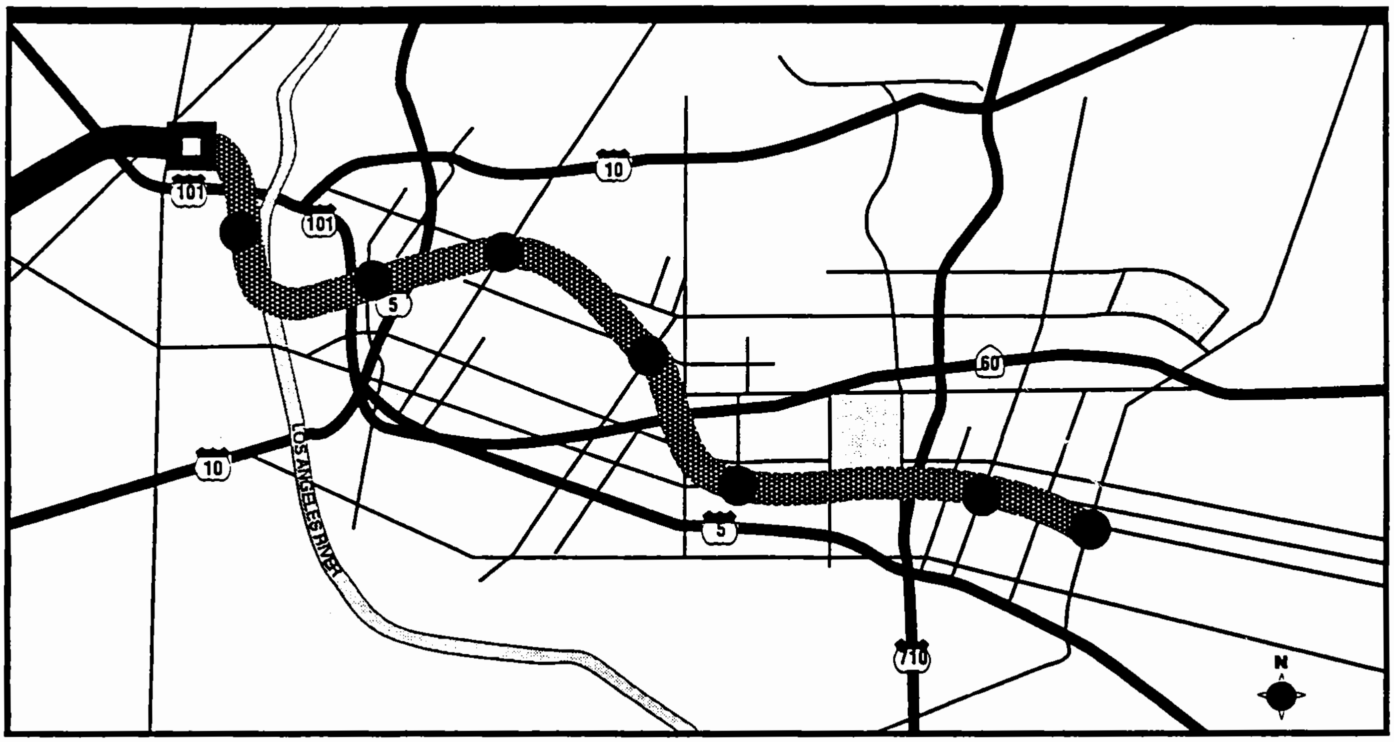
FINAL ENVIRONMENTAL IMPACT REPORT

Los Angeles East Side Corridor
June 1994



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Los Angeles County Metropolitan Transportation Authority

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VOLUME I

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EXECUTIVE SUMMARY

S-1 PURPOSE OF THE FINAL EIR

The purpose of this Final Environmental Impact Report (FEIR) is to present the Locally Preferred Alternative (LPA) for the Los Angeles Eastside Corridor, which was selected by the Los Angeles County Metropolitan Transportation Authority (MTA) Board of Directors in June 1993 following public review of the ten alternatives presented in the April 1992 Alternatives Analysis/Draft Environmental Impact Statement/Draft Environmental Impact Report (AA/DEIS/DEIR). The Corridor, located in central Los Angeles County, extends eastward from the Los Angeles Central Business District (LACBD) to just east of Atlantic Boulevard, as shown in Figures S-1.1 and S-1.2.

The April 1992 AA/DEIS/DEIR was circulated and reviewed by interested and concerned parties, including private citizens, community groups, the business community, elected officials and public agencies. Public hearings were held to solicit citizen and agency comments and written comments were reviewed as part of the decision-making process. Selection of the LPA was made by the MTA Board after consideration of the comments received from the circulation of the AA/DEIS/DEIR and at the public hearings. The decision was then documented in a Preferred Alternative Report.

The MTA applied to the Federal Transit Administration (FTA) for the initiation of preliminary engineering activities and preparation of a Final EIS/EIR. The Final EIS/EIR, once finalized, will be used by federal, state, regional and local agencies to make discretionary decisions regarding the project. A decision by FTA and MTA to fund this project will be made based on a thorough consideration of environmental effects presented in the Final EIS/EIR.

S-2 REGIONAL PLANNING CONTEXT

Currently adopted regional planning documents which cover the study area include the Regional Mobility Plan (RMP) of the Southern California Association of Governments and the 30-Year Integrated Transportation Plan of the MTA. Both plans are currently undergoing revision, however, neither revision has yet been officially adopted. Both the adopted RMP and the 30-Year Plan have identified the Eastern Extension of the Metro Red Line as a high priority funded and committed rail project.

As noted in a letter from the Southern California Association of Governments, "The Eastern Extension is an adopted project identified in the Regional Transportation Improvement Program (RTIP), an identified funded project in MTA's Current Local Plan (CLP) of the 1994 Regional Mobility Element, is consistent with the goals, objectives and policies of the adopted 1989 Regional Mobility Plan (RMP) and is a Transportation Control Measure (TCM) as defined in Section 108F of the Federal Clean Air Act and is a Transit TCM in the adopted Air Quality Management Plan for the South Coast Air Basin."[1]

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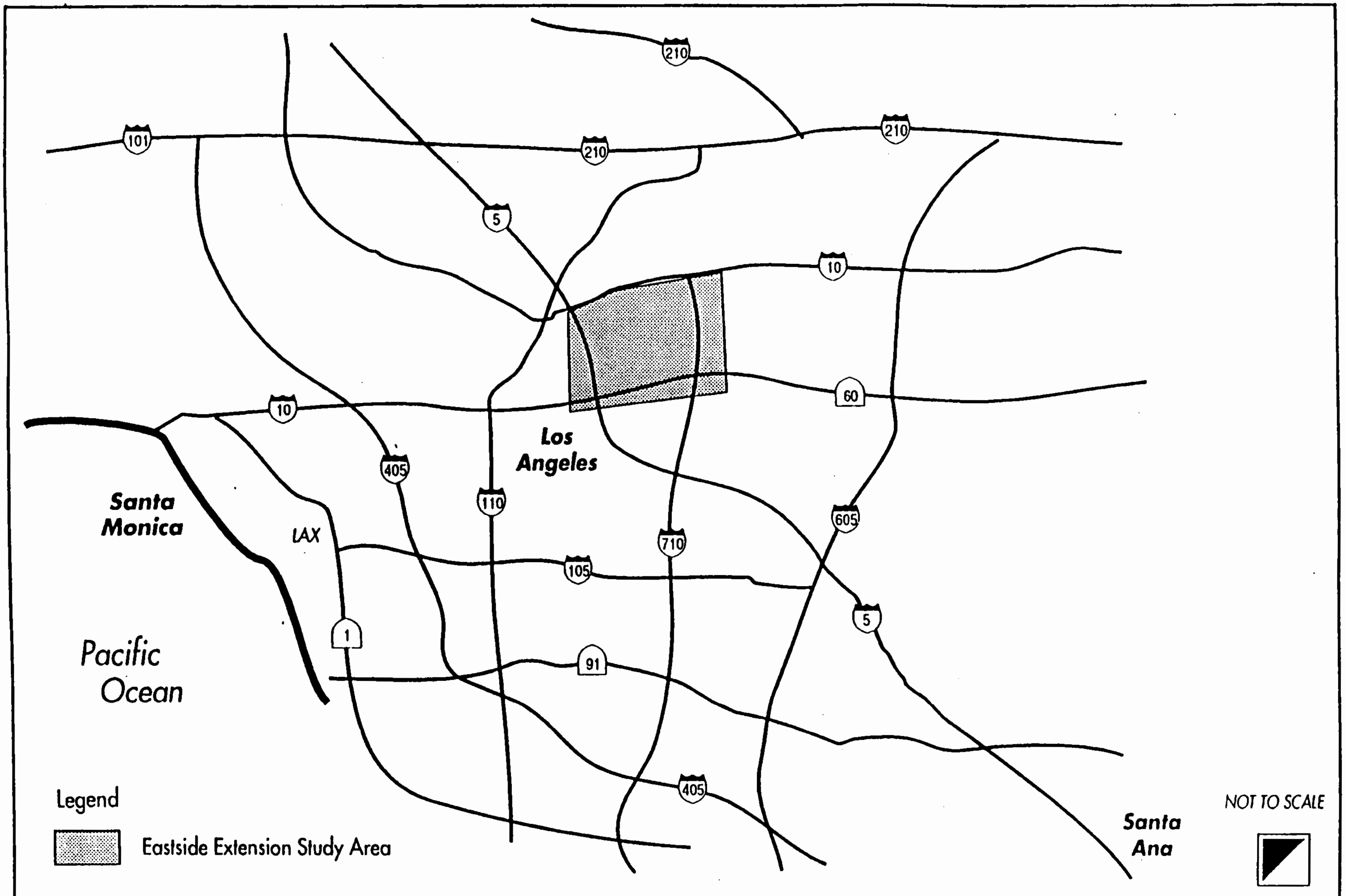
[1] letter from Barry L. Samsten, Associate Transporation Planner, Department of Policy and Planning, Southern California Association of Governments, April 1, 1994.

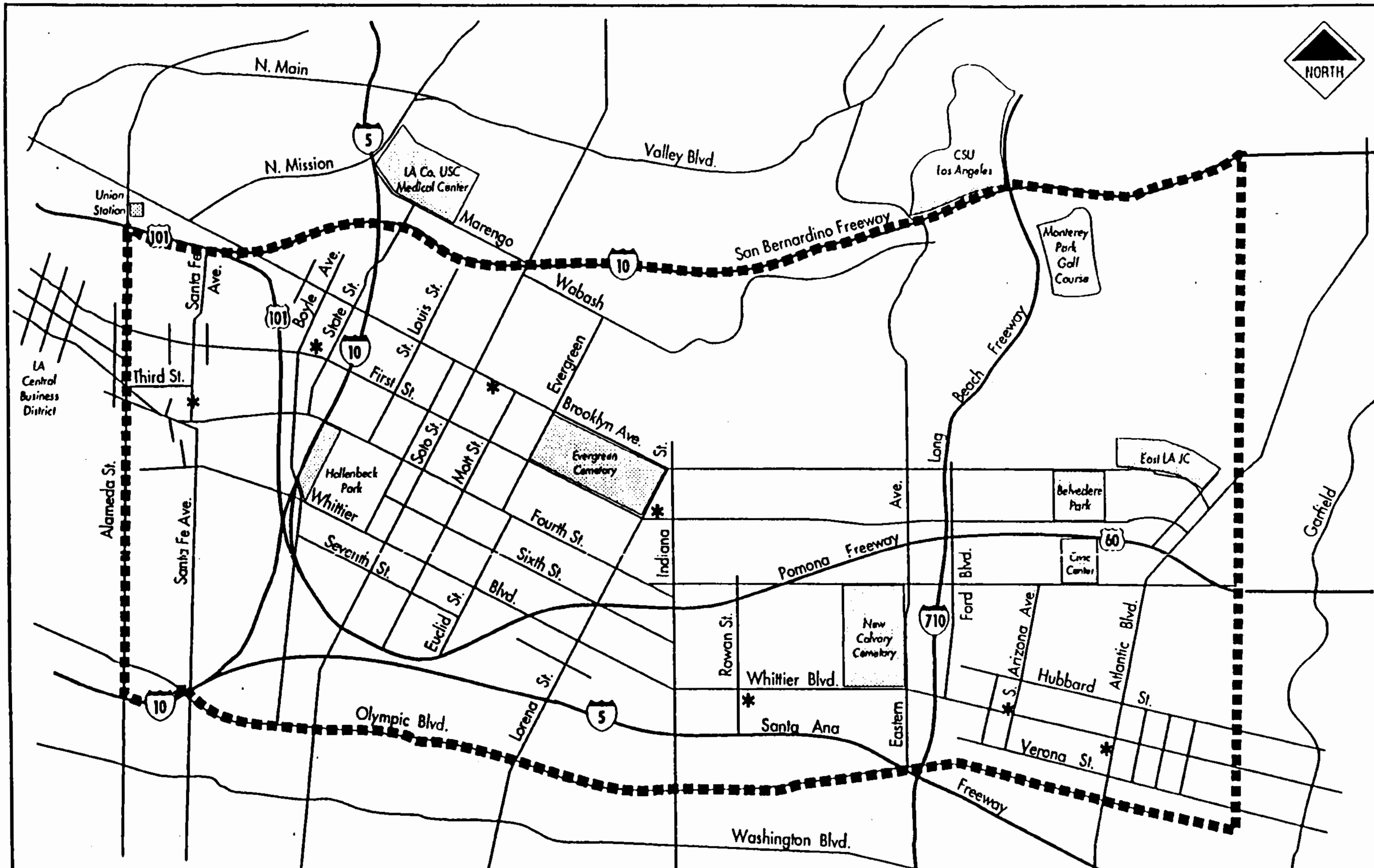


Metro Redline Eastside Extension

Regional Vicinity

FIGURE

S-1.1



Legend

* Proposed Station Entrance Locations

Note: Map depicts key streets which are in the intersection analysis

Metro Redline Eastside Extension	*Study Area*	FIGURE **S-1.2**

Since the adoption of the LPA by the MTA Board, the Preferred Alternative has been incorporated into the Regional Mobility Element (RME) planning process by SCAG. The Draft RME was published in December 1993 and the RME Preferred Plan is to be presented to the SCAG Regional Council in May 1994 for adoption by July 1994. The 1994 RME will replace the 1989 RMP as the region's adopted transportation plan. Both the Draft RME and the RME Preferred Plan include the Metro Red Line Eastern Extension Preferred Alternative. It has been included in the travel demand forecasting model used by SCAG to forecast future mobility and air quality levels. The enhanced transit mode split attributable to the Red Line project is therefore built into the Regional Mobility Element and will be assumed as part of the Air Quality Management Plan.

The RME proposes a centers-based transit network which has the objective to develop and implement a multi-modal transit system that connects regional activity centers with their surrounding communities, sub-regional areas, and southern California as a whole. SCAG states in the RME that the successful implementation of an efficient centers-based transit network will require the following three primary service components: inter/intra-regional rail and express bus, sub-regional urban rail and express/limited bus, and local transit inclusive of area circulators, shuttles and demand responsive services.

The Long Range Bus and Rail Program included in the RME Preliminary Regional Action Program calls for implementation of the Metro Red Line Eastern Extension in two phases, an extension from Union Station to Boyle Heights by 2001 and a further extension to Atlantic Boulevard by 2009. These actions are noted in the RME as needed to meet Mobility Plan goals and Air Quality Plan attainment.

S-3 NEED FOR THE PROPOSED ACTION

Travel projections prepared by the Southern California Association of Governments (SCAG) as part of the 1989 Regional Mobility Plan (RMP) identified the need for major rail transit improvements in the region, especially in Los Angeles County, to meet the mandates of the Clean Air Act and the mobility needs of the region. Current freeway and local street facilities cannot be expanded sufficiently to handle the forecasted demand for mobility. The latest regional forecasts for the year 2010 estimate that person trips will increase by over 40 percent for the region and by almost 30 percent in Los Angeles County.

The MTA, as part of the development and adoption of the 30-Year Integrated Transportation Plan (April 1992, incorporated herein by reference), addressed the mobility deficiency issues identified in the 1989 RMP for Los Angeles County.

Specifically related to the Eastside Corridor study area, all major freeways serving the area are currently over capacity during peak periods, and for many hours in the off-peak period. It is important to note that no major improvements to existing freeways in the study area are identified in the RMP or the 30-Year Plan. In addition, during the project scoping meetings and subsequent community meetings, the residents of the Eastside Corridor expressed their need for improved transit service because many are transit-dependent, work not only in the LACBD but in areas west and north of the downtown, and need better access to the region's educational, employment and cultural opportunities.

S-4 ALTERNATIVES CONSIDERED

The alternatives evaluated in this Final EIR for the Los Angeles Eastside Corridor are: (1) the No-Project Alternative and (2) the Locally Preferred Alternative. See Section 2-4 for a discussion of alternatives evaluated as part of the AA/DEIS/DEIR.

S-4.1 INTRODUCTION

Following public review of the ten alternatives presented in the April 1992 Alternatives Analysis/ Draft Environmental Impact Statement/Draft Environmental Impact Report (AA/DEIS/DEIR), the MTA Board of Directors selected in June 1993 a Locally Preferred Alternative (LPA). This heavy rail LPA has been refined, based on Preliminary Engineering findings and is presented in this Final EIR. A more detailed description of the LPA, as modified during Preliminary Engineering, is included in the Metro Red Line Segment Three East Side Extension Preliminary Engineering Design Report, 1994. This report and all other documents referenced in this Final EIS/EIR are available for public review at the Los Angeles County Metropolitan Transportation Authority's (MTA's) offices and are incorporated herein by reference.

S-4.2 NO-BUILD ALTERNATIVE

The No-Build Alternative allows for the evaluation of impacts associated with not building the LPA. Analysis of the No-Build Alternative should aid decision-makers in their review of the benefits to be derived from the LPA when weighted against its costs. Cost considerations include such factors as future traffic congestion, air quality levels, economic development and the ability of the region to continue to meet its basic transportation needs. The No-Build Alternative includes the transportation improvements identified as the year 2010 background assumptions.

The basic components of the No-Build Alternative include committed (i.e, funded) highway and transit projects for the Eastside Corridor area, as programmed by the MTA, Caltrans, the City of Los Angeles and the County of Los Angeles. No new major capital highway projects are programmed for the Eastside Corridor study area. All future highway improvements, including HOV or carpool lane projects, are regional and are included in the background highway network.

There are no new major capital transit projects programmed for the Eastside Corridor area. However, regional improvements to peak hour local bus service from increased frequencies and other regional rail projects are expected to result in a general increase in transit accessibility for residents to employment and retail centers. Due to the current ridership levels and forecasted growth in the study area, the local bus service frequencies would probably be increased. Feeder bus access to Eastside Corridor rail stations would also improve. Express services on freeways do not currently serve residents of the study area; therefore, current express service levels (with minor adjustments) are assumed for the background 2010 bus/rail system. Major east-west and north-south lines would receive increased transit service. It is assumed for the No-Build Alternative that no new physical facilities (none is planned by the City of Los Angeles and County of Los Angeles) would be constructed to improve bus transit travel times, except for those that might be needed for new developments in the area.

S-4.3 LOCALLY PREFERRED ALTERNATIVE (LPA)

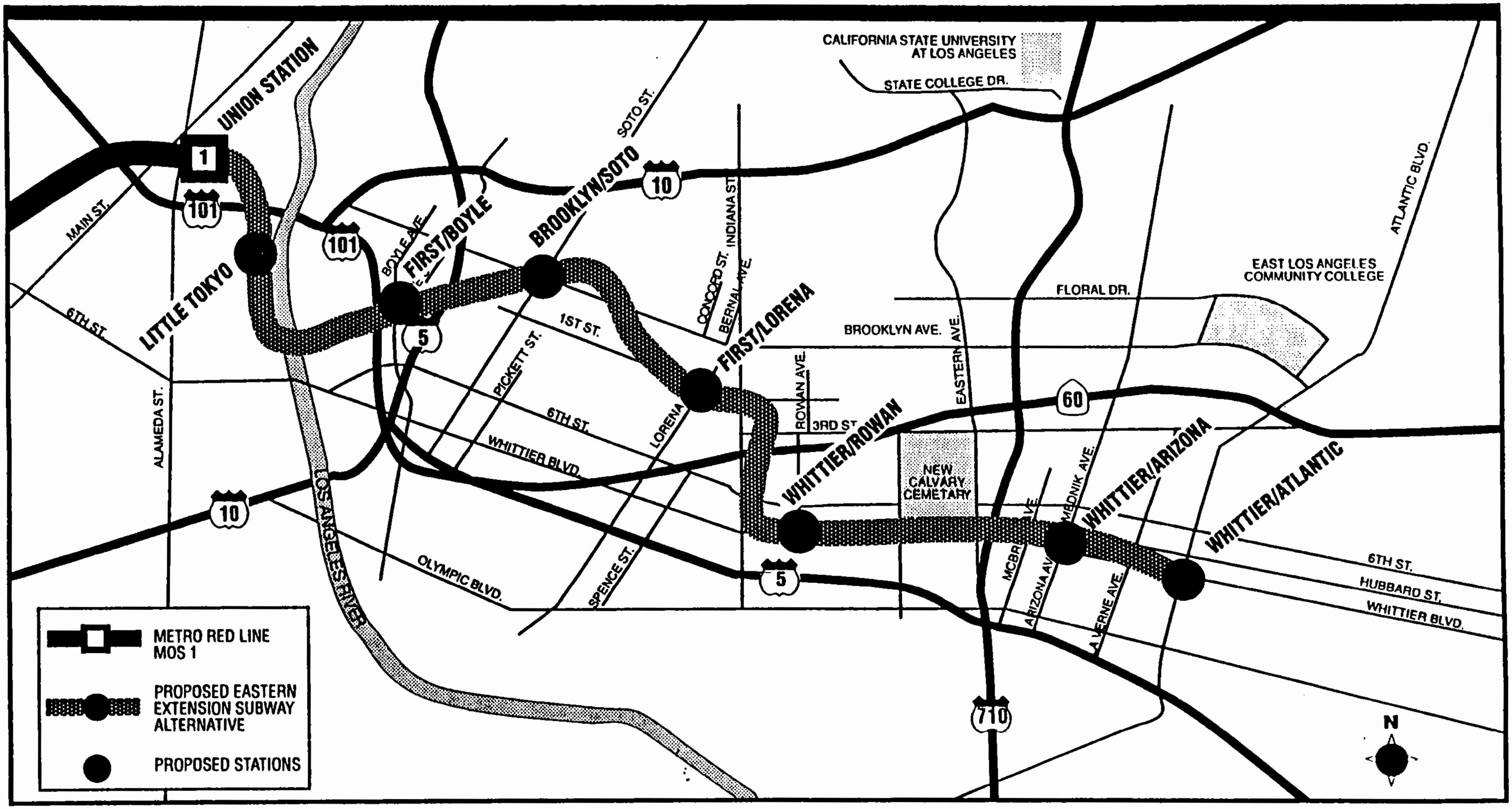
As selected by the MTA Board of Directors in June, 1993, and consistent with the technology decision in the 1980 Final Alternatives Analysis/Environmental Impact Statement/Environmental Impact Report on Transit System Improvements in the Los Angeles Regional Core, incorporated herein by reference, the LPA for the Eastside Corridor is a heavy-rail system that would extend the Metro Rail Red Line currently in operation in downtown Los Angeles. The LPA would consist of cut-and-cover and open-cut underground stations connected by tunnel line sections that generally would be located within public streets rights-of-way. The design criteria and standards used for the LPA are consistent with the latest Metropolitan Transportation Authority/Rail Construction Corporation (MTA/RCC) Metro Red Line System Design Criteria and Standards documents. The documents discuss in detail: (1) general system criteria, (2) station criteria, (3) subsystems criteria, (4) civil/structural criteria and (5) mechanical/electrical criteria.

The LPA is a 6.8-mile below-grade alignment with seven stations extending from Los Angeles Union Station east to the intersection of Whittier Boulevard and Atlantic Boulevard (Figure S-4.1). The depth of the tunnel (from top of rail to ground surface) would generally range from 45 feet as it passes under the Los Angeles River to approximately 110 feet as it passes under State Route 60 (Pomona) freeway.

The LPA alignment would begin approximately 130 feet east of the Union Station platform where the tracks would branch from the existing tunnel structure that includes the tracks leading to the Metro Yard and Shops. The tracks (one for each direction) would branch off each side of the existing tunnel structure and proceed south in separately mined tunnels beneath the U.S. 101 (Hollywood) freeway, swing apart to allow for the inbound tunnel to pass under the current Metro Rail yard lead tracks, pass under private property and come together at the Little Tokyo station under street right-of-way at the intersection of Santa Fe Avenue and Third Street. The large separation between tunnels precludes cross passages between the two tunnels. For this segment, therefore, two emergency exits to the surface would need to be provided for each tunnel to meet Fire/Life Safety requirements.

After leaving the Little Tokyo station, the alignment would proceed in twin mined tunnels through a long eastward curve, passing beneath the Metro Yard and Shops and crossing under the Los Angeles River just north of the Fourth Street Bridge. The alignment would leave the curve in a northeasterly direction, passing under private property and the U.S. 101 (Hollywood) freeway before reaching a station located near the intersection of First Street and Boyle Avenue (First/Boyle station). A 375-foot crossover would be located at the southwestern end of this station.

From the First/Boyle station, the alignment would proceed in a northeasterly direction, passing below private property and the I-5 (Golden State) freeway. It would then run under private property parallel to and approximately midway between Brooklyn Avenue and New Jersey Street before entering an off-street station southeast of the intersection of Brooklyn Avenue and Soto Street (Brooklyn/Soto station).



METROPOLITAN
TRANSPORTATION AUTHORITY

METRO EASTERN EXTENSION

Los Angeles Eastside Corridor Locally Preferred Alternative

SCALE: 1 INCH= 07 MILE

DATE: June 1993

A1-008/3 94

FIGURE S-4.1

From the Brooklyn/Soto station, the alignment would make an S-curve bringing it further south under First Street, still parallel to Brooklyn Avenue. In order to avoid going under Evergreen Cemetery property and to avoid changing the location and orientation of the Brooklyn/Soto station, 750 and 1,000-foot curves are required in this section. Once under First Street, the alignment would pass through a station under the street right-of-way at the intersection of First Street and Lorena Avenue (First/Lorena station). A 375-foot crossover would be located at the western end of this station. From the First/Lorena station, the alignment would make a southerly turn east of Indiana Street, bending back to run under Indiana Street immediately south of State Route 60 (Pomona) freeway. This curve goes past Indiana Street, since the First/Lorena station is too close to Indiana Street and the short curve that would be required to connect directly onto Indiana Street would jeopardize the speed of the train. The alignment would then continue south under Indiana Street until approximately Princeton Street, where it would make an easterly curve to run east beneath Whittier Boulevard. After completing this curve, the alignment would pass through a station under the street right-of-way at the intersection of Whittier and Rowan Avenues (Whittier/Rowan station). A 375-foot crossover is proposed for the western end of the Whittier/Rowan station.

From the Whittier/Rowan station, the LPA would continue east under Whittier Boulevard past but not under the New Calvary Cemetery. The alignment would deviate from Whittier Boulevard as the boulevard turns to head southeast immediately west of the I-710 (Long Beach) freeway. The alignment would continue east past the freeway before making a slight curve to come parallel to Whittier Boulevard. The alignment would continue in a southeasterly direction under private property and through an off-street station near the intersection of Whittier and Arizona boulevards (Whittier/Arizona station) before swinging south via an S-curve to continue heading southeast under Whittier Boulevard. The alignment would pass through a station under the street right-of-way at the intersection of Whittier Boulevard and Atlantic Avenue (Whittier/Atlantic station) and would end with a 750-foot tail track section. A 375-foot crossover is proposed for the western end of the Whittier/Atlantic station.

S-4.4 KEY SYSTEM CHARACTERISTICS OF THE LPA

S-4.4.1 Physical Facilities

Figures S-4.2 through S-4.8 show the proposed vertical and horizontal locations and orientations, based on preliminary engineering, of the seven stations included in the LPA. The stations would utilize standard modular station designs consistent with the latest MTA/RCC Metro Red Line System Design Criteria and Standards documents. A standard modular double-end and single-end mezzanine subway station, with double-height public space over the platform, has been developed for use on the Red Line Eastern Extension. Four of the stations are designed with crossovers to enable the trains to move from one track to the other. With the exception of the Little Tokyo Station, all under-street stations and crossovers would be excavated from the surface and covered with a deck. Off-street stations, crossovers and the Little Tokyo station would be constructed using an open cut technique.

FIGURE S-4.2 (a): LITTLE TOKYO STATION

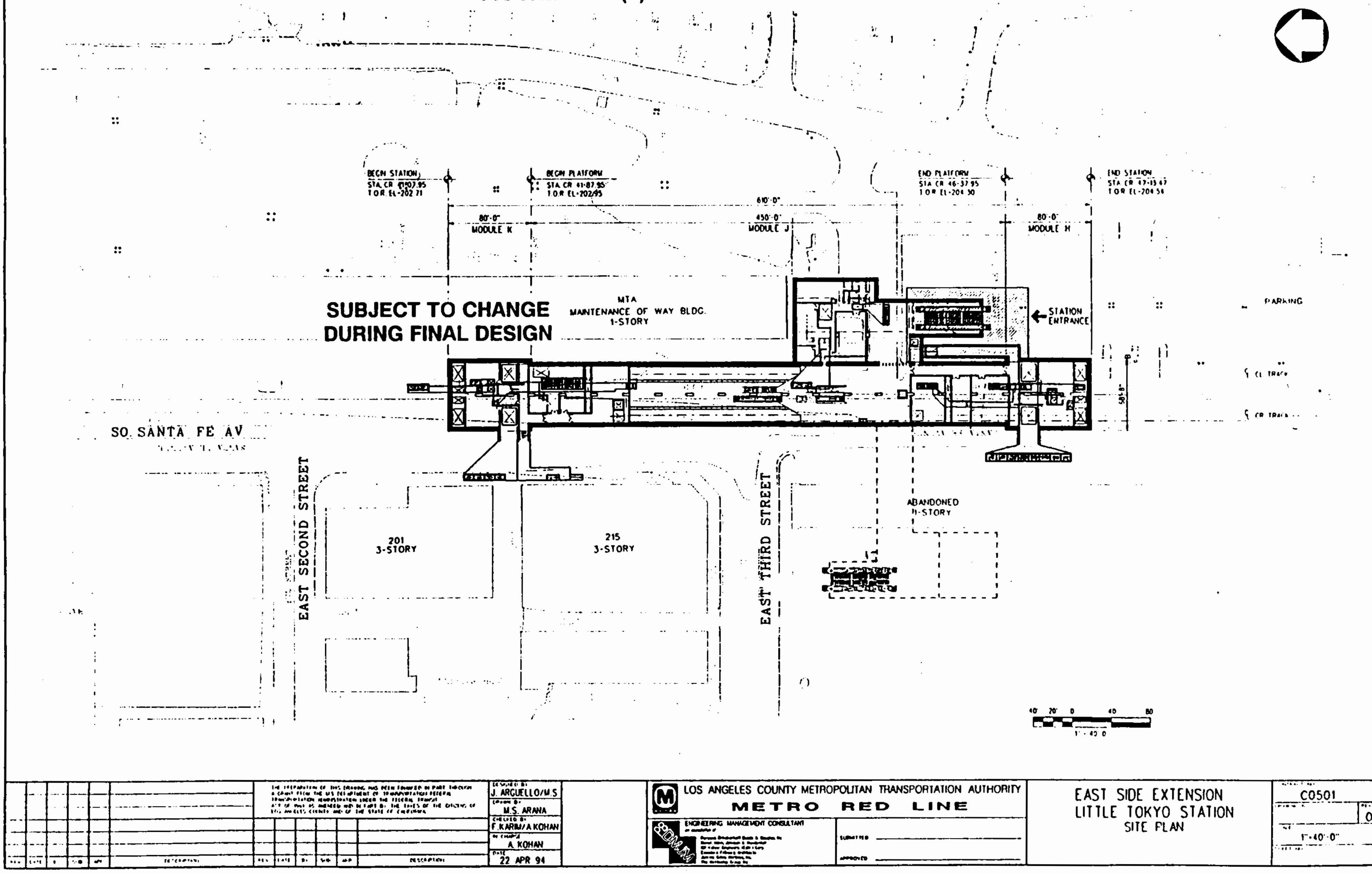


FIGURE S-4.2 (b): LITTLE TOKYO STATION

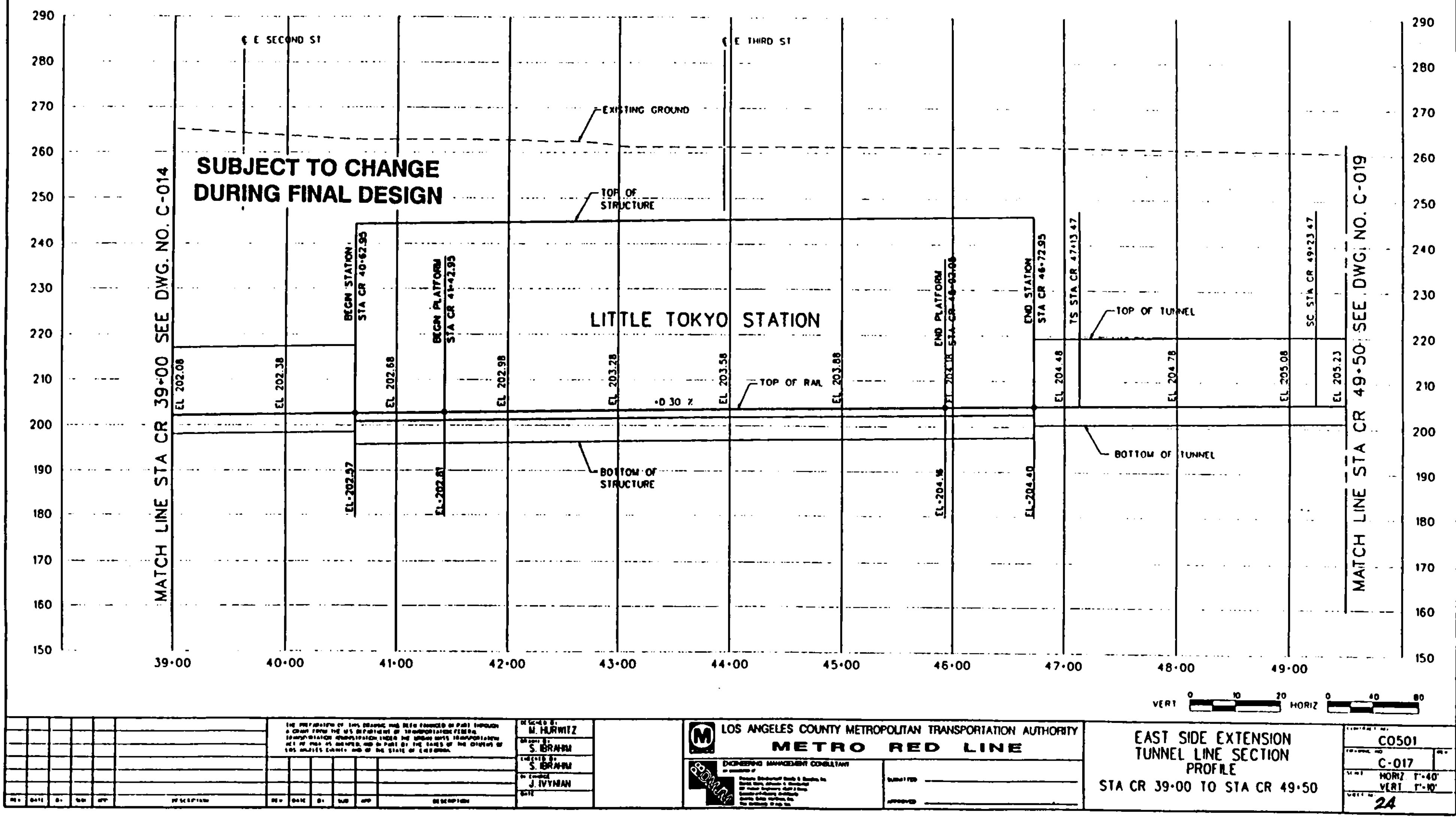
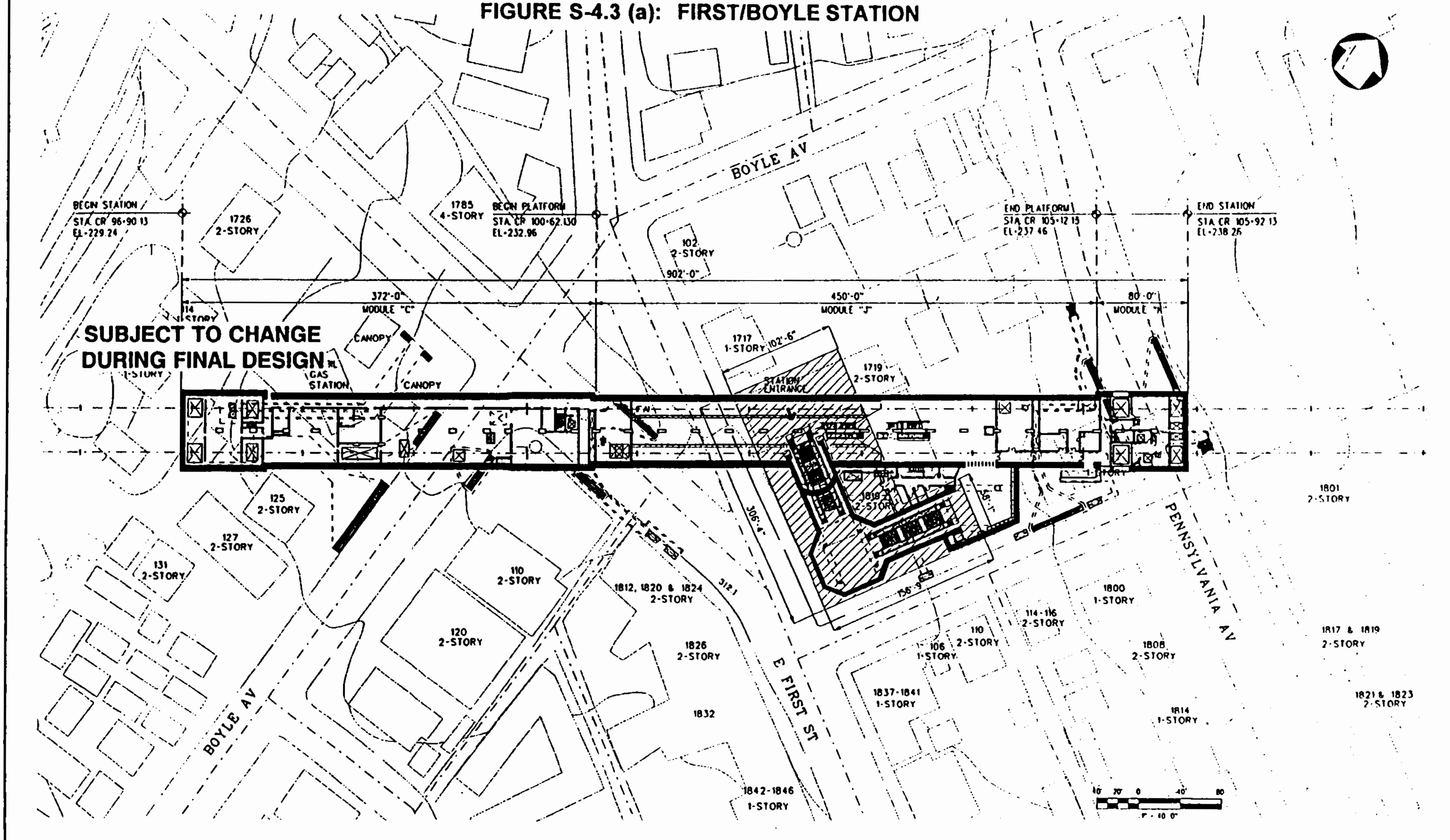


FIGURE S-4.3 (a): FIRST/BOYLE STATION



S-11

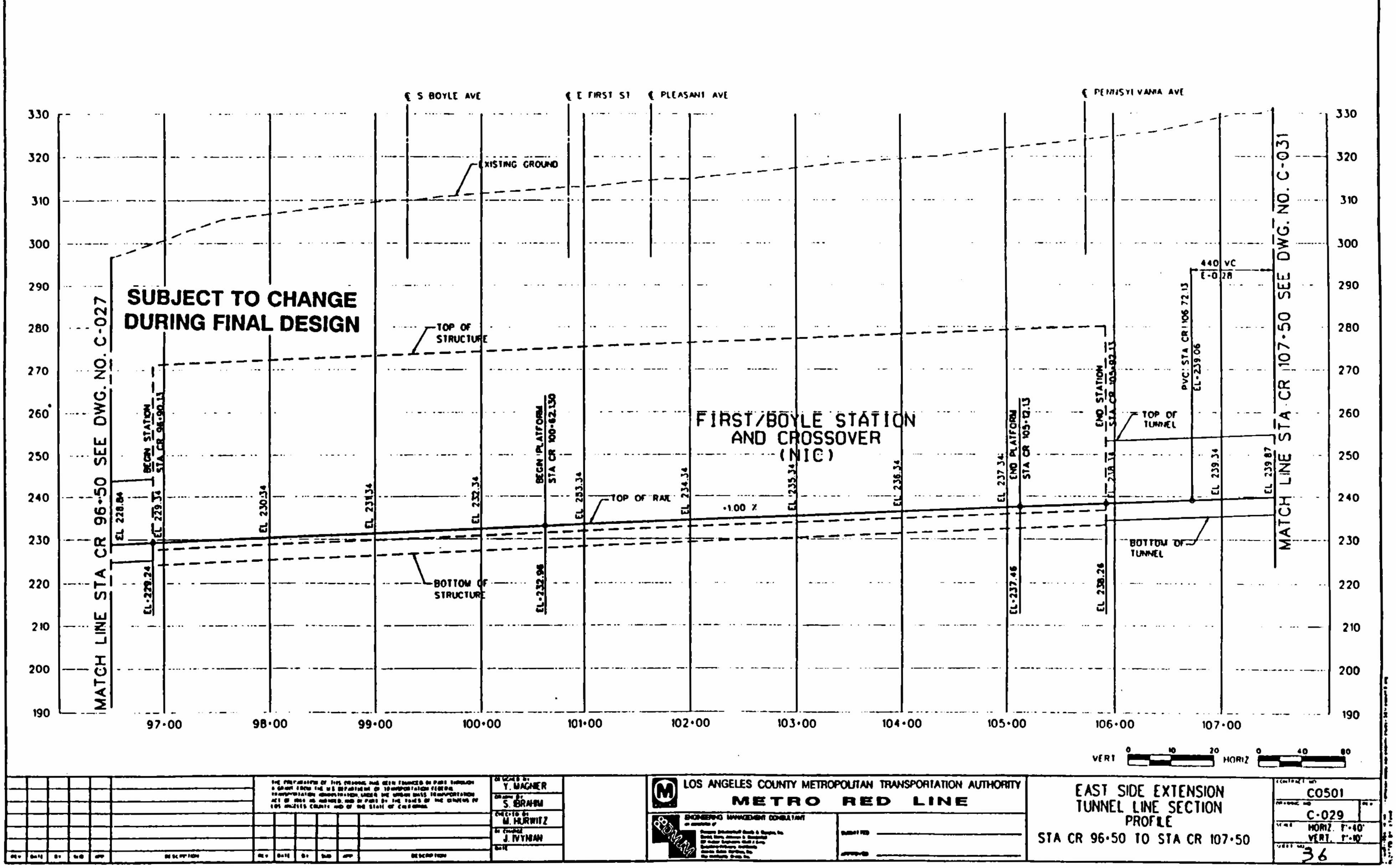
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
FIRST/BOYLE STATION
SITE PLAN

DESIGNED BY J. ARGUELLO/M.S.
DRAWN BY M.S. ARANA
CHECKED BY A. KOHAN/M. P.
IN CHARGE A. KOHAN

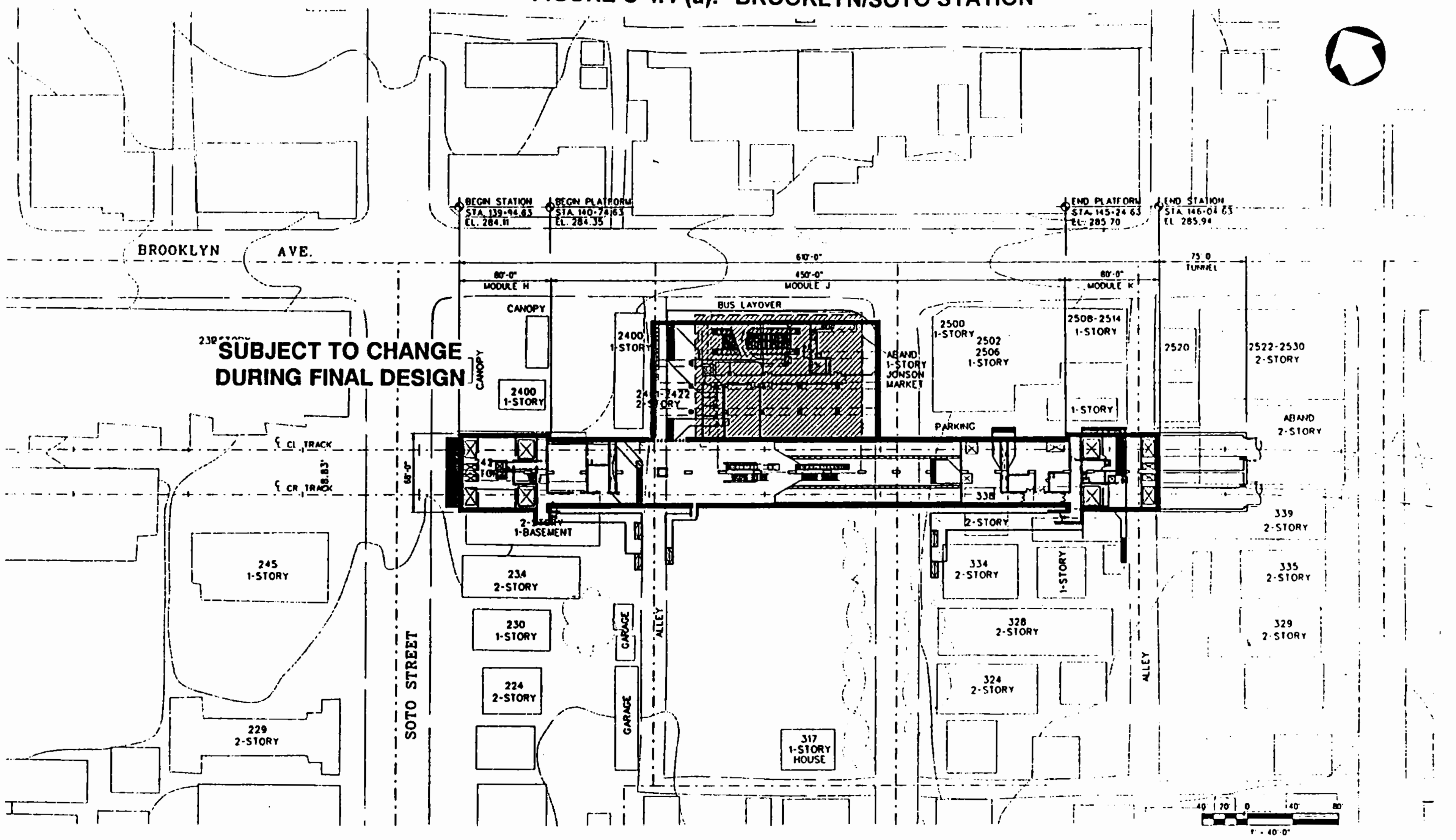
C0521
0
1"=40'-0"

FIGURE S-4.3 (b): FIRST/BOYLE STATION



S-13

FIGURE S-4.4 (a): BROOKLYN/SOTO STATION



DESIGNED BY	F. KARIM/M.S.
DRAWN BY	M.S. ARANA
CHECKED BY	J. ARGUELLO/A.K.
IN CHARGE	A. KOHAN
DATE	22 APR 94

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSPORTATION ADMINISTRATION, UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED, AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
BROOKLYN/SOTO STATION
SITE PLAN

CONTRACT NO. C0531 | REV 0 | SCALE 1"=40'-0"

