67	Construction will start in 1995.	Los Angeles CIP Project #7838.
Los Angeles	Street conversion: Two streets would be converted into a one-way couplet.	On 8th and 9th Streets between Western Avenue and the Harbor Freeway (Highway 110).	66/67	No scheduled date.	
Los Angeles	Electrical line upgrade: This project will add underground cables to existing conduit to increase electrical capacity. The street trenching work should take less than 3 to 4 months.	In the general vicinity of the intersection of Olympic Boulevard and Los Angeles Street.	66/67	1997	This is a LADWP project. The new cables will rebuild Distribution Station #34.
Los Angeles	Highway off-ramp widening	At the intersection of state Highway 110 and 9th Street.	66/67	Not known at this time.	This is a Caltrans project.
Los Angeles	Street improvement: The project will overlay the existing asphalt concrete pavement with a minimum of two-inch asphalt concrete pavement and construct bus pads at bus stop locations.	On Figueroa Street between 7th Street and 12th Street.	66/67, 70	Construction will start in 1995.	Los Angeles CIP Project #8155.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Street improvement: The project will widen streets and also cut back the curb return at a street corner. The improvements will include the construction of asphalt concrete pavements, integral concreted curbs and gutters and sidewalks; and relocation of catch basins and overhead utilities. Additional rights-of-way will be required.	Near the Piper Technical Center: the southeast corner of Macy Street and Vignes Street.	70	Construction will start after 1995.	Los Angeles CIP Project #7947.
Los Angeles	Bridge retrofit: This historic bridge will undergo seismic retrofit.	On Macy Street over the Los Angeles River.	70	Undetermined	
Los Angeles	Storm drain installation.	On Vermont Avenue from 79th Street to 81st Street.	204	Construction will start after 1995.	Los Angeles CIP Project #8015.
Los Angeles	Park and ride lot construction	At the intersection of state Highway 105 and Vermont Avenue.	204	Not known at this time.	This is a Caltrans project.
Los Angeles	Heavy rail transit: A Metro Red Line station is being constructed.	Near the intersection of Vermont Avenue and Wilshire Boulevard.	204	Construction started in 1992.	
Los Angeles	Heavy rail transit: A Metro Red Line station will be constructed.	Near the intersection of Vermont Avenue and Beverly Boulevard.	204	Construction started in 1992.	
Los Angeles	Heavy rail transit: A Metro Red Line station will be constructed.	Near the intersection of Vermont Avenue and Santa Monica Boulevard.	204	Construction started in 1992.	

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles	Heavy rail transit: A Metro Red Line station will be constructed.	Near the intersection of Vermont Avenue and Sunset Boulevard.	204	Construction started in 1992.	
Los Angeles	Heavy rail transit: This location will serve as a construction site for the Metro Red Line.	Near the intersection of Vermont Avenue and Hollywood Boulevard.	204	Construction will start in 1993.	This is called the "muckout" site.
Los Angeles	Storm drain installation.	On Van Nuys Boulevard from just north of Saticoy Street to Covello Street.	560	Construction starts in 1995.	Los Angeles CIP Project #7971.
Los Angeles	Street reconstruction.	On Chandler Boulevard from Van Nuys Boulevard to Hazeltine Avenue.	560	Construction starts in 1993.	Los Angeles CIP Project #7973.
Los Angeles	Electrical line installation: This project will install electrical cable and conduit.	On Rayen Street from Cedros Avenue to Van Nuys Boulevard.	560	Service from this feeder is planned by June 1, 1993.	This is a LADWP project. This project will "reenergize" Feeder #133-11.
Los Angeles	Seismic retrofit	At the overcrossing intersection of state Highway 101 and Van Nuys Boulevard.	560	Not known at this time.	This is a Caltrans project.
Los Angeles County	Water line installation: A new line will be put in.	The part of the water line running along Olympic Boulevard would extend from the Long Beach Freeway (Highway 710) to Montebello Boulevard. The two portions running through Los Angeles County WOULD extend from (1) the Long Beach Freeway to Goodrich Boulevard and (2) from Gerhart Avenue to Concourse Avenue.	66/67	1993-1994	This project is being undertaken by the Central Basin Metropolitan Water District.
Los Angeles County	Road widening	On Whittier Boulevard between Atlantic Boulevard and Garfield Avenue.	18, 66/67, M 10	Construction is scheduled to start in 1993-1994.	This is a Caltrans project.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles County	Road resurfacing	On Olympic Boulevard from Simmons Avenue to Montebello city boundary (near Concourse Avenue).	18, 66/67	Construction is scheduled to start in the winter of 1993.	
Los Angeles County	Road resurfacing	On 1st Street between Indiana Street and Rowan Avenue.	30/31	Construction is scheduled to start in 1993-1994.	
Los Angeles County	Storm drain construction: This is a flood control project.	Near the intersection of Colorado Street and Brand Boulevard.	Study Route 182	Construction is scheduled to start in 1992-1993.	This project is referred to as the Belson Drain.
Los Angeles County	Storm drain construction: This is a flood control project.	On Van Nuys Boulevard between Roscoe Boulevard and Sherman Way.	560	Construction is scheduled to start in 1992-1993.	This project is referred to as the Lanrito Drain.
Los Angeles County	Storm drain construction: This is a flood control project.	Near the intersection of Concord Street and Glenoaks Boulevard.	Study Route 182	Construction is scheduled to start in 1994-1995.	This project is referred to as the Hoover High Drain.
Los Angeles County	Storm drain construction: This is a flood control project.	On Atlantic Avenue between Artesia Boulevard and South Street.	LB 60	Construction is scheduled to start in 1994-1995.	This project is referred to as the Harding Drain.
Los Angeles County	Storm drain construction: This is a flood control project.	Along the east-west segment between Hill Street and Pacific Coast Highway. The following four major streets would be affected: Magnolia Avenue, Pacific Avenue, Long Beach Boulevard and Atlantic Avenue.	LB 50, LB 60	Construction is scheduled to start after 1994-1995.	This is referred to as Project #9037.
Los Angeles County	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Rowan Avenue and Whittier Boulevard.	18	This line is projected to open in 2001.	The station is a part of Alternatives 3, 5, 6, 7, 8, 9 and 10.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Los Angeles County	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Arizona Avenue and Whittier Boulevard.	18	This line is projected to open in 2001.	The station is a part of Alternatives 3, 5, 6, 7, 8, 9 and 10.
Los Angeles County	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Atlantic Boulevard and Whittier Boulevard.	18, 70	This line is projected to open in 2001.	The station is a part of Alternatives 3 through 10.
Los Angeles County	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Goodrich Boulevard and Whittier Boulevard.	18, 70	This line is projected to open in 2001.	The station is a part of Alternatives 3 and 4.
Montebello	Street widening	On Whittier Boulevard between the city limits (western limit near Garfield Avenue, eastern limit near Van Norman Road).	18, M 10	The western end is currently under construction. The center part is being designed with construction expected in 1995. The eastern end widening of Whittier Boulevard will follow.	
Monterey Park	Street resurfacing	On New Avenue from Garvey Avenue to the south.	70	1992-1993	
Monterey Park	Sanitary outfall sewer: A new sewer line will be constructed.	On Garvey Avenue between Ynez Avenue and Alhambra Avenue.	70	Unknown	This project is being undertaken by the Los Angeles County Sanitation Districts.

APPENDIX A.5: RELATED PROJECTS

JURISDICTION	PROJECT TYPE AND DESCRIPTION[1]	LOCATION	BUS ROUTES AFFECTED	PROJECTED YEAR OF IMPLEMENTATION	MISCELLANEOUS
Monterey Park	Heavy rail transit: A Metro Red Line station may be constructed here as part of the eastern extension.[2]	Near the intersection of Atlantic Boulevard and Brooklyn Avenue.	30/31, 70	This line is projected to open in 2001.	The station is a part of Alternatives 4 and 10.
Pasadena	Historic bridge reconstruction	Colorado Boulevard over Arroyo Seco.	Study Route 182	Currently under reconstruction.	City of Pasadena Department of Transportation has expressed opposition to ETB wiring of bridge.
Pasadena	Street lighting	On Green Street from Los Robles Avenue to Hill Avenue.	Study Route 182	On hold; (to be coordinated with ETB project).	
Pasadena	Light rail transit: The Metro Blue Line will be extended from downtown Los Angeles to Pasadena.	Intersection of Colorado Boulevard and Fairoaks Avenue (the proposed Blue Line extension and Study Route 182 cross here).	Study Route 182	Construction is scheduled to start in 1994.	
Torrance	Handicapped curb ramps: Ramps will be installed at street intersections.	On 182nd Street from Kingsdale Avenue to Western Avenue.	40	1992-1993	

Notes: [1] This list does not include transportation system management (TSM) improvements that could improve traffic flow along the proposed electric trolley bus (ETB) routes.
[2] The Metro Red Line eastern extension project is still being formulated. There are presently eight build alternatives (termed Alternatives 3 through 10).

Sources: Capital Improvement Programs (CIPs) and other utility/infrastructure planning documents provided by the 20 municipalities, the California Department of Transportation (Caltrans) and four utilities through whose jurisdictions ETB routes would pass (1992). The 20 municipalities include the County of Los Angeles and the following 19 cities: Alhambra, Burbank, Commerce, Compton, El Monte, Glendale, Hawthorne, Inglewood, Lawndale, Long Beach, Los Angeles, Montebello, Monterey Park, Pasadena, Pico Rivera, Redondo Beach, Rosemead, South El Monte and Torrance. The four utilities are the City of Los Angeles' Department of Water and Power (LADWP), Metropolitan Water District of Southern California, Southern California Edison and Southern California Gas Company.

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
18127 South Alameda Street, Compton	Dominguez Ranch House; Rancho San Pedro	1826	1	Mission Revival/Adobe	Riccard, George/	California Historical Landmark No. 152; Listed In The National Register 05/28/76; Gebhard & Winter 1985; Alameda Corridor 1992 Environmental Impact Report	LB 50
500 East Anaheim Street, Long Beach	Hancock Motors	1928	5	Garage		Long Beach Historical Landmark No. 31	LB 40, LB 60
5000 East Anaheim Street, Long Beach	Recreation Park Golf Clubhouse	N/A	5			Long Beach Historical Landmark No. 60	LB 40
629 Atlantic Avenue, Long Beach	Residential Home	N/A	5	Stores & Residential		Long Beach Historical Landmark No. 62	LB 60, LB 90
703 Atlantic Avenue, Long Beach	St. Luke's Episcopal Church	1934	5	Religious		Long Beach Historical Landmark No. 71	LB 60, LB 90
224 East Broadway, Long Beach	American Hotel	1905	5	3-Story Hotel		Long Beach Historical Landmark No. 3	LB 40, LB 50, LB 60, LB 90
855 Cedar Avenue, Long Beach	Second Church Of Christ Scientist	1924	5	Religious		Long Beach Historical Landmark No. 65	LB 40, LB 50, LB 60, LB 90
855 Elm Avenue, Long Beach	Scottish Rite Cathedral	1926	5	Club		Long Beach Historical Landmark No. 64	LB 40, LB 50
708 Gladys Avenue, Long Beach	Skinny House	1931	5	3-Story Sfr		Long Beach Historical Landmark No. 68	LB 90
215 Long Beach Boulevard, Long Beach	Pacific Tower (Times Bldg.)	1923	5	12-Story Office Building		Long Beach Historical Landmark No. 56	LB 50, LB 60, LB 90, LB 40, LB 50, LB 60, LB
240 Long Beach Boulevard, Long Beach	Acres Of Books	1924	5	Store Building		Long Beach Historical Landmark No. 1	LB 50, LB 60, LB 90, LB 40, LB 50, LB 60, LB
300 Long Beach Boulevard, Long Beach	Us Post Office--Long Beach Main Branch	1932	1	Starved Classicism Post Office	Wetmore, James A./ Simon, Louis A.	Listed In The National Register, 01/11/1985	LB 50, LB 60, LB 90, LB 40, LB 50, LB 60, LB
5351 Long Beach Boulevard, Long Beach	Masonic Hall Commercial Building	1928	5	Club		Long Beach Historical Landmark No. 84	LB 50
540 Olive Avenue, Long Beach	St. Anthony's Church	N/A	5	Nursing Home		Long Beach Historical Landmark No. 70	LB 90
101 Pine Avenue, Long Beach	First National Bank Of Long Beach	1906	1	Renaissance, 6-Story Office Building	Train & Williams/	Listed In The National Register, 09/13/1990; Long Beach Historical Landmark No. 28	LB 60, LB 90
401 Pine Avenue, Long Beach	Walkers Department Store	1940	5	4-Story Commercial Building		Long Beach Historical Landmark No. 77	LB 50, LB 60, LB 90
601 Pine Avenue, Long Beach	Thrifty Drug/ Famous Dept. Store	1926	5	Store Building		Long Beach Historical Landmark No. 74	LB 50, LB 60, LB 90

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
301 1st Street, Los Angeles	Little Tokyo Historic District	1880	1D	Art Deco Religion; Religious	Cline, Edgar/ Et Al.	Listed In The National Register, 08/22/1986; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
121 East 1st Street, Los Angeles		1906	3	Hotel/ Motel	Parkinson & Bergstrom/	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
309 East 1st Street, Los Angeles		1933	1	Commercial	W.C. Cook/ Mieki Hayano	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
312 East 1st Street, Los Angeles	Newark Brothers Building	1906	3	Commercial Building	Rosenheim/ Mc Neil	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
320 East 1st Street, Los Angeles	Progressive Theatre	1910	3	Theater	Young/	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
325 East 1st Street, Los Angeles	L.A. Hongwanji Buddhist Temple	1920	1	Commercial; Temple	Edgar Harris/ C Conolley	State Office of Historic Preservation Statewide Database; Los Angeles Historic-Cultural Monument #313; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
331 East 1st Street, Los Angeles		1914	1	Commercial	Alfred F. Priest/ Pozzo Construction Co.	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
337 East 1st Street, Los Angeles		1905	1	Commercial		State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
341 East 1st Street, Los Angeles		1905	1	Commercial Building		State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
342 East 1st Street, Los Angeles	Koyasan Temple	1940	4	Religious Building	C. Deuel/	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
347 East 1st Street, Los Angeles		1911	1	Commercial		State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
352 East 1st Street, Los Angeles	Moline Plow Company	1904	4	Commercial	Morgan & Walls/	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
355 East 1st Street, Los Angeles	L A. Hongwanji Buddhist Temple	1924	1	Religious Temple	Edgar Harris/ C Conolley	Los Angeles Historic-Cultural Monument #313; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
617 East 1st Street, Los Angeles	L A Soap Company	1898	3	Commercial Building	Morgan & Walls/	State Office of Historic Preservation Statewide Database	RTD 30/31
900 Block East 1st Street, Los Angeles	First Street Bridge	N/A	2	Bridge		Determined Eligible For The National Register By 1987 Caltrans Historic Bridge Survey, Inventory #1166	RTD 30/31
1401 East 1st Street, Los Angeles	Aliso Village	1941	5	International, 2-Story Public Housing	Adams, Davis, Flewelling, Etc./	Gebhard & Winter 1985	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1913 East 1st Street, Los Angeles	Edmond A Kellan Residence	1887	5	Queen Anne Residence		State Office of Historic Preservation Statewide Database; Los Angeles Community Redevelopment Agency Boyle Heights 1 1982 Determination Of Eligibility Report	RTD 30/31
114 East 2nd Street, Los Angeles	St. Vibiana Cathedral	1876	4	Religious Cathedral	Austin, John C.; Kysor/	Los Angeles Historic-Cultural Monument #17; State Office of Historic Preservation Statewide Database	RTD 30/31
1943 East 2nd Street, Los Angeles	Susan A Bell Apartment Building	1897	3	Residential MF		State Office of Historic Preservation Statewide Database	RTD 30/31
1913 West 3rd Street, Los Angeles		1912	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 16
2512 West 3rd Street, Los Angeles	Mother Trust Superet Center	1948	5	Georgian Neo-Classical Religious		Los Angeles Historic-Cultural Monument # 555, 3/18/92	RTD 16
2516 West 3rd Street, Los Angeles		1923	4	Religious Building	Truedell & Newton/ E.L.D. Martinet	State Office of Historic Preservation Statewide Database	RTD 16
6333 West 3rd Street, Los Angeles		1934	4	Ancillary Building	/ Roger Dahljolm	State Office of Historic Preservation Statewide Database	RTD 16
7801 West 3rd Street, Los Angeles	Farmers Market	1852	5	Spanish Colonial Adobe		Los Angeles Historic-Cultural Monument #543, 7/24/91	RTD 16
1302 4th Avenue, Los Angeles		N/A	5D	Renaissance Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1323 4th Avenue, Los Angeles		N/A	5D	Craftsman, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1328 4th Avenue, Los Angeles		1911	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1331 4th Avenue, Los Angeles		1910	5D	Craftsman/ Tudor Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1332 4th Avenue, Los Angeles		1909	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1338 4th Avenue, Los Angeles		1918	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1409 4th Avenue, Los Angeles		N/A	5D	Craftsman/ Tudor Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1415 4th Avenue, Los Angeles		1908	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
4114 4th Avenue, Los Angeles		1932	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4115 4th Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4118 4th Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4119 4th Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4122 4th Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4123 4th Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4126 4th Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4127 4th Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4130 4th Avenue, Los Angeles		1938	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4133 4th Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4134 4th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4137 4th Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4138 4th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4142 4th Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4143 4th Avenue, Los Angeles		1932	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4146 4th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4147 4th Avenue, Los Angeles		1928	5D	English Revival Influence, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4150 4th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
120 East 4th Street, Los Angeles	Edison Substation	N/A	4			Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 16

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
101 West 4th Street, Los Angeles	I N Van Nuys Hotel; Hotel Barclay	1895	1D	Classical Revival, 6-Story Hotel	Morgan & Walls/ Leonardt, C.; Baker Iron Works; Low	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; Los Angeles Historic-Cultural Monument #288; Listed In The National Register 08/10/1979 -Part Of Spring Street Financial District	RTD 16
1609 West 4th Street, Los Angeles		1920	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 16
1629 West 4th Street, Los Angeles		1922	5	2-Story Residential MF		State Office of Historic Preservation Statewide Database	RTD 16
1629 West 4th Street, Los Angeles		1922	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 16
2529 West 4th Street, Los Angeles		1924	5	Residential MF	Lester T Squires/ H T Agenbaun	State Office of Historic Preservation Statewide Database	RTD 16
1319 5th Avenue, Los Angeles		1907	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1326 5th Avenue, Los Angeles		N/A	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1340 5th Avenue, Los Angeles		N/A	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1344 5th Avenue, Los Angeles		N/A	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1347 5th Avenue, Los Angeles		1911	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1407 5th Avenue, Los Angeles		1910	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
1412 5th Avenue, Los Angeles		1909	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
4113 5th Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4117 5th Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4118 5th Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4121 5th Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4122 5th Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4125 5th Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4126 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4129 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4130 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4133 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4134 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4137 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4138 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4141 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4142 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4145 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4146 5th Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
225 East 5th Street, Los Angeles	Fire Station No. 23; Old Fire Station 23; Fire	1910	1	No Style Listed Fire Station	Hudson & Munsell/ Engstrum, F.O. Co.	Listed In The National Register, 06/09/1980; Los Angeles Historic-Cultural Monument #37; State Office Of Historic Preservation Statewide Database	RTD 16, RTD 18
100 West 5th Street, Los Angeles	Hotel Rosslyn Annex	1913	1D	Renaissance Revival, 13-Story Hotel; Hotel/ Motel	Parkinson & Bergstrom/ Engstrum, F. O.; Rosslyn Fireproof Bldg.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 18

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
101 West 5th Street, Los Angeles	New Hotel Rosslyn	1913	1D	13-Story Hotel	Parkinson & Bergstrom/ Engstrum, F. O.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District	RTD 16, RTD 18, RTD 30/31
131 West 5th Street, Los Angeles	Title Insurance Bldg	1910	1D	12-Story Unknown; Commercial	Parkinsteon / Bergstron/ Chester Fireproof Bldg Co	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 18
210 West 5th Street, Los Angeles	Palm Court Of Alexandria Hotel	1906	4	Commercial Building	Parkinson/ Bilicke - Rowan Fireproof Bldg. Co.	Los Angeles Historic-Cultural Monument #80; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
215 West 5th Street, Los Angeles	Chester Williams Building	1926	1D	12-Story Commercial Building	Curlett & Beelman/ Macneil	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
220 West 5th Street, Los Angeles	Jewelry Trades Building; Title Guarantee Block	1912	1D	Romanesque, 8-Story Commercial Building	Morgan, Walls & Morgan/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
315 West 5th Street, Los Angeles	Metropolitan Building	1913	1D	9-Story Commercial Building	Parkinson & Bergstrom/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
401 West 5th Street, Los Angeles	Title Guarantee And Trust Company Building	1930	1	Art Deco; Gothic/Zig Zag Moderne, 12-Story Commerce/Trade	Parkinson & Parkinson/ Multiple; P J Walker	Listed In The National Register, 07/26/1984; Los Angeles Historic-Cultural Monument #278; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
427 West 5th Street, Los Angeles	(Site Of) Philharmonic Auditorium	1906	4	Theatre (demolished)	C F Whittlesley/	Los Angeles Historic-Cultural Monument #81; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
600 West 5th Street, Los Angeles	Los Angeles Central Library	1924	3	Government Building	Bertram G Goodhue/	State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
601 West 5th Street, Los Angeles	One Bunker Hill Building; Edison Bldg	1930	2	Art Deco Commercial	Allison & Allison/ P J Walker	Los Angeles Historic-Cultural Monument #347, 3/25/88; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
630 West 5th Street, Los Angeles	Los Angeles Central Library	1925	1	Mexican Late Baroque Education; Library	Goodhue, Bertram G./	Listed In The National Register, 12/18/1970; Los Angeles Historic-Cultural Monument #46; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
118 East 6th Street, Los Angeles	Coles P. E. Buffet/ Pacific Electric Railway	1908	5	Railway Terminal		Los Angeles Historic-Cultural Monument #104	RTD 18
421 East 6th Street, Los Angeles	City Towel Supply Building	1921	3	Classical Revival/Industrial Vernacular, 3-Story Industrial/Laundry	Saunders, Walter J./ Johnson, S. P.; Wams, W. E.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
1500 Block East 6th Street, Los Angeles	Sixth Street/ Whittier Boulevard Bridge	N/A	2	Bridge		Determined Eligible For The National Register By 1987 Caltrans Historic Bridge Survey, Inventory #595	RTD 18
2800 East 6th Street, Los Angeles		1921	4	1-Story Residence	/ D Anderson	State Office of Historic Preservation Statewide Database	RTD 18
2837 East 6th Street, Los Angeles		1908	3	Residence	/ Herman Scheider	State Office of Historic Preservation Statewide Database	RTD 18
3042 East 6th Street, Los Angeles		1908	4	Residence	Mary A Tilton/	State Office of Historic Preservation Statewide Database	RTD 18
3085 East 6th Street, Los Angeles		1905	3	1-Story Residence	H M Allen/ H M Allen	State Office of Historic Preservation Statewide Database	RTD 18
3220 East 6th Street, Los Angeles		1910	4	Residence	Andrew Schrock/ Amdrew Schrock	State Office of Historic Preservation Statewide Database	RTD 18
217 West 6th Street, Los Angeles	Finney's Cafeteria; The Chocolate Shop	1914	1D	4-Story Commercial Building	Plummer/ Feil/ Neustadt	Los Angeles Historic-Cultural Monument #137; State Office of Historic Preservation Statewide Database; Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District.	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
315 West 6th Street, Los Angeles	Wood Brothers Building	1922	1D	3-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
412 West 6th Street, Los Angeles	Park Central Building; Baker-Detwiler Building	1913	3	Renaissance Revival, 14-Story Commercial/Offices;	Fitzhugh, Thornton/ Unknown; Foundation By James A. Hill	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
460.West 6th Street, Los Angeles		1930	3	Theater	B Marcus Priteca/ Lange Bergstrom	State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
478 West 6th Street, Los Angeles	Juarez Theatre	1931	5	Theatre	Priteca, B. Marcus/	Los Angeles Historic-Cultural Monument #251	RTD 16, RTD 18
502 -510 West 6th Street, Los Angeles	Associated Realty Building	1920	3	Renaissance Revival, 12-Story Commercial/Offices	Dodd & Richards/ Scofield Eng. Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Datavase	RTD 16, RTD 18

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515 West 6th Street, Los Angeles	Pacific Mutual Life Insurance Company Bldg.	1920	3	Renaissance Revival, 12-Story Commercial/Offices	Dodd & Richards/ Scofield Eng. & Const. Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 16, RTD 18
523 West 6th Street, Los Angeles	Pacific Mutual Building	1936	3	Beaux Arts Commercial/Office	Parkinson, J & D;Dodd & Richards/ Scofield Eng. & Const. Co.	Los Angeles Historic-Cultural Monument #398, 11/23/88; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
600 West 6th Street, Los Angeles	Edwards & Wildey Building; National Oil Bldg	1924	3	Romanesque Revival, 13-Story Offices/Commercial;	Walker & Eisen; Parkinson, J. D./ Edwards, Wildey, & Dixon Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
612 West 6th Street, Los Angeles	Edwards & Wildey Building Addition	1926	3	Italian Gothic, 2-Story Bank/Offices	Parkinson & Parkinson/ Edwards, Wildey & Dixon	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
1710 West 6th Street, Los Angeles		1918	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
1728 West 6th Street, Los Angeles		1923	5	Religious Building	Allison & Allison/ W Crowell Co	State Office of Historic Preservation Statewide Database	RTD 18
1905 West 6th Street, Los Angeles		1922	5	Hotel/ Motel		State Office of Historic Preservation Statewide Database	RTD 18
1925 West 6th Street, Los Angeles		1924	5	Hotel/ Motel		State Office of Historic Preservation Statewide Database	RTD 18
2030 West 6th Street, Los Angeles		1925	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
2127 West 6th Street, Los Angeles		1918	4	Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
2205 West 6th Street, Los Angeles		1920	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
2230 West 6th Street, Los Angeles	Gen. Douglas Mac Arthur Park	1886	5	Park		Los Angeles Historic-Cultural Monument #100	RTD 18
2403 West 6th Street, Los Angeles		1913	5	Residential MF	I Nooman/ Day Labor	State Office of Historic Preservation Statewide Database	RTD 16
2432 West 6th Street, Los Angeles		1924	5	Commercial	/ William Fleming Co	State Office of Historic Preservation Statewide Database	RTD 18
2500 West 6th Street, Los Angeles		1925	5	8-Story Commercial Building	Shields, Fisher, & Lake/ Trewhitt Shields Co	State Office of Historic Preservation Statewide Database	RTD 18

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2501 West 6th Street, Los Angeles		1925	3	Residential MF	Russell & Alpangh/ Scofield Engineer Co	State Office of Historic Preservation Statewide Database	RTD 18
2820 -2830 West 6th Street, Los Angeles	De Neve, Felipe, Branch L A Public Library	1929	1	Mediterranean Education; Library;	Whittlesey, Austin/	Listed In The National Register, 05/19/1987; Los Angeles Historic-Cultural Monument #452, 10/17/89; State Office of Historic Preservation Statewide Database	RTD 18
3251 West 6th Street, Los Angeles	United Church Of Religious Science	N/A	2	Religious Building		State Office of Historic Preservation Statewide Database	RTD 18
3451 West 6th Street, Los Angeles	Chapman Park Market Building	1929	2	Mediterranean Revival Unknown	Morgan, Walls, & Clements/	Officially Determined Eligible to the National Register On 9-19-1983; Los Angeles Historic-Cultural Monument #386, 8/30/88; State Office of Historic Preservation Statewide Database	RTD 18
3501 West 6th Street, Los Angeles	Chapman Park Studio Building	1929	2	Mediterranean Revival, 2-Story Shop/Studio	Morgan, Walls, & Clements/	Los Angeles Historic-Cultural Monument #280; Officially Determined Eligible to the National Register On 9-19-1983	RTD 18
3519 West 6th Street, Los Angeles		N/A	2	Unknown		State Office of Historic Preservation Statewide Database	RTD 18
122 East 7th Street, Los Angeles	Mercantile Building/Standard Holding Corp.	1923	3	Neo-Gothic, 13-Story Offices/Commercial;	Walker & Eisen/ Edwards, Wildey, & Dixon Company	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31
111 West 7th Street, Los Angeles	Board Of Trade Building	1925	1D	Neo Classical, 10-Story Commercial/Offices;	Curlett & Beelman/ Mcneil, J. V.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 30/31
117 West 7th Street, Los Angeles	Hellman Bank Building	1924	1D	Unknown; Commercial	Schultz / Weaver/ Scofield	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 30/31
210 West 7th Street, Los Angeles	Van Nuys Bldg	1911	1D	11-Story Unknown; Commercial	Morgan / Walls / Morgan/ Crowell	State Office of Historic Preservation Statewide Database; Listed On The National Register, 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 30/31, RTD 40, RTD 45, RTD 70
401 West 7th Street, Los Angeles	Pantages Theatre/Warner Bros. Downtown Theatre	1919	3	Beaux Arts, 9-Story Commercial Building	Priteca, B. Marcus/ Newcomb, Earl B.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
431 West 7th Street, Los Angeles	L A Athletic Club Building	1912	4	Beaux Arts Ancillary Building;	Parkinson And Bergstrom/	Los Angeles Historic-Cultural Monument #69; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
513 West 7th Street, Los Angeles	Brock & Co. Jewelers/ Cliftons Cafeteria	1922	3	Churriguereque Restaurant	Dodd & Richards/ Scofield Engineering Co	Los Angeles Historic-Cultural Monument #358, 4/15/88; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
527 West 7th Street, Los Angeles		1913	3	Commercial Building	J Austin/Milwaukee Bldg/	State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
529 West 7th Street, Los Angeles	Quinby Building	1926	3	13-Story Commercial Building	Meyer & Holler/ Meyer & Holler	State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
700 West 7th Street, Los Angeles		1925	3	Commercial Building	Curlett & Beelman/ Scofield Engineering Co	State Office of Historic Preservation Statewide Database	RTD 66/67
818 West 7th Street, Los Angeles	Barker Brothers Building	1925	2	Beaux Arts/Renaissance Revival, 2-Story Commercial Building	Curlett & Beelman/ Scofield Co	Los Angeles Historic-Cultural Monument #356, 4/26/88; State Office of Historic Preservation Statewide Database	RTD 66/67
1610 West 7th Street, Los Angeles	Young's Market Building	1924	3	Greco Roman Commercial Building	Plummer, Charles F./ Crowell Co	Los Angeles Historic-Cultural Monument #113; State Office of Historic Preservation Statewide Database	RTD 66/67
217 East 8th Street, Los Angeles	217 East 8th Street Building	1926	3	Gothic Revival/Commercial, 12-Story Commercial/Offices;	Lee, W. Douglas/ Lee, W. Douglas	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 66/67
315 East 8th Street, Los Angeles	Textile Center Building	1925	3	Commercial Building	W. Douglas Lee/ W. Douglas Lee	State Office of Historic Preservation Statewide Database	RTD 66/67
200 West 8th Street, Los Angeles	Lane Mortgage Building	1922	3	Renaissance Revival, 12-Story Commercial/Offices	Smith, Loy Lester/ Clinton Const. Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 66/67
301 West 8th Street, Los Angeles	Merritt Building	1914	1D	Italian Renaissance, 5-Story Commercial Building	Reid Brothers/ Mc Neil	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70
315 West 8th Street, Los Angeles	Textile Center Building	1925	3	Gothic Revival, 12-Story Commercial/Offices	Lee, W. Douglas/ Lee, W. Douglas	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 66/67

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
403 West 8th Street, Los Angeles	Garfield Building	1929	1	Art Deco, 12-Story Office Building	Beelman, Claud/ Baruch Co	Listed in The National Register, 06/25/1982; Los Angeles Historic-Cultural Monument #121; State Office of Historic Preservation Statewide Database	RTD 66/67
416 West 8th Street, Los Angeles	Commercial Exchange Building	1923	3	Renaissance Revival, 13-Story Offices/Commercial	Walker & Eisen/ Wm. Simpson Const Co.; Kress Moving Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 66/67
419 West 8th Street, Los Angeles		1905	3	Commercial	Doran/ Martin	State Office of Historic Preservation Statewide Database	RTD 66/67
813 West 8th Street, Los Angeles	1st Methodist Church Of Los Angeles	1922	3	Religious Building	Austin/	State Office of Historic Preservation Statewide Database	RTD 66/67
3251 West 8th Street, Los Angeles	Administration Building	N/A	2			Officially Determined Eligible to the National Register On 9-19-83	RTD 66/67
127 East 9th Street, Los Angeles	Harris Newmark Building (Exterior)	1926	5	Renaissance Revival, 12-Story Loft Building	Curlett & Beelman/	Los Angeles Historic-Cultural Monument #345, 2/23/88	RTD 40, RTD 45, RTD 66/67, RTD 70
101 West 9th Street, Los Angeles	William May Garland Building	1923	3	Renaissance Revival, 13-Story Commercial/Offices;	Curlett & Beelman/ P. J. Walker Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office Of Historic Preservation Statewide Database	RTD 66/67
102 West 9th Street, Los Angeles	Marsh & Strong Building	1912	3	Renaissance Revival, 12-Story Commercial/Offices;	Dorn, Fred R./ Alta Planing Mill Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 66/67
245 West 9th Street, Los Angeles		1902	5	Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
257 West 9th Street, Los Angeles		1900	5	Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
263 West 9th Street, Los Angeles		1908	5	Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
315 West 9th Street, Los Angeles	Coast Federal Savings Building	1926	5	Beaux Arts/Italian Renaissance Commercial	Morgan, Wells, & Clements/	Los Angeles Historic-Cultural Monument #346, 3/11/88	RTD 66/67
318 West 9th Street, Los Angeles	Insurance Exchange Building	1923	3	Renaissance Revival, 12-Story Commercial/Offices;	Curlett & Beelman/ Macdonald & Kahn	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 66/67
369 West 9th Street, Los Angeles		1895	5	Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
419 West 9th Street, Los Angeles		1912	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 66/67
437 West 9th Street, Los Angeles	Morgan House (Harbor Area Y W C A)	N/A	5	Craftsman	Morgan, Julia/	Los Angeles Historic-Cultural Monument #186	RTD 66/67

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1319 12th Avenue, Los Angeles		1910	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1320 12th Avenue, Los Angeles		1914	5D	Art Deco, 2-Story Apartments		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1325 12th Avenue, Los Angeles		N/A	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1332 12th Avenue, Los Angeles		1912	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1338 12th Avenue, Los Angeles		1912	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1339 12th Avenue, Los Angeles		1908	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1342 12th Avenue, Los Angeles		1914	5D	Prairie, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1402 12th Avenue, Los Angeles		1914	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1403 12th Avenue, Los Angeles		1910	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1406 12th Avenue, Los Angeles		1916	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1409 12th Avenue, Los Angeles		1948	5D	Craftsman, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1417 12th Avenue, Los Angeles		1913	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
3425 West 15th Street, Los Angeles	The House Of God Church	N/A	5/5D	Carpenter Gothic Revival, 1-Story Church		Los Angeles Department Of Planning 1990 Survey;Central Arlington Heights Neighborhood District	RTD 30/31
160 West 24th Street, Los Angeles		1888	4	Queen Anne, 2 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;Significant For Unaltered Condition And Location Near Los Angeles Cbd	RTD 40, RTD 45
1308 West 25th Street, Los Angeles	Campbell Altig Gregory Residence	1891	4	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1286 West 29th Street, Los Angeles		1900	3	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1294 West 29th Street, Los Angeles		1900	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1300 West 29th Street, Los Angeles		1922	4	Residential MF		State Office of Historic Preservation Statewide Database	RTD 204

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1306 West 29th Street, Los Angeles		1907	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1332 West 29th Street, Los Angeles		1900	1	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1340 West 29th Street, Los Angeles		1907	1	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1346 West 29th Street, Los Angeles		1907	3	2-Story Residence	/ R C Thompson	State Office of Historic Preservation Statewide Database	RTD 204
1352 West 29th Street, Los Angeles		1900	1	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1358 West 29th Street, Los Angeles		1907	1	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1360 West 29th Street, Los Angeles		1900	1	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1168 West 30th Street, Los Angeles		1909	5	Residence	/ John Hayes	State Office of Historic Preservation Statewide Database	RTD 204
1171 West 30th Street, Los Angeles		1906	3	Residence	/ Sayer Hansen	State Office of Historic Preservation Statewide Database	RTD 204
1175 West 30th Street, Los Angeles		1907	3	Residential Fourplex	Ernest Gray/	State Office of Historic Preservation Statewide Database	RTD 204
1187 West 30th Street, Los Angeles		1907	3	Residential MF		State Office of Historic Preservation Statewide Database	RTD 204
1195 West 30th Street, Los Angeles		1900	3	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1200 West 30th Street, Los Angeles		1900	3	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1201 West 30th Street, Los Angeles		1902	5	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1206 West 30th Street, Los Angeles		1900	3	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1207 West 30th Street, Los Angeles		1921	3	Residential MF	Larralde & Barber/ Jones & Williams	State Office of Historic Preservation Statewide Database	RTD 204
1214 West 30th Street, Los Angeles		1900	3	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1215 West 30th Street, Los Angeles		1900	3	Residential MF	/ Denver Building Co	State Office of Historic Preservation Statewide Database	RTD 204
1220 West 30th Street, Los Angeles		1900	3	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1221 West 30th Street, Los Angeles		1900	3	1-Story Residence	/ Denver Building Co	State Office of Historic Preservation Statewide Database	RTD 204
1227 West 30th Street, Los Angeles		1900	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1238 West 30th Street, Los Angeles		1909	4	Unknown		State Office of Historic Preservation Statewide Database	RTD 204
1240 West 30th Street, Los Angeles		1900	3	Residence	Frank Hudson/ W B Kirlen	State Office of Historic Preservation Statewide Database	RTD 204
1241 West 30th Street, Los Angeles		1894	4	Residential MF		State Office of Historic Preservation Statewide Database	RTD 204
1246 West 30th Street, Los Angeles		1900	3	Residential MF		State Office of Historic Preservation Statewide Database	RTD 204
1247 West 30th Street, Los Angeles		1903	5	Residence		State Office of Historic Preservation Statewide Database	RTD 204