FIGURE S-4.4 (b): BROOKLYN/SOTO STATION

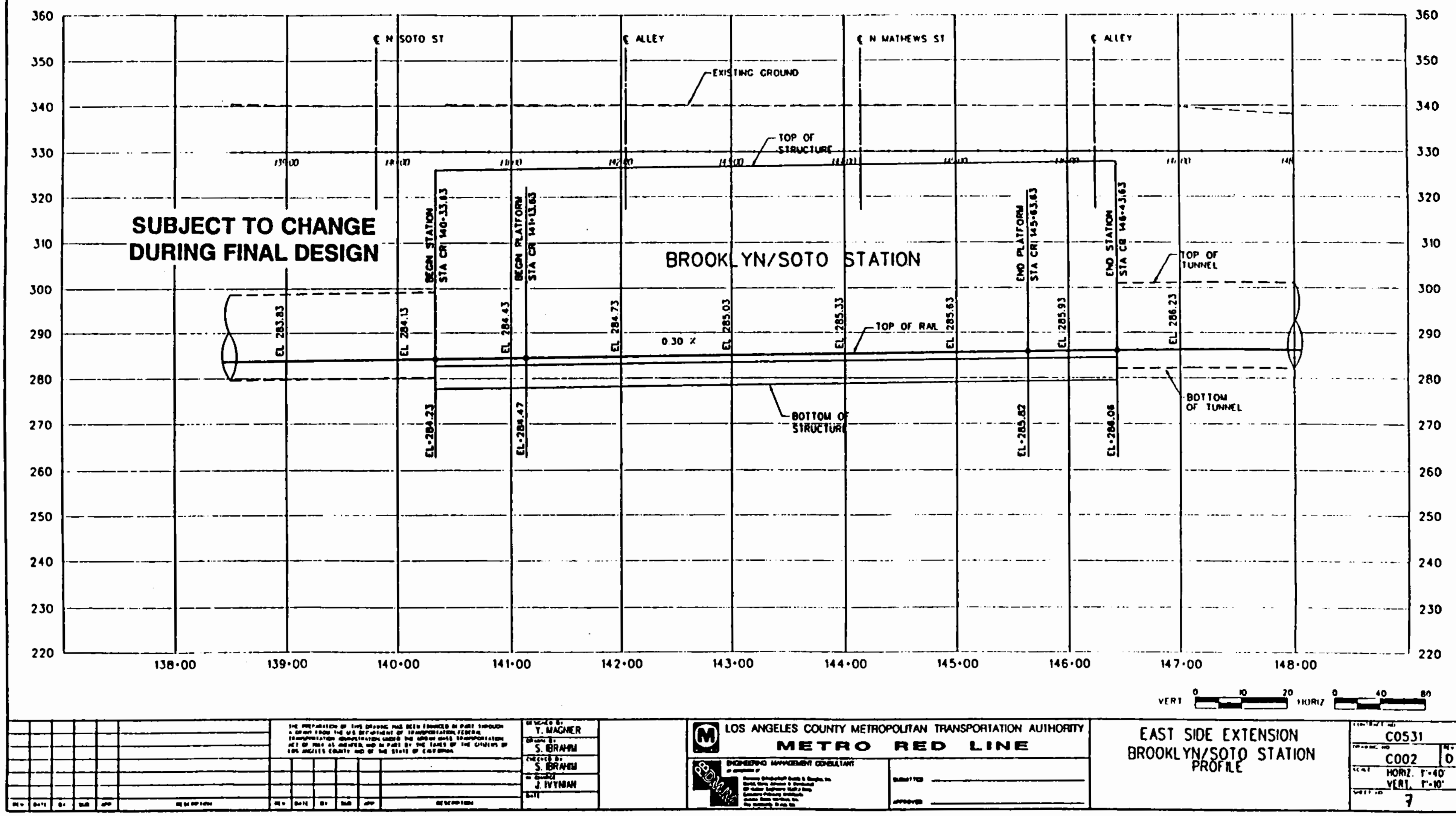


FIGURE S-4.5 (a): FIRST/LORENA STATION

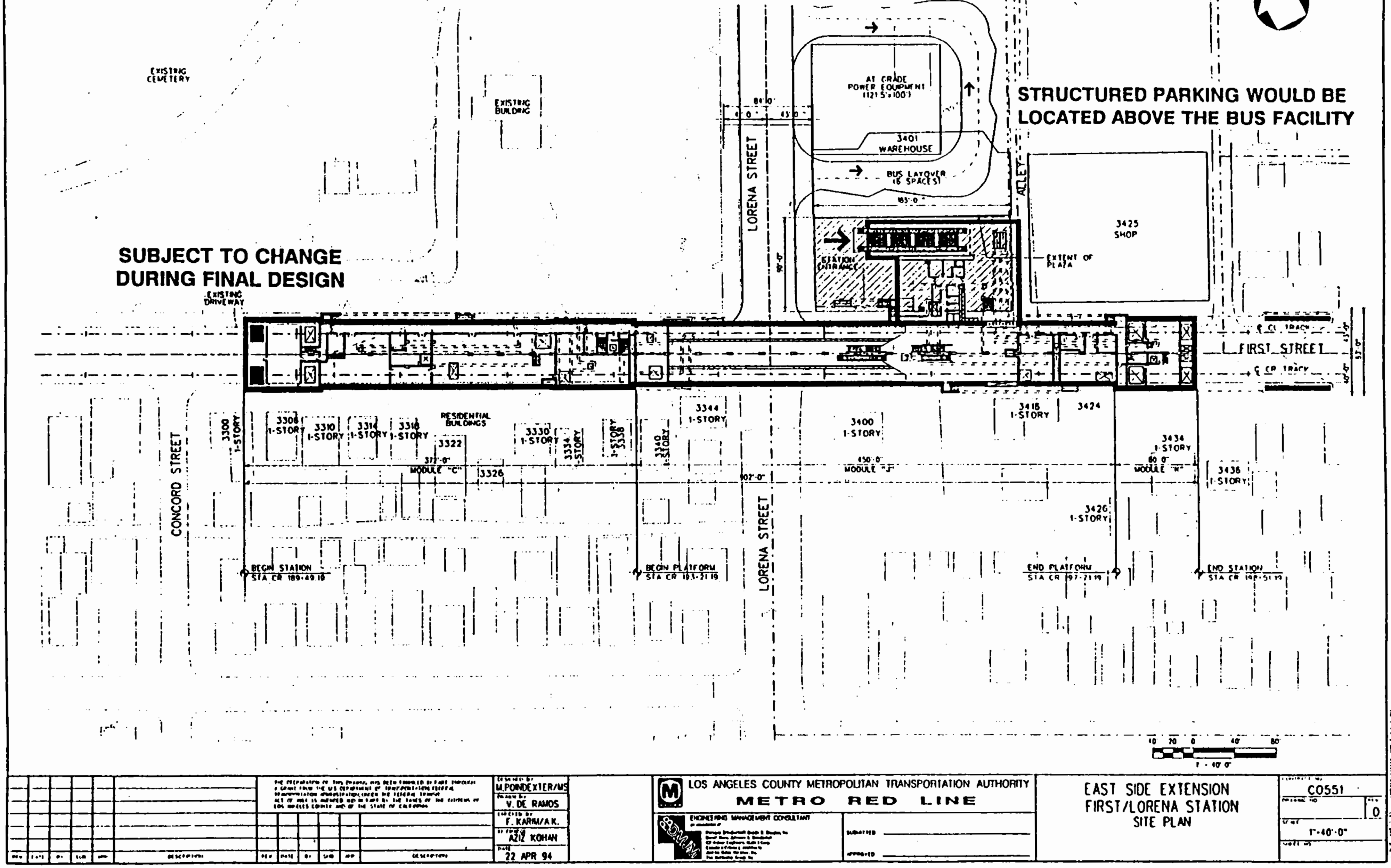


FIGURE S-4.5 (b): FIRST/LORENA STATION

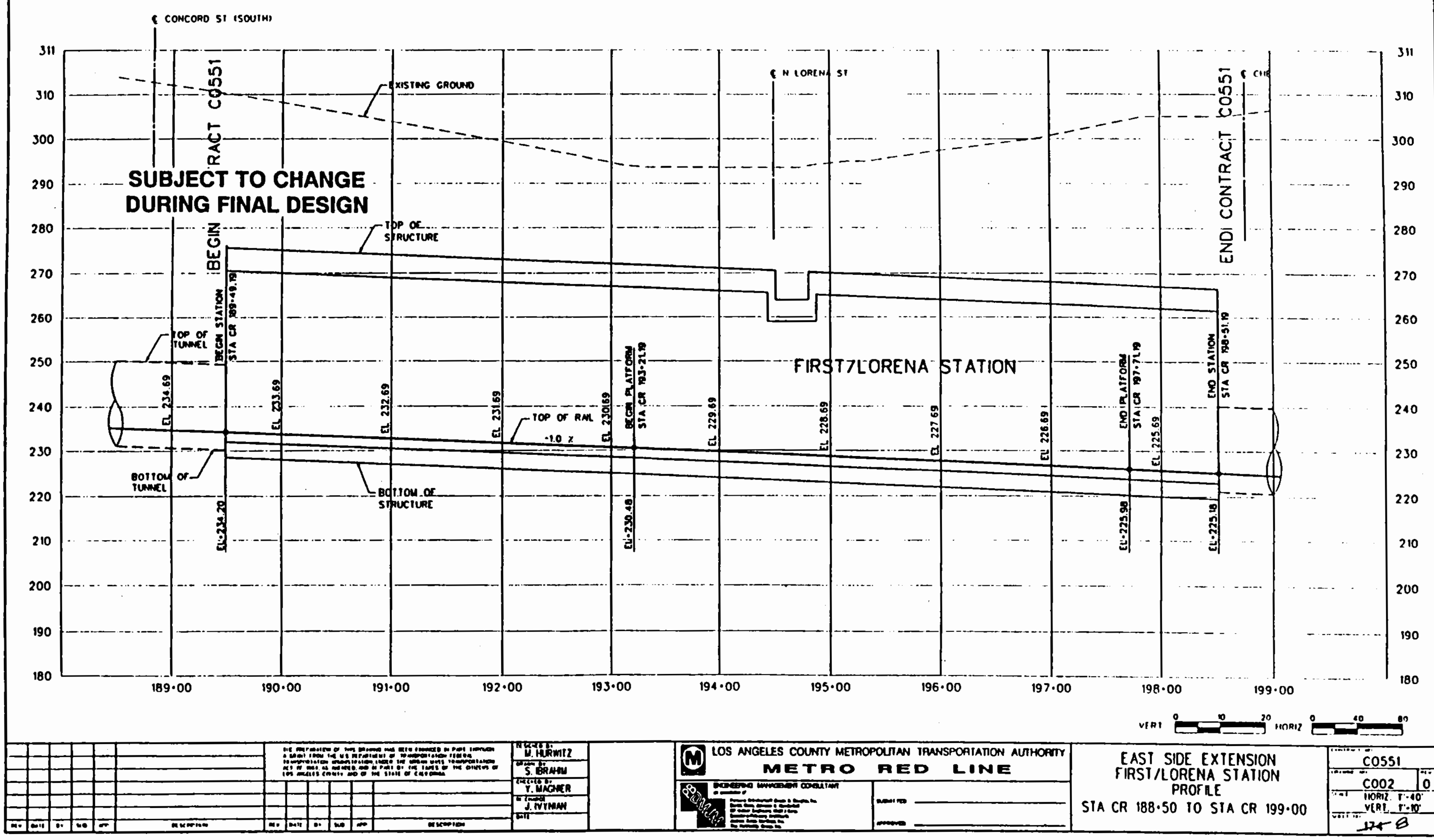


FIGURE S-4.6 (a): WHITTIER/ROWAN STATION

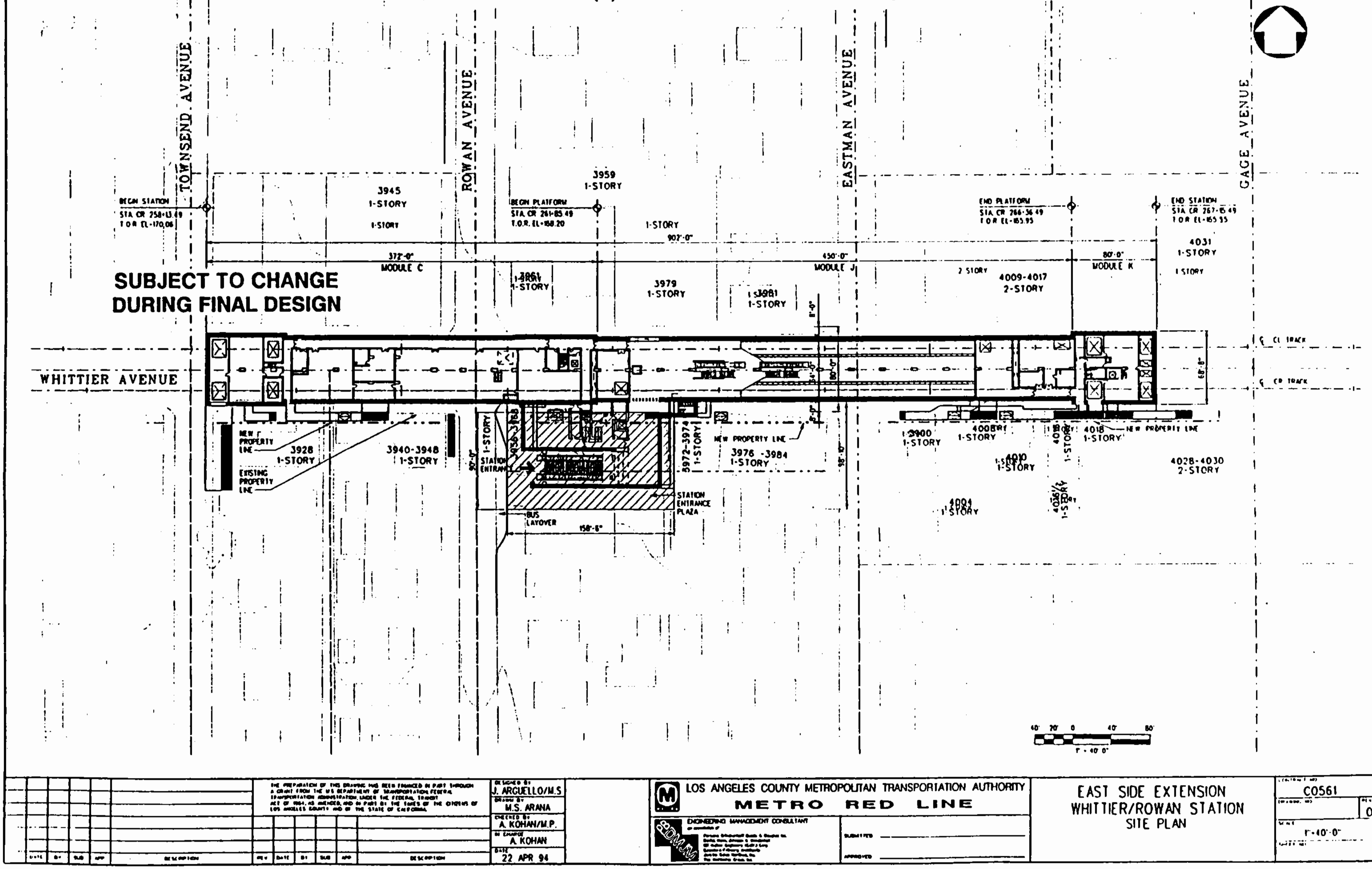


FIGURE S-4.6 (b): WHITTIER/ROWAN STATION

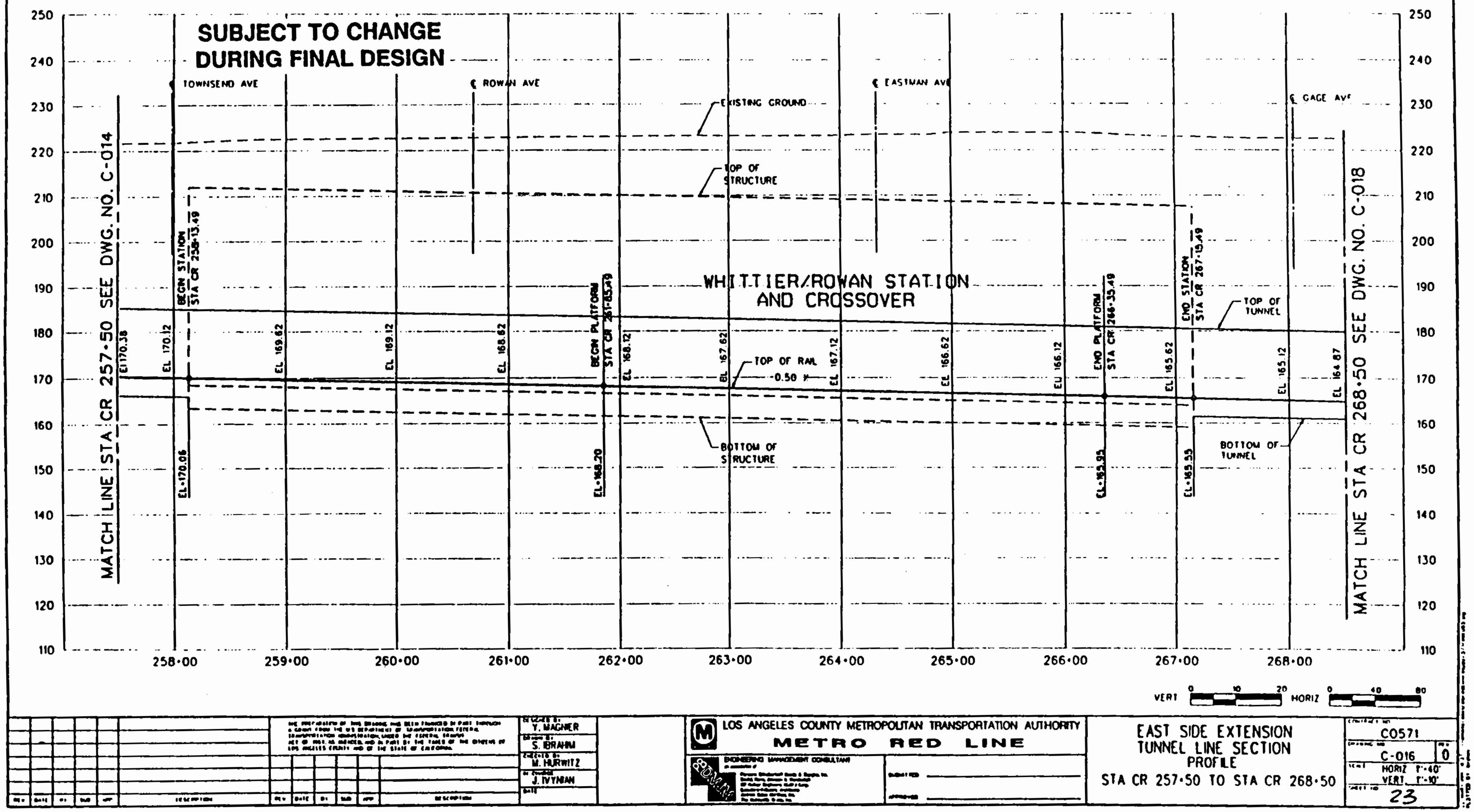


FIGURE S-4.7 (a): WHITTIER/ARIZONA STATION

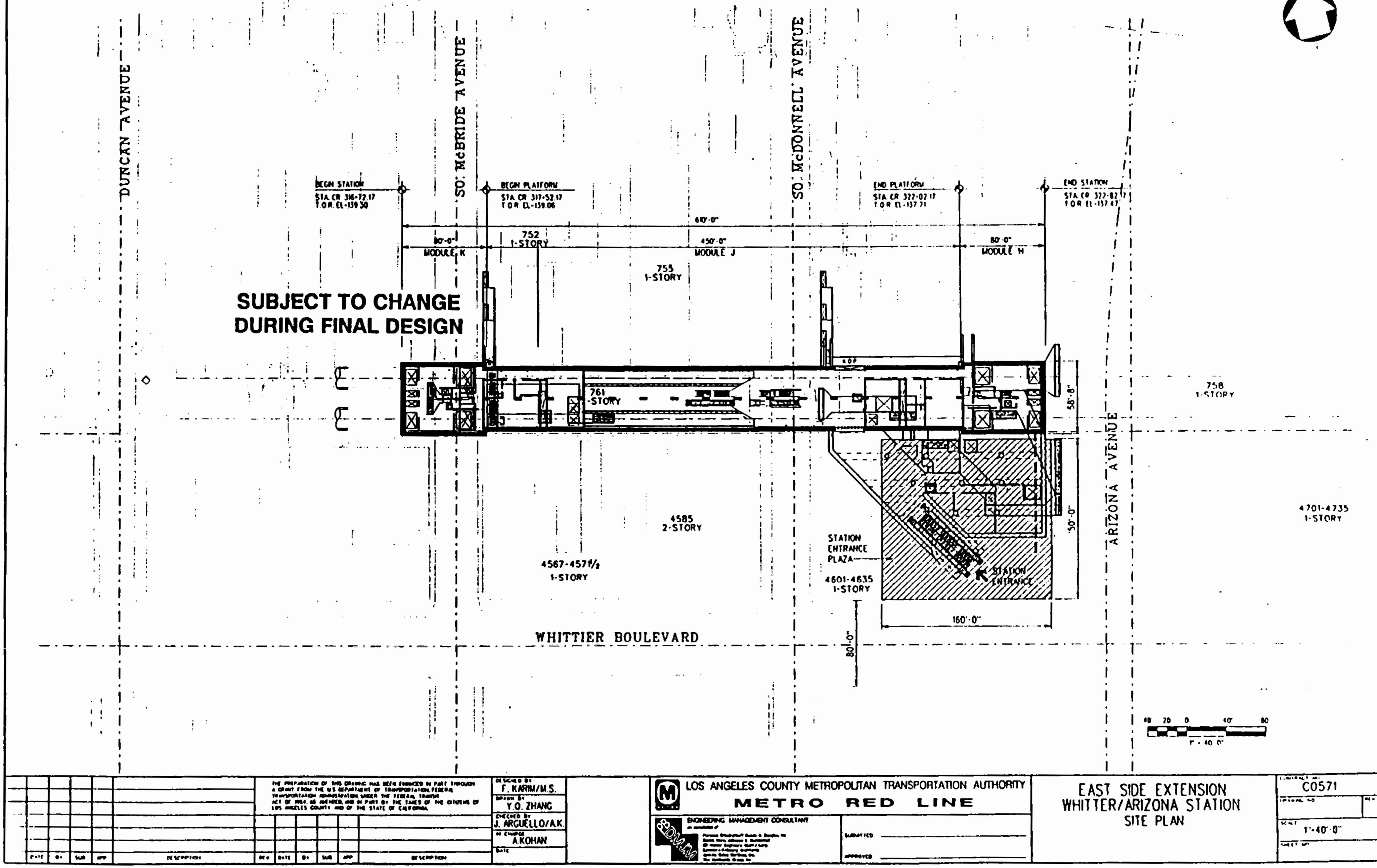


FIGURE S-4.7 (b): WHITTIER/ARIZONA STATION

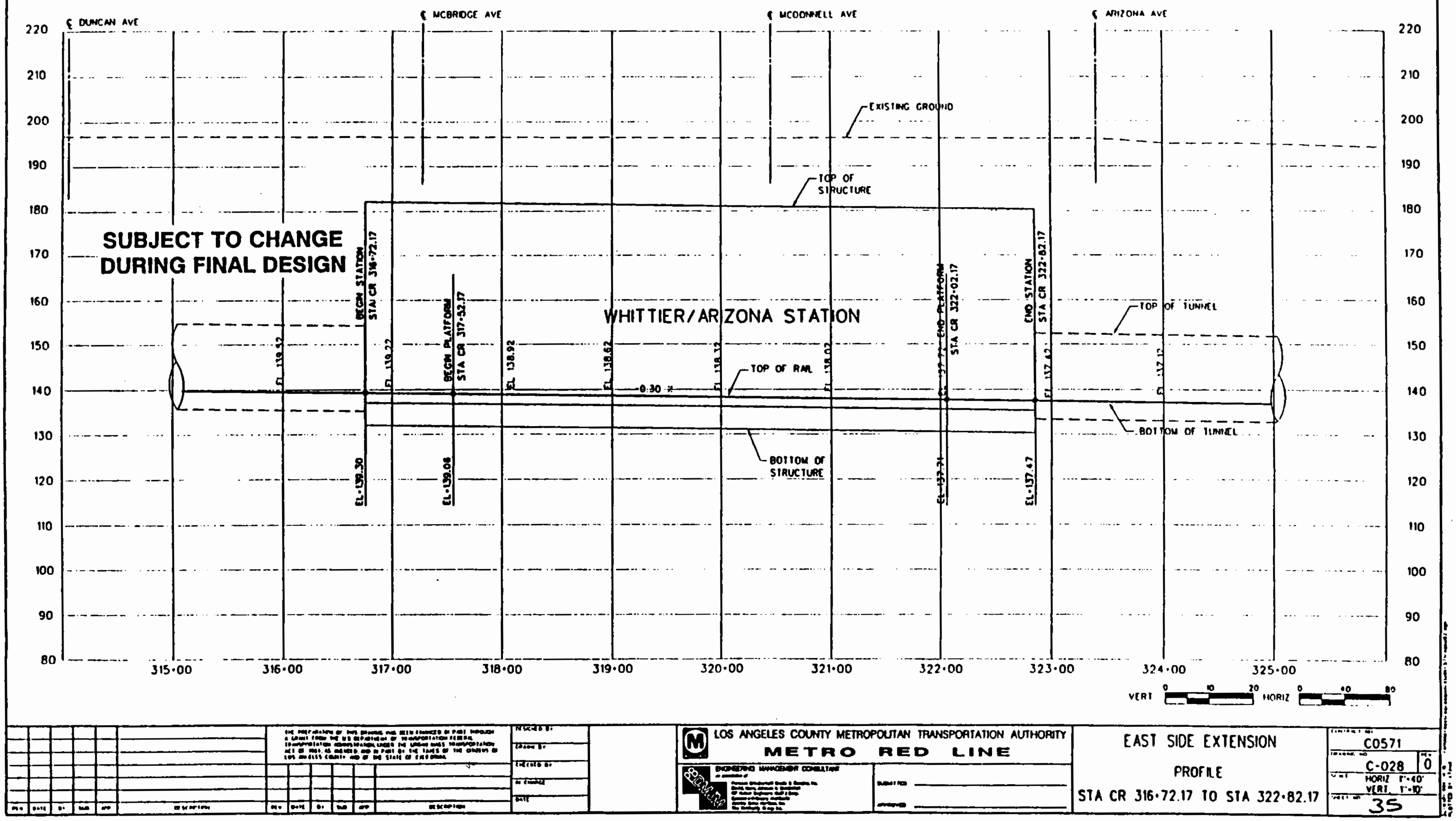


FIGURE S-4.8 (a): WHITTIER/ATLANTIC STATION

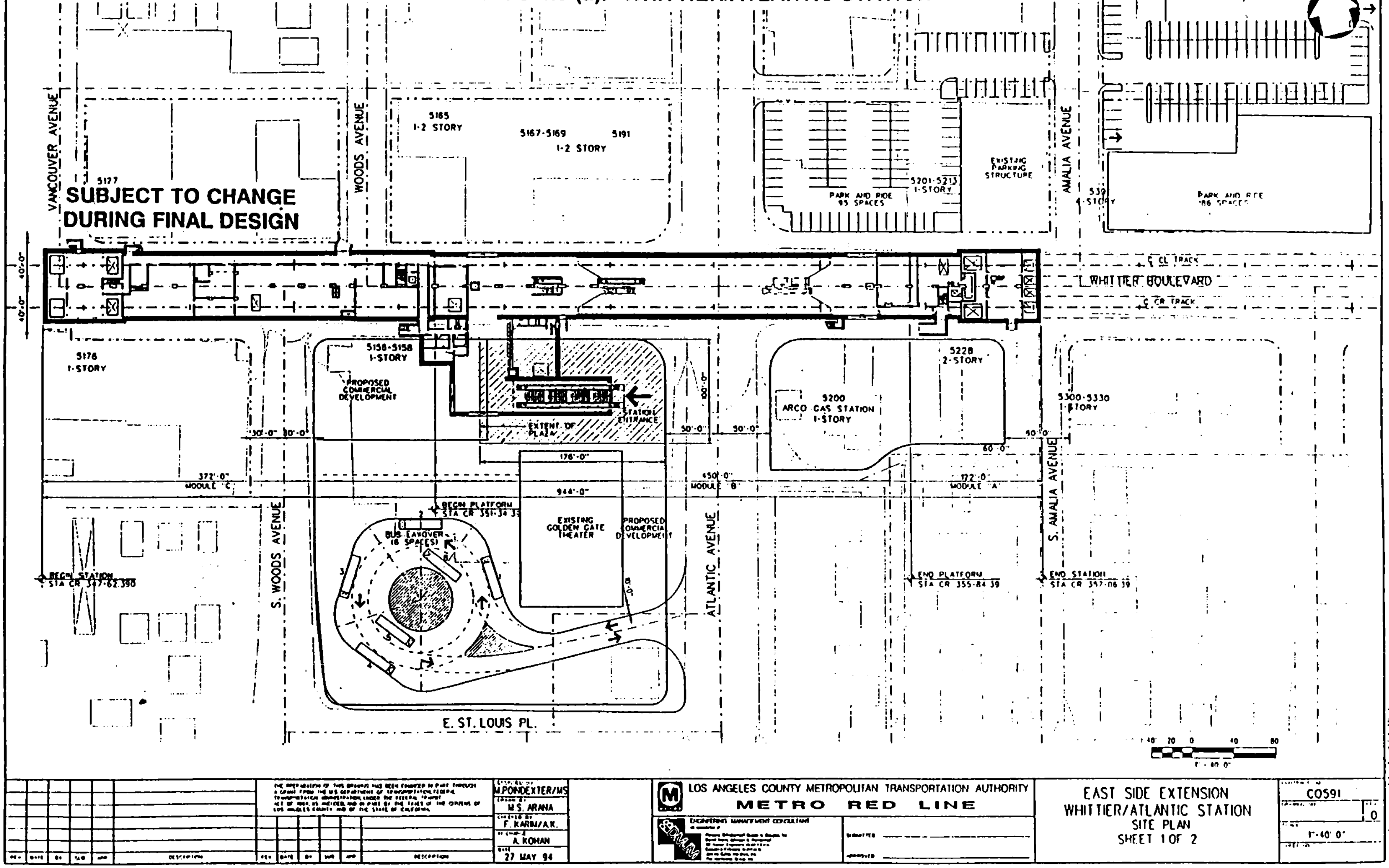


FIGURE S-4.8 (b): WHITTIER/ATLANTIC STATION

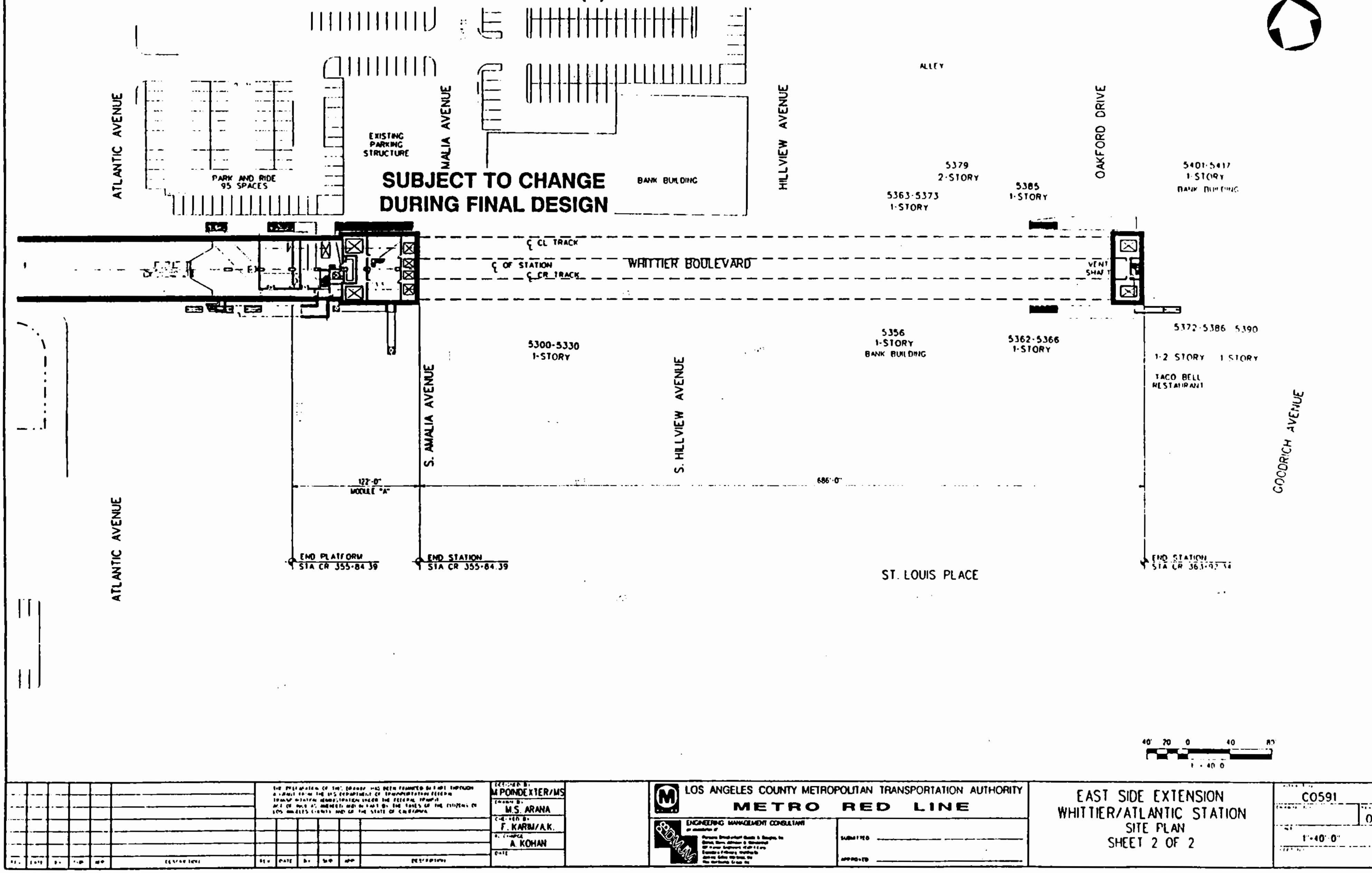
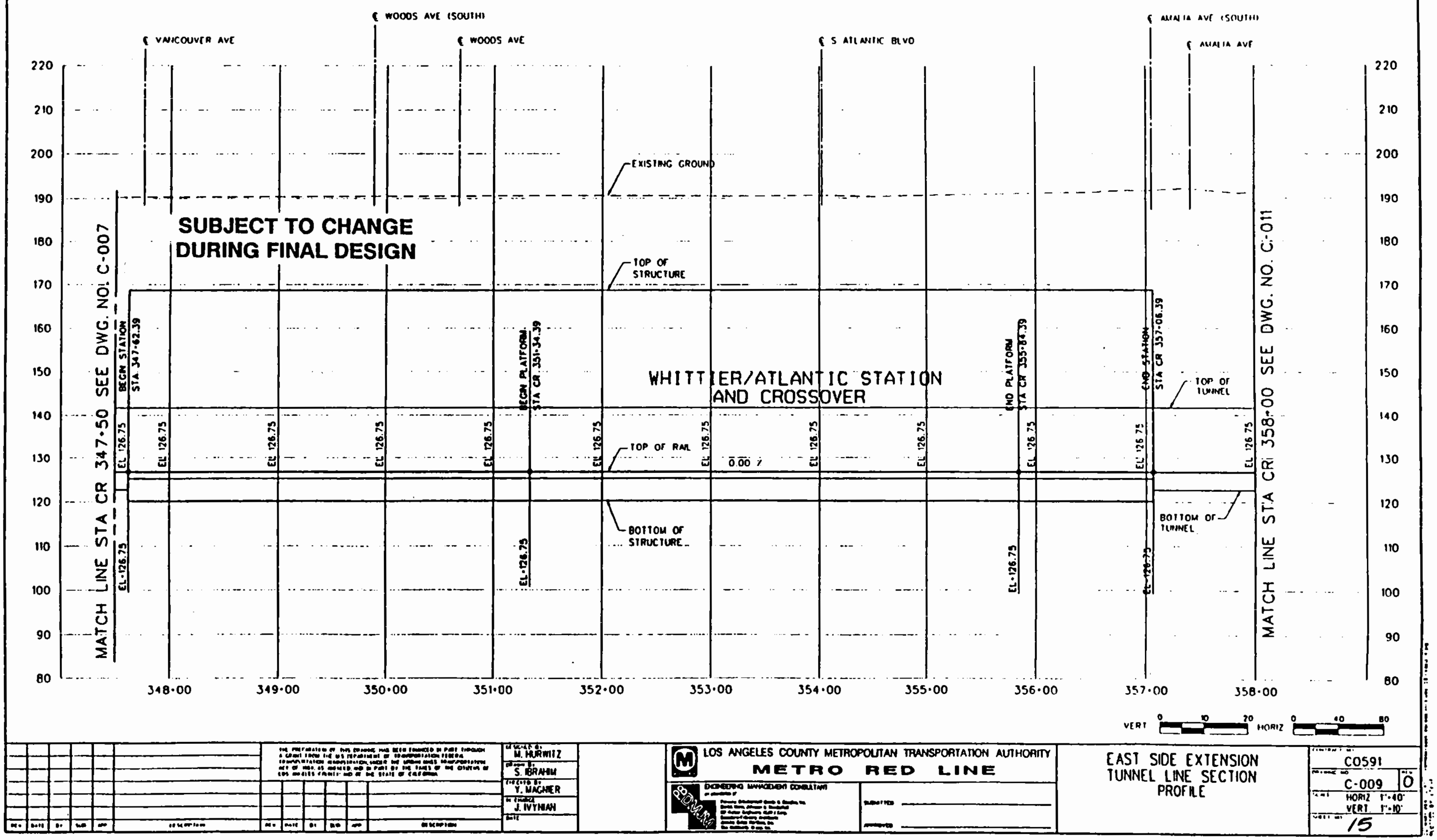


FIGURE S-4.8 (c): WHITTIER/ATLANTIC STATION



In locating the stations, efforts have been made during the planning and engineering phases to minimize, to the extent possible, the acquisition of private property as well as the possible impacts on residential property and local businesses. A mix of on- and off-street stations has therefore been adopted for the LPA to best meet these objectives. Primary station entrance locations have been identified for all stations.

Criteria used for identifying these station entrances included efforts to:

- minimize residential acquisitions/displacement of active retail/commercial businesses,
- facilitate rail/bus transfers,
- create a pedestrian supporting environment,
- evaluate joint development potential,
- provide an area around rail station entrances that creates a sense of safety, and
- minimize major environmental issues.

Final orientation of station entrances may be revised based on negotiations with the community, landowners and developers during final design. The general location of all other structures that affect station areas, such as vent shafts, fresh air intakes, and emergency exit stair hatches was established during the preliminary engineering phase. Important features identified before and during preliminary engineering for each of the stations in the LPA are discussed below.

a. Little Tokyo Station

The Little Tokyo station would be located approximately 60 feet under Santa Fe Avenue at Third Street, directly opposite the existing MTA Rail Maintenance-of-Way Building. There are two optional locations for the station entrance. The first entrance option would be located at the southwest corner of the intersection and the second on the east side of Santa Fe Avenue, in the Metro yard just east of the maintenance-of-way building (see Figure S-4.2).

b. First/Boyle Station

The First/Boyle station would be located just east of the U.S. 101 (Hollywood) freeway approximately 80 feet under First and Boyle streets (see Figure S-4.3). The station would extend diagonally under the present First/Boyle intersection and cross private property and Pennsylvania Avenue at the north end, just prior to ending below the White Memorial Hospital parking lot. The entrance to the station would be located at the northwest corner of First and Bailey Streets. The entrance design was developed to accommodate the future development of the Mariachi Plaza. The station would also include a 375-foot double crossover on the southwesterly end, located under private property (to be acquired).

c. Brooklyn/Soto Station

After the route crosses Soto Street, the Brooklyn/Soto station would begin. The station would be located approximately 200 feet south of and parallel to Brooklyn Avenue (see Figure S-4.4). It would lie 55 feet under private property (to be acquired) for about one and a half blocks. The main entrance would be located at the northwest corner of Brooklyn Avenue and Mathews Street under an existing abandoned one-story structure to be acquired and demolished. All proposed structures, shafts, emergency stairs, fresh-air intakes, etc., would be located at the perimeter of each lot, leaving land suitable for future development.

d. First/Lorena Station

The First/Lorena station would be located 65 feet under First Street and include a 375-foot crossover on the western end (see Figure S-4.5). A combination of hilly terrain along First Street and deep sewers would force the station to be as deep as 85 feet on the eastern end. In order to keep the station from being any deeper, a notch has been designed into the roof to allow a major storm sewer to remain in place. The station entrance would be located at the northeast corner of First Street and Lorena Street and provide access to a single-end mezzanine station containing one knock-out panel. The station would also include up to 500 parking spaces located at the northeast corner of First Street and Lorena Street north of the station entrance.

e. Whittier/Rowan Station

The Whittier/Rowan station and a 375-foot crossover would be located 55 feet under Whittier Boulevard between Townsend Avenue and Gage Avenue, with the station entrance at the southeast corner of Whittier Boulevard and Rowan Avenue (see Figure S-4.6).

f. Whittier/Arizona Station

The Whittier/Arizona station would be located immediately north of the first alley north of Whittier Boulevard, about 55 feet below private property (see Figure S-4.7). The eastern end of the station would abut the western edge of Arizona Avenue. The station entrance would lie at the northwest corner of Whittier Boulevard and Arizona Avenue.

g. Whittier/Atlantic Station

The Whittier/Atlantic station would be located 65 feet under Whittier Boulevard and include a 375-foot crossover beginning at Vancouver Avenue with the station itself nearly centered at Atlantic Boulevard (see Figure S-4.8). The entrance would be located in front of an historic theater on the southwest corner of Whittier Boulevard and Atlantic Avenue. Up to 1,200 parking spaces are ultimately anticipated to be provided in one or two surface lots or structures at the northeast and/or southwest corners of Whittier Boulevard and Atlantic Avenue. A mined tail track would exist east of this station.

S-4.4.2 Initial Operable Segments (IOSs)

It is possible that the LPA would be built in segments, i.e., some tunnel sections and stations would be built beginning at Union Station and ending at an interim terminus station and, at a later date, the remainder of the LPA stations and tunnel line segments would be built. Two segments, known as Initial Operable Segments (IOSs), have been developed for environmental review and analysis. The two IOSs reviewed in the FEIR are shown in Table S-4.1.

TABLE S-4.1: PROPOSED INITIAL OPERABLE SEGMENTS			
IOS IDENTIFIER	NUMBER OF STATIONS	LENGTH	STATIONS INCLUDED
IOS-1	2	2.0 miles	• Little Tokyo • First/Boyle
IOS-2	4	3.7 miles	• Little Tokyo • First/Boyle • Brooklyn/Soto • First/Lorena

Source: Metropolitan Transportation Authority, 1994

S-4.4.3 Operating Characteristics/Patronage

The proposed Metro Red Line bus/rail interface plan for the eastern extension includes the provision of feeder bus access to all rail stations. The major difference in the LPA-related bus service compared to the No-Build alternative is the provision of improved headways (more frequent service) in the north-south routes. These north-south bus routes (MTA lines 250/253, 251/252, 254, 255/46, 256, 258/259 and 260; Montebello lines 10 and 35) provide feeder service to the rail stations proposed in the LPA and IOSs. The bus/rail interface plan for the eastern extension is summarized in the following subsections.

- **Little Tokyo**

For the Little Tokyo station, public bus transit access would be provided by MTA Line 30/31 via bus stops along First Street. Montebello Municipal Bus Line 40 would serve this station via Fourth Street. Feeder bus service to this station is also proposed via shuttle type service (similar to the current Los Angeles Department of Transportation [LADOT] DASH service) to be operated along the Alameda Street, Central Avenue and San Pedro Street corridors.

- **First/Boyle**

Public transit access by bus to the First/Boyle Station would be provided by MTA Line 30/31 via bus stops along First Street. MTA Line 250 would also serve this station via bus stops along Boyle Avenue. The Boyle Heights shuttle, LADOT Line 620, would serve this station via First Street and Boyle Avenue.

- **Brooklyn/Soto**

The Brooklyn/Soto Station bus access would be provided by MTA Line 251/252 via bus stops along Soto Street. MTA Line 68 would serve this station via bus stops along Brooklyn Avenue. MTA Lines 253 and 255 would be rerouted to serve this station via on-street bus stops. MTA Line 104 would be extended further north to terminate at this station, in an off-street terminal. Line 620, operated by LADOT, would also terminate at this station.

- **First/Lorena**

Bus access to the First/Lorena Station would be provided by terminating all MTA Route 30 shortlines and Route 31 trips at this station in an off-street terminal. A shuttle service is proposed to operate along the segment of First Street to East Los Angeles College that would no longer be served by Route 31. MTA Lines 65 and 255 would be rerouted to serve this station via on-street bus stops. MTA Line 470/471, a freeway express route, would terminate at this station serving residents and patrons who live and work at sites to the East. This service would be provided for IOS-2 and would continue until the full LPA is completed.

- **Whittier/Rowan**

Bus access to the Whittier/Rowan Station would be provided by MTA Line 18 via bus stops along Whittier Boulevard. An off-street terminal for MTA Line 255 is programmed to serve this station via Rowan Avenue. MTA Line 255 would terminate at this station.

- **Whittier/Arizona**

Public bus access to the Whittier/Arizona Station would be provided by MTA Line 18 via bus stops along Whittier Boulevard. MTA Line 258 would serve the station via Arizona Avenue. MTA Line 258 would terminate at this station, and it is proposed that MTA Line 256 be rerouted to also terminate at this station. MTA Line 259 would serve this station via bus stops along Arizona Avenue.

- **Whittier/Atlantic**

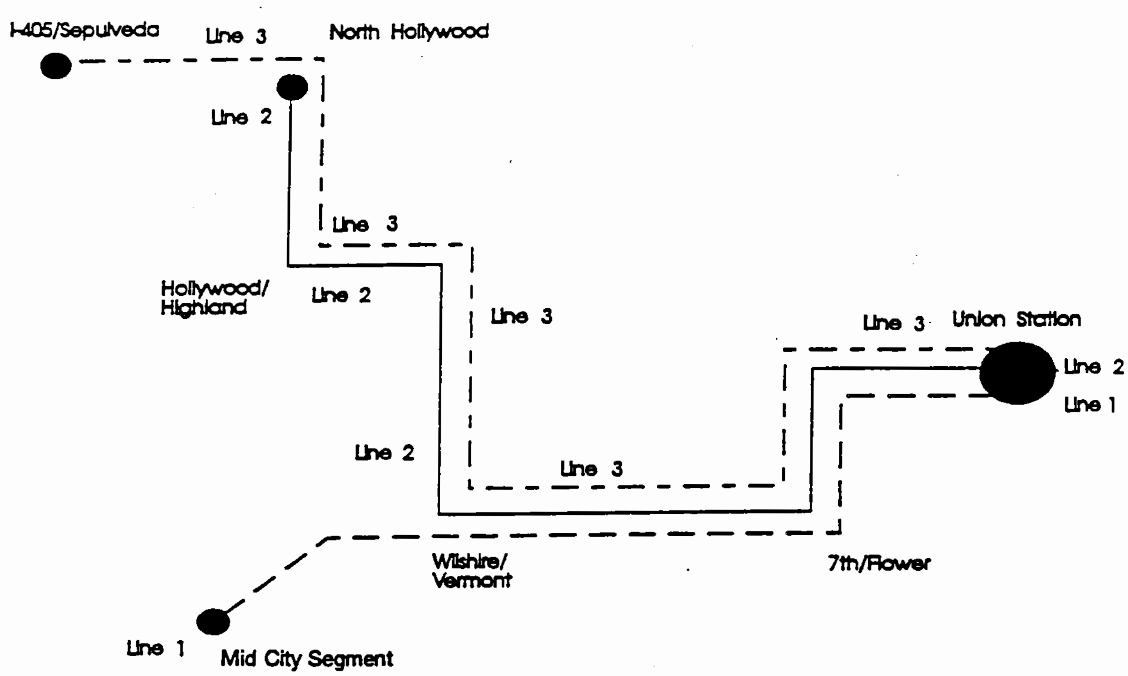
Bus access to the Whittier/Atlantic Station would be provided by MTA Line 18 via Whittier Boulevard. This Line is proposed to terminate at this station. Patrons wishing to continue further east on Whittier could do so by transferring to Montebello Municipal Bus Lines, which offer frequent service. MTA Lines 460, 462 and 466 also are proposed to terminate at this station. Currently these lines operate on the Santa Ana Freeway passing Atlantic Boulevard to Downtown. MTA Line 470/471 is proposed to terminate at this station upon completion of the full LPA. It would operate to the proposed First/Lorena terminal station if IOS-2 is built.

MTA Line 66/67 is proposed to be rerouted to serve the Whittier/Atlantic station. These lines currently serve this area via Olympic Boulevard. Route 67 trips would terminate at the station, where an off-street terminal would be provided for the many MTA Lines. It is assumed that the Montebello Municipal Bus Lines and the Orange County Transit Authority (OCTA) Lines also would terminate at this station.

a. Service Plan

The MTA 30-Year Plan Red Line operating configurations were assumed for this Final EIR. In the Year 2010, the Red Line, prior to the addition of the Eastern Extension LPA, is expected to consists of three operating lines (see Figure S-4.9):

- Line 1: Mid-City Segment to Union Station
- Line 2: North Hollywood to Union Station
- Line 3: I-405/Sepulveda to Union Station



Source: Parsons Brinckerhoff Quade & Douglas, Inc; Myra L. Frank & Associates, Inc., 1993.

FIGURE S-4.9: ASSUMED OPERATING LINES FOR RED LINE

Traveling west from Union Station, all three lines run in a common section to the Wilshire/Vermont station. Line 1 branches at this location to a westside station in the Mid-City Segment. Lines 2 and 3 would operate north on Vermont Avenue, west on Hollywood Boulevard and under the Hollywood Hills to North Hollywood, where Line 2 would turn around. Line 3 would continue to the vicinity of the I-405/Sepulveda, where it would reverse direction and return to Union station.

Based on MTA 30-Year Plan assumptions, the LPA would extend Lines 1 and 2 to the Whittier/ Atlantic station. The service headways shown in Table S-4.2 have been assumed for the LPA.

TABLE S-4.2: 2010 FUTURE SERVICE LEVELS

SEGMENT	OPERATING LINE	HEADWAYS (minutes)		CARS PER TRAIN	
		PEAK	OFF-PEAK	PEAK	OFF-PEAK
IOS-1	First/Boyle to Pico/San Vicente	4	6	4	4
	First/Boyle to North Hollywood	8	12	4	4
	Union Station to I-405/Sepulveda	8	12	4	4
IOS-2	First/Lorena to Pico/San Vicente	4	6	4	4
	First/Lorena to North Hollywood	8	12	4	4
	Union Station to I-405/Sepulveda	8	12	4	4
LPA	Whittier/Atlantic to Pico/San Vicente	4	6	4	4
	Whittier/Atlantic to North Hollywood	8	12	4	4
	Union Station to I-405/Sepulveda	8	12	4	4

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

The major difference in the Year 2010 Red Line transit operating plan between the No-Build and the LPA is the addition of the rail alternative east of Union Station (Lines 1 and 2 extended) and the increase in service frequencies (headways) for Line 1 (Pico/San Vicente to the Eastside terminus) from eight minutes to four minutes in the peak period and from 12 minutes to six minutes in the off-peak period. This would provide an effective peak period headway of 2.7 minutes for the LPA. The off-peak headway would be 4.0 minutes. Because the LPA is an integral part of the regional system and not an isolated component, there would be, as in the case with the improved north-south headways, additional transit trips that do not have an origin or destination within the Eastside Corridor study area.

Weekday service is planned as follows:

- Peak Periods:
  - 6:00 AM - 9:00 AM
  - 3:00 PM - 6:00 PM
- Off-Peak Periods:
  - 5:00 AM - 6:00 AM
  - 9:00 AM - 3:00 PM
  - 6:00 PM - 1:00 AM

b. Travel Times

Estimated travel times for the LPA are based on the performance characteristics of the Red Line heavy rail vehicle now in operation in downtown Los Angeles between Union Station and MacArthur Park. Maximum operating design speed is 70 miles per hour, and station dwell times are assumed to be 20 seconds. Average speeds on the LPA, including station stops, acceleration and deceleration, would be 30 miles per hour. Travel times for the service routes (including the IOSs) were determined by computer simulation and are shown below in Table S-4.3.

TABLE S-4.3: SERVICE ROUTE TRAVEL TIMES
(Minutes)

OPERATING LINE		1-WAY TRAVEL TIMES	TERMINAL TIMES [a]		ROUND TRIP TIMES
			EAST TERM.	WEST TERM.	
LPA	Whittier/Atlantic to Pico/San Vicente	31	2 ½	2 ½	67
	Whittier/Atlantic to North Hollywood	43	2 ½	2 ½	91
IOS-1	First/Boyle to Pico/San Vicente	21	2 ½	2 ½	47
	First/Boyle to North Hollywood	33	2 ½	2 ½	71
IOS-2	First/Lorena to Pico/San Vicente	25	2 ½	2 ½	55
	First/Lorena to North Hollywood	37	2 ½	2 ½	79
Union Station to I-405/Sepulveda	Union Station to I-405/Sepulveda	37	2 ½	2 ½	79

Notes: [a] Terminal Times are the amount of time that it takes for the train to reverse direction.

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

The passenger vehicle for the LPA would be the same as the one being used on the existing Metro Rail Red Line, which is heavy rail. Each car is 75 feet long, with seating for 59 passengers. The cars are designed to accommodate a normal peak load of 169 people, with a maximum load of 301 people.

Trains would run via automatic train operation which would regulate train speeds and control programmed entry and stopping of trains at stations. All non-automatic train functions would be controlled by the operator in the train's lead car. These functions include the operation of passenger vehicle doors, train dwell times in stations, train departure and communications. In addition, the central control system would monitor all train operations, stations and sub-systems (electrical, communication, ventilation, etc.)

In order to provide the planned service described in Table S-4.2 with the calculated round trip times shown in Table S-4.3, 12 trains would be required for the Whittier/Atlantic to Mid-City Segment service, 17 trains would be required for the Whittier/Atlantic to North Hollywood service and 10 trains would be required for the Union Station to Union Station to I-405/Sepulveda service. Adding two four-car standby trains to put into service during either service disruptions or equipment failures and a 20 percent margin of spare vehicles to account for vehicles either needing repair or scheduled for maintenance, the total fleet size requirement would be 196 cars, as summarized in Table S-4.4.

TABLE S-4.4: FLEET SIZE PROJECTIONS

SERVICE		NUMBER OF PEAK TRAINS	CARS PER TRAIN	CAR REQUIREMENTS			
				REVENUE	STANDBY	SPARES	TOTAL
LPA	Whittier/Atlantic to Pico/San Vicente	12	4	48	0	10	58
	Whittier/Atlantic to North Hollywood	17	4	68	4	14	86
	Union Station to I-405/Sepulveda	10	4	40	4	8	52
	LPA TOTAL	39	N/A	156	8	32	196
IOS-1	First/Boyle to Pico/San Vicente	9	4	36	0	10	44
	First/Boyle to North Hollywood	12	4	48	4	8	62
	Union Station to I-405/Sepulveda	10	4	40	4	8	52
	IOS-1 TOTAL	31	N/A	124	8	26	158
IOS-2	First/Lorena to Pico/San Vicente	10	4	40	0	12	48
	First/Lorena to North Hollywood	14	4	56	4	8	72
	Union Station to I-405/Sepulveda	10	4	40	4	8	52
	IOS-2 TOTAL	34	N/A	136	8	28	172

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

The maximum number of cars that the current Red Line yard can accommodate is 180. Trains can also be stored overnight at terminal stations properly equipped with tail tracks of sufficient length. As currently designed, three trains could be stored overnight at the Whittier/Atlantic station: one in each tail track and a third train on one platform track. Additional trains could also be stored at the I-405/Sepulveda terminus if so designed. A shift from four-car to six-car trains would increase the fleet size requirements and would make necessary a review of additional storage and maintenance facilities for the full system.

c. Crossovers

Operating criteria adopted by the MTA require that a minimum of a 10-minute, single-track headway be achievable anywhere along the line. In order to fulfill this criterion and to expedite terminal operations on the LPA and the two IOSs, crossovers are required as indicated in Table S-4.5.

STATION	CROSSOVER LOCATION
Little Tokyo	none
First/Boyle	west end
Brooklyn/Soto	none
First/Lorena	west end
Whittier/Rowan	west end
Whittier/Arizona	none
Whittier/Atlantic	west end

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

d. **Tail Tracks**

Tail tracks are lengths of track that lie beyond the terminal station. They can serve two purposes. First, tail tracks provide "safe braking distance" enabling trains to enter a terminal station at reasonable speeds. For example, depending upon the grade of the track, a 300 to 400 foot tail track should enable the train on the Red Line to enter a station at 25 miles per hour. The second function of tail tracks is to enable the storage of trains. This can become critical when a disabled train must be removed from service to keep from severely disrupting the system operation. Overnight storage can also expedite the start of service in the morning from outlying areas.

At Whittier/Atlantic, a 750-foot tail track is planned at the end of each mainline track. This would provide 300 feet for braking distance and 450 feet for storage of 6-car trains. Tail tracks at First/Boyle and First/Lorena would be 80 feet if either station is operated as a temporary terminal. The 80 feet of track would enable trains to enter the station at two miles per hour.

e. **Yard Access**

As currently configured, all trains entering and leaving the Red Line Yard are routed into Union Station. Trains would enter the Eastern Extension in one of the following ways:

- Trains would enter the Union Station platform from the yard, reverse direction and be routed east; or

- Trains would be dispatched into service first to the West Side from the yard, then on the return trip, they would be routed through Union Station to the east.

S-4.4.4 Capital Costs

This section summarizes the capital costs for the LPA and the IOSs. Development of the capital costs took into account the latest unit costs for the Metro Rail Red Line construction.

Due to small differences in bus fleet estimates between the LPA and the current no-build service, no bus-related costs have been added to the LPA costs. Bus-related costs are assumed within the baseline of the MTA 30-Year Integrated Transportation Plan. Therefore, cost comparisons presented in this EIR are only between the LPA and the IOSs.

Table S-4.6 provides a summary of capital cost estimates in 1994 dollars and escalated to the mid point of construction. Capital cost estimates are for guideways/structures, maintenance facilities, waste handling, water treatment, utility relocations, passenger vehicles, system-wide equipment, trackwork, testing and operations, insurance, city/county master agreements, general engineering, construction management, right-of-way, professional services and contingencies.

TABLE S-4.6: CAPITAL COST ESTIMATES

ALTERNATIVE	1994 DOLLARS (millions)	ESCALATED TO MID-POINT OF CONSTRUCTION (millions of $s)
LPA – Seven stations	$1,642	$1,821
IOS-1 – Two stations	451	522
IOS-2 – Four stations	847	980

Source: Preliminary Engineering Report, Engineering Management Consultant/ Rail Construction Corporation, 1994

S-4.4.5 Operating Costs

Operating and maintenance costs included in the complete transit program adopted in the MTA 30-Year Plan cover six different transit modes: MTA bus operation, heavy rail (Red Lines), light rail (Blue Lines), other rail (Green Line and LAX-Palmdale), municipal bus operators and the commuter rail system (Metrolink). The adopted plan includes the extension of the Red Line to the Eastside Corridor. The estimated annual O&M costs are provided in Table S-4.7 for the Red Line operating plan.

TABLE S-4.7: OPERATING AND MAINTENANCE COST ESTIMATES

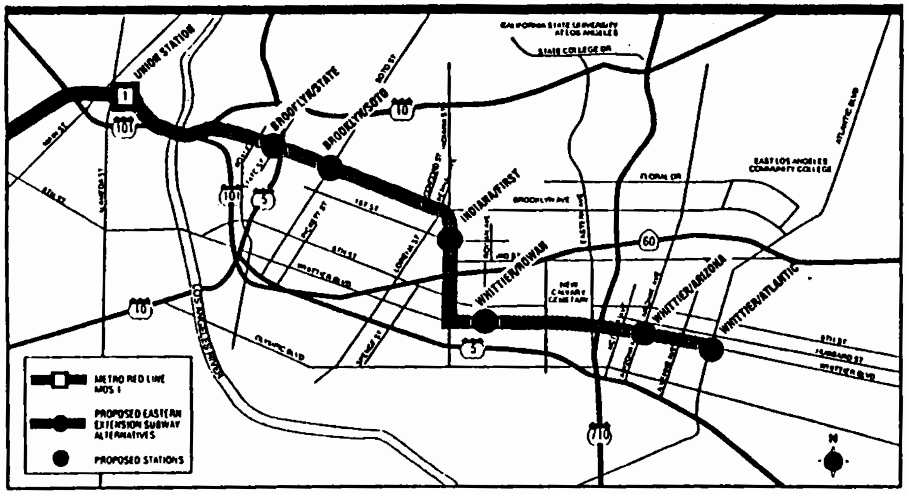
ALTERNATIVE	ANNUAL OPERATING AND MAINTENANCE COSTS (Millions of Dollars)
LPA – Seven stations	18.468
IOS-1 – Two stations	5.316
IOS-2 – Four stations	10.074

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

S-5 COMPARISON OF THE ALTERNATIVES

S-5.1 ALTERNATIVES CONSIDERED IN AA/DEIS/DEIR

Ten transit alternatives were defined and evaluated in the AA/DEIS/DEIR for the Los Angeles Eastside Corridor. A No-Build Alternative was discussed and is described in Section 2.2 of this document. The Transportation System Management (TSM) Alternative for the Eastside Corridor study area presented in the AA/DEIS/DEIR included an increase in the east-west bus service in the Study Area. Additional north-south bus service was also included. The TSM alternative included all of the transportation improvements identified in the No-Build Alternative. Alternatives 3 through 10 in the AA/DEIS/DEIR were rail alternatives over various routes in the Eastside Corridor (See Figures S-5.1 and S-5.2). For a detailed discussion of these alternatives and their associated impacts, see the April 1993 Los Angeles Eastside Corridor AA/DEIS/DEIR.



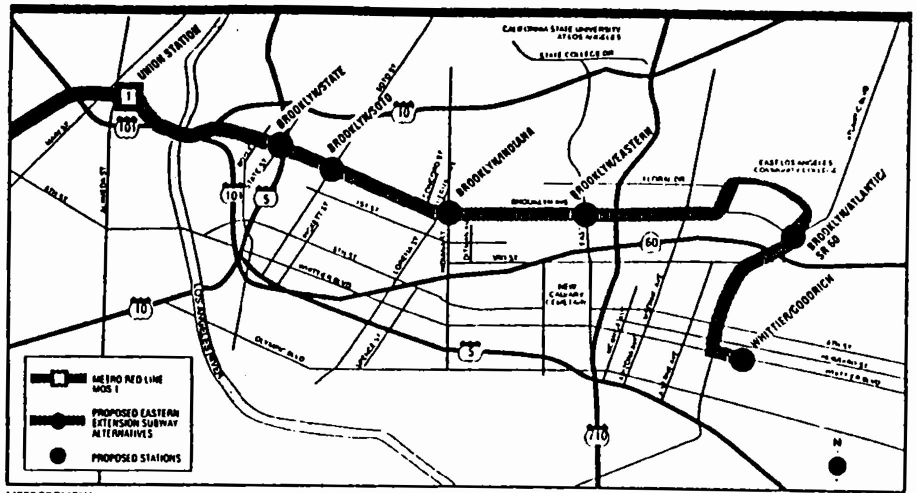
METROPOLITAN TRANSPORTATION AUTHORITY

METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
BROOKLYN AVENUE/ALT. 3

SCALE

DATE: APRIL 1993



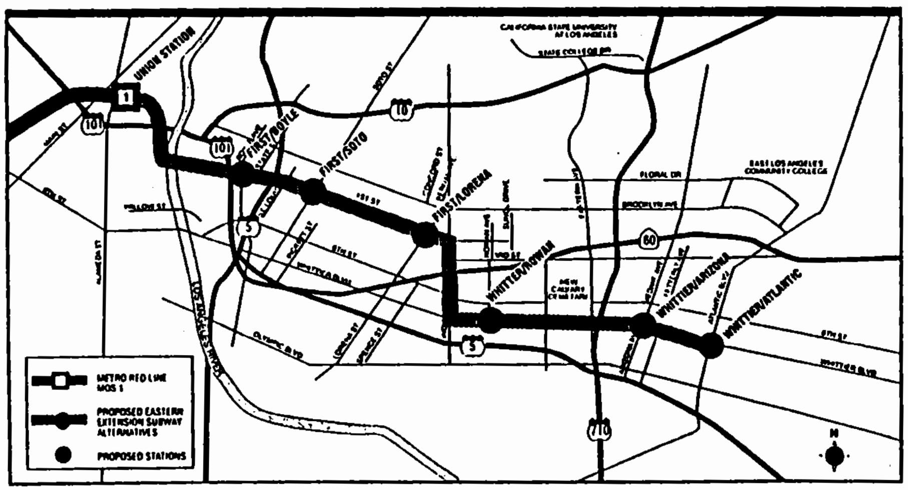
METROPOLITAN TRANSPORTATION AUTHORITY

METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
BROOKLYN/COLLEGE/ALT 4

SCALE

DATE APRIL 1993



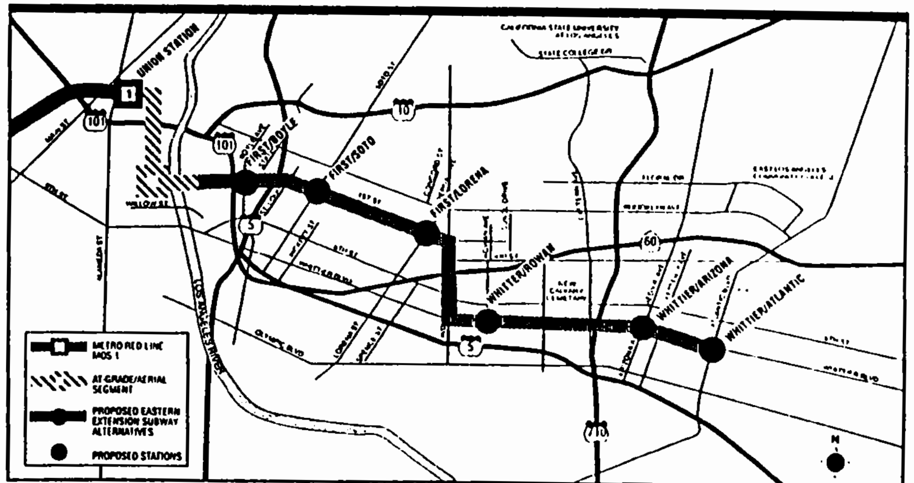
METROPOLITAN TRANSPORTATION AUTHORITY

METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
FIRST STREET/ALT. 5

SCALE:

DATE: APRIL 1993



METROPOLITAN TRANSPORTATION AUTHORITY

METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
FIRST STREET (WITH METRO RAIL YARD STATION)/ALT. 6

SCALE

DATE APRIL 1993

FIGURE S-5.1 RAIL ALTERNATIVES IN THE AA/DEIS/DEIR

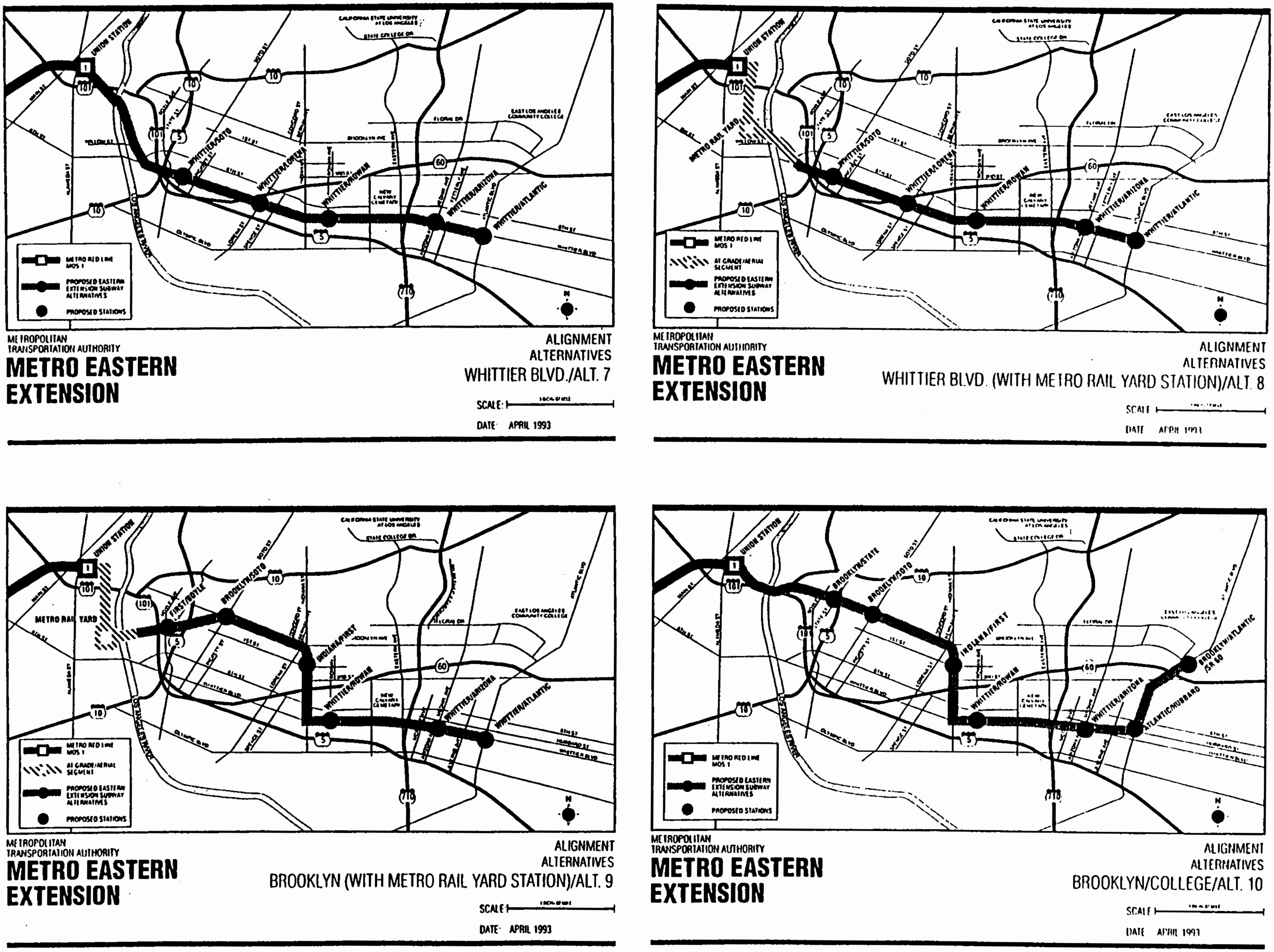


FIGURE S-5.1 RAIL ALTERNATIVES IN THE AA/DEIS/DEIR

S-5.2 CHARACTERISTICS OF AA/DEIS/DEIR ALTERNATIVES

The Eastside Corridor AA/DEIS/DEIR process was undertaken to identify alternative transit improvements for the study area. This section presents a brief comparative evaluation of the alternatives considered in the AA/DEIS/DEIR, discusses the trade-offs among the alternatives and reviews the environmentally superior alternative. It draws on the background information and analyses presented in chapters one through four of the AA/DEIS/DEIR.

Table S-5.1 provides key characteristics for the AA/DEIS/DEIR alternatives including a comparison of capital and operating costs, levels of mobility and accessibility, environmental impacts and measures of equity.

S-5.2.1 Capital and Operating Costs

As shown on Table S-5.1, the capital costs for the AA/DEIS/DEIR alternatives ranged from minimal costs for the TSM to $1.8 billion (1992 dollars) for Alternative 10, a 7.1-mile rail alternative with seven stations. The range of capital costs between the rail alternatives was $433 million and varied for the most part due to three factors: (1) length of the alignment, (2) number of stations and (3) station box locations (i.e., costs for property acquisition). The lowest cost rail alternative was Alternative 7, which had the fewest number of stations-- five, and was the shortest of the rail alternatives with a length of 5.4 miles.

Annual costs for operation of the full Red Line in 1992 dollars ranged from $92 million for the No-Build Alternative to $124 million annually for rail alternatives 4 and 10. Eastside corridor alternatives with longer lengths and higher number of stations tended to exhibit higher annual Red Line operating costs. The lowest annual operating costs were associated with the shortest of the rail alternatives with the least number of stations. Because of the increased local bus feeder service over the TSM alternative, the build alternatives' bus operating costs were approximately $5 million more annually than the Red Line operating costs.

a. Attainment of Goals and Objectives

A number of transit-related goals and objectives have been identified for the Eastside Corridor study area, as discussed in Chapter 1. These include improved mobility and access, support for local land use plans, minimal environmental impacts for the community and ability to finance the selected alternative.

- **Mobility and Accessibility**

Table S-5.1 provides various measures of mobility and accessibility associated with the AA/DEIS/DEIR transit alternatives. The highest regional transit ridership among the alternatives was rail Alternative 9 with 1,529,900 riders in the Year 2010. The No-Build Alternative represented the fewest number of regional transit trips with 1,498,700, followed by an estimated 1,503,700 regional transit trips for the improved-bus TSM Alternative. The difference in total regional transit trips among the rail alternatives was approximately 4,500 daily.

Daily boardings/alightings within the Eastside Corridor for the AA/DEIS/DEIR rail alternatives ranged from 53,800 for Alternative 7 to 64,000 for Alternative 9, a difference of 10,200.

TABLE S-5.1: COMPARISONS OF KEY CHARACTERISTICS OF EASTSIDE CORRIDOR AA/DEIS/DEIR ALTERNATIVES

CATEGORY	NO-BUILD	TSM	ALT. 3	ALT. 4	ALT. 5	ALT. 6A	ALT. 6B	ALT. 7	ALT. 8A	ALT. 8B	ALT. 9A	ALT. 9B	ALT. 10
COSTS													
Capital costs (millions of 1992 dollars)	$0	Minimal	$1,473 - 1,488	$1,651 - 1,669	$1,448 - 1,451	$1,601 - 1,604	$1,593 - 1,596	$1,337 - 1,340	$1,460 - 1,464	$1,406 - 1,409	$1,707 - 1,722	$1,631 - 1,646	$1,750 - $1,770
Equivalent annual capital costs (millions of 1992 dollars)	$0	Minimal	$156 - 158	$178 - $180	$154 - 155	$180 - 182	$167 - 169	$142 - 143	$156 - 157	$148 - 149	$182 - 183	$171 - 172	$189 - 190
Number of rail miles in Eastside Corridor	0	0	5.8	7.5	5.6	6.4	6.3	5.4	5.7	5.6	6.5	6.4	7.1
Number of rail stations in eastside corridor	0	0	6	6	6	7	7	5	6	6	7	7	7
Full Red Line operating costs (millions of 1992 dollars)	$94	$94	$120	$124	$120	$123	$123	$117	$120	$120	$123	$123	$124
MOBILITY (YEAR 2010)													
Daily transit trips in the region	1,498,700	1,503,700	1,529,300	1,525,800	1,525,400	1,526,200	1,526,200	1,527,100	1,529,000	1,529,000	1,529,900	1,529,900	1,527,400
Daily eastside corridor rail boardings/alightings	0	0	58,400	60,400	55,200	59,500	59,500	53,800	56,000	56,000	64,000	64,000	62,400
Increase in annual new transit trips over the TSM alternative (millions)	N/A	0	6.93	5.93	6.09	6.10	6.10	6.33	6.87	6.87	7.13	7.13	6.42
ACCESSIBILITY													
Transit travel times by walk access from Whittier/Atlantic to Los Angeles central business district (year 2010)	N/A	61 min.	35 min.	41 min.	36 min.	38 min.	38 min.	36 min.	37 min.	37 min.	35 min.	35 min.	38 min.
Transit travel times by walk access from Whittier/Atlantic to Studio City in San Fernando valley (year 2010)	N/A	82 min.	59 min.	65 min.	60 min.	62 min.	62 min.	67 min.	59 min.	59 min.	62 min.	62 min.	54 min.
Transit travel times by walk access from Whittier/Atlantic to Westwood -- UCLA main campus (year 2010)	N/A	103 min.	76 min.	82 min.	79 min.	79 min.	79 min.	74 min.	76 min.	76 min.	79 min.	79 min.	76 min.
Annual travel time dollars saved by TSM riders using rail alternatives (millions of 1992 dollars)	N/A	$0	$14.1	$14.3	$14.1	$14.2	$14.2	$13.2	$14.1	$14.1	$14.5	$14.5	$14.1
Percent households without private transportation within 0.4-Mile radius of stations (1990 census)	N/A	N/A	25%	24%	26%	27%	27%	21%	23%	23%	27%	27%	24%
Percent population between ages 6-18 within 0.4-Mile radius of stations (1990 census)	N/A	N/A	23%	22%	23%	23%	23%	23%	23%	23%	23%	23%	23%
Percent population over 65 within 0.4-Mile radius of stations (1990 census)	N/A	N/A	7%	9%	8%	7%	7%	8%	8%	8%	7%	7%	8%

TABLE S-5.1: COMPARISONS OF KEY CHARACTERISTICS OF EASTSIDE CORRIDOR AA/DEIS/DEIR ALTERNATIVES

CATEGORY	NO-BUILD	TSM	ALT. 3	ALT. 4	ALT. 5	ALT. 6A	ALT. 6B	ALT. 7	ALT. 8A	ALT. 8B	ALT. 9A	ALT. 9B	ALT. 10
ENVIRONMENTAL													
TRAFFIC													
Number of intersections with significant impacts under CEQA	N/A	N/A	3	4	4	4	4	1	2	2	2	2	3
LAND USE													
Total population within 0.4-Mile radius of stations	N/A	N/A	88,000	82,000	88,000	94,000	94,000	64,000	72,000	72,000	95,000	95,000	97,000
Total employment within 0.4-Mile radius of stations	N/A	N/A	33,000	47,000	35,000	42,000	42,000	26,000	34,000	34,000	42,000	42,000	30,000
ECONOMIC													
Number of annual jobs created during construction	0	MINIMAL	1,600 - 2,000	1,800 - 2,200	1,600 - 1,900	1,900 - 2,300	1,700 - 2,100	1,500 - 1,800	1,600 - 1,900	1,500 - 1,900	1,900 - 2,300	1,700 - 2,100	1,900 - 2,300
ACQUISITION AND DISPLACEMENTS													
Number of residential units acquired	0	0	5 - 78	0 - 53	3 - 22	2 - 22	20 - 40	6 - 20	0 - 20	0 - 20	5 - 78	23 - 96	5 - 78
Number of businesses and public/institutional facilities acquired	0	0	14 - 26	4 - 11	22 - 28	23 - 29	28 - 34	17 - 23	18 - 24	26 - 32	22 - 34	28 - 40	17 - 29
Number of parking spaces acquired	0	0	85 - 210	55 - 105	70 - 145	70 - 145	85 - 160	61 - 136	75 - 150	75 - 150	100 - 225	115 - 240	70 - 180
VISUAL													
Potentially significant visual impacts under CEQA							VISUAL IMPACT ON 4TH STREET BRIDGE			VISUAL IMPACT ON 6TH STREET BRIDGE		VISUAL IMPACT ON 4TH STREET BRIDGE	
AIR QUALITY													
Potential air emissions reductions in ROG'S, CO, NOX & PM10 over No-Build (pounds per day)	0	107	459	470	463	477	477	492	522	522	540	540	474
NOISE/VIBRATION													
Number of noise & vibration impacts before mitigation/after mitigation	0	0	247-368 /3-4	176-209 /0	252-338 /0	266-352 /0-1	271-357 /0-1	84-169 /0-1	77-162 /0-1	76-161 /0-1	359-450 /3	364-455 /3	275-395 /3-4

TABLE S-5.1: COMPARISONS OF KEY CHARACTERISTICS OF EASTSIDE CORRIDOR AA/DEIS/DEIR ALTERNATIVES

CATEGORY	NO-BUILD	TSM	ALT. 3	ALT. 4	ALT. 5	ALT. 6A	ALT. 6B	ALT. 7	ALT. 8A	ALT. 8B	ALT. 9A	ALT. 9B	ALT. 10
SOILS/GEOLOGY													
Number of potential pre-existing hazardous waste sites near rail alignments	N/A	N/A	79	127	70	71	72	89	90	88	75	72	123
CULTURAL/HISTORIC													
Number of potential adverse and adversely affected properties	0	0	3 - 4	0 - 1	3	3	4	4	4	4	3 - 4	4 - 5	0 - 1
COMMUNITY FACILITIES													
Number of community facilities served by rail transit	0	0	67	76	69	73	69	73	57	53	74	70	77
Number of community facilities within 300 feet of station construction sites	0	0	12	11	6	6	6	9	9	8	10	11	15
RAIL CONSTRUCTION													
Number of streets potentially affected	0	0	18 - 23	19 - 22	21 - 23	24 - 26	23 - 25	18 - 20	21 - 23	20 - 22	22 - 27	21 - 26	20 - 24
Number of on-street parking spaces affected	0	0	318 - 366	226 - 250	349 - 373	454 - 478	429 - 453	311 - 335	346 - 370	321 - 345	386 - 434	361 - 409	299 - 335
Number of major utility conflicts	0	0	2 - 3	2	1 - 2	3 - 4	3 - 4	2 - 3	3 - 4	2 - 3	3	2	2
Percent commercial adjacent to cut-and-cover construction	0	0	29 - 44%	35 - 43%	33 - 40%	30 - 36%	33 - 40%	41 - 50%	36 - 44%	41 - 50%	28 -42%	27 - 40%	33 - 45%
EQUITY													
Percent of households below poverty level within 0.4-Mile radius of stations (1990 census)	N/A	N/A	25%	22%	25%	26%	26%	22%	24%	24%	26%	26%	23%
Percent hispanic persons within 0.4-Mile radius of stations (1990 census)	N/A	N/A	95%	90%	90%	93%	93%	96%	94%	94%	93%	93%	92%

Source: AA/DEIS/DEIR Table 5-1, pg. 5-3; Parsons, Brinckerhoff, Quade & Douglas, Inc.; Myra L. Frank and Associates, Inc. 1993.

Transit travel times were estimated from the Whittier/Atlantic intersection to various locations in Los Angeles County. As shown in Table S-5.1 for example, the travel time for the rail alternatives from this origin to the Los Angeles Central Business District would range between 31 and 37 minutes, as compared to an all-bus trip of 55 minutes.

The Eastside Corridor includes a high level of households without access to private transportation. The areas within 0.4 miles of the possible transit stations for each AA/DEIS/DEIR rail alternative contain between 21 (Alternative 7) and 27 percent (alternatives 6 and 9) of such households, as compared to a City of Los Angeles figure of 15 percent and a County of Los Angeles figure of 11 percent. A high percentage of youth also reside in the Eastside Corridor area, with 22 to 23 percent within the station areas as compared to City and County of Los Angeles percentages of 17 and 18 percent, respectively. The elderly population (65+ years of age) within the station areas ranges between seven to nine percent for the Eastside Corridor and is less than the city and county average of ten percent.

b. Environmental Impacts

A number of environmental impacts for the AA/DEIS/DEIR alternatives are summarized on Table S-5.1 by alternative. As shown, the impacts vary among the alternatives for each environmental category. For the rail alternatives, the expected impacts are related to the actual location of the proposed alignments and stations in relation to the current physical and social environments.

The impacts associated with the No-Build Alternative are provided, at times, as a basis for comparison with the TSM and Rail alternatives. Environmental impacts associated with the TSM alternative were not substantial, since these alternatives would not entail major construction or operation changes.

For many environmental categories, the absolute number differences in environmental impacts among the AA/DEIS/DEIR rail alternatives was not significant, i.e., traffic, economic, air quality, cultural/historic, community facilities and Section 4(f).

Acquisitions and displacements of residential and commercial properties would be necessary for construction and operation of the AA/DEIS/DEIR rail alternatives. The number and extent of these acquisitions varied, depending not only on the alternative but also on the station box and primary entrance locations within each alternative. Moreover, the proposed off-street stations (Brooklyn/Soto [Alternatives 3, 4, 9 and 10] and Whittier/Arizona [Alternatives 3, 5, 6, 7, 8, 9 and 10) involved higher numbers of acquisitions than the corresponding on-street stations. Table 2-4.1 shows the ranges of residential and non-residential acquisitions involved with each AA/DEIS/DEIR rail alternative. Overall, the alignments with the least number of total stations and the least number of off-street stations involved the fewest acquisitions.

Few significant visual impacts under CEQA were anticipated for the alternatives except for the proposed aerial structures over the Los Angeles River for Alternatives 6B, 8B and 9B. Under CEQA, these alternatives had potentially significant visual impacts on either the Fourth or Sixth Street historic bridges, as shown in Table S-5.1.

After mitigation, only three significant noise and vibration impacts under CEQA were anticipated to remain from the operation of the rail transit alternatives. The variation in these impacts both before and after mitigation for the AA/DEIS/DEIR rail alternatives is shown in Table 5-1.

Following an analysis of historic records and a survey of the Eastside Corridor, a number of sites were identified as potentially containing hazardous materials. The number of these sites ranged from 70 for Alternative 5 to 127 for Alternative 4.

Construction impacts are mainly related to cut-and-cover activities at the stations, and vary according to the station box locations and the alternatives. Some stations were proposed with both on- and off-street locations (Brooklyn/Soto [Alternatives 3, 4, 9 and 10] and Whittier/Arizona [Alternatives 3, 5, 6, 7, 8, 9 and 10]). Typically, the on-street stations had the higher levels of construction impacts on businesses in these station areas, while the off-street stations had less effect on the business and greater impacts on the adjacent residential areas.