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1264 West 30th Street, Los Angeles		1897	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 204
223 West 40th Place, Los Angeles		1905	5D	Turn Of The Century/ Colonial Revival, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;Queen Anne/ Transitional Thematic Group	RTD 40, RTD 45
3331 West 43rd Place, Los Angeles		1939	3/5D	Art Deco, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
3341 West 43rd Place, Los Angeles	Watchtower Theatre/ Jehovah's Witness	1931	3/5D	Art Deco, 1-Story Theater/ Commercial	Morgan, Walls & Clements/ Lindgren & Swinerton	Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District;Habs Ca-2029;Gebhard & Winter 1985	RTD 40
3343 West 43rd Place, Los Angeles		1933	4/5D	Art Deco, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
3401 West 43rd Place, Los Angeles		1939	5D	Streamline Moderne, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
3411 West 43rd Place, Los Angeles		N/A	5D	Streamline Moderne Influence; French Rev, 1; 2-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
3419 West 43rd Place, Los Angeles		1941	5D	Streamline Moderne Influence, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
328 West 45th Street, Los Angeles		1907	5D	Turn Of The Century, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
332 West 45th Street, Los Angeles		1925	5D	Turn Of The Century/ Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
336 West 45th Street, Los Angeles		1909	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
337 West 45th Street, Los Angeles		1906	5D	Turn Of The Century, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
341 West 45th Street, Los Angeles		1908	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
344 West 45th Street, Los Angeles		1909	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
345 West 45th Street, Los Angeles		1911	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
348 West 45th Street, Los Angeles		1936	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
349 West 45th Street, Los Angeles		1909	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
350 West 45th Street, Los Angeles		1960	5D	Turn Of The Century, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
351 West 45th Street, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
354 West 45th Street, Los Angeles		1907	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
355 West 45th Street, Los Angeles		1906	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 45th Street Craftsman/ Turn Of Century District	RTD 45
160 West 50th Street, Los Angeles		1910	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
206 West 50th Street, Los Angeles		1907	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
207 West 50th Street, Los Angeles		1953	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
210 West 50th Street, Los Angeles		1913	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
211 West 50th Street, Los Angeles		1907	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
214 West 50th Street, Los Angeles		1948	5D	Turn Of The Century/ Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
215 West 50th Street, Los Angeles		1907	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
219 West 50th Street, Los Angeles		1908	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
220 West 50th Street, Los Angeles		1908	5D	Turn Of The Century/ Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
224 West 50th Street, Los Angeles		1908	5D	Turn Of The Century/ Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
226 West 50th Street, Los Angeles		1905	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
231 West 50th Street, Los Angeles		1911	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
232 West 50th Street, Los Angeles		1907	5D	Turn Of The Century/ Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
235 West 50th Street, Los Angeles		1903	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
236 West 50th Street, Los Angeles		1907	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
237 West 50th Street, Los Angeles		1908	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
240 West 50th Street, Los Angeles		1912	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
241 West 50th Street, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 50th Street Craftsman District	RTD 45
331 West 50th Street, Los Angeles		1909	5	American Foursquare/ Queen Anne Influ., 2-Story Residence		Los Angeles Department of Planning 1991 Survey	RTD 45
322 West 52nd Street, Los Angeles		1912	5D	Craftsman, 2-Story Residential Fourplex		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45
326 West 52nd Street, Los Angeles		1910	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45
327 West 52nd Street, Los Angeles		1907	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45
331 West 52nd Street, Los Angeles		1907	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45
332 West 52nd Street, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45
336 West 52nd Street, Los Angeles		1908	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45
337 West 52nd Street, Los Angeles		1908	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45
339 West 52nd Street, Los Angeles		1906	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45
342 West 52nd Street, Los Angeles		1923	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 52nd Street Craftsman Cluster	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
844 West 54th Street, Los Angeles		1909	5	Residence	/ F E Edmison	State Office of Historic Preservation Statewide Database	RTD 45
860 West 54th Street, Los Angeles		1908	5	Residence		State Office of Historic Preservation Statewide Database	RTD 45
900 West 54th Street, Los Angeles		1910	5	2-Story Residence	Oliver W Wood/ O W Wood	State Office of Historic Preservation Statewide Database	RTD 204, RTD 45
936 West 54th Street, Los Angeles		1922	5	Residence	/ Abe Jacobs	State Office of Historic Preservation Statewide Database	RTD 204, RTD 45
940 West 54th Street, Los Angeles		1913	5	1-Story Residence	Roy Herzberger/ Roy Herzberger	State Office of Historic Preservation Statewide Database	RTD 204, RTD 45
1024 West 54th Street, Los Angeles		1909	5	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204, RTD 45
1048 West 54th Street, Los Angeles		1912	5	1-Story Residence	/ E J Shepard	State Office of Historic Preservation Statewide Database	RTD 204, RTD 45
1052 West 54th Street, Los Angeles		1912	5	1-Story Residence	F H Redpath Co/ F H Redpath Co	State Office of Historic Preservation Statewide Database	RTD 204, RTD 45
1122 West 54th Street, Los Angeles		1912	5	Residence	F H Redpath Co/ F H Redpath Co	State Office of Historic Preservation Statewide Database	RTD 45
1126 West 54th Street, Los Angeles		1912	5	Residence	F H Redpath Co/ F H Redpath Co	State Office of Historic Preservation Statewide Database	RTD 45
1134 West 54th Street, Los Angeles		1912	5	Residence	F H Redpath Co/ F H Redpath Co	State Office of Historic Preservation Statewide Database	RTD 45
1138 West 54th Street, Los Angeles		1912	5	Residence	F H Redpath Co/ F H Redpath Co	State Office of Historic Preservation Statewide Database	RTD 45
3301 West 54th Street, Los Angeles		1929	5D	Spanish Colonial Revival, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Crenshaw Boulevard Commercial District	RTD 40
163 West 55th Street, Los Angeles		1909	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
164 West 55th Street, Los Angeles		1905	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
201 West 55th Street, Los Angeles		1908	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
204 West 55th Street, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
205 West 55th Street, Los Angeles		1907	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
208 West 55th Street, Los Angeles		1923	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
209 West 55th Street, Los Angeles		1904	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
212 West 55th Street, Los Angeles		1908	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
215 West 55th Street, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
216 West 55th Street, Los Angeles		1941	5D	Turn Of The Century, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
219 West 55th Street, Los Angeles		1909	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
220 West 55th Street, Los Angeles		1906	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
224 West 55th Street, Los Angeles		1903	5D	Turn Of The Century, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
225 West 55th Street, Los Angeles		1921	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
228 West 55th Street, Los Angeles		1910	5D	Colonial Revival/ Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
229 West 55th Street, Los Angeles		1908	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
232 West 55th Street, Los Angeles		1956	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
235 West 55th Street, Los Angeles		1921	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
236 West 55th Street, Los Angeles		1906	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
240 West 55th Street, Los Angeles		1911	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
241 West 55th Street, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;West 55th Street Craftsman District	RTD 45
920 West 55th Street, Los Angeles		1909	5	1-Story Residence	F H Redpath/ F H Redpath	State Office of Historic Preservation Statewide Database	RTD 204
928 West 55th Street, Los Angeles		1909	5	1-Story Residence	/ F E Edmison	State Office of Historic Preservation Statewide Database	RTD 204
932 West 55th Street, Los Angeles		1909	5	1-Story Residence	F H Redpath/ F H Redpath	State Office of Historic Preservation Statewide Database	RTD 204

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1025 West 55th Street, Los Angeles		1911	5	1-Story Residence	/ Emily Fountain	State Office of Historic Preservation Statewide Database	RTD 204
1028 West 55th Street, Los Angeles		1913	5	Residence	/ E A Eastman	State Office of Historic Preservation Statewide Database	RTD 204
1040 West 55th Street, Los Angeles		1919	5	1-Story Residence	/ B A Dexter	State Office of Historic Preservation Statewide Database	RTD 204
1041 West 55th Street, Los Angeles		1911	5	Residence	Edmison Cook Co/ Edmison Cook Co	State Office of Historic Preservation Statewide Database	RTD 204
1044 West 55th Street, Los Angeles		1911	5	Residence	/ Jacob Smith	State Office of Historic Preservation Statewide Database	RTD 204
1045 West 55th Street, Los Angeles		1911	5	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1048 West 55th Street, Los Angeles		1910	5	1-Story Residence	/ Jacob Smith	State Office of Historic Preservation Statewide Database	RTD 204
1053 West 55th Street, Los Angeles		1912	5	Residence	C B Johnson/ Jacob Kamp	State Office of Historic Preservation Statewide Database	RTD 204
941 West 56th Street, Los Angeles		1911	5	1-Story Residence	/ G Dombrowsky	State Office of Historic Preservation Statewide Database	RTD 204
1021 West 56th Street, Los Angeles		1917	5	2-Story Residence	J E Botkin/ J E Botkin	State Office of Historic Preservation Statewide Database	RTD 204
1041 West 56th Street, Los Angeles		1911	5	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1052 West 56th Street, Los Angeles		1911	5	1-Story Residence	John V Eyre/ John V Eyre	State Office of Historic Preservation Statewide Database	RTD 204
1057 West 56th Street, Los Angeles		1913	5	1-Story Residence	/ John Macsean	State Office of Historic Preservation Statewide Database	RTD 204
227 West 57th Street, Los Angeles		1906	5D	Turn Of The Century/ Colonial Influence, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;Queen Anne/ Transitional Thematic Group	RTD 45
900 West 57th Street, Los Angeles		1910	5	1-Story Residence	/ F E Edmison	State Office of Historic Preservation Statewide Database	RTD 204
1038 West 57th Street, Los Angeles		1928	5	Residential MF	Jules B Koppel/ Leo J Minkner	State Office of Historic Preservation Statewide Database	RTD 204
1046 West 57th Street, Los Angeles		1931	5	Residential MF	W Eckert/ Foster-Huntley Inc	State Office of Historic Preservation Statewide Database	RTD 204
1050 West 57th Street, Los Angeles		1931	5	Residential MF	W Eckert/ Foster-Huntley Inc	State Office of Historic Preservation Statewide Database	RTD 204
1061 West 57th Street, Los Angeles		1929	5	2-Story Residential MF	/ O K Clarke	State Office of Historic Preservation Statewide Database	RTD 204
3238 West 59th Place, Los Angeles		1920	5	Craftsman, 1 1/2-Story Residence		Los Angeles Department Of Planning 1990 Survey	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
901 West 60th Street, Los Angeles		1907	5	Residence		State Office of Historic Preservation Statewide Database	RTD 204
943 West 60th Street, Los Angeles		1900	5	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 204
1012 West 60th Street, Los Angeles		1923	5	Residential MF	Saul H Brown/ John Kissler	State Office of Historic Preservation Statewide Database	RTD 204
1018 West 60th Street, Los Angeles		1922	5	Residential MF	/ S Adelman	State Office of Historic Preservation Statewide Database	RTD 204
1022 West 60th Street, Los Angeles		1922	5	Residential MF	/ S Adelman	State Office of Historic Preservation Statewide Database	RTD 204
1028 West 60th Street, Los Angeles		1922	5	Residential MF	/ S Adelman	State Office of Historic Preservation Statewide Database	RTD 204
1050 West 60th Street, Los Angeles		1923	5	Residential MF	P Hale/ Morrow & Baer	State Office of Historic Preservation Statewide Database	RTD 204
927 West 61st Street, Los Angeles		1939	3	Residential MF	R E Williams/ Perry Fredericksen	State Office of Historic Preservation Statewide Database	RTD 204
1129 West 61st Street, Los Angeles		1916	5	Residence	John F Boice/ Moses Shaw	State Office of Historic Preservation Statewide Database	RTD 204
1017 West 62nd Street, Los Angeles		1890	3	Residence		State Office of Historic Preservation Statewide Database	RTD 204
225 West 66th Street, Los Angeles		1923	5D	Queen Anne Influence, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;Queen Anne/ Transitional Thematic Group	RTD 45
129 West 70th Street, Los Angeles		1911	5D	Turn Of The Century/ Queen Anne, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;Queen Anne/ Transitional Thematic Group	RTD 45
221 West 78th Street, Los Angeles		1920	5	Turn Of The Century, 1-Story Residence		Los Angeles Department of Planning 1991 Survey	RTD 45
165 West 88th Place, Los Angeles		95	5D	Queen Anne, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;Queen Anne/ Transitional Thematic Group	RTD 45
327 West 91st Place, Los Angeles		1904	5D	Queen Anne, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;Queen Anne/ Transitional Thematic Group	RTD 45
310 West 95th Street, Los Angeles	Faith Lutheran Church & Covenant School	1927	5	Spanish Colonial Revival, 2-Story Church And School		Los Angeles Department of Planning 1991 Survey	RTD 45
200 West 97th Street, Los Angeles		90	5D	Turn Of The Century/ Colonial Revival, 1 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey;Queen Anne/ Transitional Thematic Group	RTD 45
1315 West Adams Boulevard, Los Angeles	William & Ella Bonsall Residence	1899	4	Residence		State Office of Historic Preservation Statewide Database	RTD 204
1449 West Adams Boulevard, Los Angeles	African Methodist Cathedral	1930	5	Italian Romanesque Revival Church	Patterson, H.M./	Los Angeles Historic-Cultural Monument #341, 1/22/88	RTD 204

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
800 North Alameda Street, Los Angeles	Los Angeles Union Passenger Terminal	1939	1	Moderne Railroad Depot	Parkinson,John & Donald B./ Robert E Mckee	Listed In The National Register, 11/13/1980; Los Angeles Historic-Cultural Monument #101; State Office Of Historic Preservation Statewide Database	RTD 40, RTD 40, RTD 45
900 North Alameda Street, Los Angeles	U S Post Office- Los Angeles Terminal Annex	1937	1	Mission/Spanish Revival Post Office	Underwood, Gilbert S./ Neal A Melick	Listed In The National Register, 01/11/1985; Determined Eligible/Determination Of Eligibility Process, 05/24/1983; Officially Determined Eligible to the National Register On 5-24-83; State Office of Historic Preservation Statewide Database	RTD 40, RTD 40, RTD 45
1801 Albion Street, Los Angeles	Albion Worker's Cottage & Milagro Market; Albi	1878	5D	Pioneer Constr./Worker's Cottages; Itall, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey; Los Angeles Historic-Cultural Monu	RTD 45
1819 Albion Street, Los Angeles		N/A	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2303 Alta Street, Los Angeles		1888	5D	Queen Anne/Eastlake Influence, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency Lincoln Heights 1 1981 Architectural/ Historical Survey	RTD 45
2311 Alta Street, Los Angeles		53	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2322 Alta Street, Los Angeles		26	5D	Turn Of Century/Colonial, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2326 Alta Street, Los Angeles		95	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2327 Alta Street, Los Angeles		1915	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2328 Alta Street, Los Angeles		95	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2333 Alta Street, Los Angeles		1893	5D	Queen Anne, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2338 Alta Street, Los Angeles		1907	5D	Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency Lincoln Heights 1 1981 Architectural/ Historical Survey	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
2339 Alta Street, Los Angeles		1893	5D	Queen Anne, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency Lincoln Heights 1 1981 Architectural/ Historical Survey	RTD 45
403 South Alvarado Street, Los Angeles		1905	4	Residence		State Office of Historic Preservation Statewide Database	RTD 18
417 South Alvarado Street, Los Angeles		1910	5	Residence		State Office of Historic Preservation Statewide Database	RTD 18
0 Alvarado Terrace, Los Angeles	Alvarado Terrace Historic District	1902	1D	Modern Movement Landscape; Park		Listed In The National Register, 05/17/1984	RTD 30/31
1317 Alvarado Terrace, Los Angeles	Edmund H Barmore House	1902	4	English/German Chateaux Residence	Charles Shattuck/	Los Angeles Historic-Cultural Monument #83; State Office of Historic Preservation Statewide Database	RTD 30/31
1325 Alvarado Terrace, Los Angeles	Morris R Cohn House	1902	3	Queen Anne/Shingle Colonial Reviv. Residence Sf	Hudson & Munsell/ J Hanson	Los Angeles Historic-Cultural Monument #84; State Office of Historic Preservation Statewide Database	RTD 30/31
1333 Alvarado Terrace, Los Angeles	Wilbur F Gilbert House	1902	4	Residence	/ Powers, Pomeroy; Ben Powers	Los Angeles Historic-Cultural Monument #85; State Office of Historic Preservation Statewide Database	RTD 30/31
1345 Alvarado Terrace, Los Angeles	Residence	1902	4	Residence	Haley/	Los Angeles Historic-Cultural Monument #86; State Office of Historic Preservation Statewide Database	RTD 30/31
1353 Alvarado Terrace, Los Angeles	Residence; Robert H Raphael House	1902	4	Chateau, 2-Story Residence	Hunt & Eager/ Olaf Johnson	Los Angeles Historic-Cultural Monument #87; State Office of Historic Preservation Statewide Database	RTD 30/31
5107 Argus, Los Angeles		1913	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5112 Argus, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5113 Argus, Los Angeles		1922	5D	English Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5118 Argus, Los Angeles		1920	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5120 Argus, Los Angeles		1935	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5123 Argus, Los Angeles		1919	5/5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5128 Argus, Los Angeles		1912	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5129 Argus, Los Angeles		1923	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5132 Argus, Los Angeles		1923	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5133 Argus, Los Angeles		1913	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5136 Argus, Los Angeles		1911	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5139 Argus, Los Angeles		1921	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5142 Argus, Los Angeles		1925	5D	English Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5143 Argus, Los Angeles		1915	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5149 Argus, Los Angeles		1920	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5153 Argus, Los Angeles		1939	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5154 Argus, Los Angeles		1935	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
1130 South Arlington Avenue, Los Angeles	Milbank/Mc Fie Estate	1913	5	Mediterranean, 2-Story Residence	Stimson, G. Lawrence/	Los Angeles Historic-Cultural Monument #420, 12/13/89	RTD 30/31
1209 South Arlington Avenue, Los Angeles	Ernest A Montgomery Home	1908	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1214 South Arlington Avenue, Los Angeles		1921	4	Residence	Ache/	State Office of Historic Preservation Statewide Database	RTD 30/31
1220 South Arlington Avenue, Los Angeles		1925	4	Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1221 South Arlington Avenue, Los Angeles		1925	3	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1233 South Arlington Avenue, Los Angeles	H George Beer	1923	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1240 South Arlington Avenue, Los Angeles	William L Thornton Home	1911	4	2-Story Residence	Milwaukee Building Co/ Milwaukee Building Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1245 South Arlington Avenue, Los Angeles	David E Spangler	1915	4	2-Story Residence	Butler Bros Construction/ Butler Bros Construction	State Office of Historic Preservation Statewide Database	RTD 30/31
1250 South Arlington Avenue, Los Angeles	Jon P Schleiein Home	1925	3	Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1251 South Arlington Avenue, Los Angeles		1922	3	2-Story Residence	Milwaukee Building Co./ Wilwaukee Building Co	State Office of Historic Preservation Statewide Database	RTD 30/31
214 South Avenue 18, Los Angeles		1886	5D	Vernacular, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Area Architectural/ Historical Survey	RTD 45
246 South Avenue 18, Los Angeles		1905	5D	Colonial Revival, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
260 South Avenue 18, Los Angeles		1895	5D	Queen Anne, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
213 South Avenue 19, Los Angeles		90	5D	Queen Anne Influence, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
215 South Avenue 19, Los Angeles		1895	5D	Queen Anne Influence, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
217 South Avenue 19, Los Angeles		1911	5D	Vernacular Cottage, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
226 South Avenue 19, Los Angeles		1892	5D	Queen Anne Influence, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
230 South Avenue 19, Los Angeles		1941	5D	Colonial/ Craftsman, 1-Story Residential Court		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
243 South Avenue 19, Los Angeles		1918	5D	American Foursquare/ Colonial Infl., 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
246 South Avenue 19, Los Angeles		1890	5D	Colonial Revival Influence, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
247 South Avenue 19, Los Angeles		1898	5D	Eclectic, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
255 South Avenue 19, Los Angeles		1905	5D	Colonial Revival, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
225 South Avenue 20, Los Angeles		1925	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
231 South Avenue 20, Los Angeles		1910	5D	Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
257 South Avenue 20, Los Angeles		1906	5D	Turn Of Century/Colonial, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
261 South Avenue 20, Los Angeles		1888	5D	Queen Anne Influence, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
265 South Avenue 20, Los Angeles		1878	5D	Vernacular, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
1324 South Berendo Street, Los Angeles	Pico Heights Christian Church	1917	4	Religious Building		State Office of Historic Preservation Statewide Database	RTD 30/31
411 Bernard Street, Los Angeles	Phillip Fritz Residence	1888	4	Residence		State Office of Historic Preservation Statewide Database	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
403 South Bonnie Brae Street, Los Angeles	Grier-Musser House	1885	5	Eastlake, 2-Story Residence		Los Angeles Historic-Cultural Monument #333, 12/18/87; State Office of Historic Preservation Statewide Database	RTD 16
423 South Bonnie Brae Street, Los Angeles		1910	5	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 16
818 South Bonnie Brae Street, Los Angeles	Mooers, Frederick Mitchell, Residence	1894	1	Moorish; Eclectic, 2-Story Residence Sf	Merithew/ Wright	Listed In The National Register, 06/03/1976; Los Angeles Historic-Cultural Monument #45; State Office of Historic Preservation Statewide Database	RTD 66/67
824 South Bonnie Brae Street, Los Angeles	Charles B Boothe Residence;Bonnie Brae Theater	1893	3	Colonial Revival/Moorish Infl. Residence Sf	Bradbeer, James/ Arnold	Los Angeles Historic-Cultural Monument #491, 7/30/90; State Office of Historic Preservation Statewide Database	RTD 66/67
1314 South Bonnie Brae Street, Los Angeles		1907	1	Residence	Charles Shattuck/	State Office of Historic Preservation Statewide Database	RTD 30/31
105 North Boyle Avenue, Los Angeles	Lambourn & Turner Grocery/Hotel Mt Pleasant	1876	5	Hotel/ Motel		State Office of Historic Preservation Statewide Database	RTD 30/31
300 North Broadway, Los Angeles	Hall Of Justice	1926	3	Classical/Renaissance Revival Influence, 12-Story Institutional/ Jail	Allied Architects; Montrose Warn/	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office Of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 70
1500 Block North Broadway, Los Angeles	North Broadway Bridge	N/A	2	Bridge		Determined Eligible For The National Register By 1987 Caltrans Historic Bridge Survey, Inventory #545	RTD 45
1830 North Broadway, Los Angeles		1910	5D	Commercial/Utilitarian; Turn Of Century/, 2; 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1985 Lincoln Heights 1 Expanded Architectural/ Historical Survey	RTD 45
2126 North Broadway, Los Angeles		39	5D	Post War Moderne, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2137 North Broadway, Los Angeles		09	5D	Vernacular/Classical Influence, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2201 North Broadway, Los Angeles	Federal Bank Building	1910	3/5D	Classical Revival; Italian Renaissance, 1-Story Bank; Commercial	Neher & Skilling/	Los Angeles Department of Planning 1989 Survey;Lahcm# 396;Part Of The Lincoln Heights Neighborhood District;Gebhard & Winter 1985;State Office of Historic Preservation Database; Los Angeles Historic-Cultural Monument #396, 11/23/88	RTD 45
2205 North Broadway, Los Angeles		96	5D	Mission Revival, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
2407 North Broadway, Los Angeles		01	5D	Vernacular/Classical Influence, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2417 North Broadway, Los Angeles		1930	5D	Commercial Vernacular, 2-Story Commercial Bldg.		State Office of Historic Preservation Statewide Database;Altered Since Previous Survey But Los Angeles Department of Planning 1989 Survey Confirms Still Contibutes To District	RTD 45
2421 North Broadway, Los Angeles	Lincoln Heights Chamber Of Commerce Bldg	N/A	5D	Art Deco, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2430 North Broadway, Los Angeles		1928	5D	Art Deco, 1-Story Bank		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;State Office of Historic Preservation Statewide Database	RTD 45
2621 North Broadway, Los Angeles		26	5D	Vernacular, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2624 North Broadway, Los Angeles		12	5D	Art Deco, 2-Story Theatre		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2701 North Broadway, Los Angeles		11	5D	Vernacular/Classical Influence, 3-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2707 North Broadway, Los Angeles		41	5D	Vernacular, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2716 North Broadway, Los Angeles		1922	5D	Commercial Vernacular/Deco Infl., 2-Story Commercial Bldg.	Stokley & Bamford/ Kemp Bros	Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;State Office of Historic Preservation Statewide Database	RTD 45
2721 North Broadway, Los Angeles		90	5D	Vernacular, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2725 North Broadway, Los Angeles		30	5D	Classical Influence, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2729 North Broadway, Los Angeles		24	5D	Vernacular/Classical Influence, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2814 North Broadway, Los Angeles		1910	5D	Colonial Revival, 2-Story Mortuary		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;State Office of Historic Preservation Statewide Database	RTD 45
2826 North Broadway, Los Angeles		19	5D	Classical Influence, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
2919 North Broadway, Los Angeles		27	5D	Renaissance Revival Influence, 2-Story Apt. Building		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3001 North Broadway, Los Angeles	Lincoln Heights Station	53	5D	Post War Moderne, 1-Story Post Office		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3011 North Broadway, Los Angeles		1914	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1982 Lincoln Heights 2 Architectural/ Historical Survey	RTD 45
3015 North Broadway, Los Angeles		1885	4/5D	Eastlake, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;State Office of Historic Preservation Statewide Database;Los Angeles Community Redevelopment Agency 1982 Lincoln Heights 2 Architectural/ Histo	RTD 45
3017 North Broadway, Los Angeles		62	4/5D	Eastlake, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;State Office of Historic Preservation Statewide Database;Los Angeles Community Redevelopment Agency 1982 Lincoln Heights 2 Architectural/ Histo	RTD 45
3110 North Broadway, Los Angeles	Horace B. Dibble House; Residence	1887	3/5D	Eastlake/Queen Anne Infl., 2-Story Residence	/ Vernon	Los Angeles Department of Planning 1989 Survey;Los Angeles Historic-Cultural Monument #157;Part Of The Lincoln Heights Neighborhood District;State Office of Historic Preservation Statewide Database; Los Angeles Historic-Cultural Mo	RTD 45
3121 North Broadway, Los Angeles		1915	5D	Vernacular, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency 1982 Lincoln Heights 2 Architectural/ Historical Survey	RTD 45
3125 North Broadway, Los Angeles		06	5D	Turn Of Century/Queen Anne Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3220 North Broadway, Los Angeles		40	5D	Classical Influence, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3325 North Broadway, Los Angeles		55	5D	Mission Revival, 1-Story Church		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3400 North Broadway, Los Angeles		1905	5D	Utilitarian, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency Lincoln Heights 1 1981 Architectural/ Historical Survey	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
3401 North Broadway, Los Angeles	Abraham Lincoln High School	N/A	5/5D	Pwa Moderne, 2-Story High School		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3402 North Broadway, Los Angeles		22	5D	Vernacular, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3422 North Broadway, Los Angeles		22	5D	Vernacular, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3516 North Broadway, Los Angeles		1930	5D	Wpa Moderne, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District;Los Angeles Community Redevelopment Agency Lincoln Heights 1 1981 Architectural/ Historical Survey	RTD 45
3522 North Broadway, Los Angeles		13	5D	Renaissance Influence, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3532 North Broadway, Los Angeles		23	5D	Vernacular/Classical Influence, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3616 North Broadway, Los Angeles		05	5D	Turn Of Century, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3620 North Broadway, Los Angeles		02	5D	Turn Of Century/Colonial, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3630 North Broadway, Los Angeles		07	5D	Vernacular/Craftsman Influence, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
3636 North Broadway, Los Angeles		N/A	5D	Turn Of Century/Colonial, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
0 South Broadway, Los Angeles	Braun Bldg; Broadway Theatre And Commercial Di	1913	1	Commercial Building	Sanders/	State Office Of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
237 South Broadway, Los Angeles	Boston Dry Goods Store	1895	3	Commercial Building	Eisen & Hunt/ Arnold Mackey Young	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
249 South Broadway, Los Angeles	Irvine Block/ Byrne Building	1895	3	Beaux Arts/Classical; Classical Revival, 5-Story Commercial/Offices;	Hunt, Sumner; Morgan & Walls/	Los Angeles Historic-Cultural Monument #544, 8/2/91; Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
300 -849 South Broadway, Los Angeles	Broadway Theater And Commercial District	N/A	1D	Art Deco Commercial/Theaters	Multiple/	Listed In The National Register, 05/09/1979; Additional Documentation, 02/26/1986	RTD 30/31, RTD 40, RTD 45, RTD 70

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
304 South Broadway, Los Angeles	Bradbury Building	1893	1/1D	Art Nouveau, 5-Story Office Building	Wyman, George H./	Listed In The National Register, 07/14/1971; Designated National Landmark, 05/05/1977; Los Angeles Historic-Cultural Monument #6; Also Listed In The National Register 05/09/1979 As Feature Of The Broadway Theater And Commercial District	RTD 30/31, RTD 40, RTD 45, RTD 70
307 South Broadway, Los Angeles	Million Dollar Theater; Edison Building	1917	1/1D	Early Commercial; Spanish Renaissance, 12-Story Offices/ Theater	Martin, A. C./ Arnold	Listed In The National Register, 07/20/1978; Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
315 South Broadway, Los Angeles	Grand Central Market; Homer Laughlin Building	1897	1D	6-Story Ancillary Building	Fitzhugh, Thornton; Parkinson/ Carl Leonard	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 70, RTD 30/31, RTD 40, RT
318 South Broadway, Los Angeles	Blackstone Building	1907	4D	3-Story Store Building		Non-Contributing Feature Of The Broadway Theater And Commercial National Register District	RTD 16, RTD 40, RTD 45, RTD 70, RTD 30/31, RT
340 South Broadway, Los Angeles	Trustee Building	1905	1D	4-Story Commercial	Parkinson & Bergstrom/ Bailey	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 40, RTD 45, RTD 70, RTD 30/31, RT
341 South Broadway, Los Angeles	Karl's; Commercial Bldg	1903	1D	2-Story Commercial	Edelman, A. M./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
350 South Broadway, Los Angeles	O. T. Johnson Block	1895	1D	Italiantate, 3-Story Commercial	Young, R. B./ Union Ironworks	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 40, RTD 45, RTD 70, RTD 30/31, RT
355 South Broadway, Los Angeles	Nelson Building; Grant Building	1897	1D	2-Story Commercial Building	Van Trees, Frank/ Hays/Baker Iron Works	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database; Top 5 Stories Removed Since District Listing.	RTD 30/31, RTD 40, RTD 45, RTD 70
356 South Broadway, Los Angeles	O. T. Johnson Building	1902	1D	Romanesque, 7-Story Commercial Building	Parkinson, John/ Pedgrift/Pedgrift	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 40, RTD 45, RTD 70, RTD 30/31, RT

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
401 South Broadway, Los Angeles	Broadway Department Store	1913	1D	10-Story Department Store	Parkinson & Bergstrom/ Weaver Const Co	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
424 South Broadway, Los Angeles	Judson-Rives Building; Broadway Central Block	1906	1D	10-Story Commercial/Theater;	Aldrich, C. R./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
430 South Broadway, Los Angeles	Bumiller Building; Bumiller Bldg	1906	1D	6-Story Commercial Building	Morgan & Walls/ Leonaldt	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
431 South Broadway, Los Angeles	Wilson Building	1909	1D	3-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
501 South Broadway, Los Angeles	Fifth Street Store	1927	1D	11-Story Commercial Building	Curlett, A. E./ Weaver	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
510 South Broadway, Los Angeles	O. T. Johnson Building #2	1905	1D	5-Story Commercial Building	Young, R. B./ Ashbridge	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
512 South Broadway, Los Angeles	Roxie Theater	1931	5	Art Deco Theater	Cooper, John M./	Los Angeles Historic-Cultural Monument #526, 3/20/91	RTD 30/31, RTD 40, RTD 45, RTD 70
517 South Broadway, Los Angeles	Remick Building	1902	1D	6-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
518 South Broadway, Los Angeles	Roxie Theater	1931	1D	Art Deco, 2-Story Theater; Commercial	Cooper, J. M./ Cooper	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
525 South Broadway, Los Angeles	Reeves Building; Rowan Bldg	1903	4D	5-Story Commercial Building	Parkinson, John/	Non-Contributing Feature Of The Broadway Theater And Commercial National Register District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
526 South Broadway, Los Angeles	Cameo Theater	1910	5	Italian Renaissance Revival, 2-Story Theater	Rosenheim, Alfred F./	Los Angeles Historic-Cultural Monument #524, 3/20/91	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
526 South Broadway, Los Angeles	Cameo Theater; Clunes Broadway Theater	1910	1D	2-Story Theater; Commercial	Rosenheim, A. F./ Jacobs & Sons	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
529 South Broadway, Los Angeles	Broadway Interiors	1928	1D	5-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
532 South Broadway, Los Angeles	Arcade Theater	1910	5	Beaux Arts, 7-Story Theater	Morgan & Walls/	Los Angeles Historic-Cultural Monument #525, 3/20/91	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
533 South Broadway, Los Angeles	Reed's	1931	1D	2-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
534 South Broadway, Los Angeles	Arcade Theater; Pantages Theater #1	1910	1D	Renaissance And Grecian Influence, 7-Story Theater	Morgan & Walls/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
537 South Broadway, Los Angeles	Hartfields	1931	1D	Art Deco, 6-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
540 South Broadway, Los Angeles	Arcade Building	1924	1D	12-Story Commercial Building	Kenneth Macdonald/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
546 South Broadway, Los Angeles	Hubert-Thom Mcann Building; Eden Hotel	1900	1D	Italianate, 3-Story Commercial	Parkinson, John/ Haupt	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
553 South Broadway, Los Angeles	Metropolitan Annex	1923	1D	Italian Renaissance, 6-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70

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558 South Broadway, Los Angeles	Silverwood's Building	1920	1D	5-Story Commercial Building	Walker & Eisen/ Kubach	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
601 South Broadway, Los Angeles	Norton Building	1906	1D	6-Story Commercial Building	Parkinson & Parkinson/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
610 South Broadway, Los Angeles	Walter P. Story Building	1908	1D	11-Story Commercial Building	Morgan & Walls/ Peck	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
614 South Broadway, Los Angeles	Desmond's Building; Desmonds Department Store	1924	1D	Spanish Baroque, 6-Story Commercial Building	Martin, A. C./ Barrett/ Hilp	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
615 South Broadway, Los Angeles	Los Angeles Theatre	1931	1D	French Renaissance, 2-Story Theatre; Theater	Lee, S. Charles/ Macdonald/ Driver	Los Angeles Historic-Cultural Monument #225; Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
617 South Broadway, Los Angeles	Malling's	1930	1D	French Renaissance, 2-Story Ancillary Building	Lee, Charles S./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
618 South Broadway, Los Angeles	Broadway Cafeteria; Schabers Cafeteria	1928	1D	Spanish Colonial, 2-Story Restaurant	Plummer, Charles F./ Scofield/ Walls	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
630 South Broadway, Los Angeles	Palace Theater	1911	5	Italian Renaissance Theater	Lansburgh, G. Albert/	Los Angeles Historic-Cultural Monument #449, 8/16/89	RTD 30/31, RTD 40, RTD 45, RTD 70
635 South Broadway, Los Angeles	Hoffman Building	1906	4D	4-Story Store Building		Non-Contributing Feature Of The Broadway Theater And Commercial National Register District	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
636 South Broadway, Los Angeles	Palace Theater; Orpheum Theater #3	1910	1D	French Renaissance, 5-Story Office/Theater	Landsburgh, G. Albert/ Leonardt	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
638 South Broadway, Los Angeles	Forrester Building	1907	1D	8-Story Commercial Building	Whittlesey, C. F./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
639 South Broadway, Los Angeles	Bullocks- Hollenbeck Block	1912	1D	10-Story Commercial Building	Morgan & Walls; Bergstrom/Walls/ Haupt	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
641 South Broadway, Los Angeles	Bullock's; Tehama Building	1906	1D	7-Story Commercial Building	Parkinson & Bergstrom/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70, RTD 3
644 South Broadway, Los Angeles	J. E. Carr Building	1906	1D	8-Story Commercial Building	Young, R. B./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
648 South Broadway, Los Angeles	Cliftons Cafeteria	1916	4D	4-Story Restaurant		Non-Contributing Feature Of The Broadway Theater And Commercial National Register District	RTD 30/31, RTD 40, RTD 45, RTD 70
700 South Broadway, Los Angeles	Lankershim Hotel	1902	1D	9-Story Hotel	Young, R. B./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
701 South Broadway, Los Angeles	State Theater Building	1921	5	Spanish Renaissance/Plateresque Department Store	Weeks & Day/	Los Angeles Historic-Cultural Monument #522, 3/20/91	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
703 South Broadway, Los Angeles	United Building; Loews State Timber Bldg	1920	1D	Spanish Renaissance/Moorish, 12-Story Offices/ Theater	Weeks & Day; Reid/ Macdonald/ Kahn	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
710 South Broadway, Los Angeles	Yorkshire Hotel; J D Hooker Bldg	1909	1D	6-Story Commercial Building	Parkinson & Bergstrom/ Engstrom	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
716 South Broadway, Los Angeles	Parmelee Building	1907	1D	6-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