S-5.3 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

An environmentally superior alternative needs to be identified under CEQA. Although the No-Build and TSM alternatives would involve fewer environmental impacts, they would not provide the desired levels of mobility and accessibility for this lower-income, transit-dependent and principally hispanic community. The AA/DEIS/DEIR rail alternatives, on the other hand, would provide access to a broader range of employment, shopping, educational and cultural opportunities, consistent with the goals and objectives for this Eastside Corridor.

The environmental impacts vary by subject area for each of the rail alternatives and by the sub-alternative station box locations within each rail alternative. Overall, none of the rail alternatives can be identified as necessarily superior in terms of environmental considerations.

The determination of superiority requires weighing the varied impacts among the alternatives, and the reader is invited to apply his or her values as to the significance of these impacts by subject area, location and alternative.

S-6 SELECTION AND RATIONALE OF THE LOCALLY PREFERRED ALTERNATIVE

In June 1993, the MTA Board of Directors selected a Locally Preferred Alternative (LPA) from among ten alternatives (as presented in the April 1993 Eastside Corridor AA/DEIS/DEIR). The alternative selected was identified as Alternative 9B with modifications to avoid the Evergreen Cemetery by passing the route to the south of the cemetery and placing a station at First and Lorena rather than at First/Indiana. The MTA Board also recognized that this modification would eliminate the impacts that otherwise would have occurred to the narrow Indiana Street and Ramona High School under Alternative 9 before modification.

Based on the preliminary engineering findings, other changes have occurred to the project since the MTA Board selected the LPA, and these changes are described in Section 2-6 below.

Following circulation of the AA/DEIS/DEIR, the MTA reviewed the public comments and evaluated each of the above alternatives against the following criteria: environmental impacts associated with the alternatives after mitigation, community support, support for economic development of the community and system-wide benefits including increased ridership and operational advantages.

Based on this review, Rail Alternative 9B with some modifications was selected as the LPA. The modification was designed to respond to public comments by avoiding impacts to Evergreen Cemetery and Ramona High School. Table S-5.1 above summarizes critical characteristics of the alternatives reviewed in the AA/DEIS/DEIR.

A number of considerations led to the selection of the LPA by the MTA Board of Directors:

- Alternative 9B had the highest ridership of all the alternatives evaluated in the AA/DEIS/DEIR. In addition, Alternative 9B had the highest potential increase in new transit trips of all the alternatives evaluated in the AA/DEIS/DEIR. The LPA would provide East Los Angeles with a direct connection (via the Red Line) to downtown Los Angeles, mid-Wilshire, Hollywood and the San Fernando Valley. With a single transfer, the LPA would provide connection to the Blue Line to Long Beach and Pasadena, and all of the regional Metrolink destinations.
- Alternative 9B had the highest potential reduction in potential air emissions.
- Alternative 9B had the highest potential annual travel time savings.
- Alternative 9B had the highest total population within a 0.4-mile radius of the stations.
- Alternative 9B had the third highest number of community facilities within 300 feet of the stations.
- Alternative 9B had the second lowest number of intersections with significant impacts.

Within the Eastside Corridor, the LPA (modified Alternative 9B) connects major activity centers including:

- Little Tokyo East, which includes the 3rd Street and vicinity artists loft area, Yaohan Plaza shopping center, Zenshuji Soto Buddhist Mission, Los Angeles Hompa Hongwanji Buddhist Temple and the Maryknoll School,
- the First/Boyle area, which includes the current retail area and the area to be developed as Mariachi Plaza,
- the Brooklyn/Soto area, which includes the current active retail area,
- the First/Lorena area, which includes the El Mercado and other retail activities,
- the Whittier/Rowan area, which includes the intersection of two major thoroughfares in East Los Angeles, and

- the highly active Whittier commercial area, which is bracketed by the Whittier/Arizona and Whittier/Atlantic intersections.

These centers would be linked to other commercial areas such as Broadway Street in the CBD, the Wilshire District, Vermont Avenue, Hollywood Boulevard, North Hollywood and other areas as the Metro Red Line is expanded.

The LPA's costs and benefits were reviewed based on established criteria and found to be comparable to the other alternatives. At $1.64 billion (in 1992 dollars), the LPA fell in the middle of the $1.34 to $1.75 billion range of cost for a rail extension all the way to Atlantic Boulevard. With the highest patronage of any of the alternatives considered, the LPA would increase the effectiveness and efficiency of the public transit system as a whole in a corridor where transit dependency is twice the county average.

Based on the public hearings and ongoing community participation process, the rail alternatives that emerged with the largest community support were 9B and 6B. The alternatives were identical from Union Station to the First/Boyle station and from First Street and Indiana Street to Atlantic Boulevard. The most significant difference was that Alternative 6B served First Street with a First/Soto station, while 9B served Brooklyn Avenue with a Brooklyn/Soto station. The Brooklyn/Soto station area is a more active retail center for the community.

Comments received during the public review period identified two issues related to Alternative 9B: tunneling under the northeast corner of Evergreen Cemetery and tunneling within 25 feet of Ramona High School. The variation incorporated into the LPA avoids these issues by dropping south to First Street before reaching Evergreen Cemetery and substituting the First/Indiana station with a new First/Lorena station.

S-7 PLANNING SINCE CIRCULATION OF THE AA/DEIS/DEIR

This section summarizes the planning that has occurred after circulation of the AA/DEIS/DEIR, during preliminary engineering. Preliminary engineering commenced in July 1993, immediately after the MTA Board approved Alternative 9B (modified) as the Locally Preferred Alternative (LPA). In approving the LPA, the Board directed staff to revise the alignment so as to avoid: (1) going under any portion of Evergreen Cemetery, (2) impacts on Ramona High School and (3) impacts on the narrow Indiana Street in the vicinity of First Street. Alignment 9B included an aerial station in the Metro Rail yard and six additional stations.

During preliminary engineering, a number of additional studies were undertaken to refine location decisions. Based on these studies and on the direction of the MTA Board, some modifications have been made to Alternative 9B as presented in the AA/DEIS/DEIR. These location and other refinements have come about because of the more detailed analyses that are part of preliminary engineering. Work has included cost studies, operational criteria analyses, identification of conflicts with existing utilities and searching for ways to reduce environmental impacts. The refinements are not considered a significant change to the LPA; rather they are directed at mitigating environmental effects, reducing cost and enhancing the operational effectiveness of the LPA.

The changes to the LPA are briefly summarized here, and discussed in more detail in the sections that follow:

Revisions to station locations include:

- The Metro Rail yard station (now called the Little Tokyo station) was moved from aerial in the yard to subway under Santa Fe Avenue,
- The First/Boyle station has been rotated counter-clockwise to respond to improved (flatter) curves from the Little Tokyo station, and
- The First/Lorena station has been substituted for the First/Indiana station to respond to concerns about going under Evergreen Cemetery and impacts on a local high school and the narrow Indiana Street.

Alignment revisions include:

- A shift from aerial to subway configuration between Little Tokyo and First/Boyle stations, with resulting reduction in curves between these stations,
- An alignment shift between Brooklyn/Soto and First/Lorena stations to avoid the Evergreen Cemetery, and
- An alignment shift between First/Lorena and Whittier/Rowan stations to reflect the shift in the First/Lorena station location and to avoid Ramona High School.

Operational enhancements include:

- The addition of crossovers at the First/Boyle and Whittier/Rowan stations, and
- The definition of bus facilities for terminating bus lines at the Brooklyn/Soto, First/Lorena, Whittier/Rowan, Whittier/Arizona and Whittier/Atlantic stations.

Facility definition refinements include:

- The addition of parking facilities at the First/Lorena station.

Initial operating segment (IOS) definition revisions include:

- The addition of a shorter IOS to allow for various funding scenarios.

S-7.1 REVISIONS TO STATION LOCATIONS

Station locations and alignments between stations are mutually dependent. In some instances, e.g. Little Tokyo, a station shift required a shift in the alignment around the station, both horizontally and vertically. In other instances, a shift in alignment, e.g. avoidance of Evergreen Cemetery, required a change in station location (e.g. from First/Indiana to First/Lorena). Stations are discussed in this section and alignments are discussed in the following section.

S-7.1.1 Metro Rail Yard (Little Tokyo Station)

Alternative 9B included an aerial station on the east side of the Metro Rail yard. During preliminary engineering it was determined that a station in this location would adversely affect yard activities and would reduce, by almost one-third, the amount of track available for storage and maintenance of the Metro Rail fleet. Moving the station to Santa Fe Avenue resulted in alignment adjustments between the Little Tokyo station and First/Boyle station. (These adjustments are more fully discussed in Section 2-6.2.1.

There was a reduction in alignment impacts that occurred with the shift from an aerial to a subway configuration. In order to connect the previously proposed aerial station with the First/Boyle station on the east side of the Los Angeles River, an aerial structure would have required a portal immediately adjacent to the Aliso Village housing project, requiring significant right-of-way from both residential and industrial facilities. Both construction and operational impacts on the housing project would have been adverse, because the tunnel section would have been shallow enough that it would have been difficult to mitigate noise and vibration impacts.

Impacts on historic resources from the previously proposed aerial station and associated aerial segment over the Los Angeles River included adverse visual effects on the National Register eligible First and Fourth Street bridge structures. Portions of the Aliso Village housing project may also be eligible for the National Register and would have been adversely affected because of takings during construction and noise and vibration impacts after construction.

A number of studies were performed to reduce impacts on yard operations and to reduce the costs of the station. The proposed station under Santa Fe Avenue is essentially the same as the underground station shown in the AA/DEIS/DEIR in Alternative 9A. As part of preliminary engineering, it was identified as the least costly alternative, largely because it (1) allows a more direct subway connection to the First/Boyle station on the east side of the river, (2) involves less acquisition of property on the west side of the river for additional yard capacity and on the east side of the river for a portal, (3) would not involve a bridge over the river and (4) would not require any disruption, replacement or relocation of yard facilities.

S-7.1.2 First/Boyle Station

The First/Boyle station was rotated counter-clockwise to respond to the change in the curves from the Little Tokyo station. The station entrance at Mariachi Plaza did not change, but the underground alignment of the station rotated counter-clockwise. Instead of being under First Street, it is now located diagonally under the First/Boyle intersection. This change would reduce the curves both entering and leaving this station, allowing for higher rail system speeds. In addition, the change in station orientation would reduce the impacts on traffic by placing over two-thirds of the station off-street.

S-7.1.3 First/Lorena Station

A station at First/Lorena (originally part of Alternative 6 in the AA/DEIS/DEIR) was substituted for the First/Indiana station shown in Alternative 9, when it was decided to change the alignment so as to avoid Evergreen Cemetery. Section 2-6.2.2 discusses the alignment alternatives studied to avoid Evergreen Cemetery.

The First/Lorena Station shown in the AA/DEIS/DEIR was shifted eastward slightly to avoid a driveway entrance to Evergreen Cemetery. The station entrance is on the northeast corner of First Street and Lorena Street, as shown in the AA/DEIS/DEIR. Shifting the station eastward also required "notching" the roof of the station to accommodate a 72-inch storm drain structure in Lorena Street.

S-7.2 ALIGNMENT REVISIONS

Most of the alignment revisions were made to reflect changes in station locations or to avoid conflicts with sensitive uses.

S-7.2.1 Shift from Aerial to Subway Between Little Tokyo and First/Boyle Stations

With an aerial station in the yard, the line section was also aerial. In order to get from the aerial yard station to the station at First/Boyle, an elaborate S-curve was required, heading first south out of the station, east across the river, north and then east to reach the First/Boyle station. With a subway configuration for the Little Tokyo station, it was possible to flatten the curve and reduce the length of track because the subway alternative does not require specific vertical clearances for bridge structures, other railroad structures and streets. The subway alternative also reduced acquisition costs by eliminating the need for acquiring industrial structures on the east side of the river for the portal.

S-7.2.2 Brooklyn/Soto Station to First/Lorena Station

A number of comments on the AA/DEIS/DEIR were received from members of the eastside community expressing concern about the subway going under any portion of Evergreen Cemetery. The alignment for Alternative 9B proceeded east under Brooklyn Avenue from the Brooklyn/Soto station, and then curved south on to Indiana Avenue before proceeding to a station at First Street and Indiana Avenue. The curve from Brooklyn Avenue to Indiana Avenue crossed under the northeast corner of Evergreen Cemetery.

In order to avoid Evergreen Cemetery, there were basically two choices: 1) stay under Brooklyn Avenue and curve south to the east of the cemetery or 2) curve south to the west of the cemetery to get to First Street. The first alternative would have eliminated any opportunity for a station in the First/Indiana/Lorena area because the radius of the curve would swing too far east to serve this activity area. The second alternative, curving south just east of the Brooklyn/Soto station and then proceeding east under First Street to Lorena Street, was selected because it maintained service to the First/Indiana/Lorena area. The station entrance at First/Lorena would be about 350 feet west of the station entrance at First/Indiana.

S-7.2.3 First/Lorena Station to Whittier/Rowan Station

As noted in Section 2-6.1.3, the First/Lorena Station was shifted eastward to avoid conflicts with a driveway entrance to Evergreen Cemetery. Because the station box is only about 350 to 400 feet west of Indiana Avenue, it was not possible to immediately curve south on Indiana Avenue;

the curve radius would be too tight. In order to keep the alignment under a street and away from Ramona High School, the alignment was shifted eastward to Alma Avenue.

S-7.3 OPERATIONAL ENHANCEMENTS

S-7.3.1 Crossovers

Current operating criteria require that a minimum 10-minute single tracking headway be achievable anywhere along the line. In order to achieve this operating standard, crossovers are defined at the following stations: First/Boyle, First/Lorena, Whittier/Rowan and Whittier/Atlantic. The First/Lorena and Whittier/Atlantic crossovers were shown in the AA/DEIS/DEIR.

S-7.3.2 Bus Facilities

Transportation planning during preliminary engineering has included analyses of bus operations and the need to provide facilities for terminating certain routes at LPA stations. All station plans, except Little Tokyo and First/Boyle, now include accommodations for terminating bus lines.

S-7.4 INITIAL OPERATING SEGMENTS

The AA/DEIS/DEIR discussed an Initial Operating Segment (IOS) that would consist of the first four LPA stations: Little Tokyo, First/Boyle, Brooklyn/Soto and First/Lorena. In response to potential funding timing constraints, an additional IOS has been identified and impacts analyzed in this FEIR. IOS-1 would consist of stations at Little Tokyo and First/Boyle. IOS-2 would consist of the first four stations.

S-7.5 PARKING FACILITIES

In addition to the parking facilities identified for the Whittier/Atlantic station, the FEIR has identified a parking facility at the First/Lorena Station. The facility could include up to 500 cars. It was identified as part of the IOS-2 definition under which the First/Lorena Station would function as a temporary end-of-line station.

S-7.6 STREET NAME CHANGE

The City and County of Los Angeles have changed the name of Brooklyn Avenue to Cesar Chavez Avenue. For this final EIR, however, the street name of Brooklyn Avenue has been used due to its extensive use in the AA/DEIS/DEIR on various graphics and in numerous tables.

S-8 SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES

Table S-8.1 summarizes by subject area the potential environmental impacts for each of the alternatives under consideration in this Final EIR. The mitigation measures are summarized in the table, and levels of significance for the potential environmental impacts under CEQA are identified for both before and after the application of these mitigation measures. A detailed discussion of these impacts, mitigation measures and levels of significance under CEQA can be found in Chapters 3 and 4 of this Final EIR.

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
3-1 TRANSIT				
No-Build	• 1,498,700 daily regional transit trips (2010).	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• 1,630,678 daily regional transit trips (2010) • 65,902 daily LPA rail boardings/alightings (2010) • 131,978 more daily new transit trips than No-Build	Beneficial	• None Required	Beneficial
Initial Operable Segment-1	• 1,625,885 daily regional transit trips (2010) • 21,030 daily IOS-1 rail boardings/alightings (2010) • 127,185 more daily new transit trips than No-Build	Beneficial	• None Required	Beneficial
Initial Operable Segment-2	• 1,626,663 daily regional transit trips (2010) • 31,378 daily IOS-2 rail boardings/alightings (2010) • 127,963 more daily new transit trips than No-Build	Beneficial	• None Required	Beneficial
3-2 TRAFFIC				
No-Build	• 15 instances of intersections operating at LOS E or F would occur during p.m. peak hour (2010), an increase of 11 over existing conditions.	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Compared to No-Build, 4 intersections significantly affected: o Whittier Boulevard/Lorena Street o Whittier Boulevard/Indiana Street o Whittier Boulevard/Atlantic Boulevard o Whittier Boulevard/Arizona Boulevard • 16 intersections would operate at LOS E or F, an increase of 1 over 2010 No-Build.	Significant	• At Whittier/Lorena: o No feasible mitigation	Significant
			• At Whittier/Indiana: o Add westbound left-turn lane via restriping Whittier Boulevard on the east and west approaches or o Provide enhanced shuttle service focused on First/Lorena station via Indiana and Lorena Streets. • At Whittier/Arizona: o Add east and westbound left turn lanes via restriping. • At Whittier/Atlantic: o Add dual left-turn lanes in the east/west and southbound directions, requiring road widening on Whittier Boulevard and Atlantic Boulevard.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Initial Operable Segment-1	• No additional intersections would operate at LOS E or F compared to No-Build.	Not Significant	• None Required	Not Significant
Initial Operable Segment-2	• Compared to No-Build, 2 intersections significantly affected: o Whittier Boulevard/Lorena Street o Whittier Boulevard/Indiana Street	Significant	• At Whittier/Lorena: o No feasible mitigation	Significant
			• At Whittier/Indiana: o Add westbound left-turn lane via restriping Whittier Boulevard on the east and west approaches **or** o Provide enhanced shuttle service focused on First/Lorena station via Indiana and Lorena Streets.	Not Significant
3-3 PARKING				
Parking Impacts During Construction				
No-Build	• Not Applicable	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Construction activity and construction worker parking would result in parking demand exceeding 80% of the supply at the following stations: o First/Boyle - 4 off-street spaces removed and 44 on-street spaces removed during 4-year construction period. o Brooklyn/Soto - 25 off-street spaces removed and 24 on-street spaces removed during 4-year construction period. o Whittier/Rowan - 52 on-street spaces removed during decking/street restoration (3 to 3.5 years) and 37 on-street spaces removed during remainder of 4-year construction period	Significant	• Provide replacement parking or park enough construction workers off-site to bring utilization to 80%: o First/Boyle - 14 replacement spaces during decking/street restoration and 9 during remainder of construction period. o Brooklyn/Soto - 99 replacement spaces o Whittier/Rowan - 77 replacement spaces during decking/street restoration and 65 spaces for remainder of construction period.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)	• On- and off-street parking would be removed at the following stations but would not result in parking utilization equal to or greater than 80% of supply: o Little Tokyo - 46 on-street spaces removed during decking/street restoration and remainder of construction period o First/Lorena - 44 on-street spaces removed during decking/street restoration only o Whittier/Arizona - 10 off-street spaces removed and 24 on-street spaces removed during decking/street restoration and remainder of construction period. o Whittier/Atlantic - 33 on-street spaces removed during decking/street restoration and 11 on-street spaces removed during remainder of construction period.	Not Significant	• None Required	Not Applicable
Initial Operable Segment-1	• Parking utilization would exceed 80% of supply at First/Boyle: o 4 off-street spaces removed o 44 on-street parking spaces removed during decking/street restorations and remainder of construction period.	Significant	• At First/Boyle - Provide replacement parking or park enough construction workers off-site to bring utilization to 80% This equals 14 replacement spaces during decking/street restoration and 9 during remainder of construction period.	Not Significant
Initial Operable Segment-2	• Same as IOS-1 plus • Parking utilization would exceed 80% of supply at Brooklyn/Soto: o 25 off-street spaces removed o 24 on-street spaces removed during decking/street restoration and remainder of 4-year construction period.	Significant	• Same as IOS-1 plus • At Brooklyn/Soto - provide 99 replacement spaces.	Not Significant
Parking Impacts During Operation				
No-Build	• Parking demand would equal or exceed 80% of supply at the following station (2010): o Brooklyn/Soto	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Estimated park-and-ride supply of 1,200 spaces at First/Lorena station would meet estimated demand of 978 spaces.	Not Significant	• None Required	Not Applicable

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)	• Increased utilization of spaces in proximity to rail stations (where no park-and-ride facility planned) due to rail system attracting riders. Parking demand would equal or exceed 80% of supply at the following stations: o Little Tokyo o First/Boyle o Brooklyn/Soto o Whittier/Rowan	Significant	• Conduct periodic studies of parking intrusion into neighborhoods. Establish preferential parking districts as appropriate. • Provide bicycle parking. • Include preferential parking for carpools/vanpools at parking facilities. • Provide metered and unmetered curb spaces in commercial areas. • Support employer-sponsored rideshare or transit incentive programs. • Provide parking enforcement against potential parking intrusion into adjacent, private commercial parking.	Not Significant
Initial Operable Segment-1	• Estimated parking demand of 733 spaces at First/Boyle IOS-1 terminal station.	Significant	• See mitigation measures for the LPA	Not Significant
	• Parking demand could exceed 80% of supply at the Little Tokyo and First/Boyle stations.	Significant	• See mitigation measures for the LPA	Not Significant
Initial Operable Segment-2	• Estimated park-and-ride supply of 500 spaces at First/Lorena station would meet estimated demand of 479 spaces.	Not Significant	• None Required	Not Applicable
	• Parking demand would equal or exceed 80% of supply at the following stations o Little Tokyo o First/Boyle o Brooklyn/Soto	Significant	• See mitigation measures for the LPA	Not Significant
4-1 LAND USE AND DEVELOPMENT				
No-Build	• Regional planning agency (SCAG) projects residential & non-residential growth between 1990 and 2010 throughout Eastside Corridor. Insufficient capacity may exist for residential growth projected by SCAG in Little Tokyo (964 units) and First/Boyle (502 units) station areas.	Not Applicable	• Not Applicable	Not Applicable

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative	• Presence of rail at Little Tokyo and First/Boyle stations could accelerate projected residential growth in the station influence areas.	Potentially Significant	• Review community plan designations and zoning to permit additional residential development around station area(s), consistent with urban design considerations and community concerns. Focus residential growth around station area(s) through application of urban design strategies. • Develop station area planning and urban design analyses to: (1) promote mobility, (2) coordinate with other economic/revitalization efforts, (3) aid in achieving economic revitalization goals, (4) work with local jurisdictions to ensure proper densities and land uses.	Not Significant
	• Presence of rail could complement development objectives in all other station influence areas.	Potentially Beneficial	• None required	Potentially Beneficial
Initial Operable Segment-1	• Presence of rail at Little Tokyo and First/Boyle stations could accelerate projected residential growth in the station influence areas.	Potentially Significant	• See LPA regarding Little Tokyo and First/Boyle stations	Not Significant
Initial Operable Segment-2	• Presence of rail at Little Tokyo and First/Boyle stations could accelerate projected residential growth in the station influence areas.	Potentially Significant	• See LPA regarding Little Tokyo and First/Boyle stations	Not Significant
	• Presence of rail could complement development objectives in Brooklyn/Soto and First/Lorena station influence areas.	Potentially Beneficial	• None required	Potentially Beneficial

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-2 ECONOMIC IMPACTS				
No-Build	• No impact is anticipated	Not applicable	• Not Applicable	Not applicable
Locally Preferred Alternative	• 2,500-3,000 construction jobs per year over 10-year period. • Indirect economic benefits of $1,104,700,000.	Beneficial	• None required	Beneficial
	• Annual property tax losses: o City of Los Angeles: $22,916 o County of Los Angeles: $185,810 • Some reduction in sales tax and business license fee revenues	Not Significant	• Project-induced growth may enhance city, county and state tax revenues	Not Significant
Initial Operable Segment-1	• 1,200-1,500 construction jobs per year over 5-year period. • Indirect benefits of $273,400,000	Beneficial	• None Required	Beneficial
Initial Operable Segment-1 (Cont'd)	• Annual property tax losses: o City of Los Angeles: $8,351 o County of Los Angeles: $17,265 • Some reduction in sales tax and business license fee revenues	Not Significant	• Project-induced growth may enhance city, county and state tax revenues	Not Significant
Initial Operable Segment-2	• 2,500-3,000 construction jobs per year over 5-year period. • Indirect benefits of $560,300,000	Beneficial	• None Required	Beneficial
	• Annual property tax losses: o City of Los Angeles: $22,916 o County of Los Angeles: $52,105 • Some reduction in sales tax and business license fee revenues	Not Significant	• Project-induced growth may enhance city, county and state tax revenues	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-3 LAND ACQUISITION/DISPLACEMENT & RELOCATION				
No-Build	• No impacts anticipated	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Acquisition of 17 single-family and 181 multi-family residential dwelling units, displacing 825 persons. • Acquisition of 55 businesses, displacing 389 employees.	Significant	• Relocation assistance under the Uniform Relocation Assistance and Real Property Acquisition Policies Act	Not Significant
	• Acquisition and demolition of a portion of the housing stock in the Corridor, resulting in significant impacts at the First/Boyle, Brooklyn/Soto, Whittier/Rowan and Whittier/Arizona station areas to the extent that the residents desire to be relocated within the subject station influence area.	Potentially Significant	• MTA will work with the community, elected officials, local housing agencies and other housing providers to implement a program to replenish loss of housing stock, with family and senior citizen housing to be included in MTA and joint development projects. The program will include: o Transit-based housing development: MTA will make available sites for joint development including housing; station sites not available until after station construction; site-specific programs developed through Community Transportation Linkages Program. o Pre-development financing and housing rehabilitation: $5 million revolving loan fund targeted to assist community-based developers and property owners develop in station areas. o Reuse of existing structures: MTA will develop a program to offer structures to community-based housing and social service providers prior to demolition of existing structures.	Potentially Significant
Initial Operable Segment-1	• Acquisition of 6 single-family and 57 multi-family residential dwelling units, displacing 247 persons. • Acquisition of 2 businesses, displacing 6 employees	Significant	• Relocation assistance under the Uniform Relocation Assistance and Real Property Acquisition Policies Act	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS				
POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Initial Operable Segment-1 (Cont'd)	• Acquisition and demolition of a portion of the housing stock in the Corridor, resulting in significant impacts at the First/Boyle station area to the extent that the residents desire to be relocated within that station influence area.	Potentially Significant	• See LPA mitigation regarding housing stock.	Potentially Significant
Initial Operable Segment-2	• Acquisition of 6 single-family and 138 multi-family residential dwelling units, displacing 590 persons. • Acquisition of 11 businesses, displacing 76 employees	Significant	• Relocation assistance under the Uniform Relocation Assistance and Real Property Acquisition Policies Act	Not Significant
	• Acquisition and demolition of a portion of the housing stock in the Corridor, resulting in significant impacts at the First/Boyle, Brooklyn/Soto areas to the extent that the residents desire to be relocated within the subject station influence area.	Potentially Significant	• See LPA mitigation regarding housing stock.	Potentially Significant
4-4 COMMUNITIES/NEIGHBORHOODS - STATION AREA DEMOGRAPHICS				
No-Build	• No impact anticipated	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• All stations are located in areas with high proportions of transit-dependent persons. Proposed rail service would provide new transit connections between East Los Angeles and other areas. Improved transit access for residents, businesses and communities in neighborhoods served by rail stations.	Beneficial	• None required	Beneficial
	• Construction of the rail alternatives could temporarily adversely affect neighborhoods in the vicinity of stations, including temporary impacts on access/circulation, noise/vibration and air quality.	Potentially Significant	• See Section 4-18, Construction, below.	See Section 4-18
Initial Operable Segment-1	• Little Tokyo and First/Boyle stations are located in areas with high proportions of transit-dependent persons. Proposed rail service would provide new transit connections between East Los Angeles and other areas. Improved transit access for residents, businesses and communities in neighborhoods served by rail stations.	See LPA	• See LPA	See LPA
	• See LPA regarding temporary construction impacts.	Potentially Significant	• See Section 4-18, Construction, below.	See Section 4-18
Initial Operable Segment-2	• Little Tokyo, First/Boyle, Brooklyn/Soto and First/Lorena stations are located in areas with high proportions of transit-dependent persons. Proposed rail service would provide new transit connections between East Los Angeles and other areas. Improved transit access for residents, businesses and communities in neighborhoods served by rail stations.	See LPA	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Initial Operable Segment-2 (Cont'd)	• See LPA regarding temporary construction impacts.	Potentially Significant	• See Section 4-18, Construction, below.	See Section 4-18
4-5 VISUAL & AESTHETICS				
No-Build	• No impact anticipated	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Parking/bus facilities at IOS-2 and LPA termini (First/Lorena and Whittier/Atlantic stations) would change visual setting. • Parking/bus facility at Whittier/Atlantic (Northeast corner of Amalia Avenue and Whittier Boulevard) would cast shade and shadow during a.m. on two houses to the north and during p.m. on three houses to the east.	Not Significant	• MTA will create station-specific master plans to address area development, station design and station art work. • Station sites will include landscaping and art work consistent with neighborhood character. • Lighting at rail termini facilities and park-and-ride lots would be directed onto site premises. • Construction Period Arts Program • At the Whittier/Atlantic station (southwest corner of Whittier/Atlantic), structures would be designed to minimize adverse effects at the Golden Gate Theater. • At the Whittier/Atlantic station (northeast corner of Amalia Avenue and Whittier Boulevard), existing trees along the north side of parking facility will be maintained or replaced to provide a visual buffer between residences and the structure.	Not Significant
Initial Operable Segment-1	• No impact anticipated	Not Applicable	• None Required	Not Applicable
Initial Operable Segment-2	• Parking facilities at First/Lorena would change visual setting.	Not Significant	• See first 4 mitigation measures for LPA above.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-6 AIR QUALITY				
No-Build	• Reduction of emissions over existing conditions due to mandated improvements in vehicular efficiency.	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• 1.77 million vehicle miles per day saved. • Reduction of auto air pollutants (pounds/day): ROG = 1,300, CO = 11,700, NOx = 1,460, PM_{10} = 820. • LPA does not cause or contribute to violation of one- or eight-hour state or federal CO standards. • Addition of park-and-ride lots at First/Lorena and Whittier/Atlantic does not violate one- or eight-hour state or federal CO standards.	Beneficial	• None Required	Beneficial
Initial Operable Segment-1	• 1.70 million vehicle miles per day saved. • Reduction of auto air pollutants (pounds/day): ROG = 1,250, CO = 11,300, NOx = 1,400, PM_{10} = 780. • Does not cause or contribute to violation of one- or eight-hour state or federal standards.	Beneficial	• None Required	Beneficial
Initial Operable Segment-2	• 1.72 million vehicle miles per day saved. • Reduction of auto air pollutants (pounds/day): ROG = 1,260, CO = 11,300, NOx = 1,410, PM_{10} = 790. • Does not cause or contribute to violation of one- or eight-hour state or federal standards. • Addition of park-and-ride lot at First/Lorena does not violate one- or eight-hour state or federal CO standards.	Beneficial	• None Required	Beneficial
4-7 AIRBORNE NOISE				
No-Build	• Future (2010) ambient noise environment expected to remain similar to current conditions.	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Localized noise impacts from vent shafts and ancillary equipment are expected to occur, particularly in the vicinity of the First/Boyle, Brooklyn/Soto, First/Lorena and Whittier/Arizona stations.	Potentially Significant	• Vent shafts and fan vents should be located at least 50 feet from residences, if possible, especially in quieter neighborhoods. • During the final engineering phase of the project, the RCC System Design Criteria will be utilized in selected locations as necessary to reduce noise from vent shafts and ancillary equipment to within RCC noise impact thresholds.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)	• Increased traffic volumes during peak hour periods would potentially result in increases in community noise levels from 3 to 7 dBA at residences along some streets in the First/Boyle, Brooklyn/Soto, Whittier/Rowan, Whittier/Arizona and Whittier/Atlantic station areas.	Significant	• Adopt a traffic control plan to discourage non-local traffic on affected local streets.	Potentially Significant
	• Possible traffic-related noise impacts at residences along Woods Avenue and Louis Place from station and bus/parking facility.	Significant	• Placement of bus entrance on Atlantic Boulevard rather than Woods Avenue or Louis Place. • Noise wall for the southern and western portions of the bus facility.	Not Significant
Initial Operable Segment-1	• Localized impacts from vent shafts at First/Boyle station	Potentially Significant	• See LPA mitigation regarding noise impacts from vent shafts and ancillary equipment.	Not Significant
	• Increased traffic volumes during peak hour periods would potentially result in increases in community noise levels from 3 to 7 dBA at residences along some streets in the First/Boyle station area.	Significant	• Adopt a traffic control plan to discourage non-local traffic on affected local streets.	Potentially Significant
Initial Operable Segment-2	• Localized impacts from vent shafts at First/Boyle and Brooklyn/Soto stations	Potentially Significant	• See LPA mitigation regarding noise impacts from vent shafts and ancillary equipment.	Not Significant
	• Increased traffic volumes during peak hour periods would potentially result in increases in community noise levels from 3 to 7 dBA at residences along some streets in the First/Boyle and Brooklyn/Soto station areas.	Significant	• Adopt a traffic control plan to discourage non-local traffic on affected local streets.	Potentially Significant
4-8 GROUNDBORNE NOISE AND VIBRATION				
No-Build	• No major new sources of groundborne noise and vibration or substantial increases to existing sources of vibration (e.g., automobiles, trucks, etc.) are expected.	Not Applicable	• Not Applicable	Not Applicable

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative	• Structures affected by groundborne noise and vibration: o 303 residential buildings o 1 fire station o 1 hospital o 1 music school o 6 churches o 1 library o 2 schools o 4 medical offices o 1 business office o 1 community building o 1 club	Significant	• Use of approximately 6,400 alignment-feet (i.e., both tracks) of special resilient fasteners and 9,200 alignment-feet of floating slab trackbed • Use of standard design features such as: o continuous welded rail instead of jointed rail o rail vehicles with light weight trucks o resiliently mounted direct fixation fasteners as a rail support system o special grinding and truing equipment.	Not Significant
Initial Operable Segment-1	• Structures affected by groundborne noise and vibration: o 25 residential o 2 churches o 1 school o 1 club	Significant	• See LPA	Not Significant
Initial Operable Segment-2	• Structures affected by groundborne noise and vibration: o 197 residential o 1 fire station o 1 medical office o 4 churches o 2 schools o 1 community building o 1 club	Significant	• See LPA	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-9 GEOTECHNICAL/ SUBSURFACE/ SEISMICITY				
Geotechnical				
No-Build	• No impact anticipated	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	**Landform Alteration:** Significant long-term impacts to existing landforms not expected when project becomes operational.	Not Significant	• See Table S-8.2	Not Significant
	Subsidence: Evidence indicates no ground subsidence currently within project area.	Not Significant		Not Significant
	Cut-and-Cover Excavations for Proposed Station Sites: Vertically cut walls of excavation slough and cave in alluvial soils, particularly when excessively wet or dry.	Potentially Significant		Not Significant
	Mining for Tunnels: Tunnel stability is of concern during construction due to running sand and potential for settlement of soils. Large boulders may be encountered.	Potentially Significant		Not Significant
	Handling of Excavated Material: Soil containing hydrocarbons or chemicals may leach into the subsoil from underground storage tanks.	Potentially Significant		Not Significant
	Subsurface Gas: Hydrogen sulfide and methane are likely to be encountered during tunnel construction between Union Station and north of the Little Tokyo station area. Methane may also be encountered where the LPA crosses the Boyle Heights oil fields. Potential for the accumulation of these gases within the completed tunnel.	Significant		Potentially Significant
	Corrosivity: Subsurface materials along the LPA are mildly to moderately corrosive to concrete, and moderately corrosive to extremely corrosive to metals.	Significant		Not Significant
	Groundwater: Addressed in Section 4-10.	See Section 4-10		See Section 4-10
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA
Pre-existing Hazardous Waste				
No-Build	• No impact anticipated	Not Applicable	• Not Applicable	Not Applicable

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative	• A total of 18 sites were identified in the Stage 1 Environmental Site Assessment. Further analysis identified contaminated soil in the Union Station area, Boyle Heights Oil Field, vicinity of Whittier/Rowan station and vicinity of intersection of Whittier Boulevard and Eastern Avenue.	Potentially Significant	• See Table S-8.2	Not Significant
Initial Operable Segment-1	• 6 sites identified in the Stage 1 Environmental Site Assessment between Union Station and First/Boyle station. Further analysis identified contaminated soil in the Union Station area.	Potentially Significant	• See Table S-8.2	Not Significant
Initial Operable Segment-2	• 9 sites identified in the Stage 1 Environmental Site Assessment between Union Station and the First/Lorena station. Further analysis identified contaminated soil in the Union Station area and Boyle Heights Oil Field.	Potentially Significant	• See Table S-8.2	Not Significant
Seismic				
No-Build	• No impact anticipated	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• In seismically active area and would be subject to severe ground motions during an earthquake on a nearby fault (0.60-0.75g).	Potentially Significant	• Design internal structural elements to resist maximum credible earthquake (0.75g). • If faults are discovered during tunnel construction, determine if fault is potentially active; where active, replace standard concrete tunnel liner with reinforced cast-in-place concrete liner or welded steel lining as appropriate.	Not Significant
	• Crosses 2 escarpments (Coyote Pass and unnamed escarpment 1 mile to the south of Coyote Pass)	Potentially Significant	• Additional studies are being performed to delineate possible faults; preliminary results at the Coyote Pass escarpment suggest that this feature is a fold rather than a fault. • Detailed fault study program to evaluate faulting, folding and potential seismic activity in connection with the two escarpments to serve as basis to meet engineering criteria.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)	• Potential very low for impacts from seiches, earthquake-induced flooding, landslides and surface fault rupture.	Not Significant	• No mitigation necessary	Not Applicable
	• Local zones of potentially liquefiable layers within and below tunnel envelope. These areas include the portion of the alignment from Union Station to 4th Street and within the limits of the Little Tokyo and First/Boyle stations.	Potentially Significant	• As is typically done during final design, additional geotechnical work would be completed for areas where liquefaction may be possible. • Undertake appropriate site preparation & foundation design measures.	Not Significant
Initial Operable Segment-1	• Same as LPA with regard to potential for an earthquake on a nearby fault; seiches, earthquake-induced flooding, landslides and surface fault rupture.	Not Significant	• No mitigation necessary	Not Significant
	• Crosses 1 escarpment (Coyote Pass). • Same as LPA regarding potentially liquefiable areas.	Potentially Significant	• See LPA mitigation regarding fault study program • See LPA mitigation regarding liquefiable areas.	Not Significant
Initial Operable Segment-2	• See IOS-1.	See IOS-1	• See IOS-1	See IOS-1
4-10 WATER RESOURCES				
Surface Water				
No-Build	• No impacts anticipated	Not applicable	• No mitigation necessary	Not applicable
Locally Preferred Alternative	• Potential water quality impacts primarily would be associated with sediment loadings on the storm water and/or surface water systems.	Not Significant	• A Notice of Intent along with a permit application and detailed plans, as required by RWCQB, will be completed. • Installation of oil/water separators with siltation basins.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)	• Dewatering has remote potential to cause ground subsidence and differential settlement of adjacent structures.	Not Significant	• Dewatering areas would be confined to immediate excavation area. • Compressed air, chemical grouting, freezing, slurry shields or earth pressure balance shields may be used. • Dewatering and water discharge would be conducted in conformance with all applicable requirements.	Not Significant
	• Construction at parking lots and park-and-ride lots may introduce negligible quantities of contaminants into storm water runoff.	Not Significant	• None required	Not Significant
	• Possible minor surface erosion at station excavation sites where soil is exposed.	Not Significant	• See Section 4-9.	Not Significant
	• During operation, minimal amounts of water associated with groundwater seepage or rainwater runoff anticipated in tunnels and stations. Pollutants entering tunnel not anticipated to enter surface water.	Not Significant	• Water that may enter tunnel structures and surface runoff will be treated before discharged into drainage system.	Not Significant
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Floodplains				
No-Build	• No impact anticipated	Not Significant	• None required	Not Significant
Locally Preferred Alternative	• Union Station, the proposed Little Tokyo Station and the non-revenue rail lead from Union Station to the Yard may be within a 100-year flood zone.	Potentially Significant	• In the event of flooding in or near the Metro Rail Yard, rail vehicles would be moved to high points along the then existing Red Line alignment; efforts would be made to prevent water from entering the tunnels, Union Station or and other portions of the tunnels by use of sand bags or other feasible options; and flood protection would be designed into the Little Tokyo station by constructing the entrances, emergency exits and ventilation shafts above the 100-year flood level. Any water entering the tunnels would be treated as required.	Not Significant
Initial Operable Segment-1	• See LPA	Significant	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	Significant	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Groundwater				
No-Build	• No impact anticipated	Not Significant	• None required	Not Significant
Locally Preferred Alternative	• Groundwater would be encountered during construction and would require dewatering.	Significant	• Additional piezometers and monitoring wells are recommended in the vicinity of the Little Tokyo Station. In addition, field pump tests will be completed in areas that require pre-construction dewatering. • A dewatering system will be installed where necessary. Design will depend on hydraulic head and level of contamination. • Dewatering will be limited to immediate excavation areas. • To reduce potential settlement during tunneling, use of: o open shield fitted with breasting doors and poling plates for excavation face control. o a shield with a pressure regulated trap door. o a suitable earth pressure balance machine o chemical grouting • For tunneling beneath the groundwater table, use of compressed air, slurry or earth pressure balancing shields. • Plans for dewatering would be coordinated with the California Department of Water Resources and the Central and West Basin Water Replenishment District.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)	• Groundwater contaminated by hydrocarbons and dissolved hydrogen sulfide may be encountered in the vicinity of Union Station.	Potentially Significant	• Contaminated groundwater will be remediated utilizing hydrogen peroxide, filtration, siltation basins, oil water separators and active carbon. • Treated water then will be discharged into the storm drain system.	Not Significant
	• Dewatering would require permits and consultation with RWQCB, CDWR and CWBWRD.	Not Significant	• An NPDES permit will be obtained for dewatering and remediation. • Coordinate with CDWR and CWBWRD regarding pumping and water rights.	Not Significant
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA
4-11 NATURAL FEATURES AND ECOSYSTEMS				
No-Build	• None	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• No significant impacts to biological resources. No habitats for sensitive species affected. Some existing landscaping and common urban vegetation removed during construction.	Not Significant	• No mitigation measures. See Section 4-5 for mitigation regarding landscaping.	Not Significant
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-12 ENERGY				
No-Build	• None	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Reduction in energy consumed due to trip diversion from cars and buses to rail.	Beneficial	• None required	Beneficial
	• Electricity consumed for rail propulsion.	Not Significant	• Use improved traction motor speed controls for better efficiency. Use regenerative braking. Automatic train control. Incorporate energy conservation approaches into station design.	Not Significant
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-13 SAFETY AND SECURITY				
No-Build	• None	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Potential for injury or accident due to fire, faulty equipment or improper boarding or alighting of rail vehicles. Potential for accidents producing fires or other major disasters. Potential for crime and antisocial behavior in rail stations.	Potentially Significant	• Design station entrances to minimize conflicts involving bus/auto traffic and pedestrian traffic/access. • Provide adequate lighting, slip-resistant walking surfaces and fail-safe train control. • Provide adequate emergency exits, stand-by electrical power and emergency response and communications systems. • Use materials with low combustibility. • Incorporate fire protection systems, alarms and ventilation systems and provide other emergency provisions such (i.e., safety evacuation walkways and tunnel cross-passages). • Employ safety measures in station design: clearly light station; avoid low ceilings, columns and darkened areas; use straight and wide stair passages. • Provide intercoms on trains; provide routine transit police patrols of trains and station areas. • Develop emergency response procedures. • Maintain and augment police and security staffing as necessary. • Provide well-trained and adequate police force.	Not significant
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-14 HISTORIC, ARCHAEOLOGICAL AND CULTURAL RESOURCES				
Historic Resources				
No-Build	• None	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Acquisition and demolition of three buildings that appear eligible for the California Register: o Tenement House (First/Boyle station) o Apartments for Elija Ginsburg (Brooklyn/Soto station) o Fallis Residence (Brooklyn/Soto station)	Significant	• Photographic documentation to be archived for future reference	Not Significant
Initial Operable Segment-1	• Acquisition and demolition of one building that appears eligible for the California Register: o Tenement House (First/Boyle station)	Significant	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA
Archaeological				
No-Build	• None	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Presence of cultural deposits within the project areas unknown; each of the stations has low probability for prehistoric sites. • Highest potential for historical sites at First/Boyle and Brooklyn/Soto stations.	Potentially significant	• Review procedures regarding archaeological/paleontological monitors, collection of artifacts, discovery reports and communication with engineers, inspectors, contractors and foremen prior to construction. • Qualified archaeological team to monitor work in cut-and-cover areas and to evaluate deposits encountered to determine their significance. • Provide full-time monitors at First/Boyle and Brooklyn/Soto stations.	Not Significant
Initial Operable Segment-1	• See LPA with regard to presence of cultural deposits. • Highest potential for historical sites at First/Boyle station.	Potentially Significant	• See LPA	Not Significant
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Paleontological Resources				
No-Build	• None	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Tunneling may result in destruction of fossils.	Potentially Significant	• Retain qualified paleontologist to perform periodic inspections of selected portions of excavated materials from tunneling; monitor will insect cut-and-cover excavation at each excavation site. • Prepare treatment plan specifying procedures for recovery, preparation, identification, curation and storage of unusually large or productive fossil occurrence. • Monitor will test screen undisturbed sediment for smaller fossil remains; if found, monitor will flag site to ensure not disturbed by excavation, evaluate site for additional test screening. • Develop storage maintenance agreement with a local museum to accept fossil collections from Corridor. • Prepare final report of any recovered fossil remains.	Potentially Significant
	• Cut-and-cover excavation in station areas may expose fossils	Potentially Significant	• Retain qualified paleontologist to perform periodic inspections of excavations and salvage exposed fossils. • Allow paleontologist to direct grading in area of exposed fossil to evaluate and salvage. • Collect matrix samples; process through fine mesh screens. • Provisions for preparation and curation before fossils are donated to a suitable repository.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA
4-15 SECTION 106 COMPLIANCE - CEQA DETERMINATION NOT APPLICABLE				
No-Build	• None	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Acquisition of property containing the historic AT&SF Outbound Freight House • Acquisition of historic Brooklyn Theater	Adverse Effect	• Contractor required to confine construction traffic to safe distance from structure(s) • Preservation stipulations and covenants regarding transfer, lease or sale of building.	No Adverse Effect
	• Acquisition and temporary move of Jewish Home for Wayfarers and the Walter & Lillie Webb residence.	Adverse Effect	• MTA shall ensure property is moved in accordance with appropriate approaches and properly secured and protect from vandalism or weather damage. • Preservation stipulations and covenants regarding transfer, lease or sale of building.	No Adverse Effect
	• One historic building, the Golden Gate Theater, would be acquired for the Whittier/Atlantic Station and terminal station facilities.	Adverse Effect	• Any adjacent facilities will meet design compatibility provisions of November 1983 Memorandum of Agreement • Preservation stipulations and covenants regarding transfer, lease or sale of building.	No Adverse Effect
Initial Operable Segment-1	• Acquisition of property containing the historic AT&SF Outbound Freight House.	Adverse Effect	• See LPA mitigation for AT&SF Outbound Freight House	No Adverse Effect
	• Acquisition and temporary move of Jewish Home for Wayfarers and Walter & Lillie Webb residence.	Adverse Effect	• See LPA mitigation for Jewish Home for Wayfarers	No Adverse Effect
Initial Operable Segment-2	• Acquisition of property containing the historic AT&SF Outbound Freight House • Acquisition of historic Brooklyn Theater	Adverse Effect	• See LPA mitigation for AT&SF Outbound Freight House and Brooklyn Theater	No Adverse Effect
	• Acquisition and temporary move of Jewish Home for Wayfarers and Walter & Lillie Webb residence.	Adverse Effect	• See LPA mitigation for Jewish Home for Wayfarers	No Adverse Effect

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-16 COMMUNITY FACILITIES/PARKLANDS/CEMETERIES				
Operation				
No-Build	• None	Not Applicable	• Not Applicable	Not Applicable
Locally Preferred Alternative	• Improved transit access to community facilities within the study area, with the exception of police and fire services.	Beneficial	• None required	Beneficial
	• Community facilities affected by noise/vibration during operation: o 1 fire station o 1 hospital o 2 schools o 1 library o 5 other facilities o 6 churches	Potentially Significant	• Floating slab and/or special resilient fasteners	Not Significant
Initial Operable Segment-1	• Community facilities affected by noise/vibration during operation: o 1 school o 2 churches	Potentially Significant	• See LPA	Not Significant
Initial Operating Segment-2	• Community facilities affected by noise/vibration during operation: o 1 fire station o 1 school o 1 other facility o 5 churches	Potentially Significant	• See LPA	Not Significant
Construction				
Locally Preferred Alternative	• Schools may be affected by increased traffic and potential haul routes	Potentially Significant	• Coordinate with LADOT in implementing traffic signage for pedestrians and motorists in advance of construction sites and equipment. • Develop preferred haul route plans that shall avoid streets on which schools are located; in the case of a potential haul route past a school, trucks shall be prohibited from hauling past the school during normal school hours. • Provide crossing guards within the vicinity of all station construction sites and truck haul routes, as needed and appropriate.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)	• At White Memorial Medical Center, possible closure of parking lot entrance along Pennsylvania Avenue. • East LA Doctor's hospital may be affected by low-level vibration and noise. • Emergency vehicles at both hospitals may experience increased response times due to increased traffic during construction.	Potentially Significant	• Coordinate with hospital officials regarding traffic work site plans to ensure adequate access to hospital facilities. • For East Los Angeles Doctor's Hospital, noise and vibration survey to be performed prior to construction to determine if construction activities would affect hospital's instruments.	Not Significant
	• Noise and vibration may affect 3 churches near the Whittier/Rowan station.	Potentially Significant	• Install floating slab and/or special resilient fasteners.	Not Significant
	• Acquisition of one church in the Whittier/Arizona station area.	Significant	• Provide relocation assistance under the Uniform Relocation Assistance and Real Property Acquisition Policies Act.	Not Significant
	• Noise and vibration may affect a community legal foundation at Whittier Atlantic and community health center at Whittier/Rowan.	Potentially Significant	• Construct soundwalls fronting the community health center during construction. • Install floating slab to reduce noise and vibrations during passing of trains.	Not Significant
	• Police and fire may be affected by increased traffic in station areas.	Potentially Significant	• Coordinate construction activity with police and fire services.	Not Significant
Initial Operable Segment-1	• Schools may be affected by increased traffic and potential haul routes.	Potentially Significant	• See LPA mitigation regarding schools.	Not Significant
	• Emergency response units at White Memorial Medical Center may be affected by increased traffic in station area. • At White Memorial Medical Center, possible closure of parking lot entrance along Pennsylvania Avenue.	Potentially Significant	• Coordinate with hospital officials regarding traffic work site plans to ensure adequate access to hospital facilities.	Not Significant
	• Police and fire may be affected by increased traffic in station areas.	Potentially Significant	• See LPA mitigation regarding police and fire services.	Not Significant
Initial Operable Segment-2	• See IOS-1	See IOS-1	• See IOS-1	See IOS-1
4-17 SECTION 4(f) EVALUATION - NOT APPLICABLE				

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-18 CONSTRUCTION IMPACTS				
No-Build	• No construction impacts.	Not Applicable	• Not Applicable	Not Applicable
4-18.1 CONSTRUCTION METHODS				
Locally Preferred Alternative	• Construction of LPA will involve construction impacts as described in subsequent sections. The mitigation measures listed here reflect standard practices of the MTA to reduce anticipated impacts.	Not Applicable	See Table S-8.3	Not Applicable
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA
4-18.2 CONSTRUCTION IMPACTS - TRAFFIC				
Locally Preferred Alternative	• Some permanent street closures in vicinity of all stations for duration of construction period (3-4 years).	Not Significant	• Package construction contracts so that multiple excavation efforts do not happen in close proximity to one another. • Work with LADOT and LACDPW to prepare work site Traffic Control Plans in final design documents identifying detour routes, signing/barricade locations and turnarounds. • Develop preferred haul route plans for each construction package prohibiting use of local residential streets or streets on which schools are located; if no alternative exists, prohibit trucks from hauling past schools during school hours. • If tunnel excavation site is at either First/Boyle or Whittier Rowan station:	Not Significant
	• Temporary lane and night-time street closures (3-7 months) for deck installation/restoration at the following "in-street" stations: o First/Boyle o First/Lorena o Whittier/Rowan o Whittier/Atlantic	Potentially Significant		Not Significant
	• Intersections significantly affected by truck trips to/from tunnel excavation sites (PM peak hour only, assuming 8-hour schedule) are: o Soto Street at Wabash Street o Lorena Street at Whittier Boulevard o Route 101 southbound ramps at Fourth Street o Indiana Street at Whittier Boulevard	Significant		Not Significant
	• Intersections significantly affected by truck trips to/from station area (PM peak only, assuming 8-hour schedule) if simultaneous trucking of tunnel and station excavation materials: o Route 101 southbound ramps at Fourth Street o Atlantic Boulevard at Whittier Boulevard o Lorena Street at Whittier Boulevard o Soto Street at I-10/Wabash Street.	Significant		Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)	• Addition of construction equipment and worker trips to existing traffic.	Not Significant	o Avoid concentrating truck hauling activities into an 8-hour period. o Minimize truck hauling activities in the PM peak hour. o Develop haul route plan that distributes trucks over more than one arterial street route to/from freeways, but avoids local residential streets; trucks should also avoid Fourth Street ramps to access Route 101. • Spread hauling operations over more than one shift (not concentrated in one 8-hour period). • Coordinate with other major construction projects within 1-mile radius to avoid overlapping haul routes.	Not Significant
Initial Operable Segment-1	• Some permanent street closures in vicinity of Little Tokyo and First/Boyle stations for duration of construction period (3-4 years).	Not Significant	• See LPA	Not Significant
	• Temporary lane and nighttime street closures (4 months) for deck installation/restoration at First/Boyle stations.	Potentially Significant	• See LPA	Not Significant
	• Intersection at Rt.101 southbound ramps at Fourth Street could be significantly affected by truck trips to/from tunnel excavation site at First/Boyle station (PM peak hour only). • Same intersection could be significantly affected by simultaneous trucking of tunnel and station excavated materials.	Significant	• See LPA	Not Significant
	• Addition of construction equipment and worker trips to existing traffic.	Not Significant	• See LPA	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Initial Operable Segment-2	• Some permanent street closures in vicinity of all IOS-2 stations for duration of construction period (3-4 years)	Not Significant	• See LPA	Not Significant
	• Temporary lane and nighttime street closures (3-6 months) for deck installation/restoration at First/Boyle and First/Lorena stations.	Potentially Significant	• See LPA	Not Significant
	• Intersection at Route 101 southbound ramps at Fourth Street could be significantly affected by truck trips to/from tunnel excavation site at First/Boyle station (PM peak hour only). • Intersection at Soto Street at Wabash Street could be significantly affected by truck trips to/from tunnel excavation site at Brooklyn/Soto station (PM peak hour only). • Same two intersections could be significantly affected by simultaneous trucking of tunnel and station excavation materials.	Significant	• See LPA	Not Significant
	• Addition of construction equipment and worker trips to existing traffic.	Not Significant	• See LPA	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-18.3 CONSTRUCTION IMPACTS - AIR QUALITY				
Locally Preferred Alternative	• SCAQMD threshold criteria would be violated for: o NOx during utility relocation, o NOx and PM_{10} during site preparation/demolition, o CO, NOx, ROG, PM_{10} during station excavation o CO, NOx, ROG, PM_{10} during station construction o CO, NOx, ROG, PM_{10} during tunnel boring, and o NOx,ROG,PM_{10} during parking structure excavation and construction. • Cumulative emissions would violate SCAQMD threshold criteria for: o NOx,ROG and PM_{10} during utility relocation and site preparation/demolition, o CO, NOx, SO_2, ROG and PM_{10} during station excavation and tunnel boring, and o CO, NOx, ROG and PM_{10} during station construction and parking structure excavation/construction.	Temporary/ Potentially Significant	Mitigation measures that would reduce PM_{10} (fugitive dust) emissions include: • Comply with SCAQMD Rule 403 and Rule 1403; • Pave or chemically treat all unpaved road surfaces, parking lots and vehicle staging areas; • Pave construction access roads as soon as created; • Establish dirt removal programs; • Phase grading to prevent susceptibility of large areas to erosion; • Schedule activities to minimize exposed excavated soil; • Cover road surface with material of lower silt content or soil stabilizers; • Suspend grading during first and second-stage smog alerts and high winds; • Water/chemically treat all active projects multiple times daily; require enclosures of open storage piles of sand or dirt; • Prohibit parking on unpaved lots; • Require enclosures or chemical stabilization of open storage piles of sand, dirt or other aggregate materials; and • Require trucks hauling dirt, sand, soil, backfill to be covered with tarpaulin from point of origin to destination.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Locally Preferred Alternative (Cont'd)			Mitigation measures that would reduce construction-related emissions include: • Maintain construction equipment by keeping it tuned, • Use clean and low-sulfur fuel for equipment when available, • Use low emission on-site stationary equipment, • Use existing power sources or clean-fuel generators, • Use low emission on-site stationary equipment as feasible, and • Phase the construction activites. Mitigation measures that would reduce construction traffic emissions through traffic flow improvements include: • Configure parking to minimize traffic interference, • Minimize obstruction on through-traffic lanes, • Provide flag-person to guide traffic, • Schedule operations affecting traffic for off-peak hours, • Develop traffic plan to minimize traffic flow interference, • Schedule goods movements for off-peak hours as feasible, and • Provide dedicated turn lanes as appropriate. Mitigation measures that would reduce VOC emissions include: • Use precoated and natural materials for finished surfaces, • Use water based or low-VOC materials for architectural surfaces, and • Use low-emitting spray equipment.	
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS		CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA
4-18.4 CONSTRUCTION IMPACTS - NOISE				
Locally Preferred Alternative	• Short-term, localized impacts from equipment and construction processes. Greatest potential for adverse effects at the following stations: First/Boyle, Brooklyn/Soto, First/Lorena and Whittier/Arizona	Potentially Significant	• RCC System Design Criteria would be followed. • Cut-and-cover would shield station noise. • Provide permissible noise limits in construction contracts. • Conduct periodic noise. measurements at identified sensitive receptors. • Contractor to use equipment that meets allowable noise criteria. • Drilled-pile construction to be used, not driven piles.	Potentially Significant
	• Concreting from drop holes in residential areas may produce short-term (one-week) noise impacts; significant only if concreting were to occur at night.	Potentially Significant	• No nighttime concreting permitted in residential areas, unless special noise abatement measures are adopted to satisfy appropriate residential noise criterion.	Not Significant
Initial Operable Segment-1	• See LPA regarding First/Boyle station.	Potentially Significant	• See LPA	Potentially Significant
	• See LPA regarding drop holes.	Potentially Significant	• See LPA mitigation regarding drop holes.	Not Significant
Initial Operable Segment-2	• See LPA regarding First/Boyle and Brooklyn/Soto stations.	Potentially Significant	• See LPA	Potentially Significant
	• See LPA regarding drop holes.	Potentially Significant	• See LPA mitigation regarding drop holes.	Not Significant

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-18.5 CONSTRUCTION IMPACTS - VIBRATION				
Locally Preferred Alternative	• Short-term groundborne vibration lasting one 1 to 2 days while tunneling machine passes nearby residential buildings or other sensitive receptors.	Not Significant	• RCC System Design Criteria would be followed. • Noise-reduction measures also serve to reduce vibration. • Contractor shall conduct activities so that vibration levels at a distance of 200 feet from the construction limits do not exceed rms unweighted vibration velocity levels over 1 to 100 Hz. • Vibration levels and time of work restrictions can be implemented in specially-designated locations.	Not Significant
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA
4-18.6 CONSTRUCTION IMPACTS - UTILITIES				
Locally Preferred Alternative	• Cut-and-cover construction at all station sites will require temporary supporting and/or rerouting of smaller utility lines. • Larger (36-inch or greater) gravity flow lines at Whittier/Rowan, Whittier/Arizona and Whittier/Atlantic stations may require support by auxiliary set of beams spanning between sheeting system. • Short-term, localized disruption to utility service.	Potentially Significant	• Periodic coordination with utility providers during final design and construction • Scheduling and notification of adjacent properties affected by temporary service disruption. • Protect/temporarily relocate utilities as necessary.	Not Significant
Initial Operable Segment-1	• Cut-and-cover construction at all station sites will require temporary supporting and/or rerouting of smaller utility lines. • Short-term, localized disruption to utility service.	Potentially Significant	• See LPA	Not Significant
Initial Operable Segment-2	• See IOS-1	See IOS-1	• See IOS-1	See IOS-1

TABLE S-8.1: SUMMARY OF ENVIRONMENTAL IMPACTS

	POTENTIAL ENVIRONMENTAL IMPACTS	CEQA DETERMINATION OF SIGNIFICANCE	MITIGATION MEASURES	CEQA SIGNIFICANCE AFTER MITIGATION
4-18.7 CONSTRUCTION IMPACTS - BUSINESS DISRUPTION				
Locally Preferred Alternative	Businesses in station areas would experience temporary: • elimination of off-street parking, • elimination of vehicular access to businesses, • noise, vibration and dust, and • reduction in visibility.	Not Significant	• See Table S-8.3	Not Significant
	• Temporary reduction in visibility and pedestrian access to businesses in the Whittier/Atlantic station area.	Potentially Significant		Potentially Significant
Initial Operable Segment-1	• See LPA	See LPA	• See LPA	See LPA
Initial Operable Segment-2	• See LPA	See LPA	• See LPA	See LPA

Source: Myra L. Frank & Associates, Inc., 1994.

TABLE S-8.2: GEOTECHNICAL/SUBSURFACE/SEISMICITY MITIGATION MEASURES

Landform Alteration

- No mitigation necessary.

Sensitive Structures Survey

- A survey will be conducted during final design to locate structures adjacent to tunnel and surface excavations that would require special construction stabilization.

Cut-and-Cover Operations

- Special shoring will be used to prevent sloughing or caving of the soils and possible distress to surrounding structures from loss of support.
- After cut-and-cover excavations, reinforced concrete slabs will be placed for base, intermediate and roof levels along with exterior perimeter walls.
- Where possible, major surface excavations will be located adjacent to undeveloped land. Small or inexpensive structures located adjacent to proposed excavations may be removed if efforts to protect such structures would be more expensive than the structures themselves.
- In some areas, temporary shoring will be combined with limited excavation stages and controlled groundwater removal to minimize earth movements and allow excavation next to existing structures.
- If poor soil conditions are encountered or if deep excavations are planned adjacent to major surface structures, underpinning may be required.
- Other options may be used in lieu of pier or pile underpinning: (1) chemical grouting (using approved non-toxic grouts) in sandy soils and 2) compaction grouting in sands, silts and clays.

Mining for Tunnels

- For soft ground reaches, a shield will be used in conjunction with the tunnel shield machine (TSM) and all excavation will take place within the shield.
- Immediately after tunneling, precast concrete liners will be installed to ensure support and stability.
- A permanent support system of cast-in-place concrete segments will be installed inside of the precast concrete liners. In hard rock tunnels, support will be provided by rock bolts, shotcrete or arch ribs and lagging. In areas where running sands are anticipated, chemical grouting of the soils ahead of the TSM may be required.

Excavation Material Handling

- Most subsoil is expected to be classified Group 3, which is suitable as fill material. The construction contractors have the option of selling this type of soil to interested buyers. If the contractor were unable to sell or otherwise dispose of Group 3 excavated materials, they could be hauled to Class III disposal sites.
- Surface accumulations of sediment from excavation and excavated materials handling activities will not be allowed to reach significant volumes. As part of their contractual obligation, construction contractors will be required to immediately clean up any and all contamination generated as a result of contractor or subcontractor activities. Periodic cleaning of streets and sidewalks in the construction area will be required to regularly remove the more nominal, day-to-day operational spills activity.

Groundwater

- See Section 4-10 of Table S-8.1 for discussion of groundwater mitigation.

Continued

TABLE S-8.2: GEOTECHNICAL/SUBSURFACE/SEISMICITY MITIGATION MEASURES

Subsurface Gas

- The avoidance of safety hazards from explosive gas in tunnels will be a primary element in project planning and construction efforts. The following measures are planned for tunneling in gassy or potentially gassy ground.

  Construction

  - Additional test borings will be made in advance of the LPA heading to identify upcoming hazardous conditions.
  - Methods will be used for locating uncharted oil and gas wells. A magnetometer could be used to detect ferrous metals in the path of the excavator; although RCC is currently evaluating alternative technologies for identifying abandoned oil wells, e.g., ground penetrating radar or impulse radar scanning.
  - In coordination with the California Division of Oil and Gas, MTA will establish procedures to safely plug and abandon oil or gas wells. Use of a magnetometer or other techniques to identify abandoned wells along with well abandonment procedures will be included in the construction contracts.
  - MTA will provide available methane gas documentation and interpretations by qualified experts to those bidding on the construction contracts involving tunneling or station construction.
  - MTA will include in bid documents for tunneling or station construction the requirements that, prior to commencing underground work, the contractor provide all employees involved in underground construction work with at least eight hours of training in dealing with the hazards created by subsurface gas, including safety precautions and emergency procedures to be followed when working underground.
  - Periodic emergency drills and simulated rescues will be staged to reinforce the training. These procedures will be implemented through the Metro Rail Project "Construction Safety and Security Manual."
  - In tunnels classified "gassy" or "potentially gassy," MTA will require that all equipment at the face meet CAL OSHA requirements for permissible or Class I Division II equipment. The tunneling machines will have gas sensors that automatically stop operations at pre-set levels and all workers in the tunnels will, at all times, have self-contained self-rescuers.
  - To detect unknown geologic faults, groundwater or subsurface gas pockets that the project may cross, MTA will assign a trained and qualified geologic technician under the direction of a certified engineering-geologist to monitor the working faces of the tunnel. The engineering-geologist will inspect and log the tunnel geology to obtain accurate information about, and timely interpretation of, geologic conditions encountered during construction. MTA will use this information to map the location of ground water, gassy ground and geologic faults, and will modify the tunnel design to accommodate these factors.
  - Based on the results of the geologic evaluation of tunnels, MTA will review its plans for incorporating adequate backup power supplies and utilize fixed or mobile generators to supply emergency power for the ventilation and dewatering pumps in critical areas.
  - MTA has specified the use of membrane clamps and seals on grout holes and grout pipes to ensure that the membrane surrounding the tunnel is properly sealed and closed off after grouting. Conduit seals and collars will be installed on any penetrations. MTA has included detailed procedures for installing membrane in contract specifications. This same procedure will be used for the next phase of construction.
  - MTA will comply with Title 8, Subchapter 5, Groups 1 and 2 of the Electrical Safety Orders, CAC, and other special orders, as may be issued by the California Division of Occupational Safety and Health.
  - MTA will coordinate final design and construction of the next phase of the Metro Rail Project with the California State Division of Occupational Safety and Health, which has responsibility for compliance with state orders on safety of subsurface tunneling through hazardous material.
  - MTA will continue to ensure ongoing coordination with local fire departments and invite key personnel underground during construction to familiarize them with the tunnel.
  - MTA will locate gas probes and abandon them in a safe manner. MTA has established procedures for backfilling the borings after there is no further need to monitor the probe. A separate group, responsible to the Construction Manager, will collect, reduce and interpret gas data.