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719 South Broadway, Los Angeles	F W Woolworth	1920	1	Art Deco-Zig Zag Moderne, 3-Story Commercial	Weeks & Day; Mcclure/ Macdonald/ Kahn/ Peck	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
722 South Broadway, Los Angeles	Barker Brothers Building	1909	1D	7-Story Theater	Young, R. B./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
731 South Broadway, Los Angeles	Cheney Block	1913	1D	4-Story Unknown		Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
737 South Broadway, Los Angeles	Issacs Building	1913	1D	Gothic Influence, 8-Story Commercial Building	Richards/Neustadt/ Richards/Neustadt	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
744 South Broadway, Los Angeles	Globe Theater; Morosco Theater/Garland Theater	1912	1D	10-Story Offices/ Theater	Morgan, Walls, & Morgan/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
756 South Broadway, Los Angeles	Chapman Building; Los Angeles Investment Co	1911	1D	13-Story Commercial Building	Mcconnell, Ernest/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
800 South Broadway, Los Angeles	Tower Theater	1927	5	Baroque Theater	Lee, S. Charles/	Los Angeles Historic-Cultural Monument #450, 8/16/89	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
800 South Broadway, Los Angeles	Tower Theater	1927	5	Baroque Theater	Lee, S. Charles/	Los Angeles Historic-Cultural Monument #450, 8/16/89	RTD 45
801 South Broadway, Los Angeles	Hamburgers Deptartment Store	1907	1	Beaux Arts Department Store	Rosenheim, Alfred F./	Los Angeles Historic-Cultural Monument #459, 10/17/89; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
802 South Broadway, Los Angeles	Tower Theater	1927	1D	French Renaissance, 4-Story Theater/Retail	Lee, Charles, S./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
806 South Broadway, Los Angeles	Singer Building; Southern California Music Co	1922	1D	Italian Renaissance, 7-Story Commercial Building	Meyer & Holler/ Milwaukee Building Co	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
806 South Broadway, Los Angeles	Rialto Theatre	1930	5	Neon Marquis Theater		Los Angeles Historic-Cultural Monument #472, 12/20/89	RTD 30/31, RTD 40, RTD 45, RTD 70
812 South Broadway, Los Angeles	Rialto Theater	1917	1D	2-Story Theater	Dennis, O. P./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
814 South Broadway, Los Angeles	Apparel Center Building; Wurlitzer Bldg	1923	1D	Spanish Renaissannce, 12-Story Commercial Building	Walker & Eisen/	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
820 South Broadway, Los Angeles	Braun Building	1913	1D	6-Story Loft Building	Saunders, W. J./	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
830 South Broadway, Los Angeles	Anjac Fashion Building; Platt Music Co Bldg	1927	1D	Gothic Revival, 12-Story Commercial Building	Walker & Eisen/ Lange/ Bergstrom	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
842 South Broadway, Los Angeles	Orpheum Theater	1925	1D	Spanish Renaissance, 13-Story Offices/ Theater	Schultze & Weaver;Landsburgh, G./ Mcneil	Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
849 South Broadway, Los Angeles	Eastern Colombia Building	1930	1D	Zigzag Moderne, 13; 14-Story Commercial Building	Beelman, Claude/ Mcneil	Los Angeles Historic-Cultural Monument #294; Listed In The National Register 05/09/1979 As A Contributing Feature Of The Broadway Theater And Commercial District; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70, RTD 30/31,
850 South Broadway, Los Angeles	Ninth/Broadway Building	1929	1	Commercial Building	Beelman, Claude/ Mcneil	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
901 South Broadway, Los Angeles	Blackstones Dept. Store, Famous Dept. Store	1916	3	Classical Revival, 6-Story Commercial	Parkinson, John/ Crowell, Weymouth	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 30/31, RTD 40, RTD 45, RTD 70

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
908 South Broadway, Los Angeles	Broadway Leasehold Co Building	1914	3	Commercial Building	Milwaukee Building Co/ Davidson Constructing Co	State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 66/67, RTD 70,
921 South Broadway, Los Angeles	United Artist's Theatre; Texas Co. Bldg.	1927	3	Art Deco/Neo Gothic, 13-Story Retail/Office	Walker & Eisen/ Scofield Engineering Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 30/31, RTD 40, RTD 45, RTD 70
927 South Broadway, Los Angeles	United Artists Theater Building	1927	5	Spanish Gothic Revival, 12-Story Commercial	Crane, C.H./	Los Angeles Historic-Cultural Monument #523, 3/20/91	RTD 30/31, RTD 40; RTD 45; RTD 70, RTD 30/31,
933 South Broadway, Los Angeles	United Artists, Texaco Company Building	1927	2	Commercial Building	Walker & Eisen & Crane/ Scofield Engineering Co	Officially Denr; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
939 South Broadway, Los Angeles	Western Costume Building; 939 S. Broadway Bldg	1924	3	Renaissance Revival, 11-Story Commercial/Offices	Kenneth Macdonald, Jr. & Co./ Macdonald & Kahn	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 30/31, RTD 40; RTD 45; RTD 70, RTD 30/31,
1023 South Broadway, Los Angeles	Western Pacific Building	1925	3	Renaissance Revival, 12-Story Offices/Commercial	Walker & Eisen/ Los Angeles Investment Company	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 30/31, RTD 40, RTD 45, RTD 70
1050 South Broadway, Los Angeles	Los Angeles Transit Bldg;L A Railway Corp Bldg	1920	3	Renaissance Revival, 2-Story Commercial/Offices	Noerenberg & Johnson/ Howard Huntington	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 30/31, RTD 40, RTD 45, RTD 70
1100 South Broadway, Los Angeles	Commercial Club; Hotel Case	1925	3	Renaissance Revival, 13-Story Club Building	Curlett & Beelman/ Scofield Engineering Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 30/31, RTD 40, RTD 45, RTD 70
1101 South Broadway, Los Angeles	Los Angeles Examiner Building	1913	3	Mission Revival, 4-Story Newspaper Facility	Haenke, Dodd & Morgan/ Alta Planing Mill	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 30/31, RTD 40, RTD 45, RTD 70
1111 South Broadway, Los Angeles	Herald Examiner Building	1913	4	Spanish Colonial Revival Commercial Building	Morgan, Julia;Haenke-dodd-morgan/	Los Angeles Historic-Cultural Monument #178; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
3806 South Broadway, Los Angeles		N/A	5	Mission Revival, 2-Story Apartments		Los Angeles Department of Planning 1991 Survey	RTD 40, RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
3926 South Broadway, Los Angeles		N/A	5	Craftsman, 2 1/2-Story Residence		Los Angeles Department of Planning 1991 Survey	RTD 40, RTD 45
4254 South Broadway, Los Angeles		N/A	5	Spanish Colonial Revival, 2-Story Mortuary		Los Angeles Department of Planning 1991 Survey	RTD 45
4601 South Broadway, Los Angeles	S. H. Kress & Co.	1931	5	Renaissance Revival, 3-Story Commercial	Fleming, John G./ Mckee, Robert E.	Los Angeles Department of Planning 1991 Survey	RTD 45
8601 South Broadway, Los Angeles		N/A	5	Renaissance Revival, 1-Story Bank		Los Angeles Department of Planning 1991 Survey;South Broadway Streamline Grouping	RTD 45
470 South Burlington Avenue, Los Angeles		1921	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
629 Camulos Street, Los Angeles		1906	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 18
5112 Caspar Avenue, Los Angeles		95	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5119 Caspar Avenue, Los Angeles		1908	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5125 Caspar Avenue, Los Angeles		1914	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5129 Caspar Avenue, Los Angeles		1905	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5133 Caspar Avenue, Los Angeles		1920	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5134 Caspar Avenue, Los Angeles		1920	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5138 Caspar Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5150 Caspar Avenue, Los Angeles		1923	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5153 Caspar Avenue, Los Angeles		1927	5D	Spanish Colonial Revival/Eclectic, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5160 Caspar Avenue, Los Angeles		1916	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5164 Caspar Avenue, Los Angeles		1926	5D	English Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
333 South Central Avenue, Los Angeles	The Produce Exchange Company	1905	3	Industrial Vernacular, 2-Story Commercial		Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 45, RTD 70
132 North Chicago Street, Los Angeles	Boyle Heights Presbyterian Church	1895	3	Religious Building		State Office of Historic Preservation Statewide Database	RTD 30/31
1000 Clement Street, Los Angeles		N/A	5	Vernacular, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey	RTD 70
364 Cloverdale Avenue, Los Angeles	Apartment Bldg.	1930	5	Art Deco, 4-Story Residence	Smale, C.J./	Los Angeles Historic-Cultural Monument #427, 4/7/89	RTD 16
5261 College View Boulevard, Los Angeles		1913	5	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey	S-182
1460 Colorado Boulevard, Los Angeles	Islander Motel	1937	5	Streamline Moderne, 2-Story Motel		Los Angeles Department of Planning 1989 Survey	S-182
1760 Colorado Boulevard, Los Angeles	Argus Court	1923	5	Tudor Revival, 1-Story Residence	Taylor & Taylor/	Los Angeles Department of Planning 1989 Survey; Los Angeles Historic-Cultural Monument #471, 12/20/89	S-182
1801 Colorado Boulevard, Los Angeles	Kenney's Coffee Shop	1948	5	Pw Moderne, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey	S-182
1948 Colorado Boulevard, Los Angeles		1932	5	Deco, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey	S-182
2010 Colorado Boulevard, Los Angeles		1937	5	Deco, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey	S-182
2016 Colorado Boulevard, Los Angeles	1st Congregational Church Of Eagle Rock	1924	5	Renaissance Revival, 2-Story Church	Marston, Mott M./ Anderson, Houghton	Los Angeles Department of Planning 1989 Survey;State Office of Historic Preservation Statewide Database	S-182
2030 Colorado Boulevard, Los Angeles		N/A	5	Vernacular, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey	S-182
2156 Colorado Boulevard, Los Angeles	J. H. Duffy Building	1931	5	Vernacular, 2-Story Commercial	/ Edwards - Wildey	Los Angeles Department of Planning 1989 Survey	S-182
2225 Colorado Boulevard, Los Angeles	Eagle Rock Branch Library	1927	1	Spanish Colonial Revival, 2-Story Library	Newton & Murray;Kleinspell / Addison, T. H.	Los Angeles Department of Planning 1989 Survey;Listed On The National Register; Los Angeles Historic-Cultural Monument #292	S-182
2362 Colorado Boulevard, Los Angeles		1912	5	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey	S-182
2391 Colorado Boulevard, Los Angeles	Cota Richfield	1926	5	Commercial Vernacular, 1-Story Gas Station		Los Angeles Department of Planning 1989 Survey	S-182
1357 Constance Street, Los Angeles	Morris Marks Residence	1901	3	Residence	/ Morris Marks	State Office of Historic Preservation Statewide Database	RTD 30/31
315 South Coronado Street, Los Angeles		1910	5	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 16

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
323 South Coronado Street, Los Angeles		1910	5	1-Story Residence	Stewart/ Stewart	State Office of Historic Preservation Statewide Database	RTD 16
324 South Coronado Street, Los Angeles		1920	5	Residence	C Bras/ C Bras	State Office of Historic Preservation Statewide Database	RTD 16
413 South Coronado Street, Los Angeles		1923	5	Residence	P Nichols/ P Nichols	State Office of Historic Preservation Statewide Database	RTD 18
541 South Coronado Street, Los Angeles		1915	5	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 18
620 South Coronado Street, Los Angeles		1920	5	3-Story Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
4104 Creed Avenue, Los Angeles		1936	5D	Streamline Moderne/ Spanish Colonial, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4108 Creed Avenue, Los Angeles		1938	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4118 Creed Avenue, Los Angeles		1938	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4122 Creed Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4130 Creed Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4134 Creed Avenue, Los Angeles		1938	5D	Colonial/ Streamline Moderne, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4138 Creed Avenue, Los Angeles		1938	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4142 Creed Avenue, Los Angeles		1938	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4148 Creed Avenue, Los Angeles		1940	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4218 Creed Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4222 Creed Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4226 Creed Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4232 Creed Avenue, Los Angeles		1932	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4240 Creed Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4244 Creed Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4248 Creed Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4252 Creed Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4254 Creed Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4256 Creed Avenue, Los Angeles		1932	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4260 Creed Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4264 Creed Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4266 Creed Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4270 Creed Avenue, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4274 Creed Avenue, Los Angeles		N/A	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4278 Creed Avenue, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4282 Creed Avenue, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4286 Creed Avenue, Los Angeles		1932	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4290 Creed Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4294 Creed Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
5311 Crenshaw Boulevard, Los Angeles	Ford/Crenshaw Motors	N/A	5	Streamline, 1-Story Auto Showroom		Los Angeles Department Of Planning 1990 Survey	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5344 Crenshaw Boulevard, Los Angeles		N/A	5D	Spanish Colonial Revival, 2-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Part Of The Crenshaw Boulevard Commercial District	RTD 40
5356 Crenshaw Boulevard, Los Angeles		N/A	5D	Commercial Vernacular, 2-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Part Of The Crenshaw Boulevard Commercial District	RTD 40
5419 Crenshaw Boulevard, Los Angeles		N/A	5	Art Deco, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey	RTD 40
5424 Crenshaw Boulevard, Los Angeles		1927	5D	Spanish Colonial Influence, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Part Of The Crenshaw Boulevard Commercial District	RTD 40
5450 Crenshaw Boulevard, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Part Of The Crenshaw Boulevard Commercial District	RTD 40
5454 Crenshaw Boulevard, Los Angeles		N/A	5D	Baroque Influence, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Part Of The Crenshaw Boulevard Commercial District	RTD 40
5460 Crenshaw Boulevard, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Part Of The Crenshaw Boulevard Commercial District	RTD 40
4317 Degnan Boulevard, Los Angeles		1948	5D	Postwar Modern, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
4330 Degnan Boulevard, Los Angeles		N/A	5D	Forties Colonial Influence, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
4333 Degnan Boulevard, Los Angeles		1946	5D	Streamline Moderne Influence, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
4337 Degnan Boulevard, Los Angeles		1946	5D	Streamline Moderne Influence, 1-Story Commercial		Los Angeles Department Of Planning 1990 Survey;Leimert Place Commercial District	RTD 40
3901 Dublin Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3905 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3909 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3915 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
3925 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3941 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3945 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3961 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3971 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3975 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3979 Dublin Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3985 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3995 Dublin Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
4001 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
4005 Dublin Avenue, Los Angeles		1938	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
4011 Dublin Avenue, Los Angeles		1942	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4015 Dublin Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
5037 Eagle Rock Boulevard, Los Angeles		1922	5	Commercial, 1-Story Commercial		Los Angeles Department of Planning 1989 Survey	S-182
5040 Eagle Rock Boulevard, Los Angeles		N/A	5	Renaissance Revival, 2-Story Commercial		Los Angeles Department of Planning 1989 Survey	S-182
5117 Eagle Rock Boulevard, Los Angeles		1923	5/5D	Commercial Vernacular/Class. Infl., 2-Story Commercial		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5123 Eagle Rock Boulevard, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5126 Eagle Rock Boulevard, Los Angeles		1922	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5127 Eagle Rock Boulevard, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5128 Eagle Rock Boulevard, Los Angeles		1912	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5133 Eagle Rock Boulevard, Los Angeles		1905	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5137 Eagle Rock Boulevard, Los Angeles		1921	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5140 Eagle Rock Boulevard, Los Angeles		1911	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5143 Eagle Rock Boulevard, Los Angeles		1914	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5149 Eagle Rock Boulevard, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5157 Eagle Rock Boulevard, Los Angeles		1919	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5163 Eagle Rock Boulevard, Los Angeles		1918	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
1750 North Edgemont Street, Los Angeles	13th Church Of Christ Scientist	1926	5	Italian Renaissance Revival Church	Allison & Allison/	Los Angeles Historic-Cultural Monument # 559, 4/21/92	RTD 204
5141 El Rio Avenue, Los Angeles		1913	5	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey	S-182

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
608 South Euclid Avenue, Los Angeles		1906	4	Residence		State Office of Historic Preservation Statewide Database	RTD 18
624 South Evergreen Avenue, Los Angeles		1912	5	Residence	/ E B Maxey	State Office of Historic Preservation Statewide Database	RTD 18
746 South Figueroa Street, Los Angeles		1922	3	Commercial		State Office of Historic Preservation Statewide Database	RTD 66/67
938 South Figueroa Street, Los Angeles	Friday Morning Club; Variety Arts Center	1923	1	Renaissance Social Club	Allison & Allison/ Winter Construction Co	Listed In The National Register, 05/17/1984; State Office of Historic Preservation Statewide Database; Los Angeles Historic-Cultural Monument #196; State Office of Historic Preservation Statewide Database	RTD 66/67
244 West Florence Avenue, Los Angeles	Engine Company # 33	N/A	5	Renaissance Revival, 1-Story Fire Station		Los Angeles Department of Planning 1991 Survey	RTD 45
4910 Floristan Avenue, Los Angeles		1912	5	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey	S-182
538 South Flower Street, Los Angeles	California Club Building	1930	2	Beaux Arts Social Hall	Farquhar, Robert David/ Walker	Los Angeles Historic-Cultural Monument #43; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
729 South Flower Street, Los Angeles		1926	3	Commercial	Myron Hunt/ Scofield Engineering Co	State Office of Historic Preservation Statewide Database	RTD 66/67
737 South Flower Street, Los Angeles		1926	4	6-Story Commercial Building	Felchin Shaw & Franklin/ Meyer & Siegel Co	State Office of Historic Preservation Statewide Database	RTD 66/67
810 South Flower Street, Los Angeles	L.A. Gas & Electric Corporation	1923	3	Commercial Building	John & Donald Parkinson/ P.J. Walker Company	State Office of Historic Preservation Statewide Database	RTD 66/67
935 South Flower Street, Los Angeles		1912	3	Residential MF		State Office of Historic Preservation Statewide Database	RTD 66/67
950 South Flower Street, Los Angeles		1925	5	Apartment		State Office of Historic Preservation Statewide Database	RTD 66/67
1011 South Flower Street, Los Angeles	Petroleum Building	1925	3	Commercial Building	Meyer & Holler/ Meyer & Holler	State Office of Historic Preservation Statewide Database	RTD 66/67, RTD 70
767 Garland Avenue, Los Angeles	Residence	N/A	5	Queen Anne, 2-Story Residence		Los Angeles Historic-Cultural Monument #129	RTD 66/67
4113 Garthwaite Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4117 Garthwaite Avenue, Los Angeles		1932	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4121 Garthwaite Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4125 Garthwaite Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4135 Garthwaite Avenue, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4139 Garthwaite Avenue, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4145 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4151 Garthwaite Avenue, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4155 Garthwaite Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4191 Garthwaite Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4235 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4239 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4247 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4259 Garthwaite Avenue, Los Angeles		1941	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4265 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4269 Garthwaite Avenue, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4279 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4283 Garthwaite Avenue, Los Angeles		1941	5D	Spanish Colonial Revival, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4291 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4301 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4311 Garthwaite Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4317 Garthwaite Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4321 Garthwaite Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 2-Story Residential Fourplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4333 Garthwaite Avenue, Los Angeles		1931	5D	French Revival Influence, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
939 South Gramercy Place, Los Angeles		1927	3	4-Story Residence	Smith/ Lazar/Kiltnick	State Office of Historic Preservation Statewide Database	RTD 66/67
1201 South Gramercy Place, Los Angeles	Diller Residence	1924	3	2-Story Residence	Jones/ Cooper	State Office of Historic Preservation Statewide Database	RTD 30/31
1206 South Gramercy Place, Los Angeles	Staub Residence	1923	3	2-Story Residence	Quintin/	State Office of Historic Preservation Statewide Database	RTD 30/31
1210 South Gramercy Place, Los Angeles	Conger Residence	1923	3	2-Story Residence	/ Hartigan	State Office of Historic Preservation Statewide Database	RTD 30/31
1214 South Gramercy Place, Los Angeles	Wigmore Residence	1922	3	2-Story Residence	Feil/Verge/ Feil/Verge	State Office of Historic Preservation Statewide Database	RTD 30/31
1215 South Gramercy Place, Los Angeles	Fisch Residence	1922	3	2-Story Residence	Davis/Davis/ Davis/Davis	State Office of Historic Preservation Statewide Database	RTD 30/31
1217 South Gramercy Place, Los Angeles	Heller Residence	1922	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1219 South Gramercy Place, Los Angeles	Valentine Residence	1922	3	2-Story Residence	Jones/ Cooper	State Office of Historic Preservation Statewide Database	RTD 30/31
1224 South Gramercy Place, Los Angeles	Leary Residence	1922	3	2-Story Residence	Leary/ Leary	State Office of Historic Preservation Statewide Database	RTD 30/31
1225 South Gramercy Place, Los Angeles	Martin Residence	1920	3	2-Story Residence	/ Hanson	State Office of Historic Preservation Statewide Database	RTD 30/31
1230 South Gramercy Place, Los Angeles	Mcpeak Residence	1922	3	2-Story Residence	/ Nelson	State Office of Historic Preservation Statewide Database	RTD 30/31
1231 South Gramercy Place, Los Angeles	Letson Residence	1916	3	2-Story Residence	Martin/ Hamilton	State Office of Historic Preservation Statewide Database	RTD 30/31
1234 South Gramercy Place, Los Angeles	Hunt Residence	1916	3	2-Story Residence	Noum/ Day Workers	State Office of Historic Preservation Statewide Database	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1237 South Gramercy Place, Los Angeles	Jarrett Residence	1909	3	2-Story Residence	/ Dodd	State Office of Historic Preservation Statewide Database	RTD 30/31
800 South Grand Avenue, Los Angeles		1921	5	Commercial		State Office of Historic Preservation Statewide Database	RTD 66/67
851 South Grand Avenue, Los Angeles	Embassy Auditorium And Hotel	1913	3	Beaux Arts, 9-Story Hotel/ Auditorium	Fitzhugh, Thornton/ La Investment Co	Los Angeles Historic-Cultural Monument #299; State Office of Historic Preservation Statewide Database	RTD 66/67
4300 South Grand Avenue, Los Angeles		1937	5	Art Deco, 2-Story School		Los Angeles Department of Planning 1991 Survey	RTD 45
515 Grand View Street, Los Angeles		1904	5	2-Story Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
3610 Harriman Avenue, Los Angeles		1923	5	Eclectic Arroyo Stone Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey	RTD 45
5101 Hermosa Avenue, Los Angeles	Eagle Rock Womens Twentieth Century Club	1915	3/5D	Craftsman, 2-Story Clubhouse		Los Angeles Department of Planning 1989 Survey; Part Of The Hill Drive & Environs Residential District; Los Angeles Historic-Cultural Monument #537, 7/2/91	S-182
5119 Hermosa Avenue, Los Angeles		1922	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5122 Hermosa Avenue, Los Angeles		1924	5D	English Revival/Tudor Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5123 Hermosa Avenue, Los Angeles		1922	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5126 Hermosa Avenue, Los Angeles		1913	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5129 Hermosa Avenue, Los Angeles		1913	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5132 Hermosa Avenue, Los Angeles		1921	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5139 Hermosa Avenue, Los Angeles		1911	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5142 Hermosa Avenue, Los Angeles		1922	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5147 Hermosa Avenue, Los Angeles		22	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5151 Hermosa Avenue, Los Angeles		1915	5D	Colonial Revival, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5152 Hermosa Avenue, Los Angeles		1916	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5155 Hermosa Avenue, Los Angeles		1926	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5158 Hermosa Avenue, Los Angeles		1910	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5182 Hermosa Avenue, Los Angeles		1915	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5167 Hermosa Avenue, Los Angeles		1923	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5109 Highland View Avenue, Los Angeles		N/A	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5112 Highland View Avenue, Los Angeles		21	5D	Mediterranean Influence, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5113 Highland View Avenue, Los Angeles		1922	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5120 Highland View Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5123 Highland View Avenue, Los Angeles		1916	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5127 Highland View Avenue, Los Angeles		1920	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5128 Highland View Avenue, Los Angeles		1922	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5133 Highland View Avenue, Los Angeles		1913	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5136 Highland View Avenue, Los Angeles		1922	5D	Spanish Colonial Revival, 1-Story Apartments		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5139 Highland View Avenue, Los Angeles		1913	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5145 Highland View Avenue, Los Angeles		1924	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5148 Highland View Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5152 Highland View Avenue, Los Angeles		1920	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5153 Highland View Avenue, Los Angeles		1920	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5158 Highland View Avenue, Los Angeles		1915	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5159 Highland View Avenue, Los Angeles		1912	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5163 Highland View Avenue, Los Angeles		1922	5D	Colonial Revival, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5164 Highland View Avenue, Los Angeles		1924	5D	English Revival/Tudor Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
324 South Hill Street, Los Angeles	The Aldine	1893	2	4-Story Hotel/ Motel		State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 70
400 South Hill Street, Los Angeles		1946	2	Unknown		State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 70
426 South Hill Street, Los Angeles	Hotel Clark	1913	2	11-Story Hotel	Eli P Clark; Harrison Albright/ F O Engstrum Co	Officially Determined Eligible to the National Register On 5-24-83; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 70
437 South Hill Street, Los Angeles	Federal Title Bldg	1927	2	Commercial Building	Walker & Eisen/ R. Milsap; R Milsap	State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
448 South Hill Street, Los Angeles		1923	2	13-Story Commercial Building	Curlett & Beelman/ Scofield Engineering	State Office of Historic Preservation Statewide Database	RTD 18, RTD 18, RTD 40, RTD 45, RTD 70
630 South Hill Street, Los Angeles	Bullock's Downtown Department Stores	1906	3	Classical Revival Influence Deparment Stores	Parkinson & Bergstrom; Haupt, P./	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
635 South Hill Street, Los Angeles	Los Angeles Fur Mart Building	1925	3	Art Deco, 8-Story Commercial/Office	Curlett & Beelman/ L. Harris Realty Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
700 South Hill Street, Los Angeles	Great Western Savings Building	1922	3	Renaissance Revival, 12-Story Commercial/Offices;	Curlett, Aleck/	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70
701 South Hill Street, Los Angeles	Foreman & Clark Building	1928	3	Renaissance Revival/Neo Gothic, 13-Story Commercial/Offices;	Curlett & Beelman/ J. V. Mcneil Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 66/67

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
742 South Hill Street, Los Angeles	Union Bank Building/ Hill Street Annex	1923	3	Classical/Moderne, 12-Story Commercial/Offices;	Curlett & Beelman/ Mcneil, J. V.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 66/67, RTD 70
855 South Hill Street, Los Angeles	Pacific National Bank Bldg; Ninth & Hill Bldg	1925	3	Renaissance Revival; Beaux Arts/Italian, 12; 0-Story Commercial/Offices;	Morgan, Walls & Clements/ Robert E. Millsap; Scofield Engineering	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database; Los Angeles Historic-Cultural Monument #346, 3/11/88	RTD 66/67
1036 South Hill Street, Los Angeles	Mayan Theatre	1926	3	Mayan Motion Pic. Theatre	Morgan, Walls, & Clements/ Schofield Engineering Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 70
1048 South Hill Street, Los Angeles	Belasco Theater #2	1926	3	3-Story Religious Building	Morgan, Walls, & Clements/ Walker Co	State Office of Historic Preservation Statewide Database	RTD 40, RTD 45, RTD 70
1800 South Hill Street, Los Angeles		1947	5	Streamline Moderne, 2-Story Commercial		Los Angeles Department of Planning 1991 Survey	RTD 40, RTD 45
3906 South Hill Street, Los Angeles		1915	5D	Craftsman, 2-Story Residential Fourplex		Los Angeles Department of Planning 1991 Survey;3900 Block Of South Hill Street Craftsman/ Foursquare/ Mission District	RTD 40, RTD 45
3912 South Hill Street, Los Angeles		1908	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;3900 Block Of South Hill Street Craftsman/ Foursquare/ Mission District	RTD 40, RTD 45
3916 South Hill Street, Los Angeles		1922	5D	Mission Revival, 2-Story Residential Duplex		Los Angeles Department of Planning 1991 Survey;3900 Block Of South Hill Street Craftsman/ Foursquare/ Mission District	RTD 40, RTD 45
3922 South Hill Street, Los Angeles		1923	5D	Mission Revival, 2-Story Residential Fourplex		Los Angeles Department of Planning 1991 Survey;3900 Block Of South Hill Street Craftsman/ Foursquare/ Mission District	RTD 40, RTD 45
3940 South Hill Street, Los Angeles		1913	5D	Greek Revival, 2-Story Residential Duplex		Los Angeles Department of Planning 1991 Survey;3900 Block Of South Hill Street Craftsman/ Foursquare/ Mission District	RTD 40, RTD 45
3946 South Hill Street, Los Angeles		1914	5D	Craftsman, 2-Story Residential Fourplex		Los Angeles Department of Planning 1991 Survey;3900 Block Of South Hill Street Craftsman/ Foursquare/ Mission District	RTD 40, RTD 45
3950 South Hill Street, Los Angeles		1908	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;3900 Block Of South Hill Street Craftsman/ Foursquare/ Mission District	RTD 40, RTD 45

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
3958 South Hill Street, Los Angeles		N/A	5D	American Foursquare/ Classical Revival, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;3900 Block Of South Hill Street Craftsman/ Foursquare/ Mission District	RTD 40, RTD 45
1418 Holbrook Street, Los Angeles		1925	5	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey	S-182
1455 Holbrook Street, Los Angeles		1888	5	Vernacular/ Farmhouse, 1-Story Residence		Los Angeles Department of Planning 1989 Survey	S-182
4800 Hollywood Boulevard, Los Angeles	Barnsdall, Aline House; Hollyhock House	1922	1	Mayan Influence Residence	Wright, Frank Lloyd/ Barnsdall, Aline	Listed In The National Register, 05/06/1971; Habs Ca-356;Los Angeles Historic-Cultural Monument #33 And #34	RTD 204
1001 South Hope Street, Los Angeles		1913	3	Commercial		State Office of Historic Preservation Statewide Database	RTD 66/67
1033 South Hope Street, Los Angeles	Pacific Employers Insurance Co. Building	1937	3	Art Deco/International Influence Commercial/Offices;	Clements, Stiles O./ Rudolph, Edwin F.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 66/67
1329 South Hope Street, Los Angeles	Independent Order Of Foresters Lodge	1926	3	Gothic Revival, 3-Story Lodge; Social Hall	Hunt & Burns/ Jergesen & Dequine	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 70
1414 South Hope Street, Los Angeles	California Luthern Hospital	1925	3	Mediterranean, 8-Story Hospital	Walker & Eisen/	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 70
3355 Huntington, Los Angeles	Mazatlan Theatre	1940	5	Art Deco, 1-Story Theatre		Los Angeles Department of Planning 1989 Survey	RTD 45
4691 Huntington, Los Angeles	Seaside Gas Station	1941	5	Streamline Moderne, 1-Story Gas Station		Los Angeles Department of Planning 1989 Survey;State Office of Historic Preservation Statewide Database	RTD 45
4739 Huntington, Los Angeles		N/A	5	Craftsman, 2-Story Duplex		Los Angeles Department of Planning 1989 Survey	RTD 45
1200 South Kenmore Avenue, Los Angeles	J. M. Schaefle Memorial Congregational Church	1920	4	Religious Building		State Office of Historic Preservation Statewide Database	RTD 30/31
1203 North Kipling Avenue, Los Angeles	Residence, Playhouse & Studio	1925	5	Craftsman Sfr	Edwards, H.A./	Los Angeles Historic-Cultural Monument #383, 8/5/88	S-182
5120 La Roda Avenue, Los Angeles		1920	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5121 La Roda Avenue, Los Angeles		1921	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5125 La Roda Avenue, Los Angeles		1912	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5126 La Roda Avenue, Los Angeles		1920	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5140 La Roda Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5141 La Roda Avenue, Los Angeles		1920	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5147 La Roda Avenue, Los Angeles		1920	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5152 La Roda Avenue, Los Angeles		1921	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5159 La Roda Avenue, Los Angeles		1922	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5160 La Roda Avenue, Los Angeles		1932	5D	English Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5165 La Roda Avenue, Los Angeles		1924	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
452 South Lake Street, Los Angeles		1904	5	Residence	H J Horton/	State Office of Historic Preservation Statewide Database	RTD 18
462 South Lake Street, Los Angeles		1914	5	2-Story Residential MF	R C Furguson/ J A Widdle	State Office of Historic Preservation Statewide Database	RTD 18
512 South Lake Street, Los Angeles		1905	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
845 South Lake Street, Los Angeles	Bernard, Susana Machado, House And Barn	1901	1	Art Nouveau Gothic Residence Sf	Parkinson, John/ Rebman	Listed In The National Register, 04/09/1979; Los Angeles Historic-Cultural Monument #208; State Office of Historic Preservation Statewide Database	RTD 66/67
1370 Las Flores, Los Angeles		1914	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Mount Helena Avenue Craftsman District	S-182
4156 Leimert Boulevard, Los Angeles		1933	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4164 Leimert Boulevard, Los Angeles		1933	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4172 Leimert Boulevard, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4180 Leimert Boulevard, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4243 Leimert Boulevard, Los Angeles		1937	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4251 Leimert Boulevard, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4255 Leimert Boulevard, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4261 Leimert Boulevard, Los Angeles		1929	5/5D	Streamline Moderne/ Spanish Colonial, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4269 Leimert Boulevard, Los Angeles		1935	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4273 Leimert Boulevard, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Tract 10023 Spanish Colonial Revival District	RTD 40
4290 Leimert Boulevard, Los Angeles		1931	5D	Spanish Colonial Revival, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
2812 Lincoln Park Avenue, Los Angeles		N/A	5D	Queen Anne, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
2908 Lincoln Park Avenue, Los Angeles		1985	5D	Vernacular, 2-Story Farmhouse		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45
507 South Lorena Street, Los Angeles		1906	4	Residence	/ C Kenyon	State Office of Historic Preservation Statewide Database	RTD 18
850 South Los Angeles Street, Los Angeles	Cooper Building	1923	3	Renaissance Revival, 11-Story Industrial/Offices;	Curlett & Beelman/ Mcneil, J. V.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 66/67
4600 Los Feliz Boulevard, Los Angeles	Monterey Apartments	1925	5	Early California Spanish Courtyard Residence	Smithley, C.K./	Los Angeles Historic-Cultural Monument #353, 5/11/88	RTD 204
1222 South Lucerne Boulevard, Los Angeles		1921	4	1-Story Residence	Los Angeles Finance Co/ Los Angeles Finance Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1225 South Lucerne Boulevard, Los Angeles	Carles B Davison Home	1918	3	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1226 South Lucerne Boulevard, Los Angeles	Violet J Gilenease Home	1921	3	1-Story Residence	Los Angeles Finance Co/ Los Angeles Finance Co	State Office of Historic Preservation Statewide Database	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1230 South Lucerne Boulevard, Los Angeles	Laura E Phillips Home	1921	3	1-Story Residence	Los Angeles Finance Co/ Los Angeles Finance Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1231 South Lucerne Boulevard, Los Angeles	Herbert E White Home	1917	3	1-Story Residence	/ Little & White	State Office of Historic Preservation Statewide Database	RTD 30/31
1236 South Lucerne Boulevard, Los Angeles	Rosalie Hildebrandt Home	1921	3	1-Story Residence	Los Angeles Finance Co/ Los Angeles Finance Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1237 South Lucerne Boulevard, Los Angeles	Mary Ann Senks Home	1917	3	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1241 South Lucerne Boulevard, Los Angeles		1917	4	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1244 South Lucerne Boulevard, Los Angeles	Glen L Codman	1920	4	1-Story Residence	Los Angeles Finance Co/ Los Angeles Finance Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1245 South Lucerne Boulevard, Los Angeles		1920	3	1-Story Residence	/ Los Angeles Finance Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1250 South Lucerne Boulevard, Los Angeles	Viola L Arvine	1918	3	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1251 South Lucerne Boulevard, Los Angeles	Louise G Kistruck Home	1918	5	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1254 South Lucerne Boulevard, Los Angeles	Emma A Bailey Home	1918	3	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1255 South Lucerne Boulevard, Los Angeles	James F Troul Home	1919	3	1-Story Residence	/ Little	State Office of Historic Preservation Statewide Database	RTD 30/31
1260 South Lucerne Boulevard, Los Angeles	Minnie M Campbell Home	1918	3	1-Story Residence	/ Little & White	State Office of Historic Preservation Statewide Database	RTD 30/31
1261 South Lucerne Boulevard, Los Angeles	Samantha M Tormey Home	1920	3	1-Story Residence	/ Los Angeles Finance Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1264 South Lucerne Boulevard, Los Angeles	Ada A Kodapp Home	1916	4	1-Story Residence	/ White	State Office of Historic Preservation Statewide Database	RTD 30/31
1265 South Lucerne Boulevard, Los Angeles	Raymond C Hill Home	1917	3	1-Story Residence	/ Little & White	State Office of Historic Preservation Statewide Database	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1270 South Lucerne Boulevard, Los Angeles	Edwin R Brown Home	1918	3	1-Story Residence	/ Little & White	State Office of Historic Preservation Statewide Database	RTD 30/31
1271 South Lucerne Boulevard, Los Angeles	William A Gilmore Home	1918	3	1-Story Residence	/ Little & White	State Office of Historic Preservation Statewide Database	RTD 30/31
1274 South Lucerne Boulevard, Los Angeles	Erwin W Lowell Home	1914	3	1-Story Residence	/ A Matheson	State Office of Historic Preservation Statewide Database	RTD 30/31
1275 South Lucerne Boulevard, Los Angeles	Hugh B Hollingsworth Home	1915	3	1-Story Residence	/ Maurie	State Office of Historic Preservation Statewide Database	RTD 30/31
1278 South Lucerne Boulevard, Los Angeles	Frank A Hartley Home	1917	3	1-Story Residence	/ Little & White	State Office of Historic Preservation Statewide Database	RTD 30/31
1281 South Lucerne Boulevard, Los Angeles	Glenn C Seelve Home	1917	3	1-Story Residence	/ Little & White	State Office of Historic Preservation Statewide Database	RTD 30/31
1284 South Lucerne Boulevard, Los Angeles	Martha M Whaley Home	1914	3	1-Story Residence	/ Maurie	State Office of Historic Preservation Statewide Database	RTD 30/31
1285 South Lucerne Boulevard, Los Angeles	Madge Revell Home	1914	4	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
500 Block East Macy Street, Los Angeles	Macy Street Bridge	N/A	2	Bridge		Determined Eligible For The National Register By 1987 Caltrans Historic Bridge Survey, Inventory #130	M 10
900 East Macy Street, Los Angeles	Macy Street Viaduct	1926	5	Spanish Renaissance Viaduct/ Bridge		Gebhard & Winter 1985; Alameda Corridor 1992 Environmental Impact Report	RTD 70, RTD 45, RTD 70
1030 East Macy Street, Los Angeles	Residence	N/A	5	Residence		Los Angeles Historic-Cultural Monument #102	RTD 70, RTD 45
535 North Main Street, Los Angeles	La Iglesia Nuestra Senora De Los Angeles	1818	1	Religious Building	Ramirez, Jose/ Jose Ramirez; Jose Chapman	State Office of Historic Preservation Statewide Database	RTD 70
406 South Main Street, Los Angeles		1906	3	8-Story Commercial Building	John F. Blee/ C. Wesley Roberts	State Office of Historic Preservation Statewide Database	RTD 30/31
500 South Main Street, Los Angeles	Charnock Block; Pershing Hotel	1888	3	Second Empire, 2-3-Story Commercial/Offices;		Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18, RTD 30/31
558 South Main Street, Los Angeles	William G. Kerckhoff Building	1907	3	Commercial Building	Morgan & Walls/ Alta Planning Mill	State Office of Historic Preservation Statewide Database	RTD 30/31
620 South Main Street, Los Angeles	Main Mercantile Building	1905	3	Proto-Modern, 6-Story Commercial/Offices;	/ Mcneil, J. V.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
7509 South Main Street, Los Angeles		1925	5	Commercial Vernacular, 2-Story Commercial		Los Angeles Department of Planning 1991 Survey	RTD 45
627 South Manhattan Place, Los Angeles		1924	4	Religious Building;	Russell & Alpaugh/	State Office of Historic Preservation Statewide Database	RTD 18
1200 South Manhattan Place, Los Angeles	Pico Heights Methodist Episcopalian Church	1906	3	Religious Building	Marsh/Russell/	State Office of Historic Preservation Statewide Database	RTD 30/31
1207 South Manhattan Place, Los Angeles		1928	3	Religious Building	Pope & Burton/ Lynch/ Cannon	State Office of Historic Preservation Statewide Database	RTD 30/31
1216 South Manhattan Place, Los Angeles		1916	3	Residence	/ Hamilton	State Office of Historic Preservation Statewide Database	RTD 30/31
1240 South Manhattan Place, Los Angeles		1915	3	Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1254 South Manhattan Place, Los Angeles		1915	3	Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
2700 Martin Luther King Jr Boulevard, Los Angeles	Church Of The Transfiguration	1937	5	Renaissance Revival, 2-Story Church		Los Angeles Department Of Planning 1990 Survey	RTD 40
5116 Maywood Avenue, Los Angeles		1909	5/5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5117 Maywood Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5124 Maywood Avenue, Los Angeles		1923	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5128 Maywood Avenue, Los Angeles		1921	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5131 Maywood Avenue, Los Angeles		1908	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5136 Maywood Avenue, Los Angeles		1922	5D	English Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5137 Maywood Avenue, Los Angeles		1925	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5140 Maywood Avenue, Los Angeles		1908	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5141 Maywood Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5149 Maywood Avenue, Los Angeles		1908	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5154 Maywood Avenue, Los Angeles		1924	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5160 Maywood Avenue, Los Angeles		1932	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5161 Maywood Avenue, Los Angeles		1930	5D	Spanish Colonial Revival, 1-Story Duplex Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
2900 Menlo Avenue, Los Angeles	Menlo Avenue-West 29th St. Historic District	1896	1D	Colonial Revival Single Dwellings	Multiple/	Listed In The National Register, 02/12/1987	RTD 204
3746 Mercury Avenue, Los Angeles		24	5	Craftsman Apartments, 2-Story Residence		Los Angeles Department Of Planning 1989 Survey	RTD 45
4300 Mercury Avenue, Los Angeles		1923	5	Eclectic/Arroyo Stone Craftsman, 1-Story Residence	/ Joseph Parlilo	Los Angeles Department of Planning 1989 Survey;State Office of Historic Preservation Statewide Database	RTD 45
4401 Mercury Avenue, Los Angeles	Rosehill Courts	1942	5	2-Story Public Housing	Ruck, W. F. & Beelman, Claude/	Los Angeles Department of Planning 1989 Survey;Gebhard & Winter 1985	RTD 45
514 South Mott Street, Los Angeles		1895	3	Residence		State Office of Historic Preservation Statewide Database	RTD 18
5202 Mount Helena Avenue, Los Angeles		1914	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Mount Helena Avenue Craftsman District	S-182
5122 Mount Royal, Los Angeles		1924	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5123 Mount Royal, Los Angeles		1922	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5128 Mount Royal, Los Angeles		1921	5D	Colonial Revival/Craftsman Infl., 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5129 Mount Royal, Los Angeles		1926	5D	English Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5132 Mount Royal, Los Angeles		1926	5D	English Revival, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5133 Mount Royal, Los Angeles		1918	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5138 Mount Royal, Los Angeles		1919	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5139 Mount Royal, Los Angeles		1910	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5153 Mount Royal, Los Angeles		1912	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5154 Mount Royal, Los Angeles		1927	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5159 Mount Royal, Los Angeles		1922	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5160 Mount Royal, Los Angeles		1927	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5163 Mount Royal, Los Angeles		1920	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
627 South Normandie Avenue, Los Angeles		1929	3	Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
1324 South Normandie Avenue, Los Angeles	Saint Sophia Cathedral	1952	4	Byzantine Cathedral	Kalionzes, Klingerman,& Walker/	Los Angeles Historic-Cultural Monument #120; State Office of Historic Preservation Statewide Database	RTD 30/31
1407 South Norton Avenue, Los Angeles		1912	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
1411 South Norton Avenue, Los Angeles		1912	5D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Woolsey Tract/ Central Arlington Neighborhood District	RTD 30/31
2310 Ocean View Avenue, Los Angeles		1918	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 18
2420 Ocean View Avenue, Los Angeles		1910	5	Residence		State Office of Historic Preservation Statewide Database	RTD 18
2430 Ocean View Avenue, Los Angeles		1928	4	7-Story Residential MF	Leonard Jones/ J Leighton	State Office of Historic Preservation Statewide Database	RTD 18
2504 Ocean View Avenue, Los Angeles		1923	5	Residential MF	H J Knour/ P Holmes	State Office of Historic Preservation Statewide Database	RTD 18
515 South Olive Street, Los Angeles	Biltmore Hotel	1923	2	Hotel; Hotel/ Motel	Sitton; Schultze & Weaver/ Scofield Engineering Co	Los Angeles Historic-Cultural Monument #60; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
617 South Olive Street, Los Angeles	Alexander And Oviatt Building; Oviatt Building	1927	1	Art Deco; Art Deco/Italian Renaissance, 13-Story Commerce/Trade	Walker & Eisen; Feil, Joseph/ Feil & Paradise; P. J. Walker Co.	Listed In The National Register, 08/11/1983; Los Angeles Historic-Cultural Monument #195; Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation S	RTD 16, RTD 18