TABLE S-8.2: GEOTECHNICAL/SUBSURFACE/SEISMICITY MITIGATION MEASURES

<u>Monitoring</u>

- MTA will monitor measurements taken by gas probes and the ventilation air in the tunnel before and during construction. Automatic and manual gas monitoring equipment will be provided for the heading and return air provided in the tunnels where mechanical excavators are being used. The monitoring equipment will shut down the mechanical excavators under specific defined conditions.
- Audible and visual warning devices will be installed on tunnel excavating machines and in the tunnels to alert employees when detectors have identified the presence and levels of methane gas.
- Records of gas tests and air flow measurements will be available at the surface and to the California Division of Industrial Safety/Mining and Tunneling Unit.

<u>Ventilation</u>

- An adequately sized collection and ventilation system will be installed to prevent the buildup of explosive gas concentrations anywhere in the tunnel.
- MTA will coordinate final design and construction with the California State Division of Safety and Health, which has responsibility for compliance with state orders on safety of subsurface tunneling through hazardous materials. The applicable controlling provisions of the California Administrative Code (Title 8, "Industrial Relations," Chapter 4: "Division of Industrial Safety (Division)," and Subchapter 20: "Tunnel Safety Orders") are among the most stringent tunnel safety orders in the country.
- The design of tunnels includes a high-density polyethylene (HDPE) membrane, one-tenth of an inch thick, to prevent the entry of hydrocarbons (including methane gas) into the tunnel. Procedures have been developed for sealing potential leaks in the membrane by the use of collars, clamps and gaskets.
- Contractors will submit to MTA and implement a detailed ventilation plan similar to that required by the federal Mine Safety Health Administration.
- An emergency ventilation system of fans and controls will be provided by MTA to bring in fresh air and also to exhaust gases when required. The system will have explosion relief mechanisms, will be fireproof and shall be capable of reducing hydrogen sulfide emissions to acceptable levels. A vapor recovery system may be required. In addition, the main ventilation flow will be reversible.
- Fresh air will be delivered in adequate quantities to all underground work areas. The supply will be sufficient to prevent hazardous or harmful accumulation of dust, fumes, vapors or gases and will not be less than 200 cubic feet per man per minute at a velocity of sixty linear feet per minute.

<u>Spark Control</u>

- Smoking and other sources of ignition will be prohibited. Welding, cutting and other spark-producing operations will be done only in atmospheres containing less than 20 percent of the lower explosive limit and under the direct supervision of qualified persons.

<u>Gas Control</u>

- For areas known to contain gas, MTA will install gas barrier membranes in all concrete tunnel sections and in the stations. Where needed, collection wells will be sunk ahead of the tunnel excavation machines so gas can be pumped out.

<u>Safety and Security</u>

- A project-specific emergency plan and a project safety and security manual will be developed.
- Refuge chambers or alternate escape routes will be provided in accordance with requirements of the California Division of Industrial Safety. Workers will be provided with emergency rescue equipment and trained in its use. In all tunnels classified "gassy" or "potentially gassy," equipment, procedures and schedules for air testing will be utilized in accordance with established tunnel safety orders of California OSHA.

Continued

TABLE S-8.2: GEOTECHNICAL/SUBSURFACE/SEISMICITY MITIGATION MEASURES

Presence of Tar

- Additional soil borings will be made in critical areas to define precisely the vertical and horizontal extent of tar sands. These borings will also include in-site measurements of gas content and soil expansion material.
- Laboratory testing of tar sand samples from the borings will be conducted to provide information on their strength and deformation characteristics at different temperatures, confining pressures, strain rates and street levels.
- Based on data derived from tests, specific excavation, shoring and foundation design criteria will be formulated to ensure short- and long-term stability of project facilities in tar and sand areas. Conversely, once the location of shallow tar sands is precisely known, it may prove more economical to increase tunnel depth or change station locations to avoid problem areas.

Operations

- o Control gas hazards through engineering and administrative practices, including: 1) pressure differential techniques to minimize gas intrusion and 2) seal the structure using appropriate techniques.
- o MTA will provide natural ventilation, ventilation created by train movements and under-platform exhaust systems that will operate continuously during revenue service. This has been designed into the Metro Rail system and will be continued.
- o MTA will institute its procedures for control room operators activations of emergency ventilation fans. MTA has designed an automatic system for the control room so that, if the alarm should warn of increasing levels of methane gas and the appropriate actions required of a human operator do not occur within 30 seconds, a computerized sequence of events will be initiated to activate the required fans, blowers and vents of the regular ventilation system, etc.
- o MTA will continue to institute a system for collecting and testing of air samples from underground areas of Metro Rail to monitor flammable and toxic gases before harmful or explosive concentrations could accumulate. Such a system has been designed for the first segment of Metro Rail.
- o The collection tubes for the system will sample gases from stations, tunnels, cross passages, equipment rooms, exhaust ducts and other high or low areas where hydrocarbon or hydrogen sulfide gases are likely to collect. The tubes are located so that the gas monitoring data could help identify the source of gas intrusion, should one occur.
- o MTA has examined its construction designs and has incorporated sufficient planning to accommodate the special needs of the handicapped patron to use emergency egresses with as little assistance from employees or other patrons as can reasonably be expected. MTA has set up a Fire/Life Safety Committee to review this issue during final design for the project.
- o MTA operators to receive appropriate training.

Pre-existing Hazardous Materials

- Additional soil borings and monitoring/nested wells will be established in critical areas to define precisely the vertical and horizontal extent of contamination.
- The method of waste disposal is restricted according to the classification of the waste material by the California Hazardous Waste Control Law. This law, found in Section 25100, Chapter 6.5, Division 20 of the Health and Safety Code, will be followed for disposal of hazardous or extremely hazardous materials. The regulations of the waste disposal facility will also be followed.
- There are three options for the disposition of contaminated soils:
  - o land disposal. Soil containing naturally occurring hydrocarbons or contaminated with manufactured hydrocarbons may be disposed of at Class III or Class II landfills. Soil containing hazardous levels of contamination may be disposed of at a Class I facility.
  - o treatment or recycling. Certain facilities are capable of accepting hydrocarbon contaminated soils. Treatment/recycling facilities usually remediate the soil and use the finished product for applications as fill materials, asphaltic pavement or asphaltic sealant.
  - o off-site remediation, with subsequent disposal as clean fill to a Class III landfill or unclassified waste management unit.
- The routes to be followed when transporting solids or hazardous wastes are subject to the approval of the City of Los Angeles and other local jurisdictions.

TABLE S-8.3: BUSINESS DISRUPTION MITIGATION MEASURES

• The MTA/RCC will work with community residents, elected officials, local businesses and community organizations to tailor the mitigation program to best meet community needs. Both standard and site specific mitigation measures will be implemented/developed. These measures will be tailored to meet the specific construction site needs and will be implemented by a combination of construction contract drawings, specifications and public affairs programs.
Standard Mitigation
• MTA/RCC staff will be assigned to work directly with the public to provide project information and to resolve construction-related problems.
• Prior to and during construction, the RCC will contact and interview individual businesses potentially affected by construction activities to gain knowledge and understanding of how these businesses carry out their work, business usage, delivery and shipping patterns and critical times of the day and year for business activities. Data gathered will also assist RCC as it works with the Los Angeles Department of Transportation and the Los Angeles Department of Public Works to develop the Worksite Site Traffic Control plans. Among other elements, these plans will identify alternate access routes to maintain critical business activities.
• MTA will inform the public of its progress in implementing the measures selected through a quarterly program of auditing, monitoring and reporting. A quarterly status report will be made available to the public. The MTA/RCC will continue to work with the Eastern Extension Review Advisory Committee (RAC) through all project phases. This work includes reporting on project status and facilitation of communication between the RAC and the MTA/RCC.
• **Construction Site and Field Offices:** MTA/RCC staff will establish a Metro information field office(s) located along the LPA. The information offices will be open various days of the work week for the duration of the construction period. A schedule will be developed before construction begins. The field office(s) in conjunction with other MTA/RCC staff will serve multiple purposes: o provide the community and businesses with a physical location where information pertaining to construction can be exchanged, o enable MTA/RCC to better understand community/business needs during the construction period, o allow MTA/RCC to participate in local events in an effort to promote public awareness of the project, o manage construction related matters pertaining to the public, o notify property owners, residences and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks), o provide literature to the public and press, o promote and provide presentations on the project via MTA's Speaker Bureau, o respond to phone inquires, o coordinate business outreach programs, o schedule promotional displays, o participate in community committees.
• **Information Line:** An information telephone line will be available to provide community members and businesses the opportunity to express their views regarding construction. Calls received will be reviewed by MTA/RCC staff and will, as appropriate, be forwarded to the necessary party for action (e.g., utility company, fire department, Resident Engineer in charge of construction operations). Information available from the telephone line will include current project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints and general information. During construction of the project, phone service will be provided in both English and Spanish and will be operated on a 24-hour basis.
• **Advertisements:** The MTA/RCC will provide bilingual English/Spanish advertisements for local print and radio for affected businesses. In addition, a bilingual English/Spanish construction update is proposed that would be available regularly throughout the community.
• **Business Support Programs:** The MTA/RCC will provide affected businesses the support to implement promotions for their businesses.
• **Signage:** The MTA/RCC will work with establishments affected by LPA construction activities. Appropriate signage will be developed and displayed by the MTA/RCC to direct both pedestrian and vehicular traffic to businesses via alternate routes.
• **Traffic Management Plans:** Traffic management plans to maintain access to all businesses will be prepared for all LPA station sites. In addition, daily cleaning of work areas will be performed by contractors for the duration of the construction period. Provisions will be contained in construction contracts to require the maintenance of driveway access to businesses to the extent feasible.

Continued

TABLE S-8.3: BUSINESS DISRUPTION MITIGATION MEASURES
• **Deck Level:** Prior segments of the Metro Rail project have used decks that are raised (3-4 feet) above the street level. For the LPA, decking at the under-street cut-and-cover stations will be installed flush with the existing street or sidewalk levels.
• **Sidewalk Design and Maintenance During Construction:** Wherever feasible, sidewalks will be maintained at a 10-foot width during construction. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), it will be restored to a 10-foot width during the majority of construction period. In some places this may require placing the temporary sidewalk actually on the deck. Each sidewalk design shall be of a good quality and be approved by the RCC Resident Engineer prior to construction. Handicapped access shall be maintained during construction where feasible.
• **Construction Site Fencing During Construction:** Construction site fencing shall be of good quality, capable of supporting the accidental application of the weight of an adult without collapse or major deformation. Fence designs or examples shall be submitted to the RCC Resident Engineer for approval prior to installation. Where major boulevards must be fenced, business owners shall be offered the opportunity to request covered walkways in lieu of chain link type fencing. Where covered walkways or other solid surface fencing is installed, a program will be implemented to allow for art work (e.g., by local students) on the surface(s). Where feasible and approved by local neighbors and businesses, chain link fences shall be planted with vines to minimize visual impact during construction period of up to five years.
• **Construction Site Maintenance:** The construction site shall be maintained in a neat manner, with all trash collected daily, all wood and pipes stacked neatly and all small parts stored in closed containers.
• **Bridge Loan Program:** The current MTA/RCC bridge loan program will be reviewed by the MTA/RCC to determine its possible application and effectiveness for the local businesses that would be affected by LPA construction. Revisions may be made to the program to allow for a broader application than currently exists; however, such revisions will, of necessity, continue to take into account not only the needs of the local businesses but also the risk levels for the MTA/RCC associated with this program.
Site-Specific Mitigation
These measures are for business and land use patterns that exist today (1994). In the event that different business and/or land use patterns exist at the time of construction, the following mitigation measures will need to be re-evaluated for the new circumstances and adjusted accordingly. In addition, additional measures beyond those identified below may be required as construction progresses.
• **Little Tokyo:** Alternate parking or compensation may be necessary for the temporary loss of seven off-street parking spaces fronting an architectural firm and for the possible temporary impairment of access to loading docks at a vacant toy building during construction of the Little Tokyo station.
• **First/Boyle:** Signage will be provided to businesses affected by construction activities as part of mitigation of the First/Boyle station. MTA/RCC should coordinate the with the schedule and design for the Mariachi Plaza.
• **Brooklyn/Soto:** The MTA will afford the tailor shop located south of Brooklyn Avenue along Mathews Street the opportunity to relocate during construction of the Brooklyn/Soto station. However, should the tailor shop choose not to relocate, signage will be provided and pedestrian access will be maintained.
• **First/Lorena:** During construction of the First/Lorena station, the contractor will be required to coordinate with the auto sales retailer and adjacent neighborhood market to maintain access to these establishments to the extent feasible. In addition, adequate signage will be provided to ensure visibility from the street.
• **Whittier/Rowan:** The MTA will provide adequate signage to businesses located adjacent to the Whittier/Rowan station during construction.
• **Whittier/Arizona:** During final design of the Whittier/Arizona station the station box may be moved north out of the alley to provide access to the businesses fronting on Whittier Boulevard. Relocation assistance will be provided to the furniture store as a result of acquisition of the associated furniture warehouse.
• **Whittier/Atlantic:** Signage will be provided to businesses affected by construction activities associated with the Whittier/Atlantic station. During decking of the station box, contractors will be required to coordinate with the bank and gas station in order to maintain access to these establishments to the extent feasible.

Source: Myra L. Frank and Associates, 1994

S-9 AREAS OF CONTROVERSY

- The community would like to see local preference in the selection of contractors and workers on this project. Geographic preference in federally assisted projects is illegal.

- The community would like a variety of community enhancements during the construction period. Since these enhancements are not mitigation for significant construction impacts, they are not eligible for federal funding support. The extent to which local funds can be committed to these activities/improvements is an area of controversy.

- There is a great deal of community concern about the effects of construction on local businesses. There have been a number of requests that the MTA compensate businesses for losses during the construction period. The extent and method of that compensation is an area of controversy.

S-10 ISSUES TO BE RESOLVED

The following issues are yet to be resolved regarding the Eastside Corridor:

- The choice of an Initial Operable Segment (IOS) of either two or four stations.

- The choice between Option 1 (west side of Santa Fe Avenue) and Option 2 (Metro Rail yard) for the location of the Little Tokyo station entrance.

- The role of the MTA in a housing replenishment program and the level of participation in that program.

- Issues associated with planning, design and integration of the station areas into the surrounding communities will be addressed by the Community Transportation Linkages program.

- The MTA Board will be considering policies to address the issue of community enhancements during construction.

- The MTA Board will be considering policies to address the issue of compensation to businesses during construction.

S-11 USES OF THE ENVIRONMENTAL DOCUMENT

This document is a Final Environmental Impact Report, fulfilling the requirements of the California Environmental Quality Act (CEQA).

This Final EIR will be used by state, regional and local agencies to make discretionary decisions regarding the project. The Federal Transit Administration and the Los Angeles County Metropolitan Transportation Authority will decide whether to fund this project. If local funds other than Proposition A and C are used, agencies such as the State of California Transportation Commission could also use the EIR as part of the funding approval process.

The agencies listed on Table S-11.1 could use the Final EIS/EIR, once finalized, as part of the process of issuing permits or approvals necessary to construct the project.

TABLE S-11.1: POTENTIAL AGENCY USES OF THE EIS/EIR

AGENCY	APPROVAL
U.S. Corps of Engineers	Approve permits, e.g., 404 permit for Los Angeles River crossing
U.S. Environmental Protection Agency	Approve permits, e.g., NPDES permit during construction
California Department of Transportation	Approve permits, e.g., freeway crossing
Regional Water Quality Control Board	Approve permits, e.g., discharge
South Coast Air Quality Management District	Approve permits
County of Los Angeles	Right-of-way acquisition (e.g., county streets)
Los Angeles County Flood Control District	Approvals for Los Angeles River crossings
City of Los Angeles	Right-of-way acquisition (e.g., city streets)

Source: Myra L. Frank & Associates, Inc., 1993.

CHAPTER 1: PURPOSE AND NEED

This chapter summarizes the need for the extension of the Metro Red Line or other possible transportation improvements to the Eastside Corridor and provides an overview of the regional setting and Corridor study area, the existing transportation facilities and services and the community goals and objectives for the proposed project. This chapter also includes a discussion of the role of the Final EIR in the selection and implementation of the Locally Preferred Alternative (LPA) for the Corridor.

1-1 REGIONAL SETTING

The Corridor, located in central Los Angeles County, extends eastward from the Los Angeles Central Business District (LACBD) to just east of Atlantic Boulevard, as shown in Figures 1-1.1 and 1-1.2.

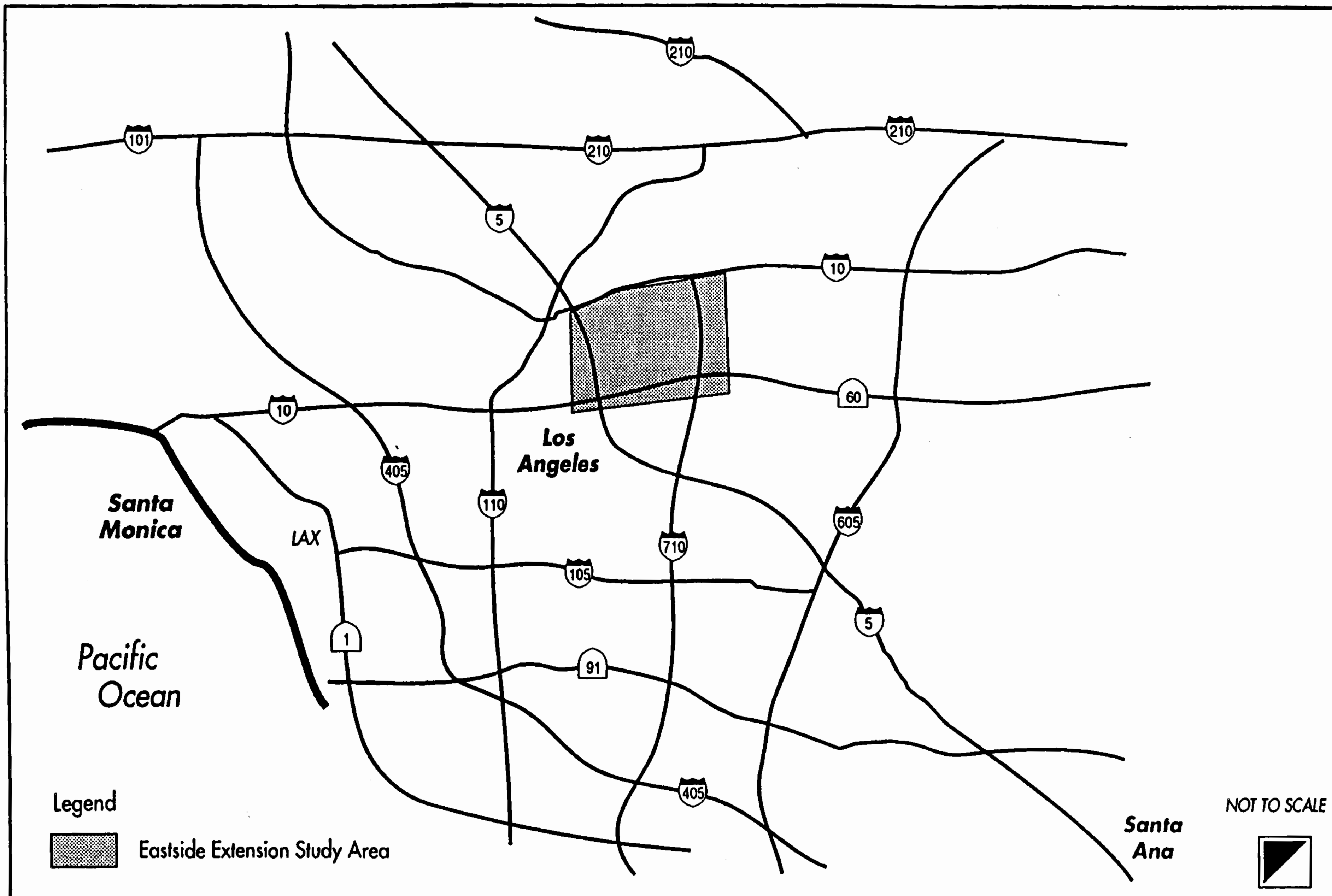
Los Angeles County, with a 1990 population of 8.8 million people, is the most populous county in the state. Los Angeles County contains over 60 percent of the population of the Southern California Association of Governments (SCAG) regional planning area, which includes the counties of Los Angeles, Orange, Riverside, San Bernardino, Ventura and Imperial. Between 1980 and 1990, the county population grew from 7.4 million people to 8.8 million people, an increase of 19 percent. By the year 2010 (the study forecast year), Los Angeles County is projected by SCAG to have a population of 11.4 million persons (a 30 percent increase) and the SCAG regional planning area is projected to have a population of 21 million persons (a 43 percent increase).

The Corridor study area, which is approximately 25 square miles, includes the Boyle Heights and Central City North communities of the City of Los Angeles and the unincorporated Los Angeles County community of East Los Angeles. According to the 1990 U.S. Census, the study area population was 274,000 persons. The 1980 population for the study area was approximately 220,000 persons. By the year 2010, the population is expected to increase by 9 percent to almost 300,000 persons. According to the census, 94 percent of the combined East Los Angeles and Boyle Heights areas population was Hispanic. A more detailed discussion of the communities and neighborhoods is included in Section 4-4 of this document.

1-2 PLANNING CONTEXT

1-2.1 PLANNING AND DEVELOPMENT PROCESS

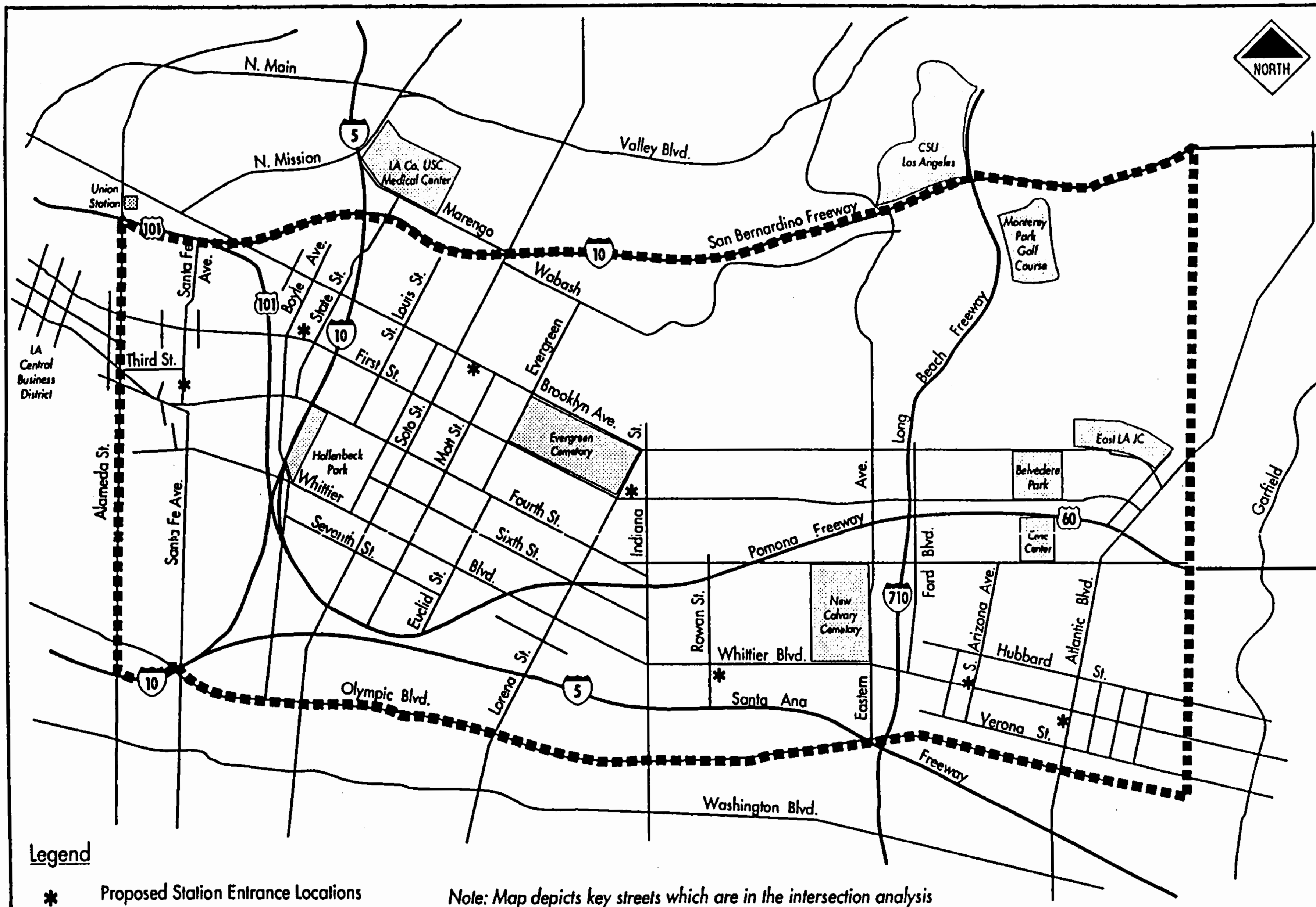
The MTA is planning and building a 400-mile rail transit system and 300-miles of carpool (HOV) lanes for the Los Angeles region. The system is designed to connect the various communities of Los Angeles County as well as to provide local service for the immediate downtown Los Angeles area.



Metro Redline Eastside Extension

Regional Vicinity

FIGURE
1-1.1



Metro Redline Eastside Extension	Study Area	FIGURE 1-1.2

The Eastside Corridor transit needs have been studied in a series of previous technical studies as listed below:

- LACMTA, Study of Metro Rail Extension Through the Northern Segment of the Santa Ana Corridor, 1988.
- SCAG, 1989 Regional Mobility Plan.
- SCAG, East Los Angeles - West San Gabriel Valley Area Transportation Study, 1989.
- SCAG, Metro Red Line Extension System Planning Study, 1989.
- LACMTA, Transitional Analysis, 1990.

These studies, incorporated herein by reference, led to a request to the Federal Transit Administration (FTA) for project planning approval. In July 1991, the FTA authorized MTA to proceed with the project planning process that would fulfill federal and state environmental requirements for a possible extension of the Red Line to the Eastside Corridor.

The federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) also included the initial part of the rail project in the authorization as a part of Segment 3 of Metro Rail. Funding was included in the Transportation Appropriations act for fiscal year 1993.

Based on these previous studies, environmental regulations and FTA guidelines, three alternatives were studied during the AA/DEIS/DEIR process: (1) the No-Build alternative, (2) the Transportation System Management (TSM) alternative and (3) a set of Rail (Red Line) alternatives. The AA/DEIS/DEIR process, including the required circulation, public hearings and review, ensured that significant transportation and environmental impacts with respect to these alternatives were assessed, and that public participation and comments were solicited to help guide the decision-making process.

The identification, examination and assessment of all reasonable and feasible alternatives were necessary to meet the requirements of the National Environmental Policy Act (NEPA), as well as the California Environmental Quality Act (CEQA). CEQA requires similar environmental analysis in Environmental Impact Reports (EIRs) and public review for projects that will have significant effects on the environment. The State encourages joint preparation of EIRs and EISs and has produced guidelines to facilitate preparation of joint documents. Selection of the Locally Preferred Alternative (LPA) was made by the MTA Board after consideration of the comments received from the circulation of the AA/DEIS/DEIR and at the public hearings. The Preferred Alternative is described and analyzed in detail in this report.

1-2.2 REGIONAL PLANNING CONTEXT

Currently adopted regional planning documents which cover the study area include the Regional Mobility Plan (RMP) of the Southern California Association of Governments and the 30-Year Integrated Transportation Plan of the MTA. Both plans are currently undergoing revision, however, neither revision has yet been officially adopted. Both the adopted RMP and the 30-Year Plan have identified the Eastern Extension of the Metro Red Line as a high priority funded and committed rail project.

As noted in a letter from the Southern California Association of Governments, "The Eastern Extension is an adopted project identified in the Regional Transportation Improvement Program (RTIP), an identified funded project in MTA's Current Local Plan (CLP) of the 1994 Regional Mobility Element, is consistent with the goals, objectives and policies of the adopted 1989 Regional Mobility Plan (RMP) and is a Transportation Control Measure (TCM) as defined in Section 108F of the Federal Clean Air Act and is a Transit TCM in the adopted Air Quality Management Plan for the South Coast Air Basin."[1]

Since the adoption of the LPA by the MTA Board, the Preferred Alternative has been incorporated into the Regional Mobility Element (RME) planning process by SCAG. The Draft RME was published in December 1993 and the RME Preferred Plan is to be presented to the SCAG Regional Council in May 1994 for adoption by July 1994. The 1994 RME will replace the 1989 RMP as the region's adopted transportation plan. Both the Draft RME and the RME Preferred Plan include the Metro Red Line Eastern Extension Preferred Alternative. It has been included in the travel demand forecasting model used by SCAG to forecast future mobility and air quality levels. The enhanced transit mode split attributable to the Red Line project is therefore built into the Regional Mobility Element and will be assumed as part of the Air Quality Management Plan.

The RME proposes a centers-based transit network which has the objective to develop and implement a multi-modal transit system that connects regional activity centers with their surrounding communities, sub-regional areas, and southern California as a whole. SCAG states in the RME that the successful implementation of an efficient centers-based transit network will require the following three primary service components: inter/intra-regional rail and express bus, sub-regional urban rail and express/limited bus, and local transit inclusive of area circulators, shuttles and demand responsive services.

The Long Range Bus and Rail Program included in the RME Preliminary Regional Action Program calls for implementation of the Metro Red Line Eastern Extension in two phases, an extension from Union Station to Boyle Heights by 2001 and a further extension to Atlantic Boulevard by 2009. These actions are noted in the RME as needed to meet Mobility Plan goals and Air Quality Plan attainment.

1-3 NEED FOR TRANSPORTATION IMPROVEMENTS

1-3.1 TRANSPORTATION FACILITIES AND SERVICES IN THE CORRIDOR

1-3.1.1 Roadways

The Corridor study area is served by several freeways that connect to neighboring communities and other parts of the Los Angeles and Southern California metropolitan area. The San Bernardino Freeway (I-10), with eight general traffic lanes and two high-occupancy vehicle (HOV) lanes, runs east-west along the northern edge of the study area. To the south, the Pomona Freeway (Route 60), with eight general traffic lanes, also runs east-west. Both freeways

[1] letter from Barry L Samsten, Associate Transportation Planner, Department of Policy and Planning, Southern California Association of Governments, April 1, 1994.

connect the study area with the LACBD to the west and San Bernardino and Riverside counties to the east.

The Santa Ana Freeway (I-5) and U.S. 101, with eight to twelve general traffic lanes, runs in a northwesterly direction and connects the study area to the LACBD and Orange County to the south. These three freeways also connect at the East Los Angeles interchange on the western end of the study area. The Long Beach Freeway (I-710), with eight general traffic lanes, runs north-south and connects the study area with Alhambra to the north and Long Beach to the south. It has interchanges with the San Bernardino, Pomona and Santa Ana freeways.

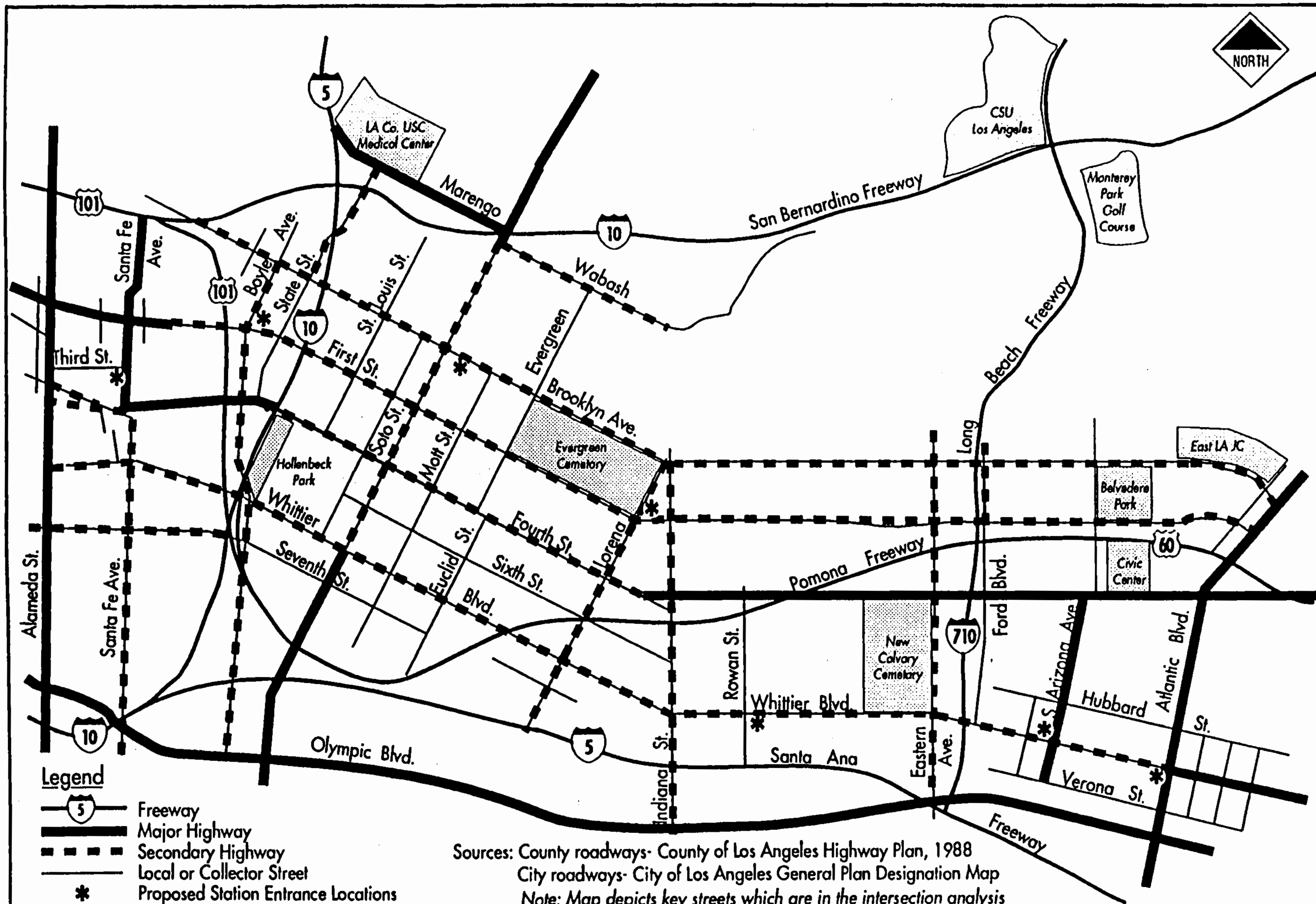
The City of Los Angeles General Plan Street and Highways Master Plan defines seven primary roadway types. These include freeways, divided major highways, major highways, scenic highways, secondary highways, collector streets and local streets. The County of Los Angeles General Plan Highways Map defines five primary roadway types. These include freeways, major highways, secondary highways, limited secondary highways (equivalent to City of Los Angeles' Collector Street) and parkways.

Figure 1-3.1 illustrates the functional classification of the primary roadway system in the study area, based on the city and county functional classification systems. Table 1-3.1 summarizes characteristics of key local roadways in the study area also using the City and County classification systems in their respective jurisdictions.

1-3.1.2 Public Transportation

The primary provider of transit service within the Corridor study area is the Los Angeles County Metropolitan Transportation Authority (MTA). Additional local service to major activity centers in the community and along Fourth Street and Atlantic Boulevard is provided by the City of Montebello Municipal Bus Lines.

There are also many express lines which border the study area and primarily serve other areas of the San Gabriel Valley and the counties of San Bernardino, Riverside and Orange. Most express routes are oriented to the El Monte Busway (HOV lanes), which runs within the San Bernardino Freeway (I-10) right-of-way. There are express stops on the El Monte Busway at California State University at Los Angeles (CSULA) and at the Los Angeles County/ University of Southern California (USC) Medical Center. The express services are operated by MTA, Foothill Transit, Omnitrans (San Bernardino) and the Riverside Transit Agency (RTA). Express service from Orange County runs in mixed flow along the Santa Ana Freeway (I-5) and is operated jointly by the Orange County Transit Authority (OCTA) and MTA. The express bus routes along the Santa Ana Freeway would be potentially terminated at the Whittier/Atlantic Station only after the Metro Red Line is extended to that location.



Metro Redline Eastside Extension	Study Area Roadway Functional Classifications	FIGURE 1-3.1

TABLE 1-3.1: SUMMARY OF STUDY AREA ROADWAY CHARACTERISTICS

ROADWAY	CITY OR COUNTY PLAN CLASSIFICATION
EAST/WEST	
Brooklyn Avenue	Secondary
Riggin Street	Secondary
First Street	
East of Mission Road	Secondary
West of Mission Road	Major
Third Street/Beverly Boulevard East of Indiana Street	Major
Fourth Street	
West of Santa Fe Avenue	Secondary
Santa Fe Avenue to I-5	Major
East of I-5 Freeway	Secondary
Whittier Boulevard	
West of Atlantic Boulevard	Secondary
East of Atlantic Boulevard	Major
Olympic Boulevard	Major
NORTH/SOUTH	
Alameda Street	Major
Boyle Avenue	Secondary
State Street North of Brooklyn Avenue	Secondary
Soto Street	
South of Whittier Boulevard	Major
Whittier Boulevard to I-10	Secondary
North of I-10	Major
Lorena Street	Secondary
Indiana Street	Secondary
Eastern Avenue	Secondary
Atlantic Boulevard	Major
Santa Fe Avenue	
S/O Fourth Street	Secondary
N/O Fourth Street	Major

Source: Los Angeles County Highway Plan, October 1988.

Table 1-3.2 lists the express lines serving the Corridor. Relative to the Corridor, most of these lines carry through trips bound for the LACBD, except for those passenger boardings at the El Monte Busway express stops.

TABLE 1-3.2: EXISTING EXPRESS BUS ROUTES SERVING CORRIDOR

LINE NUMBER	OPERATOR	FREEWAY ORIENTATION	PEAK HEADWAY (minutes)	MID-DAY HEADWAY (minutes)	DAILY WEEKDAY BOARDINGS	DAILY BOARDINGS (in study area)
456	MTA	I-170	20	30	2,400	80
457	MTA	I-170	22	–	200	1
460	MTA	I-5	20	30	3,200	120
462	MTA	I-5	20	60	1,200	30
466	MTA	I-5	25	–	370	1
701	OCTA	I-5	25	–	N/A	N/A
702	OCTA	I-5	10	–	N/A	N/A
470/471	MTA	SR60	15	30	6,100	1,050
480/481	FOOTHILL	I-10	8	15	6,500	210
482	FOOTHILL	I-10	15	60	3,000	20
483/485	MTA	I-10	8	15	7,500	N/A
484	MTA	I-10	15	30	8,600	130
486	MTA	I-10	12	60	3,300	30
487/489/ 491	MTA	I-10	6	60	4,500	950
488	MTA	I-10	20	30	2,200	20
490	MTA	I-10	15	30	4,800	80
492	FOOTHILL	I-10	30	–	430	N/A
494	FOOTHILL	I-10	30	–	400	N/A
495	FOOTHILL	I-10	10	–	1,700	N/A
497	MTA	I-10	6	–	1,450	N/A
498	FOOTHILL	I-10	5	–	2,000	N/A
110	INLAND EMPIRE	I-10	10	60	N/A	N/A
496	INLAND EMPIRE	I-10	60	60	N/A	N/A

Sources: MTA Line Timetables and Route Maps, January 1991; OCTA Planning Department; Foothill Transit Timetables and Route Maps and Ridership Data, April 1991; Inland Empire Connection Timetables and Route Maps, July 1991; MTA Profile 10 data on Express Lines.

Within the study area, there are approximately 60,000 daily transit boardings. This represents a very high level of transit use in this densely populated area. It also reflects the mostly local nature of such bus trips. Table 1-3.3 summarizes the current local bus services in the Red Line Eastern Extension Corridor.

Bus transit service will remain the primary transit mode for the majority of the transit riders in the region. Bus service will not be removed from the transit system but will be modified in the LPA study area to provide effective bus/rail interface connections. Feeder bus service will provide connections to the LPA for local and regional trips as well as serving shorter trips.

LINE NUMBER	OPERATOR	PEAK HEADWAY (minutes)	MID-DAY HEADWAY (minutes)	DAILY WEEKDAY BOARDINGS	DAILY BOARDINGS (in study area)
18	MTA	7	10	29,600	12,900
30/31	MTA	5	12	37,100	9,100
65	MTA	16	30	5,200	2,500
66/67	MTA	5	10	25,300	8,900
68	MTA	8	10	20,600	6,500
250	MTA	40	40	220	140
251/252	MTA	6	10	19,300	5,300
253	MTA	40	40	530	500
254	MTA	25	60	3,300	900
255/46	MTA	45	45	1,560[a]	N/A
256	MTA	22	40	3,500	740
258/259	MTA	20	30	2,400	1,100
260	MTA	10	20	14,000	3,700
620[b]	MTA	12	12	700	700
10	MONTEBELLO	10	10	6,370	N/A
35	MONTEBELLO	30	30	520	N/A
40	MONTEBELLO	10	10	12,328	N/A

Notes: [a] Lines 255 and 46 data are combined due to interlining of both routes to the north of the study area. Line 255 penetrates the study area connecting Boyle Heights and City Terrace to East Los Angeles along Rowan Avenue, with its southern terminus at Whittier Boulevard.
[b] New route, called Boyle Heights Shuttle, in service since August 1991.

Sources: MTA Line Timetables and Route Maps, June 1990 to January 1991; Montebello Municipal Bus Lines, Spring 1991; MTA Profile 10 Boarding Data on Local Lines; Southern California Association of Governments; East Los Angeles/West San Gabriel Valley Area Transportation Study, June 1989.

Bus headways were assumed to be maintained for local access to businesses and residential areas on the major east-west (parallel service) routes to the LPA Metro Red Line and some parallel lines may be re-routed to connect to Red Line stations. Current bus service frequencies and probable frequency modifications, to provide enhanced bus/rail interface, are detailed in Table 3-1.2 in Chapter 3.

Also adjacent to the Corridor study area are some existing Metrolink commuter rail services from the San Gabriel Valley and Orange County focused on Union Station in the LACBD. Future stops are planned at CSULA on the San Bernardino to Los Angeles line and in Montebello on the Union Pacific Riverside to Los Angeles line.

1-3.2 TRANSPORTATION RELATED GOALS AND OBJECTIVES

The proposed goals and objectives for this Eastern Extension Final EIR have been adapted from the transportation and land use goals and objectives of the participating government agencies and are consistent with other transit improvements being planned for Los Angeles County. These six primary goals, with supporting objectives, are presented below and were used to assist in the selection of the Locally Preferred Alternative by the MTA.

1. Improve access and mobility, i.e., the primary goal of the proposed transit project is to improve mobility for residents of the Eastside Corridor.

    - Provide direct service to employment opportunities,
    - Provide direct service to education, medical, shopping and cultural opportunities,
    - Minimize total travel times,
    - Maximize transit ridership potential, and
    - Provide convenient access to the regional transit system.

2. Support land use and development goals, i.e., provide a transit project that will be compatible with and will complement the City of Los Angeles and County of Los Angeles plans for:

    - Community plan consistency,
    - Regional plan consistency, and
    - Joint development opportunities.

3. Achieve local consensus, i.e., the project will be developed in a manner that will ensure responsiveness to the community and policy makers.

    - Define the desired transit system attributes from a community perspective,
    - Maximize opportunities for community and citizen input,
    - Enhance the public image of the proposed transit improvements, and
    - Build community and political support through effective communication and integration with local and regional plans.

4. Provide a transportation project which is compatible with and enhances the physical environment where possible.

    - Implement an alternative that minimizes adverse effects on the environment,
    - Minimize air pollution,
    - Minimize noise impacts,
    - Minimize vibration impacts,
    - Minimize disturbance of public facilities,
    - Minimize impacts on cultural resources (historic, archaeological and parks), and
    - Conform to all local, state and federal environmental regulations.

5. Provide a transportation project that minimizes impacts on the community.

   - Minimize business and residential dislocations, community disruption and property damage,
   - Avoid creating physical barriers, destroying neighborhood cohesiveness or in other ways lessening the quality of the human environment,
   - Minimize traffic and parking impacts in the vicinity of the new rail stations, and
   - Minimize impacts during construction.

6. Provide a transportation project that is within the ability to fund including capital and operating costs.

   - Ensure adequate local funding commitments to secure federal and state contributions,
   - Ensure adequate operating funds, and
   - Ensure fiscal consistency with the MTA's long range financial plan.

1-3.3 SPECIFIC TRANSPORTATION PROBLEMS IN THE CORRIDOR

1-3.3.1 Existing Roadway Intersection Service Levels

One of the primary indicators of the need for transportation system improvements is the level of service of the existing network of surface streets and freeways. Roadway level of service is most often measured at intersections of arterial streets or arterials with collector streets. Intersections are the most critical part of the roadway system due to the fact that each intersecting roadway must share capacity with the other street. Intersection level of service methodology is explained in detail in Chapter 3 of the Final EIR.

Level of service is based on the volume of traffic entering the intersection compared to the theoretical capacity of the intersection to carry traffic. A volume/capacity ratio is developed for each location which expresses that comparison. Level of service (LOS) is based on the volume/capacity ratio and it ranges from LOS A, which is considered excellent, free flow operating conditions, to LOS F which describes extremely poor, severely congested conditions. In urban areas, the lowest acceptable level of service for planning purposes is generally considered to be LOS D with LOS E and F considered to warrant mitigation.

As part of the Final EIR traffic impact analysis, a total of 72 intersections have been evaluated to determine existing and potential future levels of service with and without the project. These intersections are shown on Figure 3-2.1 in Chapter 3. The analysis was conducted for the PM peak hour at all 72 locations and for the AM peak hour at 9 locations. The analysis of existing conditions during the AM peak hour reveals that two out of nine intersections (22 percent) are currently operating at level of service E or F (considered to be below generally acceptable conditions). During the PM peak hour, five intersections are estimated to currently operate at LOS E or F (seven percent of all study intersections).

The future No-Build level-of-service analysis provides useful data relative to project need, since project transportation benefits would occur in the future. The future no-build analysis indicates that three intersections in the AM peak hour (33 percent) and 15 in the PM peak hour (21 percent) would be at LOS E or F. When considering only the intersections of arterial streets (i.e., deleting local street intersections from the analysis), the percentage of intersections with poor operating conditions is higher (local street intersections often operate at LOS A, B, C and D even if the arterial intersections are severely congested). In total, more than one-quarter of all key intersections in the study area are expected to operate at very poor service levels in the future without the project. The study area is also characterized by limited rights-of-way and few opportunities to expand or significantly improve the surface roadway system. Therefore, any improvement in mobility must be achieved by either reducing the demand for vehicle travel or developing alternatives to the existing network of arterial roadways.

The Congestion Management Program (CMP) for Los Angeles County includes a program for monitoring major arterial, freeway and transit system conditions in the county. For freeways, the traditional level of service scale of A to F is expanded to include LOS designations F0, F1, F2 and F3, which correspond to the length of time that a freeway segment experiences level of service F. The F3 designation represents the worst conditions, with level of service F conditions (severe congestion and speeds less than 20 MPH) experienced for three hours or more. Table 1-3.4 reveals the results of CMP freeway monitoring in the study area.

TABLE 1-3.4: CMP FREEWAY MONITORING RESULTS

FREEWAY	LOCATION	NORTHBOUND/ EASTBOUND		SOUTHBOUND/ WESTBOUND	
		AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS
I-10	East LA City Limit	B	F0	D	C
I-10	Atlantic Boulevard	C	F3	F2	C
Route 60	E/O Indiana Street	B	F1	F1	B
I-710	S/O Route 60	C	D	D	F1

Source: 1993 Congestion Management Program, MTA, 1993.

The monitoring results indicate that each freeway experiences LOS F0 or worse during the AM or PM peak hour in at least one direction, and in both directions at two of the four monitoring stations. The CMP data indicate that the PM peak period is clearly the worst time period, with severe congestion on the freeways in the eastbound direction on I-10 and Route 60 (i.e., the outbound afternoon/evening commuter flow from Los Angeles). During the AM peak hour, congested conditions exist on both I-10 and Route 60 westbound.

1-3.3.2 Congested Corridor Action Plan (MTA)

MTA completed a draft Congested Corridor Action Plan in 1993 which provides a summary of mobility indicators in eleven of the most congested corridors in the County as well as potential strategies to address the mobility problems. The eastern extension study area is part of Corridor 1B, the San Bernardino/Pomona Freeway Corridor. The Red Line Eastern Extension study area represents the eastern portion of Corridor 1B, which extends from downtown

Los Angeles to the San Bernardino County Line. Throughout the entire corridor (including the portion which overlaps the Eastern Extension study area), the Action Plan states that approximately 58 percent of the arterial intersections and 85 percent of the freeway monitoring locations are operating at level of service F or worse. Transit vehicles are estimated to travel at an average speed of 19 miles per hour with an average of 39 passengers per vehicle. These findings are based on CMP data, and clearly indicate current surface roadway and freeway congestion not only in the study area, but also in the entire I-10/Route 60 corridor east of the LACBD.

1-3.3.3 Regional Travel Forecasts

Travel projections prepared by SCAG as part of the 1989 Regional Mobility Plan (RMP) identified the need for major rail transit improvements in the region, especially in Los Angeles County, to meet the mandates of the Clear Air Act and the mobility needs of the region. Current freeway and local street facilities cannot be expanded sufficiently to handle the forecasted demand for mobility. The latest regional forecasts for the year 2010 estimate that person trips will increase by over 40 percent for the region and by almost 30 percent in Los Angeles County.

The MTA, as part of the development and adoption of the 30-Year Integrated Transportation Plan (April 1992), addressed the mobility deficiency issues identified in the 1989 RMP for Los Angeles County.

Specifically related to the Eastside Corridor study area, all major freeways serving the area are currently over capacity during peak periods, and for many hours in the off-peak period. It is important to note that no major improvements to existing freeways in the study area are identified in the RMP or the 30-Year Plan. During the project scoping meetings and subsequent community meetings, the residents of the Eastside Corridor expressed their need for improved transit service because many are transit-dependent, work not only in the LACBD but in areas west and north of the downtown, and need better access to the region's educational, employment and cultural opportunities. These problems were identified in the project goals and objectives (Section 1-3.2).

In 1990, the Eastside Corridor consisted of a low- to moderate-income population, which is expected to grow by 9 percent to 297,000 in 2010. The Eastside corridor contains a dense concentration of households, particularly in the western portion of the study region.

Employment access is one of the major transportation problems that affect Eastside Corridor residents. According to the analysis of the study area work force, of the home-based work trips (1990) generated from the Eastside Corridor, nine percent were to the LACBD, 36 percent were to areas located immediately west and north of the LACBD, 13 percent were to the south of the LACBD, 24 percent were internal trips and 18 percent were to the balance of Los Angeles County and the region. According to the forecasts for 2010, an almost identical pattern is projected for the future.

The Eastside Corridor's transportation problems are exacerbated by socioeconomic factors. As reported in the 1990 Census, the percentage of occupied dwelling units in the Corridor whose residents did not have automobiles was approximately 25 percent, which is almost 70 percent greater than the City of Los Angeles figure (15 percent). Many of the area's residents were young, with 23 percent between the ages of 6 and 18 years, and only 8 percent were elderly (over 65 years). About one-third of the housing units were owner-occupied, and vacancy rates were generally low, around three percent. Most of the housing units were single-family houses with an average size of 4.1 persons per household, which is about 40 percent higher than the City and County of Los Angeles averages of 2.9 and 2.8 persons per household, respectively. In addition, in 1990, 94 percent of the area's population was Hispanic.

1-4 USES OF THE ENVIRONMENTAL DOCUMENT

The Final EIS/EIR, once finalized, will be used by federal, state, regional and local agencies to make discretionary decisions regarding the project. The Federal Transit Administration and the MTA will decide whether to fund this project. If local funds other than Proposition A and C are used, agencies such as the State of California Transportation Commission could also use the EIR as part of the funding approval process.

Agencies listed on Table 1-4.1 could use the Final EIS/EIR as part of the process of issuing permits or approvals necessary to construct the project.

TABLE 1-4.1: POTENTIAL AGENCY USES OF THE FINAL EIS/EIR

AGENCY	APPROVAL
U.S. Corps of Engineers	Approve permits, e.g., 404 permit for Los Angeles River crossing
U.S. Environmental Protection Agency	Approve permits, e.g., NPDES permit during construction
California Department of Transportation	Approve permits, e.g., freeway crossing
Regional Water Quality Control Board	Approve permits, e.g., discharge
South Coast Air Quality Management District	Approve permits
County of Los Angeles	Right-of-way acquisition (e.g., county streets)
Los Angeles County Flood Control District	Approvals for Los Angeles River crossings
City of Los Angeles	Right-of-way acquisition (e.g., city streets)
City of Commerce	Right-of-way acquisition (e.g., city streets)

Source: Myra L. Frank & Associates, Inc., 1993.

1-5 ROLE OF THE FEIS IN PROJECT DEVELOPMENT AND DECISION MAKING

The AA/DEIS/DEIR has particularly important implications for the federal project development process for major public transportation improvements. The preparation of the AA/DEIS/DEIR, together with the required circulation, public hearings and review, ensures that all significant transportation and environmental impacts are assessed, and that public participation and comments are solicited to help guide the decision-making process.

The identification, examination and assessment of all reasonable and feasible alternatives are necessary to meet the requirements of the National Environmental Policy Act (NEPA), as well as the California Environmental Quality Act (CEQA). CEQA requires similar environmental analysis in Environmental Impact Reports (EIRs) and public review for projects that will have significant effects on the environment. The state encourages joint preparation of EIRs and EISs and has produced guidelines to facilitate preparation of joint documents.

The FEIR responds to comments offered during the AA/DEIS/DEIR review process and focuses on the Locally Preferred Alternative (LPA). During this phase of project development, mitigation measures for adverse impacts have been developed and preliminary engineering has been advanced. (See Section 2-6 for a discussion of planning activities that have occurred since the circulation of the AA/DEIS/DEIR.) Completion of an FEIS/FEIR, acceptance of the final document by the Federal Transit Administration (FTA) and completion of preliminary engineering are prerequisites to MTA's receipt of federal funds for final design and construction of the proposed Eastside Corridor transit improvements.

1-5.1 LOCALLY PREFERRED ALTERNATIVE

Ten alternatives were studied in the AA/DEIS/DEIR, including a No-Build option, a Transportation Systems Management (TSM) alternative and eight heavy rail transit alternatives. The final step in the AA/DEIS/DEIR process was the selection from among these alternatives of a Locally Preferred Alternative (LPA). After considering all of the information available, including public comment on the alternatives, MTA chose Alternative 9B, modified to minimize effects on a cemetery and a school. The LPA is discussed further in Section 2-3 of this document.

Two alternatives have been further analyzed in this Final EIR, i.e. the No-Build Alternative and the LPA (Alternative 9B, modified). For a review of the remaining alternatives, please see the April 1992 AA/DEIS/DEIR and Section 2-4 of this Final EIR.

1-5.2 RECORD OF DECISION

The purpose of the FEIS/FEIR, once finalized, is to ensure that all significant environmental consequences and, where applicable, all reasonable and feasible mitigation measures have been considered in the selection of the Locally Preferred Alternative for the Eastside Corridor. FTA's official determination will be reflected in a Record of Decision (ROD) following availability of the document for 30-days. A favorable ROD indicates that all environment-based legal requirements for project development have been satisfied and federal project financing can be approved.

The ROD will present the basis for decision, summarize any mitigation measures that will be incorporated into the project and document any required Section 4(f) approval. Subsequent to the ROD, changes to the alignment, stations, mitigation measures or findings discussed in the ROD would require a revised ROD. Changes to the Locally Preferred Alternative that would result in significant environmental effects that were not evaluated in this FEIR or the discovery of new information or circumstances not evaluated in the FEIS/FEIR that would result in significant environmental impacts would require a supplemental environmental impact document.

CHAPTER 2: ALTERNATIVES CONSIDERED

2-1 INTRODUCTION

This chapter describes the alternatives that are evaluated in this Final EIR for the Los Angeles Eastside Corridor. Two alternatives are reviewed: (1) the No-Build alternative, and (2) the Locally Preferred Alternative.

Following public review of the ten alternatives presented in the April 1992 Alternatives Analysis/ Draft Environmental Impact Statement/Draft Environmental Impact Report (AA/DEIS/DEIR), the MTA Board of Directors selected in June 1993 a Locally Preferred Alternative (LPA). This heavy rail LPA has been refined, based on Preliminary Engineering findings and is presented in this Final EIR. A more detailed description of the LPA, as modified during Preliminary Engineering, is included in the Metro Red Line Segment Three East Side Extension Preliminary Engineering Design Report, 1994. This report and all other documents referenced in this Final EIR are available for public review at the Los Angeles County Metropolitan Transportation Authority's (MTA's) offices and are incorporated herein by reference.

Background assumptions, physical and operating characteristics, capital costs and operating and maintenance costs are provided in this chapter. Alternatives considered during selection of the LPA and reasons for the LPA selection are also provided; and changes that have occurred to the project since circulation of the AA/DEIS/DEIR are discussed.

In the development of the future transit alternatives, the Federal Transit Administration (FTA) requires a definition of transportation facilities and services reasonably expected to be in place in the future analysis ("forecast") year. For analysis purposes, this common set of transportation capacity and service levels (called background assumptions) is held constant for the region outside the Eastside Corridor study area. The forecast year for this Final EIR is 2010. The year 2010 background assumptions include transportation improvements not only in the County of Los Angeles but also in the urbanized portion of SCAG's regional transportation planning area.

Transportation improvements with the most significant effects on the Eastside Corridor would be projects and programs for the Los Angeles County portion of the regional plan. The current Los Angeles County plan is detailed in the MTA's April 1992 30-Year Integrated Transportation Plan (30-Year Plan), which establishes a framework of highway, bus, rail and demand management strategies and matching financial strategies designed to address current and projected mobility needs in Los Angeles County. The background assumptions used for the Eastside Corridor study are all consistent with the "fundable plan" component of the 30-Year Plan.

Background assumptions for the alternatives include the following transportation improvements:

- Freeway capacity improvements and gap closures (Table 2-1.1),
- Regional high occupancy vehicle (HOV) lanes and transitway network (Table 2-1.2),
- Urban rail network (Table 2-1.3),
- Regional commuter rail network (Table 2-1.4), and
- Freeway express and local bus systems increases.

TABLE 2-1.1: FREEWAY GAP CLOSURES/NEW FREEWAYS

COUNTY	ROUTE	DESCRIPTION
LOS ANGELES COUNTY	SR-30	Gap closure from SR-66 to San Bernardino County line.
	SR-71	Gap Closure from Holt/Valley Boulevard to SR-60.
	SR-126	Newly aligned freeway from I-5 north to Ventura County line.
	SR-138	Widen from Avenue T to 165th Street.
	I-5	Widen from Orange County Line to I-605 interchange.
	I-105	New Century Freeway built between Norwalk (I-605) and Sepulveda Boulevard (SR-1).
	I-710	Gap closure from I-10 to I-210/SR-134.
ORANGE COUNTY	I-5	Widen from Fourth Street interchange to Los Angeles County line.
	SR-73	New San Joaquin Hills Transportation Corridor from MacArthur Boulevard to I-5 South.
	SR-231	New Eastern Transportation Corridor (freeway) from SR-91 to Jamboree Road.
	SR-241	New Foothill Transportation Corridor (freeway) from SR-231 to San Diego County line.
VENTURA COUNTY	SR-126	Newly aligned freeway from Los Angeles County line to Fillmore.
RIVERSIDE COUNTY	SR-91	Widen from Magnolia Avenue interchange to Orange County line.
	SR-60	Widen from Redlands Boulevard interchange to Valley Way interchange.
	SR-74	Widen from I-15 to I-215 interchanges.
	I-215	Convert to freeway from south of Van Buren to SR-60 junction.
	SR-71	Gap closure from SR-91 interchange to San Bernardino County line.
SAN BERNARDINO COUNTY	SR-30	Gap closure from Los Angeles County line to I-215.
	SR-60	Widen freeway from Los Angeles to Riverside County lines (both ways).
	SR-71	Gap closure from Riverside to Los Angeles County lines.
	I-215	Widen freeway from I-10 to SR-30 interchanges.

Source: Fundable Plan of Highway Component, MTA 30-Year Integrated Transportation Plan, April 1992; SCAG 1989 Regional Mobility Plan.

TABLE 2-1.2: REGIONAL HOV AND TRANSITWAY NETWORK

COUNTY	ROUTE	LIMITS
Los Angeles County	I-5	From Route 14 to I-10.
	I-10	From El Monte to San Bernardino County Line.
	SR-14	From I-5 to Avenue P-8 in Palmdale.
	SR-30	From SR-57 to Foothill Freeway.
	SR-57	From Orange County line to SR-60.
	SR-60	From San Bernardino County line to I-710.
	SR-71	From Holt/Valley Boulevard to SR-60.
	SR-91	From Harbor Freeway (I-110) to Orange County line.
	I-105	From Norwalk to LAX.
	I-110	From I-10 to I-5 north.
	SR-118	From Ventura County line to I-5.
	I-110	From I-405 to I-10.
	SR-134	From Routes 101/170 to I-210.
	SR-170	From I-5 to Routes 101/134.
	I-210	From SR-30 to SR-134.
	1-405	From I-5 south to Orange County line.
	I-605	From I-10 to I-405.
	I-710	From I-10 to I-210.
Orange County	I-5	SR-1 interchange in San Clemente to Los Angeles County line.
	SR-91	Riverside to Los Angeles County line.
	I-405	El Toro interchange to Los Angeles County line (existing).
	SR-55	I-405 to SR-91.
	SR-57	Los Angeles County line to I-5/SR-22 interchange.
	SR-73	I-405 to I-5 south.
	SR-231	SR-91 to I-5.
	SR-133	SR-241 to I-405.
	SR-241	SR-133 to San Diego County Line.
Riverside County	SR-91	Orange County line to SR-91/I-215/SR-60.
	SR-71	SR-91 to San Bernardino County line.
	I-215	SR-91/SR-60 interchange to San Bernardino County line.
San Bernardino County	SR-30	Los Angeles County line to I-215.
	SR-60	Los Angeles County line to I-15 interchange.
	I-10	Los Angeles County line to I-15 interchange.
	SR-71	SR-71 Riverside County line to SR-71/SR-60 interchange.

Sources: Fundable Plan of Highway Component, MTA 30-year Integrated Transportation Plan (April 1992); SCAG Constrained Improvements, Regional Mobility Plan (in counties other than Los Angeles).

TABLE 2-1.3: URBAN RAIL TRANSIT NETWORKS IN LOS ANGELES AND ORANGE COUNTIES

LINES	SEGMENTS/CORRIDORS	BOUNDARIES
LOS ANGELES COUNTY		
RED LINE	Segments 1,2,3	Union Station to North Hollywood, with leg to Mid-City Segment.
	San Fernando Valley	North Hollywood to Sepulveda Boulevard.
BLUE LINE	Southern Pacific Railway/Long Beach Boulevard	7th and Flower to Long Beach Mall.
	Santa Fe Railway/Foothill Freeway	Union Station to Sierra Madre.
	Downtown Connector	Union Station to 7th/Flower.
	Santa Fe Railway	Sierra Madre To Azusa.
	Exposition Branch	7th/Flower to University of Southern California (USC).
	Burbank to Los Angeles	Union Station to Burbank Airport.
GREEN LINE	Century Freeway	Norwalk to El Segundo (Freeman/El Segundo).
	Eastern extension to Orange County/Commuter Rail (Imperial Highway)	Norwalk to Studebaker Road.
	North Coast extension to Westchester Parkway	El Segundo to north of LAX.
	South Coastal to Torrance (Hawthorne Boulevard)	El Segundo to Torrance.
OTHER LINES	I-405/SR-14 (high-speed rail corridor)	LAX to Palmdale.
ORANGE COUNTY (Initial Urban Rail Network)		
FIXED GUIDEWAY/ AUTOMATED TECHNOLOGY	Alton Parkway/Main Street/Katella Avenue/Harbor Boulevard	Irvine to Fullerton.
FIXED GUIDEWAY/ AUTOMATED TECHNOLOGY	Santa Fe Railway/Imperial Highway	Fullerton to Norwalk.
LIGHT RAIL TRANSIT	Pacific Electric Right-of-way	Santa Ana to Garden Grove.

Source: Fundable Plan of Rail Component, MTA 30-Year Integrated Transportation Plan (April 1992); OCTA Urban Rail Master Plan (October 1991).

TABLE 2-1.4: REGIONAL COMMUTER RAIL NETWORK COVERAGE		
RAIL CORRIDOR (LINE)	EXISTING PASSENGER SERVICES	ADDITIONAL COUNTIES TO BE SERVED IN THE FUTURE
LOSSAN - Oceanside to Los Angeles (Santa Fe Railway)	San Juan Capistrano-Los Angeles Commuter Rail and AMTRAK (San Diego-Los Angeles)	None
Santa Clarita to Los Angeles (Southern Pacific Railroad)	Santa Clarita-Los Angeles	Los Angeles From I-5 to Avenue P-8 in Palmdale
Palmdale to Santa Clarita	N/A	Los Angeles
Moorpark to Los Angeles (Southern Pacific Railroad)	AMTRAK (Santa Barbara to Los Angeles) Moorpark-Los Angeles	Ventura, Los Angeles
San Bernardino To Los Angeles (Southern Pacific Railroad and Santa Fe Railway)	San Bernardino - Los Angeles	None
San Bernardino-Riverside-Fullerton (Santa Fe Railway)	N/A	San Bernardino, Riverside, Orange
Riverside to Los Angeles (Union Pacific Railroad)	Riverside	San Bernardino
San Bernardino-Riverside-Orange-Santa Ana-Irvine (Santa Fe Railway)	N/A	San Bernardino, Riverside, Orange
San Bernardino-Mentone (Santa Fe Railway)	N/A	San Bernardino
Riverside to Hemet (Santa Fe Railway)	N/A	Riverside

Source: Fundable Plan of Rail Component, MTA 30-Year Integrated Transportation Plan (April 1992).

2-2 NO-BUILD ALTERNATIVE

Review of the No-Build Alternative allows for an evaluation of impacts associated with not building the LPA. Analysis of the No-Build alternative should aid decision-makers in their review of the benefits to be derived from the LPA when weighed against its costs. Cost considerations include such factors as future traffic congestion, air quality levels, economic development and the ability of the region to continue to meet its basic transportation needs. The No-Build Alternative includes the transportation improvements identified as the year 2010 background assumptions presented in Section 2-1.

2-2.1 HIGHWAYS

No new major capital highway projects are programmed within the Eastside Corridor study area (see Figure 1-1.2). One of the two major highway improvements programmed in proximity to the Eastside Corridor study area is an extension of the existing HOV lanes (one lane in each direction) on the I-10 (San Bernardino Freeway) from the current terminus at the El Monte Bus Center to the I-15 freeway in San Bernardino. The other proposed improvement is the I-710 (Long Beach Freeway) gap closure, which includes three general traffic lanes and one HOV lane in each direction from Valley Boulevard (just north of I-10) to the I-210 (Foothill Freeway) in Pasadena. A description of existing highway facilities is given in Section 1-3.1.1.

2-2.2 TRANSIT

There are no new major capital transit projects programmed for the Eastside Corridor area. However, regional improvements to peak hour frequencies and the implementation of other regional rail projects are expected to result in a general increase in transit accessibility for residents to employment and retail centers. Due to the current ridership levels and forecasted growth in the study area, the local bus frequencies would probably be increased. Feeder bus access to Eastside Corridor rail stations would also improve. The proposed Metro Red Line bus/rail interface plan for the eastern extension which describes the feeder bus access is presented below in Section 2-3.4.1. Express services on freeways do not currently serve residents of the study area; therefore, current express service levels (with minor adjustments) are assumed for the background 2010 bus/rail system. The bus routes for the study area are shown in Figure 2-2.1.

For the No-Build alternative, proposed increases in peak period service are shown in the No-Build column of Table 2-2.1. As shown in Table 2-1.5, major east-west and north-south lines would receive increased transit service. It is assumed for the No-Build alternative that no new physical facilities (none is planned by the City of Los Angeles and the County of Los Angeles) would be constructed to improve bus transit travel times, except for those that might be needed for new developments in the area. A description of the existing transit services is given in Section 1-3.1.2.

2-3 LOCALLY PREFERRED ALTERNATIVE (LPA)

As selected by the MTA Board of Directors in June, 1993, and consistent with the technology decision in the 1980 Final Alternatives Analysis/Environmental Impact Statement/Environmental Impact Report on Transit System Improvements in the Los Angeles Regional Core[1], incorporated herein by reference, the LPA for the Eastside Corridor would be a heavy-rail system that would represent an extension of the Metro Rail Red Line currently in operation in downtown Los Angeles. The LPA would consist of cut-and-cover and open-cut underground stations connected by tunnel line sections that generally would be located within public streets rights-of-way. The design criteria and standards used for the LPA are consistent with the latest Metropolitan Transportation Authority/Rail Construction Corporation (MTA/RCC) Metro Red Line System Design Criteria and Standards documents. The five volumes discuss in detail: (1) general system criteria, (2) station criteria, (3) subsystems criteria, (4) civil/structural criteria, and (5) mechanical/electrical criteria.

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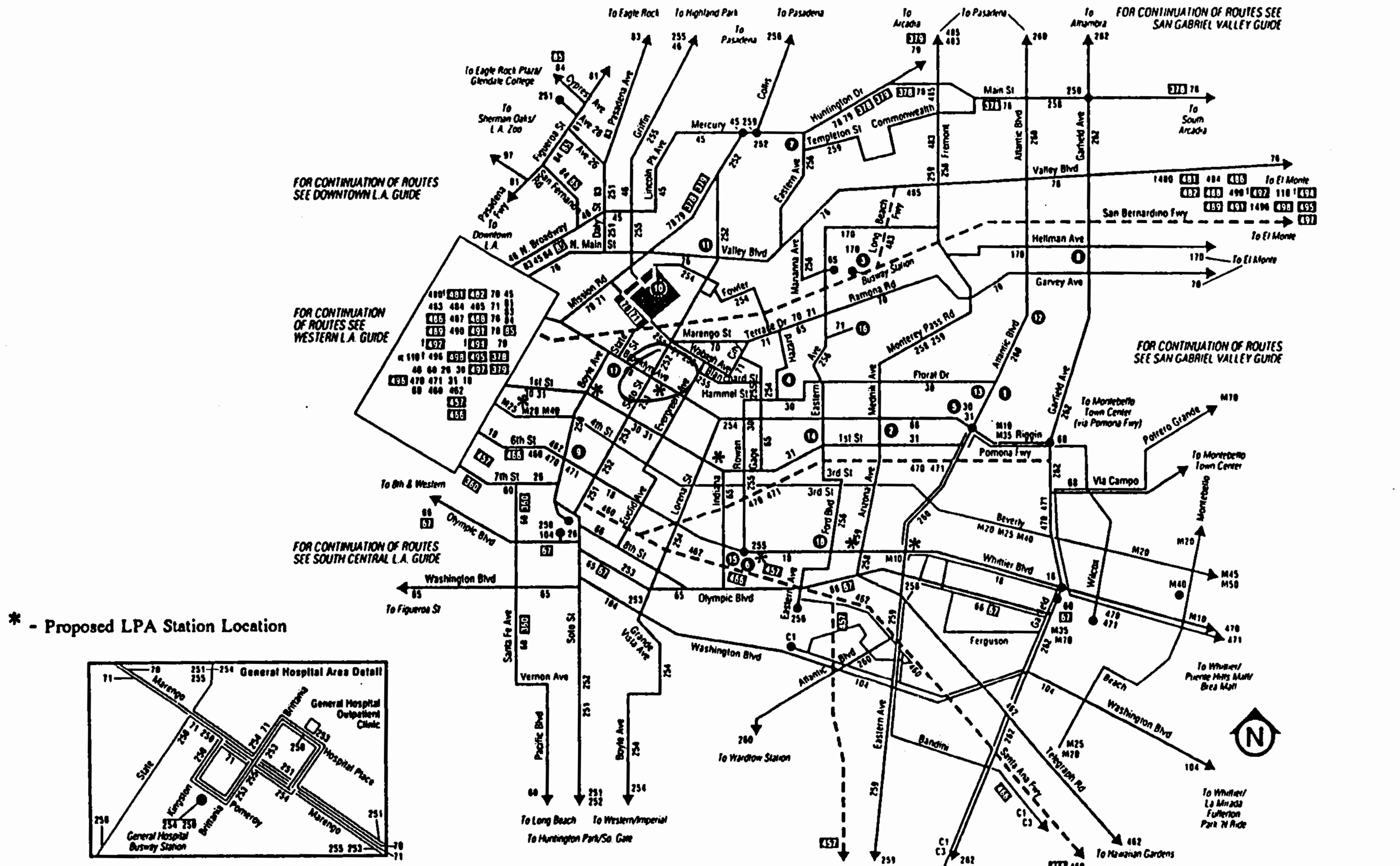
[1] This Tier I EIS reviewed transit mode alternatives for the Los Angeles Regional Core and identified the Wilshire Corridor as the priority corridor. Heavy rail was identified as the recommended transit technology.

TABLE 2-2.1: LOCAL BUS ROUTES SERVING EASTSIDE CORRIDOR PEAK PERIOD HEADWAYS

LINE NUMBER	DESCRIPTION	HEADWAYS (minutes)				
		EXISTING	NO-BUILD (YEAR 2010)	LPA (YEAR 2010)	IOS-1 (YEAR 2010)	IOS-2 (YEAR 2010)
18	Whittier	7	5	4	4	4
18L	Whittier-Limited	-	-	-	-	-
30/31	First	5	4	4	4	4
30L/31L	First-Limited	-	-	-	-	-
65	Washington, Indiana, Gage	16	15	6	6	6
66/67	Olympic	5	5	4	4	4
68	Brooklyn	8	6	4	4	4
68L	Brooklyn-Limited	-	-	-	-	-
70	Garvey/ City Terrace	10	10	10	10	10
104	Brooklyn	30	30	30	30	30
250/253	Boyle-State, Evergreen	20	20	10	10	10
251/252	Soto	6	6	5	5	5
254	Lorena	25	25	6	6	6
255/46	Rowan	45	40	6	6	6
256	Ford/Eastern	22	20	6	6	6
258/259	Arizona	20	15	5	5	5
260	Atlantic	10	10	6	6	6
262	Garfield	30	15	10	10	10
460[a]	I-5	20	20	20	20	20
462[a]	I-5	20	10	10	10	10
466[a]	I-5	25	15	15	15	15
470/471[a]	SR60	15	15	10	10	10
620	Boyle Heights Shuttle	20	20	10	10	10
M10	Whittier/Atlantic	10	10	6	6	6
M35	Garfield, Riggin	30	30	12	12	12
M40	Fourth	10	6	8	8	8

Notes: [a] Express Bus Route serving Eastside Corridor

Source: MTA Modeling/GIS Division, April 1994; ICF Kaiser Engineers, April 1994; (Parsons Brinckerhoff Quade & Douglas, Inc. and Mundle & Associates, March 4, 1993, AA/DEIS/DEIR Los Angeles Eastside Corridor, April 1993.)



* - Proposed LPA Station Location

Source: Los Angeles County Metropolitan Transportation Authority

Metro Redline Eastside Extension	East Los Angeles Bus Routes	FIGURE 2-2.1

2-3.1 ALIGNMENT DESCRIPTION

The LPA is a 6.8-mile below-grade alignment with seven stations extending from Los Angeles Union Station east to the intersection of Whittier Boulevard and Atlantic Boulevard (Figure 2-3.1). The depth of the tunnel (from top of rail to ground surface) would generally range from 45 feet as it passes under the Los Angeles River to approximately 110 feet as it passes under State Route 60 (Pomona) freeway. Appendix 4 contains plan and profile drawings for the tunnel sections of the LPA. These drawings illustrate the location and depth of the tunnel and stations for the LPA. For a more detailed description of the stations, see Section 2.3.2 below.

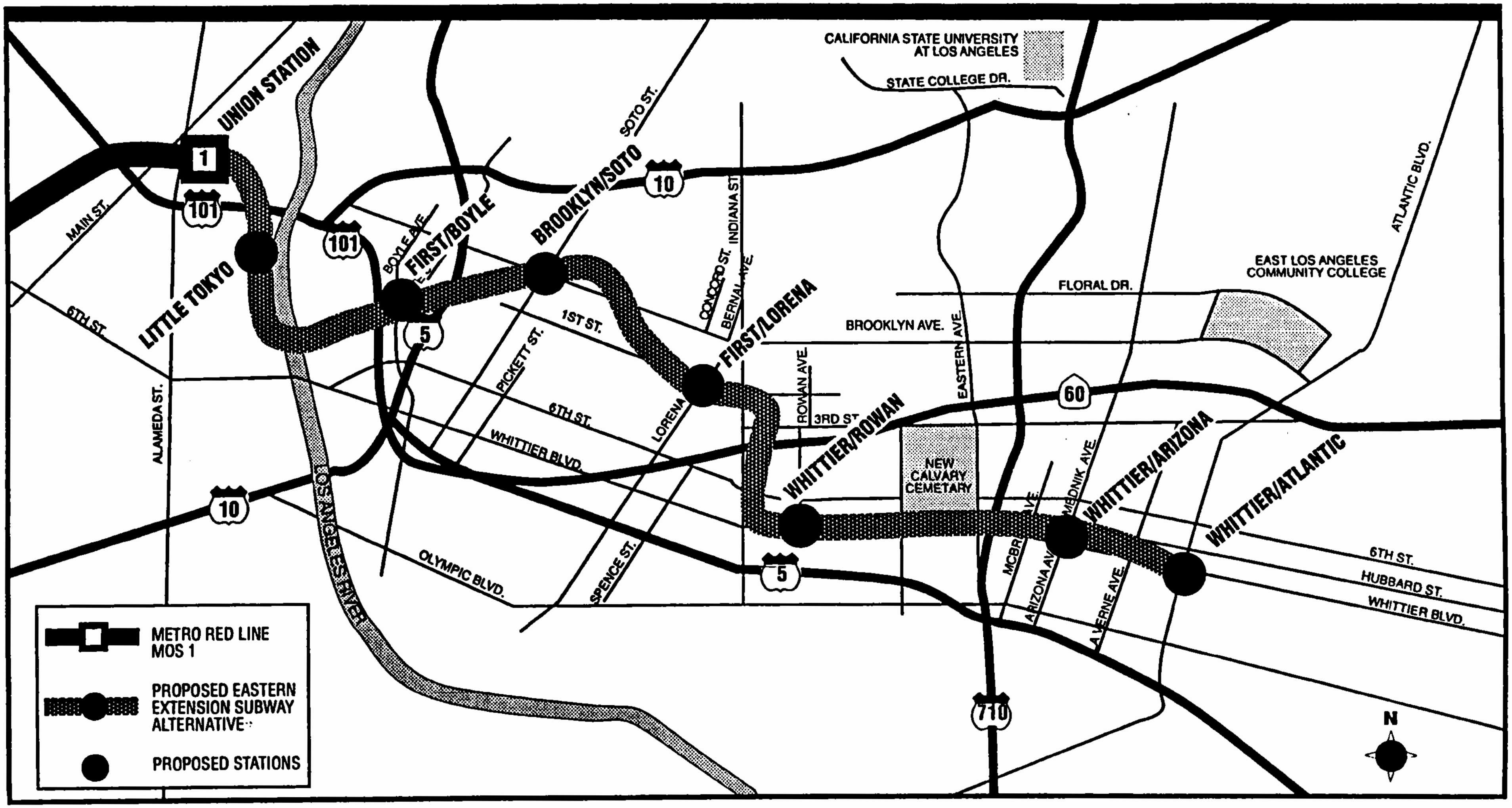
The LPA alignment would begin approximately 130 feet east of the Union Station platform where the tracks would branch from the existing tunnel structure that includes the tracks leading to the Metro Yard and Shops. The tracks (one for each direction) would branch off each side of the existing tunnel structure and proceed south in separately mined tunnels beneath the U.S. 101 (Hollywood) freeway, swing apart to allow for the inbound tunnel to pass under the current Metro Rail yard lead tracks, pass under private property and come together at the Little Tokyo station under street right-of-way at the intersection of Santa Fe Avenue and Third Street. The large separation between tunnels precludes cross passages between the two tunnels. For this segment, therefore, two emergency exits to the surface would need to be provided for each tunnel to meet Fire/Life Safety requirements.

After leaving the Little Tokyo station, the alignment would proceed in twin mined tunnels through a long eastward curve, passing beneath the Metro Yard and Shops and crossing under the Los Angeles River just north of the Fourth Street Bridge. The alignment would leave the curve in a northeasterly direction, passing under private property and the U.S. 101 (Hollywood) freeway before reaching a station located near the intersection of First Street and Boyle Avenue (First/Boyle station). A 375-foot crossover would be located at the southwestern end of this station.

From the First/Boyle station, the alignment would proceed in a northeasterly direction, passing below private property and the I-5 (Golden State) freeway. It would then run under private property parallel to and approximately midway between Brooklyn Avenue and New Jersey Street before entering an off-street station southeast of the intersection of Brooklyn Avenue and Soto Street (Brooklyn/Soto station).

From the Brooklyn/Soto station, the alignment would make an S-curve bringing it further south under First Street, still parallel to Brooklyn Avenue. Generally 750 and 1,000 foot radius curves are required in this segment to avoid entering Evergreen Cemetery property and to avoid potential impacts associated with changing the location and orientation of the Brooklyn/Soto station. Once under First Street, the alignment would pass through a station under the street right-of-way at the intersection of First Street and Lorena Avenue (First/Lorena station). A 375-foot crossover would be located at the western end of this station.

From the First/Lorena station, the alignment would make a southerly turn east of Indiana Street, bending back to run under Indiana Street immediately south of State Route 60 (Pomona) freeway. This curve goes past Indiana Street, since the First/Lorena station is too close to Indiana Street and the short curve that would be required to connect directly onto Indiana Street would jeopardize the speed of the train. The alignment would then continue south under Indiana



METROPOLITAN TRANSPORTATION AUTHORITY

METRO EASTERN EXTENSION

Los Angeles Eastside Corridor Locally Preferred Alternative

SCALE: 1 INCH= 07 MILE

DATE: June 1993

A1-008/3.94

FIGURE 2-3.1

Street until approximately Princeton Street, where it would make an easterly curve to run east beneath Whittier Boulevard. After completing this curve, the alignment would pass through a station under the street right-of-way at the intersection of Whittier and Rowan Avenues (Whittier/Rowan station). A 375-foot crossover is proposed for the western end of the Whittier/Rowan station.

From the Whittier/Rowan station, the LPA would continue east under Whittier Boulevard past but not under the New Calvary Cemetery. The alignment would deviate from Whittier Boulevard as the boulevard turns to head southeast immediately west of the I-710 (Long Beach) freeway. The alignment would continue east past the freeway before making a slight curve to come parallel to Whittier Boulevard. The alignment would continue in a southeasterly direction under private property and through an off-street station near the intersection of Whittier and Arizona boulevards (Whittier/Arizona station) before swinging south via an S-curve to continue heading southeast under Whittier Boulevard. The alignment would pass through a station under the street right-of-way at the intersection of Whittier Boulevard and Atlantic Avenue (Whittier/Atlantic station) and would end with a 750-foot tail track section. A 375-foot crossover is proposed for the western end of the Whittier/Atlantic station.

2-3.2 STATION DESCRIPTIONS

Figures 2-3.2 through 2-3.8 show the proposed vertical and horizontal locations and orientations, based on preliminary engineering, of the seven stations included in the LPA. The stations would utilize standard modular station designs consistent with the latest MTA/RCC Metro Red Line System Design Criteria and Standards documents. (See also Section 4-18.1.) A standard modular double-end and single-end mezzanine subway station, with double-height public space over the platform, has been developed for use on the Red Line Eastern Extension. (See Section 4-18.1 for a discussion of these modular station designs.) Four of the stations are designed with crossovers to enable the trains to move from one track to the other. With the exception of the Little Tokyo Station, all under-street stations and crossovers would be excavated from the surface and covered with a deck. Off-street stations, crossovers and the Little Tokyo station would be constructed using an open cut technique.

In locating the stations, efforts have been made during the planning and engineering phases to minimize, to the extent possible, the acquisition of private property as well as the possible impacts on residential property and local businesses. A mix of on- and off-street stations has therefore been adopted for the LPA to best meet these objectives. Primary station entrance locations have been identified for all stations. Criteria used for identifying these station entrances included efforts to:

- minimize residential acquisitions/displacement of active retail/commercial businesses,
- facilitate rail/bus transfers,
- create a pedestrian supporting environment,
- evaluate joint development potential,
- provide an area around rail station entrances that creates a sense of safety, and
- minimize major environmental issues.

FIGURE 2-3.2(a): LITTLE TOKYO STATION

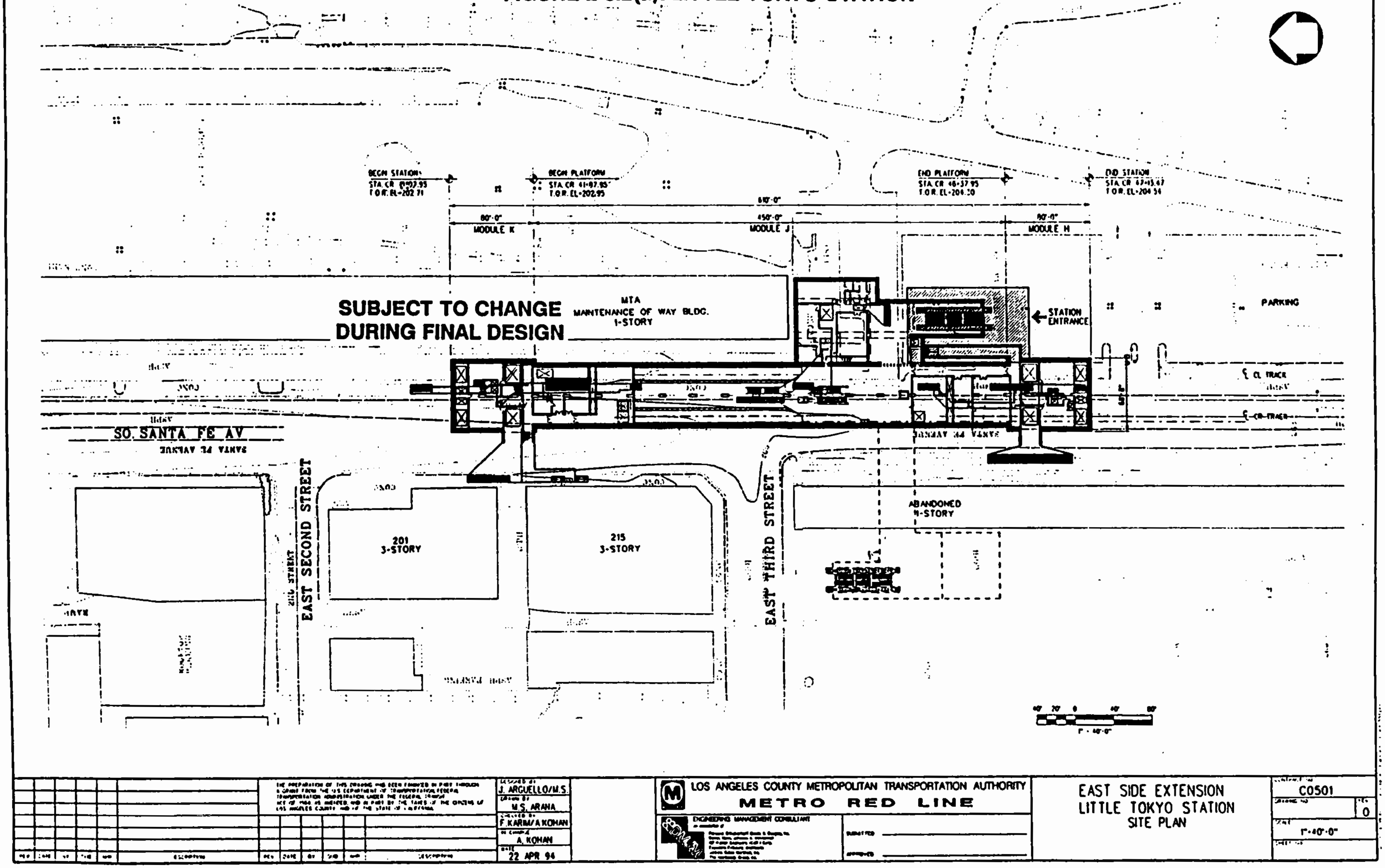


FIGURE 2-3.2(b): LITTLE TOKYO STATION

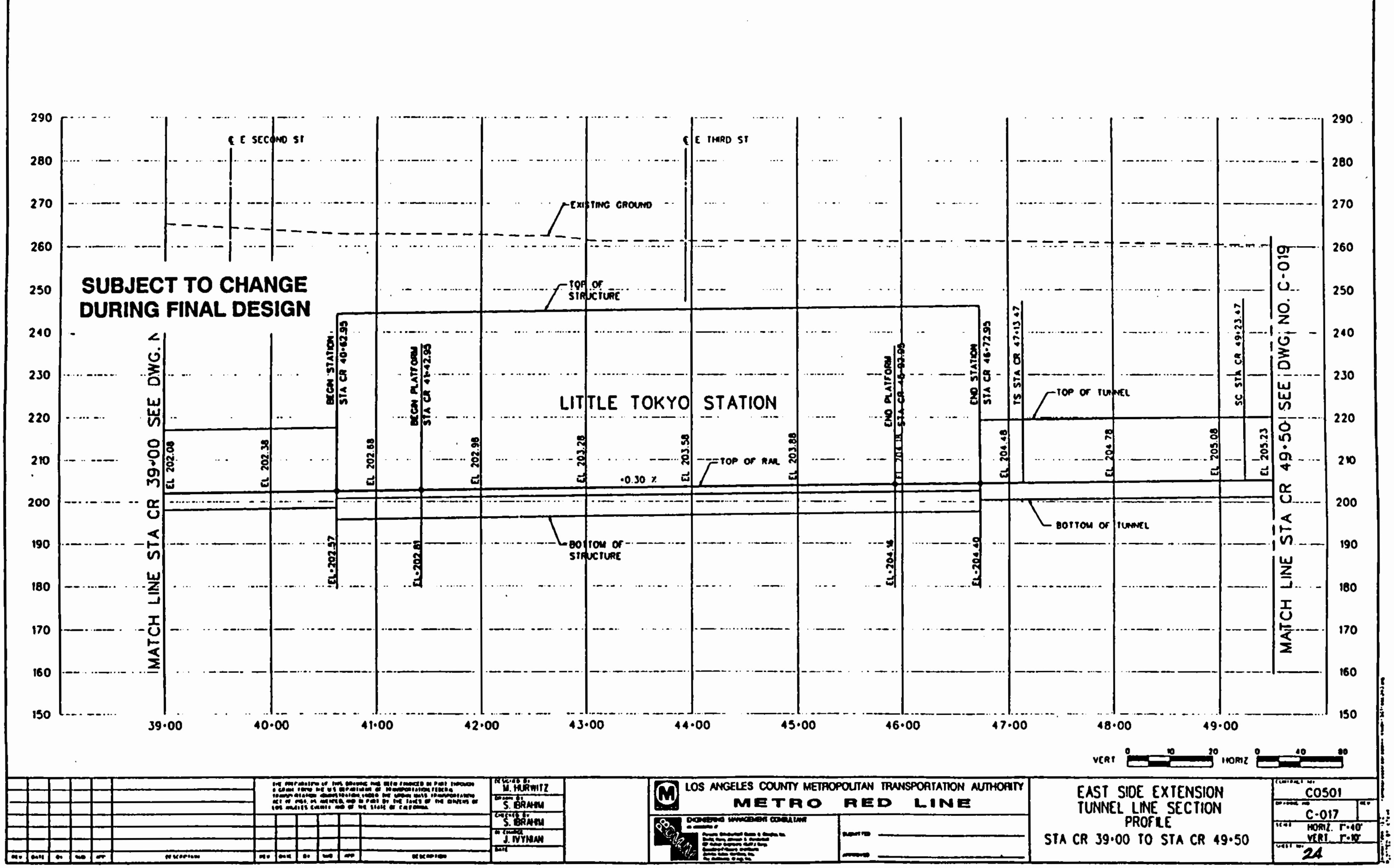


FIGURE 2-3.3(a): FIRST/BOYLE STATION

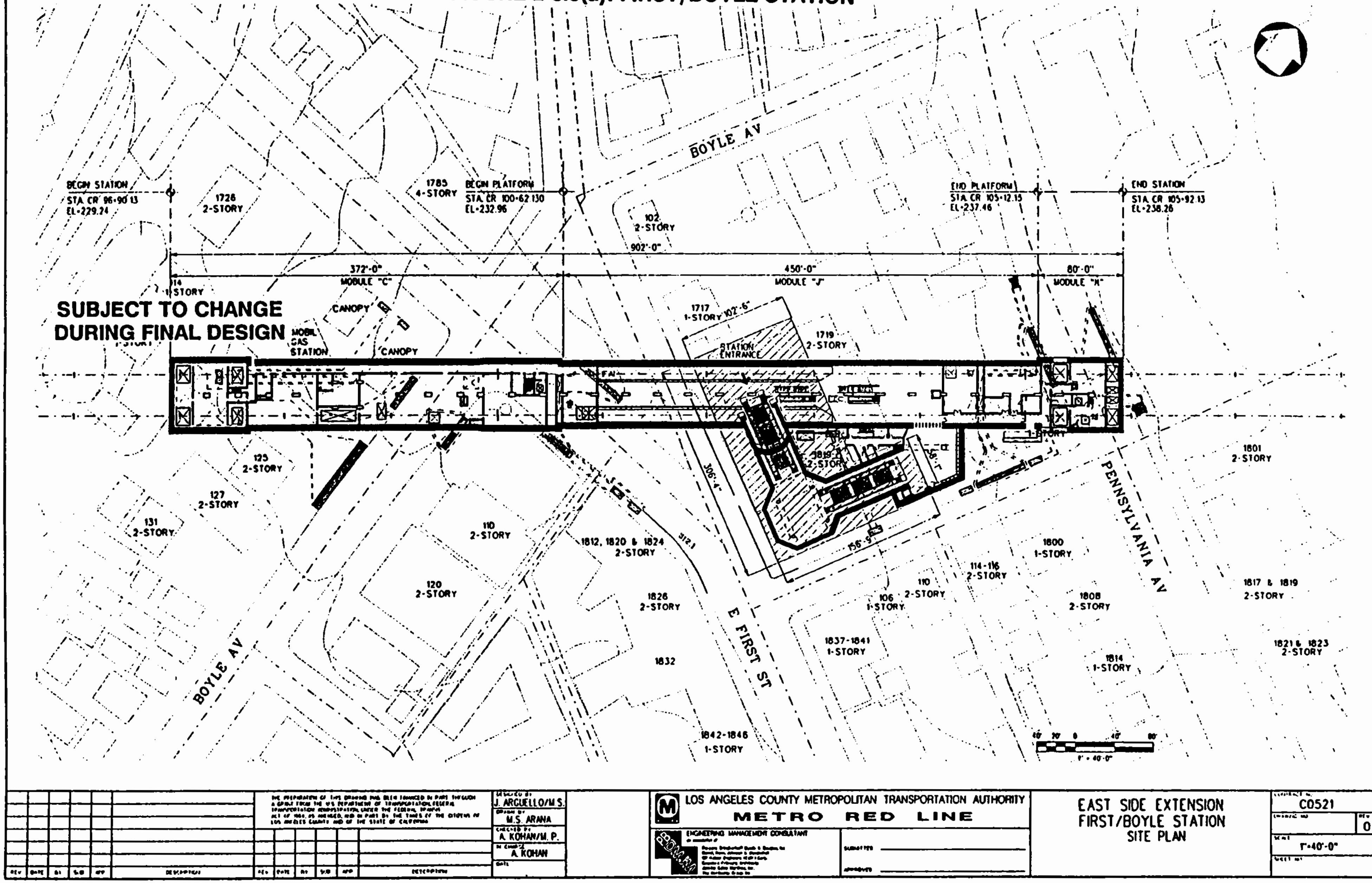


FIGURE 2-3.3(b): FIRST/BOYLE STATION

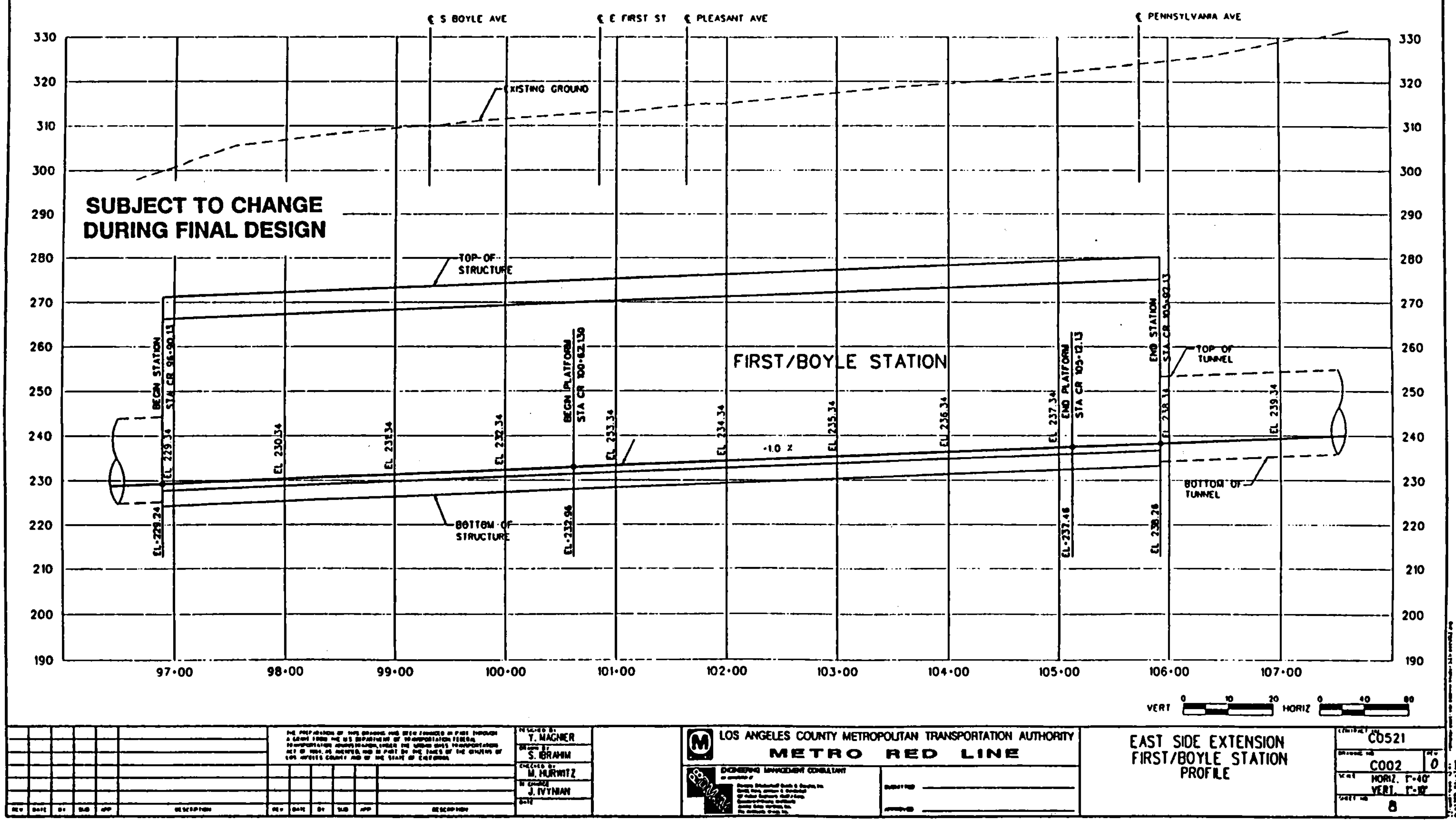


FIGURE 2-3.4(a): BROOKLYN/SOTO STATION

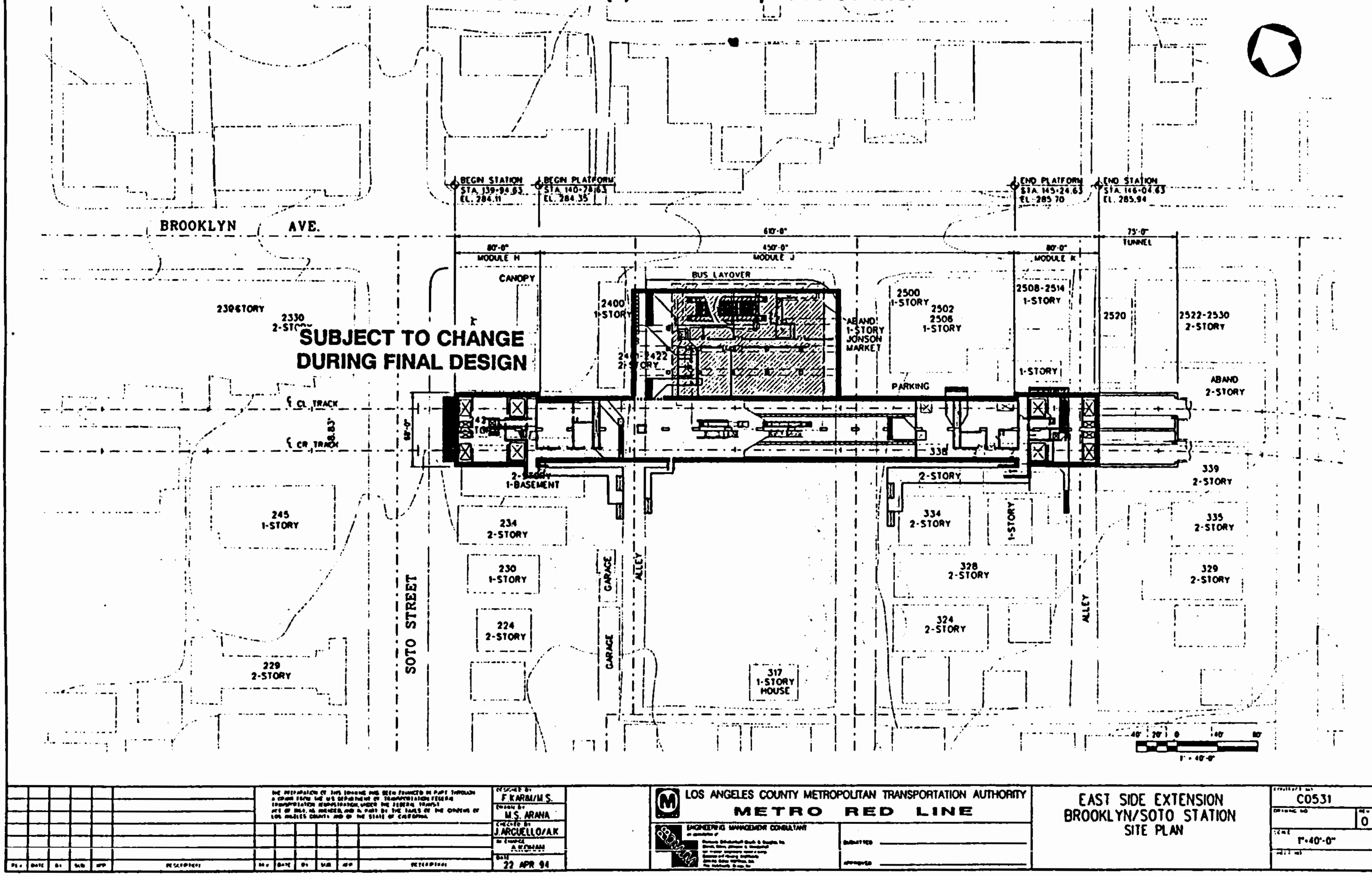


FIGURE 2-3.4(b): BROOKLYN/SOTO STATION

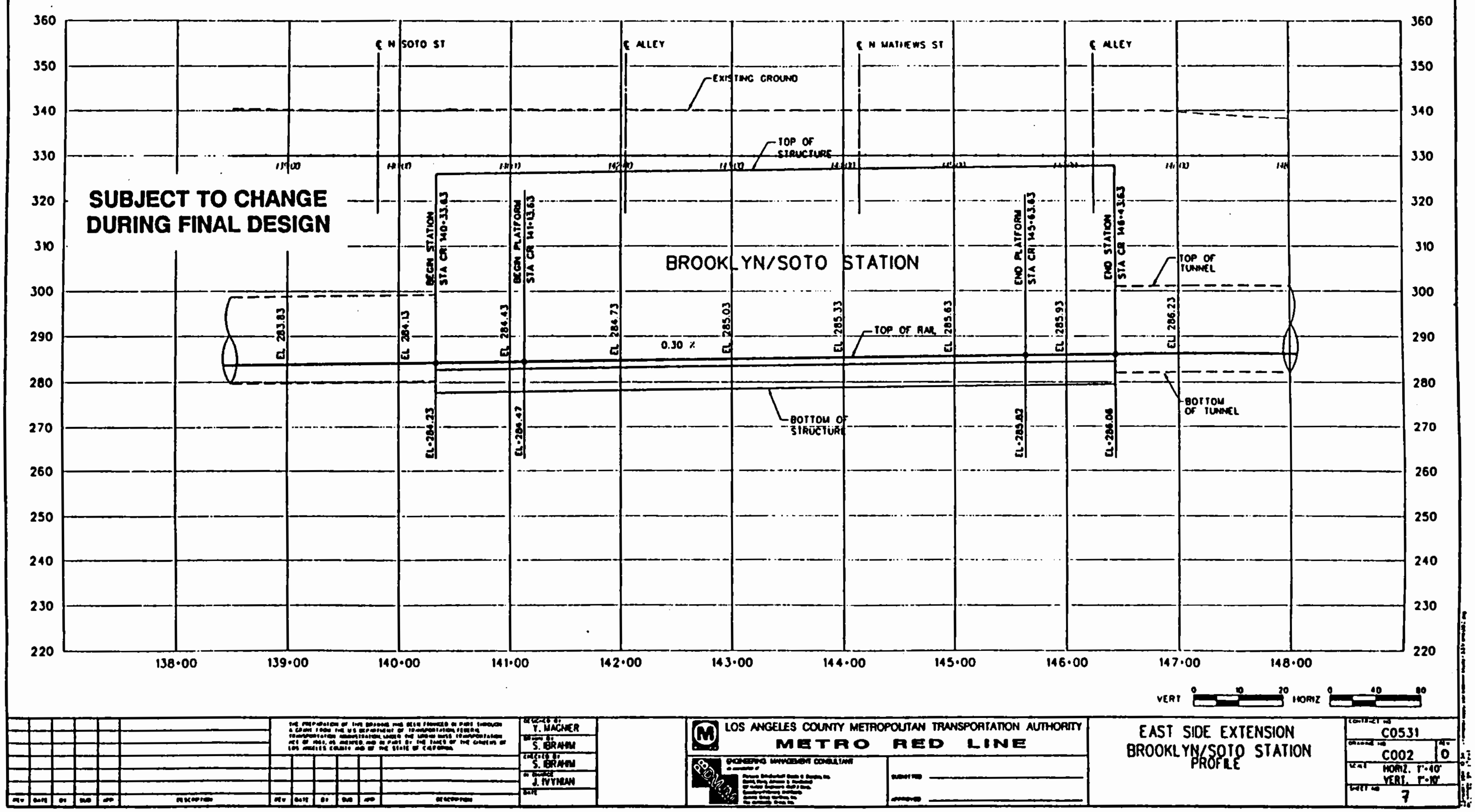


FIGURE 2-3.5(a): FIRST/LORENA STATION

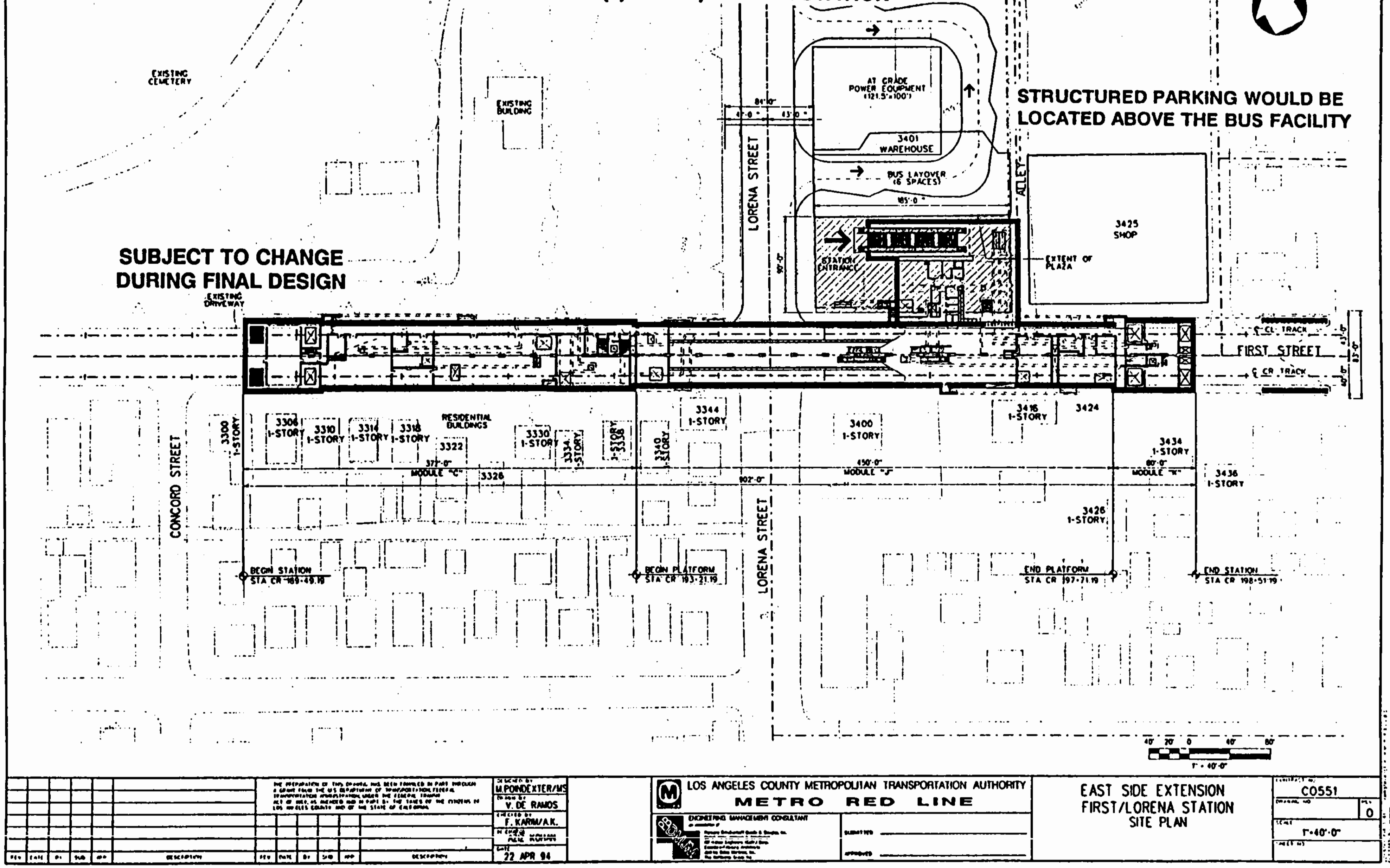


FIGURE 2-3.5(b): FIRST/LORENA STATION

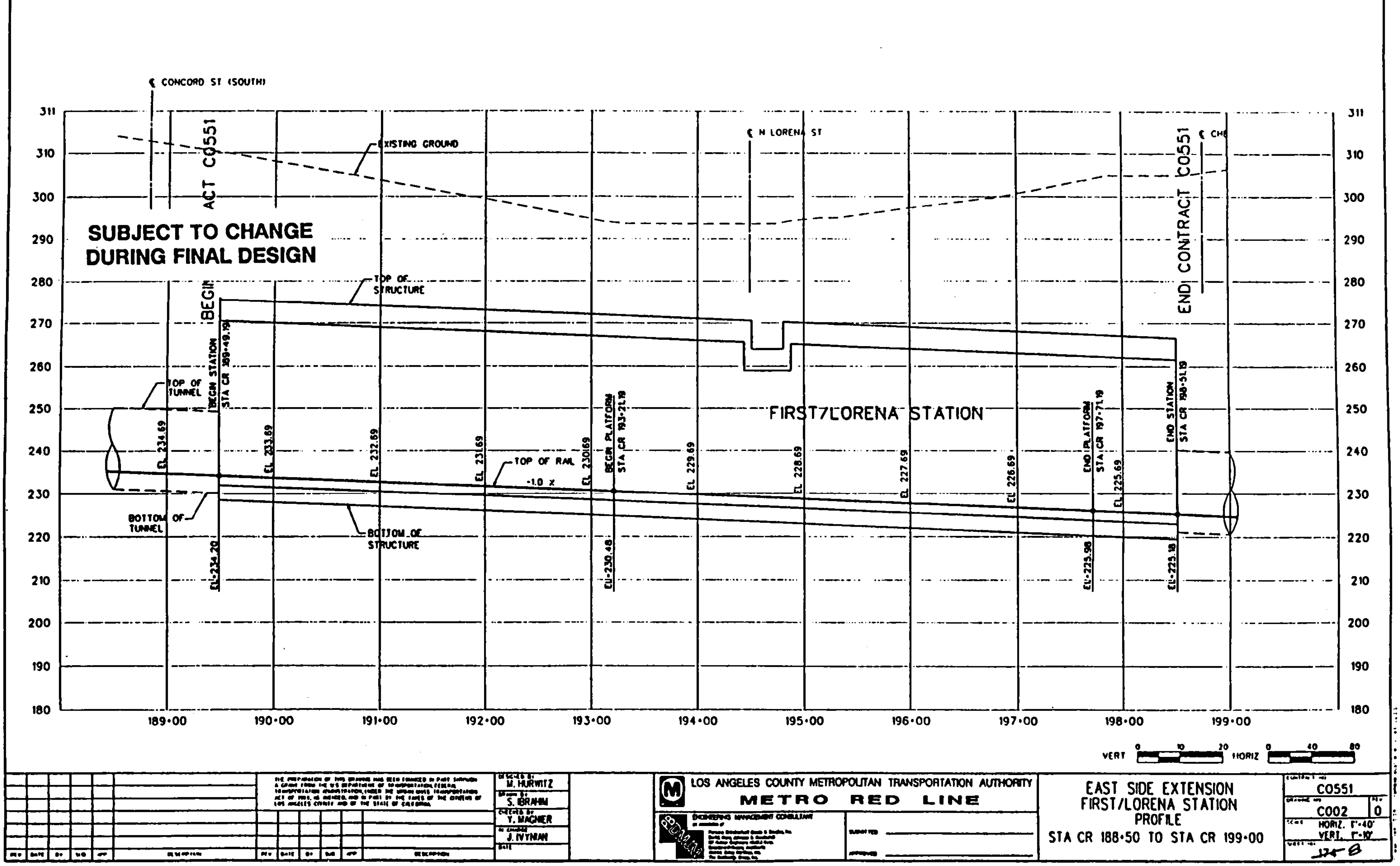
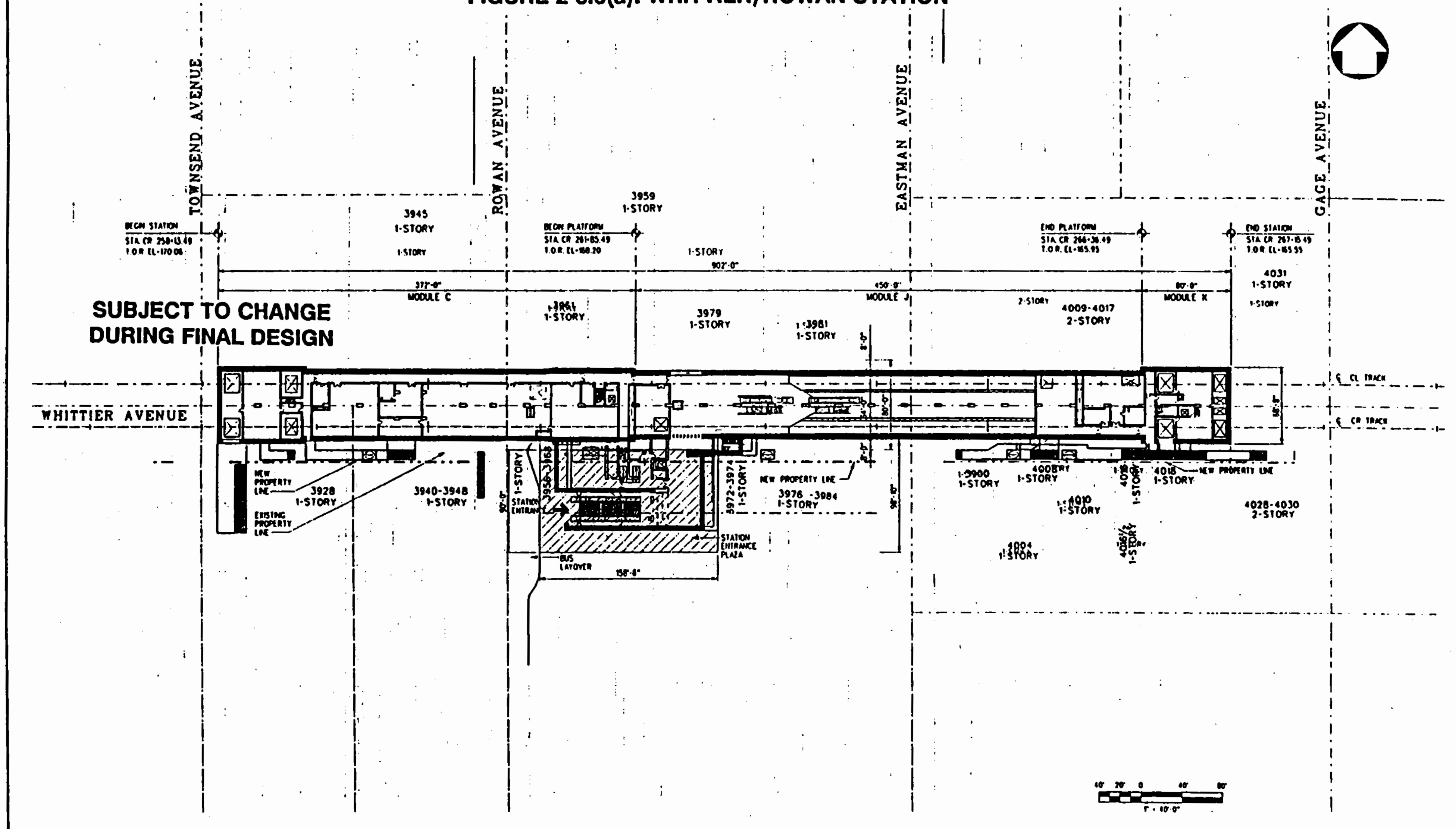


FIGURE 2-3.6(a): WHITTIER/ROWAN STATION



DESIGNED BY	J. ARGUELLO/M.S.
DRAWN BY	M.S. ARANA
CHECKED BY	A. KOHAN/M.P.
DATE	22 APR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

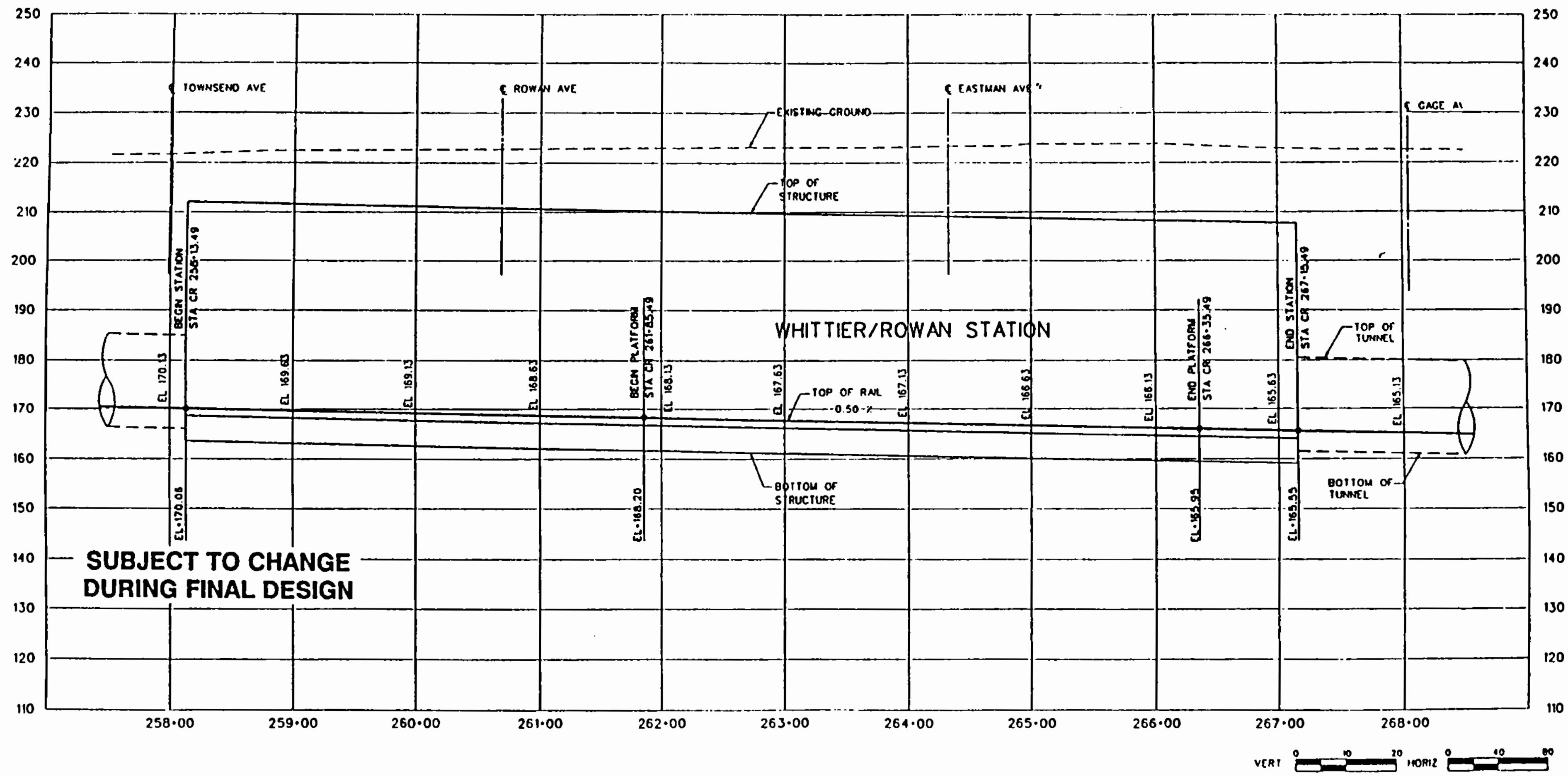
EAST SIDE EXTENSION
WHITTIER/ROWAN STATION
SITE PLAN

CONTRACT NO. C0561

REV 0

SCALE 1"=40'-0"

FIGURE 2-3.6(b): WHITTIER/ROWAN STATION



DESIGNED BY	Y. MAGNER
DRAWN BY	S. IBRAHIM
CHECKED BY	S. IBRAHIM
IN CHARGE	J. IVYNIAN
DATE	21 MAR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED ______

APPROVED ______

EAST SIDE EXTENSION
WHITTIER/ROWAN STATION
PROFILE

CONTRACT NO	C0561
DRAWING NO	C002
REV	0
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO	251 B

FIGURE 2-3.7(a): WHITTIER/ARIZONA STATION

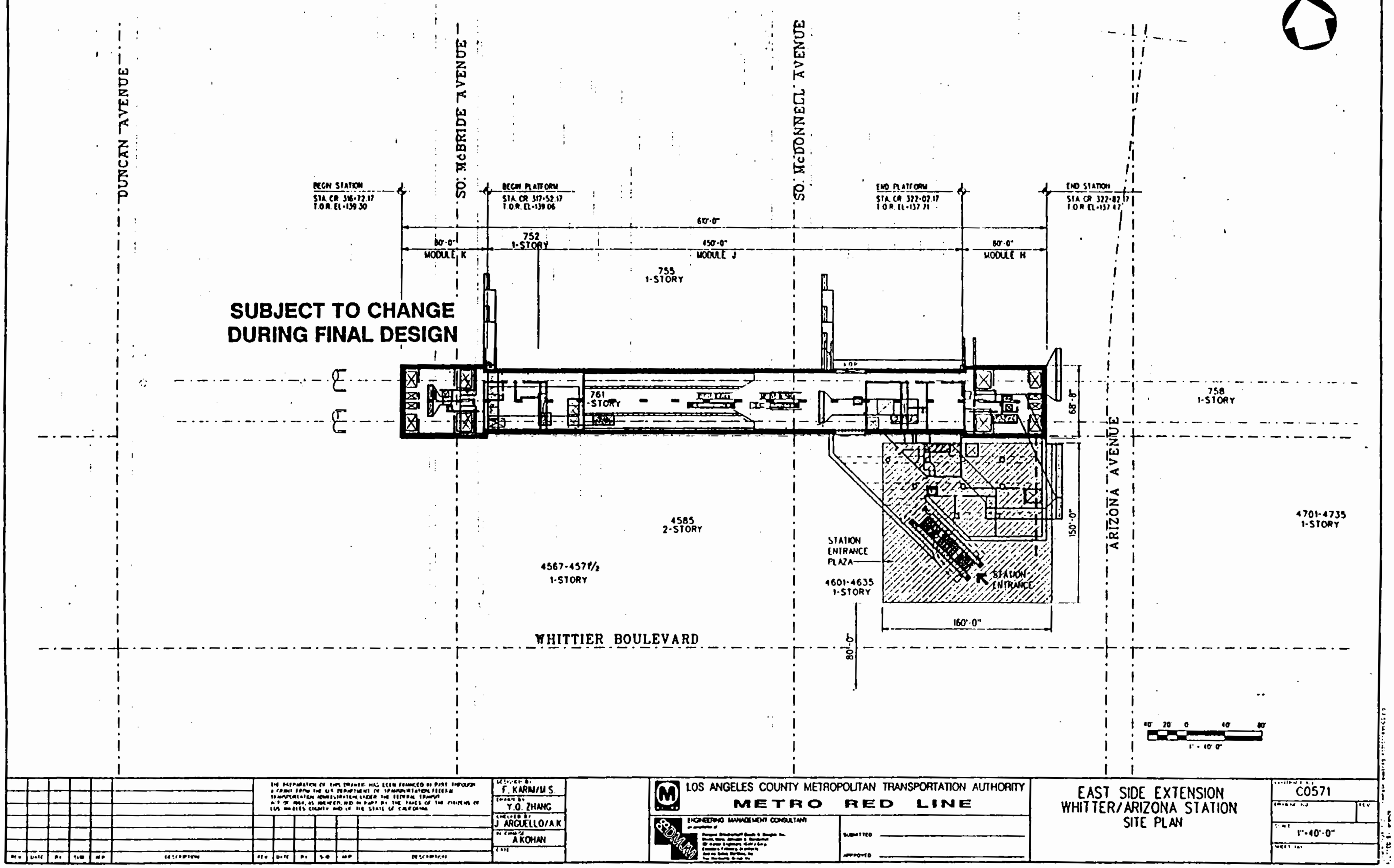


FIGURE 2-3.7(b): WHITTIER/ARIZONA STATION

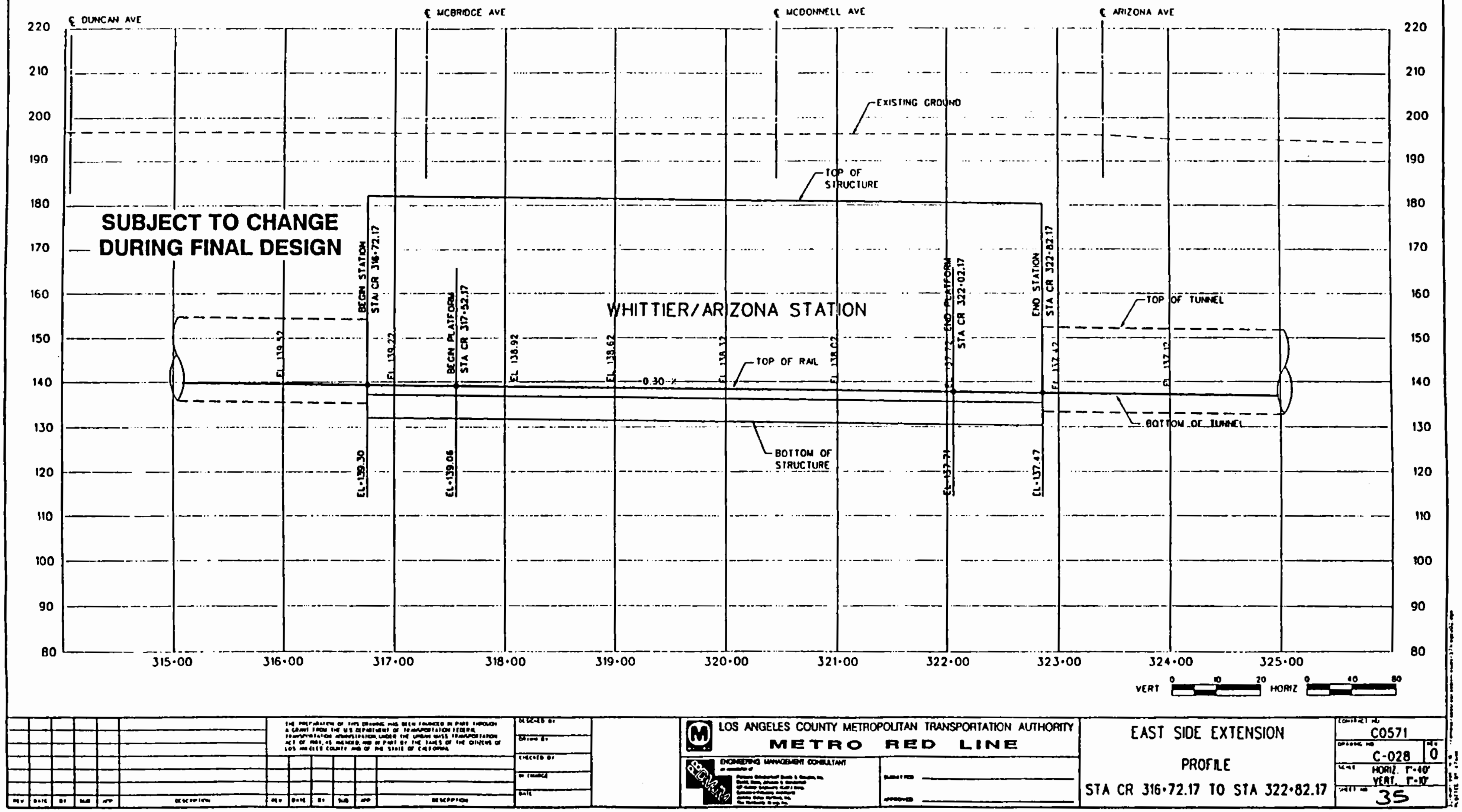


FIGURE 2-3.8(a): WHITTIER/ATLANTIC STATION

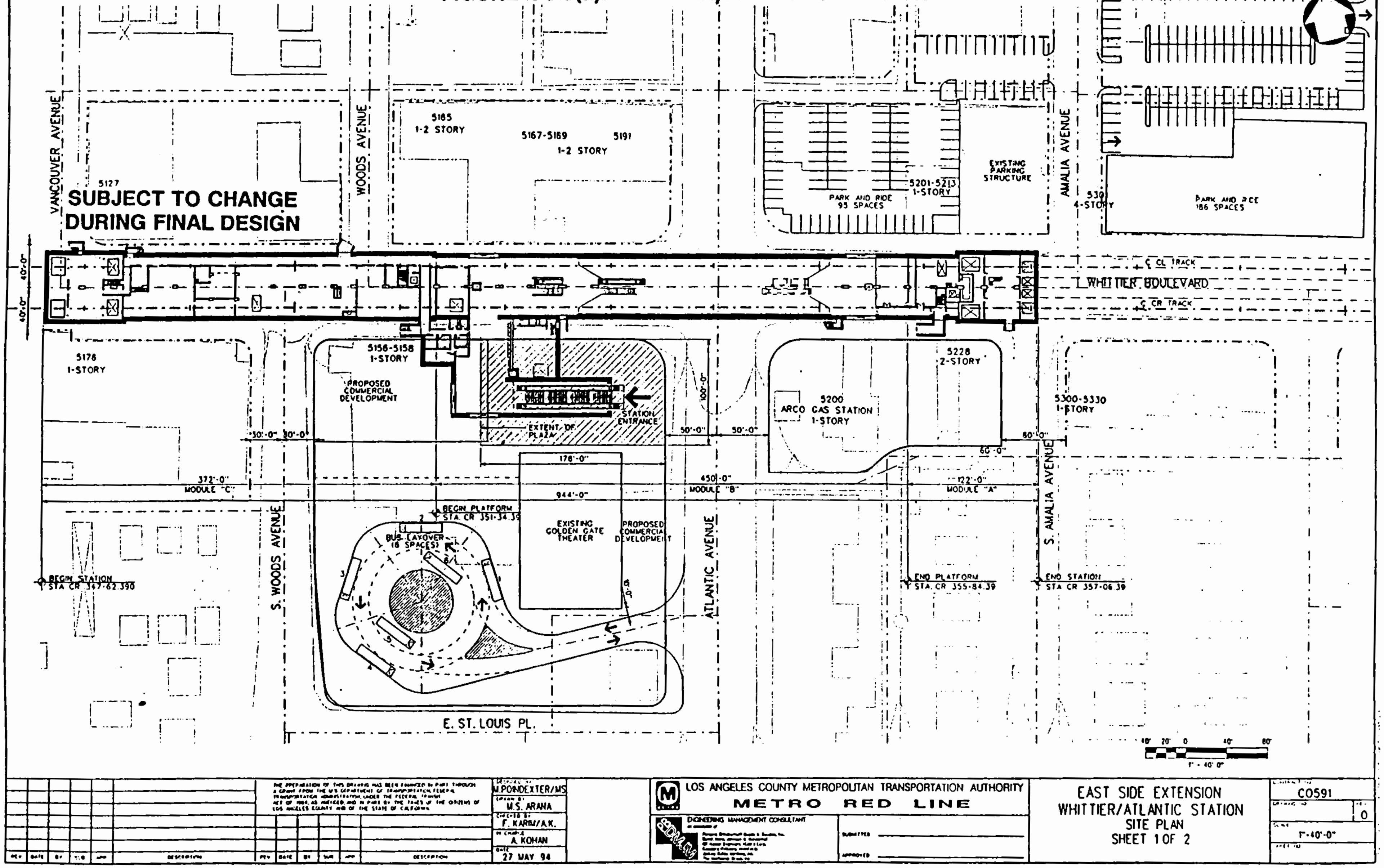


FIGURE 2-3.8(b): WHITTIER/ATLANTIC STATION

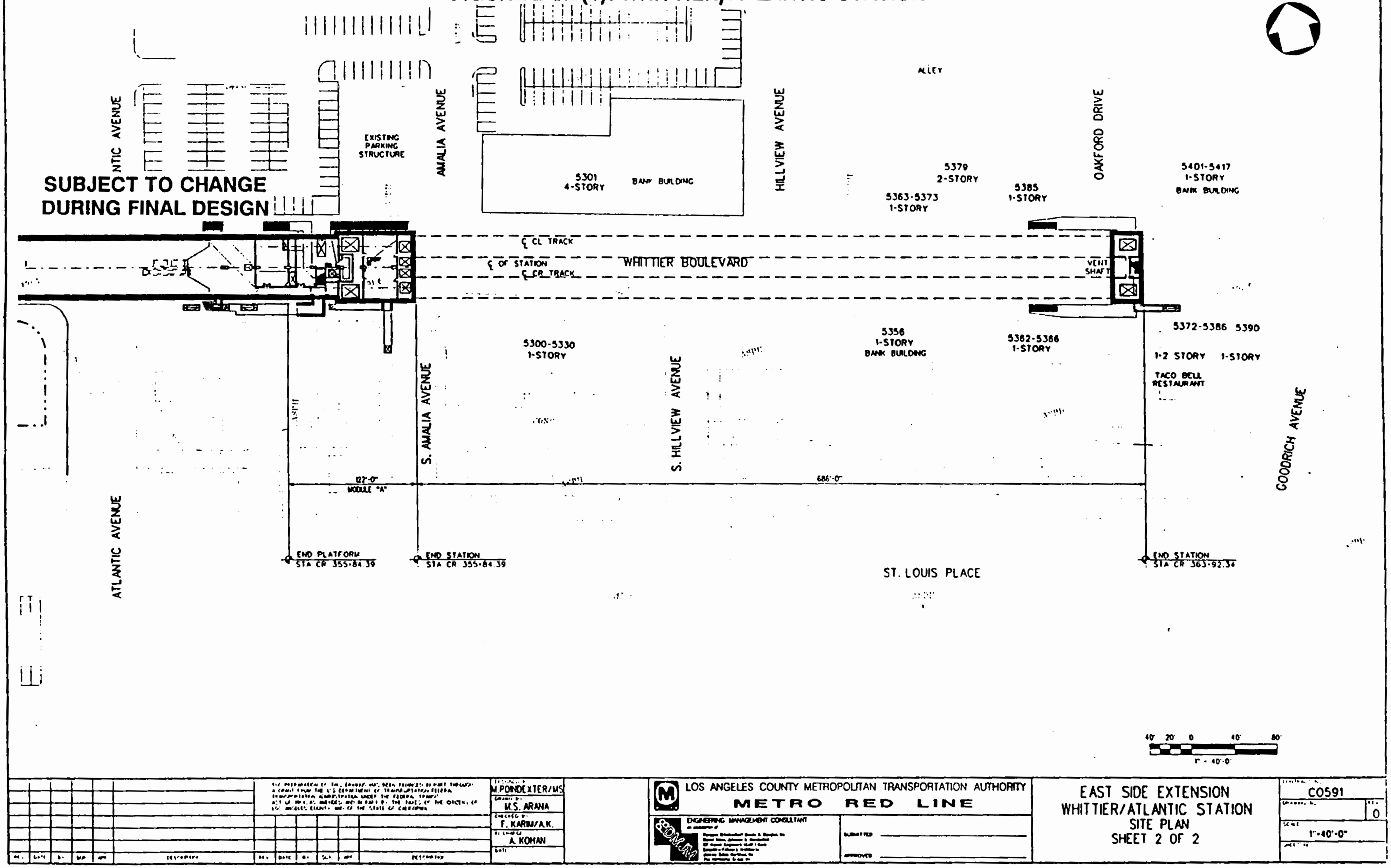
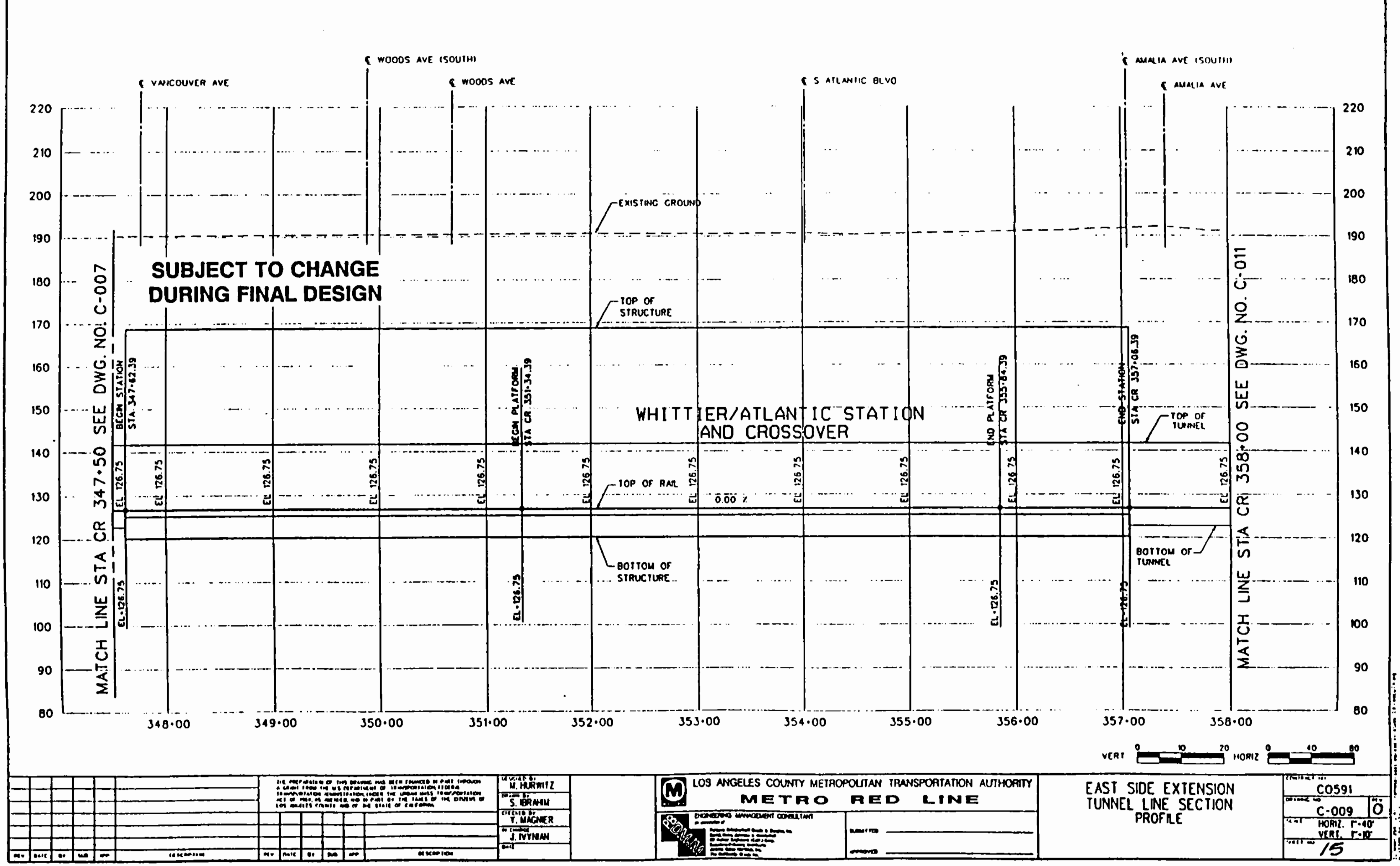


FIGURE 2-3.8(c): WHITTIER/ATLANTIC STATION



Final orientation of station entrances may be revised based on discussions with the community, landowners and developers during final design. The general location of all other structures that affect station areas, such as vent shafts, fresh air intakes, and emergency exit stair hatches was established during the preliminary engineering phase. Important features identified before and during preliminary engineering for each of the stations in the LPA are discussed below.