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
649 South Olive Street, Los Angeles	Giannini/ Bank Of America/ Bank Of Italy Bldg.	1922	3	Beaux Arts/Classical, 12-Story Commercial/Office	Morgan, Walls, & Clements/ Lange & Bergstrom	Los Angeles Historic-Cultural Monument #354, 4/26/88; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
649 South Olive Street, Los Angeles	Giannini/ Bank Of America/ Bank Of Italy Bldg.	1922	3	Beaux Arts/Classical Commercial/Office	Morgan, Walls, & Clements/ Lange & Bergstrom	Los Angeles Historic-Cultural Monument #354, 4/26/88; State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
712 South Olive Street, Los Angeles	Ville De Paris Store	1917	3	6-Story Commercial Building	Dodd & Richards/ Weymouth Crowell Co	State Office of Historic Preservation Statewide Database	RTD 66/67
716 South Olive Street, Los Angeles	South California Telegraph Co/Olive St	1908	3	Commercial Building		State Office of Historic Preservation Statewide Database	RTD 66/67
801 South Olive Street, Los Angeles		1928	5	Commercial		State Office of Historic Preservation Statewide Database	RTD 66/67
4200 South Olive Street, Los Angeles		1905	5	Turn Of The Century, 1-Story Residence		Los Angeles Department of Planning 1991 Survey;Notable For Brick Construction In Residential Use	RTD 45
0 Olvera Street, Los Angeles	Los Angeles Plaza Historic District; El Pueblo	N/A	1D	Adobe, Multiple Style Early Settlement	Unknown/	Listed In The National Register, 11/03/1972; Additional Documentation, 11/12/1981	RTD 40, RTD 70
2416 East Olympic Boulevard, Los Angeles	Southern California Gas Company Complex	1919	2	Spanish Colonial Revival/ Streamline, 1 & 2-Story Gas Company Complex	Cleland, J. W.; Bostoc, W. M./ Gas Co.; Millsap, R.; Payne, W.	Determined Eligible For The National Register 08/18/1989 - Los Angeles Wastewater Facilities Project	RTD 66/67
2500 Block East Olympic Boulevard, Los Angeles	9th Street/ Olympic Boulevard Bridge	N/A	2	Bridge		Determined Eligible For The National Register By 1987 Caltrans Historic Bridge Survey, Inventory #163	RTD 66/67
5400 East Olympic Boulevard, Los Angeles	Pacific Goodrich Rubber Co Bldg	1927	3	Ancillary Building	Weyle/	State Office of Historic Preservation Statewide Database	RTD 66/67
618 West Olympic Boulevard, Los Angeles		1934	5	Commercial		State Office of Historic Preservation Statewide Database	RTD 66/67
3501 West Olympic Boulevard, Los Angeles	Bessie L Burrall Home	1913	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
3505 West Olympic Boulevard, Los Angeles	Edward M Daugerty Home	1919	4	Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
607 South Park View Street, Los Angeles	Park Plaza Hotel	1925	5	Beaux Arts/Bertram Goodhue, 12-Story Hotel	Curlett, Aleck/	Los Angeles Historic-Cultural Monument #267	RTD 18
2000 Pasadena Avenue, Los Angeles	G N C Industries	1957	5D	Mission Revival, 1-Story Comm./Institutional		Los Angeles Department of Planning 1989 Survey;Part Of The Lincoln Heights Neighborhood District	RTD 45

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
401 East Pico Boulevard, Los Angeles	Allied Crafts Building	1925	3	Gothic Revival, 10-Story Commercial/Offices;	Lee, W. Douglas/ Lloyd & Casler; Lee, W. Douglas	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31
417 East Pico Boulevard, Los Angeles	Lloyd & Casler Building/ Kurtzman Building	1924	3	Gothic Revival, 6-Story Commercial/Office	Lee, W. Douglas/ Lloyd & Casler	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31
312 West Pico Boulevard, Los Angeles	Abbie L. Earl Bldg; National Engraving Co.	1913	3	Federal Revival, 2 1/2-Story Light Industrial	Keim, T. Beverly, Jr./ Huntsberger Reed Co.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 70
700 West Pico Boulevard, Los Angeles	Masonic Temple	1907	3	Classical Revival, 5-Story Religious Building	Hudson & Munsell/ Engstrum, F. O.	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31,RTD 70, RTD 30/31, RTD 70
1400 West Pico Boulevard, Los Angeles		1898	5	2-Story Commercial		State Office of Historic Preservation Statewide Database	RTD 30/31
1600 West Pico Boulevard, Los Angeles	Doria Apts.	1905	5	Mission Revival Residence		Los Angeles Historic-Cultural Monument #432, 5/5/89	RTD 30/31
3405 West Pico Boulevard, Los Angeles		1927	3	Religious Building	Cross/ Jones	State Office of Historic Preservation Statewide Database	RTD 30/31
4050 West Pico Boulevard, Los Angeles	Forum Theater	1923	3	Beaux Arts, 2-Story Theater	Borgmeyer, E. G./	Los Angeles Department Of Planning 1990 Survey;State Office Of Historic Preservation Statewide Survey Database	RTD 30/31
4159 West Pico Boulevard, Los Angeles		1924	5	Residential MF		State Office of Historic Preservation Statewide Database	RTD 30/31
1530 Pleasant Avenue, Los Angeles	Antonio Valla Residence; Templo El Buen Pastor	1895	3D	Colonial Revival; Mission Revival, 2 1/2-Story Residence/ Religious		Los Angeles Community Redevelopment Agency Boyle Heights 1 1982 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31
1544 Pleasant Avenue, Los Angeles	Joseph Baker Residence	1903	4/3D	Colonial Revival/Amer. Foursquare Residence		State Office of Historic Preservation Statewide Database; Los Angeles Community Redevelopment Agency Boyle Heights 1 1982 Determination Of Eligibility Report	RTD 30/31
1550 Pleasant Avenue, Los Angeles	Charles M Ferguson Residence	1903	3D	Colonial Revival, 1-Story Residence		State Office of Historic Preservation Statewide Database; Los Angeles Community Redevelopment Agency Boyle Heights 1 1982 Determination Of Eligibility Report	RTD 30/31
1603 Pleasant Avenue, Los Angeles	August Wohlfarth Residence	1889	3D	Queen Anne Residence		State Office of Historic Preservation Statewide Database; Los Angeles Community Redevelopment Agency Boyle Heights 1 1982 Determination Of Eligibility Report	RTD 30/31
1623 Pleasant Avenue, Los Angeles	Frank E Lopez Residence	1894	4/3D	Queen Anne, 2; 1-Story Residence		State Office of Historic Preservation Statewide Database; Los Angeles Community Redevelopment Agency Boyle Heights 1 1982 Determination Of Eligibility Report	RTD 30/31
1626 Pleasant Avenue, Los Angeles	Charles Fochlinger Residence	1905	3D	Shingle/ Craftsman Residence		State Office of Historic Preservation Statewide Database; Los Angeles Community Redevelopment Agency Boyle Heights 1 1982 Determination Of Eligibility Report	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1200 South Plymouth Boulevard, Los Angeles		1927	3	2-Story Residential MF	Goldberg/ Forman	State Office of Historic Preservation Statewide Database	RTD 30/31
1245 South Plymouth Boulevard, Los Angeles		1924	3	Residential MF	/ Holton	State Office of Historic Preservation Statewide Database	RTD 30/31
1259 Queen Anne Place, Los Angeles		1923	4	Residential MF	Foljambe/ Pinkerton	State Office of Historic Preservation Statewide Database	RTD 30/31
1282 Queen Anne Place, Los Angeles		1925	3	Residential MF	Noyes/ Clopine	State Office of Historic Preservation Statewide Database	RTD 30/31
1286 Queen Anne Place, Los Angeles		1925	4	Residential MF		State Office of Historic Preservation Statewide Database	RTD 30/31
3904 Roxton Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3910 Roxton Avenue, Los Angeles		1938	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3914 Roxton Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3924 Roxton Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3930 Roxton Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3934 Roxton Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3944 Roxton Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3950 Roxton Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3954 Roxton Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
3960 Roxton Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3964 Roxton Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3970 Roxton Avenue, Los Angeles		1937	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3974 Roxton Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
1325 Saginaw Street, Los Angeles		1911	4	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey	S-182
108 North San Pedro Street, Los Angeles		1925	1	Commercial	William E. Young/	State Office Of Historic Preservation Statewide Database	RTD 40
120 North San Pedro Street, Los Angeles	Japanese Union Church Of L. A.	1923	1	Religious Center	Patterson, H.M./	Los Angeles Historic-Cultural Monument #312; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40
437 Savoy Street, Los Angeles	Charles B Wellman Residence	1894	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 45
5112 Shearin Avenue, Los Angeles		1920	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5115 Shearin Avenue, Los Angeles		1916	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5120 Shearin Avenue, Los Angeles		1923	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5121 Shearin Avenue, Los Angeles		1923	5D	Craftsman, 2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5124 Shearin Avenue, Los Angeles		1922	5D	English Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5127 Shearin Avenue, Los Angeles		1924	5D	Mission Influence, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5137 Shearin Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5138 Shearin Avenue, Los Angeles		1923	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5144 Shearin Avenue, Los Angeles		1914	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5145 Shearin Avenue, Los Angeles		1902	5D	Craftsman, 1 1/2-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5146 Shearin Avenue, Los Angeles		1923	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5149 Shearin Avenue, Los Angeles		1923	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5156 Shearin Avenue, Los Angeles		1921	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5159 Shearin Avenue, Los Angeles		1921	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5162 Shearin Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5163 Shearin Avenue, Los Angeles		1922	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
2827 Sierra Street, Los Angeles		N/A	5	Queen Anne, 1-Story Residence		Los Angeles Department of Planning 1989 Survey	RTD 45
138 North Soto Street, Los Angeles		1931	4	2-Story Residential MF		State Office of Historic Preservation Statewide Database	RTD 30/31
257 South Spring Street, Los Angeles		1898	4	Commercial Building	Reid & Reid/ Swensen	State Office of Historic Preservation Statewide Database	RTD 16, RTD 40, RTD 45, RTD 70
354 -704 South Spring Street, Los Angeles	Spring Street Financial District	1902	1D	Moderne Commerce/ Trade	Morgan, Walls & Morgan/ Parkinson, John	Listed In The National Register, 08/10/1979	RTD 16, RTD 18
408 South Spring Street, Los Angeles	Braly Building/ California Savings Bank	1902	1D	12-Story Commercial Building	Parkinson/ Ramish, Marsh	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 18
410 South Spring Street, Los Angeles	Hellman Bldg	1913	1D	Commercial Building	Morgan, Walls, & Morgan/	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 18
416 South Spring Street, Los Angeles	Stowell Hotel	1913	1D	Hotel/ Motel	Noonan/ Leonardt	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 18

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
433 South Spring Street, Los Angeles	Title Insurance & Trust Co.	1928	1D	Art Deco, 11-Story Commercial Building	Parkinson & Parkinson/ Scofield Engineering Co	State Office of Historic Preservation Statewide Database; Los Angeles Historic-Cultural Monument #385, 8/5/88; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
453 South Spring Street, Los Angeles	Citizens National Bank	1914	1D	Commercial Building	Parkinson & Bergstrom/	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 18, RTD 40, RTD 45, RTD 70
514 South Spring Street, Los Angeles	Security National Bank	1916	1D	Commercial	Parkinson/	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16
548 South Spring Street, Los Angeles	Merchants National Bank	1913	1D	12-Story Commercial Building	Curlett/ Commercial Fireproof Co	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16
601 South Spring Street, Los Angeles		1905	1D	Ancillary Building	Walker, King, Parkinson/ Leonardt	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 40, RTD 45, RTD 70
618 South Spring Street, Los Angeles	Los Angeles Stock Exchange Building	1931	1D	Classical Moderne, 12-Story Commercial Building	Lunden, Samuel E./	Los Angeles Historic-Cultural Monument #205; State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 16, RTD 30/31
639 South Spring Street, Los Angeles		1919	1D	13-Story Commercial Building	Morgan, Walls, Morgan/ Crowell	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 40, RTD 45, RTD 70
704 South Spring Street, Los Angeles		1923	1D	13-Story Commercial Building	Morgan & Walls/ Edwards, Wildey, Co	State Office of Historic Preservation Statewide Database; Listed In The National Register 08/10/1979 As A Contributing Feature Of The Spring Street Financial District.	RTD 30/31, RTD 40, RTD 45, RTD 70
756 South Spring Street, Los Angeles	Central Finance Building; Great Republic Life	1923	3	Renaissance Revival, 11-Story Offices/Commercial;	Walker & Eisen/ Lange & Bergstrom	Los Angeles Community Redevelopment Agency Central Business District 1983 Determination Of Eligibility Report; State Office of Historic Preservation Statewide Database	RTD 30/31, RTD 40, RTD 45, RTD 70
1253 Stadium Way, Los Angeles	Cathedral High School	1923	5	High School		Los Angeles Historic-Cultural Monument #281	RTD 45

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
3011 West Stocker Place, Los Angeles		1938	5D	Spanish Colonial Revival (thirties), 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
3021 West Stocker Place, Los Angeles		1939	5D	Streamline Moderne/ Spanish Colonial, 2-Story Residential/ Apts		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
100 West Sunset Boulevard, Los Angeles	Plaza Church	1822	5	Church		Los Angeles Historic-Cultural Monument #3	RTD 70
3904 Sutro Avenue, Los Angeles		1934	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3908 Sutro Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3912 Sutro Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3916 Sutro Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3920 Sutro Avenue, Los Angeles		1934	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3924 Sutro Avenue, Los Angeles		1932	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3928 Sutro Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3932 Sutro Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3936 Sutro Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3944 Sutro Avenue, Los Angeles		1934	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
3948 Sutro Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3952 Sutro Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3956 Sutro Avenue, Los Angeles		1933	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3960 Sutro Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3964 Sutro Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
3968 Sutro Avenue, Los Angeles		1935	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
4000 Sutro Avenue, Los Angeles		1936	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department Of Planning 1990 Survey;Roxton-Dublin-Sutro Spanish Colonial Revival District	RTD 40
4100 Sutro Avenue, Los Angeles		1929	5D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4134 Sutro Avenue, Los Angeles		1939	5D	Norman Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
4140 Sutro Avenue, Los Angeles		1928	5D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Stocker Plaza Spanish District	RTD 40
14410 Sylvan Street, Los Angeles	Valley Municipal Building	1932	3	Zig Zag Moderne Government Building	Schabarum, P.K./ Brittain	Los Angeles Historic-Cultural Monument #202; State Office of Historic Preservation Statewide Database	RTD 560
430 South Union Avenue, Los Angeles		1926	4	3-Story Residential MF	J M Close/	State Office of Historic Preservation Statewide Database	RTD 18
1339 South Union Avenue, Los Angeles	Miss Helena Fleishman Residence	1885	5	Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
310 South Van Ness Avenue, Los Angeles		1926	3	Religious Building	Martin/ Nutler	State Office of Historic Preservation Statewide Database	RTD 16, RTD 18
1219 South Van Ness Avenue, Los Angeles		1915	3	2-Story Residence	Lund/ Lund	State Office of Historic Preservation Statewide Database	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1222 South Van Ness Avenue, Los Angeles		1918	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1224 South Van Ness Avenue, Los Angeles		1922	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1225 South Van Ness Avenue, Los Angeles		1921	3	2-Story Residence	/ Hillock	State Office of Historic Preservation Statewide Database	RTD 30/31
1230 South Van Ness Avenue, Los Angeles		1923	3	2-Story Residence	Reyanza/ Philo/ Slasor	State Office of Historic Preservation Statewide Database	RTD 30/31
1236 South Van Ness Avenue, Los Angeles		1925	3	2-Story Residence	Lord/ Allen/ Bird	State Office of Historic Preservation Statewide Database	RTD 30/31
1237 South Van Ness Avenue, Los Angeles		1912	4	2-Story Residence	/ Sheets	State Office of Historic Preservation Statewide Database	RTD 30/31
1244 South Van Ness Avenue, Los Angeles		1911	3	2-Story Residence	Cogswell/ Conner	State Office of Historic Preservation Statewide Database	RTD 30/31
1245 South Van Ness Avenue, Los Angeles		1909	3	Residence	Moxon/ Galloway	State Office of Historic Preservation Statewide Database	RTD 30/31
2704 South Vermont Avenue, Los Angeles		1922	4	Residential MF	Roy L Jones/	State Office of Historic Preservation Statewide Database	RTD 204
5407 South Vermont Avenue, Los Angeles		1922	5	Commercial	J R Daniels/ Escherick Brothers	State Office of Historic Preservation Statewide Database	RTD 204
5717 South Vermont Avenue, Los Angeles		1953	5	Commercial	Frank Homolka & Assoc/	State Office of Historic Preservation Statewide Database	RTD 204
5800 South Vermont Avenue, Los Angeles	Great Sw Market	1929	4	Commercial	Walter R Hagedohm/ Israel Nussbaum	State Office of Historic Preservation Statewide Database	RTD 204
5837 South Vermont Avenue, Los Angeles		1930	3	Commercial	Walker & Eisen/	State Office of Historic Preservation Statewide Database	RTD 204
5853 South Vermont Avenue, Los Angeles	Tempo Theater	1923	3	Commercial	H C Deckbar/ Al Nelson	State Office of Historic Preservation Statewide Database	RTD 204
5929 South Vermont Avenue, Los Angeles		1922	3	Educational Building	John C Austin/	State Office of Historic Preservation Statewide Database	RTD 204
208 West Vernon Avenue, Los Angeles		1895	5D	Colonial/ Queen Anne Influence, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;West Vernon Avenue Queen Anne Pair	RTD 45

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
210 West Vernon Avenue, Los Angeles		1895	5D	Colonial/ Queen Anne Influence, 2-Story Residence		Los Angeles Department of Planning 1991 Survey;West Vernon Avenue Queen Anne Pair	RTD 45
1262 Victoria Avenue, Los Angeles	Residence Of William Grant Still	1923	5	2-Story Residence		Los Angeles Historic-Cultural Monument #169	RTD 30/31
1194 South Victoria Avenue, Los Angeles		1924	3	2-Story Residence	Cooper/ Mortabend Construction Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1204 South Victoria Avenue, Los Angeles		1916	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1207 South Victoria Avenue, Los Angeles		1921	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1219 South Victoria Avenue, Los Angeles		1911	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1224 South Victoria Avenue, Los Angeles		1910	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1227 South Victoria Avenue, Los Angeles		1905	4	2-Story Residence	Smith/ Easton	State Office of Historic Preservation Statewide Database	RTD 30/31
1237 South Victoria Avenue, Los Angeles	Residence For John G. Grundy	1919	2D	Craftsman, 2-Story Residential Sf	Unknown/ Mrs. E. H. Voight	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1237 South Victoria Avenue, Los Angeles	Oxford Square Craftsman District	1903	2D	Craftsman/ Craftsman Influence Residential District	Unknown/ Emil Firth (Subdivision)	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1243 South Victoria Avenue, Los Angeles	William J. And Elmyra Eckert Residence	1908	2D	Craftsman, 2 1/2-Story Residential Sf	Unknown/ Unknown	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1246 South Victoria Avenue, Los Angeles	Thomas And Etta Chancellor Residence	1908	2/2D	Craftsman/Tudor Revival, 2 1/2-Story Residential Sf	Unknown/ Unknown	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1247 South Victoria Avenue, Los Angeles	John A. And Anna M. Howsley Residence	1926	2D	Spanish Colonial Revival/Craftsman, 2-Story Residential Sf	Calhoun, W. E./ Howsley, John A. (Owner Built)	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1252 South Victoria Avenue, Los Angeles	Maria And Richard Dunnigan Residence	1907	2D	Shingle/Craftsman, 2-Story Residential Sf	Unknown/ Unknown	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1253 South Victoria Avenue, Los Angeles	Abraham, Mattie & Roy Heltchew Residence	1908	2D	Craftsman, 2-Story Residential Sf	Unknown/ Sherwood, Damon	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1258 South Victoria Avenue, Los Angeles	Residence For Lee And Lou Ellen Callahan	1910	2D	Craftsman, 2-Story Residential Sf	Unknown/ Unknown	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1261 South Victoria Avenue, Los Angeles	William P. And Lucy G. Baker Residence	1909	2D	Craftsman, 2 1/2-Story Residential Sf	Unknown/ Unknown	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1262 South Victoria Avenue, Los Angeles	Residence Of William Grant Still	1923	5	Spanish Colonial Revival, 2-Story Residential Sf	Unknown/ Unknown	City Of Los Angeles Cultural Heritage Monument #169; METRO RAIL Red Line West 1992 Survey; Determined Not Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1269 South Victoria Avenue, Los Angeles	Residence For Peter Johnson	1903	2D	Craftsman/Queen Anne/Classical, 2 1/2-Story Residential Sf	Unknown/ Unknown	METRO RAIL Red Line West 1992 Survey; Determined Eligible For Inclusion In The National Register, 08/12/1992 As A Contributing Feature Of The Oxford Square Craftsman District.	RTD 30/31
1312 South Victoria Avenue, Los Angeles		1938	4D	Colonial Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1319 South Victoria Avenue, Los Angeles		1923	4D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1320 South Victoria Avenue, Los Angeles		1948	4D	Mission Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1323 South Victoria Avenue, Los Angeles		1922	4D	Mission Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1324 South Victoria Avenue, Los Angeles		1922	4D	Mission Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1402 South Victoria Avenue, Los Angeles		1910	4D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1403 South Victoria Avenue, Los Angeles		1923	4D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1408 South Victoria Avenue, Los Angeles		1912	4D	Prairie/ Mission Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1409 South Victoria Avenue, Los Angeles		1923	5/4D	Craftsman/ Tudor Revival, 2 1/2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1412 South Victoria Avenue, Los Angeles		N/A	4D	Mediterranean/ Renaissance Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1415 South Victoria Avenue, Los Angeles		1912	4D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1420 South Victoria Avenue, Los Angeles		1924	4D	Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1426 South Victoria Avenue, Los Angeles		1922	4D	Mediterranean/ Mission Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1432 South Victoria Avenue, Los Angeles		1911	4D	Craftsman, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1438 South Victoria Avenue, Los Angeles		1924	4D	Mediterranean, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1502 South Victoria Avenue, Los Angeles		1912	5/4D	Mission Revival Influence, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1508 South Victoria Avenue, Los Angeles		1908	5/4D	Craftsman/ Tudor Revival, 2 1/2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1514 South Victoria Avenue, Los Angeles		1923	4D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
1524 South Victoria Avenue, Los Angeles		1920	4D	Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
6060 South Victoria Avenue, Los Angeles	Saint John The Evangelist Church	1946	5	Modern, 2-Story Church		Los Angeles Department Of Planning 1990 Survey	RTD 40
4301 Victoria Park, Los Angeles	S. J. Peters Residence	1921	4D	Spanish Colonial Revival/ Mission Rev., 2-Story Residence	Tyler, Frank M./	Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4311 Victoria Park, Los Angeles	Michael & Nellie Shannon Residence	1911	5/4D	Craftsman/ Tudor Revival Influence, 2 1/2-Story Residence	Train & Williams/	Los Angeles Department Of Planning 1990 Survey;Victoria Park District;West Adams Heritage Association Files	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4331 Victoria Park, Los Angeles	Residence For Charles Goldstein	1923	4D	Spanish Colonial Revival, 2-Story Residence	Roberts, J. William/ Roberts, J. William	Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4345 Victoria Park, Los Angeles	Henry P. And Ada M. Hoffman Residence	1909	4/4D	Craftsman, 2 1/2-Story Residence	Jarrett And Bixby/	Los Angeles Department Of Planning 1990 Survey;Victoria Park District;West Adams Heritage Association Files	RTD 30/31
4353 Victoria Park, Los Angeles		1923	4D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4357 Victoria Park, Los Angeles		1923	4D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4401 Victoria Park, Los Angeles		1923	4D	Spanish Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4411 Victoria Park, Los Angeles		1950	4D	Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4415 Victoria Park, Los Angeles		1923	4D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4423 Victoria Park, Los Angeles	Duplex For P. H. Kaufman	1923	4D	English Revival, 2-Story Residential Duplex	Holloway, Charles S./ Holloway, Charles S.	Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4427 Victoria Park, Los Angeles	Duplex For F. M. Law	1922	4D	Spanish Colonial Revival/ Mission Rev., 2-Story Residential Duplex	Holloway, Charles S./ Holloway, Charles S.	Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4433 Victoria Park, Los Angeles	Duplex For George F. Rubsch	1925	4D	Spanish Colonial Revival/ Eclectic, 2-Story Residential Duplex	Carlet, J. T./ Dawson, H. T.	Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4439 Victoria Park, Los Angeles		1908	5/4D	Craftsman/ Tudor Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4443 Victoria Park, Los Angeles	Duplex For Fred Munsey	1922	4D	Mission Revival Influence, 2-Story Residential Duplex	Balsen, William F./ Young, D.	Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4447 Victoria Park, Los Angeles	Duplex For F. Balderbach	1923	4D	Spanish Colonial Revival/ Mission Rev., 2-Story Residential Duplex	Weingardus, H. B./	Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4451 Victoria Park, Los Angeles	Duplex For J. C. And Mille Dent	1923	4D	Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
4455 Victoria Park, Los Angeles	Duplex For C. E. Keeling	1923	4D	Prairie/ Colonial Revival, 2-Story Residential Duplex		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4465 Victoria Park, Los Angeles		1923	4D	Spanish Colonial Revival, 2-Story Residence		Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
4469 Victoria Park, Los Angeles		1924	4D	Spanish Colonial Revival, 2-Story Residential Duplex	/ Law, Russell	Los Angeles Department Of Planning 1990 Survey;Victoria Park District	RTD 30/31
5116 Vincent Avenue, Los Angeles		1926	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5117 Vincent Avenue, Los Angeles		1923	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5122 Vincent Avenue, Los Angeles		1923	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5123 Vincent Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5127 Vincent Avenue, Los Angeles		1923	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5133 Vincent Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5136 Vincent Avenue, Los Angeles		1924	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5139 Vincent Avenue, Los Angeles		1922	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5140 Vincent Avenue, Los Angeles		1922	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5147 Vincent Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5148 Vincent Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5152 Vincent Avenue, Los Angeles		1922	5D	Craftsman, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5155 Vincent Avenue, Los Angeles		1923	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5156 Vincent Avenue, Los Angeles		1923	5D	Colonial Revival/Craftsman Infl., 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
5159 Vincent Avenue, Los Angeles		1924	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5162 Vincent Avenue, Los Angeles		1925	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
5163 Vincent Avenue, Los Angeles		1923	5D	Spanish Colonial Revival, 1-Story Residence		Los Angeles Department of Planning 1989 Survey;Part Of The Hill Drive & Environs Residential District	S-182
155 West Washington Boulevard, Los Angeles	Industrial Exchange Building	1926	5	Eclectic/ Gothic Influence, 11-Story Offices/ Retail	Meyer & Holler/ Meyer & Holler	Los Angeles Department of Planning 1991 Survey	RTD 40, RTD 45
934 Westchester Place, Los Angeles	Amos E Mille Home	1925	3	2-Story Residence	Shirley/ Shirley	State Office of Historic Preservation Statewide Database	RTD 66/67
940 Westchester Place, Los Angeles	Concetta De Blasi Home	1925	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
944 Westchester Place, Los Angeles	William Rohe Home	1918	3	2-Story Residence	Lagman/ Kzahack Co	State Office of Historic Preservation Statewide Database	RTD 66/67
948 Westchester Place, Los Angeles	Dora H Lustig Home	1918	3	2-Story Residence	/ Land	State Office of Historic Preservation Statewide Database	RTD 66/67
951 Westchester Place, Los Angeles	Mary C Schaffer Home	1925	3	2-Story Residence	/ Palmer	State Office of Historic Preservation Statewide Database	RTD 66/67
952 Westchester Place, Los Angeles	M Norins Home	1923	3	1-Story Residence	Rust/ Erickson	State Office of Historic Preservation Statewide Database	RTD 66/67
955 Westchester Place, Los Angeles	Howard R Clarke/ Otto Wartenweiler Home	1925	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
956 Westchester Place, Los Angeles	Louis N Cleveland Home	1924	4	2-Story Residence	Brown/ De La Croix	State Office of Historic Preservation Statewide Database	RTD 66/67
960 Westchester Place, Los Angeles	Edwin F Troomey Home	1922	3	2-Story Residence	Winget/	State Office of Historic Preservation Statewide Database	RTD 66/67
961 Westchester Place, Los Angeles	Ernest M Clark Home	1916	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
964 Westchester Place, Los Angeles	Rose C Strong Home	1915	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
965 Westchester Place, Los Angeles	Charles T Larabee Home	1922	3	2-Story Residence	Palmer/ Palmer	State Office of Historic Preservation Statewide Database	RTD 66/67
968 Westchester Place, Los Angeles	Laura Bush Home	1930	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
969 Westchester Place, Los Angeles	Hiro M Dickerson Home	1922	5	1-Story Residence	Rakow/ Rakow	State Office of Historic Preservation Statewide Database	RTD 66/67
972 Westchester Place, Los Angeles	Fred C Traub Home	1924	3	2-Story Residence	Mccutcheon/ Traub	State Office of Historic Preservation Statewide Database	RTD 66/67