2-3.2.1 Little Tokyo Station

The Little Tokyo station would be located approximately 60 feet under Santa Fe Avenue at Third Street, directly opposite the existing MTA Rail Maintenance-of-Way Building. There are two optional locations for the station entrance. The first entrance option would be located at the southwest corner of the intersection and the second on the east side of Santa Fe Avenue, in the Metro Yard just east of the maintenance-of-way building (see Figure 2-3.2).

2-3.2.2 First/Boyle Station

The First/Boyle station would be located just east of the U.S. 101 (Hollywood) freeway approximately 80 feet under First and Boyle streets (see Figure 2-3-3). The station would extend diagonally under the present First/Boyle intersection and cross private property and Pennsylvania Avenue at the north end, just prior to ending below the White Memorial Hospital parking lot. The entrance to the station would be located at the northwest corner of First and Bailey Streets. The entrance design was developed to accommodate the future development of the Mariachi Plaza. The station would also include a 375-foot double crossover on the southwesterly end, located under private property (to be acquired).

2-3.2.3 Brooklyn/Soto Station

After the route crosses Soto Street, the Brooklyn/Soto station would begin. The station would be located approximately 200 feet south of and parallel to Brooklyn Avenue (see Figure 2-3.4). It would lie 55 feet under private property (to be acquired) for about one and a half blocks. The main entrance would be located at the northwest corner of Brooklyn Avenue and Mathews Street under an existing abandoned one-story structure to be acquired and demolished. All proposed structures, shafts, emergency stairs, fresh-air intakes, etc., would be located at the perimeter of each lot, leaving land suitable for future development.

2-3.2.4 First/Lorena Station

The First/Lorena station would be located 65 feet under First Street and include a 375-foot crossover on the western end (see Figure 2-3.5). A combination of hilly terrain along First Street and deep sewers would force the station to be as deep as 85 feet on the eastern end. In order to keep the station from being any deeper, a notch has been designed into the roof to allow a major storm sewer to remain in place. The station entrance would be located at the northeast corner of First Street and Lorena Street and provide access to a single-end mezzanine station containing one knock-out panel. The station would also include up to 500 parking spaces located at the northeast corner of First Street and Lorena Street north of the station entrance. As shown on Figure 2-3.5, a bus facility is also proposed for this station. Should a parking structure be built at this station, it would be constructed over the bus facility.

2-3.2.5 Whittier/Rowan Station

The Whittier/Rowan station and a 375-foot crossover would be located 55 feet under Whittier Boulevard between Townsend Avenue and Gage Avenue, with the station entrance at the southeast corner of Whittier Boulevard and Rowan Avenue (see Figure 2-3.6).

2-3.2.6 Whittier/Arizona Station

The Whittier/Arizona station would be located immediately north of the first alley north of Whittier Boulevard, about 55 feet below private property (see Figure 2-3.7). The eastern end of the station would abut the western edge of Arizona Avenue. The station entrance would lie at the northwest corner of Whittier Boulevard and Arizona Avenue.

2-3.2.7 Whittier/Atlantic Station

The Whittier/Atlantic station would be located 65 feet under Whittier Boulevard and include a 375-foot crossover beginning at Vancouver Avenue with the station itself nearly centered at Atlantic Boulevard (see Figure 2-3.8). The entrance would be located in front of an historic theater on the southwest corner of Whittier Boulevard and Atlantic Avenue. Up to 1,200 parking spaces are ultimately anticipated to be provided in one or two structures at the northeast and/or southwest corners of Whittier Boulevard and Atlantic Avenue. A bus facility is also proposed for the southwest quadrant of the intersection. A mined tail track would exist east of this station.

2-3.3 INITIAL OPERABLE SEGMENTS (IOSs)

It is possible that the LPA would be built in segments, i.e., some tunnel sections and stations would be built beginning at Union Station and ending at an interim terminus station and, at a later date, the remainder of the LPA stations and tunnel line segments would be built. Two segments, known as Initial Operable Segments (IOSs), have been developed for environmental review and analysis. The two IOSs reviewed in the FEIR are shown in Table 2-3.1.

TABLE 2-3.1: PROPOSED INITIAL OPERABLE SEGMENTS

IOS IDENTIFIER	NUMBER OF STATIONS	LENGTH	STATIONS INCLUDED
IOS-1	2	2.0 mile	• Little Tokyo • First/Boyle
IOS-2	4	3.7 mile	• Little Tokyo • First/Boyle • Brooklyn/Soto • First/Lorena

Source: Metropolitan Transportation Authority, 1994

2-3.4 OPERATING CHARACTERISTICS

The following sections describe the planned operating service for the LPA and the IOSs along with the corresponding fleet sizes and facility and equipment requirements for the transit system.

2-3.4.1 Feeder Bus Access

The proposed Metro Red Line bus/rail interface plan for the eastern extension includes the provision of feeder bus access to all rail stations. The major difference in the LPA-related bus service compared to the No-Build alternative is the provision of improved headways (more frequent service) in the north-south routes. These north-south bus routes (MTA lines 250/253, 251/252, 254, 255/46, 256, 258/259 and 260; Montebello lines 10 and 35), as shown in Table 2-1.5 and Figure 2-1.1, provide feeder service to the rail stations proposed in the LPA and IOSs. The bus/rail interface plan for the eastern extension is summarized in the following subsections.

a. Little Tokyo

For the Little Tokyo station, public bus transit access would be provided by MTA Line 30/31 via bus stops along First Street. Montebello Municipal Bus Line 40 would serve this station via Fourth Street. Feeder bus service to this station is also proposed via shuttle type service (similar to the current Los Angeles Department of Transportation [LADOT] DASH service) to be operated along the Alameda Street, Central Avenue and San Pedro Street corridors.

b. First/Boyle

Public transit access by bus to the First/Boyle Station would be provided by MTA Line 30/31 via bus stops along First Street. MTA Line 250 would also serve this station via bus stops along Boyle Avenue. The Boyle Heights shuttle, LADOT Line 620, would serve this station via First Street and Boyle Avenue.

c. Brooklyn/Soto

Brooklyn/Soto Station bus access would be provided by MTA Line 251/252 via bus stops along Soto Street. MTA Line 68 would serve this station via bus stops along Brooklyn Avenue. MTA Lines 253 and 255 would be rerouted to serve this station via on-street bus stops. MTA Line 104 would be extended further north to terminate at this station, in an on-street terminal. Line 620, operated by LADOT, would also terminate at this station.

d. First/Lorena

Bus access to the First/Lorena Station would be providèd by terminating all MTA Route 30 shortlines and Route 31 trips at this station in an off-street terminal. A shuttle service is proposed to operate along the segment of First Street to East Los Angeles College that would no longer be served by Route 31. MTA Lines 65 and 255 would be rerouted to serve this station via on-street bus stops. MTA Line 470/471, a freeway express route, would terminate at this station serving residents and patrons who live and work at sites to the East. This service would be provided for IOS-2 and would continue until the full LPA is completed.

e. Whittier/Rowan

Bus access to the Whittier/Rowan Station would be provided by MTA Line 18 via bus stops along Whittier Boulevard. An on-street terminal for MTA Line 255 is programmed to serve this station via Rowan Avenue. MTA Line 255 would terminate at this station.

f. Whittier/Arizona

Public bus access to the Whittier/Arizona Station would be provided by MTA Line 18 via bus stops along Whittier Boulevard. MTA Line 258 would serve the station via Arizona Avenue on-street stops. MTA Line 258 would terminate at this station, and it is proposed that MTA Line 256 be rerouted to also terminate at this station. MTA Line 259 would serve this station via bus stops along Arizona Avenue.

g. Whittier/Atlantic

Bus access to the Whittier/Atlantic Station would be provided by MTA Line 18 via Whittier Boulevard. This Line is proposed to terminate at this station. Patrons wishing to continue further east on Whittier could do so by transferring to Montebello Municipal Bus Lines, which offer frequent service. MTA Lines 460, 462 and 466 also are proposed to terminate at this station. Currently these lines operate on the Santa Ana Freeway passing Atlantic Boulevard to downtown Los Angeles. MTA Line 470/471 is proposed to terminate at this station upon completion of the full LPA. It would operate to the proposed First/Lorena terminal station if IOS-2 were built.

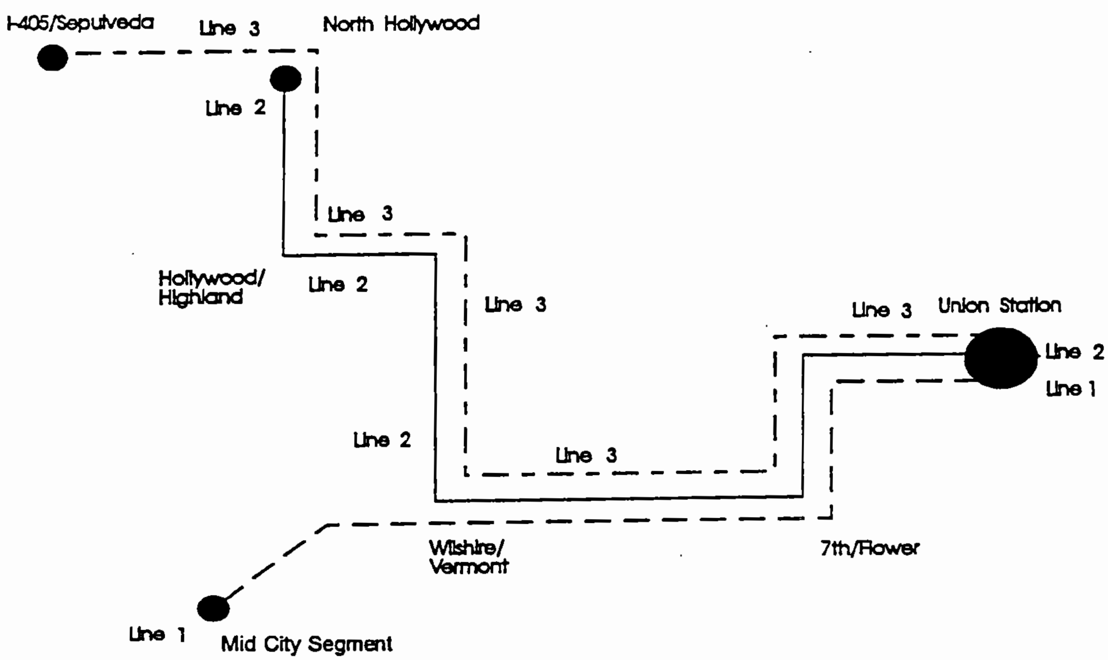
MTA Line 66/67 is proposed to be rerouted to serve the Whittier/Atlantic station. These lines currently serve this area via Olympic Boulevard. Route 67 trips would terminate at the station, where an off-street terminal would be provided for the many MTA Lines. It is assumed that the Montebello Municipal Bus Lines and the Orange County Transit Authority (OCTA) Lines also would terminate at this station.

2-3.4.2 Service Plan

The MTA 30-Year Plan Red Line operating configurations were assumed for this Final EIR. In the Year 2010, the Red Line, prior to the addition of the Eastern Extension LPA, is expected to consists of three operating lines (see Figure 2-3.9):

- Line 1: Mid-City Segment to Union Station
- Line 2: North Hollywood to Union Station
- Line 3: I-405/Sepulveda to Union Station

Traveling west from Union Station, all three lines run in a common section to the Wilshire/Vermont station. Line 1 branches at this location to a westside station in the Mid-City Segment. Lines 2 and 3 would operate north on Vermont Avenue, west on Hollywood Boulevard and under the Hollywood Hills to North Hollywood, where Line 2 would turn around. Line 3 would continue to the vicinity of the I-405/Sepulveda, where it would reverse direction and return to Union station.



Source: Parsons Brinckerhoff Quade & Douglas, Inc; Myra L. Frank & Associates, Inc., 1993.

FIGURE 2-3.9: ASSUMED OPERATING LINES FOR RED LINE

TABLE 2-3.2: 2010 FUTURE SERVICE LEVELS

SEGMENT	OPERATING LINE	HEADWAYS (minutes)		CARS PER TRAIN	
		PEAK	OFF-PEAK	PEAK	OFF-PEAK
IOS-1	First/Boyle to Mid-City Segment	4	6	4	4
	First/Boyle to North Hollywood	8	12	4	4
	Union Station to I-405/Sepulveda	8	12	4	4
IOS-2	First/Lorena to Mid-City Segment	4	6	4	4
	First/Lorena to North Hollywood	8	12	4	4
	Union Station to I-405/Sepulveda	8	12	4	4
LPA	Whittier/Atlantic to Mid-City Segment	4	6	4	4
	Whittier/Atlantic to North Hollywood	8	12	4	4
	Union Station to I-405/Sepulveda	8	12	4	4

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

Based on MTA 30-Year Plan assumptions, the LPA would extend Lines 1 and 2 to the Whittier/ Atlantic station. The service headways shown in Table 2-3.2 have been assumed for the LPA.

The major difference in the Year 2010 Red Line transit operating plan between the No-Build and the LPA is the addition of the rail alternative east of Union Station (Lines 1 and 2 extended) and the increase in service frequencies (headways) for Line 1 (Mid-City Segment to the Eastside terminus) from eight minutes to four minutes in the peak period and from 12 minutes to six minutes in the off-peak period. This would provide an effective peak period headway of 2.7 minutes for the LPA. The off-peak headway would be 4.0 minutes. Because the LPA is an integral part of the regional system and not an isolated component, there would be, as in the case with the improved north-south headways, additional transit trips that do not have an origin or destination within the Eastside Corridor study area.

Weekday service is planned as follows:

- Peak Periods:
  - 6:00 AM - 9:00 AM
  - 3:00 PM - 6:00 PM
- Off-Peak Periods:
  - 5:00 AM - 6:00 AM
  - 9:00 AM - 3:00 PM
  - 6:00 PM - 1:00 AM

2-3.4.3 Travel Times

Estimated travel times for the LPA are based on the performance characteristics of the Red Line heavy rail vehicle now in operation in downtown Los Angeles between Union Station and MacArthur Park. Maximum operating design speed is 70 miles per hour, and station dwell times are assumed to be 20 seconds. Average speeds on the LPA, including station stops, acceleration and deceleration, would be 30 miles per hour. Travel times for the service routes (including the IOSs) were determined by computer simulation and are shown below in Table 2-3.3.

TABLE 2-3.3: SERVICE ROUTE TRAVEL TIMES
(Minutes)

OPERATING LINE		1-WAY TRAVEL TIMES	TERMINAL TIMES [a]		ROUND TRIP TIMES
			EAST TERM.	WEST TERM.	
LPA	Whittier/Atlantic to Mid-City Segment	31	2 ½	2 ½	67
	Whittier/Atlantic to North Hollywood	43	2 ½	2 ½	91
IOS-1	First/Boyle to Mid-City Segment	21	2 ½	2 ½	47
	First/Boyle to North Hollywood	33	2 ½	2 ½	71
IOS-2	First/Lorena to Mid-City Segment	25	2 ½	2 ½	55
	First/Lorena to North Hollywood	37	2 ½	2 ½	79
Union Station to I-405/Sepulveda	Union Station to I-405/Sepulveda	37	2 ½	2 ½	79

Notes: [a] Terminal Times are the amount of time that it takes for the train to reverse direction.

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

2-3.4.4 Fleet Size

The passenger vehicle for the LPA would be the same as the one being used on the existing Metro Rail Red Line, which is heavy rail. Each car is 75 feet long, with seating for 59 passengers. The cars are designed to accommodate a normal peak load of 169 people, with a maximum load of 301 people.

Trains would run via automatic train operation which would regulate train speeds and control programmed entry and stopping of trains at stations. All non-automatic train functions would be controlled by the operator in the train's lead car. These functions include the operation of passenger vehicle doors, train dwell times in stations, train departure and communications. In addition, the central control system would monitor all train operations, stations and sub-systems (electrical, communication, ventilation, etc.)

In order to provide the planned service described in Table 2-3.2 with the calculated round trip times shown in Table 2-3.3, 12 trains would be required for the Whittier/Atlantic to Mid-City Segment service, 17 trains would be required for the Whittier/Atlantic to North Hollywood service and 10 trains would be required for the Union Station to Union Station to I-405/Sepulveda service. Adding two four-car standby trains to put into service during either service disruptions or equipment failures and a 20 percent margin of spare vehicles to account for vehicles either needing repair or scheduled for maintenance, the total fleet size requirement would be 196 cars, as summarized in Table 2-3.4.

TABLE 2-3.4: FLEET SIZE PROJECTIONS

SERVICE		NUMBER OF PEAK TRAINS	CARS PER TRAIN	CAR REQUIREMENTS			
				REVENUE	STANDBY	SPARES	TOTAL
LPA	Whittier/Atlantic to Mid-City Segment	12	4	48	0	10	58
	Whittier/Atlantic to North Hollywood	17	4	68	4	14	86
	Union Station to I-405/Sepulveda	10	4	40	4	8	52
	LPA TOTAL	39	N/A	156	8	32	196
IOS-1	First/Boyle to Mid-City Segment	9	4	36	0	10	44
	First/Boyle to North Hollywood	12	4	48	4	8	62
	Union Station to I-405/Sepulveda	10	4	40	4	8	52
	IOS-1 TOTAL	31	N/A	124	8	26	158
IOS-2	First/Lorena to Mid-City Segment	10	4	40	0	12	48
	First/Lorena to North Hollywood	14	4	56	4	8	72
	Union Station to I-405/Sepulveda	10	4	40	4	8	52
	IOS-2 TOTAL	34	N/A	136	8	28	172

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

The maximum number of cars that the current Red Line yard can accommodate is 180. Trains can also be stored overnight at terminal stations properly equipped with tail tracks of sufficient length. As currently designed, three trains could be stored overnight at the Whittier/Atlantic station: one in each tail track and a third train on one platform track. Additional trains could also be stored at the I-405/Sepulveda terminus if so designed. A shift from four-car to six-car trains would increase the fleet size requirements and would make necessary a review of additional storage and maintenance facilities for the full system.

2-3.4.5 Crossovers

Operating criteria adopted by the Rail Construction Corporation require that a minimum 10-minute, single-track headway be achievable anywhere along the line. In order to fulfill this criterion and to expedite terminal operations on the LPA and the two IOSs, crossovers are required as indicated in Table 2-3.5.

TABLE 2-3.5: LPA CROSSOVER REQUIREMENTS	
STATION	**CROSSOVER LOCATION**
Little Tokyo	none
First/Boyle	west end
Brooklyn/Soto	none
First/Lorena	west end
Whittier/Rowan	west end
Whittier/Arizona	none
Whittier/Atlantic	west end

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

2-3.4.6 Tail Tracks

Tail tracks are lengths of track that lie beyond the terminal station. They can serve two purposes. First, tail tracks provide "safe braking distance" enabling trains to enter a terminal station at reasonable speeds. For example, depending upon the grade of the track, a 300-400 foot tail track should enable the train on the Red Line to enter a station at 25 miles per hour. The second function of tail tracks is to enable the storage of trains. This can become critical when a disabled train must be removed from service to keep from severely disrupting the system operation. Overnight storage can also expedite the start of service in the morning from outlying areas.

At Whittier/Atlantic, a 750-foot tail track is planned at the end of each mainline track. This would provide 300 feet for braking distance and 450 feet for storage of 6-car trains. Tail tracks at First/Boyle and First/Lorena would be 80 feet if the station is operated as a temporary terminal. The 80 feet of track would enable trains to enter the station at two miles per hour.

2-3.4.7 Yard Access

As currently configured, all trains entering and leaving the Red Line Yard are routed into Union Station. Trains would enter the Eastern Extension in one of the following ways:

- Trains would enter the Union Station platform from the Yard, reverse direction, and be routed east; or

- Trains would be dispatched into service first to the West Side from the Yard, then on the return trip, they would be routed through Union Station to the east.

2-3.5 CAPITAL COSTS

This section summarizes the capital costs for the LPA and the IOSs. Development of the capital costs took into account the latest unit costs for the Metro Rail Red Line construction.

Due to small differences in bus fleet estimates between the LPA and the current no-build service, no bus-related costs have been added to the LPA costs. Bus-related costs are assumed within the baseline of the MTA 30-Year Integrated Transportation Plan. Therefore, cost comparisons presented in this EIS/EIR are only between the LPA and the IOSs.

Table 2-3.6 provides a summary of capital cost estimates in 1994 dollars and escalated to the mid point of construction. Capital cost estimates are for guideways/structures, maintenance facilities, waste handling, water treatment, utility relocations, passenger vehicles, system-wide equipment, trackwork, testing & operations, insurance, city/county master agreements, general engineering, construction management, right-of-way, professional services and contingencies.

TABLE 2-3.6: CAPITAL COST ESTIMATES

ALTERNATIVE	1994 DOLLARS (millions)	ESCALATED TO MID-POINT OF CONSTRUCTION (millions of $s)
LPA – Seven stations	$1,642	$1,821
IOS-1 – Two stations	451	522
IOS-2 – Four stations	847	980

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

2-3.6 OPERATING COSTS

O&M costs included in the complete transit program adopted in the MTA 30-Year Plan cover six different transit modes: MTA bus operation, heavy rail (Red Lines), light rail (Blue Lines), other rail (Green Line and LAX-Palmdale), municipal bus operators and the commuter rail system (Metrolink). The adopted plan includes the extension of the Red Line to the Eastside Corridor. The estimated annual O&M costs are provided in Table-2.3.7 for the Red Line operating plan, as discussed in Section 2-3.4.

TABLE 2-3.7: OPERATING AND MAINTENANCE COST ESTIMATES

ALTERNATIVE	ANNUAL OPERATING AND MAINTENANCE COSTS (Millions of Dollars)
LPA – Seven stations	$18.468
IOS-1 – Two stations	5.316
IOS-2 – Four stations	10.074

Source: Preliminary Engineering Report, Engineering Management Consultant/Rail Construction Corporation, 1994

2-4 COMPARISON OF THE ALTERNATIVES

2-4.1 ALTERNATIVES CONSIDERED IN AA/DEIS/DEIR

Ten transit alternatives were defined and evaluated in the AA/DEIS/DEIR for the Los Angeles Eastside Corridor. A No-Build alternative was discussed therein and is again described in Section 2.2 of this document. A brief description of the nine other alternatives follows. For a detailed discussion of these alternatives and their associated impacts, see the April 1993 Los Angeles Eastside Corridor AA/DEIS/DEIR.

2-4.1.1 Transportation Systems Management (TSM)

The Transportation System Management (TSM) Alternative for the Eastside Corridor study area presented in the AA/DEIS/DEIR included an increase in the east-west bus service in the Study Area. Additional north-south bus service was also included. The TSM alternative included all of the transportation improvements identified in the No-Build alternative.

Alternatives 3 through 10 in the AA/DEIS/DEIR were rail alternatives over various routes in the Eastside Corridor (See Figure 2-4.1).

2-4.1.2 Rail Alternative 3 - Brooklyn Avenue

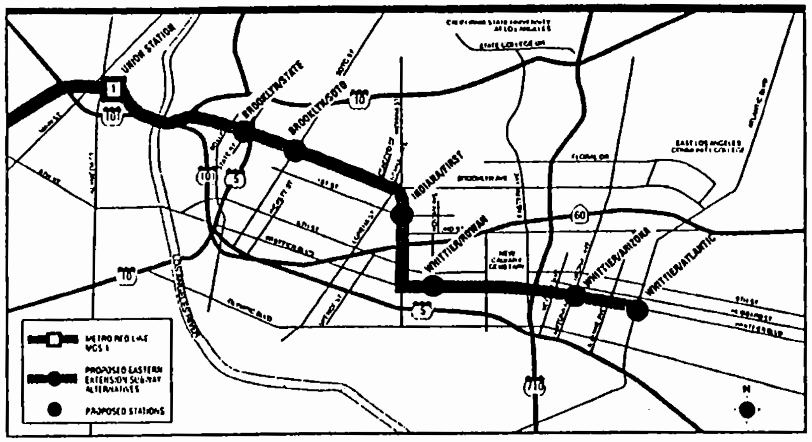
The 5.8-mile Brooklyn Avenue Alternative 3 subway alignment reviewed in the April 1993 AA/DEIS/DEIR traveled between Union Station and a proposed terminus at the intersection of Whittier and Atlantic Boulevards. This alignment generally followed Brooklyn Avenue to Indiana Street, where it curved south to Whittier Boulevard. The line then traveled east along Whittier Boulevard to Atlantic Boulevard, where it terminated. As shown on Figure 2-4.1, six stations were proposed for this alternative.

2-4.1.3 Rail Alternative 4 - Brooklyn Avenue/East Los Angeles Community College

The 7.5-mile Brooklyn/College Alternative 4 subway alignment reviewed in the April 1993 AA/DEIS/DEIR traveled between Union Station and a terminus at Whittier Boulevard and Goodrich Boulevard. This alignment followed Brooklyn Avenue to East Los Angeles Community College. At the college, the line turned northerly and then continued east around the campus so that it could swing south and continue down Atlantic Boulevard. The line continued south until it reached Whittier Boulevard, where it turned east and then terminated just east of Atlantic Boulevard at Goodrich Boulevard. As shown on Figure 2-4.1, six stations were proposed for this alternative.

2-4.1.4 Rail Alternative 5 - First Street

The 5.6-mile First Street Alignment 5 subway alignment reviewed in the April 1993 AA/DEIS/DEIR travelled between Union Station and a terminus at Whittier and Atlantic Boulevards. The alignment followed First Street to Indiana Street, where it curved south. The line continued south to Whittier Boulevard, where it turned east and continued to a terminus at Atlantic Boulevard. As shown on Figure 2-4.1, six stations were proposed for this alternative.

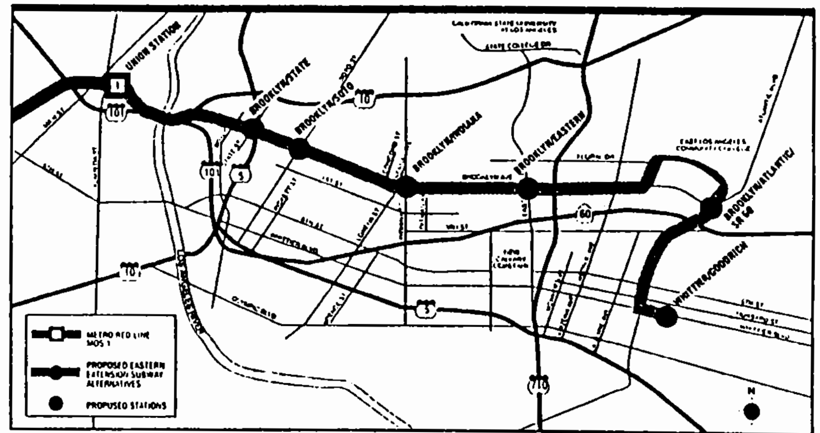


METROPOLITAN TRANSPORTATION AUTHORITY
METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
BROOKLYN AVENUE/ALT. 3

SCALE

DATE: APRIL 1993

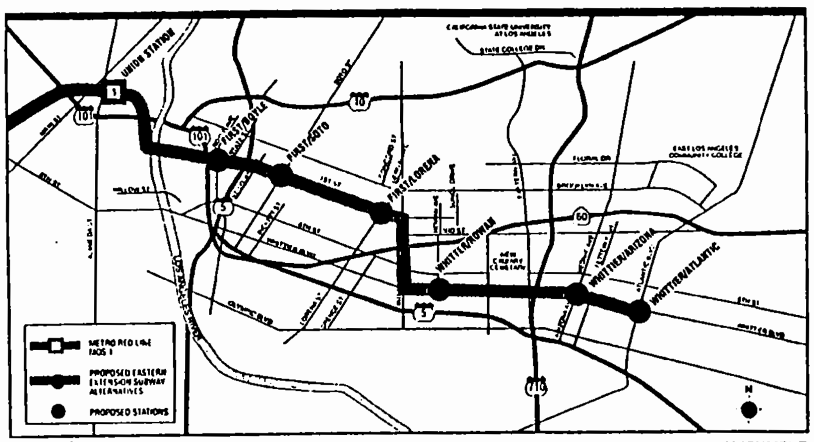


METROPOLITAN TRANSPORTATION AUTHORITY
METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
BROOKLYN/COLLEGE/ALT. 4

SCALE

DATE: APRIL 1993

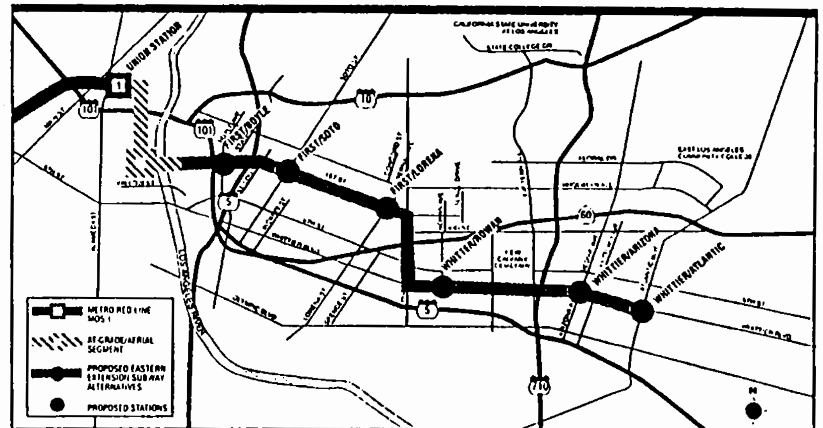


METROPOLITAN TRANSPORTATION AUTHORITY
METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
FIRST STREET/ALT. 5

SCALE

DATE: APRIL 1993



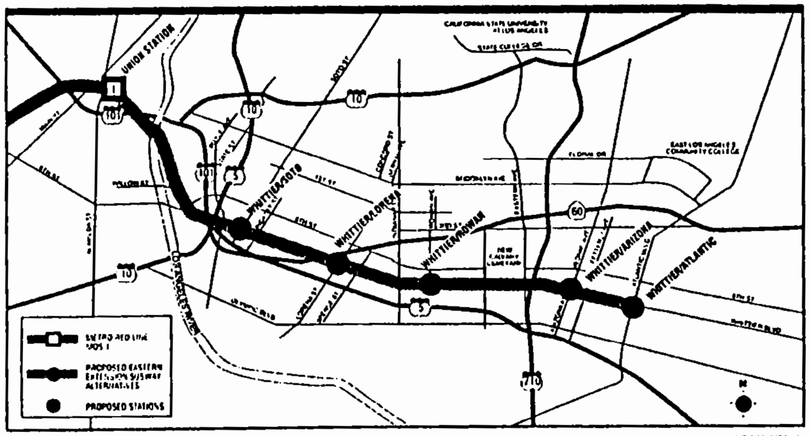
METROPOLITAN TRANSPORTATION AUTHORITY
METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
FIRST STREET (WITH METRO RAIL YARD STATION)/ALT. 6

SCALE

DATE: APRIL 1993

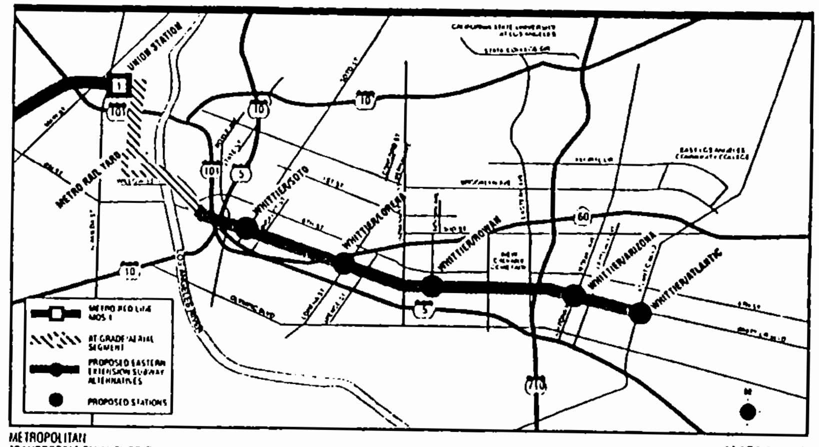
FIGURE 2-4.1 RAIL ALTERNATIVES IN THE AA/DEIS/DEIR



METROPOLITAN TRANSPORTATION AUTHORITY
METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
WHITTIER BLVD./ALT. 7

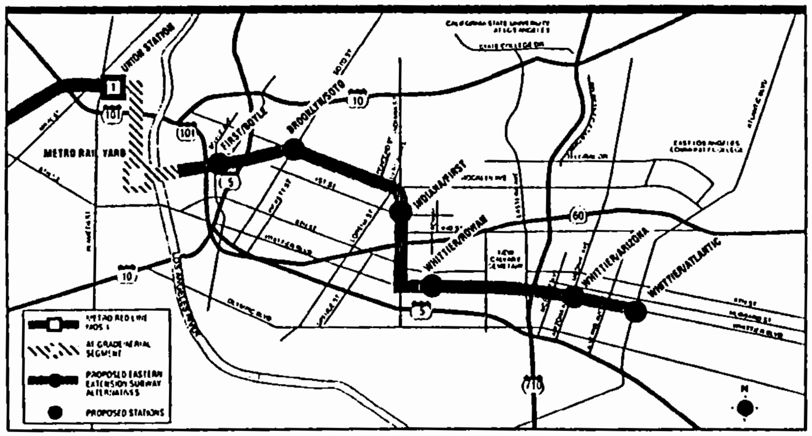
SCALE
DATE APRIL 1993



METROPOLITAN TRANSPORTATION AUTHORITY
METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
WHITTIER BLVD. (WITH METRO RAIL YARD STATION)/ALT. 8

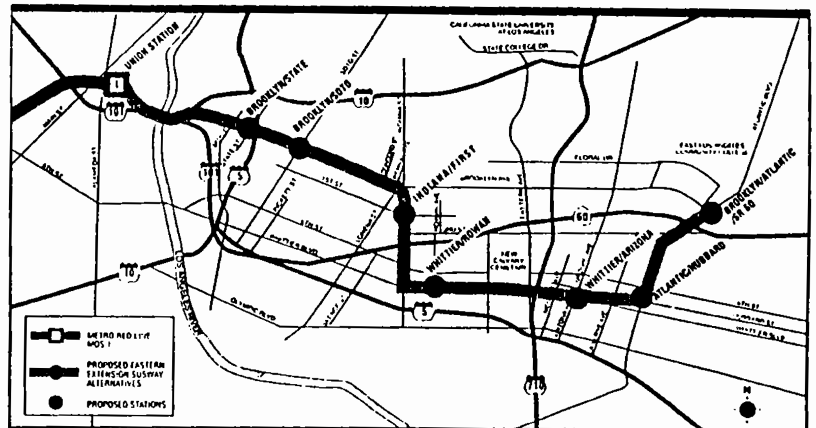
SCALE
DATE APRIL 1993



METROPOLITAN TRANSPORTATION AUTHORITY
METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
BROOKLYN (WITH METRO RAIL YARD STATION)/ALT. 9

SCALE
DATE APRIL 1993



METROPOLITAN TRANSPORTATION AUTHORITY
METRO EASTERN EXTENSION

ALIGNMENT ALTERNATIVES
BROOKLYN/COLLEGE/ALT. 10

SCALE
DATE APRIL 1993

FIGURE 2-4.1 RAIL ALTERNATIVES IN THE AA/DEIS/DEIR

2-4.1.5 Rail Alternative 6 - First Street with Little Tokyo (previously called Metro Rail Yard) Station

The 6.4-mile Alternative 6 reviewed in the April 1993 AA/DEIS/DEIR was virtually identical to Alternative 5 except that one station was added in Little Tokyo (previously called the Metro Rail yard station) located on the west bank of the Los Angeles River just south of First Street. Two options were included for the station in Little Tokyo: (1) Subway Option 6A, with a subway station under Santa Fe Avenue, and (2) Aerial Option 6B with an elevated Metro Rail yard station, an aerial structure over the Los Angeles River, and a transition back to a subway configuration to join the First Street alignment, already defined for Alternative 5.

For both options, the line then followed First Street until Indiana Street, where it curved south and continued south to Whittier Boulevard. The alignment then turned east and continued to a proposed terminus at Atlantic Boulevard. As shown on Figure 2-4.1, seven stations were proposed for this alternative.

2-4.1.6 Rail Alternative 7 - Whittier Boulevard

The 5.4-mile Whittier Boulevard Alternative 7 subway alignment presented in the April 1993 AA/DEIS/DEIR traveled between Union Station and a proposed terminus at Whittier and Atlantic boulevards. The line followed Whittier Boulevard along its entire route. As shown on Figure 2-4.1, five stations were proposed for this alternative.

2-4.1.7 Rail Alternative 8 - Whittier Boulevard with Little Tokyo (previously called the Metro Rail Yard) Station

The 5.6-mile Alternative 8 presented in the AA/DEIS/DEIR was essentially identical to Alternative 7 except that one station was added in Little Tokyo (previously called the station in the Metro Rail yard). Similar to Alternative 6, there were two options for the station in the Little Tokyo Station. East of the Los Angeles River, this alternative joined the Whittier Boulevard alignment, already defined for Alternative 7. As shown on Figure 2-4.1, six stations were proposed for this alternative.

2-4.1.8 Rail Alternative 9 - Brooklyn Avenue with Little Tokyo (previously called the Metro Rail Yard) Station

The 6.5-mile Brooklyn Avenue Alternative 9 was similar to Alternative 3 except that it included a Little Tokyo station (previously called the Metro Rail yard station) and a station at First Street and Boyle Avenue before heading north-east to Brooklyn Avenue. It then followed Brooklyn Avenue to Indiana Street, where it curved south to Whittier Boulevard. The line then traveled east along Whittier Boulevard to Atlantic Boulevard, where it terminated. As with alternatives 6 and 8, two options were included for the Little Tokyo station. After crossing the Los Angeles River (either in subway [Alternative 9A] or in an aerial structure [Alternative 9B]), the line would travel to a station at First and Boyle and continue northeast to join the Brooklyn Alternative 3. As shown on Figure 2-4.1, seven stations were proposed for this alternative.

2-4.1.9 Rail Alternative 10 - Brooklyn Avenue/Whittier Boulevard/East Los Angeles Community College

The 7.1-mile Alternative 10 subway alignment defined in the AA/DEIS/DEIR traveled between Union Station and a proposed terminus at Brooklyn Avenue and Atlantic Boulevard. This alignment generally followed Brooklyn Avenue to Indiana Street, where it curved south to Whittier Boulevard. The line then traveled east along Whittier Boulevard to Atlantic Boulevard, where it turned north and terminated at Brooklyn Avenue. As shown on Figure 2-4.1, seven stations were proposed for this alternative.

2-4.2 CHARACTERISTICS OF AA/DEIS/DEIR ALTERNATIVES

The Eastside Corridor AA/DEIS/DEIR process was undertaken to identify alternative transit improvements for the study area. This section presents a brief comparative evaluation of the alternatives considered in the AA/DEIS/DEIR, discusses the trade-offs among the alternatives and reviews the environmentally superior alternative. It draws on the background information and analyses presented in the chapters one through four of the AA/DEIS/DEIR.

Table 2-4.1 provides key characteristics for the AA/DEIS/DEIR alternatives including a comparison of capital and operating costs, levels of mobility and accessibility, environmental impacts and measures of equity.

2-4.2.1 Capital and Operating Costs

As shown on Table 2-4.1, the capital costs for the AA/DEIS/DEIR alternatives ranged from minimal costs for the TSM to $1.8 billion (1992 dollars) for Alternative 10, a 7.1-mile rail alternative with seven stations. The range of capital costs between the rail alternatives was $433 million and varied for the most part due to three factors: (1) length of the alignment, (2) number of stations and (3) station box locations (i.e., costs for property acquisition). The lowest cost rail alternative was Alternative 7, which had the fewest number of stations -- five -- and was the shortest of the rail alternatives with a length of 5.4 miles.

Annual costs for operation of the full Red Line in 1992 dollars ranged from $92 million for the No-Build Alternative to $124 million annually for rail alternatives 4 and 10. Eastside corridor alternatives with the longer lengths and higher number of stations tended to exhibit higher annual Red Line operating costs. The lowest annual operating costs was associated with the shortest of the rail alternatives with the least number of stations. Because of the increased local bus feeder service over the TSM alternative, the build alternatives' bus operating costs were approximately $5 million more annually than the Red Line operating costs.

2-4.2.2 Attainment of Goals and Objectives

A number of transit-related goals and objectives have been identified for the Eastside Corridor study area, as discussed in Chapter 1. These include improved mobility and access, support for local land use plans, minimal environmental impacts for the community and ability to finance the selected alternative.

CATEGORY	NO-BUILD	TSM	ALT. 3	ALT. 4	ALT. 5	ALT. 6A	ALT. 6B	ALT. 7	ALT. 8A	ALT. 8B	ALT. 9A	ALT. 9B	ALT. 10
COSTS													
Capital costs (millions of 1992 dollars)	$0	Minimal	$1,473 - 1,488	$1,651 - 1,669	$1,448 - 1,451	$1,601 - 1,604	$1,593 - 1,596	$1,337 - 1,340	$1,460 - 1,464	$1,406 - 1,409	$1,707 - 1,722	$1,631 - 1,646	$1,750 - $1,770
Equivalent annual capital costs (millions of 1992 dollars)	$0	Minimal	$156 - 158	$178 - $180	$154 - 155	$180 - 182	$167 - 169	$142 - 143	$156 - 157	$148 - 149	$182 - 183	$171 - 172	$189 - 190
Number of rail miles in Eastside Corridor	0	0	5.8	7.5	5.6	6.4	6.3	5.4	5.7	5.6	6.5	6.4	7.1
Number of rail stations in eastside corridor	0	0	6	6	6	7	7	5	6	6	7	7	7
Full Red Line operating costs (millions of 1992 dollars)	$94	$94	$120	$124	$120	$123	$123	$117	$120	$120	$123	$123	$124
MOBILITY (YEAR 2010)													
Daily transit trips in the region	1,498,700	1,503,700	1,529,300	1,525,800	1,525,400	1,526,200	1,526,200	1,527,100	1,529,000	1,529,000	1,529,900	1,529,900	1,527,400
Daily eastside corridor rail boardings/alightings	0	0	58,400	60,400	55,200	59,500	59,500	53,800	56,000	56,000	64,000	64,000	62,400
Increase in annual new transit trips over the TSM alternative (millions)	N/A	0	6.93	5.93	6.09	6.10	6.10	6.33	6.87	6.87	7.13	7.13	6.42
ACCESSIBILITY													
Transit travel times by walk access from Whittier/Atlantic to Los Angeles central business district (year 2010)	N/A	61 min.	35 min.	41 min.	36 min.	38 min.	38 min.	36 min.	37 min.	37 min.	35 min.	35 min.	38 min.
Transit travel times by walk access from Whittier/Atlantic to Studio City in San Fernando valley (year 2010)	N/A	82 min.	59 min.	65 min.	60 min.	62 min.	62 min.	67 min.	59 min.	59 min.	62 min.	62 min.	54 min.
Transit travel times by walk access from Whittier/Atlantic to Westwood -- UCLA main campus (year 2010)	N/A	103 min.	76 min.	82 min.	79 min.	79 min.	79 min.	74 min.	76 min.	76 min.	79 min.	79 min.	76 min.
Annual travel time dollars saved by TSM riders using rail alternatives (millions of 1992 dollars)	N/A	$0	$14.1	$14.3	$14.1	$14.2	$14.2	$13.2	$14.1	$14.1	$14.5	$14.5	$14.1
Percent households without private transportation within 0.4-Mile radius of stations (1990 census)	N/A	N/A	25%	24%	26%	27%	27%	21%	23%	23%	27%	27%	24%
Percent population between ages 6-18 within 0.4-Mile radius of stations (1990 census)	N/A	N/A	23%	22%	23%	23%	23%	23%	23%	23%	23%	23%	23%
Percent population over 65 within 0.4-Mile radius of stations (1990 census)	N/A	N/A	7%	9%	8%	7%	7%	8%	8%	8%	7%	7%	8%

TABLE 2-4.1: COMPARISONS OF KEY CHARACTERISTICS OF EASTSIDE CORRIDOR AA/DEIS/DEIR ALTERNATIVES

CATEGORY	NO-BUILD	TSM	ALT. 3	ALT. 4	ALT. 5	ALT. 6A	ALT. 6B	ALT. 7	ALT. 8A	ALT. 8B	ALT. 9A	ALT. 9B	ALT. 10
ENVIRONMENTAL													
TRAFFIC													
Number of intersections with significant impacts under CEQA	N/A	N/A	3	4	4	4	4	1	2	2	2	2	3
LAND USE													
Total population within 0.4-Mile radius of stations	N/A	N/A	88,000	82,000	88,000	94,000	94,000	64,000	72,000	72,000	95,000	95,000	97,000
Total employment within 0.4-Mile radius of stations	N/A	N/A	33,000	47,000	35,000	42,000	42,000	26,000	34,000	34,000	42,000	42,000	30,000
ECONOMIC													
Number of annual jobs created during construction	0	MINIMAL	1,600 - 2,000	1,800 - 2,200	1,600 - 1,900	1,900 - 2,300	1,700 - 2,100	1,500 - 1,800	1,600 - 1,900	1,500 - 1,900	1,900 - 2,300	1,700 - 2,100	1,900 - 2,300
ACQUISITION AND DISPLACEMENTS													
Number of residential units acquired	0	0	5 - 78	0 - 53	3 - 22	2 - 22	20 - 40	6 - 20	0 - 20	0 - 20	5 - 78	23 - 96	5 - 78
Number of businesses and public/institutional facilities acquired	0	0	14 - 26	4 - 11	22 - 28	23 - 29	28 - 34	17 - 23	18 - 24	26 - 32	22 - 34	28 - 40	17 - 29
Number of parking spaces acquired	0	0	85 - 210	55 - 105	70 - 145	70 - 145	85 - 160	61 - 136	75 - 150	75 - 150	100 - 225	115 - 240	70 - 180
VISUAL													
Potentially significant visual impacts under CEQA							visual impact on 4th Street bridge			visual impact on 6th Street bridge		visual impact on 4th Street bridge	
AIR QUALITY													
Potential air emissions reductions in ROG'S, CO, NOX & PM10 over No-Build (pounds per day)	0	107	459	470	463	477	477	492	522	522	540	540	474
NOISE/VIBRATION													
Number of noise & vibration impacts before mitigation/after mitigation	0	0	247-368 /3-4	176-209 /0	252-338 /0	266-352 /0-1	271-357 /0-1	84-169 /0-1	77-162 /0-1	76-161 /0-1	359-450 /3	364-455 /3	275-395 /3-4

TABLE 2-4.1: COMPARISONS OF KEY CHARACTERISTICS OF EASTSIDE CORRIDOR AA/DEIS/DEIR ALTERNATIVES

CATEGORY	NO-BUILD	TSM	ALT. 3	ALT. 4	ALT. 5	ALT. 6A	ALT. 6B	ALT. 7	ALT. 8A	ALT. 8B	ALT. 9A	ALT. 9B	ALT. 10
SOILS/GEOLOGY													
Number of potential pre-existing hazardous waste sites near rail alignments	N/A	N/A	79	127	70	71	72	89	90	88	75	72	123
CULTURAL/HISTORIC													
Number of potential adverse and adversely affected properties	0	0	3 - 4	0 - 1	3	3	4	4	4	4	3 - 4	4 - 5	0 - 1
COMMUNITY FACILITIES													
Number of community facilities served by rail transit	0	0	67	76	69	73	69	73	57	53	74	70	77
Number of community facilities within 300 feet of station construction sites	0	0	12	11	6	6	6	9	9	8	10	11	15
RAIL CONSTRUCTION													
Number of streets potentially affected	0	0	18 - 23	19 - 22	21 - 23	24 - 26	23 - 25	18 - 20	21 - 23	20 - 22	22 - 27	21 - 26	20 - 24
Number of on-street parking spaces affected	0	0	318 - 368	226 - 250	349 - 373	454 - 478	429 - 453	311 - 335	346 - 370	321 - 345	386 - 434	361 - 409	299 - 335
Number of major utility conflicts	0	0	2 - 3	2	1 - 2	3 - 4	3 - 4	2 - 3	3 - 4	2 - 3	3	2	2
Percent commercial adjacent to cut-and-cover construction	0	0	29 - 44%	35 - 43%	33 - 40%	30 - 36%	33 - 40%	41 - 50%	36 - 44%	41 - 50%	28 -42%	27 - 40%	33 - 45%
EQUITY													
Percent of households below poverty level within 0.4-Mile radius of stations (1990 census)	N/A	N/A	25%	22%	25%	26%	26%	22%	24%	24%	26%	26%	23%
Percent hispanic persons within 0.4-Mile radius of stations (1990 census)	N/A	N/A	95%	90%	90%	93%	93%	96%	94%	94%	93%	93%	92%

Source: AA/DEIS/DEIR Table 5-1, pg. 5-3; Parsons Brinckerhoff Quade & Douglas, Inc.; Myra L. Frank and Associates, Inc. 1993

a. Mobility and Accessibility

Table 2-4.1 provides various measures of mobility and accessibility associated with the AA/DEIS/DEIR transit alternatives. The highest regional transit ridership among the alternatives was rail Alternative 9 with 1,529,900 riders in the Year 2010. The No-Build alternative represented the fewest number of regional transit trips with 1,498,700, followed by an estimated 1,503,700 regional transit trips for the improved-bus TSM Alternative. The difference in total regional transit trips among the rail alternatives was approximately 4,500 daily.

Daily boardings/alightings within the Eastside Corridor for the AA/DEIS/DEIR rail alternatives ranged from 53,800 for Alternative 7 to 64,000 for Alternative 9, a difference of 10,200.Transit travel times were estimated from the Whittier/Atlantic intersection to various locations in Los Angeles County. As shown in Table 2-4.1 for example, the travel time for the rail alternatives from this origin to the Los Angeles Central Business District would range between 31 and 37 minutes, as compared to an all-bus trip of 55 minutes.

The Eastside Corridor includes a high level of households without access to private transportation. The areas within 0.4 miles of the possible transit stations for each AA/DEIS/DEIR rail alternative contain between 21 (Alternative 7) and 27 percent (alternatives 6 and 9) of such households, as compared to a City of Los Angeles figure of 15 percent and a County of Los Angeles figure of 11 percent. A high percentage of youth also reside in the Eastside Corridor area with 22 to 23 percent within the station areas as compared to City and County of Los Angeles percentages of 17 and 18 percent, respectively. The elderly population (+65 years of age) within the station areas ranges between seven to nine percent for the Eastside Corridor and is less than the City and County average of ten percent.

b. Environmental Impacts

A number of environmental impacts for the AA/DEIS/DEIR alternatives are summarized on Table 2-4.1 by alternative. As shown, the impacts vary among the alternatives for each environmental category. For the rail alternatives, the expected impacts are related to the actual location of the proposed alignments and stations in relation to the current physical and social environments.

The impacts associated with the No-Build alternative are provided, at times, as a basis for comparison with the TSM and Rail alternatives. Environmental impacts associated with the TSM alternative were not substantial, since these alternatives would not entail major construction or operation changes.

For many environmental categories, the absolute number differences in environmental impacts among the AA/DEIS/DEIR rail alternatives were not significant, i.e., traffic, economic, air quality, cultural/historic, community facilities and Section 4(f).

Acquisitions and displacements of residential and commercial properties would be necessary for construction and operation of the AA/DEIS/DEIR rail alternatives. The number and extent of these acquisitions varied, depending not only on the alternative but also on the station box and primary entrance locations within each alternative. Moreover, the proposed off-street stations (Brooklyn/Soto [Alternatives 3, 4, 9 and 10] and Whittier/Arizona [Alternatives 3, 5, 6, 7, 8, 9 and

10) involved higher numbers of acquisitions than the corresponding on-street stations. Table 2-4.1 shows the ranges of residential and non-residential acquisitions involved with each AA/DEIS/DEIR rail alternative. Overall, the alignments with the least number of total stations and the least number of off-street stations involved the fewest acquisitions.

Few significant visual impacts under CEQA were anticipated for the alternatives except for the proposed aerial structures over the Los Angeles River for Alternatives 6B, 8B and 9B. Under CEQA, these alternatives had potentially significant visual impacts on either the Fourth or Sixth Street historic bridges, as shown in Table 2-4.1.

After mitigation, only three significant noise and vibration impacts under CEQA were anticipated to remain from the operation of the rail transit alternatives. The variation in these impacts both before and after mitigation for the AA/DEIS/DEIR rail alternatives is shown in Table 5-1.

Following an analysis of historic records and a survey of the Eastside Corridor, a number of sites were identified as potentially containing hazardous materials. The number of these sites ranged from 70 for Alternative 5 to 127 for Alternative 4.

Construction impacts are mainly related to cut-and-cover activities at the stations, and vary according to the station box locations and the alternatives. Some stations were proposed with both on- and off-street locations (Brooklyn/Soto [Alternatives 3, 4, 9 and 10] and Whittier/Arizona [Alternatives 3, 5, 6, 7, 8, 9 and 10]). Typically, the on-street stations had the higher levels of construction impacts on businesses in these station areas, while the off-street stations had less effect on the business and greater impacts on the adjacent residential areas.

2-4.3 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

An environmentally superior alternative needs to be identified under CEQA. Although the No-Build and TSM alternatives would involve fewer environmental impacts, they would not provide the desired levels of mobility and accessibility for this lower-income, transit-dependent and principally hispanic community. The AA/DEIS/DEIR rail alternatives, on the other hand, would provide access to a broader range of employment, shopping, educational and cultural opportunities, consistent with the goals and objectives for this Eastside Corridor.

The environmental impacts vary by subject area for each of the rail alternatives and by the sub-alternative station box locations within each rail alternative. Overall, none of the rail alternatives can be identified as necessarily superior in terms of environmental considerations.

The determination of superiority requires weighing the varied impacts among the alternatives, and the reader is invited to apply his or her values as to the significance of these impacts by subject area, location, and alternative.

2-5 SELECTION AND RATIONALE OF THE LOCALLY PREFERRED ALTERNATIVE

In June 1993, the MTA Board of Directors selected a Locally Preferred Alternative (LPA) from among ten alternatives (as presented in the April 1993 Eastside Corridor AA/DEIS/DEIR). The alternative selected was identified as Alternative 9B with modifications to avoid the Evergreen

Cemetery by passing the route to the south of the cemetery and placing a station at First and Lorena rather than at First/Indiana. The MTA Board also recognized that this modification would eliminate the impacts that otherwise would have occurred to the narrow Indiana Street and Ramona High School under Alternative 9 before modification.

Based on the preliminary engineering findings, other changes have occurred to the project since the MTA Board selected the LPA, and these changes are described in Section 2-6 below.

Following circulation of the AA/DEIS/DEIR, the MTA reviewed the public comments and evaluated each of the above alternatives against the following criteria: the environmental impacts associated with the alternatives after mitigation, community support, support for the economic development of the community and system-wide benefits including increased ridership and operational advantages.

Based on this review, Rail Alternative 9B with some modifications was selected as the LPA. The modification was designed to respond to public comments by avoiding impacts to Evergreen Cemetery and Ramona High School. Table 2-4.1 above summarizes critical characteristics of the alternatives reviewed in the AA/DEIS/DEIR.

A number of reasons led to the selection of the LPA by the MTA Board of Directors:

- Alternative 9B had the highest ridership of all the alternatives evaluated in the AA/DEIS/DEIR. In addition, Alternative 9B had the highest potential increase in new transit trips of all the alternatives evaluated in the AA/DEIS/DEIR. The LPA would provide East Los Angeles with a direct connection (via the Red Line) to downtown Los Angeles, mid-Wilshire, Hollywood, and the San Fernando Valley. With a single transfer, the LPA would provide connection to the Blue Line to Long Beach and Pasadena, and all of the regional Metrolink destinations.

- Alternative 9B had the highest potential reduction in potential air emissions.

- Alternative 9B had the highest potential annual travel time savings.

- Alternative 9B had the highest total population within a 0.4 mile radius of the stations.

- Alternative 9B had the third highest number of community facilities within 300 feet of the stations.

- Alternative 9B had the second lowest number of intersections with significant impacts.

Within the Eastside Corridor, the LPA (modified Alternative 9B) connects major activity centers including:

- Little Tokyo East, which includes the 3rd Street and vicinity artists loft area, Yaohan Plaza shopping center, Zenshuji Soto Buddhist Mission, Los Angeles Hompa Hongwanji Buddhist Temple and the Maryknoll School,

- the Brooklyn/Soto area, which includes the current active retail area,
- the First/Lorena area, which includes the El Mercado and other retail activities,
- the Whittier/Rowan area, which includes the intersection of two major thoroughfares in East Los Angeles, and
- the highly active Whittier commercial area, which is bracketed by the Whittier/Arizona and Whittier/Atlantic intersections.

These centers would be linked to other commercial areas such as Broadway Street in the CBD, the Wilshire District, Vermont Avenue, Hollywood Boulevard, North Hollywood, and other areas as the Metro Red Line is expanded.

The LPA's costs and benefits were reviewed based on established criteria and found to be comparable to the other alternatives. At $1.64 billion (in 1992 dollars), the LPA fell in the middle of the $1.34 to $1.75 billion range of cost for a rail extension all the way to Atlantic Boulevard. With the highest patronage of any of the alternatives considered, the LPA would increase the effectiveness and efficiency of the public transit system as a whole in a corridor where transit dependency is twice the county average.

Based on the public hearings and ongoing community participation process, the rail alternatives that emerged with the largest community support were 9B and 6B. The alternatives were identical from Union Station to the First/Boyle station and from First Street and Indiana Street to Atlantic Boulevard. The most significant difference was that Alternative 6B served First Street with a First/Soto station, while 9B served Brooklyn Avenue with a Brooklyn/Soto station. The Brooklyn/Soto station area is a more active retail center for the community.

Comments received during the public review period identified two issues related to Alternative 9B: tunneling under the north-east corner of Evergreen Cemetery and tunneling within 25 feet of Ramona High School. The variation incorporated into the LPA avoids these issues by dropping south to First Street before reaching Evergreen Cemetery and substituting the First/Indiana station with a new First/Lorena station.