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
975 Westchester Place, Los Angeles	James W Dunham Home	1917	3	2-Story Residence	/ Whitice	State Office of Historic Preservation Statewide Database	RTD 66/67
976 Westchester Place, Los Angeles	John Boyle Home	1918	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
979 Westchester Place, Los Angeles	Charles H Isler Home	1920	3	2-Story Residence	Williams/ Newton/Williams	State Office of Historic Preservation Statewide Database	RTD 66/67
982 Westchester Place, Los Angeles	Eliza P Houghton Home	1915	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
985 Westchester Place, Los Angeles	Helen M Borden Home	1915	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
1250 South Western Avenue, Los Angeles		1928	4	Residential MF	Maltzman/ Rose	State Office of Historic Preservation Statewide Database	RTD 30/31
1250 South Western Avenue, Los Angeles		1928	4	Residential MF	Maltzman/ Rose	State Office of Historic Preservation Statewide Database	RTD 30/31
521 South Westlake Avenue, Los Angeles		1908	5	Commercial	W J Saunders/	State Office of Historic Preservation Statewide Database	RTD 18
760 South Westmoreland Avenue, Los Angeles	First Baptist Church Of L A	1927	5	Eclectic Church	Allison & Allison/	Los Angeles Historic-Cultural Monument #237	RTD 66/67
2721 Whittier Boulevard, Los Angeles		1895	5	Residence		State Office of Historic Preservation Statewide Database	RTD 18
2806 Whittier Boulevard, Los Angeles	Crystal Theater	1922	4	Commercial	J T Zeller/ Anderson & Waggoner	State Office of Historic Preservation Statewide Database	RTD 18
2825 Whittier Boulevard, Los Angeles		1924	4	Commercial	Walker & Eisen/	State Office of Historic Preservation Statewide Database	RTD 18
2901 Whittier Boulevard, Los Angeles		1923	4	Commercial	A Godfrey Bailey/ Gruner-Day Labor	State Office of Historic Preservation Statewide Database	RTD 18
2930 Whittier Boulevard, Los Angeles	Collins Residence	1888	3	Eastlake, 2-Story Residence		Los Angeles Historic-Cultural Monument #266; State Office of Historic Preservation Statewide Database	RTD 18
2935 Whittier Boulevard, Los Angeles		1926	5	Commercial		State Office of Historic Preservation Statewide Database	RTD 18
2940 Whittier Boulevard, Los Angeles		1908	5	Commercial	J B Cook/ Atkinson Corr	State Office of Historic Preservation Statewide Database	RTD 18
3000 Whittier Boulevard, Los Angeles		1913	4	Commercial	August Wackerbarth/ H C Fink & Griffith	State Office of Historic Preservation Statewide Database	RTD 18
3030 Whittier Boulevard, Los Angeles		1923	4	Residential MF	De-lux Building Co/ H A Michel	State Office of Historic Preservation Statewide Database	RTD 18

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
2001 Wilshire Boulevard, Los Angeles		1923	5	Commercial Building	Kenyie & Nerrill/ W K Bush	State Office of Historic Preservation Statewide Database	RTD 18
2501 Wilshire Boulevard, Los Angeles	La Fonda Restaurant Building	1926	5	Spanish Colonial Revival, 2-Story Theater	Morgan, Walls & Clements/	Los Angeles Historic-Cultural Monument #268	RTD 18
3143 Wilshire Boulevard, Los Angeles		1931	3	Commercial		State Office of Historic Preservation Statewide Database	RTD 18, RTD 204
4121 Wilshire Boulevard, Los Angeles	Los Altos Apartments	1925	5	Spanish Revival Residential	Rust, E.B./	Los Angeles Historic-Cultural Monument #311	RTD 66/67
951 South Wilton Place, Los Angeles	Desser Residence	1924	3	Residence	/ Brock	State Office of Historic Preservation Statewide Database	RTD 66/67
957 South Wilton Place, Los Angeles	Loeffler Residence	1919	3	Residence	Priest/ May/ Greenwood	State Office of Historic Preservation Statewide Database	RTD 66/67
963 South Wilton Place, Los Angeles		1917	3	Residence	Esdoussek/ Escoussek	State Office of Historic Preservation Statewide Database	RTD 66/67
981 South Wilton Place, Los Angeles	Schlegel Residence	1923	4	Residence	Schlegel/ Schlegel	State Office of Historic Preservation Statewide Database	RTD 66/67
987 South Wilton Place, Los Angeles	Clawson Residence	1923	3	Residence	Schulz/ Schulz	State Office of Historic Preservation Statewide Database	RTD 66/67
993 South Wilton Place, Los Angeles	Goldenson Residence	1918	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 66/67
1214 South Wilton Place, Los Angeles	Yuncer Residence	1924	3	2-Story Residence	Raine/ Raine	State Office of Historic Preservation Statewide Database	RTD 30/31
1215 South Wilton Place, Los Angeles	Mittry Residence	1924	3	2-Story Residence	Falkenrath/ Mittry	State Office of Historic Preservation Statewide Database	RTD 30/31
1219 South Wilton Place, Los Angeles	Bichsler Residence	1925	3	2-Story Residence	Smith/ Gabriel	State Office of Historic Preservation Statewide Database	RTD 30/31
1220 South Wilton Place, Los Angeles	Guinney Residence	1920	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1224 South Wilton Place, Los Angeles	Shuken Residence	1924	3	2-Story Residence	Geck/ Geck	State Office of Historic Preservation Statewide Database	RTD 30/31
1225 South Wilton Place, Los Angeles	Bates Residence	1924	4	2-Story Residence	Jones/ Cooper	State Office of Historic Preservation Statewide Database	RTD 30/31
1230 South Wilton Place, Los Angeles	Leiner Residence	1923	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1236 South Wilton Place, Los Angeles	Molony Residence	1924	3	2-Story Residence	Ott/ Ott	State Office of Historic Preservation Statewide Database	RTD 30/31
1237 South Wilton Place, Los Angeles	Ku Tiner Residence	1924	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1245 South Wilton Place, Los Angeles	Chessman Residence	1923	3	2-Story Residence	Leiner/ Leiner	State Office of Historic Preservation Statewide Database	RTD 30/31
1250 South Wilton Place, Los Angeles	Jarrett Residence	1923	3	2-Story Residence	Jones/	State Office of Historic Preservation Statewide Database	RTD 30/31
1251 South Wilton Place, Los Angeles		1934	3	Residence	Black/ Security Finance Bldg Co	State Office of Historic Preservation Statewide Database	RTD 30/31
1200 South Windsor Boulevard, Los Angeles	Bertha Kather Home	1923	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1201 South Windsor Boulevard, Los Angeles	Elizabeth Hartman Home	1922	3	2-Story Residence	/ Leaver	State Office of Historic Preservation Statewide Database	RTD 30/31

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1206 South Windsor Boulevard, Los Angeles		1924	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1212 South Windsor Boulevard, Los Angeles	William & Elisabeth Gesner Home	1923	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1213 South Windsor Boulevard, Los Angeles	Mary E Auman Home	1922	3	1-Story Residence	/ Leaver	State Office of Historic Preservation Statewide Database	RTD 30/31
1216 South Windsor Boulevard, Los Angeles		1915	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1220 South Windsor Boulevard, Los Angeles	Henry Johnson Home	1903	5	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1221 South Windsor Boulevard, Los Angeles	Mary A Davis Home	1910	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1224 South Windsor Boulevard, Los Angeles	A Kenton Pope Home	1908	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1227 South Windsor Boulevard, Los Angeles	Anna J Bickwell Home	1910	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1230 South Windsor Boulevard, Los Angeles	James R Colgan Home	1912	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1235 South Windsor Boulevard, Los Angeles	John C Dianks Home	1910	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1237 South Windsor Boulevard, Los Angeles	Catherine M Wakeman Home	1921	3	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1238 South Windsor Boulevard, Los Angeles	Emil Firth Home	1909	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1241 South Windsor Boulevard, Los Angeles	Frank & Mary Megowan Home	1924	3	2-Story Residence	Thomas/ Thomas	State Office of Historic Preservation Statewide Database	RTD 30/31
1244 South Windsor Boulevard, Los Angeles	James E Mahon Home	1923	3	2-Story Residence	Hale/ Marrow & Baer	State Office of Historic Preservation Statewide Database	RTD 30/31
1253 South Windsor Boulevard, Los Angeles	Sidney Hyler Home	1921	3	2-Story Residence	/ Mcmullin	State Office of Historic Preservation Statewide Database	RTD 30/31
1259 South Windsor Boulevard, Los Angeles		1924	4	2-Story Residence	/ Mclean	State Office of Historic Preservation Statewide Database	RTD 30/31
1263 South Windsor Boulevard, Los Angeles	Edward Tyman Home	1922	3	2-Story Residence	Knepel/ Knepel	State Office of Historic Preservation Statewide Database	RTD 30/31

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
1264 South Windsor Boulevard, Los Angeles	William E Dimmich Home	1921	4	1-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
1276 South Windsor Boulevard, Los Angeles	Harry W Watson Home	1909	4	2-Story Residence		State Office of Historic Preservation Statewide Database	RTD 30/31
18127 South Alameda Street, Los Angeles County	Dominguez Ranch Adobe; Rancho San Pedro	1830	1	Mission/Spanish Revival Ranchhouse	Riccard, George/	Listed In The National Register, 05/28/1976	LB 50
5170 -5188 Whittier Boulevard, Los Angeles County	Golden Gate Theatre/ Vega Building	1927	1	Spanish Churrigueresque, 2-Story Movie Theater	Balch Brothers/ Vega Corporation	Listed In The National Register 02/23/1982; METRO RAIL Red Line East - 1992 Survey; Gebhard & Winter 1985	RTD 18, RTD 70
101 East Garvey Avenue, Monterey Park	Former Chamber Of Commerce Building	N/A	5	City Hall And Jail		Historical Society Of Monterey Park Landmark List	RTD 70
0 Colorado Boulevard, Pasadena	Colorado Street Bridge	1913	1	Reinforced Concrete Arched Bride	Waddell & Herrington/	Listed In The National Register, 02/12/1981; City Of Pasadena - Cultural Heritage Landmarks, March 1992	S-182
0 East Colorado Boulevard, Pasadena	Old Pasadena Historic District	N/A	1D	Mixed (more Than 2 Styles From Different Commercial District	Multiple/	Listed In The National Register, 09/15/1983	S-182
0 East Colorado Boulevard, Pasadena	Civic Center Financial District	1905	1D	Late 19th And 20th Century Revivals Commerce/Trade	Multiple/	Listed In The National Register, 10/29/1982	S-182
520 East Colorado Boulevard, Pasadena	Singer Building	1926	1	Spanish Colonial Revival Commerce/Trade	Babcock, Everett Phipps/	Listed In The National Register, 05/16/1985	S-182
587 East Colorado Boulevard, Pasadena	First Trust Building And Garage; Lloyd's Bank	1927	1	Renaissance Offices/ Garage	Bennett & Haskell/ Et Al.	Listed In The National Register, 06/12/1987	S-182
400 West Colorado Boulevard, Pasadena	Elks Club Lodge No. 672	1911	2	Colonial Revival Social; Clubhouse	Hunt, Myron/ Bennett & Haskell	Determined Eligible/Owner Objection, 05/16/1985	S-182
0 Walnut Street, Pasadena	Pasadena Civic Center District	N/A	1D	Beaux Arts Social	Multiple/	Listed In The National Regster, 07/28/1980	S-182
9235 Whittier Boulevard, Pico Rivera	National Bank Of Pico	1929	2	Store Building		Officially Determined Eligble to the National Register On 11-28-78	M 10
2730 Brighton Street, Rosemead		1925	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3014 Brighton Street, Rosemead		1940	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3026 Brighton Street, Rosemead		1926	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70

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LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
3027 Brighton Street, Rosemead		1940	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3041 Brighton Street, Rosemead		1925	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3047 Brighton Street, Rosemead		1927	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2707 Del Mar Avenue, Rosemead		1924	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2713 Del Mar Avenue, Rosemead		1924	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3015 Del Mar Avenue, Rosemead		1924	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3021 Del Mar Avenue, Rosemead		1914	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3039 Del Mar Avenue, Rosemead		1923	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2708 Denton Avenue, Rosemead		1920	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2717 Denton Avenue, Rosemead		1937	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2723 Denton Avenue, Rosemead		1927	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2731 Evelyn Avenue, Rosemead		1923	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3026 Evelyn Avenue, Rosemead		1921	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3026 Evelyn Avenue, Rosemead		1921	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2702 Falling Leaf Avenue, Rosemead		1926	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
7508 Garvey Avenue, Rosemead		1939	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
7528 Garvey Avenue, Rosemead		1932	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALUATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
7731 Garvey Avenue, Rosemead		1924	5	1-Story Commercial		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
7751 Garvey Avenue, Rosemead		1919	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
7772 Garvey Avenue, Rosemead		1937	5	Commercial		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
7849 Garvey Avenue, Rosemead		1934	5	Residential		Rosemead Graffiti Removal Program Historical Documentation 1991-1992	RTD 70
7853 Garvey Avenue, Rosemead		1935	5	Residential		Rosemead Graffiti Removal Program Historical Documentation 1991-1992	RTD 70
7863 Garvey Avenue, Rosemead		1927	5	Commercial		Rosemead Graffiti Removal Program Historical Documentation 1991-1992	RTD 70
7910 Garvey Avenue, Rosemead		1918	5	Commercial		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
7916 Garvey Avenue, Rosemead		1938	5	Commercial		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8048 Garvey Avenue, Rosemead		1940	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8069 Garvey Avenue, Rosemead		1935	5	Commercial		Rosemead Graffiti Removal Program Historical Documentation 1991-1992	RTD 70
8234 Garvey Avenue, Rosemead		1940	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8351 Garvey Avenue, Rosemead		1939	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8404 Garvey Avenue, Rosemead		1927	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8408 Garvey Avenue, Rosemead		1935	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8434 Garvey Avenue, Rosemead		1938	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8434 Garvey Avenue, Rosemead		1938	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2723 Jackson Avenue, Rosemead		1923	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70

APPENDIX A.6: HISTORIC/CULTURAL RESOURCES WITHIN A ONE-BLOCK STUDY AREA OF PROPOSED ETB ROUTES

LOCATION OF RESOURCE	HISTORIC OR COMMON NAME	YEAR BUILT	EVALU ATION	DESCRIPTION	ARCHITECT/ BUILDER	SIGNIFICANCE/ SOURCE	ROUTE(S)
2729 Jackson Avenue, Rosemead		1927	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
3048 Jackson Avenue, Rosemead		1923	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2706 Lindy Avenue, Rosemead		1926	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2722 Lindy Avenue, Rosemead		1910	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2732 Lindy Avenue, Rosemead		1923	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2740 Lindy Avenue, Rosemead		1940	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
7707 Newmark Avenue, Rosemead		1926	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8316 Park Street, Rosemead		1941	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
8334 Park Street, Rosemead		1923	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2713 Prospect Avenue, Rosemead		1937	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2733 Prospect Avenue, Rosemead		1933	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2743 Prospect Avenue, Rosemead		1923	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2746 San Gabriel Boulevard, Rosemead		1937	5	Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70
2703 Strathmore Avenue, Rosemead		1936	5	1-Story Residential		Rosemead Graffiti Removal Program Historical Documentation CDBG Target Area, 01/1991-1992	RTD 70

Source: Myra L. Frank & Associates, Inc., October 19, 1992

APPENDIX A.7 -
ELECTRIC TROLLEY BUS PROJECT
NOTICE OF PREPARATION

ELECTRIC TROLLEY BUS PROJECT
NOTICE OF PREPARATION
JUNE 15, 1992

TO: All Interested Agencies, Organizations and Individuals

FROM: Southern California Rapid Transit District
425 South Main Street
Los Angeles, CA 90013-1393
(213) 972-6000

SUBJECT: Notice of Preparation of an Environmental Impact Report

The Southern California Rapid Transit District (RTD) in cooperation with the Los Angeles County Transportation Commission (LACTC) hereby presents notice that it will be the Lead Agency for an Environmental Impact Report (EIR) for the:

PROJECT TITLE: Electric Trolley Bus Project

We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. If your agency is a Responsible Agency as defined by State CEQA Guidelines (Section 15381), your agency will need to use the EIR prepared for this project when considering your permit or other approval for the project. If your agency is not a responsible agency as defined by the CEQA Guidelines, or if you are an interested individual or organization, we would still appreciate your views on the scope and content of the environmental document for this project.

The project description, a locational map, and the probable environmental effects are identified in the enclosed materials. An Initial Study checklist is attached.

Due to the time limits mandated by state law, your response must be sent at the earliest possible date but no later than 30 days after the receipt of this notice. Please send your responses before July 20, 1992, to the Southern California Rapid Transit District, 425 South Main Street, Los Angeles, CA 90013-1393, ATTN: Mr. Nadeem Tahir, (213) 972-3858. Please include the name and telephone number of a contact person in your agency for continued EIR coordination.

Background

The overall Electric Trolley Bus (ETB) Project involves the conversion of 19 existing bus lines within Los Angeles County from diesel-fueled buses to non-polluting ETBs. This EIR will cover the 12 lines recommended under Phase I of the project. ETBs are in use in several North American cities, including San Francisco, Seattle, and Vancouver, Canada.

This project is driven in large part by the guidelines in the South Coast Air Quality Management District's (SCAQMD) 1991 Air Quality Management Plan (AQMP). The AQMP proposes that, by the year 2010, 30 percent of the bus miles logged within the region be from electric urban buses. The purpose of this EIR is to review potential environmental impacts associated with Phase I of the ETB Project.

Project Description

The 12 bus lines scheduled for conversion to ETB service include some of the busiest thoroughfares in the area and are spread throughout Los Angeles County, covering areas ranging from downtown Los Angeles, South-Central Los Angeles, the Westside, the Eastside, the San Fernando Valley, and Long Beach. The lines would be along existing roads and total 188 miles. The 12 routes (see Figure 1) are as follows:

- o RTD line 16. West 3rd Street (9.22 miles).
- o RTD line 18. West 6th Street -- Whittier Boulevard (14.29 miles).
- o RTD line 30/31. West Pico Boulevard -- East 1st Street (13.25 miles).
- o RTD line 40. South Bay Galleria -- Transit Center -- Hawthorne -- Inglewood -- Union Station -- Los Angeles County Jail (19.68 miles).
- o RTD line 45. Broadway (17.21 miles).
- o RTD line 66/67. West 8th Street -- East Olympic Boulevard (13.47 miles).
- o RTD line 70. Garvey Avenue (16.45 miles).
- o RTD Tri-Cities line. Burbank/Glendale/Pasadena (This new line is still a preliminary concept, although it would follow parts of existing RTD lines 92/93 and 180/181 [14.30 miles]).
- o RTD line 204. Vermont Avenue (17.01 miles).
- o RTD line 560. Van Nuys Boulevard (12.31 miles).
- o Montebello Transit line 10. Whittier Boulevard (6.67 miles).
- o A Long Beach Transit line consisting of portions of lines 40, 50, 60, and 90. Long Beach Boulevard -- Atlantic Avenue -- 7th Street -- Anaheim Street (34.33 miles; the mileage breakdown for the four portions are 5.44, 9.82, 11.07, and 8.00 miles, respectively).

The ETBs use electric motors that receive power via twin poles attached to the ETBs that connect to overhead electric wires strung along the streets. In addition to the new ETBs and overhead contact system (OCS), other project components include poles to support the wires, electrical substations, modified existing bus maintenance and storage yards, and possibly trees, bus shelters, and various landscaping along the routes.

Two to four start-up lines would be initially selected for final engineering design and construction. Present plans state that the first ETB line would begin service in December of 1994.

ELECTRIC TROLLEY BUS ROUTES
(PHASE 1)

Figure 1

ELECTRIC TROLLEY BUS PROJECT
INITIAL STUDY CHECKLIST
(06/12/92)

Identification of Environmental Effects

	YES	MAYBE	NO
1. **EARTH.** Will the proposal result in:			
a. Unstable earth conditions or in changes in geologic structures?	( )	( )	(X)

The Electric Trolley Bus (ETB) Project would involve very little earth work. All of the proposed bus routes are along existing streets. Project components would require minor surface adaptation, the most involved being grading during construction of traction power substation (TPSS) sites. However, even the TPSSs would require minimal surface site grading.

	YES	MAYBE	NO
b. Disruptions, displacements, compaction or overcovering of the soil?	( )	(X)	( )

The installation of TPSSs would require site grading to provide a level surface for concrete pads.

	YES	MAYBE	NO
c. Change in topography or ground surface relief features?	( )	( )	(X)

Because the project is in an urban area that has already been significantly altered, no notable changes in topography are expected.

	YES	MAYBE	NO
d. The destruction, covering or modification of any unique geologic or physical features?	( )	( )	(X)

The project area is largely developed, and it is unlikely that there are any remaining unmodified unique features which could be destroyed or covered.

	YES	MAYBE	NO
e. Any increase in wind or water erosion of soils, either on or off the site?	( )	(X)	( )

Construction activities for the TPSSs would temporarily increase the potential for soil erosion by exposing bare soil to wind. This is expected to be of minimum significance. Increased erosion, however, could be mitigated through standard construction practices such as prompt reseeding or site watering.

	YES	MAYBE	NO
f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel or a river or stream or the bed of the ocean or any bay, inlet, or lake?	( )	( )	(X)

No body of water is located near the proposed bus lines. Neither construction or operation is expected to produce changes in siltation, deposition, or erosion which may modify any water body.

g. Exposure of people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards? ( ) ( ) (X)

It is not anticipated that the proposed project routes would expose people or property to geologic hazards other than those present generally in Southern California.

2. **AIR**. Will the proposal result in:

a. Substantial air emissions or deterioration of ambient air quality over the long term? ( ) ( ) (X)

The proposed project would produce a net benefit in air quality since it would replace existing diesel-fueled buses with non-polluting ETBs.

b. The creation of objectionable odors or dust? ( ) (X) ( )

Construction at the TPSS sites may temporarily generate fugitive dust and objectionable odors from fossil fuel powered construction equipment. The project would create a net odor benefit during operation since the ETBs would not create odors associated with diesel exhaust.

c. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally? ( ) ( ) (X)

Neither construction or operation of the proposed project is anticipated to change climatic conditions, moisture, or temperature. No significant impacts are anticipated.

3. **WATER**. Will the proposal result in:

a. Changes in currents, or the course or direction of water movements, in either marine or fresh waters? ( ) ( ) (X)

The project routes are not located near marine or fresh water bodies and therefore would not produce changes in the course or direction of water movements.

b. Changes in absorption rates, drainage patterns or the rate and amount of surface water runoff? ( ) ( ) (X)

The absorption and drainage in this urban area would not be changed by the proposed project. Runoff would be directed to existing storm drains, but no increase is anticipated.

	YES	MAYBE	NO
c. Alterations to the course or flow of flood waters?	( )	( )	(X)

The project components are mostly attachments to the existing urban surface and structures. As a result, the course of flood waters would not be altered.

d. Change in the amount of surface water in any water body? (e.g., perennial or intermittent streams; seasonal or year-round springs; ponds and marshes?	( )	( )	(X)

The project would not generate any additional surface water or alter existing water paths. As currently exists, drainage would be directed to existing storm drains.

e. Alteration of water quality including, but not limited to, temperature, dissolved oxygen, or turbidity?	( )	( )	(X)

No significant change in the constituents of surface water runoff is expected. However, there may be less oil and grease deposited on the project's streets since the ETBs would contain fewer oil-containing parts than their diesel counterparts. Therefore, potentially less oil would be deposited and swept into the storm drain system during rain storms. There may be some beneficial effect from this.

f. Alteration of the direction or rate of flow of groundwaters, including changes in infiltration or percolation rates?	( )	( )	(X)

The area on and around the bus routes is largely impervious surface and, besides, the project would make no significant changes to existing surfaces. No change in percolation or infiltration rates is anticipated.

g. Change in the quantity of groundwaters, either through direct additions or withdrawals, or through interception of any aquifer by cuts or excavations?	( )	( )	(X)

See response to 3.f. above. In addition, none of the ground work associated with the project will be sufficiently deep to intercept any aquifiers.

h. Substantial reduction in the amount of water otherwise available for public water supplies?	( )	( )	(X)

The project will not affect public water supplies, which are provided from sources outside the study area, including Northern California and the Colorado River.

4. **PLANT LIFE.** Will the proposal result in:

	YES	MAYBE	NO
a. Change in the diversity of species or number of any species of plants (including trees, shrubs, grass, crops and aquatic plants)?	( )	(X)	( )

Landscaping the routes with trees is under consideration. Should this be pursued, the EIR would assess the types and sizes of trees that may be planted. The area through which the proposed project passes is highly urbanized, which makes it unlikely that the project would result in a change in the diversity or number of any species of plants. The California Natural Diversity Data Base will be queried; should any species of concern be found, appropriate treatment will be recommended.

	YES	MAYBE	NO
b. Reduction of the numbers of any unique, rare or endangered species of plants?	( )	( )	(X)

The highly urbanized character of the study area makes it unlikely that any unique, rare, or endangered species of plants remain near the project corridor.

	YES	MAYBE	NO
c. Introduction of new species of plants into an area, or result in a barrier to the normal replenishment of existing species?	( )	(X)	( )

New landscaping may be introduced; however, it would not result in a barrier to the normal replenishment of existing species.

	YES	MAYBE	NO
d. Reduction in acreage of any agricultural crop?	( )	( )	(X)

No agricultural crops exist in the proposed project's highly urbanized area.

	YES	MAYBE	NO
e. Any effect upon a Significant Ecological Area which is identified in the Los Angeles County General Plan?	( )	(X)	( )

As part of the EIR process, the General Plan will be reviewed for Significant Ecological Areas along the project routes.

5. **ANIMAL LIFE.** Will the proposal result in:

	YES	MAYBE	NO
a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms or insects)?	( )	( )	(X)

In this urban region, it is unlikely that construction or operation activities of the proposed project would result in adverse impacts to any species of animal. Landscaping may provide additional habitat and attract animals.

b. Reduction of the numbers of any unique, rare or

	YES	MAYBE	NO
endangered species of animals?	( )	( )	(X)

It is unlikely that any such animals remain in the project area.

	YES	MAYBE	NO
c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	( )	( )	(X)

No new species would be introduced, and the project is not expected to be a barrier to animals.

	YES	MAYBE	NO
d. Deterioration to existing fish or wildlife habitat?	( )	( )	(X)

The bus routes are in highly urbanized areas, and no nearby fish or wildlife habitat has been identified.

6. **NOISE.** Will the proposal result in:

	YES	MAYBE	NO
a. Increases in existing noise or vibration levels?	( )	(X)	( )

Noise and vibration levels will likely increase temporarily during construction activities. During operation, there should be a beneficial effect from the ETBs, which are quieter than existing diesel buses. TPSSs may generate additional noise in the immediate area around them.

	YES	MAYBE	NO
b. Exposure of people to severe noise levels?	( )	(X)	( )

Noise levels may temporarily be severe during construction due to the operation of a variety of construction equipment.

	YES	MAYBE	NO
7. **LIGHT AND GLARE.** Will the proposal produce new light or glare?	( )	(X)	( )

The TPSSs will be lighted during night hours. The extent of possible light or glare will be examined, and issues of proximity will be discussed.

8. **LAND USE.** Will the proposal result in:

	YES	MAYBE	NO
a. A substantial alteration of the present or planned land use of an area?	( )	( )	(X)

The project would not alter the land uses of the area. Existing bus routes would be used; only the source of propulsion would be different. The TPSSs, while they would be new, would be relatively small and would not occupy large plots of land.

	YES	MAYBE	NO
b. A conflict with adopted environmental plans and goals of the community where it is located?	( )	( )	(X)

	YES	MAYBE	NO

The relationship of the ETB Project to local land use policies, including community projects, related projects and redevelopment projects, and general land use compatibility issues will be examined. It is not anticipated that the ETB Project would conflict with such plans.

9. **NATURAL RESOURCES.** Will the proposal result in:

	YES	MAYBE	NO
a. Increase in the rate of use of any natural resources?	( )	(X)	( )

The project would produce an incremental increase in the amount of electricity consumed in the area and, consequently, an increase in the amount of natural resources required to generate the electricity. On the other hand, diesel fuel will be conserved. The EIR will estimate the amount of diesel saved and the amount of electricity required.

	YES	MAYBE	NO
b. Substantial depletion of any nonrenewable natural resource?	( )	( )	(X)

Substituting ETBs for diesel buses will not result in a substantial depletion of a nonrenewable natural resource. In part this is because the electricity from electric generating plants can be produced with a variety of fuel types. Power plants can use coal, natural gas, fuel oil, etc., to generate electricity. Hence, the ETB Project would not deplete substantially any one type of resource. The electricity for the ETBs would come from a menu of resources, unlike the current buses' sole reliance on diesel fuel.

10. **RISK OF UPSET.** Will the proposal involve:

	YES	MAYBE	NO
a. A risk of an explosion or the release of hazardous substances (including, but not limited to oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?	( )	(X)	( )

There would be no risk of explosion or release due to fuels from the ETBs since they would not carry any fuel. However, there may be some risk at the TPSSs, which would contain transformers and batteries.

	YES	MAYBE	NO
b. Possible interference with an emergency response plan or an emergency evacuation plan?	(X)	( )	( )

The project may interfere with such plans in at least a couple of instances. First, the overhead wires may not provide adequate clearances for fire fighting equipment (e.g., ladders). Second, buses may be stranded in the streets in the event of a failure to the electrification system. The potential for auxiliary power units (APUs) on the ETBs to mitigate such impacts will be discussed in the EIR.

c. Exposure of people or property to a flooding

	YES	MAYBE	NO
hazard, such as a change in location of flooding in the event of an accident or upset condition?	( )	( )	(X)

No part of the project would change the existing risk or location of flooding in the area.

11. **POPULATION.** Will the proposal alter the location, distribution, density or growth rate of the human population of an area?	( )	( )	(X)

The ETB Project is not expected to have any significant effect upon population in the area. Distribution and density would not be affected.

12. **HOUSING.** Will the proposal affect existing housing or create a demand for additional housing?	( )	( )	(X)

Construction may create minor temporary disruptions to existing housing. But no such disruptions are expected during operation. There is no expectation that the ETB Project will increase demand for housing.

13. **TRANSPORTATION/CIRCULATION.** Will the proposal result in:

a. Generation of substantial additional vehicular movement?	( )	( )	(X)

The proposed project changes the mode of transportation, not the quantity of buses or patronage. Therefore, there will not be substantial additional vehicular movement.

b. Effects on existing parking facilities, or demand for new parking?	( )	(X)	( )

There may be temporary disruptions to existing parking facilities during construction. No change in the demand for new parking is expected due to the change in bus operating mode.

c. Substantial impact upon existing transportation systems?	( )	( )	(X)

No substantial impact is expected, although there may be temporary minor disruptions during construction: Local traffic effects would result from additional traffic generated by construction vehicles and temporary street and lane closures.

d. Alterations to present patterns of circulation or movement of people and/or goods?	(X)	( )	( )

	YES	MAYBE	NO

Temporary construction impacts were mentioned above in 13.c. The project would also alter patterns during operation. Some of the routes would have a changed street path (e.g., the new Tri-Cities line). In addition, the potential use of the larger articulated buses would require that some bus stops be altered.

	YES	MAYBE	NO
e. Alterations to waterborne, rail or air traffic?	( )	( )	(X)

No alterations to these types of traffic are likely.

	YES	MAYBE	NO
f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?	( )	(X)	( )

The larger and less maneuverable articulated ETBs have a higher accident rate than standard ETBs. Also, ETBs are quieter than diesel buses, which could create a greater risk of accidents between vehicles, bicyclists, and pedestrians.

	YES	MAYBE	NO
14. **PUBLIC SERVICES.** Will the proposal have an effect upon or result in a need for new or altered governmental services?	( )	( )	(X)

No new demand on public services (e.g., fire, police, schools) is expected from the ETB Project.

15. **ENERGY.** Will the proposal result in:

	YES	MAYBE	NO
a. Use of substantial amounts of fuel or energy?	(X)	( )	( )

A substantial amount of energy would be required to generate the electricity needed by the ETBs. The use of ETBs would save quantities of diesel fuel consumed by conventional buses. The EIR will estimate the amount of diesel saved and the amount of electricity required.

	YES	MAYBE	NO
b. A substantial increase in demand upon existing sources of energy or require the development of new sources of energy?	( )	( )	(X)

Although there would be an incremental increase in demand upon existing sources of energy, it is not expected that the increase will be substantial.

	YES	MAYBE	NO
16. **UTILITIES.** Will the proposal result in a need for new systems or substantial alterations to utilities such as, but not limited to, gas, water, sewer, storm water drainage or solid waste disposal?	( )	( )	(X)

The ETB Project would not require new or altered utilities such as those listed above.

17. **HUMAN HEALTH.** Will the proposal result in:

	YES	MAYBE	NO
a. Creation of any health hazard or potential health hazard (excluding mental health)?	( )	(X)	( )

The electrical nature of this project makes electrocution of people and exposure to transit-generated electromagnetic fields (EMFs) potential issues; they will be discussed in the EIR.

b. Exposure of people to potential hazards?	( )	(X)	( )

The electrical components of the project create a potential for electromagnetic interference (EMI) along the proposed routes. This will be addressed in the EIR.

18. **AESTHETICS.** Will the proposal result in:

a. Obstruction of any scenic vista or view from existing residential areas, public lands or roads?	( )	(X)	( )

The overhead contact system (OCS) may obstruct views and have a detrimental effect on aesthetics. Existing views will be described and compared to the post-construction condition. Should adverse effects be found, potential mitigation measures such as landscaping or other visual screening would be considered. The aesthetics of the TPSSs are not expected to be adverse since they are small, but they may require aesthetic mitigation treatments in some areas.

b. Creation of an aesthetically offensive site?	( )	( )	(X)

The OCS may obstruct views and change the character of the proposed routes, but it would not create aesthetically offensive sites.

c. Change in character of the general project area?	( )	(X)	( )

The character of the bus routes may be changed by the OCS. This may be especially true at street intersections where multiple ETB routes cross; such areas may have a rather thick horizon of contact wires and supports.

19. **RECREATION.** Will the proposal result in an impact upon the quality or quantity of existing recreational opportunities?	( )	( )	(X)

It is not expected that any aspect of the ETB Project would affect recreational facilities.

20. **CULTURAL, ARCHAEOLOGICAL, HISTORICAL AND PALEONTOLOGICAL RESOURCES.** Will the proposal result in:

a. Alteration or destruction of a prehistoric or historic archaeological site?	( )	(X)	( )

YES MAYBE NO

The EIR will investigate whether sensitive archaeological resources exist near any proposed TPSS sites.

b. Alteration or destruction of a paleontological resource? ( ) ( ) (X)

The project area is urban and developed. It is unlikely that any previously undiscovered paleontological resource would be found in the project area (e.g., at TPSS sites). In addition, most site work would be surface-related, and no aspect of the project would reach to any great depth.

c. Physical changes which would affect unique ethnic cultural values? ( ) ( ) (X)

No known ethnic cultural values are associated with the proposed routes.

e. Restriction of existing religious or sacred uses within the potential impact area? ( ) ( ) (X)

No aspect of the ETB Project is expected to restrict existing religious or sacred uses in the proposed project area.

21. MANDATORY FINDINGS OF SIGNIFICANCE.

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? ( ) ( ) (X)

The project is not anticipated to adversely affect any of the above subjects.

b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.) ( ) ( ) (X)

The ETB Project has the potential to achieve a positive long-term environmental goal, namely, the reduction of air pollutants from urban buses in Los Angeles County.

c. Does the project have impacts which are indivi-

	YES	MAYBE	NO
dually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)	( )	(X)	( )

Potential individual impact areas identified earlier include construction, aesthetics, risk of upset, natural resources, transportation/circulation, and noise. This project would electrify 184 miles of streets over a large geographic area. The total of the individual impacts may cumulatively have a significant effect on the environment.

	YES	MAYBE	NO
d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	( )	( )	(X)

The project would not have substantial adverse effects on human beings.

SUMMARY

Factor	No Sig. Effect Possible	Possible Sig. Effect*	Explanation
Earth	X		
Air		X	The zero-polluting ETBs would have a beneficial effect.
Water	X		
Plant Life	X		
Animal Life	X		
Noise		X	Construction activities may increase existing noise levels.
Light and Glare	X		
Land Use	X		
Natural Resources	X		
Risk of Upset		X	Overhead wires may not provide adequate clearance for fire fighting equipment. An electrification failure may strand ETBs in the streets, thereby creating a hazard.
Population	X		
Housing	X		
Transportation/ Circulation		X	Construction activities may temporarily disrupt traffic. Some routes would have changed patterns of circulation. Articulated buses may get into more accidents.
Public Services	X		
Energy		X	ETBs would require a substantial amount of electricity to run.
Utilities	X		

Human Health		X	Electrical components may electrocute people and possibly generate harmful electromagnetic fields (EMFs) and electromagnetic interference (EMI).
Aesthetics		X	The overhead contact system (OCS) may have adverse aesthetic impacts.
Recreation	X		
Cultural Res., et al	X		
Mandatory Findings of Significance		X	The potential impacts listed above may cumulatively have a significant impact on the environment.

*See County Guidelines, Section 601, and Appendix C, for examples of significant effects.

APPENDIX A.8: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL THAT RESPONDED	DATE OF RESPONSE	SIGNER	RESPONDER'S COMMENTS	REPLY TO NOTICE OF PREPARATION COMMENT AND/OR LOCATION IN EIR WHERE COMMENT IS ADDRESSED
City of Compton	07/15/92	Angel Espiritu, Director of Public Works	• ETB project will not have serious environmental impacts on Compton.	• Comment noted.
			• Use of ETB's in downtown areas is not environmentally appealing. ETB project may create an unaesthetic environment.	• See Sections 3.3, Aesthetics, and Section 3.9, Cultural Resources.
			• ETBs may not ease traffic, particularly on busy downtown streets.	• See Section 3.7, Transportation/Circulation
			• ETB project is not recommended.	• Comment noted.
			• Efforts should be concentrated on research of environmentally safe and clean fuels.	• See Chapter 4, Alternatives.
City of Culver City	07/17/92	Colleen Egbert, CEQA Manager	• Phase I routes would not enter nor have direct impacts on Culver City.	• Comment noted.
			• City in general supports conversion of buses to less-polluting fuels.	• Comment noted.
			• City believes EIR should include Phase II bus lines.	• Comment noted. Phase II routes will be the subject of future environmental reports.
Stefan Helstrom	06/19/92	Stefan Helstrom	• Would like EIR to discuss the project's backup power system.	• Alternative power units (APUs) will be installed on the ET buses. See Section 3.9, Safety/Risk of Upset.
City of Long Beach	07/06/92	Gerhardt H. Felgemaker	• City concurs with the decision to prepare an EIR.	• Comment noted.
			• Project description needs to be more detailed.	• The NOP Project Description has been expanded for the EIR. See Chapter 2, Description of the Proposed Project.
			• Tentative construction dates and durations for each line should be provided.	• See Section 2.4.5, Implementation Phasing and Section 3.16, Construction Impacts.
			• EIR should be more-site specific as to impacts.	• See Chapter 3, Environmental Setting, Impacts, and Mitigations

APPENDIX A.8: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL THAT RESPONDED	DATE OF RESPONSE	SIGNER	RESPONDER'S COMMENTS	REPLY TO NOTICE OF PREPARATION COMMENT AND/OR LOCATION IN EIR WHERE COMMENT IS ADDRESSED
City of Long Beach (Continued)			• EIR should identify areas where trees may be removed and replacement policy.	• See Section 3.3, Aesthetics, particularly Table 3.3-3.
			• Noise is of concern and the EIR should include information on construction shifts and hours, noise from electromagnetic fields (EMFs), and bus hours of operation.	• See Section 3.2, Noise and Vibration, Section 3.9, Safety/Risk of Upset and Section 3.16, Construction Impacts.
			• New lighting systems should be identified.	• See Section 3.14, Light and Glare
			• The temporary impact of construction on the response times of public services should be addressed.	• See Section 3.16, Construction Impacts.
			• The impact of construction and operation on traffic should be examined closely, including conflict between larger buses and narrow lanes.	• See Section 3.7, Transportation/Circulation and Section 3.16.4, Traffic Construction Impacts.
			• The effect of EMFs on human health should be looked at.	• See Section 3.9, Safety/Risk of Upset.
City of Los Angeles, Department of Public Works	07/22/92	Andres Santamaria	• EIR should present anticipated lengths of construction for the lines.	• See Section 3.16, Construction Impacts.
			• Electromagnetic fields should be examined for their effect on human health.	• See Section 3.9, Safety/Risk of Upset.
			• Visual impact of the overhead contact system on historic/cultural sites needs to be addressed.	• See Section 3.3, Aesthetics and Section 3.8, Cultural Resources.

APPENDIX A.8: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL THAT RESPONDED	DATE OF RESPONSE	SIGNER	RESPONDER'S COMMENTS	REPLY TO NOTICE OF PREPARATION COMMENT AND/OR LOCATION IN EIR WHERE COMMENT IS ADDRESSED
City of Los Angeles Bureau of Fire Prevention and Public Safety	08/21/92	Donald O. Manning, Dal L. Howard	• Traction power substations and substation sites should be defined, including their size, access, ability to shut down and control technologies used. The overhead contact system should be designed with respect to adequate clearances, equipment, and access for fire fighting. Trolley vehicles should be defined in terms of meeting national standards, technology for emergency exits and lighting, and auxiliary power units.	• See Chapter 2, Project Description and section 3.9, Safety/Risk of Upset.
			• All street intersections with level of service E or F decrease the level of fire protection and emergency medical services provided by the Fire Department.	• See section 3.9, Safety/Risk of Upset, and 3.11, Public Services.
City of Los Angeles Department of Water and Power	08/26/92	Edward Karapetian	• Construction of power distribution facilities may cause temporary noise air, and traffic impacts.	• See Section 3.16, Construction Impacts.
			• DWP's energy-conservation measures should be included in the EIR (The DWP included a list of its measures).	• Comment noted. Suggested mitigation measures were examined for relevance to ETB project and incorporated as appropriate.
City of Los Angeles Department of Water and Power	09/11/92	Duane D. Buchholz	• Coordination of ETB construction with the water system (such as minor relocation of water system pipelines or realignments of ETB facilities) can occur when the project is designed.	• The project's construction scenario includes the identification of all utilities (including water lines) that may affect or be affected by construction of the ETB project (see section 3.16 Construction).
			• The ETB facilities must be appropriately grounded to prohibit stray electrical current which can induce corrosion in metal pipelines.	• ETB facilities would be appropriately grounded (see section 3.16.1.8 for discussion of substation grounding).

APPENDIX A.8: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL THAT RESPONDED	DATE OF RESPONSE	SIGNER	RESPONDER'S COMMENTS	REPLY TO NOTICE OF PREPARATION COMMENT AND/OR LOCATION IN EIR WHERE COMMENT IS ADDRESSED
Los Angeles County, Department of Public Works	No date	Neil Bjornsen (telephone call)	• EIR should discuss tree maintenance in more detail.	• See Section 3.3, Aesthetics. See particularly Table 3.3-3. See also, Section 3.5, Utilities and Service Systems and Section S.5, Issues to be Resolved.
			• TPSS will make additional noise.	• See Section 3.2, Noise and Vibration
			• Only keep route number the same if route is the same.	• Comment noted. This recommendation will be taken under consideration by the RTD.
Los Angeles County Sanitation Districts	07/21/92	Marie Pagenkopp	• The Districts have no objection to the project.	• Comment noted
			• Approval is required prior to construction within a District easement and/or over a District sewer.	• Comment noted.
Metropolitan Water District of Southern California	07/23/92	Kathleen M. Kunysz	• MWD letter lists its facilities in the vicinity of the ETB Project and requests that preliminary prints of all improvement plans in the area of MWD pipelines and right-of-way be submitted for approval.	• See Section 3.5, Utilities and Service Systems.

APPENDIX A.8: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL THAT RESPONDED	DATE OF RESPONSE	SIGNER	RESPONDER'S COMMENTS	REPLY TO NOTICE OF PREPARATION COMMENT AND/OR LOCATION IN EIR WHERE COMMENT IS ADDRESSED
City of Monterey Park Planning Division	07/08/92	Willie O. Ujor	• The noise impact on the immediate areas along the routes needs to be addressed in detail.	• See section 3.2, Noise.
			• The EIR should address the issue of providing park and ride facilities in some stations and their impacts on existing land use.	• The provision of park and ride facilities are not proposed as part of this project and therefore is not discussed in this EIR.
			• The EIR should discuss the mitigation proposed for visual impacts where ETB routes cross.	• See section 3.3, Aesthetics.
			• The EIR should address impacts on transportation systems and traffic safety hazards.	• See section 3.7, Transportation/Circulation.
			• The EIR should discuss impacts of the project on public services such as extra police patrol and response time.	• See section 3.11, Public Services.
City of Pico Rivera	07/23/92	Ann M. W. Negendank	• City has serious concerns about adverse aesthetic impacts and conflict with goals of the community.	• See Section 3.3, Aesthetics.
			• City recently undergrounded its utilities along Whittier Boulevard as an aesthetic improvement.	• See Section 5.1, Cumulative Impacts.
			• City fears that the visual "clutter" may have a negative impact on the economic vitality of its local economy.	• See Section 3.3, Aesthetics and Section 3.6, Land Use, Acquisition and Displacement.
City of Pomona	07/01/92	Dennis R. Mackay	• City has no comments on the NOP.	• Comment noted.
City of San Dimas	06/29/92	Brian K. Lee	• City has no comments on the NOP.	• Comment noted.

APPENDIX A.8: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL THAT RESPONDED	DATE OF RESPONSE	SIGNER	RESPONDER'S COMMENTS	REPLY TO NOTICE OF PREPARATION COMMENT AND/OR LOCATION IN EIR WHERE COMMENT IS ADDRESSED
South Coast Air Quality Management District	07/14/92	Connie Day	• SCAQMD requested that the EIR address specific air quality issues (baseline data, sources of emissions, thresholds of significance, toxic air emissions and cumulative impacts). In general, it asked that the EIR follow the provisions in the SCAQMD's "Air Quality Handbook for Preparing Environmental Impact Reports"	• See Section 3.1, Air Quality and Section 3.16.2, Construction Air Quality, for a discussion of air quality issues relevant to this project. These sections follow the provisions outlined in the SCAQMD "Air Quality Handbook for Preparing Environmental Impact Reports."
			• Assess consistency with AQMP and CMPs.	• See Section 3.1, Air Quality.
			• Provide mitigation measures (The SCAQMD included a list of potential mitigation measures to be used).	• See Section 3.1, Air Quality and Section 3.16.2, Construction Air Quality. SCAQMD's suggested mitigation measures were examined for relevance to ETB project and incorporated as appropriate.
			• Also identify and quantify project alternatives, strategies to attain 1.5 AVR by 1999, and VMT reduction strategies.	• A major objective of the ETB project is to support and enhance high occupancy vehicles, increase AVR, and reduce overall regional VMT.
Southern California Edison	No date	Mike San Miguel (telephone call)	• SCE believes that the energy required to power the ETBs will be insignificant.	• Comment noted.

APPENDIX A.8: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL THAT RESPONDED	DATE OF RESPONSE	SIGNER	RESPONDER'S COMMENTS	REPLY TO NOTICE OF PREPARATION COMMENT AND/OR LOCATION IN EIR WHERE COMMENT IS ADDRESSED
State of California, Department of Transportation	07/17/92	Wilford Melton	• Caltrans requires encroachment permits for any work on, below or above State highway right-of-way.	• See Section 3.7 Transportation/Circulation. Caltrans requirements will be followed.
			• Caltrans recommends that a Traffic Management Plan be developed.	• Comment noted. See Section 3.16.4 for a discussion of construction traffic impacts and proposed mitigation measures.
			• Caltrans recommends that the ETBs be equipped with an alarm system to alert pedestrians of its presence near bus stops.	• Comment noted. An alarm system is not proposed for the ETB project because bus horns, in conjunction with normal safe driving practices, are expected to provide adequate pedestrian safety.

Source: Myra L. Frank and Associates, 1992.

APPENDIX A.9 -
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	STRIPING MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
RTD 16								
GEORGE BURNS RD	3RD ST	ALDEN DR	L.A.	1	1	SDY	NPAT	2HR/M 8-6
ALDEN DR	GEORGE BURNS RD	SAN VICENTE BL	L.A.	2	2	RM	2HR/M 8-6	2HR/M 8-6
SAN VICENTE BL	ALDEN DR	3RD ST	L.A.	2	3	RM	2HR/M 8-6	NPAT
3RD ST	GEORGE BURNS RD	SAN VICENTE BL	L.A.	1	2	DY	NS 7-9AM & 4-7PM,PA	NPAT
3RD ST	SAN VICENTE BL	LA CIENEGA BL	L.A.	2	2	2LT	NPAT	NPAT
3RD ST	LA CIENEGA BL	ORLANDO AV	L.A.	2	2	DY	2HR/M 8-6	2HR/M 8-4
3RD ST	ORLANDO AV	FAIRFAX AV	L.A.	2	2	DY	2HR/M 8-6	2HR/M 8-6
3RD ST	FAIRFAX AV	OGDEN DR	L.A.	2	2	DY	NPAT	NPAT
3RD ST	OGDEN DR	HAUSER BL	L.A.	2	2	2LT	NPAT	PA
3RD ST	HAUSER BL	LA BREA AV	L.A.	2	2	2LT	NS 7-9AM & 4-7PM,1HR/M 9-4	NPAT
3RD ST	LA BREA AV	SYCAMORE AV	L.A.	2	2	2LT	NS 7-9AM & 4-7PM,1HR/M 9-4	NS 7-9AM & 4-7PM,PA
3RD ST	SYCAMORE AV	HIGHLAND AV	L.A.	2	2	2LT	NPAT	NPAT
3RD ST	HIGHLAND AV	WESTERN AV	L.A.	2	2	2LT	NS 7-9AM & 4-7PM,PA	NS 7-9AM & 4-7PM,PA
3RD ST	WESTERN AV	NEW HAMPSHIRE AV	L.A.	2	2	DY	NS 7-9AM,1HR/M 9-6	NS 4-7PM,1HR/M 8-4
3RD ST	NEW HAMPSHIRE AV	VERMONT AV	L.A.	2	2	DY	NS 7-9AM & 4-7PM,PA	NPAT
3RD ST	VERMONT AV	LAFAYETTE PARK PL	L.A.	2	2	2LT	NS 7-9AM,NPAT	NS 4-7PM,NPAT
3RD ST	LAFAYETTE PARK PL	RAMPART BL	L.A.	2	2	2LT	NPAT	NS 4-7PM
3RD ST	RAMPART BL	ALVARADO ST	L.A.	2	2	DY	NS 7-9AM,2HR/M 9-6	NS 4-7PM,2HR/M 8-4
3RD ST	ALVARADO ST	UNION DR	L.A.	2	2	DY	NS 7-9AM,PA	NPAT
3RD ST	UNION DR	LUCAS AV	L.A.	2	2	2LT	NS 7-9AM,PA	NPAT
3RD ST	LUCAS AV	BIXEL ST	L.A.	2	2	2LT	NS 7-9AM,PA	NS 4-6PM,PA
BIXEL ST	3RD ST	6TH ST	L.A.	2	2	DY	1HR/M 8-6	1HR/M 8-6
6TH ST	BIXEL ST	BEAUDRY AV	L.A.	2	2	DY	NPAT	NS 7-9AM & 4-6PM,1HR/M 8-4

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
WHITTIER BL	DITMAN AV	HERBERT AV	L.A. COUNTY	2	2	DY	PA	PA
WHITTIER BL	HERBERT AV	EASTERN AV	L.A. COUNTY	2	2	DY	PA	PA
WHITTIER BL	EASTERN AV	FORD BL	L.A. COUNTY	2	2	DY	NPAT	NPAT
WHITTIER BL	FORD BL	BELDEN AV	L.A. COUNTY	2	2	DY	PA	PA
WHITTIER BL	BELDEN AV	BRADSHAWE ST	L.A. COUNTY	2	2	DY	NPAT	PA
WHITTIER BL	BRADSHAWE ST	WESTSIDE DR	L.A. COUNTY	2	2	DY	PA	PA
WHITTIER BL	WESTSIDE DR	SAYBROOK AV	L.A. COUNTY	2	2	DY	NPAT	PA
WHITTIER BL	SAYBROOK AV	GARFIELD ST	L.A. COUNTY	2	2	DY	PA	PA
SAYBROOK AV	WHITTIER BL	NORTHSIDE DR	L.A. COUNTY	1	1	NO CL	PA	PA
NORTHSIDE DR	SAYBROOK AV	WESTSIDE DR	L.A. COUNTY	1	1	DY	PA	PA
WESTSIDE DR	NORTHSIDE DR	OLYMPIC BL	L.A. COUNTY	1	1	NO CL	PA	PA
OLYMPIC BL	WESTSIDE DR	GARFIELD AV	L.A. COUNTY	2	2	2LT	PA	PA
GARFIELD AV	OLYMPIC BL	WHITTIER BL	L.A. COUNTY/ MONTEBELLO	2	2	DY	NPAT	PA
RTD 30/31								
PICO BL	RIMPAU BL	ARLINGTON AV	L.A.	2	2	DY	NS 7-9AM, 2HR/M 9-6	NS 4-6PM,2HR/M 8-4
PICO BL	ARLINGTON AV	WESTERN AV	L.A.	2	2	DY	NS 7-9AM,PA	NS 4-6PM,PA
PICO BL	WESTERN AV	ALBANY ST	L.A.	2	2	DY	NS 7-9AM, 1HR/M 9-6	NS 4-6PM, 1HR/M 8-4
PICO BL	ALBANY ST	FLOWER ST	L.A.	2	2	DY	NPAT	NPAT
PICO BL	FLOWER ST	HOPE ST	L.A.	2	2	DY	NS 7-9AM & 4-6PM, 1HR/M 9-4	NS 7-9AM & 4-6PM, 1HR/M 9-4
PICO BL	HOPE ST	HILL ST	L.A.	2	2	DY	NS 7-9AM & 3-6PM, 1HR/M 9-3	NS 7-9AM & 3-6PM, 1HR/M 9-3
PICO BL	HILL ST	BROADWAY	L.A.	2	2	DY	NS 7-9AM & 4-6PM, 1HR/M 9-4	NS 7-9AM & 4-6PM, 1HR/M 9-4
BROADWAY	PICO BL	12TH ST	L.A.	2	2	2 LT	NS 7-9AM & 3-7PM,1HR/M 9-3	NPAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING			STOPPING & PARKING PROHIBITION	
				EB/NB	WB/SB	MEDIAN TYPE	EASTBOUND/ NORTHBOUND	WESTBOUND/ SOUTHBOUND
BROADWAY	12TH ST	OLYMPIC BL	L.A.	2/3	2	DY	NS 7-9AM & 3-7PM,1HR/M 9-3	NS 7-9AM & 3-7PM,1HR/M 9-3
BROADWAY	OLYMPIC BL	1ST ST	L.A.	2/3	2	DY	NS 7-9AM, 3-7PM & 7PM-7AM,LOADING 9AM-3PM	
1ST ST	BROADWAY	SPRING ST	L.A.	2/3	2/3	DY	NS 7-9AM & 3-6PM, 1HR/M 9-3	NS 7-9AM & 3-6PM, 1HR/M 9-3
1ST ST	SPRING ST	SAN PEDRO ST	L.A.	2/3	2/3	DY	NS 7-9AM & 4-7PM, 1HR/M 9-4	NS 7-9AM & 4-7PM, 1HR/M 9-4
1ST ST	SAN PEDRO ST	ALAMEDA ST	L.A.	2	2	DY	NPAT	NPAT
1ST ST	ALAMEDA ST	VIGNES ST	L.A.	2	2	DY	NS 4-6PM, 2H/M 8-4	NS 7-9, 2H/M 9-6
1ST ST	VIGNES ST	MISSION ST	L.A.	2	2	DY	NPAT	NPAT
1ST ST	MISSION RD	GLESS ST	L.A.	2	2	DY	NS 4-7PM, 1H/M 8-4	NS 7-9AM, 1HR 9-6
1ST ST	GLESS ST	BOYLE ST	L.A.	2	2	DY	NPAT	NPAT
1ST ST	BOYLE ST	MOTT ST	L.A.	2	2	DY	1HR/M 8-6	1HR/M 8-6
1ST ST	MOTT ST	SARATOGA	L.A.	2	2	DY	NPAT	NPAT
1ST ST	SARATOGA	INDIANA ST	L.A.	2	2	DY	PA	PA
1ST ST	INDIANA ST	ROWAN AV	L.A. COUNTY	2	2	DY	1HR/M 7-6	1HR/M 7-6
1ST ST (31)	ROWAN AV	GAGE AV	L.A. COUNTY	2	2	DY	1HR/M 7-6	1HR/M 7-6
1ST ST (31)	GAGE AV	SUNOL DR	L.A. COUNTY	2	2	DY	PA	PA
1ST ST (31)	SUNOL DR	EASTERN AV	L.A. COUNTY	2	2	DY	PA	NPAT
1ST ST (31)	EASTERN AV	MEDNIK AV	L.A. COUNTY	2	2	2LT	NPAT	PA
1ST ST (31)	MEDNIK AV	WOODS AV	L.A. COUNTY	2	2	DY	PA	PA
1ST ST (31)	WOODS AV	ATLANTIC BL	MONTEREY PARK	2	2	DY	NPAT	PA
ATLANTIC BL	1ST ST	RIGGIN ST	MONTEREY PARK	2	2	RM	NPAT	NPAT
ATLANTIC BL	RIGGIN ST	FLORAL DR	MONTEREY PARK	2	2	DY	NPAT	NPAT
FLORAL DR (30)	ATLANTIC BL	BLEAKWOOD	MONTEREY PARK	1	1	DY	NPAT	NPAT
FLORAL DR (30)	BLEAKWOOD	MEDNIK AV	MONTEREY PARK	1	1	DY	PA	NPAT
FLORAL DR (30)	MEDNIK AV	DANGLER	MONTEREY PARK	2	2	DY	PA	NPAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
FLORAL DR (30)	DANGLER	MCDONNELL AV	MONTEREY PARK	2	3	DY	PA	NPAT
FLORAL DR (30)	MCDONNELL AV	I-710	MONTEREY PARK	2	2	DY	PA	NPAT
FLORAL DR (30)	I-710	BRANNICK AV	L.A. COUNTY	1	1	DY	PA	PA
BRANNICK AV (30)	FLORAL DR	HAMMEL ST	L.A. COUNTY	1	1	DY	PA	PA
HAMMEL ST (30)	BRANNICK AV	ROWAN AV	L.A. COUNTY	1	1	DY	PA	PA
ROWAN AV (30)	HAMMEL ST	FIRST ST	L.A. COUNTY	1	1	NO CL	PA	PA
RIGGIN ST	ATLANTIC BL	COLLEGIAN AV	L.A. COUNTY	2	2	DY	NPAT	NPAT
COLLEGIAN AV	RIGGIN ST	FLORAL DR	L.A. COUNTY	1	1	DY	PA	PA
RTD 40								
KINGSDALE AV	ARTESIA BL	GRANT AV	REDONDO BCH	2	2	DY	NPAT	NPAT
KINGSDALE AV	GRANT AV	S/O GRANT AV	REDONDO BCH	2	1	DY	NPAT	PA
KINGSDALE AV	S/O GRANT AV	182ND ST	REDONDO BCH	1	1	SDY/DY	NPAT	PA
182ND ST	KINGSDALE AV	HAWTHORNE BL	TORRANCE	2	2	DY	NPAT	PA
HAWTHORNE BL	182ND ST	REDONDO BCH BL	TORRANCE	4	4	RM	NPAT	NPAT
HAWTHORNE BL	REDONDO BCH BL	166TH ST	LAWNDALE	3	3/4	RM	NS 6-9AM,PA (ALSO PK IN MEDIAN)	NS 4-6PM,PA
HAWTHORNE BL	166TH ST	I-405 FWY OVERPASS	LAWNDALE	3/4	3/4	RM	NS 6-9AM,PA (ALSO PK IN MEDIAN)	NS 4-6PM,PA
HAWTHORNE BL	I-405 FWY OVERPASS	ROSECRANS AV	LAWNDALE	3	3	RM	PA (ALSO PK IN MEDIAN)	PA
HAWTHORNE BL	ROSECRANS AV	EL SEGUNDO BL	HAWTHORNE	3	3	RM	PA (ALSO PK IN MEDIAN)	PA
HAWTHORNE BL	EL SEGUNDO BL	120TH ST	HAWTHORNE	4	4	RM	NPAT	PA
HAWTHORNE BL	120TH ST	IMPERIAL HWY	HAWTHORNE	4	4	RM	PA	PA
HAWTHORNE BL	IMPERIAL HWY	LENNOX BL	L.A. COUNTY	3	3	RM	PA	PA
HAWTHORNE BL	LENNOX BL	104TH ST	L.A. COUNTY	3	3	RM	PA	PA
HAWTHORNE BL	104TH ST	LA BREA AV	INGLEWOOD	3	3	RM	PA	PA

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
LA BREA AV	CENTURY BL	MARKET ST	INGLEWOOD	3	3	RM	PA	PA
MARKET ST	LA BREA AV	HILLCREST BL	INGLEWOOD	2	2	RM	M (ALSO ALONG MEDIAN)	M
MARKET ST	HILLCREST BL	REGENT ST	INGLEWOOD	1	1	RM	M (ANGLED)	M (ANGLED)
MARKET ST	REGENT ST	FLORENCE AV	INGLEWOOD	2	2	RM	M (ALSO ALONG MEDIAN)	M
FLORENCE AV	MARKET ST	HILLCREST BL	INGLEWOOD	3	2	RM	NPAT	PA
FLORENCE AV	HILLCREST BL	REDONDO BL	INGLEWOOD	3	3	RM	NPAT	NPAT
FLORENCE AV	REDONDO BL	WEST BL	INGLEWOOD	2	2	DY	NPAT	NPAT
FLORENCE AV	WEST BL	CRENSHAW BL	L.A.	2/3	2/3	2LT	NS 7-9AM & 4-7PM,PA	NS 7-9AM & 4-7PM,PA
CRENSHAW BL	FLORENCE AV	60TH ST	L.A.	2/3	2/3	2LT	NS 7-9AM & 4-6PM,PA	NS 4-6PM,PA
CRENSHAW BL	60TH ST	SLAUSON AV	L.A.	3	3	RM	PA	PA
CRENSHAW BL	SLAUSON AV	48TH ST	L.A.	3	3	RM	PARKING BAY (FRONTAGE ROAD)	PARKING BAY (FRONTAGE ROAD)
CRENSHAW BL	48TH ST	VERNON AV	L.A.	2/3	2/3	RM	NS 7-9AM & 4-6PM,2HR/M 9-4	NS 4-6PM,2HR/M 8-4
LEIMERT BL	VERNON AV	STOCKER ST	L.A.	3	3	RM	PA	PA
M.L.KING BL	LEIMERT BL	NORMANDIE AV	L.A.	2/3	2/3	2LT	NS 7-9AM,PA	NS 4-6PM,PA
M.L.KING BL	NORMANDIE AV	VERMONT AV	L.A.	3	3	2LT	PA	PA
M.L.KING BL	VERMONT AV	FIGUEROA ST	L.A.	2/3	3	2LT	NS 7-9AM,PA	NPAT
M.L.KING BL	FIGUEROA ST	HILL ST	L.A.	3	3	2LT	NPAT	NPAT
M.L.KING BL	HILL ST	BROADWAY	L.A.	2/3	2/3	DY	NS 7-9AM,PA	NS 4-6PM,PA
BROADWAY	M.L. KING BL	38TH ST	L.A.	3	3	DY	NS 7-9AM,PA	NS 4-6PM,PA
BROADWAY	38TH ST	36TH ST	L.A.	2/3	2/3	DY	NS 7-9AM,PA	NS 4-7PM,PA
BROADWAY	36TH ST	ADAMS BL	L.A.	2/3	2/3	DY	NS 7-9AM,PA	NS 4-7PM,PA
BROADWAY	ADAMS BL	WASHINGTON BL	L.A.	2/3	2/3	DY	NS 7-9AM,PA	NS 4-7PM,2HR/M
BROADWAY	WASHINGTON BL	18TH ST	L.A.	2	2	DY	2HR/M 8-6	2HR/M 8-6
BROADWAY	18TH ST	VENICE BL	L.A.	2	2	DY	NPAT	NPAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	STRIPING MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
BROADWAY	VENICE BL	PICO BL	L.A.	2	2	DY	1HR/M 8-6	1HR/M 8-6
BROADWAY	PICO BL	1ST ST	L.A.	(SEE RTD 30/31)				
1ST ST	BROADWAY	SAN PEDRO ST	L.A.	(SEE RTD 30/31)				
SAN PEDRO ST	1ST ST	TEMPLE ST	L.A.	2	2	DY	NS 3-6PM,1HR 8-6	NPAT
TEMPLE ST	SAN PEDRO ST	ALAMEDA ST	L.A.	2	2	DY	1HR/M 8-6	CONSTRUCTION
ALAMEDA ST	TEMPLE ST	MAIN ST	L.A.	2	3	2LT	NPAT	NPAT
ALAMEDA ST	MAIN ST	ALPINE ST	L.A.	2	2	2LT	PA	1HR 8-6/M
MAIN ST	ALPINE ST	ALAMEDA ST	L.A.	2	2	DY	NPAT	NPAT
VIGNES ST	ALAMEDA ST	S.P. RAILRD OVERPASS	L.A.	2	2	DY	PA	PA
VIGNES ST	S.P. RAILRD OVERPASS	BAUCHET ST	L.A.	2	2	DY	NPAT	NPAT
RTD 45								
HUNTINGTON DR	MONTEREY RD	COLLIS AV	L.A.	3	3	RM	NPAT	NPAT
COLLIS AV	HUNTINGTON DR	HUNTINGTON DR N.	L.A.	2	2	DY	NPAT	NPAT
HUNTINGTON DR N.	COLLIS AV	MERCURY AV	L.A.	1	1	SDY	PA	NPAT
MERCURY AV	HUNTINGTON DR N.	SIERRA ST	L.A.	1	1	SDY	PA	PA
SIERRA ST	MERCURY AV	FLORA AV	L.A.	1	1	SDY	PA	PA
FLORA AV	SIERRA ST	LINCOLN PARK AV	L.A.	1	1	DY	PA	PA
LINCOLN PARK AV	FLORA AV	BROADWAY	L.A.	1	1	SDY	PA	PA
BROADWAY	LINCOLN PARK AV	EASTLAKE AV	L.A.	3	3	2LT	NS 4-7PM,PA	NS 7-5,PA
BROADWAY	EASTLAKE AV	I-5 FWY	L.A.	3	3	DY	NS 4-7PM,PA	NS 7-9AM,1HR/M 9-6
BROADWAY	I-5 FWY	AVENUE 20	L.A.	3	3	DY	NPAT	NPAT
BROADWAY	AVENUE 20	AVENUE 18	L.A.	3	3	DY	NS 4-7PM,PA	NS 7-9AM,PA
BROADWAY	AVENUE 18	SOLANO AV	L.A.	3	3	2LT	NPAT	NPAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
BROADWAY	SOLANO AV	BERNARD ST	L.A.	3	3	2LT	NS 4-7PM,PA	NS 7-9AM,PA
BROADWAY	BERNARD ST	COLLEGE ST	L.A.	2	2	2LT	NS 4-7PM,1HR/M 8-4	NS 7-9AM,1HR/M 9-6
BROADWAY	COLLEGE ST	SUNSET BL	L.A.	2	2	DY	NS 4-7PM,1HR/M 8-4	NS 7-9AM,1HR/M 9-6
BROADWAY	SUNSET BL	ALISO ST	L.A.	2	2	2LT	NPAT	NPAT
BROADWAY	ALISO ST	TEMPLE ST	L.A.	2/3	2	DY	NS 7-9AM & 3-7PM,1HR/M 9-3	NS 7-9AM & 3-7PM,1HR/M 9-3
BROADWAY	TEMPLE ST	1ST ST	L.A.	2/3	2	2LT	NS 7-9AM & 3-7PM,1HR/M 9-3	NPAT
BROADWAY	1ST ST	PICO BL	L.A.	(SEE RTD 30/31)				
BROADWAY	PICO BL	VENICE BL	L.A.	2	2	DY	1HR/M 8-6	1HR/M 8-6
BROADWAY	VENICE BL	17TH ST	L.A.	2	2	2LT	NPAT	NPAT
BROADWAY	17TH ST	18TH ST	L.A.	2	2	DY	NPAT	NPAT
BROADWAY	18TH ST	WASHINGTON BL	L.A.	2	2	DY	2HR/M 8-6	2HR/M 8-6
BROADWAY	WASHINGTON BL	23RD ST	L.A.	3	3	DY	NS 7-9AM,2HR/M 9-6	NS 4-7PM,2HR/M 8-4
BROADWAY	23RD ST	ADAMS BL	L.A.	3	3	DY	NS 7-9AM,1HR/M 9-6	NS 4-7PM,1HR/M 8-4
BROADWAY	ADAMS BL	30TH ST	L.A.	3	3	DY	NS 7-9AM,PA	NS 4-7PM,PA
BROADWAY	30TH ST	JEFFERSON BL	L.A.	3	3	DY	NS 7-9AM,PA	PA
BROADWAY	JEFFERSON BL	SLAUSON AV	L.A.	3	3	DY	NS 7-9AM,PA	NS 4-7PM,PA
BROADWAY	SLAUSON AV	MANCHESTER AV	L.A.	3	3	2LT	NS 7-9AM,PA	NS 4-7PM,PA
BROADWAY	MANCHESTER AV	83RD ST	L.A.	3	3	2LT	1HR/M 8-6	PA
BROADWAY	83RD ST	92ND ST	L.A.	3	3	2LT	PA	PA
BROADWAY	92ND ST	ATHENS WY	L.A.	3	3	RM	PA	PA
BROADWAY	ATHENS WY	IMPERIAL HWY	L.A.	2	2	RM	NPAT	NPAT
BROADWAY	IMPERIAL HWY	118TH ST	L.A.	1	1	DY	NPAT	NPAT
BROADWAY	118TH ST	120TH ST	L.A.	1	1	DY	PA	PA
BROADWAY	120TH ST	124TH ST	L.A. COUNTY/L.A.	2	2	DY	PA	PA

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
BROADWAY	124TH ST	EL SEGUNDO BL	L.A. COUNTY	2	2	2LT	PA	PA
EL SEGUNDO BL	BROADWAY	MAIN ST	L.A. COUNTY	3	3	2LT	NS 7-9AM & 4-6PM,PA	NS 7-9AM & 4-6PM,PA
MAIN ST	EL SEGUNDO BL	132ND ST	L.A. COUNTY	2	2	RM	PA	PA
MAIN ST	132ND ST	ROSECRANS AV	L.A. COUNTY	2	2	2LT	NPAT	PA
ROSECRANS AV	MAIN ST	SAN PEDRO ST	L.A. COUNTY	3	3	2LT	NPAT	NPAT
SAN PEDRO ST	ROSECRANS AV	140TH ST	L.A. COUNTY	2	2	DY	NPAT	NPAT
SAN PEDRO ST	140TH ST	135TH ST	L.A. COUNTY	2	2	DY	PA	PA
135TH ST	SAN PEDRO ST	MAIN ST	L.A. COUNTY	2	2	DY	PA	PA
RTD 66/67								
8TH ST	WESTERN AV	OXFORD ST	L.A.	2	1/2	DY	NPAT	NS 4-6PM,PA
8TH ST	OXFORD ST	ALVARADO ST	L.A.	2	2	DY	NS 7-9AM,1HR/M	NS 4-6AM,1HR/M
8TH ST	ALVARADO ST	GARLAND ST	L.A.	2	2	DY	NS 7-9AM & 4-6PM,1HR/M	NS 7-9AM & 4-6PM,1HR/M
9TH ST	GARLAND ST	FRANSISCO ST	L.A.	3	0	ONE-WAY	NPAT	NPAT
9TH ST	FRANSISCO ST	FIGUEROA ST	L.A.	5	0	ONE-WAY	NPAT	2HR/M
9TH ST	FIGUEROA ST	FLOWER ST	L.A.	4	0	ONE-WAY	NPAT	NPAT
9TH ST	FLOWER ST	GRAND AV	L.A.	4/5	0	ONE-WAY	NS 7-9AM & 5-7PM,1HR/M	NS 7-9AM & 5-7PM,1HR/M
9TH ST	GRAND AV	MAIN ST	L.A.	3/5	0	ONE-WAY	NS 7-9AM & 5-7PM,1HR/M	NS 7-9AM & 5-7PM,1HR/M
9TH ST	MAIN ST	LOS ANGELES ST	L.A.	3/4	0	ONE-WAY	NS 7-9AM & 5-7PM,1HR/M	NS 7-9AM & 5-7PM,1HR/M
9TH ST	LOS ANGELES ST.	SANTEE ST	L.A.	3	0	ONE-WAY	NS 7-9AM & 3-7PM,1HR/M	NS 7-9AM & 3-7PM,1HR/M
9TH ST	SANTEE ST	SAN PEDRO ST	L.A.	2	2	DY	NS 7-9AM & 3-7PM,1HR/M	NS 7-9AM & 3-7PM,1HR/M
OLYMPIC BL	SAN PEDRO ST	TOWNE AV	L.A.	2	2	DY	NS 7-9AM & 3-7PM,PA	NS 7-9AM & 3-7PM,PA
OLYMPIC BL	TOWNE AV	NAOMI ST	L.A.	2	2	DY	NS 7-9AM & 4-7PM,PA	NS 7-9AM & 4-7PM,PA
OLYMPIC BL	NAOMI ST	ALAMEDA ST	L.A.	2	2	DY	NPAT	NS 7-9AM & 4-7PM,PA

(CONTINUED)

EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
OLYMPIC BL	ALAMEDA ST	BOYLE ST	L.A.	2	2	DY	NPAT	NPAT
OLYMPIC BL	BOYLE ST	SOTO ST	L.A.	3	3	DY	NPAT	NPAT
OLYMPIC BL (67)	SOTO ST	GRANDE VISTA AV	L.A.	2/3	2/3	DY	NS 4-6PM,PA	NS 7-9AM,PA
OLYMPIC BL (67)	GRANDE VISTA AV	LORENA AV	L.A.	3	3	DY	NS 4-6PM,PA	NS 7-9AM,PA
OLYMPIC BL (67)	LORENA AV	SPENCE ST	L.A.	2/3	2/3	DY	NS 4-6PM,PA	NS 7-9AM,PA
OLYMPIC BL (67)	SPENCE ST	8TH ST	L.A.	3	3	DY	NS 4-6PM,PA	NS 7-9AM,PA
BOYLE ST (66 EB)	OLYMPIC BL	8TH ST	L.A.	1	1	DY	PA	PA
8TH ST (66)	SOTO ST	OLYMPIC BL	L.A.	2	2	DY	PA	PA
SOTO ST (66 WB)	8TH ST	OLYMPIC BL	L.A.	2/3	2/3	2LT	NS 7-9AM & 3-7PM,PA	NS 7-9AM & 3-7PM,PA
OLYMPIC BL	8TH ST	INDIANA ST	L.A.	2/3	2/3	DY	NS 4-6PM,PA	NS 7-9AM,PA
OLYMPIC BL	INDIANA ST	DITMAN AV	L.A. COUNTY	2/3	2/3	DY	NS 4-6PM,PA	NS 7-9AM,PA
OLYMPIC BL	DITMAN AV	EASTERN AV	L.A. COUNTY	2	2	DY	PA	PA
OLYMPIC BL	EASTERN AV	FORD ST	L.A. COUNTY	2	2	DY	NPAT	NPAT
OLYMPIC BL	FORD ST	VANCOUVER AV	L.A. COUNTY	2	2	DY	PA	PA
OLYMPIC BL	VANCOUVER AV	GERHART AV	L.A. COUNTY	2	2	2LT	PA	PA
OLYMPIC BL	GERHART AV	HENDRICKS AV	COMMERCE/ L.A. COUNTY	2	2	DY	PA	PA
OLYMPIC BL	HENDRICKS AV	SAYBROOK AV	L.A. COUNTY	2	2	DY	PA	PA
OLYMPIC BL	SAYBROOK AV	WESTSIDE DR	L.A. COUNTY	1	1	DY	PA	PA
WESTSIDE DR	OLYMPIC BL	WHITTIER BL	L.A. COUNTY	2	2	DY	PA	PA
WHITTIER BL	WESTSIDE DR	GARFIELD AV	L.A. COUNTY	2	2	DY	PA	PA
GARFIELD AV	WHITTIER BL	NORTHSIDE DR	L.A. COUNTY	2	2	DY	NPAT	NPAT
GARFIELD AV	NORTHSIDE DR	OLYMPIC BL	L.A. COUNTY	2	2	DY	PA	PA
SAN PEDRO ST (WB)	9TH ST	8TH ST	L.A.	2/3	2/3	DY	NS 7-9AM,1HR/M	NS 4-6PM,1HR/M
8TH ST	SAN PEDRO ST	SAN JULIAN AV	L.A.	2	2	DY	NPAT	NPAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	STRIPING MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
RTD 204								
VERMONT AV	120TH ST	IMPERIAL HWY	L.A.	2	3	RM	PA	PA
VERMONT AV	IMPERIAL HWY	88TH ST	L.A.	3	3	RM	PA	PA
VERMONT AV	88TH ST	83RD ST	L.A.	3	3	RM	2HR/M 8-6	2HR/M 9-6
VERMONT AV	83RD ST	GAGE AV	L.A.	3	3	RM	PA	PA
VERMONT AV	GAGE AV	M.L. KING BL	L.A.	2	2	DY	PA	PA
VERMONT AV	M.L. KING BL	EXPOSITION BL	L.A.	2	2	DY	2HR/M 8-6	2HR/M 8-6
VERMONT AV	EXPOSITION BL	JEFFERSON BL	L.A.	2	2	2LT	4HR/M 8-6	4HR/M 8-6
VERMONT AV	JEFFERSON BL	ADAMS BL	L.A.	2	2	DY	1HR/M 8-6	1HR/M 8-6
VERMONT AV	ADAMS BL	22ND ST	L.A.	2	2	DY	NS 7-9AM & 4-7PM,PA	NS 7-9AM & 4-7PM,PA
VERMONT AV	22ND ST	WASHINGTON BL	L.A.	2	2	DY	NPAT	NPAT
VERMONT AV	WASHINGTON BL	7TH ST	L.A.	2	2	DY	NS 7-9AM & 4-7PM,PA	NS 7-9AM & 4-7PM,PA
VERMONT AV	7TH ST	WILSHIRE BL	L.A.	2	2	2LT	NS 7-9AM & 4-7PM,1HR/M 9-4	NPAT
VERMONT AV	WILSHIRE BL	5TH ST	L.A.	2	2	DY	NPAT	NPAT
VERMONT AV	5TH ST	4TH ST	L.A.	2	2	2LT	NS 7-9AM & 4-7PM,1HR/M 9-4	NS 7-9AM & 4-7PM,1HR/M 9-4
VERMONT AV	4TH ST	1ST ST	L.A.	3	3	2LT	NS 7-9AM & 4-7PM,1HR/M 9-4	NS 7-9AM & 4-7PM,1HR/M 9-4
VERMONT AV	1ST ST	COUNCIL ST	L.A.	3	3	2LT	NPAT	NS 7-9AM & 4-7PM,1HR/M 9-4
VERMONT AV	COUNCIL ST	BEVERLY BL	L.A.	3	3	2LT	NS 7-9AM & 4-7PM,1HR/M 9-4	NS 7-9AM & 4-7PM,1HR/M 9-4
VERMONT AV	BEVERLY BL	ROSEWOOD AV	L.A.	3	3	DY	NPAT	NPAT
VERMONT AV	ROSEWOOD AV	101 FWY RAMPS	L.A.	3	3	2LT	NPAT	NPAT
VERMONT AV	101 FWY RAMPS	CLINTON ST	L.A.	3	3	2LT	NPAT	NPAT
VERMONT AV	CLINTON ST	MELROSE AV	L.A.	3	3	2LT	PA	PA
VERMONT AV	MELROSE AV	NORMAL AV	L.A.	3	3	2LT	NS 4-7PM,2HR/M 8-4	NPAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
VERMONT AV	NORMAL AV	SANTA MONICA BL	L.A.	3	3	2LT	NS 4-7PM,2HR/M 8-4	NS 4-7PM,2HR/M 8-4
VERMONT AV	SANTA MONICA BL	SUNSET BL	L.A.	3	3	2LT	NS 4-7PM,1HR/M 8-4	NS 4-7PM,1HR/M 8-4
VERMONT AV	SUNSET BL	HOLLYWOOD BL	L.A.	2	2	2LT	NS 4-7PM,1HR/M 8-4	NS 4-7PM,1HR/M 8-4
VERMONT AV	HOLLYWOOD BL	FRANKLIN AV	L.A.	2	2	DY	1HR/M8-6	1HR/M8-6
VERMONT AV	FRANKLIN AV	FINLEY AV	L.A.	2	2	DY	PA	PA
VERMONT AV	FINLEY AV	LOS FELIZ BL	L.A.	2	2	DY	PA	PA
LOS FELIZ BL	VERMONT AV	HILLHURST AV	L.A.	2/3	2/3	DY	NS4-7PM,PA	NS4-7PM,PA
LOS FELIZ BL	HILLHURST AV	GRIFFITH PK BL	L.A.	2/3	2/3	2LT	NS4-7PM,PA	NS7-9AM,PA
LOS FELIZ BL	GRIFFITH PK BL	RIVERSIDE DR	L.A.	2/3	2/3	2LT	NS4-7PM,PA	NS7-9AM,PA
LOS FELIZ BL	RIVERSIDE DR	BRUNSWICK AV	L.A.	2	2	DY	2HR/M8-6	2HR/M8-6
LOS FELIZ BL	BRUNSWICK AV	REVERE AV	L.A.	2	2	DY	PA	PA
LOS FELIZ BL	REVERE AV	GARDENA AV	L.A.	2	2	RM	PA	PA
LOS FELIZ BL	GARDENA AV	SAN FERNANDO RD	L.A.	2	2	DY	PA	PA
LOS FELIZ BL	SAN FERNANDO RD	BRAND BL	GLENDALE	2	2	DY	PA	PA
BRAND BL	LOS FELIZ BL	COLORADO ST	GLENDALE	2	2	DY	PA	PA
BRAND BL	COLORADO ST	BROADWAY	GLENDALE	2	2	RM	PA	PA
BROADWAY	BRAND BL	COLUMBUS AV	GLENDALE	2	2	2LT	NPAT	NPAT
COLUMBUS AV	BROADWAY	COLORADO ST	GLENDALE	2	2	2LT	NPAT	NPAT
COLORADO ST	COLUMBUS AV	CENTRAL AV	GLENDALE	2	2	2LT	NPAT	NPAT
COLORADO ST	CENTRAL AV	BRAND BL	GLENDALE	2	2	DY	NPAT	NPAT
RTD 560								
VAN NUYS BL	VENTURA BL	RIVERSIDE DR	L.A.	2/3	2	DY	NS 7-9AM & 4-7PM,1HR/M 9-4	2HR/M 8-6PM
VAN NUYS BL	RIVERSIDE DR	HUSTON ST	L.A.	2/3	3	DY	NS 7-9AM & 3-6PM,1HR/M 9-3	NPAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING			STOPPING & PARKING PROHIBITION	
				EB/NB	WB/SB	MEDIAN TYPE	EASTBOUND/ NORTHBOUND	WESTBOUND/ SOUTHBOUND
VAN NUYS BL	HUSTON ST	ADDISON ST	L.A.	2/3	3	2LT	NS 7–9AM & 3–6PM,1HR/M 9–3	NS 7–9AM & 4–6PM,PA
VAN NUYS BL	ADDISON ST	MAGNOLIA BL	L.A.	2	2	DY	2HR/M 8–6	2HR/M 8–6
VAN NUYS BL	MAGNOLIA BL	CLARK ST	L.A.	2	2	DY	PA	PA
VAN NUYS BL	CLARK ST	BURBANK BL	L.A.	2	2	RM	PA	PA
VAN NUYS BL	BURBANK BL	OXNARD ST	L.A.	3	3	2LT	1HR/M 8–6	1HR/M 8–6
VAN NUYS BL	OXNARD ST	VANOWEN ST	L.A.	3	3	DY	1HR/M 8–6	1HR/M 8–6
VAN NUYS BL	VANOWEN ST	VOSE ST	L.A.	3	3	2LT	1HR/M 8–6	1HR/M 8–6
VAN NUYS BL	VOSE ST	VALERIO ST	L.A.	3	3	2LT	NPAT	NPAT
VAN NUYS BL	VALERIO ST	SATICOY ST	L.A.	2	2	2LT	PA	PA
VAN NUYS BL	SATICOY ST	KESWICK ST	L.A.	2/3	2/3	RM	NS 7–9AM & 4–7PM,2HR/9–4	NS 7–9AM & 4–7PM,2HR/9–4
VAN NUYS BL	KESWICK ST	LANARK ST	L.A.	2	2	RM	NPAT	NPAT
VAN NUYS BL	LANARK ST	ROSCOE BL	L.A.	2/3	2/3	DY	NS 7–9AM & 4–7PM,2HR/9–4	NS 7–9AM & 4–7PM,2HR/9–4
VAN NUYS BL	ROSCOE BL	PARTHENIA ST	L.A.	3	3	2LT	NPAT	NPAT
VAN NUYS BL	PARTHENIA ST	NORDOFF ST	L.A.	2	2	2LT	PA	PA
VAN NUYS BL	NORDOFF ST	SAN FERNANDO RD	L.A.	2	2	2LT	PA	PA
VAN NUYS BL	SAN FERNANDO RD	GLENOAKS BL	L.A.	2	2	DY	PA	PA
VAN NUYS BL	GLENOAKS BL	FOOTHILL BL	L.A.	2	2	2LT	PA	PA
FOOTHILL BL	VAN NUYS BL	TERRA BELLA ST	L.A.	2	2	2LT	PA	PA
TERRA BELLA ST	FOOTHILL BL	ELDRIDGE AV	L.A.	1	1	SDY	PA	PA
ELDRIDGE AV	TERRA BELLA ST	KAGEL CYN ST	L.A.	1	1	SDY	PA	PA
KAGEL CYN ST	ELDRIDGE AV	FENTON AV	L.A.	1	1	NO CL	PA	PA
FENTON AV	KAGEL CYN ST	TERRA BELLA ST	L.A.	1	1	NO CL	PA	PA

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	STRIPING MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
TRI-CITIES LINE								
OLIVE AV	PASS AV	KENWOOD ST	BURBANK	3	2	RM	NPAT	NS; PA
OLIVE AV	KENWOOD ST	SCREENLAND DR	BURBANK	3	2	RM	NPAT	PA
OLIVE AV	SCREENLAND DR	WARNER BL	BURBANK	3	2	RM	NPAT	2HR 8-6
OLIVE AV	WARNER BL	HOLLYWOOD WY	BURBANK	2	2	RM	PA	PA
OLIVE AV	HOLLYWOOD WY	CORDOVA ST	BURBANK	2	2	RM	PA	1/2HR 8-6
OLIVE AV	CORDOVA ST	RIVERSIDE DR	BURBANK	2	2	RM	NS	NS; 1/2HR 8-6
OLIVE AV	RIVERSIDE DR	LIMA ST	BURBANK	2	2	2 LT	PA	PA
OLIVE AV	LIMA ST	CALIFORNIA ST	BURBANK	2	2	2 LT	2HR 8-6	PA
OLIVE AV	CALIFORNIA ST	ALAMEDA AV	BURBANK	2	2	2 LT	PA; NS	PA
OLIVE AV	ALAMEDA AV	FLORENCE ST	BURBANK	2	2	2 LT	PA	PA
OLIVE AV	FLORENCE ST	BUENA VISTA	BURBANK	2	2	2 LT	2HR 8-6	2HR 8-6
OLIVE AV	BUENA VISTA	LINCOLN ST	BURBANK	2	2	2 LT	2HR 8-6	PA
OLIVE AV	LINCOLN ST	MYERS ST	BURBANK	2	2	2 LT	2HR 8-6	2HR 8-6
OLIVE AV	MYERS ST	PARISH PL	BURBANK	2	2	2 LT	2HR 8-6	PA
OLIVE AV	PARISH PL	REESE PL	BURBANK	2	2	2 LT	1HR 8-6; 2HR 8-6	PA
OLIVE AV	REESE PL	VERDUGO AV	BURBANK	2	2	2 LT	2HR 8-6	PA
OLIVE AV	VERDUGO AV	BEACHWOOD DR	BURBANK	2	2	2 LT	NS	NS
OLIVE AV	BEACHWOOD DR	GRIFFITH PARK DR	BURBANK	2	2	2 LT	PA	PA
OLIVE AV	GRIFFITH PARK DR	VICTORY BL	BURBANK	2	2	2 LT	PA	2HR 8-6
OLIVE AV	VICTORY BL	LAKE ST	BURBANK	2	2	2 LT	2HR 8-6	PA; NS
OLIVE AV	LAKE ST	FIRST ST	BURBANK	2	2	DY	NPAT	NPAT
OLIVE AV	FIRST ST	SAN FERNANDO BL	BURBANK	2	2	2 LT	2 HR 9-6, NP 3-5AM; NS	NS
OLIVE AV	SAN FERNANDO BL	THIRD ST	BURBANK	2	2	2 LT	2 HR 9-6, NP 3-5AM	2 HR 9-6, NP 3-5AM

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING			STOPPING & PARKING PROHIBITION	
				EB/NB	WB/SB	MEDIAN TYPE	EASTBOUND/ NORTHBOUND	WESTBOUND/ SOUTHBOUND
OLIVE AV	THIRD ST	GLENOAKS BL	BURBANK	2	2	2 LT	2 HR 9-6, NP 3-5AM	NS
GLENOAKS BL	OLIVE AV	PROVIDENCIA AV	BURBANK	2	2	DY	2 HR 8-6, NP 3-5AM	2 HR 8-6, NP 3-5AM
GLENOAKS BL	PROVIDENCIA AV	CEDAR AV	BURBANK	3	2	RM	PA; 2HR 8-6	2HR 9-6
GLENOAKS BL	CEDAR AV	ELMWOOD AV	BURBANK	3	3	RM	2HR 8-6	PA
GLENOAKS BL	ELMWOOD AV	ALAMEDA AV	BURBANK	3	3	RM	2HR 9-6	2HR 9-6
GLENOAKS BL	ALAMEDA AV	ALLEN AV	GLENDALE	3	3	RM	PA	2HR 9-6
GLENOAKS BL	ALLEN AV	RAYMOND AV	GLENDALE	3	3	RM	PA	2HR 9-6; 1HR 9-6
GLENOAKS BL	RAYMOND AV	WINCHESTER AV	GLENDALE	3	3	RM	PA	PA
GLENOAKS BL	WINCHESTER AV	RUBERTA AV	GLENDALE	3	3	RM	2HR 9-6	PA
GLENOAKS BL	RUBERTA AV	SONORA AV	GLENDALE	3	3	RM	PA	PA
GLENOAKS BL	SONORA AV	DAVIS AV	GLENDALE	3	3	RM	2HR 9-6	2HR 9-6
GLENOAKS BL	DAVIS AV	WILLARD AV	GLENDALE	3	3	RM	PA	2HR 9-6
GLENOAKS BL	WILLARD AV	GRANDVIEW AV	GLENDALE	3	3	RM	NS	2HR 9-6
GLENOAKS BL	GRANDVIEW AV	BRUCE AV	GLENDALE	3	3	RM	2HR 9-6	2HR 9-6
GLENOAKS BL	BRUCE AV	KENILWORTH AV	GLENDALE	3	3	RM	PA	PA
GLENOAKS BL	KENILWORTH AV	PACIFIC AV	GLENDALE	3	3	RM	PA	PA;1 HR 9-6
GLENOAKS BL	PACIFIC AV	CENTRAL AV	GLENDALE	3	3	RM	NS	NS
GLENOAKS BL	CENTRAL AV	BRAND BL	GLENDALE	2	3	RM	NS	NS
BRAND BL	GLENOAKS BL	ARDEN AV	GLENDALE	2	3	RM	NS	NPAT
BRAND BL	ARDEN AV	GOODE AV/134WB OFF RAMP	GLENDALE	3	3	RM	NPAT	NPAT
BRAND BL	GOODE AV	DORAN ST	GLENDALE	2	3	RM	NPAT	NPAT
BRAND BL	DORAN ST	MILFORD ST	GLENDALE	2	3	RM	NS	NPAT
BRAND BL	MILFORD ST	WILSON AV	GLENDALE	2	2	RM	2 HR 9-6 (ANGLED)	2 HR 9-6 (ANGLED)
BRAND BL	WILSON AV	BROADWAY	GLENDALE	2	2	RM	2 HR 9-6 (ANGLED); NS	2 HR 9-6 (ANGLED)

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
BRAND BL	BROADWAY	HARVARD ST	GLENDALE	2	2	RM	NPAT; 2HR 9-6 (ANGLED)	2 HR 9-6 (ANGLED)
BRAND BL	HARVARD ST	COLORADO ST	GLENDALE	2	2	RM	2 HR 9-6 (ANGLED)	2 HR 9-6 (ANGLED)
COLORADO ST	BRAND BL	LOUISE ST	GLENDALE	2	2	DY	NS; 2HR 9-6	2HR 9-6
COLORADO ST	LOUISE ST	JACKSON ST	GLENDALE	2	2	DY	2HR 9-6	2HR 9-6
COLORADO ST	JACKSON ST	GLENDALE AV	GLENDALE	2	2	DY	2HR 9-6	NS
COLORADO ST	GLENDALE AV	EVERETT ST	GLENDALE	2	2	DY	2HR 9-6	2HR 9-6
COLORADO ST	EVERETT ST	ADAMS ST	GLENDALE	2	2	DY	NS; 2HR 9-6	2HR 9-6
COLORADO ST	ADAMS ST	CHEVY CHASE DR	GLENDALE	2	2	DY	NS; 1HR 9-6	NS; 2HR 9-6
COLORADO ST	CHEVY CHASE DR	PORTER ST	GLENDALE	2	2	DY	2HR 9-6	2HR 9-6
COLORADO ST	PORTER ST	FISCHER ST	GLENDALE	2	2	DY	NPAT	2HR 9-6
COLORADO ST	FISCHER ST	FWY 2 SB ON RAMP	GLENDALE	2	2	DY	2HR 9-6	2HR 9-6
COLORADO ST	FWY 2 SB ON RAMP	FWY 2 NB RAMPS	L.A.	2	2	DY	NPAT	NPAT
COLORADO ST	FWY 2 NB RAMPS	BROADWAY	L.A.	2	2	2 LT	NPAT; PA	1HR 8-6; NPAT
COLORADO BL	BROADWAY	LOCKHAVEN AV	L.A.	3	3	RM	NS	NS
COLORADO BL	LOCKHAVEN AV	SIERRA VILLA DR	L.A.	3	3	RM;DY	PA	NS
COLORADO BL	SIERRA VILLA DR	ELLENWOOD DR	L.A.	3	3	2 LT	PA	PA
COLORADO BL	ELLENWOOD DR	EL RIO AV	L.A.	3	3	DY; 2 LT	PA	1 HR 8-6/M
COLORADO BL	EL RIO AV	EAGLE ROCK BL	L.A.	3	3	2 LT	1HR 9-6; 1HR 8-6/M	1 HR 8-6/M
COLORADO BL	EAGLE ROCK BL	MAYWOOD AV	L.A.	3	3	RM	1 HR 8-6/ M	1 HR 8-6/M
COLORADO BL	MAYWOOD AV	HIGHLAND VIEW AV	L.A.	3	3	RM	1HR 8-6/M	1 HR 8-6
COLORADO BL	HIGHLAND VIEW AV	ARGUS DR	L.A.	3	3	RM	PA; 1HR 8-6	1 HR 8-6
COLORADO BL	ARGUS DR	LA RODA AV	L.A.	3	3	RM	PA	1 HR 8-6
COLORADO BL	LA RODA AV	TOWNSEND AV	L.A.	3	3	RM	1HR 8-6	1 HR 8-6
COLORADO BL	TOWNSEND AV	DAHLIA DR	L.A.	2	2	RM	1HR 8-6	1 HR 8-6

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	STRIPING MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
COLORADO BL	DAHLIA DR	LOLETA AV	L.A.	2	2	2 LT	1HR 8–6	PA
COLORADO BL	LOLETA AV	LOS ROBLES ST	L.A.	2	2	2 LT	PA	PA
COLORADO BL	LOS ROBLES ST	EAGLE VISTA DR	L.A.	2	2	2 LT	2 HR 8–6	PA
COLORADO BL	EAGLE VISTA DR	WIOTA ST	L.A.	2	3	RM	NS	PA
COLORADO BL	WIOTA ST	LA LOMA RD	L.A.	2	2	RM	NS	PA
COLORADO BL	LA LOMA RD	FIGUEROA ST	L.A.	2	2	2 LT; DY	NS	NS
COLORADO BL	FIGUEROA ST	PATRICIAN RD	L.A.	2	2	RM	PA	PA
COLORADO BL	PATRICIAN RD	AV 64	L.A.	1	2	RM	NS	PA
COLORADO BL	AV 64	MELROSE AV	PASADENA	1	2	DY	PA	PA
COLORADO BL	MELROSE AV	SAN RAFAEL AV N	PASADENA	1	2	2 LT	NPAT	NPAT
COLORADO BL	SAN RAFAEL AV N	LINDA VISTA AV	PASADENA	1	2	2 LT	NPAT	ROAD CLOSED
COLORADO BL	LINDA VISTA AV	ORANGE GROVE BL	PASADENA	–	–	–	ROAD CLOSED	ROAD CLOSED
COLORADO BL	ORANGE GROVE BL	ST JOHN AV	PASADENA	2	2	DY	2 HR 9–6	NS 7–9 & 4–6, 2HR 9–6
COLORADO BL	ST JOHN AV	PASADENA AV	PASADENA	2	2	2 LT	1HR 9–6	1HR 9–6
COLORADO BL	PASADENA AV	ARROYO PKWY	PASADENA	2	2	DY	1HR 9–6	1HR 9–6
COLORADO BL	ARROYO PKWY	MARENGO AV	PASADENA	2	2	DY	NPAT	NPAT
COLORADO BL	MARENGO AV	GARFIELD AV	PASADENA	2	2	DY	NPAT	1HR 9–6
COLORADO BL	GARFIELD AV	EUCLID AV	PASADENA	2	2	DY; 2 LY	NPAT	1HR 9–6
COLORADO BL	EUCLID AV	LOS ROBLES AV	PASADENA	2	2	DY	NPAT.	1HR 9–6
COLORADO BL	LOS ROBLES AV	LAKE AV	PASADENA	2	2	DY	1HR 9–6	1HR 9–6
COLORADO BL	LAKE AV	HILL AV	PASADENA	2	2	2 LT	1HR 9–6	1HR 9–6
COLORADO BL	HILL AV	HARKNESS AV	PASADENA	2	2	2 LT	1HR 9–6	NSAT
COLORADO BL	HARKNESS AV	BONNIE AV	PASADENA	2	2	2 LT	1HR 9–6	1HR 9–6
COLORADO BL	BONNIE AV	MEREDITH AV	PASADENA	2	2	2 LT	1HR 9–6	NSAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
COLORADO BL	MEREDITH AV	ALLEN AV	PASADENA	2	2	2 LT	1HR 9-6	1HR 9-6
COLORADO BL	ALLEN AV	SIERRA MADRE BL	PASADENA	2	2	2 LT	2HR 9-6	2HR 9-6
COLORADO BL	SIERRA MADRE BL	VIRGINIA AV	PASADENA	2	2	RM	1HR 9-6	1HR 9-6
COLORADO BL	VIRGINIA AV	VINEDO AV	PASADENA	2	2	RM	NSAT	1HR 9-6
COLORADO BL	VINEDO AV	SAN GABRIEL BL	PASADENA	2	2	RM	1HR 9-6;NSAT	1HR 9-6
COLORADO BL	SAN GABRIEL BL	SUNNYSLOPE AV	PASADENA	2	2	RM	NS10PM-6AM/2HR9-6	NS10PM-6AM/2HR9-6
COLORADO BL	SUNNYSLOPE AV	KINNELOA AV	PASADENA	2	2	RM;2 LT	2HR 9-6	2HR 9-6
COLORADO BL	KINNELOA AV	MADRE ST	PASADENA	2	2	2 LT	2HR 9-6	1HR 9-6
COLORADO BL	MADRE ST	HALSTEAD ST	PASADENA	2	2	2 LT	PA	PA;NSAT
COLORADO BL	HALSTEAD ST	LOTUS AV	L.A. COUNTY	2	2	2 LT	PA	1HR 9-6
COLORADO BL	LOTUS AV	BEACON PL	L.A. COUNTY	2	2	2 LT	PA	1HR 7-6
COLORADO BL	BEACON PL	ROSEMEAD BL	L.A. COUNTY	2	2	RM	1HR 7-6	NSAT
MMBL 10								
ATLANTIC BL	FLORAL DR	POMONA BL	MONTEREY PARK/ L.A. COUNTY					
ATLANTIC BL	POMONA BL	BEVERLY BL	L.A. COUNTY	2/3	2	RM	NPAT	NPAT
ATLANTIC BL	BEVERLY BL	WHITTIER BL	L.A. COUNTY	2	2	2LT	PA	PA
WHITTIER BL	ATLANTIC BL	GARFIELD AV	L.A. COUNTY	(SEE RTD 18)				
WHITTIER BL	GARFIELD AV	4TH ST	MONTEBELLO	2	2	DY	PA	PA
WHITTIER BL	4TH ST	MYRTLE ST	MONTEBELLO/ PICO RIVERA	2	2	DY	NPAT	NPAT
WHITTIER BL	MYRTLE ST	PARAMOUNT BL	PICO RIVERA	2	2	RM	NPAT	NPAT
WHITTIER BL	PARAMOUNT BL	ROSEMEAD BL	PICO RIVERA	2	2	2LT	PA	PA

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING			STOPPING & PARKING PROHIBITION	
				EB/NB	WB/SB	MEDIAN TYPE	EASTBOUND/ NORTHBOUND	WESTBOUND/ SOUTHBOUND
WHITTIER BL	ROSEMEAD BL	PASSONS BL	PICO RIVERA	2	2	RM	PA	PA
PASSONS BL	WHITTIER BL	JACKSON	PICO RIVERA	1	1	DY	PA	PA
LB 40								
ANAHEIM ST	LONG BEACH BL	XIMENO AV	LONG BEACH	2	2	2LT	2HR/M 9-6	2HR/M 9-6
ANAHEIM ST	XIMENO AV	PACIFIC COAST HWY	LONG BEACH	2	2	2LT	NPAT	PA
PCH	ANAHEIM ST	CLARK AV	LONG BEACH	3	3	RM	NPAT	NPAT
CLARK AV	PCH	ANAHEIM ST	LONG BEACH	2	2	DY	NPAT	NPAT
LB 50								
ARTESIA BL	ACACIA AV	COMP. CRK OVERPASS	COMPTON	2	2	DY	NPAT	NPAT
ARTESIA BL	COMP. CRK OVERPASS	SANTA FE RR	COMPTON	3	3	RM	NPAT	NPAT
ARTESIA BL	SANTA FE RR	LONG BEACH BL	LONG BEACH	2	2	RM	PA	PA
LONG BEACH BL	ARTESIA BL	SR-91 FWY	LONG BEACH	3	3	DY	NPAT	NPAT
LONG BEACH BL	SR-91 FWY	LA RIVER	LONG BEACH	2	2	2LT	NPAT	PA
LONG BEACH BL	LA RIVER	ZANE ST	LONG BEACH	3	2	RM/SDY	NPAT	NPAT
LONG BEACH BL	ZANE ST	ARBOR ST	LONG BEACH	2	2	2LT	PA	PA
LONG BEACH BL	ARBOR ST	SAN ANTONIO DR	LONG BEACH	2	2	2LT	NPAT	PA
LONG BEACH BL	SAN ANTONIO DR	WARDLOW RD	LONG BEACH	2	2	2LT	PA	PA
LONG BEACH BL	WARDLOW RD	SPRING ST	LONG BEACH	3	3	RM	NPAT	PA
LONG BEACH BL	SPRING ST	BLUE LINE	LONG BEACH	2	2	RM	PA	PA
LONG BEACH BL	BLUE LINE	WILLOW ST	LONG BEACH	3	3	BLUE LINE	PA	NPAT
LONG BEACH BL	WILLOW ST	20TH ST	LONG BEACH	2	2	BLUE LINE	PA	PA
LONG BEACH BL	20TH ST	PACIFIC COAST HWY	LONG BEACH	2	2	BLUE LINE	NPAT	NPAT

(CONTINUED)
EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	CITY	STRIPING EB/NB	STRIPING WB/SB	MEDIAN TYPE	STOPPING & PARKING PROHIBITION EASTBOUND/ NORTHBOUND	STOPPING & PARKING PROHIBITION WESTBOUND/ SOUTHBOUND
LONG BEACH BL	PACIFIC COAST HWY	10TH ST	LONG BEACH	2	2	BLUE LINE	PA	NPAT
LONG BEACH BL	10TH ST	OCEAN BL	LONG BEACH	2	2	BLUE LINE	NPAT	NPAT
LB 60								
ATLANTIC AV	OCEAN BL	10TH ST	LONG BEACH	2	2	DY	PA	PA
ATLANTIC AV	10TH ST	ANAHEIM ST	LONG BEACH	2	2	2LT	PA	PA
ATLANTIC AV	ANAHEIM ST	WILLOW ST	LONG BEACH	2	2	DY	PA	PA
ATLANTIC AV	WILLOW ST	SPRING ST	LONG BEACH	2	2	RM	NPAT	PA
ATLANTIC AV	SPRING ST	33RD ST	LONG BEACH	2	2	RM	NPAT	NPAT
ATLANTIC AV	33RD ST	BIXBY RD	LONG BEACH	2	2	DY	PA	PA
ATLANTIC AV	BIXBY RD	SAN ANTONIO DR	LONG BEACH	2	2	2LT	PA	PA
ATLANTIC AV	SAN ANTONIO DR	ARTESIA BL	LONG BEACH	2	2	RM	PA	PA
ARTESIA BL	ATLANTIC AV	BUTLER AV	LONG BEACH	2	2	RM	NPAT	NPAT
ARTESIA BL	BUTLER AV	LONG BEACH BL	LONG BEACH	2	2	RM	PA	PA
LB 90								
7TH ST	PCH	SANTIAGO AV	LONG BEACH	2	2	DY	NPAT	NPAT
7TH ST	SANTIAGO AV	PARK AV	LONG BEACH	2	3	DY	NPAT	NPAT
7TH ST	PARK AV	XIMENO AV	LONG BEACH	2	2	2LT	NPAT	PA
7TH ST	XIMENO AV	CHERRY AV	LONG BEACH	2	2	2LT	PA	PA
7TH ST	CHERRY AV	M.L. KING JR. AV	LONG BEACH	2	2	2LT	PA	PA
7TH ST	M.L. KING JR. AV	ELM AV	LONG BEACH	3	0	ONE-WAY	PA	PA
7TH ST	ELM AV	PACIFIC AV	LONG BEACH	3	0	ONE-WAY	2HR/M 9-6	2HR/M 9-6

(CONTINUED)

EXISTING SURFACE STREET PHYSICAL CHARACTERISTICS

NOTES:

(1) LANES:
- # = NUMBER OF LANES
- #/# = OFF-PEAK/PEAK NUMBER OF LANES
- BL = BICYCLE LANES
- NA = NO LANES IN INDICATED DIRECTION (ONE-WAY STREET)

(2) MEDIAN TYPES:
- DY = DOUBLE YELLOW CENTERLINE
- SDY = SINGLE DASHED YELLOW CENTERLINE
- 2 LT = TWO-WAY LEFT TURN LANE
- NO CL = NO CENTERLINE MARKING
- RM = RAISED MEDIAN
- ; = MEDIAN TYPE CHANGES MID-BLOCK

(3) PARKING:
- /M = METERED PARKING
- PA = PARKING ALLOWED
- NPAT = NO PARKING ANY TIME
- NS = NO STOPPING
- ; = RESTRICTIONS CHANGE MID-BLOCK

FOR ONE WAY STREETS, PARKING INFORMATION REFERS TO SIDE OF STREET NOT DIRECTION

LOCATION AND CONTROL FOR LEFT-TURNS

LINE #	INTERSECTION	DIRECTION	SIGNALIZED	LEFT TURN LANE	LEFT TURN PHASE
16	SAN VICENTE BL & 3RD ST	SOUTHBOUND TO EASTBOUND	YES	YES	NO
16	MAIN ST 6TH ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
16	CENTRAL AV & 6TH ST	SOUTHBOUND TO EASTBOUND	YES	YES	NO
16	ALAMEDA ST & 6TH ST	EASTBOUND TO NORTHBOUND	YES	NO	NO
16	ALAMEDA ST & 3RD ST	NORTHBOUND TO WESTBOUND	YES	YES	NO
16	SPRING ST & 3RD ST	WESTBOUND TO SOUTHBOUND	YES	YES	NO
16	BIXEL ST & 3RD ST	NORTHBOUND TO WESTBOUND	YES	NO	NO
18	PRIVATE ROADWAY & 5TH ST	NORTHBOUND TO WESTBOUND	NO	NO	NO
18	WILTON PL & 5TH ST	WESTBOUND TO SOUTHBOUND	YES	NO	NO
18	WILTON PL & 6TH ST	SOUTHBOUND TO EASTBOUND	YES	YES	NO
18	WESTSIDE DR & NORTHSIDE DR	WESTBOUND TO SOUTHBOUND	NO	NO	NO
18	WESTSIDE DR & OLYMPIC BL	SOUTHBOUND TO EASTBOUND	N0	NO	NO
18	GARFIELD AV & OLYMPIC BL	EASTBOUND TO NORTHBOUND	YES	YES	NO
18	GARFIELD AV & WHITTIER BL	NORTHBOUND TO WESTBOUND	YES	YES	NO
30/31	BROADWAY & PICO BL	EASTBOUND TO NORTHBOUND	YES	NO	NO
30	ROWAN AV & 1ST ST	EASTBOUND TO NORTHBOUND	YES	NO	NO
30	BRANNICK AV & HAMMEL ST	EASTBOUND TO NORTHBOUND	NO	NO	NO
30/31	COLLEGIAN AV & RIGGIN ST	SOUTHBOUND TO EASTBOUND	YES	NO	NO
30	ATLANTIC BL & RIGGIN ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
30/31	ATLANTIC BL & FLORAL DR	NORTHBOUND TO WESTBOUND	YES	YES	NO
31	ATLANTIC BL & 1ST ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
30	BRANNICK AV & FLORAL DR	WESTBOUND TO SOUTHBOUND	NO	NO	NO
30	ROWAN AV & HAMMEL ST	WESTBOUND TO SOUTHBOUND	NO	NO	NO
30/31	BROADWAY & 1ST ST	WESTBOUND TO SOUTHBOUND	YES	YES	YES*
30/31	RIMPAU BL & PICO BL	WESTBOUND TO SOUTHBOUND	YES	YES	NO

LOCATION AND CONTROL FOR LEFT-TURNS

LINE #	INTERSECTION	DIRECTION	SIGNALIZED	LEFT TURN LANE	LEFT TURN PHASE
40	ARTESIA BL & REDONDO BCH BL	EASTBOUND TO NORTHBOUND	YES	YES	YES
40	HAWTHORNE BL & REDONDO BCH BL	EASTBOUND TO NORTHBOUND	YES	YES	YES
40	MARKET ST & FLORENCE AV	WESTBOUND TO SOUTHBOUND	YES	YES	YES
40	CRENSHAW BL & FLORENCE AV	EASTBOUND TO NORTHBOUND	YES	YES	YES
40	LEIMERT AV & CRENSHAW BL	WESTBOUND TO SOUTHBOUND	YES	YES	YES
40	M.L. KING BL & BROADWAY	EASTBOUND TO NORTHBOUND	YES	YES	NO
40	BROADWAY & 1ST ST	NORTHBOUND TO EASTBOUND	YES	YES	NO
40	1ST ST & SAN PEDRO ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
40	TEMPLE ST & SAN PEDRO ST	WESTBOUND TO SOUTHBOUND	YES	NO	NO
40	ALAMEDA ST & TEMPLE ST	EASTBOUND TO NORTHBOUND	YES	NO	NO
40	ALPINE ST & ALAMEDA ST	WESTBOUND TO SOUTHBOUND	YES	NO	NO
45	MAIN ST & 135TH ST	SOUTHBOUND TO EASTBOUND	YES	YES	NO
45	EL SEGUNDO BL & MAIN ST	NORTHBOUND TO WESTBOUND	YES	YES	NO
45	BROADWAY & EL SEGUNDO BL	SOUTHBOUND TO EASTBOUND	YES	YES	NO
45	BROADWAY & LINCOLN PARK AV	EASTBOUND TO NORTHBOUND	YES	YES	NO
45	LINCOLN PARK AV & FLORA AV	WESTBOUND TO SOUTHBOUND	NO	NO	NO
45	SIERRA ST & FLORA AV	EASTBOUND TO NORTHBOUND	NO	NO	NO
45	SIERRA ST & MERCURY AV	WESTBOUND TO SOUTHBOUND	NO	NO	NO
45	MONTEREY RD & HUNTINGTON DR	SOUTHBOUND TO EASTBOUND	YES	NO	NO
45	COLLIS AV & HUNTINGTON DR N	NORTHBOUND TO WESTBOUND	YES	YES	NO
45	HUNTINGTON DR & COLLIS AV	EASTBOUND TO NORTHBOUND	NO	NO	NO
45	MERCURY AV & HUNTINGTON DR	EASTBOUND TO NORTHBOUND	NO	NO	NO
66/67	8TH ST & WILTON PL	SOUTHBOUND TO EASTBOUND	YES	NO	NO
66/67	PRIVATE RIGHT OF WAY & 6TH ST	EASTBOUND TO NORTHBOUND	NO	NO	NO
66/67	PRIVATE RIGHT OF WAY & 5TH ST	NORTHBOUND TO WESTBOUND	NO	NO	NO
66/67	5TH ST & WILTON PL	WESTBOUND TO SOUTHBOUND	YES	NO	NO
66/67	OLYMPIC BL & WESTSIDE DR	EASTBOUND TO NORTHBOUND	NO	YES	NO
66/67	8TH ST & OLYMPIC BL	SOUTHBOUND TO EASTBOUND	YES	NO	NO
66/67	SOTO ST & 8TH ST	WESTBOUND TO SOUTHBOUND	YES	YES	NO
66/67	OLYMPIC BL & BOYLE ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
66/67	SAN PEDRO ST & 8TH ST	NORTHBOUND TO WESTBOUND	YES	NO	NO