2-6 <u>PLANNING SINCE CIRCULATION OF THE DEIS/DEIR</u>

This section summarizes the planning that has occurred after circulation of the DEIS, during preliminary engineering. Preliminary engineering commenced in July 1993, immediately after the MTA Board approved Alternative 9B (modified) as the locally preferred alternative (LPA). In approving the LPA, the Board directed staff to revise the alignment so as to avoid: (1) going under any portion of Evergreen Cemetery, (2) impacts on Ramona High School and (3) impacts on the narrow Indiana Street in the vicinity of First Street. Alignment 9B, as discussed in Section 2-4.1.8, included an aerial station in the Metro Rail yard and six additional stations as shown in Figure 2-4.1.

During preliminary engineering, a number of additional studies were undertaken to refine location decisions. Based on these studies and on the direction of the MTA Board, some modifications have been made to Alternative 9B as presented in the AA/DEIS/DEIR. These location and other refinements have come about because of the more detailed analyses that are part of preliminary engineering. Work has included cost studies, operational criteria analyses, identification of conflicts with existing utilities and studying and implementing methods for reducing environmental impacts. The refinements are not considered a significant change to the LPA; rather they are directed at mitigating environmental effects, reducing cost and enhancing the operational effectiveness of the LPA.

The changes to the LPA are briefly summarized here, and discussed in more detail in the sections that follow.

Revisions to station locations include:

- The Metro Rail yard station (now called the Little Tokyo station) was moved from aerial in the yard to subway under Santa Fe Avenue,
- The First/Boyle station has been rotated counter-clockwise to create improved (flatter) curves from the Little Tokyo station, allowing for faster speeds, and
- The First/Lorena station has been substituted for the First/Indiana station to respond to concerns about going under Evergreen Cemetery and impacts on a local high school and Indiana Street.

Alignment revisions include:

- A shift from aerial to subway configuration between Little Tokyo and First/Boyle stations, with resulting reduction in curves between these stations,
- An alignment shift between Brooklyn/Soto and First/Lorena stations to avoid the Evergreen Cemetery, and
- An alignment shift between First/Lorena and Whittier/Rowan stations to reflect the shift in the First/Lorena station location and to avoid Ramona High School.

Operational enhancements include:

- The addition of crossovers at the First/Boyle and Whittier/Rowan stations, and
- The definition of bus facilities for terminating bus lines at the Brooklyn/Soto, First/Lorena, Whittier/Rowan, Whittier/Arizona and Whittier/Atlantic stations.

Facility definition refinements include:

- The addition of parking facilities at the First/Lorena station.

Initial operating segment (IOS) definition revisions include:

- The addition of a shorter IOS to allow for various funding scenarios.

2-6.1 REVISIONS TO STATION LOCATIONS

Station locations and alignments between stations are mutually dependent on each other. In some instances, e.g. Little Tokyo, a station shift required a shift in the alignment around the station, both horizontally and vertically. In other instances, a shift in alignment, e.g. avoidance of Evergreen Cemetery, required a change in station location (e.g. from First/Indiana to First/Lorena). Stations are discussed in this section and alignments are discussed in the following section.

2-6.1.1 Metro Rail Yard (Little Tokyo Station)

Alternative 9B included an aerial station on the east side of the Metro Rail yard. During preliminary engineering it was determined that a station in this location would adversely affect yard activities and would reduce, by almost one-third, the amount of track available for storage and maintenance of the Metro Rail fleet. Moving the station to Santa Fe Avenue resulted in alignment adjustments between the Little Tokyo station and First/Boyle station. (These adjustments are more fully discussed in Section 2-6.2.1.)

There was a reduction in alignment impacts that occurred with the shift from an aerial to a subway configuration. In order to connect the previously proposed aerial station with the First/ Boyle station on the east side of the Los Angeles River, an aerial structure would have had to portal (i.e., pass from above to below ground) immediately adjacent to the Aliso Village housing project, requiring significant right-of-way from both residential and industrial facilities. Both construction and operational impacts on the housing project would be adverse because the tunnel section would be shallow enough that it would be difficult to mitigate noise and vibration impacts.

Impacts on historic resources from the previously proposed aerial station and associated aerial segment over the Los Angeles River included adverse visual effects on the National Register eligible First and Fourth Street bridge structures. Portions of the Aliso Village housing project may also be eligible for the National Register and would have been adversely affected because of takings during construction and noise and vibration impacts after construction.

A number of studies were performed to reduce impacts on yard operations and to reduce the costs of the station. The proposed station under Santa Fe Avenue is essentially the same as the underground station shown in the AA/DEIS/DEIR in Alternative 9A. As part of preliminary engineering, it was identified as the least costly alternative, largely because it (1) allows a more direct subway connection to the First/Boyle station on the east side of the river, (2) involves less acquisition of property on the west side of the river for additional yard capacity and on the east side of the river for a portal, (3) would not involve a bridge over the river and (4) would not require any disruption, replacement or relocation of yard facilities.

2-6.1.2 First/Boyle Station

The First/Boyle station was rotated counter-clockwise to respond to the change in the curves from the Little Tokyo station. The station entrance at Mariachi Plaza did not change, but the underground alignment of the station rotated counter-clockwise. Instead of being under First Street, it is now located diagonally under the First/Boyle intersection. This change reduced the curves both entering and leaving this station, allowing for higher rail system speeds. In addition, the change in station orientation would reduce the impacts on traffic by placing over two-thirds of the station off-street.

2-6.1.3 First/Lorena Station

A station at First/Lorena (originally part of Alternative 6 in the AA/DEIS/DEIR) was substituted for the First/Indiana station shown in Alternative 9, when it was decided to change the alignment so as to avoid Evergreen Cemetery. Section 2-6.2.2 discusses the alignment alternatives studied to avoid Evergreen Cemetery.

The First/Lorena Station shown in the AA/DEIS/DEIR was shifted eastward slightly to avoid a driveway entrance to Evergreen Cemetery. The station entrance is on the northeast corner of First Street and Lorena Street, as shown in the AA/DEIS/DEIR. Shifting the station eastward also required "notching" the roof of the station to accommodate a 72-inch storm drain structure in Lorena Street.

2-6.2 ALIGNMENT REVISIONS

Most of the alignment revisions were made to reflect changes in station locations or to avoid conflicts with sensitive uses.

2-6.2.1 Shift from Aerial to Subway Between Little Tokyo and First/Boyle Stations

With an aerial station in the yard, the line section was also aerial. In order to get from the aerial yard station to the station at First/Boyle, an elaborate S-curve was required, heading first south out of the station, east across the river, north and then east to reach the First/Boyle station. With a subway configuration for the Little Tokyo station, it was possible to flatten the curve and reduce the length of track because the subway alternative does not require specific vertical clearances for bridge structures, other railroad structures and streets. The subway alternative also reduced acquisition costs by eliminating the need for acquiring industrial structures on the east side of the river for the portal.

2-6.2.2 Brooklyn/Soto Station to First/Lorena Station

A number of comments on the AA/DEIS/DEIR were received from members of the eastside community expressing concern about the subway going under any portion of Evergreen Cemetery. The alignment for Alternative 9B proceeded east under Brooklyn Avenue from the Brooklyn/Soto station, and then curved south on to Indiana Avenue before proceeding to a station at First Street and Indiana Avenue. The curve from Brooklyn Avenue to Indiana Avenue crossed under the northeast corner of Evergreen Cemetery.

In order to avoid Evergreen Cemetery, there were basically two choices: 1) stay under Brooklyn Avenue and curve south to the east of the cemetery or 2) curve south to the west of the cemetery to get to First Street. The first alternative would have eliminated any opportunity for a station in the First/Indiana/Lorena area because the radius of the curve would swing too far east to serve this activity area. The second alternative, curving south just east of the Brooklyn/Soto station and then proceeding east under First Street to Lorena Street, was selected because it maintained service to the First/Indiana/Lorena area. The station entrance at First/Lorena would be about 350 feet west of the station entrance at First/Indiana.

2-6.2.3 First/Lorena Station to Whittier/Rowan Station

As noted in Section 2-6.1.3, the First/Lorena Station was shifted eastward to avoid conflicts with a driveway entrance to Evergreen Cemetery. Because the station box is only about 350 to 400 feet west of Indiana Avenue, it was not possible to immediately curve south on Indiana Avenue; the curve radius would be too tight. In order to keep the alignment under a street and away from Ramona High School, the alignment was shifted eastward to Alma Avenue.

2-6.3 OPERATIONAL ENHANCEMENTS

2-6.3.1 Crossovers

Current operating criteria require that a minimum 10-minute single tracking headway be achievable anywhere along the line. In order to achieve this operating standard, crossovers are defined at the following stations: First/Boyle, First/Lorena, Whittier/Rowan and Whittier/Atlantic. The First/Lorena and Whittier/Atlantic crossovers were shown in the AA/DEIS/DEIR.

2-6.3.2 Bus Facilities

Transportation planning during preliminary engineering has included analyses of bus operations and the need to provide facilities for terminating certain routes at LPA stations. All station plans, except Little Tokyo and First/Boyle, now include accommodations for terminating bus lines.

2-6.4 INITIAL OPERATING SEGMENTS

The AA/DEIS/DEIR discussed an Initial Operating Segment (IOS) that would consist of the first four LPA stations: Little Tokyo, First/Boyle, Brooklyn/Soto and First/Lorena. In response to potential funding and timing constraints, an additional IOS has been identified and impacts analyzed in this FEIS/FEIR. IOS-1 would consist of stations at Little Tokyo and First/Boyle. IOS-2 would consist of the first four stations.

2-6.5 PARKING FACILITIES

In addition to the parking facilities identified for the Whittier/Atlantic station, the LPA project includes a parking facility for up to 500 vehicles at the First/Lorena Station. It was identified as part of the IOS-2 definition under which the First/Lorena Station would function as a temporary end-of-line station.

2-6.6 STREET NAME CHANGE

The City and County of Los Angeles have changed the name of Brooklyn Avenue to Cesar Chavez Avenue. For this final EIS/EIR, however, the street name of Brooklyn Avenue has been used due to its extensive use in the AA/DEIS/DEIR on various graphics and in numerous tables.

2-7 RELATED PROJECTS

Section 15130 of the Guidelines for the California Environmental Quality Act (CEQA) requires an analysis of cumulative impacts based on: (1) a list of existing projects, projects under construction, approved projects, projects under formal review and other "reasonably foreseeable" future projects or (2) a summary of overall growth projections which evaluates regional or area-wide conditions for the project planning area. This Final EIR uses a summary of overall growth projections as the basis for review of cumulative impacts.

2-7.1 GROWTH PROJECTIONS

As required under FTA guidelines for preparation of an Alternatives Analysis, regional growth projections from the metropolitan planning organization (the Southern California Association of Governments [SCAG]) were used. Transportation growth projections for the study area were estimated using SCAG GMA1 forecasts for 1990 and 2010. The GMA1 forecasts are SCAG's baseline projections of future growth based on a continuation of trends (with no new policy assumptions by SCAG). SCAG had projected its 1990 and 2010 forecasts based on projections made for 1987, which had used the 1980 U.S. Census as its basis. By January of 1993, SCAG had not completed new forecasts for 2010 using the 1990 U.S. Census. As a result, a methodology was developed for the Red Line Eastern Extension AA/DEIS/DEIR to provide adjusted 1990 and 2010 figures in advance of the SCAG projections. Briefly, the procedure involved calculating the change in each population-related variable for the 1990 and 2010 SCAG GMA1 forecasts and then applying that growth to the 1990 census figures. Sections 2.5 and 4.0 of the Eastside Corridor Ridership Forecasting Methods Report (January 1993) discuss the forecasting methodology used for the project in greater detail.

In general, the 2010 projections reveal that the Eastside Corridor would experience moderate growth in housing, dwelling units and employment. Please see Sections 3-1 and 4-4 of this FEIR for additional discussion of these forecasts.

2-7.2 TRANSPORTATION PROJECTS

A number of transportation projects are anticipated in Los Angeles County by the year 2010, the planning horizon year of the Eastside Corridor. Transportation projects in the background assumptions for the Eastside Corridor include those in the Fundable Plan of the Los Angeles County Metropolitan Transportation Authority's 30-Year Integrated Transportation Plan, as well as projects anticipated by year 2010 in the SCAG's regional forecast study area (Los Angeles, Orange, Ventura, western Riverside, and western San Bernadino counties). Projects that are planned for Los Angeles County are listed in Tables 2-1.1, 2-1.2, 2-1.3 and 2-1.4.

2-7.3 LOCAL PROJECTS

Although the FEIR is using the SCAG regional population, housing and employment forecasts as the basis for the analysis of cumulative impacts, the following paragraphs provide a brief review of local projects that are currently planned near the LPA.

A number of mixed retail and residential developments are currently proposed in the area west of the Little Tokyo station. Included are the First Street South Plaza (820,000+ square feet) at the southeast corner of First and Alameda streets; Little Tokyo Square (279,900 square feet) at 333 South Alameda Street; and Sunshine Pacific Center (180,000+ square feet) at the southeast corner of Second and Alameda streets. The largest proposed development near the Little Tokyo station is the 2,713,055 square foot Mangrove Estate on the block bordered by Alameda, Temple, Banning, and First streets.

The stations east of the Los Angeles River have substantially less development currently planned in their surrounding areas. There are currently three projects under construction near the First/Boyle station: a Chevron gas station (25,100 square feet) at the corner of State and Brooklyn, Hollenbeck Youth Center (15,600 square feet) at 2015 First Street and the Puente Learning Center (40,000 square feet) at 501 South Boyle Avenue. The Selcer Shopping Plaza (19,500 square feet) at 3515 First Street is proposed near the First/Lorena station and a bowling alley (745,000 square feet) is proposed at the southeast corner of Whittier and Woods near the Whittier/Atlantic station.

The largest project currently planned east of the Los Angeles River in the vicinity of the project is the Los Angeles County/USC Medical Center (1,970,000 square feet) at Cummings and Marengo streets, just north of the I-10 (San Bernadino) freeway.

CHAPTER 3: TRANSPORTATION SETTING, IMPACTS AND MITIGATION

This chapter discusses the existing and projected future transportation conditions in the Eastside Corridor study area, Los Angeles County and the region and quantifies the expected transportation impacts of the No-Build alternative, the Locally Preferred Alternative (LPA) and initial operable segments (IOSs). The first section, 3-1, describes existing and projected future transit service within the study area and the region. It summarizes anticipated impacts on transit mode shares for regional and Los Angeles County travel and compares rail patronage forecasts for the LPA and IOSs.

Section 3-2 describes existing and projected peak hour traffic operations within the Eastside Corridor study area. Focusing on projected station-oriented traffic, the potential impacts on peak hour traffic flow are described and, where appropriate, mitigation measures are identified. Section 3-3 describes anticipated impacts to study area parking associated with construction and operation of the LPA and the IOSs.

A travel demand model has been developed by the Los Angeles County Metropolitan Transportation Authority (MTA) for purposes of analyzing the impacts of the LPA and IOSs, as well as anticipated ridership along the LPA and at each of its seven stations. The model is a multi-modal model that includes highway, bus and rail analysis capabilities. Critical model components have been reviewed with the Federal Transit Administration (FTA) during preparation of the 1993 AA/DEIS/DEIR and this Final EIS/EIR.

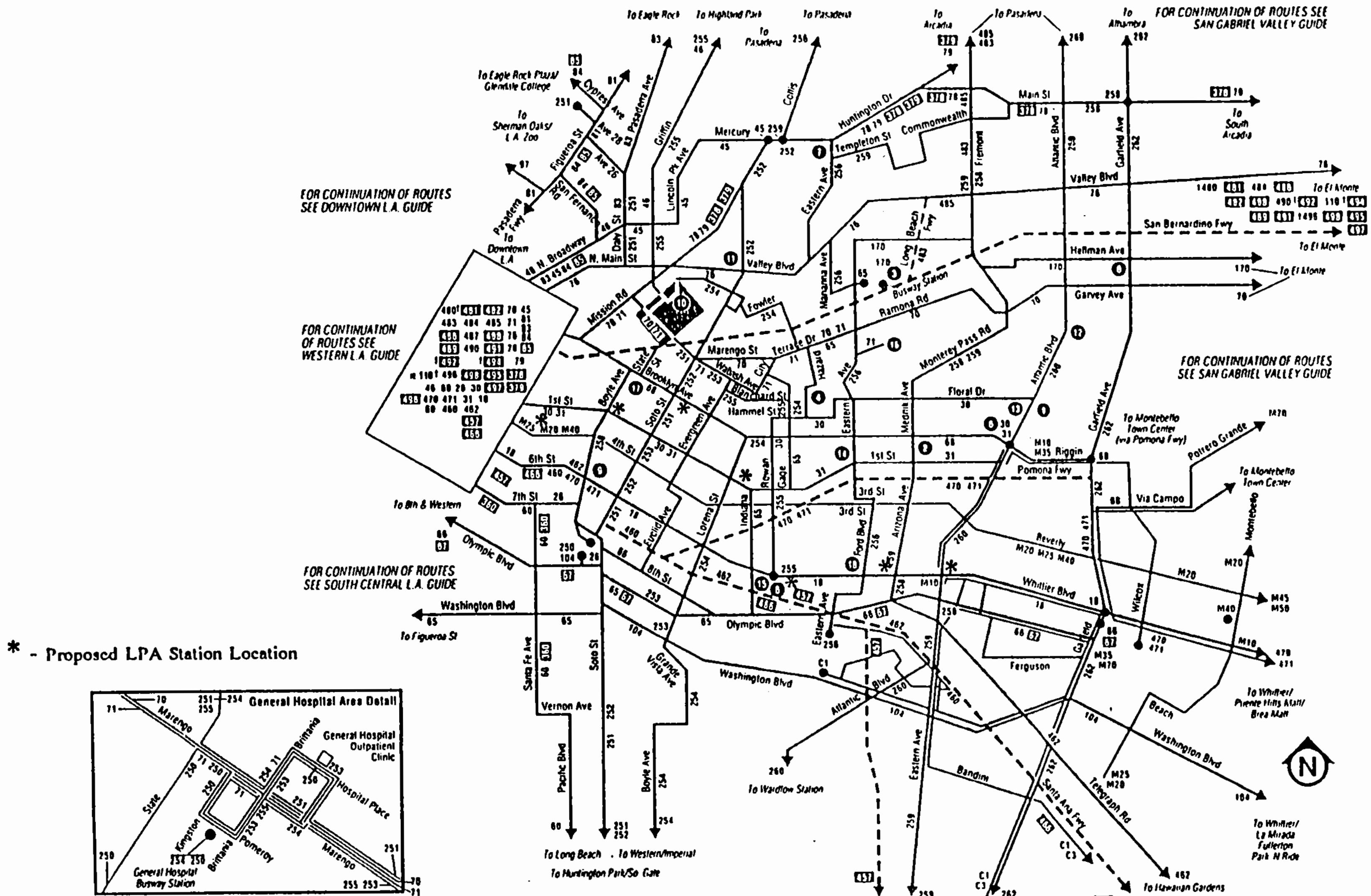
3-1 TRANSIT

3-1.1 EXISTING BUS SERVICE

The East Los Angeles community is one of the largest users of public transit in Los Angeles County and the Southern California region. This section briefly describes the existing transit services provided in the study area vicinity. Additional discussion is also included in Section 1-3 of Chapter 1 of this Final EIS/EIR.

3-1.1.1 Regional Transit Summary

The primary provider of transit service within the East Los Angeles community is the Los Angeles County Metropolitan Transportation Authority (MTA). Figure 3-1.1 shows all bus lines operating within the general study area. A total of 13 bus lines provide services in the vicinity of the proposed LPA stations. Additional local service to major activity centers in the community and along Fourth Street and Atlantic Boulevard is provided by the City of Montebello Municipal Bus Lines. Also the Boyle Heights Shuttle, operated by the LADOT, serves the Los Angeles County University of Southern California (USC) Medical Center, White Memorial Hospital, Lincoln Hospital and other facilities.



Source: Los Angeles County Metropolitan Transportation Authority

Metro Redline Eastside Extension	East Los Angeles Bus Routes	FIGURE 3-1.1

Transit service levels are generally based on demand for transit in particular corridors. Service levels are often described by route headways. Headway is the time between buses according to the schedule. A bus line which runs every 10 minutes is therefore said to have a 10-minute headway. Some bus line routings and schedules are based on policy guidelines rather than actual demand.

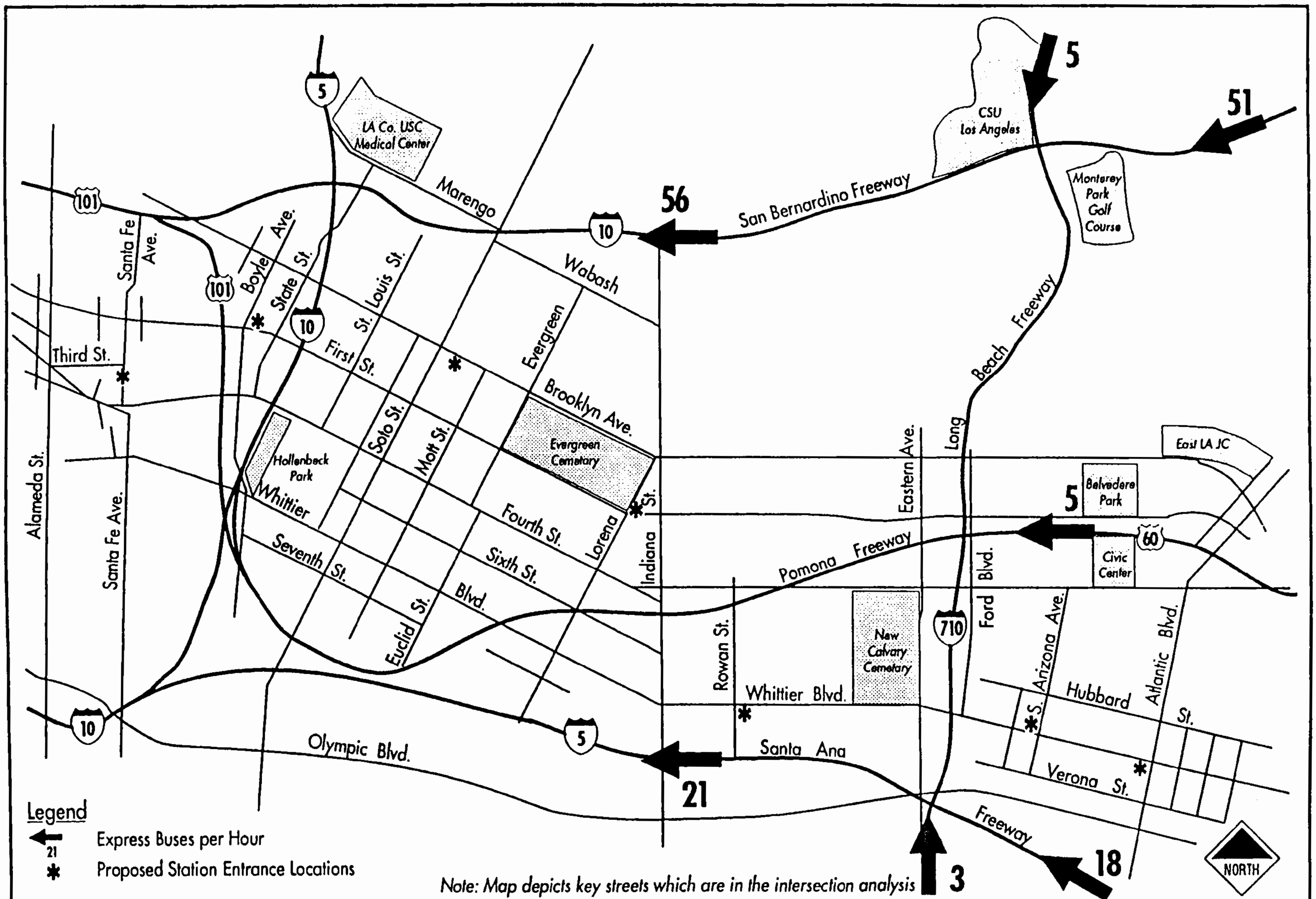
Bus line headways on the 13 lines in the area vary from 5 minutes to 40 minutes during the peak periods. Midday headways range between 5 to 60 minutes. The evening peak headways are between 14 minutes to over an hour. Of the 13 bus lines currently providing direct service to the proposed rail stations, 12 operate seven days a week, one operates Monday through Friday only, and three operate 24 hours a day.

There are also many express lines which border the study area and serve primarily other areas of the San Gabriel Valley and the counties of San Bernardino, Riverside and Orange. Most of the express routes are oriented to the El Monte Busway (HOV lanes), which runs within the San Bernardino Freeway (I-10) right-of-way. There are express stops at California State University at Los Angeles (CSULA) and at the Los Angeles County/University of Southern California (USC) Medical Center. The express services are operated by MTA, Foothill Transit, Omnitrans (San Bernardino) and the Riverside Transit Agency (RTA). Express service from Orange County operates in mixed flow along the Santa Ana Freeway (I-5) and is operated jointly by the Orange County Transit Authority (OCTA) and MTA.

Table 1-3.2 in Chapter 1 lists express bus lines serving the Eastside Corridor study area. A majority of these express bus lines carry through trips (trips with origins and destinations outside the Eastside Corridor study area) bound for the Los Angeles Central Business District (LACBD) and do not pick up a significant number of passengers within or near the study area, except for those passengers boarding at the El Monte Busway express stops. Figure 3-1.2 shows the current AM peak hour inbound express bus volumes in buses per hour.

3-1.1.2 Access to Major Local Activity Centers

Major activity centers along existing bus routes northeast of the LPA are the East Los Angeles Community College, serviced by Lines 30 and 68. To the south, the Los Angeles Community Hospital is served by Lines 66 and 67, and the East Los Angeles Doctor's Hospital is served by Lines 18 and 255. To the south and west are the Linda Vista Community Hospital and Lincoln Hospital which are served by the Boyle Heights Shuttle (Line 620) and the Hollenbeck Park served by Lines 18 and 250. To the north of the LPA alignment is White Memorial Hospital, which is served by Lines 68, 250 and the Boyle Heights Shuttle. Further to the north is Los Angeles County USC Medical Center and USC School of Medicine, which are served by Lines 250, 251, 254, 255 and the Boyle Heights Shuttle. There are also a number of junior and senior high schools along the mentioned local bus routes.



Metro Redline Eastside Extension

1992 AM Peak Hour Express Bus Volumes (Buses per Hour)

FIGURE **3-1.2**

3-1.1.3 Local Transit Service

Within the East Los Angeles community of 280,000 residents, there are over 60,000 daily transit boardings. This represents a very high level of transit use and also reflects the mostly local nature of such bus trips. Table 1-2.3 in Chapter 1 summarizes the current local bus service in the immediate study area. Census travel data for the study area have indicated that approximately 16 percent of the residents of the area use transit as their primary mode of transportation for work trips within the area. For work trips destined to Downtown Los Angeles, 45 percent of the areas residents depended on transit. Figure 3-1.1 illustrates the local bus routes in the study area. Figure 3-1.2 shows the AM peak hour express bus volumes. Figure 3-1.3 shows the AM peak hour local bus volumes on the arterial street network.

The following is a description of the bus lines that currently serve each of the proposed LPA Red Line station areas and bus boarding/alighting activities at these locations on a typical day.

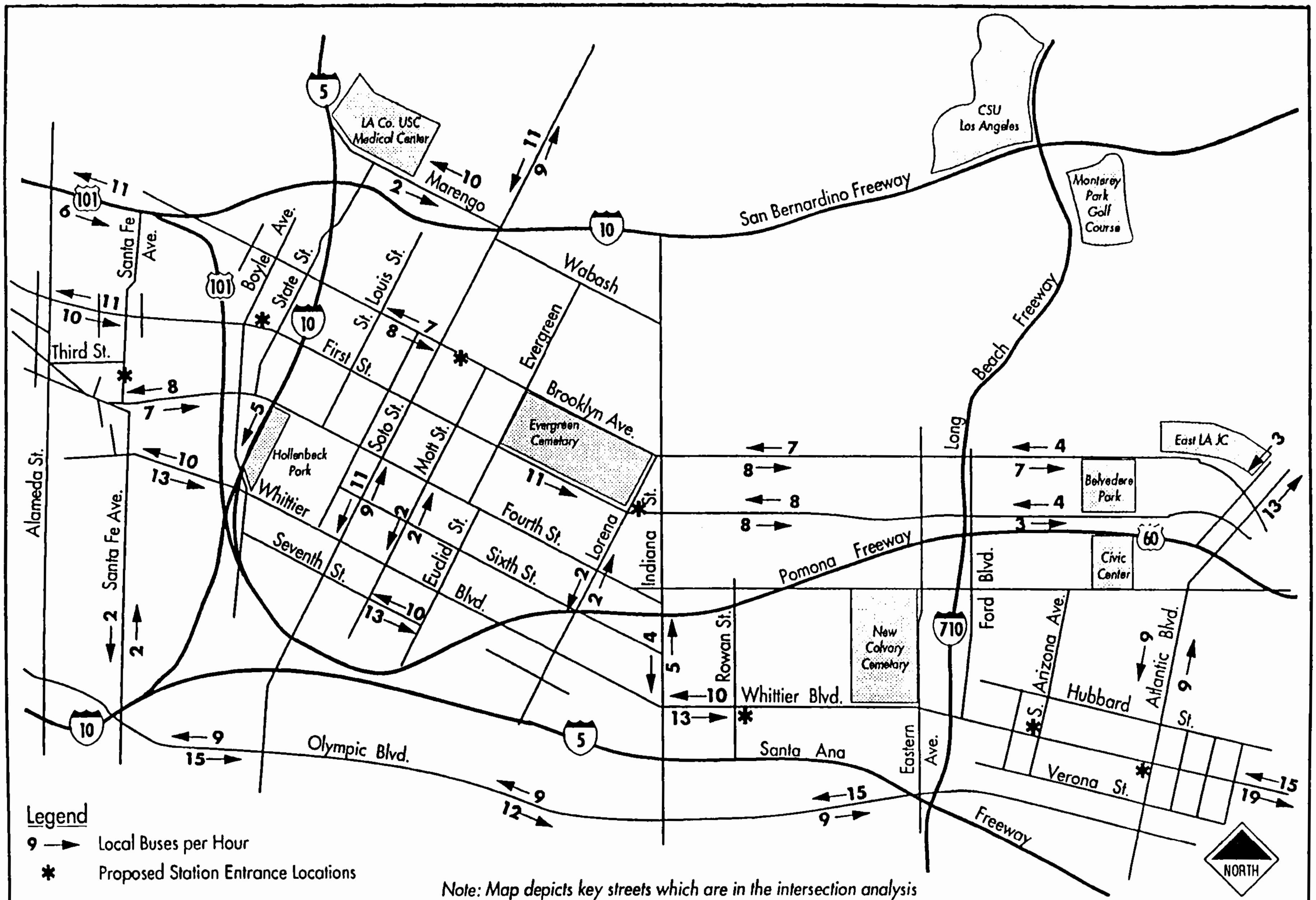
a. Little Tokyo Station

Lines 30/31 are local east/west routes serving MTA Blue Line Pico Station, through downtown Los Angeles and connecting to East Los Angeles College. The lines run across Pico Boulevard, Broadway, First Street; Line 30 runs via Floral Drive to Atlantic Boulevard and Line 31 continues along First, then on Atlantic to Floral. The lines run seven days a week/24 hours a day, with a headway of five minutes during the peak period. The routes stop at Vignes Street, near the station. On a typical day at that stop, there were a total of 59 eastbound and 78 westbound boardings and alightings. Figure 3-1.4 illustrates existing transit services in the vicinity of the Little Tokyo Station.

b. First/Boyle Station

Lines 30/31 make two stops at the intersection of First and Boyle. Eastbound service stops farside (i.e., passes through the intersection before stopping) and westbound stops nearside (i.e., stops before passing through the intersection) on First Street. On a typical day there were a total of 481 westbound and 493 eastbound boardings and alightings.

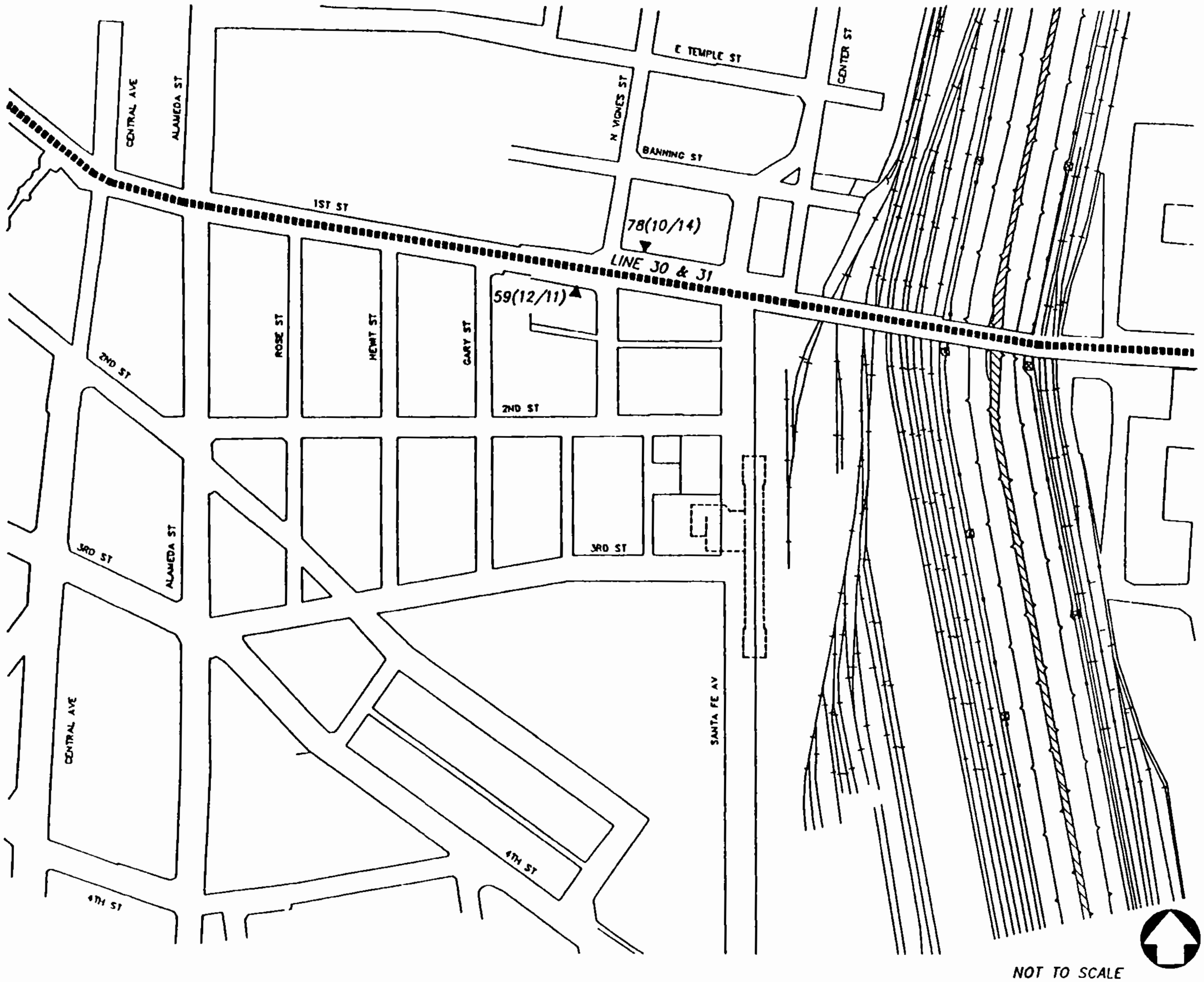
Line 250 is a local north/south route which runs along Boyle Ave and State Street to the Busway Station and Los Angeles County/USC Outpatient Clinic. It runs seven days from 6:30 AM to 7:00 PM with 20 minute headways during the peak period. Line 250 stops nearside of First Street on its northbound route and farside for the southbound route. On a typical day, there were a total of 17 northbound and 38 southbound daily boardings and alightings. Figure 3-1.5 illustrates existing transit services in the vicinity of the First/Boyle Station.



Metro Redline Eastside Extension	1992 AM Peak Hour Local Bus Volumes (Buses per Hour)	FIGURE 3-1.3

METRO RED LINE EASTSIDE EXTENSION FEIS / FEIR

LITTLE TOKYO STATION VICINITY



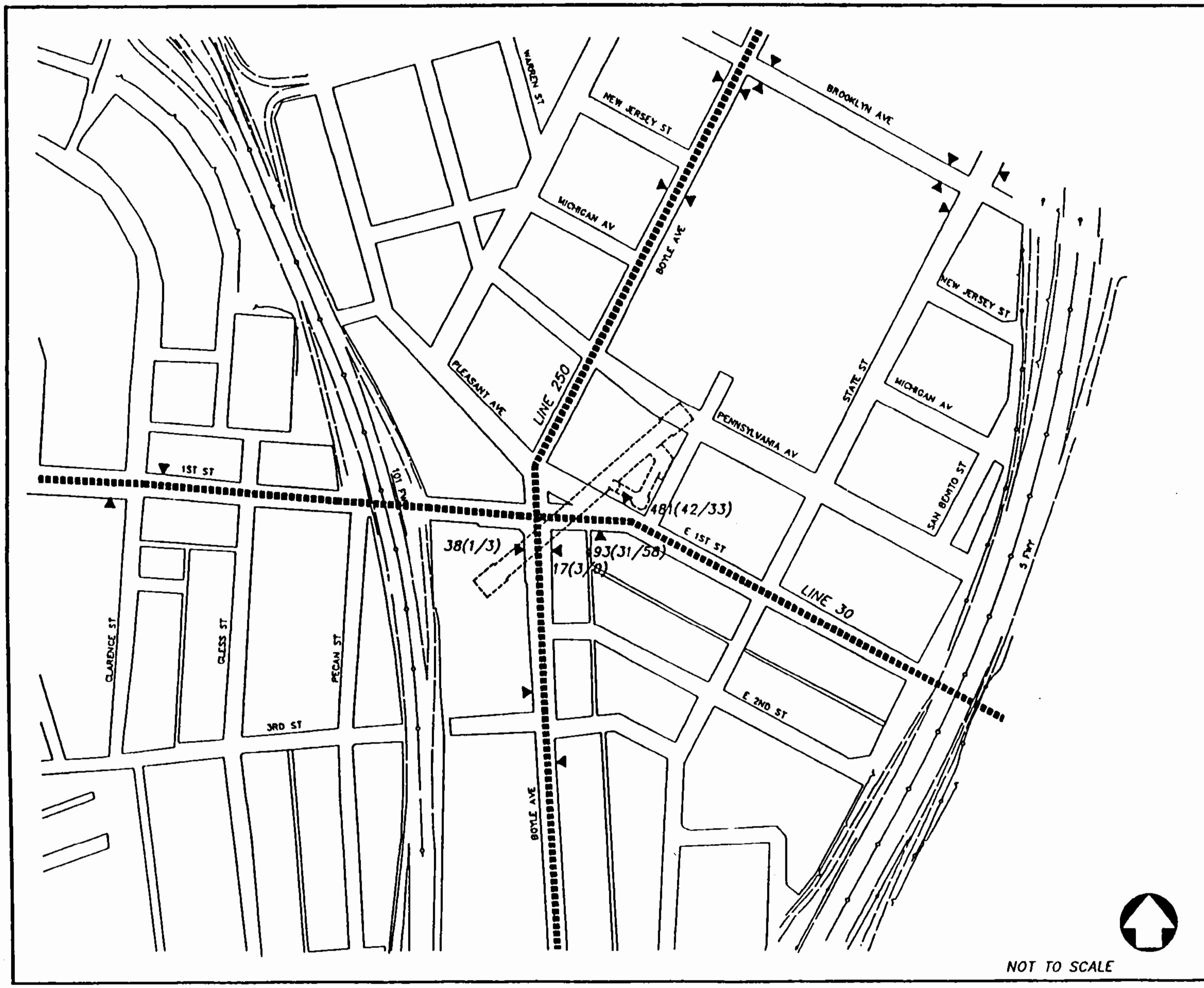
LEGEND

▲ 481(42/33)	Existing Bus Stop Daily Total (AM Peak/PM Peak)
▪▪▪▪▪▪▪▪▪▪	Existing Bus Route

Figure 3-1.4
Existing Transit System

Los Angeles County Metropolitan Transportation Authority

ETS1-LTO.DWG 4-8-94



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

FIRST/BOYLE
STATION VICINITY

LEGEND

▲ Existing Bus Stop
481(42/33) Daily Total (AM Peak/PM Peak)
■■■■■■■■■■■ Existing Bus Route

Figure 3-1.5
Existing
Transit System

Los Angeles County
Metropolitan Transportation
Authority

ETS2-FBO.DWG 4-8-94

c. Brooklyn/Soto Station

Line 68 is a local east/west route serving the MTA Blue Line Grand Station. It runs along Washington Blvd. through downtown Los Angeles on Hill Street and then Brooklyn Avenue, and finally to Montebello Town Center Mall. It runs Monday-Friday from 4:00 AM to 1:30 AM with eight minute headways during the peak hour. Saturday it operates from 4:00 AM to 10:00 PM and Sunday 5:00 AM to 10:00 PM. Line 68 runs along Brooklyn and both east and westbound stops are nearside of Soto. On a typical day there were a total of 1177 eastbound and 976 westbound boardings and alightings.

Lines 251/252 are local north/south routes that serve the MTA Blue Line 103rd Street Station. Line 251 runs along 103rd, Soto Street and Avenue 26. Line 252 runs along California Avenue, Soto Street and Huntington Drive. These lines run seven days a week/24 hours a day with a six minute peak hour headway. There are four bus stops near this station on Soto Street, two for each direction; and each is made nearside of First Street and Brooklyn Avenue. On a typical day there were a total of 1,350 northbound and 1,381 southbound boardings and alightings.

Lines 30/31 run along First Street and stop nearside of Soto Street. On a typical day there were a total of 1,198 eastbound and 1,052 westbound boardings and alightings.

Boyle Heights Shuttle Line 620 is a neighborhood shuttle that runs from Los Angeles County USC Medical Center south on State Street to White Memorial Hospital, on Boyle Avenue up Soto Street and Mott across Brooklyn and back to USC Medical Center. The shuttle runs from 9:00 AM to 6:30 PM with 20 minute headways. Figure 3-1.6 illustrates existing transit services in the vicinity of the Brooklyn/Soto Station.

d. First/Lorena Station

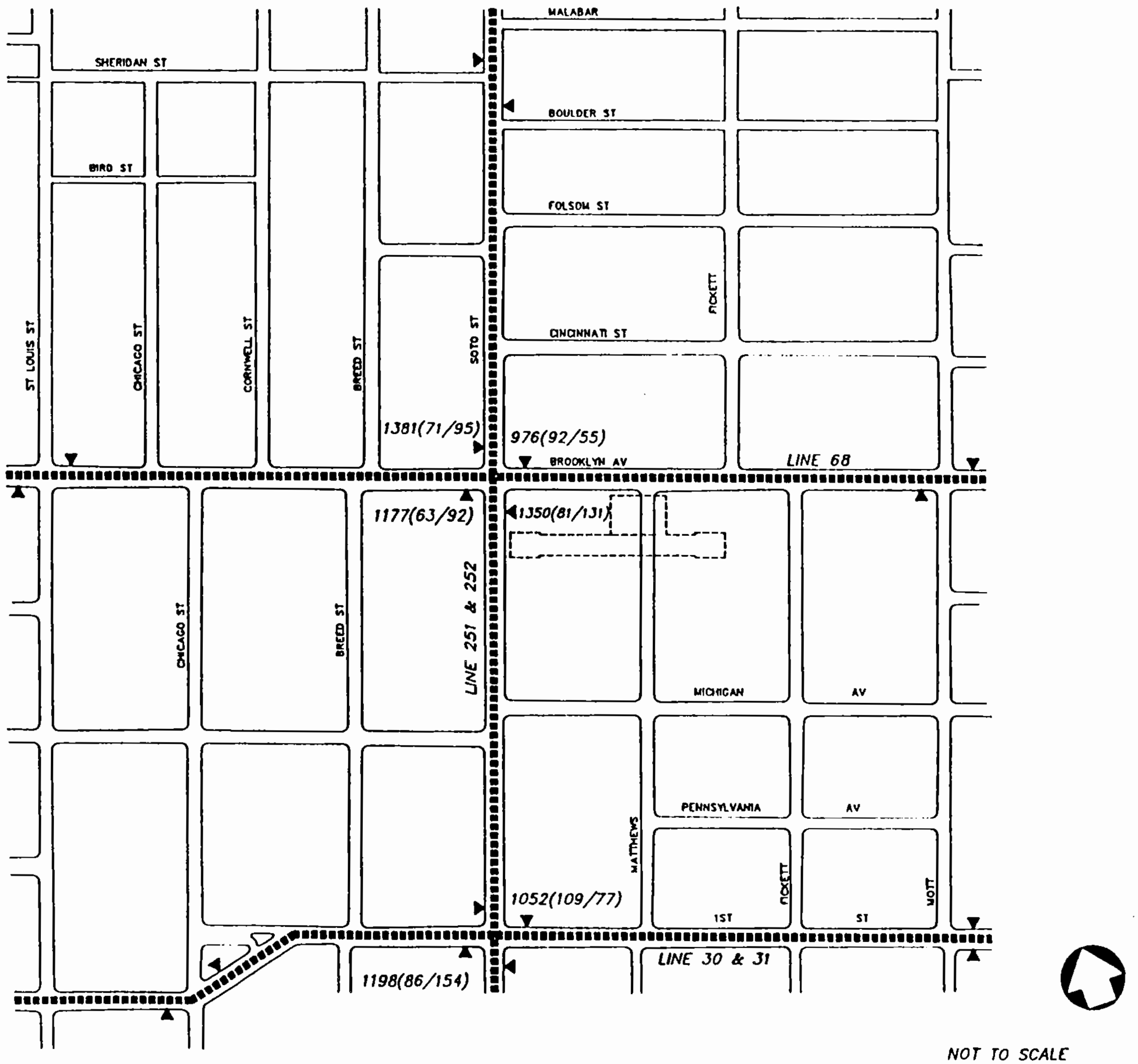
Line 65 is a local east/west route serving the MTA Blue Line Grand, San Pedro and Washington stations. It runs along Washington Boulevard from the Washington Blue Line Station, Indiana Street and Gage Avenue to the California State Los Angeles University Campus. It operates Monday through Friday from 5:30 AM to 11:00 PM with a peak hour headway of 16 minutes. Saturdays the line operates from 5:30 AM to 8:00 PM and Sundays and Holidays from 8 AM to 8 PM. This line stops nearside of First Street on Indiana Street. On a typical day there were a total of 92 northbound and 116 southbound boardings and alightings.

Line 254 is a local north/south line serving the MTA Blue Line Firestone and Imperial Stations. Line 254 starts near Los Angeles Southwest College and runs along 120th Street, Boyle Avenue and Lorena Street to USC Medical Center. It operates from 4:30 AM to 9:30 PM Monday through Friday with a peak hour headway of 25 minutes. Saturdays it operates from 6:00 AM to 8:30 PM and Sundays from 7:30 AM to 8:30 PM. Line 254 runs along Lorena Street and has two nearside stops northbound one before First Street and the second before Brooklyn Avenue. Southbound there is a stop south of Brooklyn and nearside of First Street. On a typical day there were 60 southbound and 62 northbound boardings and alightings.

Lines 30/31 run along First Street and stops nearside of both Lorena Street and Indiana Street. There were 309 westbound and 331 eastbound boardings and alightings on a typical day. Figure 3-1.7 illustrates existing transit services in the vicinity of the First/Lorena Station.

METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

BROOKLYN/SOTO
STATION VICINITY



LEGEND

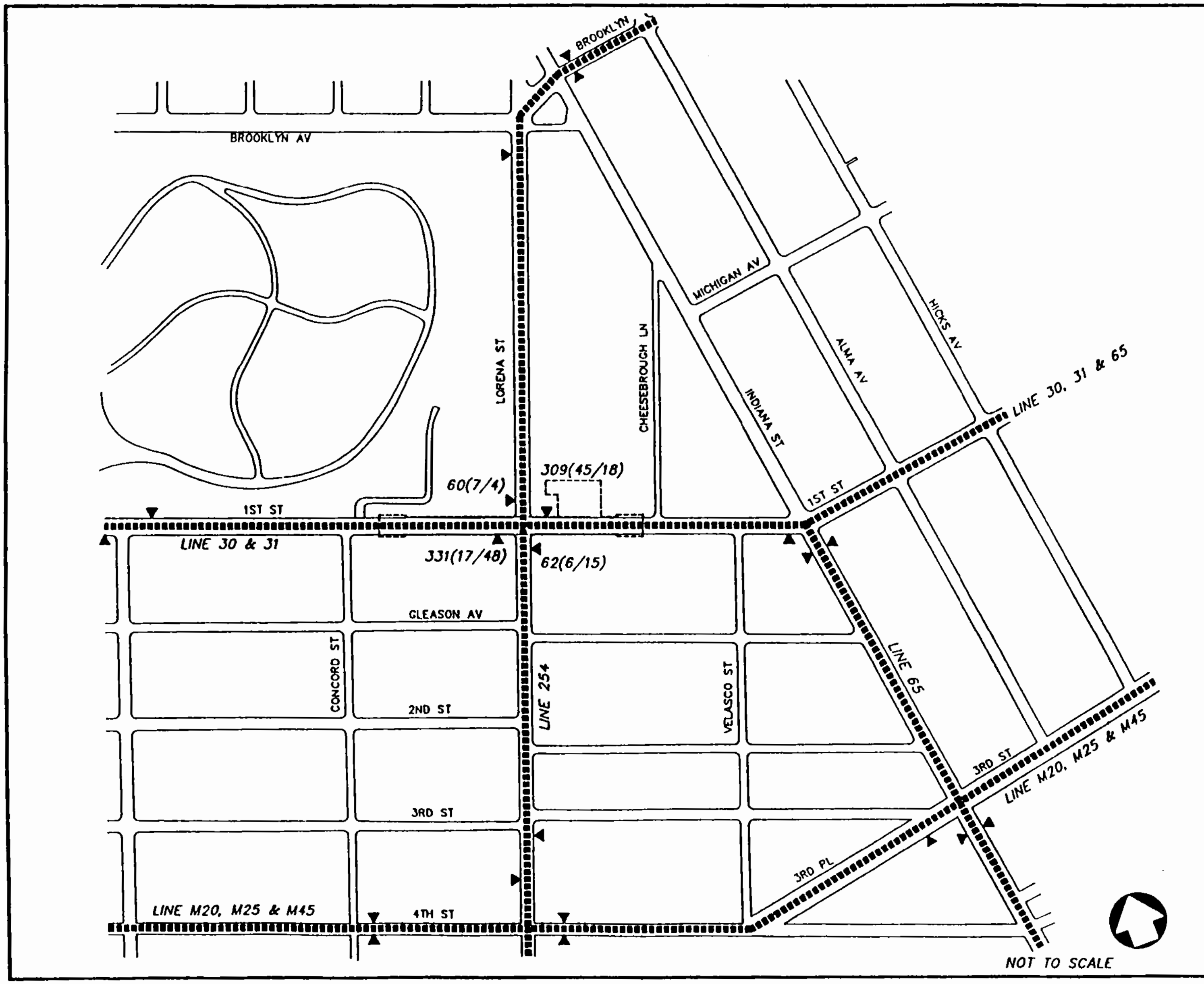
▲ Existing Bus Stop

481(42/33) Daily Total (AM Peak/PM Peak)

■■■■■■■■■■ Existing Bus Route

Figure 3-1.6
Existing
Transit System

Los Angeles County
Metropolitan Transportation
Authority



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

FIRST/LORENA
STATION VICINITY

Figure 3-1.7
Existing
Transit System

Los Angeles County
Metropolitan Transportation
Authority

e. Whittier/Rowan Station

Line 18 is a local east/west route that runs along Sixth Street/Whittier Avenue through Downtown Los Angeles. It operates seven days a week/24 hours a day, with a peak hour headway of seven minutes. Line 18 runs along Whittier Boulevard. The eastbound route makes one nearside stop before Indiana and two farside stops, one after Ditman and the second after Rowan. Westbound stops are nearside of Rowan and Ditman and farside of Indiana. This Line also stops near the Whittier/Arizona Station and the Whittier/Atlantic Station. On a typical day, at Eastman there were 237 westbound and 274 eastbound boardings and alightings, and at Ditman there were 377 westbound and 340 eastbound boardings and alightings.

Line 255 is a north/south route that runs from Whittier and Rowan to Highland Park and near USC Medical Center. Line 255 runs along Rowan, Wabash and Griffith Avenue. It operates seven days a week from 5:00 AM to 8:30 PM with a peak hour headway of 45 minutes. Line 255 stops nearside of Rowan on Whittier Boulevard. There were 27 boardings and alightings on a typical day.

Line 65 runs along Indiana Street and stops nearside of Whittier Boulevard. Figure 3-1.8 illustrates existing transit services in the vicinity of the Whittier/Rowan Station.

f. Whittier/Arizona Station

Lines 258/259 are local north/south routes. Line 258 runs along Arizona Avenue, Fremont Avenue and Alhambra. Line 259 runs along South Gate, Arizona Avenue, Templeton Street and El Sereno. They operate Monday through Friday only from 5:30 AM to 8:30 PM with 20 minute headways during the peak periods. Line 258/259 stops farside of Whittier on Arizona Avenue. Typical total daily boarding and alightings were 235 northbound and 247 southbound.

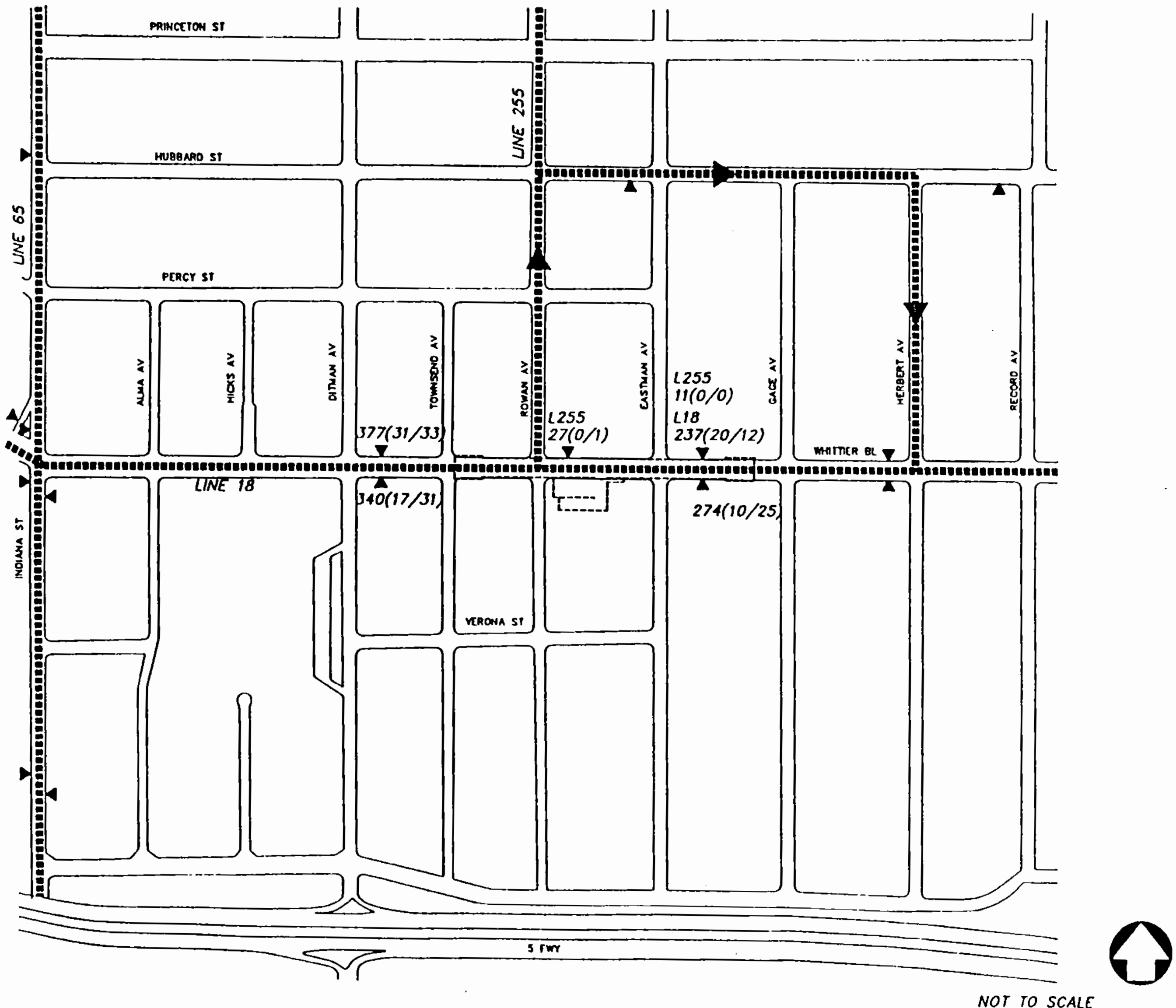
Line 18 stops farside of Ford Boulevard and Arizona Avenue in the eastbound and westbound direction. Counts showed 512 westbound and 416 eastbound daily boarding and alightings. Figure 3-1.9 illustrates existing transit services in the vicinity of the Whittier/Arizona Station.

g. Whittier/Atlantic Station

Line 260 is a north/south route that runs from the Wardlow MTA Blue Line Station in Long Beach along Long Beach Boulevard, Atlantic Boulevard and Los Robles Avenue to Altadena. It runs seven days a week from 5:00 AM to 11:00 PM with a 10 minute headway during the peak periods. Northbound stops nearside and southbound stops farside of Whittier Boulevard. On a typical day there were 817 southbound and 856 northbound boardings and alightings.

Line 18 runs along Whittier Boulevard and stops farside of Atlantic Boulevard both east and westbound. Typical daily counts showed 772 westbound and 834 eastbound boardings and alightings. Figure 3-1.10 illustrates existing transit services in the vicinity of the Whittier/Atlantic Station.

Table 3-1.1 lists, by proposed station location, the current total daily, AM and PM peak hour boarding/alighting and headway by each bus line.



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ROWAN STATION VICINITY

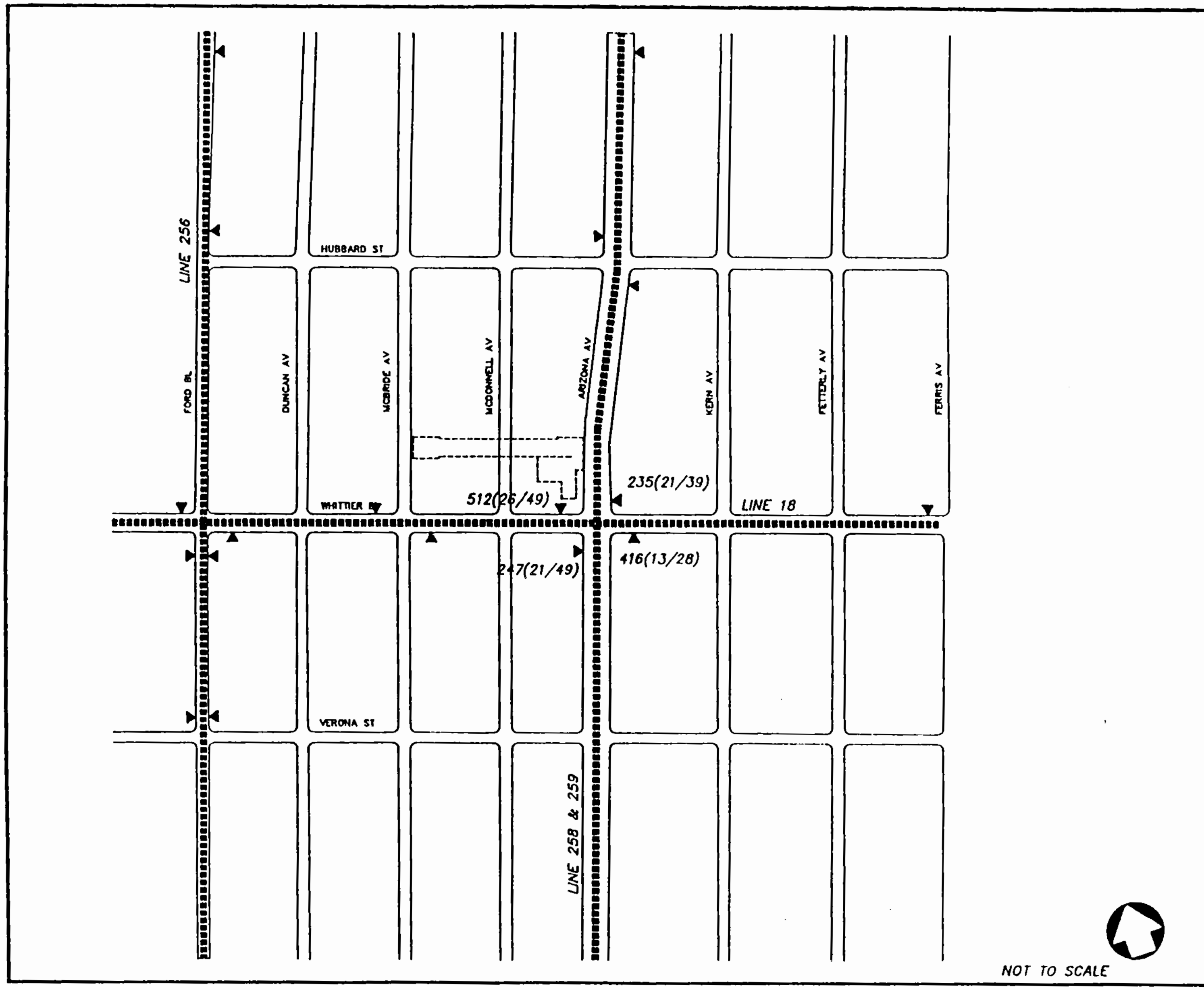
LEGEND

- ▲ Existing Bus Stop
- 481(42/33) Daily Total (AM Peak/PM Peak)
- Existing Bus Route
- One-Way Bus Flow

Figure 3-1.8
Existing Transit System

Los Angeles County Metropolitan Transportation Authority

ETSS-WRO.DWG 4-8-94



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ARIZONA
STATION VICINITY

LEGEND

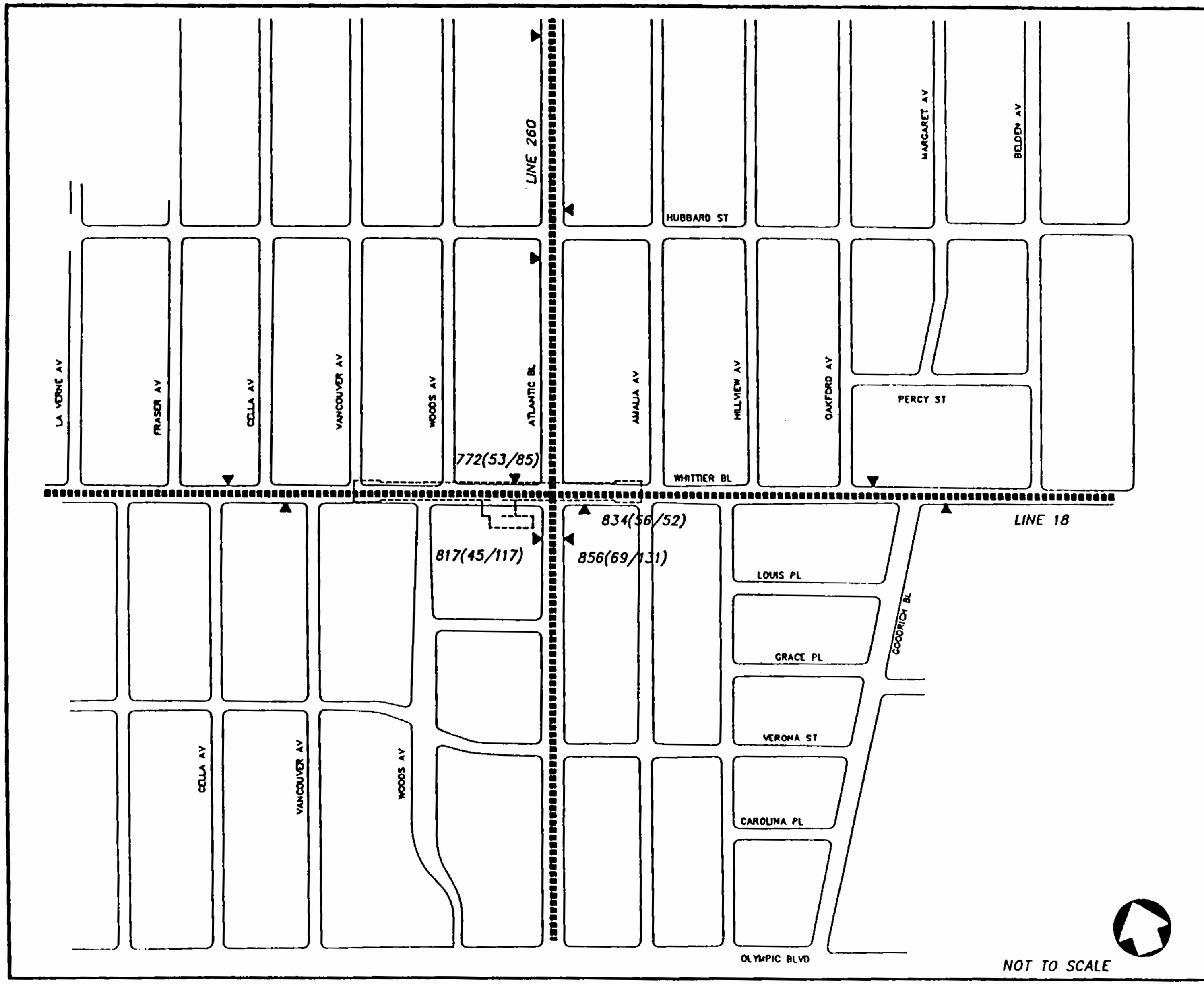
▲ Existing Bus Stop
481(42/33) Daily Total (AM Peak/PM Peak)
▪▪▪▪▪▪▪▪▪▪▪▪ Existing Bus Route

Figure 3-1.9
Existing
Transit System

Los Angeles County
Metropolitan Transportation
Authority

ETSB-WAR.DWG

4-8-94



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ATLANTIC STATION VICINITY

LEGEND

- ▲ Existing Bus Stop
- 481(42/33) Daily Total (AM Peak/PM Peak)
- ▪▪▪▪▪▪▪▪ Existing Bus Route

Figure 3-1.10
Existing Transit System

Los Angeles County Metropolitan Transportation Authority

ET57-WAT.DWG 4-8-94

TABLE 3-1.1: EXISTING (1993) BUS ACTIVITY NEAR PROPOSED STATIONS

LINE	DIRECTION	EXISTING BUS BOARDINGS/ALIGHTINGS AM PEAK ON	AM PEAK OFF	PM PEAK ON	PM PEAK OFF	TOTAL DAILY ON	TOTAL DAILY OFF	BUS FREQ. (min.) PEAK	BUS FREQ. (min.) OFF-PEAK
1. Little Tokyo Station									
Line 30	EB	5	5	15	0	60	20	5	12
	WB	0	10	5	5	10	45	5	12
2. First & Boyle Station									
Line 30	WB	35	5	25	10	350	135	5	12
	EB	10	20	10	45	155	340	5	12
Line 250	NB	5	0	0	0	10	10	20	40
	SB	10	30	0	0	0	5	20	40
3. Brooklyn & Soto Station									
Line 30	EB	20	70	55	100	445	755	5	12
	WB	70	40	50	25	685	370	5	12
Line 68	EB	50	15	60	30	520	655	8	10
	WB	70	25	30	25	535	445	8	10
Line 251/252	NB	45	35	35	95	540	810	6	10
	SB	45	25	60	35	875	505	6	10
4. First & Lorena Station									
Line 30/31	EB	5	15	5	40	270	60	5	12
	WB	35	10	10	10	60	250	5	12
Line 254	NB	5	0	5	10	30	35	25	60
	SB	5	0	5	0	30	30	25	60
Line 65	NB	5	5	5	10	30	65	16	30
	SB	15	0	10	5	90	25	16	30
5. Whittier & Rowan Station									
Line 18									
Ditman	EB	10	5	5	25	160	180	7	10
	WB	25	5	15	15	210	165	7	10
Eastman	EB	5	5	10	25	155	120	7	10
	WB	10	10	60	65	100	140	7	10
Line 255	WB @ Rowan	0	0	0	0	25	0	45	45
	WB @ Eastman	0	0	0	0	10	0	45	45
	EB @ Hubbard	0	0	0	0	0	10	45	45
6. Whittier & Arizona Station									
Line 18	EB	5	5	5	20	160	255	7	10
	WB	20	5	30	20	360	150	7	10
Line 258/259	NB	20	0	30	10	180	55	20	30
	SB	10	10	10	40	70	180	20	30
7. Whittier & Atlantic Station									
Line 18	EB	5	50	15	40	165	670	7	10
	WB	35	15	70	15	620	155	7	10
Line 260	NB	25	40	55	75	370	485	10	20
	SB	40	5	70	50	460	360	10	20

Source: Meyer Mohaddes Associates, 1994.