LOCATION AND CONTROL FOR LEFT-TURNS

LINE #	INTERSECTION	DIRECTION	SIGNALIZED	LEFT TURN LANE	LEFT TURN PHASE
70	RAMONA BL & SANTA ANITA AV	NORTHBOUND TO WESTBOUND	YES	YES	NO
70	GARVEY AV & SANTA ANITA AV	EASTBOUND TO NORTHBOUND	YES	YES	YES
70	RAMONA BL & EASTERN AV	WESTBOUND TO SOUTHBOUND	YES	YES	NO
70	EASTERN AV & CITY TERRACE DR	EASTBOUND TO NORTHBOUND	YES	NO	NO
70	CITY TERRACE & MARENGO ST	EASTBOUND TO NORTHEAST	YES	YES	NO
70	MISSION RD & MARENGO ST	WESTBOUND TO SOUTHBOUND	YES	YES	NO
70	MISSION RD & MACY ST	EASTBOUND TO NORTHBOUND	YES	YES	YES*
70	MACY ST & BROADWAY	WESTBOUND TO SOUTHBOUND	YES	YES	NO
70	PICO BL & BROADWAY	EASTBOUND TO NORTHBOUND	YES	NO	NO
70	11TH ST & FIGUEROA ST	NORTHBOUND TO WESTBOUND	YES	YES	NO
70	11TH ST & SENTOUS ST	WESTBOUND TO SOUTHBOUND	YES	YES	NO
70	SENTOUS ST & PICO BL	SOUTHBOUND TO EASTBOUND	YES	YES	NO
TRI-CITIES	VERDUGO AV & 3RD ST	EASTBOUND TO NORTHBOUND	NO	YES	NO
TRI-CITIES	BRAND BL & COLORADO BL	SOUTHBOUND TO EASTBOUND	YES	YES	YES
TRI-CITIES	ORANGE GROOVE BL & GREEN ST	SOUTHBOUND TO EASTBOUND	YES	YES	YES
TRI-CITIES	ORANGE GROOVE BL & COLORADO ST	NORTHBOUND TO WESTBOUND	YES	YES	NO
TRI-CITIES	BRAND BL & GLENOAKS BL	NORTHBOUND TO WESTBOUND	YES	YES	YES
TRI-CITIES	OLIVE AV & GLENOAKS BL	WESTBOUND TO SOUTHBOUND	YES	YES	NO
204	VERMONT AV & LOS FELIZ RD	WESTBOUND TO SOUTHBOUND	YES	YES	YES*
204	LOS FELIZ RD & BRAND BL	EASTBOUND TO NORTHBOUND	YES	YES	NO
204	BRAND BL & COLORADO ST	NORTHBOUND TO WESTBOUND	YES	YES	NO
560	VAN NUYS & FOOTHILL BL	WESTBOUND TO SOUTHBOUND	YES	YES	NO
560	FOOTHILL BL & TERRA BELLA ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
560	TERRA BELLA ST & ELDRIDGE AV	WESTBOUND TO SOUTHBOUND	NO	NO	NO
560	ELDRIDGE AV & KAGEL CANYON ST	NORTHBOUND TO WESTBOUND	NO	NO	NO
560	KAGEL CANYON ST & FENTON AV	EASTBOUND TO NORTHBOUND	NO	NO	NO
MB10	ATLANTIC BL & 1ST STREET	NORTHBOUND TO WESTBOUND	YES	YES	NO
MB10	ATLANTIC BL & WHITTIER BL	SOUTHBOUND TO EASTBOUND	YES	YES	YES
MB10	WHITTIER BL & PASSONS BL	NORTHBOUND TO WESTBOUND	YES	NO	NO

LOCATION AND CONTROL FOR LEFT-TURNS

LINE #	INTERSECTION	DIRECTION	SIGNALIZED	LEFT TURN LANE	LEFT TURN PHASE
LB40	LONG BEACH BL & ANAHEIM ST	WESTBOUND TO SOUTHBOUND	YES	NO	NO
LB40	PACIFIC AV & 7TH ST	WESTBOUND TO SOUTHBOUND	YES	NO	NO
LB40	PACIFIC AV & 1ST ST	SOUTHBOUND TO EASTBOUND	YES	YES	YES
LB40	LONG BEACH BL & 1ST ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
LB40	CLARK AV & ANAHEIM ST	EASTBOUND TO NORTHBOUND	NO	YES	NO
LB50	ACACIA ST & ARTESIA BL	SOUTHBOUND TO EASTBOUND	YES	YES	YES
LB50	LONG BEACH BL & ARTESIA BL	NORTHBOUND TO WESTBOUND	YES	YES	YES
LB50	PACIFIC AV & 7TH ST	WESTBOUND TO SOUTHBOUND	YES	NO	NO
LB50	PACIFIC AV & 1ST ST	SOUTHBOUND TO EASTBOUND	YES	YES	YES
LB50	LONG BEACH BL & 1ST ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
LB60	ACACIA ST & ARTESIA BL	SOUTHBOUND TO EASTBOUND	YES	YES	YES
LB60	ATLANTIC AV & ARTESIA BL	NORTHBOUND TO WESTBOUND	YES	YES	YES
LB60	PACIFIC AV & 7TH ST	WESTBOUND TO SOUTHBOUND	YES	NO	NO
LB60	PACIFIC AV & 1ST ST	SOUTHBOUND TO EASTBOUND	YES	YES	YES
LB60	LONG BEACH BL & 1ST ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
LB60	ATLANTIC AV & 6TH ST	EASTBOUND TO NORTHBOUND	YES	NO	NO
LB90	PACIFIC AV & 7TH ST	WESTBOUND TO SOUTHBOUND	YES	NO	NO
LB90	PACIFIC AV & 1ST ST	SOUTHBOUND TO EASTBOUND	YES	YES	YES
LB90	LONG BEACH BL & 1ST ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
LB90	M.L. KING AV & 6TH ST	EASTBOUND TO NORTHBOUND	YES	YES	NO
LB90	BELLFLOWER BL & 7TH ST	EASTBOUND TO NORTHBOUND	YES	YES	YES
LB90	LOS COYOTES DIAGONAL & BELLFLOWER BL	WESTBOUND TO SOUTHBOUND	YES	YES	YES

* PROTECTED/PERMISSIVE

EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY		YEAR
RTD 16								
3RD ST	ROBERTSON BL	LA CIENIEGA BL	1,950	2,595	90	31,900		90
3RD ST	LA CIENIEGA BL	CRESCENT HEIGHTS	1,845	2,310	91	28,600		91
3RD ST	CRESCENT HEIGHTS	FAIRFAX AV	2,035	2,485	89	30,100		89
3RD ST	FAIRFAX AV	GARDNER ST	2,245	2,455	89	29,400		89
3RD ST	GARDNER ST	LA BREA AV	2,765	3,685	90	41,800		90
3RD ST	LA BREA AV	HIGHLAND AV	2,720	3,025	90	35,700		90
3RD ST	WESTERN AV	NORMANDIE AV	2,720	3,010	91	38,500		91
3RD ST	NORMANDIE	VERMONT AV	2,525	2,815	91	38,700		91
3RD ST	VERMONT AV	HOOVER ST	2,250	2,465	90	24,700	[a]	90
3RD ST	HOOVER ST	RAMPART BL	2,605	2,620	89	31,500		89
3RD ST	RAMPART BL	ALVARADO ST	2,110	2,700	91	31,500		91
3RD ST	ALVARADO ST	BIXEL ST	1,850	2,775	91	27,700		91
BIXEL ST	3RD ST	6TH ST	475	1,105	92	11000	[a]	92
6TH ST	BIXEL ST	FIGUEROA ST	1,325	1,590	92	15,900	[a]	92
6TH ST	FIGUEROA ST	FLOWER ST	1,860	1,410	89	24,500		89
6TH ST	FLOWER ST	HOPE ST	14,810	1,505	89	17,300		89
6TH ST	HOPE ST	GRAND AV	1,815	2,125	91	26,400		91
6TH ST	GRAND AV	OLIVE ST	1,565	1,915	89	27,200		89
6TH ST	OLIVE ST	HILL ST						
6TH ST	HILL ST	BROADWAY	2,440	2,690	91	30,100		91
6TH ST	BROADWAY	SPRING ST	1,310	1,705	91	17,700		91
6TH ST	SPRING ST	MAIN ST						
6TH ST	MAIN ST	LOS ANGELES ST	670	1,395	87	14,000	[a]	87
CENTRAL AV	6TH ST	5TH ST						
5TH ST	MAIN ST	SPRING ST	1,205	760	87	7,600	[a]	87
5TH ST	SPRING ST	BROADWAY	930	680	87	6,800	[a]	87
5TH ST	BROADWAY	HILL ST	1,025	790	87	7,900	[a]	87
5TH ST	HILL ST	OLIVE ST	1,050	905	91	9,000	[a]	91
5TH ST	OLIVE ST	GRAND AV	1,735	2,165	91	24,100		91
5TH ST	GRAND AV	HOPE ST	360	375	92	3,800	[a]	92
5TH ST	HOPE ST	FLOWER ST	1,115	1,830	89	20,500		89
5TH ST	FLOWER ST	FIGUEROA ST	1,260	1,730	91	22,400		91
5TH ST	FIGUEROA ST	6TH ST	1,235	1,960	87	19,600	[a]	87
RTD 18								
6TH ST	WESTERN AV	NORMANDIE AV	1,670	2,205	91	23,400		91
6TH ST	NORMANDIE AV	VERMONT AV						
6TH ST	VERMONT AV	HOOVER ST						
6TH ST	HOOVER ST	RAMPART BL						
6TH ST	RAMPART BL	ALVARADO ST	1,580	2,080	88	20,800	[a]	88

(continued)
EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY	YEAR
6TH ST	ALVARADO ST	UNION ST	1,595	2,205	89	22,100 [a]	89
6TH ST	UNION ST	FIGUEROA ST	1,985	2,260	89	26,300	89
6TH ST	FIGUEROA ST	CENTRAL AV	SEE LINE 16				
6TH	CENTRAL AV	WHITTIER BL					
5TH ST	CENTRAL AV	FIGUEROA ST	SEE LINE 16				
WHITTIER BL	CENTRAL AV	LORENA AV	1,545	1,810	89	18,100 [a]	89
WHITTIER BL	LORENA AV	INDIANA ST	1,750	1,900	90	21,700	90
WHITTIER BL	INDIANA ST	DITMAN AV	1,380	1,650	90	21,400	90
WHITTIER BL	DITMAN AV	HERBERT AV	1,620	1,800	90	21,400	90
WHITTIER BL	HERBERT AV	DOWNEY RD	1,725	1,840	90	21,000	90
WHITTIER BL	DOWNEY RD	ATLANTIC BL					
WHITTIER BL	ATLANTIC BL	GARFIELD AV	1,970	2,105	90	28,400	90
RTD 30/31							
PICO BL	RIMPAU BL	CRENSHAW BL	2,735	2,650	91	3,100	91
PICO BL	CRENSHAW BL	ARLINGTON AV	2,400	2,390	91	27,100	91
PICO BL	ARLINGTON AV	WESTERN AV	1,835	2,135	91	23,100	91
PICO BL	WESTERN AV	NORMANDIE AV	1,110	1,620	91	20,600	91
PICO BL	NORMANDIE AV	VERMONT AV	1,810	2,265	89	25,800	89
PICO BL	VERMONT AV	HOOVER AV	1,150	1,680	88	16,800 [a]	88
PICO BL	HOPE ST	GRAND AV	1,000	1,330	90	16,100	90
PICO BL	GRAND AV	OLIVE ST	890	1,190	90	14,100	90
PICO BL	OLIVE ST	HILL ST	880	1,270	90	13,900	90
PICO BL	HILL ST	BROADWAY	925	1,395	87	14,000 [a]	87
BROADWAY	PICO BL	12TH ST	1,150	1,185	87	11,800 [a]	87
BROADWAY	12TH ST	11TH ST	1,250	1,175	87	11,800 [a]	87
BROADWAY	11TH ST	OLYMPIC BL	1,080	1,220	87	12,200 [a]	87
BROADWAY	OLYMPIC BL	9TH ST	1,065	1,305	87	13,000 [a]	87
BROADWAY	9TH ST	8TH ST	850	1,345	87	13,500 [a]	87
BROADWAY	8TH ST	7TH ST	130	145	90	2,100	90
BROADWAY	4TH ST	3RD ST	1,465	1,405	90	19,500	90
BROADWAY	3RD ST	2ND ST	1,540	1,515	89	21,500	89
BROADWAY	2ND ST	1ST ST	1,180	1,445	87	14,500 [a]	87
1ST ST	BROADWAY	SPRING ST	1,915	2,205	89	26,000	89
1ST ST	MAIN ST	LOS ANGELES ST	2,145	2,290	91	28,100	91
1ST ST	LOS ANGELES ST	SAN PEDRO ST	1,915	2,195	91	22,000 [a]	91
1ST ST	CENTRAL AV	ALAMEDA ST	1,615	2,135	90	24,200	90
1ST ST	SANTA FE ST	MISSION RD	2,795	2,380	91	26,300	91
1ST ST	INDIANA ST	EASTERN AV	830	1,275	90	13,100	90
1ST ST	EASTERN AV	MEDNICK AV	925	1,140	90	10,700	90
1ST ST	MEDNICK AV	ATLANTIC BL	1,075	970	90	9,900	90

(continued)
EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY	YEAR
ATLANTIC BL	1ST ST	FLORAL DR					
COLLEGIAN AV	FLORAL DR	RIGGIN ST					
RIGGIN ST	COLLEGIAN AV	ATLANTIC BL					
FLORAL DR	ATLANTIC BL	MEDNIK AV		1,275	90	14,100	90
FLORAL DR	MEDNIK AV	FORD BL	1,265	1,770	90	19,900	90
FLORAL DR	FORD BL	EASTERN AV	1,225		90	14,700	90
BRANNICK AV	FLORAL DR	HAMMEL ST					
HAMMEL ST	BRANNICK AV	ROWAN AV	400		89		
ROWAN AV	HAMMEL ST	1ST ST	450		90		
RTD 40							
HAWTHORNE BL	182ND ST	REDONDO BCH BL					
HAWTHORNE BL	REDONDO BCH BL	MANHATTAN BCH BL	3,920	4,480	89	58,900	89
HAWTHORNE BL	MANHATTAN BCH BL	MARINE AV		3,705	89	4,300	89
HAWTHORNE BL	MARINE AV	ROSECRANS AV	2,500	4,125	89	50,500	89
HAWTHORNE BL	ROSECRANS AV	EL SEGUNDO BL	2,515	3,970	90	39,200	90
HAWTHORNE BL	EL SEGUNDO BL	120TH ST	2,315	3,090	90	30,900	90
HAWTHORNE BL	120TH ST	IMPERIAL HWY	2,290	3,055	90	30,500	90
HAWTHORNE BL	IMPERIAL HWY	LENNOX BL	1,955	2,715	90	33,400	90
HAWTHORNE BL	LENNOX BL	CENTURY BL		2,845	90	35,700	90
HAWTHORNE BL	CENTURY BL	LA BREA AV ?	515	555	91	7,300	91
HAWTHORNE BL	LA BREA AV	FLORENCE BL					
FLORENCE BL	MARKET ST	CRENSHAW BL					
CRENSHAW BL	FLORENCE BL	HYDE PARK BL	2,355	2,575	91	33,800	91
CRENSHAW BL	HYDE PARK BL	SLAUSON AV	2,230	2,915	92	36,700	92
CRENSHAW BL	SLAUSON AV	54TH ST	2,465	3,525	91	43,500	91
CRENSHAW BL	VERNON AV	M.L. KING BL	3,460	3,850	91	50,400	91
M.L.KING BL	CRENSHAW BL	ARLINGTON AV	2,030	2,700	91	30,400	91
M.L.KING BL	ARLINGTON AV	WESTERN AV	2,455	3,055	90	36,660	90
M.L.KING BL	WESTERN AV	NORMANDIE AV	2,270	2,720	91	33,800	91
M.L.KING BL	NORMANDIE AV	VERMONT AV	2,485	2,890	90	36,700	90
M.L.KING BL	VERMONT AV	HOOVER ST	2,410	3,520	90	37,100	90
M.L.KING BL	HOOVER ST	FIGUEROA ST	2,810	2,840	90	39,100	90
BROADWAY	M.L. KING BL	38TH ST	2,350	3,090	91	27,300	91
BROADWAY	38TH ST	36TH ST	1,685	1,875	92	17,400	92
BROADWAY	WASHINGTON BL	VENICE BL	1,210	1,425	92	16,400	92
BROADWAY	VENICE BL	PICO BL					
BROADWAY	8TH ST	1ST ST	SEE LINE 30/31				
1ST ST	BROADWAY	SAN PEDRO ST	SEE LINE 30/31				
SAN PEDRO ST	1ST ST	TEMPLE ST	620	765	91	7,600 [a]	91
TEMPLE ST	SAN PEDRO ST	ALAMEDA ST	750	940	91	9,400 [a]	91

(continued)
EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY	YEAR
ALAMEDA ST	TEMPLE ST	MACY ST	1,750	2,185	91	21,900 [a]	91
ALAMEDA ST	MACY ST	ALPINE ST	1,515	1,685	91	16,700	91
VIGNES ST	ALAMEDA ST	BAUCHET ST	570	635	91	6,300 [a]	91
RTD 45							
HUNTINGTON DR	COLLIS AV	MONTEREY RD					
MERCURY AV	MONTEREY RD	SIERRA ST					
SIERRA ST	MERCURY AV	FLORA AV					
FLORA AV	SIERRA ST	PARK AV					
LINCOLN PARK AV	FLORA AV	BROADWAY					
BROADWAY	LINCOLN PARK AV	DALY ST	2,210	2,470	88	24,700 [a]	88
BROADWAY	DALY ST	ALPINE ST	2,265	2,460	88	24,600 [a]	88
BROADWAY	ALPINE ST	SUNSET BL	1,125	1,690	91	16,900 [a]	91
BROADWAY	SUNSET BL	1ST ST	1,435	1,840	89	18,400 [a]	89
BROADWAY	1ST ST	PICO BL	SEE LINE 30/31				
BROADWAY	PICO BL	M.L. KING BL	SEE LINE 40				
BROADWAY	M.L. KING BL	VERNON AV	2,350	3,090	91	27,300	91
BROADWAY	VERNON AV	54TH ST	1,905	2,475	90	28,600	90
BROADWAY	54TH ST	SLAUSON AV	2,205	2,415	91	27,400	91
BROADWAY	SLAUSON AV	GAGE AV	1,600	2,080	90	23,300	90
BROADWAY	GAGE AV	FLORENCE AV	2,060	1,910	91	22,400	91
BROADWAY	FLORENCE AV	MANCHESTER AV	1,745	1,905	91	21,400	91
BROADWAY	MANCHESTER AV	92ND ST	1,055	1,350	89	13,500 [a]	89
BROADWAY	92ND ST	108TH ST	1,155	1,305	91	14,700	91
BROADWAY	108TH ST	IMPERIAL HWY	1,185	1,355	91	15,900	91
BROADWAY	IMPERIAL HWY	120TH ST	905	855	92	8,800	92
BROADWAY	120TH ST	EL SEGUNDO BL	815	880	89	8,900	89
EL SEGUNDO BL	BROADWAY	MAIN ST	1,795		89	26,700	89
MAIN ST	EL SEGUNDO BL	135TH ST		955	89	9,400	89
135TH ST	MAIN ST	SAN PEDRO ST	1,040		89	11,400	89
SAN PEDRO ST	135TH ST	ROSECRANS AV	790		90	8,500	90
ROSECRANS AV	SAN PEDRO ST	MAIN ST				30,900	89
MAIN ST	ROSECRANS AV	135TH ST	920		90	10,300	90
135TH ST	SAN PEDRO ST	MAIN ST					
RTD 66/67							
8TH ST	WESTERN AV	VERMONT AV	1,585	2,005	89	24,900	89
8TH ST	VERMONT AV	HOOVER ST	1,280	1,780	89	17,800 [a]	89
8TH ST	HOOVER ST	ALVARADO ST	1,435	2,160	89	21,600 [a]	89
8TH ST	ALVARADO ST	UNION ST	1,260	1,790	91	17,900	91
8TH ST	UNION ST	FIGUEROA ST	1,640	2,205	87	22,000	87

(continued)
EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY	YEAR
8TH ST	FIGUEROA ST	FLOWER ST	1,650	2,705	89	29,300	89
8TH ST	FLOWER ST	HOPE ST	915	1,110	89	16,200	89
8TH ST	HOPE ST	GRAND AV					
8TH ST	GRAND AV	OLIVE ST	1,550	1,700	91	19,100	91
8TH ST	OLIVE ST	HILL ST	1,170	880	88	8,800 [a]	88
8TH ST	HILL ST	BROADWAY					
8TH ST	BROADWAY	MAIN ST					
8TH ST	MAIN ST	LOS ANGELES ST	1,165	1,080	90	10,800 [a]	90
8TH ST	LOS ANGELES ST	SANTEE ST	815	735	90	10,000	90
8TH ST	SANTEE ST	WALL ST					
8TH ST	WALL ST	SAN JULIAN ST	870	875	89	10,200	89
8TH ST	SAN JULIAN ST	SAN PEDRO ST					
SAN PEDRO ST	8TH ST	9TH ST					
9TH ST	GARLAND	FIGUEROA ST	2,640	1,775	89	28,600	89
9TH ST	FIGUEROA ST	FLOWER ST	1,945	1,110	87	11,100 [a]	87
9TH ST	FLOWER ST	HOPE ST	1,985	1,820	91	21,800	91
9TH ST	HOPE ST	GRAND AV	1,670	1,505	91	19,200	91
9TH ST	GRAND AV	OLIVE ST					
9TH ST	OLIVE ST	HILL ST					
9TH ST	HILL ST	BROADWAY	910	1,395	87	14,000 [a]	87
9TH ST	BROADWAY	MAIN ST	1,015	1,525	87	15,200 [a]	87
9TH ST	MAIN ST	LOS ANGELES ST	660	1,105	87	11,000 [a]	87
9TH ST	LOS ANGELES ST	SANTEE ST	835	1,280	87	12,800 [a]	87
9TH ST	SANTEE ST	WALL ST					
9TH ST	WALL ST	SAN JULIAN ST					
9TH ST	SAN JULIAN ST	SAN PEDRO ST	1,635	1,930	89	22,600	89
9TH ST	SAN PEDRO ST	CENTRAL AV	1265	1730	88	17300 [a]	88
OLYMPIC BL	CENTRAL AV	ALAMEDA ST	2,360	3,220	90	32,200 [a]	90
OLYMPIC BL	ALAMEDA ST	SANTA FE AV	2,565	2,575	91	32,400	91
OLYMPIC BL	SANTA FE AV	BOYLE ST	2,015	2,240	91	27,000	91
BOYLE ST	OLYMPIC BL	8TH ST	725	900	88	9,000 [a]	88
8TH ST	BOYLE	SOTO ST	755	700	88	7,000 [a]	88
8TH ST	SOTO ST	LORENA ST	970	1,080	89	13,300	89
8TH ST	LORENA ST	OLYMPIC BL	535	720	89	7,900	89
SOTO ST	8TH ST	OLYMPIC BL	2,750	2,850	88	28,600 [a]	88
OLYMPIC BL	BOYLE ST	SOTO ST	2,015	2,485	91	28,400	91
OLYMPIC BL	SOTO ST	LORENA ST	1,200	1,290	90	12,900 [a]	90
OLYMPIC BL	LORENA ST	INDIANA ST	1,985	2,105	90	25,500	90
OLYMPIC BL	INDIANA ST	EASTERN AV	2,130	2,385	90	27,900	90
OLYMPIC BL	EASTERN AV	ATLANTIC AV		2,895	90	28,400	90
OLYMPIC BL	ATLANTIC BL	GARFIELD AV		2,685	90	26,900	90

(continued)
EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY	YEAR
GARFIELD AV	OLYMPIC BL	WHITTIER BL	1,855	2,315	90	28,800	90
WHITTIER BL	GARFIELD AV	WESTSIDE DR					
WESTSIDE DR	WHITTIER BL	OLYMPIC BL					
RTD 70							
MACY RD	SUNSET BL	ALAMEDA ST					
MACY RD	ALAMEDA ST	MISSION RD	2,065	1,375	89	13,800 [a]	89
MISSION RD	MACY RD	MARENGO ST	1,580	1,340	89	13,400 [a[	89
MARENGO ST	MISSION RD	STATE ST	1,600	1,835	92	23,800	92
MARENGO ST	STATE ST	SOTO ST	1,145	1,575	89	16,100	89
MARENGO ST	SOTO ST	CITY TERRACE DR	865	1,585	91	15,900 [a]	91
CITY TERRACE DR	MARENGO ST	HERBERT AV	1,160	1,330	90	14,500	90
CITY TERRACE DR	HERBERT AV	EASTERN AV	1,195	1,395	90	15,300	90
EASTERN AV	CITY TERRACE DR	RAMONA BL					
RAMONA BL	EASTERN AV	GARVEY AV					
GARVEY AV	RAMONA BL	ATLANTIC BL					
GARVEY AV	ATLANTIC BL	GARFIELD AV					
GARVEY AV	GARFIELD AV	DEL MAR AV					
GARVEY AV	DEL MAR AV	WALNUT GROVE AV					
GARVEY AV	WALNUT GROVE AV	ROSEMEAD AV					
GARVEY AV	ROSEMEAD AV	SANTA ANITA AV					
SANTA ANITA AV	GARVEY AV	RAMONA BL					
BROADWAY	SUNSET BL	1ST ST	SEE LINE 45				
BROADWAY	1ST ST	PICO BL	SEE LINE 30/31				
PICO BL	BROADWAY	SENTOUS ST					
SENTOUS ST	PICO BL	11TH ST					
11TH ST	SENTOUS ST	FIGUEROA ST	335	1,365	87	13,700 [a]	87
FIGUEROA ST	11TH ST	PICO BL	1,380	1,655	88	16,600 [a]	88
RTD 204							
HOLLYWOOD BL	VERMONT AV	KENMORE AV	SEE LINE 180/181				
KENMORE AV	HOLLYWOOD BL	SUNSET BL					
SUNSET BL	KENMORE AV	VERMONT AV					
VERMONT AV	120TH ST	IMPERIAL HWY	1,660	1,895	89	20,900	89
VERMONT AV	IMPERIAL HWY	CENTURY BL					
VERMONT AV	CENTURY BL	MANCHESTER AV	1,785	2,205	90	27,100	90
VERMONT AV	MANCHESTER AV	FLORENCE AV	1,805	2,965	90	31,600	90
VERMONT AV	FLORENCE AV	GAGE AV	1,695	2,020	91	20,200 [a]	91
VERMONT AV	GAGE AV	SLAUSON AV	1,570	1,950	91	19,500 [a]	91
VERMONT AV	SLAUSON AV	54TH ST	1,705	1,875	91	25,900	91
VERMONT AV	54TH ST	VERNON AV					

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(continued)

EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY	YEAR
VERMONT AV	VERNON AV	M.L. KING BL	1,910	2,140	89	21,400 [a]	89
VERMONT AV	M.L. KING BL	EXPOSITION BL	1,870	2,160	89	21,600 [a]	89
VERMONT AV	EXPOSITION BL	JEFFERSON BL	1,030	2,570	89	25,700 [a]	89
VERMONT AV	JEFFERSON BL	ADAMS BL	1,940	2,330	89	23,300 [a]	89
VERMONT AV	ADAMS BL	WASHINGTON BL	2,465	2,880	91	35,700	91
VERMONT AV	WASHINGTON BL	VENICE BL	2,720	2,670	88	26,700 [a]	88
VERMONT AV	VENICE BL	PICO BL	2,650	2,665	88	26,600 [a]	88
VERMONT AV	PICO BL	OLYMPIC BL	2,530	2,700	90	27,000 [a]	90
VERMONT AV	OLYMPIC BL	8TH ST	3,330	3,300	91	52,100	91
VERMONT AV	8TH ST	7TH ST	2,730	2,755	89	27,600 [a]	89
VERMONT AV	7TH ST	WILSHIRE BL	2,740	2,935	91	48,100	91
VERMONT AV	WILSHIRE BL	6TH ST					
VERMONT AV	6TH ST	3RD ST					
VERMONT AV	3RD ST	1ST ST	3,220	3,530	91	57,100	91
VERMONT AV	1ST	BEVERLY BL	3,710	3,955	91	60,900	91
VERMONT AV	BEVERLY BL	MELROSE AV	3,285	3,730	88	37,300 [a]	88
VERMONT AV	MELROSE AV	SANTA MONICA BL	2,355	2,650	90	2,700 [a]	90
VERMONT AV	SANTA MONICA BL	SUNSET BL	1,865	2,645	89	23,600 [a]	89
VERMONT AV	SUNSET BL	HOLLYWOOD BL	1,665	1,950	91	26,700	91
RTD 560							
VAN NUYS BL	VENTURA BL	RIVERSIDE DR	1,515	2,020	89	28,100	89
VAN NUYS BL	RIVERSIDE DR	HUTSON ST	2,620	3,175	88	31,800 [a]	88
VAN NUYS BL	HUTSON ST	ADDISON ST					
VAN NUYS BL	ADDISON ST	MAGNOLIA BL	2,465	2,410	89	24,100 [a]	89
VAN NUYS BL	MAGNOLIA BL	CLARK ST	2,350	2,365	89	23,700 [a]	89
VAN NUYS BL	CLARK ST	BURBANK BL	2,930	2,755	89	27,600 [a]	89
VAN NUYS BL	BURBANK BL	OXNARD ST	2,340	2,680	90	26,800 [a]	90
VAN NUYS BL	OXNARD ST	VICTORY BL	2,310	2,700	90	2,700 [a]	90
VAN NUYS BL	VICTORY BL	VANOWEN ST	2,065	2,350	91	23,500 [a]	91
VAN NUYS BL	VANOWEN ST	SHERMAN WY	2,000	2,595	90	35,700	90
VAN NUYS BL	SHERMAN WY	ROSCOE BL	2,710	2,840	91	38,500	91
VAN NUYS BL	ROSCOE BL	PARTHENIA ST	2,480	2,825	91	38,000	91
VAN NUYS BL	PARTHENIA ST	NORDOFF ST	1,540	2,300	90	23,000 [a]	90
VAN NUYS BL	NORDOFF ST	PLUMMER ST	1,555	2,005	91	20,100 [a]	91
VAN NUYS BL	PLUMMER ST	LAUREL CANYON BL	1,520	3,010	89	36,600	89
VAN NUYS BL	LAUREL CANYON BL	SAN FERNANDO RD	2,070	2,620	91	32,100	91
VAN NUYS BL	SAN FERNANDO RD	GLENOAKS BL	1,695	2,240	89	28,200	89
VAN NUYS BL	GLENOAKS BL	FOOTHILL BL	780	985	89	11,000	89
FOOTHILL BL	VAN NUYS BL	TERRA BELLA ST	620	1,715	90	16,200	90
TERRA BELLA ST	FOOTHILL BL	FENTON AV					

(continued)
EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY	YEAR
TERRA BELLA ST	FENTON AV	ELDRIDGE AV					
TRI-CITIES							
BRAND BL	COLORADO ST	BROADWAY	1,470	1,830	92	18,300 [a]	92
MMBL 10							
ATLANTIC BL	FLORAL DR	POMONA BL		3,375	90	46,600	90
ATLANTIC BL	POMONA BL	BEVERLY BL		2,825	90	39,300	90
ATLANTIC BL	BEVERLY BL	WHITTIER BL				40,100	90
WHITTIER BL	ATLANTIC BL	GARFIELD AV	SEE RTD LINE 18				
WHITTIER BL	GARFIELD AV	MONTEBELLO BL					
WHITTIER BL	MONTEBELLO BL	PARAMOUNT BL					
WHITTIER BL	PARAMOUNT BL	ROSEMEAD BL					
WHITTIER BL	ROSEMEAD BL	PASSONS BL		1,945	92	19,500 [a]	92
LB 40							
ANAHEIM ST	LONG BEACH BL	ATLANTIC AV		1,205	92	12,000 [a]	92
ANAHEIM ST	ATLANTIC AV	ORANGE AV					
ANAHEIM ST	ORANGE AV	CHERRY AV					
ANAHEIM ST	CHERRY AV	REDONDO AV					
ANAHEIM ST	REDONDO AV	XIMENO AV					
ANAHEIM ST	XIMENO AV	PACIFIC COAST HWY					
LB 50							
ARTESIA BL	ACACIA AV	LONG BEACH BL					
LONG BEACH BL	ARTESIA BL	DEL AMO BL					
LONG BEACH BL	DEL AMO BL	CARSON ST					
LONG BEACH BL	CARSON ST	WARDLOW RD					
LONG BEACH BL	WARDLOW RD	WILLOW ST					
LONG BEACH BL	WILLOW ST	PACIFIC COAST HWY					
LONG BEACH BL	PACIFIC COAST HWY	ANAHEIM ST		1,355	92	13,500 [a]	92
LONG BEACH BL	ANAHEIM ST	7TH ST		1,375	92	13,800 [a]	92
LB 60							
ARTESIA BL	ACACIA AV	LONG BEACH BL					
ARTESIA BL	LONG BEACH BL	ATLANTIC AV					
ATLANTIC AV	ARTESIA BL	DEL AMO BL					
ATLANTIC AV	CARSON ST	WARDLOW RD					
ATLANTIC AV	WARDLOW RD	WILLOW ST					
ATLANTIC AV	WILLOW ST	PACIFIC COAST HWY					
ATLANTIC AV	PACIFIC COAST HWY	ANAHEIM ST					

(continued)

EXISTING TRAFFIC VOLUMES

PRIMARY STREET	START OF SEGMENT	END OF SEGMENT	PEAK HOUR AM	PEAK HOUR PM	PEAK HOUR YEAR	DAILY	YEAR
ATLANTIC AV	ANAHEIM ST	7TH ST		890	92	900 [a]	92
LB 90							
7TH ST	PACIFIC AV	LONG BEACH BL		1,030	92	10,300 [a]	92
7TH ST	LONG BEACH BL	ATLANTIC AV		975	92	9,700 [a]	92
7TH ST	ATLANTIC AV	CHERRY AV					
7TH ST	CHERRY AV	BELLFLOWER BL		4,580	92	45,800 [a]	92

Notes:

Peak hour counts rounded to nearest five vehicles.

Daily counts rounded to nearest hundred vehicles.

All counts taken prior to 1992 are adjusted by by 1% per year to represent a 1992 count.

[a] Daily volumes estimated from PM peak hour volumes.

PARKING IMPACTS – ARTICULATED COACHES

ROUTE #	ROUTE MILES	PARKING SPACES REQUIRING REMOVAL OR RELOCATION					
		LOW USAGE		MEDIUM USAGE		HIGH USAGE	
		# OF SPACES	SPACES/MILE	# OF SPACES	SPACES/MILE	# OF SPACES	SPACES/MILE
Line 45	17.21	40	2.3	28	1.6	16	0.9
Line 70	16.45	20	1.2	14	0.9	14	0.9
Line 204	17.01	54	3.2	33	1.9	14	0.8
Line 560	12.31	39	3.2	28	2.3	14	1.1
SUB-TOTAL	62.98	153	2.4	103	1.6	58	0.9
Line 16	9.22	15	1.6	10	1.1	20	2.2
Line 18	14.29	24	1.7	9	0.6	26	1.8
Line 30/31	13.25	41	3.1	29	2.2	25	1.9
Line 40	19.68	52	2.6	19	1.0	12	0.6
Line 66/67	13.47	26	1.9	18	1.3	28	2.1
Tri-Cities Line	14.30	27	1.9	23	1.6	31	2.2
Montebello Line 10	6.67	10	1.5	7	1.0	4	0.6
Long Beach Lines 40/50/60/90	34.33	72	2.1	39	1.1	51	1.5
SUB-TOTAL	125.21	267	2.1	154	1.2	197	1.6
TOTAL	188.19	420	2.2	257	1.4	255	1.4