3-1.2 FUTURE TRANSIT SERVICES

The major differences between the year 2010 "With Project" LPA and the existing local transit setting are the introduction of rail transit and additional bus services within the corridor and expansion or modifications to existing bus services to better coordinate with rail transit.

3-1.2.1 Bus Interface and Service Modifications

With the future introduction of rail transit service in the study area, several changes will be necessary to the existing bus system as part of the overall integrated transit plan for the study area. The purpose of implementing these changes is twofold: first, to ensure proper system interface through bus feeder/support services; and second, to eliminate competition and duplication between bus and rail services. These adjustments include such actions as rerouting of bus lines to serve stations currently not being served directly, increasing service frequencies for station feeder/connector bus lines, shortening and/or deletion of certain competing express and/or local buses, and institution of local circulator/shuttle services.

It should be pointed out that the exact bus line changes that would be implemented when the Red Line begins operation can not be identified at this time since many of the key variables used to design transit services may change by the year 2010. These include corridor employment density, population and available transit operating revenues. For planning and patronage forecasting purposes, however, certain specific actions were assumed and subsequently applied in the travel forecasting model. These represent the most logical service enhancement actions given the current transit system and represent the typical bus service modifications which may actually be implemented should rail operation begin in the future.

Due to high population densities and the relatively high levels of bus ridership in the study area, bus interface and walk access are expected to be the predominant modes of access to the Red Line, and relatively little reliance on park-and-ride is assumed. Therefore, it is planned that only two LPA stations (First/Lorena and Whittier/Atlantic) will have formal park-and-ride facilities. All LPA stations except Little Tokyo and First/Boyle are, however, expected to include bus terminal facilities reflecting the importance of bus/rail connections.

Bus headways were assumed to be maintained for local access to businesses and residential areas on the major east-west (parallel service) routes to the LPA Metro Red Line and some of those parallel lines may be re-routed to connect to Red Line stations. Current bus service frequencies and probable frequency modifications to provide enhanced bus/rail interface are detailed in Table 3-1.2.

The following paragraphs describe the existing bus lines which are likely to continue serving each station and the assumed specific bus service adjustments and support facilities which could be implemented for system interface at each location. The modifications described are assumed in the patronage/forecast model runs conducted for the project.

TABLE 3-1.2: LOCAL BUS ROUTES SERVING EASTSIDE CORRIDOR PEAK PERIOD HEADWAYS

LINE NUMBER	DESCRIPTION	HEADWAYS (minutes)				
		EXISTING	NO-BUILD (YEAR 2010)	LPA (YEAR 2010)	IOS-1 (YEAR 2010)	IOS-2 (YEAR 2010)
18	Whittier	7	5	4	4	4
18L	Whittier-Limited	-	-	-	-	-
30/31	First	5	4	4	4	4
30L/31L	First-Limited	-	-	-	-	-
65	Washington, Indiana, Gage	16	15	6	6	6
66/67	Olympic	5	5	4	4	4
68	Brooklyn	8	6	4	4	4
68L	Brooklyn-Limited	-	-	-	-	-
70	Garvey/ City Terrace	10	10	10	10	10
104	Brooklyn	30	30	30	30	30
250/253	Boyle-State, Evergreen	20	20	10	10	10
251/252	Soto	6	6	5	5	5
254	Lorena	25	25	6	6	6
255/46	Rowan	45	40	6	6	6
256	Ford/Eastern	22	20	6	6	6
258/259	Arizona	20	15	5	5	5
260	Atlantic	10	10	6	6	6
262	Garfield	30	15	10	10	10
460[a]	I-5	20	20	20	20	20
462[a]	I-5	20	10	10	10	10
466[a]	I-5	25	15	15	15	15
470/471[a]	SR60	15	15	10	10	10
620	Boyle Heights Shuttle	20	20	10	10	10
M10	Whittier/Atlantic	10	10	6	6	6
M35	Garfield, Riggin	30	30	12	12	12
M40	Fourth	10	6	8	8	8

Notes: [a] Express Bus Route serving Eastside Corridor

Source: MTA Modeling/GIS Division, April 1994; ICF Kaiser Engineers, April 1994; (Parsons Brinckerhoff Quade & Douglas, Inc. and Mundle & Associates, March 4, 1993, AA/DEIS/DEIR Los Angeles Eastside Corridor, April 1993.)

a. **Little Tokyo Station**

- MTA Line 30/31 would serve this station via bus stops along First Street.
- Montebello Municipal Bus Line 40 would serve this station via stops on 4th Street.
- A shuttle-type service, similar to current LADOT DASH service, would be planned along Alameda Street, Central Avenue and San Pedro Street corridor, to provide local connections to this station.
- Bus line re-routing or termination is not envisioned at this station.

b. **First/Boyle Station**

- MTA Line 30/31 would serve this station via bus stops along First Street.
- Montebello Municipal Bus Line 40 would serve this station via stops on 4th Street.
- MTA Line 250 would serve this station via stops along Boyle Avenue.
- LADOT Line 620 would serve this station via First Street at Boyle Avenue.
- Bus line re-routing or termination is not envisioned at this station. However, relocation of bus stops may be needed to best serve the proposed rail station portal locations.

c. **Brooklyn/Soto Station**

- MTA Line 251/252 would serve this station via bus stops along Soto Street.
- MTA Line 68 would serve this station via bus stops along Brooklyn Avenue.
- MTA Lines 253 and 255 would be rerouted to serve this station via on-street bus stops.
- MTA Line 104 would be extended further north to terminate at this station in an on-street bus terminal.
- LADOT Line 620 would be modified to terminate at this station.

d. **First/Lorena Station**

- MTA Line 68 would serve this station via bus stops along Brooklyn Avenue.
- All MTA Line 30 short lines and Line 31 trips would be terminated at this station. Current Line 30 through trips to East Los Angeles College would continue to operate to its east terminal.
- A shuttle service would be operated along the segment of First Street to East Los Angeles College that would no longer be served by Line 31.
- MTA Lines 65 and 255 would be rerouted to serve this station via on-street bus stops.
- MTA Lines 470/471 would be terminated at this station until the Whittier/Atlantic station is in operation.

e. **Whittier/Rowan Station**

- MTA Line 18 would serve this station via bus stops along Whittier Boulevard.
- An on-street bus terminal would be provided for MTA Line 255 which would serve this station via Rowan Avenue and may be terminated at this station.

f. **Whittier/Arizona Station**

- MTA Line 18 would serve this station via bus stops along Whittier Boulevard.
- MTA line 259 would serve this station via bus stops along Arizona Avenue.
- An on-street bus terminal would be provided for MTA Line 258 which would serve this station via Arizona Avenue and would terminate at this station.
- MTA Line 256 would be rerouted to this station and terminate at this station.

g. **Whittier/Atlantic Station**

- MTA Line 18 would serve this station via Whittier Boulevard. This line would be terminated at this station. Bus patrons who would need to continue further east on Whittier Boulevard may transfer to Montebello Municipal Bus Lines.
- MTA/OCTA Lines 460, 462, 466 and 467, which are currently serving Downtown Los Angeles via the Santa Ana (I-5) Freeway, would be terminated at this station.
- Upon completion of this station, the termination point of MTA Lines 470/471 would be moved from the IOS-2 terminus at First/Lorena Station to this station.
- MTA Lines 66/67, which currently serve area via Olympic Boulevard, would be rerouted to serve this station. Line 67 would be terminated at this station.

In addition, Los Angeles County may be operating new local shuttle services to and from some of the LPA stations.

3-1.2.2 Metro Red Line LPA

The physical and operation characteristics of the LPA were described in detail in Chapter 2 of this Final EIS/EIR. Table 3-1.3 compares the rail service characteristics of the year 2010 Metro Red Line system, in terms of the LPA and the two IOSs. These include the annual rail service supply (revenue car miles and revenue train hours) and the peak rail car requirements. The total Red Line network mileage and the corresponding number of Red Line stations are also provided for comparison.

TABLE 3-1.3: METRO RED LINE SERVICE CHARACTERISTICS INCLUDING PROPOSED EASTSIDE RAIL EXTENSION

ALTERNATIVES AND IOSs		ANNUAL REVENUE CAR MILES (MILLIONS)	ANNUAL REVENUE TRAIN HOURS (MILLIONS)	PEAK RAIL CARS	TOTAL NUMBER OF STATIONS	REVENUE ROUTE LENGTH (ONE-WAY MILES)
Existing (1990)		0	0	0	0	0
Year 2010	No Build	11.25	129.8	100	21	23.5
	LPA	17.41	189.8	196	28	30.0
	IOS-1: First/Boyle	13.02	141.9	158	23	25.5
	IOS-2: First/Lorena	14.61	159.3	172	25	27.5

Source: ICF Kaiser Engineers, Inc., March 1994.

3-1.3 REGIONAL PATRONAGE COMPARISON

Patronage forecasting for the LPA and the two IOS's is based on the travel demand forecasting model developed during the AA/DEIS/DEIR stage and is documented in the Service and Patronage Methodology Report (March 1993). The travel demand forecasting model used 1990 as the base year for model calibration and validation and used the year 2010 for the future year forecasts. Forecasts were developed for a typical weekday and include estimates of usage during the morning peak period and during the mid-day off-peak period.

The year 2010 regional travel pattern impacts are quantified by comparing overall transit use for the No-Build with the LPA and IOSs. The following information, based on outputs from the travel demand forecasting analyses, are used for this regional comparison:

- Regional and Los Angeles County summaries of daily transit trips and the corresponding transit percentage of total person trips made by transit in the year 2010 (Table 3-1.4);
- Breakdown of daily year 2010 transit trips by the major trip purposes for the region and Los Angeles County (Table 3-1.5);
- Daily transit boardings for the year 2010 by modal category within the region (Table 3-1.6); and
- Daily new transit trips and transit boardings on the urban rail system compared to the No-Build alternative (Table 3-1.7).

The top part of Table 3-1.4 provides the forecasted regional transit usage for the year 2010. The regional share of transit trips (bus and rail combined) shows an increase from 2.23 percent of the total 67.1 million daily person trips for the No Build alternative to 2.43 percent of the total daily person trips for the LPA. As shown in the bottom portion of the table, the Los Angeles County share of transit trips is forecast to increase from 3.55 percent of the total 36.5 million daily person trips for the No Build alternative to 3.87 percent for the year 2010 LPA.

Table 3-1.5 shows the forecast daily linked transit trips[1] by trip purpose. Home-based work trips represent the largest share of total transit trips, on the order of 60 percent of the totals in the region and in Los Angeles County. Gains in the home-based work trips made by transit for the LPA over the No Build alternative represent an increase on the order of 13 percent for the region and 13 percent for Los Angeles County.

Estimated increases in the home-based non work trips (approximately 30 percent of the total transit trips) are about two percent in the region and within Los Angeles County. Corresponding comparisons in the non-home based transit trips, which account for less than 10 percent of total transit trips, amount to a three percent increase for the LPA over the No-Build alternative.

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[1] A linked trip represents one person-trip from the point of origin to final destination, regardless of the number of modes or vehicles used to complete the trip.

TABLE 3-1.4: DAILY LINKED TRANSIT TRIPS [a] -- REGION AND LOS ANGELES COUNTY

ALTERNATIVES AND IOSs		DAILY TRANSIT TRIPS (ALL PURPOSES)	TRANSIT MODAL SHARE (%)[b]
REGION			
1990		1,088,900	2.28%
Year 2010	No-Build	1,498,700	2.23%
	LPA	1,630,678	2.43%
	IOS-1: First/Boyle	1,625,885	2.42%
	IOS-2: First/Lorena	1,626,663	2.42%
LOS ANGELES COUNTY			
ALTERNATIVES AND IOSs		**DAILY TRANSIT TRIPS (ALL PURPOSES)**	**TRANSIT MODAL SHARE (%)[c]**
1990		955,000	3.34%
Year 2010	No-Build	1,295,300	3.55%
	LPA	1,412,389	3.87%
	IOS-1: First/Boyle	1,407,654	3.86%
	IOS-2: First/Lorena	1,408,428	3.86%

Notes:
[a] A linked trip represents one person-trip from the point of origin to final destination, regardless of the number of modes or vehicles used to complete the trip.
[b] Regional daily person trips for the year 1990 = 47.6 million and for the year 2010 = 67.1 million.
[c] Los Angeles County daily person trips for the year 1990 = 28.6 million and for the year 2010 = 36.5 million.

Source: MTA and ICF Kaiser Engineers, Inc., March 1994.

TABLE 3-1.5: TOTAL DAILY LINKED TRANSIT TRIPS [a] BY MAJOR TRIP PURPOSES

ALTERNATIVES AND IOSs		HOME-BASED WORK	HOME-BASED NONWORK	NON HOME-BASED	TOTAL[b]
REGION					
1990		609,500	373,500	105,900	1,088,900
Year 2010	No-Build	896,900	462,900	138,900	1,498,700
	LPA	1,014,538	472,743	143,398	1,630,678
	IOS-1: First/Boyle	1,010,228	472,486	143,171	1,625,885
	IOS-2: First/Lorena	1,010,966	472,500	143,197	1,626,663
LOS ANGELES COUNTY					
ALTERNATIVES AND IOSs		**HOME BASED WORK**	**HOME BASED NONWORK**	**NON HOME-BASED**	**TOTAL[c]**
1990		534,200	327,300	93,500	955,000
Year 2010	No-Build	776,900	400,100	118,300	1,295,300
	LPA	880,727	409,185	122,477	1,412,389
	IOS-1: First/Boyle	876,473	408,930	122,252	1,407,654
	IOS-2: First/Lorena	877,203	408,948	122,277	1,408,428

Notes:
[a] A linked trip represents one person-trip from the point of origin to final destination, regardless of the number of modes or vehicles used to complete the trip.
[b] Daily transit trips within the SCAG region.
[c] Daily transit trips within Los Angeles County.

Source: MTA and ICF Kaiser Engineers, Inc., March 1994.

Table 3-1.6 gives the relative distribution of daily transit boardings among the five operating categories used in the travel forecasting process: (1) local MTA buses, (2) all express buses, (3) all urban rail lines, (4) commuter trains and (5) other local bus operators in Los Angeles County and the region. The share of urban rail transit boardings is projected to increases from 24.7 percent of total transit boardings for the No Build alternative to a range on the order of 25.3 to 26.1 percent for the IOSs and the LPA. This is directly related to the rail extensions to the Eastside along with a corresponding increase in service supply (frequency of service) on the east-west Red Line to the Pico/San Vicente station and the increased local bus service to the Eastside Corridor proposed rail stations.

TABLE 3-1.6: DISTRIBUTION OF REGIONAL DAILY TRANSIT BOARDINGS BY MODAL CATEGORY

MODAL CATEGORY	1990	YEAR 2010			
		NO BUILD	LPA	IOS-1: FIRST/BOYLE	IOS-2: FIRST/LORENA
MTA Local Bus	1,148,700	1,349,300	1,465,835	1,476,784	1,472,794
Express Bus	286,600	152,100	176,421	178,759	178,708
Urban Rail[a]	0	625,300	738,453	712,607	718,683
Commuter Rail	0	11,300	10,769	11,230	11,163
Other Local Bus	265,300	392,100	442,346	437,798	437,251
Total Transit Boardings	1,700,600	2,530,100	2,833,824	2,817,178	2,818,599

PERCENTAGE SHARES OF TOTAL TRANSIT BOARDINGS BY MODAL CATEGORY

MODAL CATEGORY	1990	YEAR 2010			
		NO BUILD	LPA	IOS-1: FIRST/BOYLE	IOS-2: FIRST/LORENA
MTA Local Bus	67.5%	53.3%	51.7%	52.4%	52.3%
Express Bus	16.9%	6.0%	6.2%	6.3%	6.3%
Urban Rail[a]	0.0%	24.7%	26.1%	25.3%	25.5%
Commuter Rail	0.0%	0.5%	0.4%	0.4%	0.4%
Other Local Bus	15.6%	15.5%	15.6%	15.5%	15.5%

Note: [a] This includes rail transit and other fixed-guideway lines assumed to be in operation by the Year 2010, i.e., Red Line, Blue Line, Green Line and other fixed-guideway lines in the region.

Source: MTA and ICF Kaiser Engineers, Inc, March 1994.

3-1.4 COMPARISON OF RAIL TRANSIT PATRONAGE FORECASTS

An important measure of the overall benefits provided by a major transit investment is the change in overall transit ridership that the investment would produce. This ridership change is measured for all transit services, not just the new facilities, because there is a high degree of interdependence among new rail lines, the surrounding bus services and the assumed background transportation system.

It is useful to compare the ridership generated by the LPA and IOSs with that generated by the No Build alternative. Table 3-1.7 shows the relationship of year 2010 total daily transit trips for the LPA and the two IOSs compared to the No Build alternative. The table also shows year 2010 daily new transit trips and daily new urban rail boardings for the LPA and IOSs as compared to the No Build Alternative.

TABLE 3-1.7: DAILY NEW LINKED TRANSIT TRIPS[a] AND DAILY NEW TRANSIT BOARDINGS ON THE URBAN RAIL SYSTEM COMPARED TO THE NO BUILD ALTERNATIVE (YEAR 2010)

ALTERNATIVES AND IOSs	TOTAL DAILY LINKED TRANSIT TRIPS	DAILY NEW 2010 LINKED TRANSIT TRIPS COMPARED TO NO BUILD ALTERNATIVE	TOTAL DAILY URBAN RAIL BOARDINGS	DAILY NEW TRANSIT BOARDINGS ON THE URBAN RAIL SYSTEM COMPARED TO THE NO BUILD ALTERNATIVE
No-Build	1,498,700	N/A	625,300	0
LPA	1,630,678	131,978	738,453	113,153
IOS-1: First/Boyle	1,625,885	127,185	712,607	87,307
IOS-2: First/Lorena	1,626,663	127,963	718,683	93,383

Note: [a] A linked trip represents one person-trip from the point of origin to final destination, regardless of the number of modes or vehicles used to complete the trip.

Source: MTA and ICF Kaiser Engineers, Inc., March 1994.

Daily new transit trips range from a high of 132,000 for LPA to a low of 127,000 for IOS-1. Daily new transit boardings on the urban rail system range from a high of 113,200 for the LPA to a low of 87,300 for IOS-1. It is recognized that not all of the daily new transit trips compared to the No Build Alternative are attributable to the introduction of the Eastside Corridor extension of the rail transit system. Approximately 30 percent of the daily new transit trips are forecast because of increased north-south bus feeder service on the Eastside to the Metro Red Line Stations.

The discussion of likely impacts on transit service and ridership has focused on the systems level rather than the specific transit mode used for each trip. Table 3-1.8 shows the projected daily numbers of arrivals and departures at each LPA and IOS rail transit station by mode of access, which includes walking, kiss-and-ride (dropped off by an auto driver), park-and-ride (vehicle is parked at station) and bus. For example, for the LPA Whittier/Atlantic station, Table 3-1.8 shows 23,270 daily combined arrivals (boardings) and departures (alightings), 11,635 boardings and 11,635 alightings. Other columns in the table depict the way in which these patrons are expected to arrive and depart from the station. For example in the year 2010, of the 23,270 daily Whittier/Atlantic station users, 1,380 would walk to (690) and from (690) the station, 2,200 would arrive and depart as an automobile passenger (kiss-and-ride trip), 2,690 would arrive and depart by park-and-ride and 17,000 would arrive and depart by connecting bus service. Depending on the location of the station, the availability of on-site park-and-ride lots and the extent of feeder and connecting bus services and facilities, the mode of access and egress for each station will vary. The predominant access modes are forecast to be by bus and walking. Figures 3-1.11 through 3-1.13 graphically show the daily flows of rail passengers along the LPA and IOSs.

TABLE 3-1.8: YEAR 2010 DAILY STATION VOLUMES BY MODE OF ACCESS

STATION	MODE OF ACCESS				TOTAL DAILY BOARDINGS & ALIGHTINGS
	WALK	KISS-AND-RIDE	PARK-AND-RIDE	BUS	
LPA					
Little Tokyo	3,211	835		2,911	6,957
First/Boyle	1,405	1,878		6,104	9,387
Brooklyn/Soto	3,077	1,033		3,270	7,380
First/Lorena	2,084	1,126	1,261	2,729	7,200
Whittier/Rowan	1,249	1,083		2,439	4,771
Whittier/Arizona	2,441	1,199		3,299	6,939
Whittier/Atlantic	1,377	2,195	2,691	17,005	23,268
TOTAL	14,844	9,349	3,952	37,757	65,902
IOS-1: First/Boyle					
Little Tokyo	2,990	775		2,699	6,464
First/Boyle	1,405	3,121		10,040	14,566
TOTAL	4,395	3,896		12,739	21,030
IOS-2: First/Lorena					
Little Tokyo	3,105	805		2,804	6,714
First/Boyle	1,353	1,808		5,877	9,038
Brooklyn/Soto	2,381	799		2,530	5,710
First/Lorena	2,084	1,915	1,261	4,656	9,916
TOTAL	8,923	5,327	1,261	15,867	31,378

Source: MTA and ICF Kaiser Engineers, Inc., March 1994.

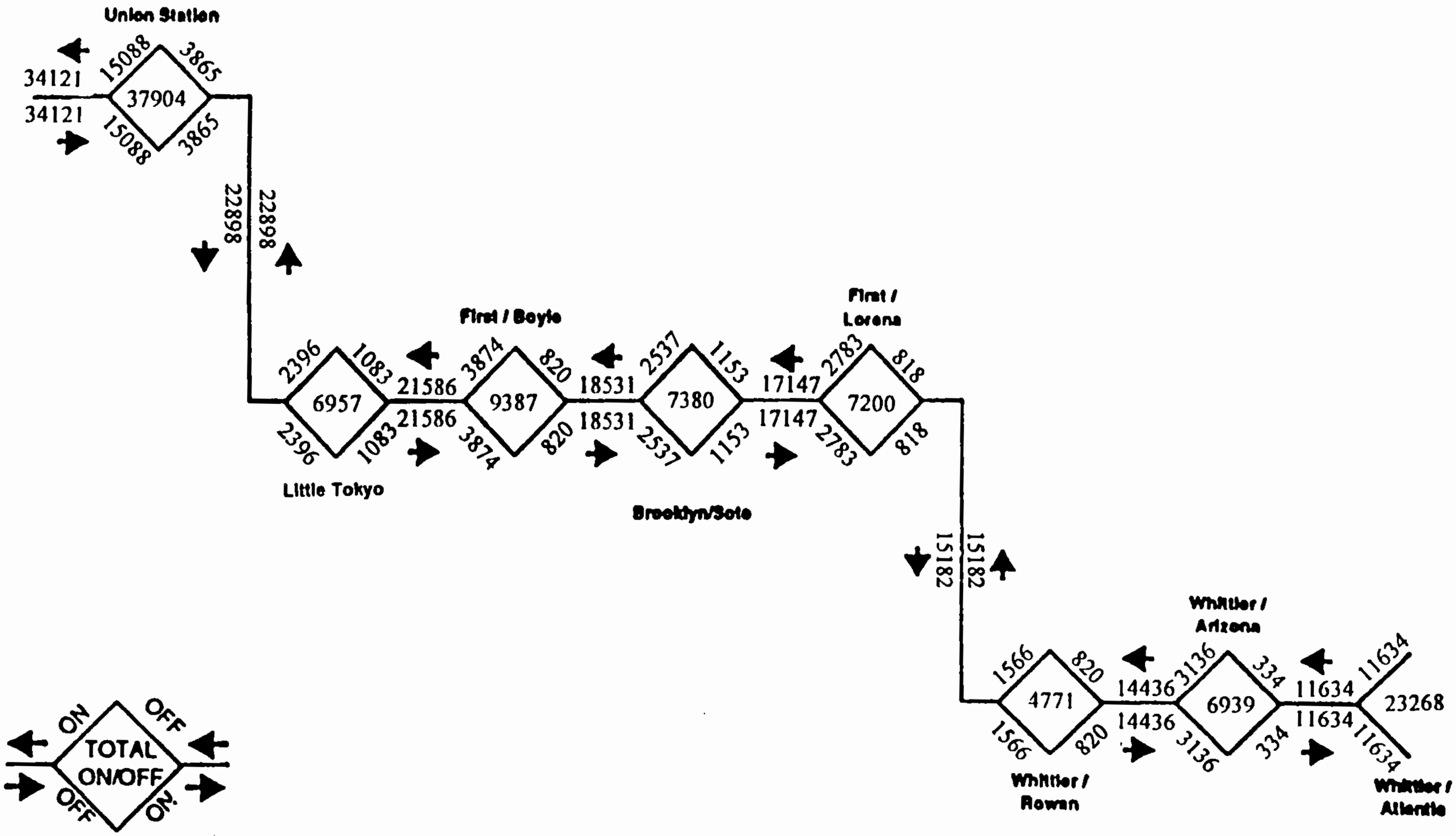
As shown, daily link volumes (passengers on board the trains in between rail stations) are forecast to be greatest along the westernmost link between Union Station and the Little Tokyo stations (See Table 3-1.9). When comparing total passenger boardings and alightings, the busiest station is forecast to be the eastern terminus station of the LPA and IOSs.

TABLE 3-1.9: MAXIMUM DAILY PASSENGER VOLUMES - YEAR 2010 (2 DIRECTIONS)

LPA AND IOSs	MAXIMUM LOAD SECTION	DAILY RIDERS[a]
LPA	Union Station to Little Tokyo	45,796
IOS-1: First/Boyle	Union Station to Little Tokyo	19,378
IOS-2: First/Lorena	Union Station to Little Tokyo	26,332

Note: [a] These are daily two-direction passenger volumes between the maximum load point stations.

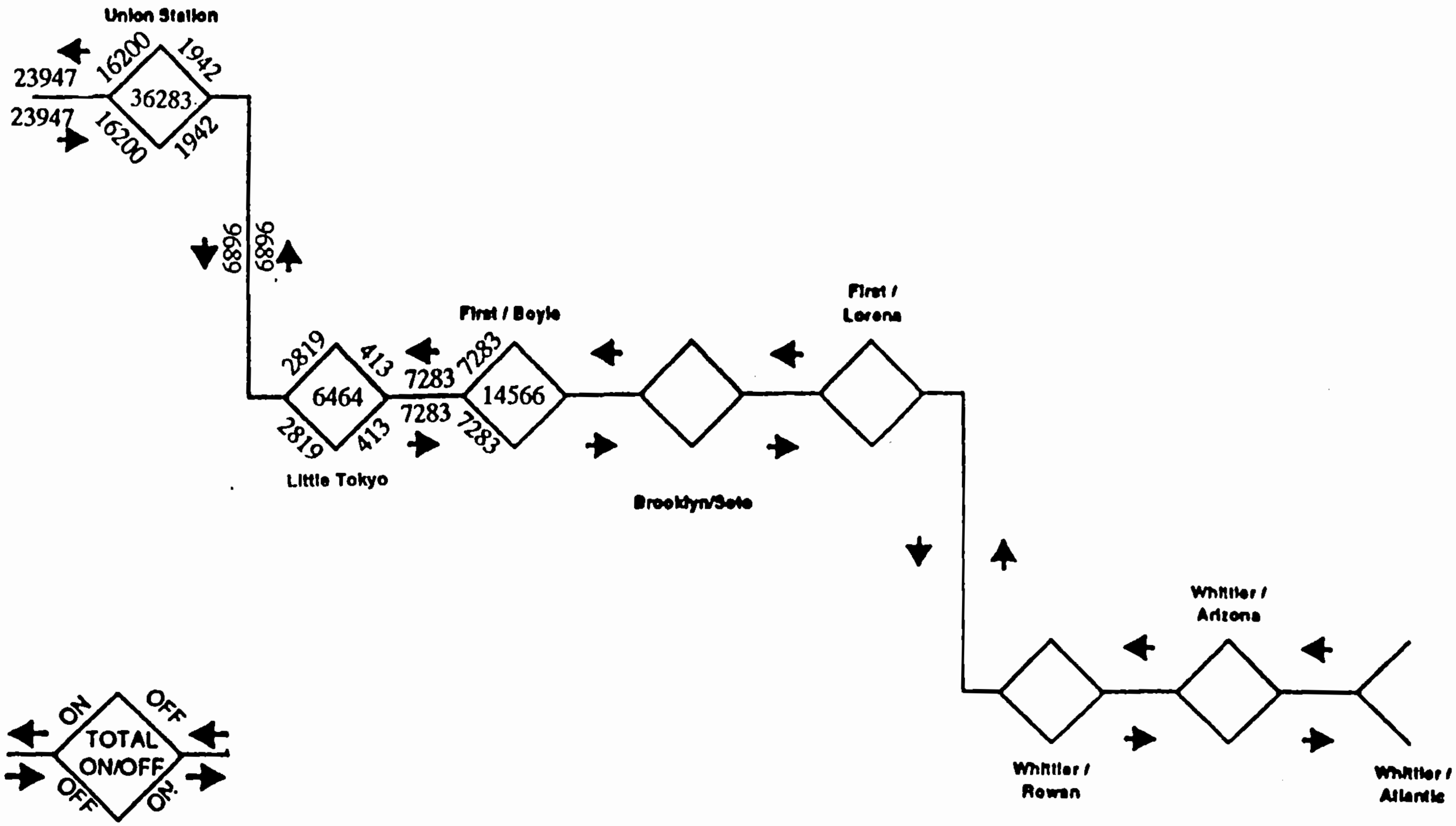
Source: MTA and ICF Kaiser Engineers, Inc., March 1994.



Source: ICF Kaiser Engineers, Inc., March 1994

LOCALLY PREFERRED ALTERNATIVE
UNION STATION TO WHITTIER/ATLANTIC TERMINUS
Daily Boarding, Alighting and Link Volumes by Direction
(Year 2010)

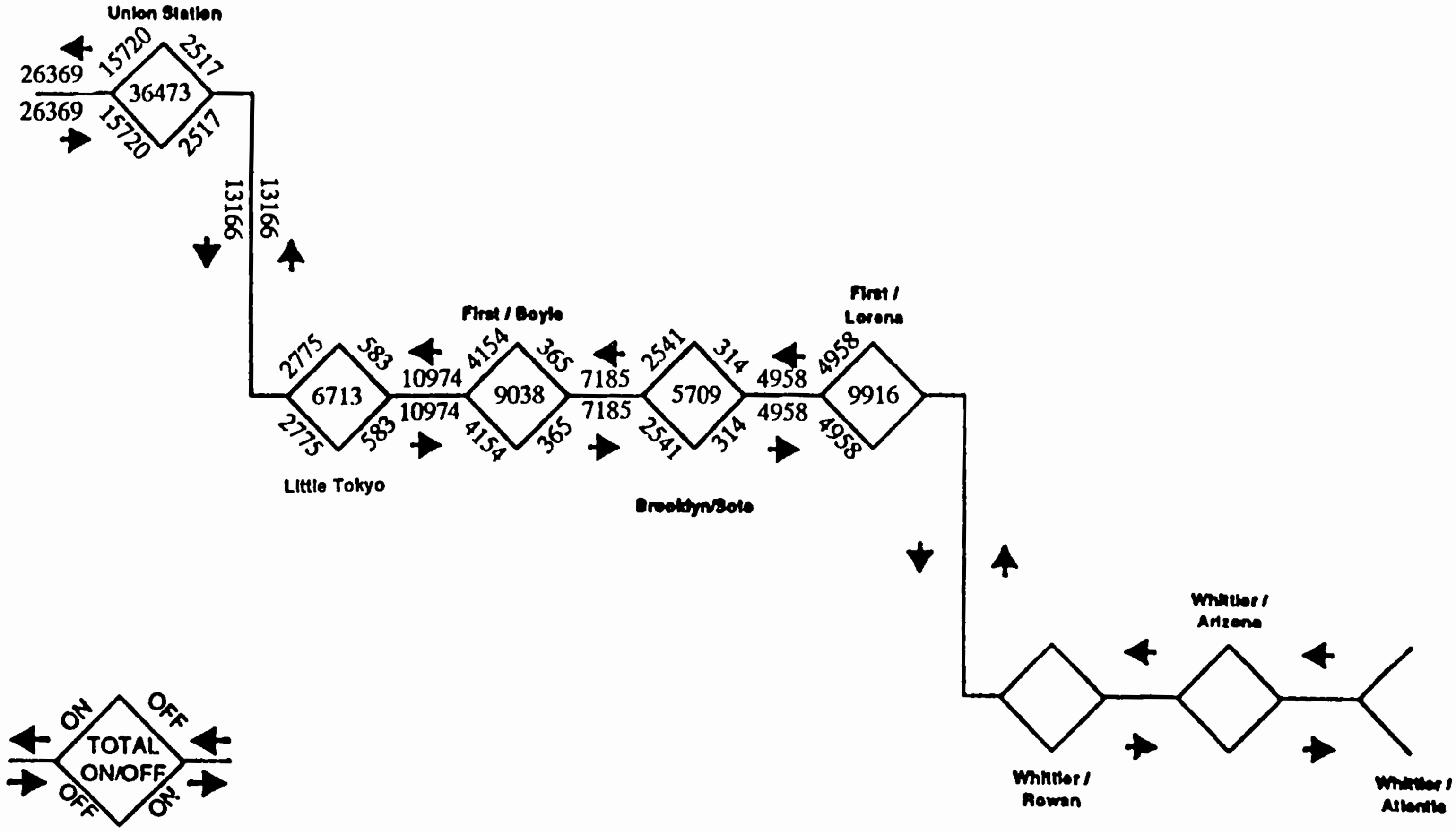
Figure 3-1.11



Source: ICF Kaiser Engineers, Inc., March 1994

INITIAL OPERABLE SEGMENT 1
UNION STATION TO FIRST/BOYLE TERMINUS
Daily Boarding, Alighting and Link Volumes by Direction
(Year 2010)

Figure 3-1.12



Source: ICF Kaiser Engineers, Inc., March 1994

INITIAL OPERABLE SEGMENT 2
UNION STATION TO FIRST/LORENA TERMINUS
Daily Boarding, Alighting and Link Volumes by Direction
(Year 2010)

Figure 3-1.13

3-1.5 TRANSIT ACCESSIBILITY

One useful indicator of transit accessibility is transit travel time between various geographic areas (for example, proposed rail station locations) in the Eastside Corridor and regional activity centers. Tables 3-1.10 through 3-1.13 show the differences in actual peak period transit travel times for persons walking to transit between the No Build Alternative and the LPA and IOSs. Four origin areas and six destination areas were selected for comparative purposes. The origin areas are First/Boyle, Brooklyn/Soto, Whittier/Arizona and Whittier/Atlantic. Destination areas include Studio City (Universal City Red Line Station), Westwood (main campus area), downtown Los Angeles (Seventh/Flower Metro Center area), Century City and downtown Pasadena. The transit travel times shown on the tables are intended to represent door-to-door times including time to gain access to transit (walking in this case), waiting time for transit vehicles (buses or trains) and riding time on a transit vehicle.

The four origin areas were selected as being representative of not only the residential community but also the business and retail community. These four origin areas are viewed by the community as major activity areas. Even though the majority of the proposed rail users would gain access to the system by bus (depending on station location), using walk access data provides comparative information related to these major activity areas. For example, the 23-minute travel time from the Whittier/Arizona station area to the Metro Center of the Los Angeles central business district (LACBD) for the LPA, as shown in Table 3-1.12, consists of the following components:

- 4-minute walk to the Whittier/Arizona station platform
- 2-minute wait for the Red Line train
- 16-minute ride on the Red Line train to Metro Center
- 1-minute walk to destination

In comparison, the same trip by bus for the 2010 No Build Alternative would take 49 minutes and consist of the following components:

- 4-minute walk to bus stop
- 2-minute wait for bus
- 27-minute bus ride to Seventh/Flower
- 1-minute walk to destination

The same trip in 1990 would have taken approximately 38 minutes.

The tables show that the station areas farther east in the corridor typically save more time than the station areas closer to the LACBD and the rail services that emanate from the downtown. In the aggregate, travelers to and from the Eastside Corridor study area in close proximity to the transit stations could expect to save considerable time with implementation of the LPA.

TABLE 3-1.10: PEAK PERIOD TRANSIT TRAVEL TIMES VIA WALK ACCESS FROM FIRST/BOYLE STATION AREA TO SELECTED DESTINATIONS

ALTERNATIVES AND IOSs		FIRST/BOYLE STATION AREA TO STUDIO CITY		FIRST/BOYLE STATION AREA TO WESTWOOD		FIRST/BOYLE STATION AREA TO DOWNTOWN		FIRST/BOYLE STATION AREA TO CENTURY CITY		FIRST/BOYLE STATION AREA TO DOWNTOWN PASADENA	
		TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)
YEAR 2010	NO BUILD	46		75		22		63		66	
	LPA	42	4	59	16	17	5	50	13	62	4
	IOS-1: First/Boyle	42	4	59	16	17	5	50	13	62	4
	IOS-2: First/Lorena	42	4	59	16	17	5	50	13	62	4
YEAR 1990		59	-13	94	-19	30	-8	87	-24	83	-17

Source: MTA and ICF Kaiser Engineers, Inc., March 1994.

TABLE 3-1.11: PEAK PERIOD TRANSIT TRAVEL TIMES VIA WALK ACCESS FROM BROOKLYN/SOTO STATION AREA TO SELECTED DESTINATIONS

ALTERNATIVES AND IOSs		BROOKLYN/SOTO STATION AREA TO STUDIO CITY		BROOKLYN/SOTO STATION AREA TO WESTWOOD		BROOKLYN/SOTO STATION AREA TO DOWNTOWN		BROOKLYN/SOTO STATION AREA TO CENTURY CITY		BROOKLYN/SOTO STATION AREA TO DOWNTOWN PASADENA	
		TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)
YEAR 2010	NO BUILD	48		76		24		65		71	
	LPA	43	5	60	16	18	6	51	14	63	8
	IOS-1: First/Boyle	48	0	65	11	23	1	56	9	68	3
	IOS-2: First/Lorena	43	5	60	16	18	6	51	14	63	8
YEAR 1990		61	-13	99	-23	33	-9	89	-24	83	-12

Source: MTA and ICF Kaiser Engineers, Inc., March 1994.

TABLE 3-1.12: PEAK PERIOD TRANSIT TRAVEL TIMES VIA WALK ACCESS FROM WHITTIER/ARIZONA STATION AREA TO SELECTED DESTINATIONS

ALTERNATIVES AND IOSs		WHITTIER/ARIZONA STATION AREA TO STUDIO CITY		WHITTIER/ARIZONA STATION AREA TO WESTWOOD		WHITTIER/ARIZONA STATION AREA TO DOWNTOWN		WHITTIER/ARIZONA STATION AREA TO CENTURY CITY		WHITTIER/ARIZONA STATION AREA TO DOWNTOWN PASADENA	
		TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.)	SAVINGS OVER NO BUILD (min.)
YEAR 2010	NO BUILD	60		88		34		77		84	
	LPA	48	12	65	23	23	11	56	21	69	15
	IOS-1:[a] First/Boyle	56	4	75	13	32	2	66	11	75	9
	IOS-2:[a] First/Lorena	56	4	75	13	32	2	66	11	75	9
YEAR 1990		79	-19	107	-19	39	-5	97	-20	78	-6

Note: [a] Times are the same for IOS-1 and IOS-2 because, in the absence of the LPA, the transit rider would ride the Whittier Boulevard bus from this destination to the Red Line Fifth/Hill Station.

Source: MTA and ICF Kaiser Engineers, Inc., March 1994.

TABLE 3-1.13: PEAK PERIOD TRANSIT TRAVEL TIMES VIA WALK ACCESS FROM WHITTIER/ATLANTIC STATION AREA TO SELECTED DESTINATIONS

ALTERNATIVES AND IOSs		WHITTIER/ATLANTIC STATION AREA TO STUDIO CITY		WHITTIER/ATLANTIC STATION AREA TO WESTWOOD		WHITTIER/ATLANTIC STATION AREA TO DOWNTOWN		WHITTIER/ATLANTIC STATION AREA TO CENTURY CITY		WHITTIER/ATLANTIC STATION AREA TO DOWNTOWN PASADENA	
YEAR 2010	NO BUILD	TRAVEL TIME (min.) 71	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.) 99	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.) 45	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.) 88	SAVINGS OVER NO BUILD (min.)	TRAVEL TIME (min.) 83	SAVINGS OVER NO BUILD (min.)
	LPA	59	12	76	23	34	11	67	21	80	3
	IOS-1: First/Boyle	66	5	85	14	42	3	76	12	70	13
	IOS-2: First/Lorena	66	5	85	14	42	3	76	12	70	13
YEAR 1990		90	-19	118	-19	50	-5	110	-22	86	-3

Note: [a] Times are the same for IOS-1 and IOS-2 because, in the absence of the LPA, the transit rider would ride the Whittier Boulevard bus from this destination to the Red Line Fifth/Hill Station.

Source: MTA and ICF Kaiser Engineers, Inc., March 1994.

3-2 TRAFFIC

The implementation of the Metro Rail Eastside Extension would affect traffic conditions in the East Los Angeles community in two ways. First, it is anticipated that operations of the rail line connecting East Los Angeles with the Los Angeles Central Business District (LACBD) and communities beyond would divert vehicle trips from the roadways to rail. This would result in a reduction in traffic volumes along freeways and regional arterials within the Eastside Corridor.

However, localized increases in traffic near station areas, especially those with parking or bus loading/unloading facilities, or those expected to be major points for access by kiss-and-ride patrons, are anticipated. These increases in traffic volumes could have an effect on traffic flow at critical intersections within the corridor and actions may be needed to mitigate estimated impacts.

Two methods of analyzing traffic conditions along the Locally Preferred Alternative (LPA) have been used in order to adequately assess potential impacts/benefits of the proposed project. First, the Eastside Corridor travel demand model has been used to generate "screenline" traffic volume forecasts with and without the LPA on selected arterial and freeway facilities near the alignment. Screenline analysis of traffic volumes along key freeway and arterial segments provides a "snapshot" of travel behavior and demand within travel corridors with and without the project. A screenline is a line drawn on a map that intersects a number of streets and highways. A screenline analysis evaluates the characteristics of the traffic crossing this screenline.

The second method used to analyze LPA traffic impacts is peak hour intersection capacity analysis of critical intersections along the LPA and in proximity to rail stations. This type of analysis provides an estimate of potential points of localized traffic congestion within the study area.

Traffic may also be affected by construction activities, including temporary lane closures, temporary street closures and construction-related auto and truck traffic. These types of potential impacts are addressed in Section 4-18 of the Final EIS/EIR.

3-2.1 EXISTING TRAFFIC CONDITIONS

3-2.1.1 Existing Daily Average Traffic Conditions

Average daily traffic volumes were obtained from Caltrans' 1991 Counts on California Highways and from data supplied by the Los Angeles Department of Transportation (LADOT). Table 3-2.1 summarizes estimated daily roadway capacity, estimated daily traffic and the daily volume-to-capacity ratio for multiple locations along key roadways in the study area. The data in the table indicates that the most critical daily capacity constraints occur on the freeway system. In general, most arterial streets currently experience daily traffic volumes which fall below their capacity, creating daily level of service conditions of LOS C or better. A few arterial streets such as Atlantic Boulevard south of First Street, Brooklyn Avenue west of Lorena, and Third Street west of I-710 are shown to experience daily LOS E or F conditions. All other arterial streets are at LOS A, B or C, based on the mid-block V/C ratio analysis.

TABLE 3-2.1: SUMMARY OF EXISTING AVERAGE DAILY TRAFFIC

LOCATION	EXISTING (1990) AVERAGE DAILY TRAFFIC			
	CAPACITY	VOLUME	V/C	LOS
1. North of Brooklyn Avenue:				
Boyle Avenue	24,000	1,680	0.07	A
State Street	24,000	13,440	0.56	A
I-5/I-10 Freeway (Golden State)	200,000	228,000	1.14	F
Soto Street	36,000	16,970	0.47	A
Mott Street	6,000	5,160	0.86	D
Lorena Street	24,000	2,830	0.12	A
Indiana Street	6,000	1,850	0.31	A
Eastern Avenue	24,000	13,740	0.57	A
I-710 Freeway (Long Beach)	160,000	123,000	0.77	C
Atlantic Boulevard	36,000	27,810	0.77	C
TOTAL	540,000	434,480	0.80	C
2. South of First Street:				
Mission Street	6,000	2,190	0.37	A
Route 101 Freeway (Santa Ana)	160,000	130,000	0.81	D
Boyle Avenue	24,000	12,100	0.50	A
State Street	24,000	2,690	0.11	A
I-5/I-10 Freeway (Golden State)	240,000	243,000	1.01	F
Soto Street	36,000	17,680	0.49	A
Mott Street	6,000	4,520	0.75	C
Lorena Street	24,000	9,830	0.41	A
Indiana Street	24,000	8,890	0.37	A
Eastern Avenue	24,000	11,110	0.46	A
I-710 Freeway (Long Beach)	160,000	123,000	0.77	C
Atlantic Boulevard	36,000	33,880	0.94	E
TOTAL	764,000	598,890	0.78	C
3. North of Whittier Boulevard:				
I-5/I-10 Freeway (Golden State)	160,000	146,000	0.91	E
Route 101 Freeway (Santa Ana)	160,000	237,000	1.48	F
Boyle Avenue	24,000	10,750	0.45	A
Soto Street	36,000	17,590	0.49	A
Mott Street	6,000	6,630	1.11	F
Route 60 Freeway (Pomona)	160,000	177,000	1.11	F
Indiana Street	24,000	11,880	0.50	A
Rowan Avenue	6,000	2,030	0.34	A
Eastern Avenue	24,000	9,070	0.38	A
I-710 Freeway (Long Beach)	160,000	165,000	1.03	F
Arizona Avenue	24,000	16,400	0.68	B
Atlantic Boulevard	36,000	20,180	0.56	A
TOTAL	820,000	819,530	1.00	E

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.1: SUMMARY OF EXISTING AVERAGE DAILY TRAFFIC

LOCATION	EXISTING (1990) AVERAGE DAILY TRAFFIC			
	CAPACITY	VOLUME	V/C	LOS
4. West of I-5 (Santa Ana) Freeway:				
I-10 Freeway (North Leg) (San Bernardino)	120,000	105,000	0.88	D
Brooklyn Avenue	24,000	12,790	0.53	A
First Street	24,000	15,930	0.66	B
Fourth Street	24,000	18,640	0.78	C
Whittier Boulevard	24,000	14,200	0.59	A
Seventh Street	24,000	10,410	0.43	A
I-10 Freeway (South Leg) (Santa Monica)	240,000	291,000	1.21	F
TOTAL	480,000	467,970	0.97	E
5. West of Lorena Street:				
Brooklyn Avenue	24,000	52,220	2.18	F
First Street	24,000	14,550	0.61	A
Sixth Street	24,000	3,490	0.15	A
Route 60 Freeway	160,000	177,000	1.11	F
Whittier Boulevard	24,000	20,150	0.84	D
I-5/I-10 Freeway (Golden State)	240,000	289,000	1.20	F
TOTAL	496,000	556,410	1.12	F
6. West of I-710 (Long Beach) Freeway				
Brooklyn Avenue	24,000	21,500	0.90	D
First Street	24,000	11,330	0.47	A
Route 60 Freeway (Pomona)	160,000	193,000	1.21	F
Third Street	24,000	23,300	0.97	E
Whittier Boulevard	24,000	25,200	1.05	F
Olympic Boulevard	36,000	23,600	0.66	B
I-5/I-10 Freeway (Golden State)	240,000	283,000	1.18	F
TOTAL	532,000	580,930	1.09	F
7. East of Atlantic Boulevard:				
Brooklyn Avenue	24,000	16,490	0.69	B
First Street	24,000	9,280	0.39	A
Route 60 Freeway (Pomona Freeway)	200,000	231,000	1.16	F
Whittier Boulevard	24,000	21,120	0.88	D
Verona Avenue	6,000	2,940	0.49	A
I-5/I-10 Freeway (Golden State)	240,000	225,000	0.94	E
TOTAL	518,000	505,830	0.98	E

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Caltrans 1991 Counts on California Highways; City of Los Angeles Department of Transportation; Orange County Environmental Management Agency.

Intersection LOS analysis is explained later in this section. Most of the freeway segments, however, experience daily level of service conditions of E or F, indicating daily travel demand which equals or exceeds available capacity.

3-2.1.2 Existing Peak Hour Intersection Conditions

Within the study area, 72 intersections are included in the peak hour capacity analysis. These intersections were chosen in consultation with the Los Angeles County Metropolitan Transportation Authority (MTA), the Los Angeles Department of Transportation (LADOT) and the Los Angeles County Department of Public Works (LACDPW). These intersections represent locations that would potentially be affected by a nearby LPA station or are on an access path to a station. The locations of these intersections are illustrated in Figure 3-2.1. The number next to each intersections corresponds to the number used in the intersection analysis tables contained in this section.

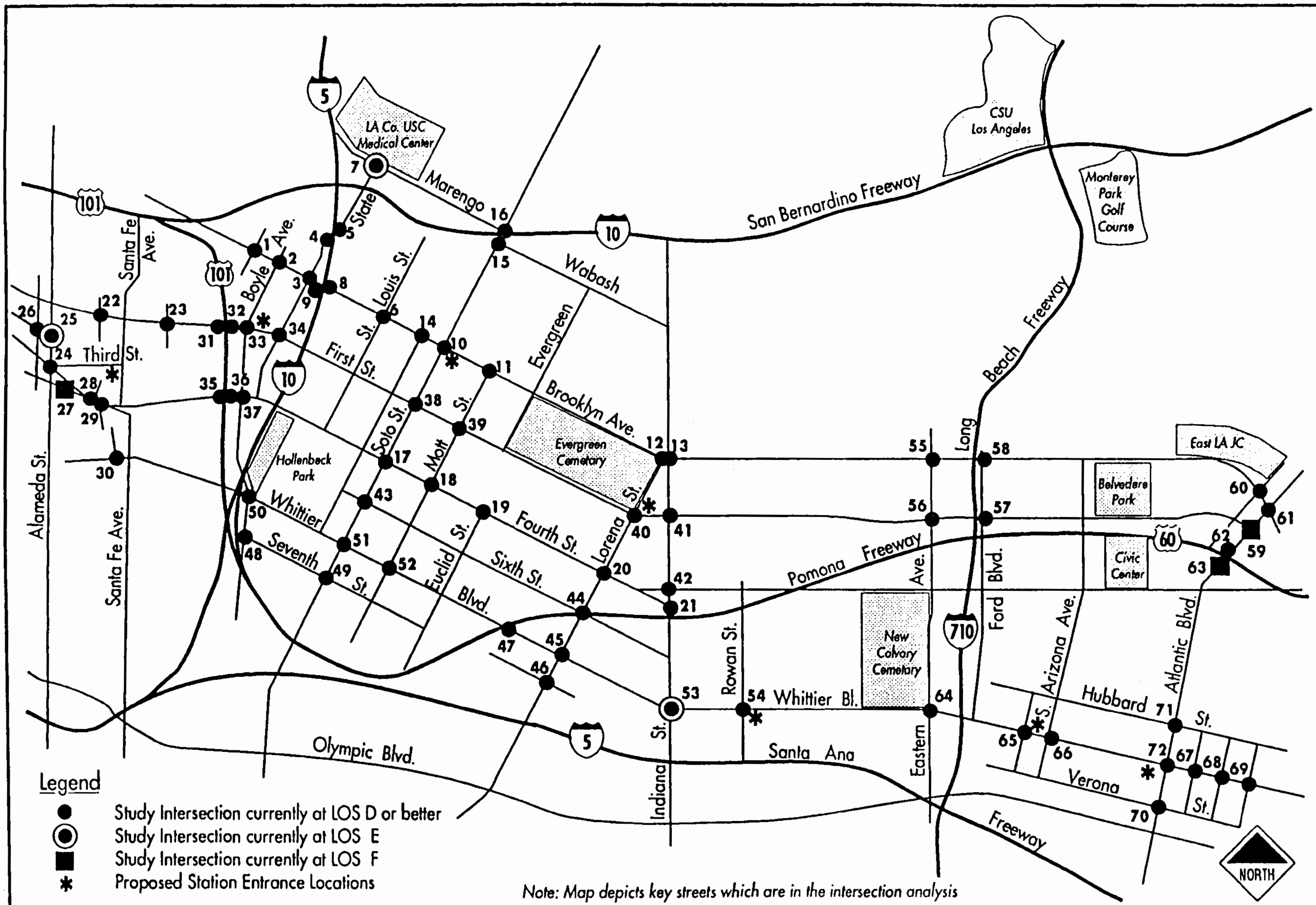
Current conditions at each intersection were analyzed using the Critical Movement Analysis (CMA) technique using a base per lane capacity assumption of 1500 vehicles per lane per hour, adjusted downward when there are multiple signal phases. The CMA technique is being used for the FEIS/FEIR in response to a request by the City of Los Angeles Department of Transportation in a comment made on the AA/DEIS/DEIR. Compared to the ICU method used in the DEIS/DEIR, the per lane capacity is lower using the CMA technique and the methodology is more complex and takes into account additional variables. Use of CMA in this FEIS/FEIR, along with other refinements to the technical analysis needed to model the LPA, have resulted in a more conservative analysis reflective of actual and future conditions.

Intersection level of service (LOS) is described on a scale of A to F, with A representing excellent operating conditions and F representing extremely congested conditions. Level of service is based on the calculated volume-to-capacity (V/C) ratio as determined using the Critical Movement Analysis technique. Table 3-2.2 describes the level of service concept and the relationship between level of service and volume-to-capacity ratio calculations.

Based on discussions with City of Los Angeles Department of Transportation staff, intersections were evaluated based on evening peak hour conditions, with the exception of nine intersections within the impact area of the Little Tokyo station. These nine intersections were evaluated for both morning and evening peak hour conditions, while analysis at the other 63 locations was conducted for PM peak only. The CMA analysis worksheets for all scenarios are included in the 1994 FEIS Traffic Technical Analysis Summary by Meyer, Mohaddes Associates, Inc. and incorporated herein by reference.

Among the 72 intersections analyzed, all but five are presently operating at acceptable levels of service of "D" or better. The five intersections currently operating at LOS E or worse are:

- First Street and Alameda Street (AM peak LOS E)
- Third at/Fourth Street Confluence and Alameda Street (AM and PM peak LOS F)
- Indiana Street and Whittier Boulevard (PM peak LOS E)
- Atlantic Boulevard/First Street/State Route 60 WB Ramp (PM peak LOS F)
- Atlantic Boulevard and Route 60 EB on-ramp (PM peak LOS F)



Metro Redline Eastside Extension

Study Intersections

FIGURE **3-2.1**

TABLE 3-2.2 LEVEL OF SERVICE INTERPRETATION

Level of Service	Description	Volume to Capacity Ratio
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	0-.59
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	.60-.60
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	.70-.79
D	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues. *This level is typically associated with design practice for peak periods.*	.80-.89
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	.90-1.00
F	Forced flow. Represents jammed conditions. Backups form locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	Over 1.00

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington, D.C., 1985 and *Interim Materials on Highway Capacity*, NCHRP Circular 212, 1982.

3-2.2 NO-BUILD CONDITIONS AND TRAFFIC IMPACTS OF PROPOSED PROJECT

Year 2010 traffic conditions have been estimated and evaluated for the No-Build Alternative and for the proposed project. The No-Build Alternative, in effect, represents the Year 2010 "background" traffic volumes in the study area, not including the shift of trips to the Eastside Corridor extension. To estimate the impacts associated with the proposed project alignment, the No-Build base volumes were modified to include Eastside Extension rail station access traffic. Station access traffic includes park-and-ride and kiss-and-ride auto traffic and bus traffic consisting of feeder and line haul buses.

The analysis of traffic impacts of the proposed project at study area intersections did not include an adjustment of traffic volumes to reflect the expected shift to transit. It is expected that a traffic decrease of three percent throughout the study area and more than three percent directly adjacent to the rail alignment may occur with completion of the LPA (See Section 3-2.2.1.a and Table 3-2.3). Therefore, the analysis is considered reasonably conservative in accordance with standard guidelines for environmental traffic analyses.

Intersection capacity analyses were performed for the seventy-two critical intersections within the LPA study area for No-Build conditions and for with-project conditions. For this study, an intersection is considered to be affected significantly if project traffic is projected to cause a deterioration in level of service to E or worse, or if project traffic results in an increase in the volume-to-capacity ratio of 0.02 or more at an intersection forecast to operate at LOS E or worse under No-Build conditions.

TABLE 3-2.3: AM PEAK SCREENLINE VOLUME COMPARISON (EXISTING, NO-BUILD AND LPA)

SCREEN LINE	LOCATION	EXISTING VOLUME	FUTURE NO-BUILD		FUTURE LPA	
			Volume	Percent Change from Existing	Volume	Percent Change from Existing
North/South						
1	I-5 to Soto, N/O Valley	14,547	15,532	6.8%	15,107	3.8%
2	I-5 to Garfield, N/O I-10	28,612	37,496	31.0%	36,693	28.2%
3	Alameda to Garfield, N/O Brooklyn	27,137	34,175	25.9%	33,231	22.5%
4	Alameda to Lorena, between 1st and 4th	25,101	27,357	9.0%	26,210	4.4%
5	Alameda to Indiana, S/O Third	38,148	42,246	10.7%	40,738	6.8%
6	Alameda to Garfield, S/O Olympic	41,755	47,518	13.8%	46,374	11.1%
7	Alameda to Atlantic, N/O Bandini	7,319	7,961	8.8%	7,732	5.6%
8	Eastern to Garfield, N/O SR60	14,026	19,544	39.3%	19,514	39.1%
9	Downey to Garfield, N/O Whittier	15,599	18,354	17.7%	18,090	16.0%
East/West						
10	Main to Bandini, E/O Alameda	38,017	40,725	7.1%	39,264	3.3%
11	Valley to Bandini, E/O Soto	46,731	52,050	11.4%	50,047	7.1%
12	Brooklyn to Olympic, E/O Indiana	31,938	37,003	15.9%	35,742	11.9%
13	Valley to Bandini, W/O I-710	49,490	56,686	14.5%	54,761	10.7%
14	Valley to Olympic, W/O Garfield	28,571	34,337	20.2%	33,666	17.8%
Summary, North/South Screenlines		212,244	250,183	17.9%	243,689	14.8%
Summary, East/West Screenlines		194,747	220,801	13.4%	213,480	9.6%
Summary, All Screenlines		406,991	470,984	15.7%	457,169	12.3%

Source of Data: MTA Red Line Eastside Corridor Travel Demand Model.

3-2.2.1 No-Build Alternative

Year 2010 traffic volume forecasts for No-Build conditions were developed using the Eastside Corridor travel forecast model, which is based on the Regional Forecast Model developed by the Southern California Association of Governments (SCAG). The travel forecast model has been updated and refined for use in the Eastside Extension FEIS/FEIR. The model has been calibrated to 1990 conditions and then used to forecast travel characteristics in 2010. The methodology used to develop the travel forecast model and generate travel demand forecasts is presented in the Service and Patronage Methodology Report (January 27, 1993; revised March 29, 1993), and has been reviewed and approved by the Federal Transit Administration (FTA). The model provides travel demand forecasts for year 2010. The levels of travel demand reflected in the forecasts are based on a set of 2010 socio-demographic projections which have been developed for the region by SCAG. The projections have been developed based on anticipated patterns of growth and development in population and job opportunities within the region between now and 2010. As such, these forecasts provide the "cumulative" traffic conditions projected for the study area and the surrounding region.

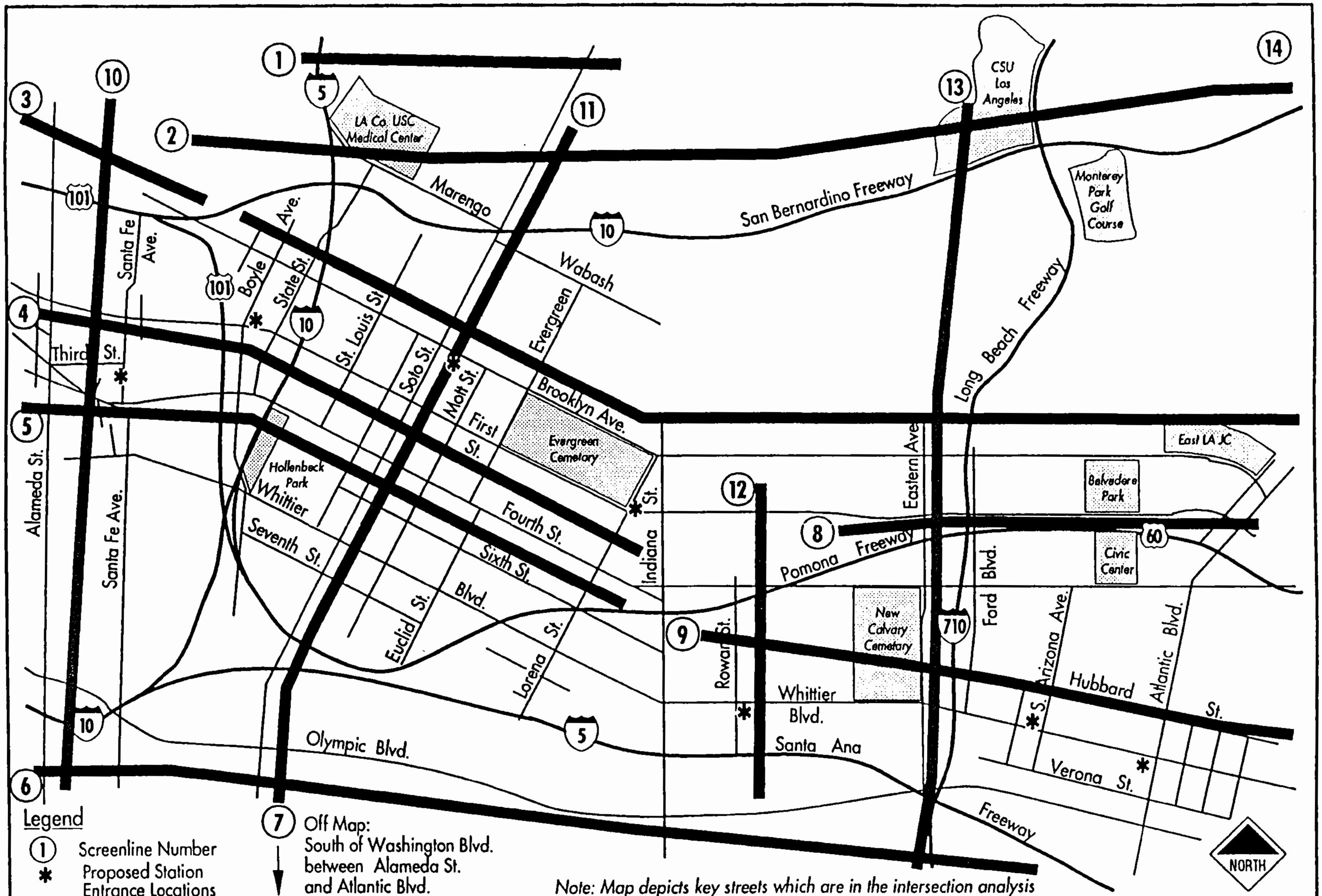
The highway network assumed for the 2010 No-Build forecast is consistent with the SCAG Regional Mobility Plan 2010 highway network. Within Los Angeles County, the network includes a selected listing of projects identified for construction between 1990 and 2010 from the MTA's Adopted 30-Year Integrated Transportation Plan, and from similar long range plans for the balance of the region. A description of the projects included in the 2010 network is contained in the Conceptual and Detailed Definitions of Alternatives, November, 1992 and Chapter 2 of this FEIS/FEIR. The most significant change to the highway network between 1990 and 2010 is the addition of high occupancy vehicle (HOV) lanes along most of the freeways within the area.

The No-Build transit network reflects the service levels anticipated by the MTA to exist in 2010. The No-Build alternative is described in the "Conceptual and Detailed Definition of Alternatives," and is consistent with the MTA Fundable Plan of the 30-Year Integrated Transportation Plan, with the exception of the deletion of the project portion of the Metro Rail Red Line. The 30-Year Plan, in addition to the extensive rail service proposed, would add an estimated 1,150 buses to the current fleet of 2,500 peak period buses by the year 2010. Within the LPA study area, it is expected that, given current ridership levels and anticipated growth, local bus service would likely be increased. However, it is also assumed in the No-Build condition that no new physical facilities would be constructed to improve bus transit travel times except for those which might occur in conjunction with development of land uses in the area.

Based on demographic projections and estimated trip generation within the study area, a traffic growth factor of 20 percent between 1990 and 2010 has been used. Review of projected growth in population and employment shows that, for the Southern California region as a whole, population and employment is projected to increase by over 40 percent by 2010. However, in Los Angeles County, the rate of increase is significantly less (28 percent for population and 27 percent for employment). In the study area, which is a mature built-out community, the anticipated growth is still lower (9 percent for population and 14 percent for employment). Therefore, the traffic growth factor used in the study area, 20 percent, or an increase of about one percent per year between 1990 and 2010 is conservative. This is consistent with LADOT guidelines for the Eastside which require an annual growth rate of one percent for traffic studies in that area of the City.

a. Year 2010 No-Build Traffic Growth

Based on the levels of growth anticipated to occur within the study area and the surrounding region, all of the freeways and many of the arterials are projected to carry traffic volumes in excess of capacity, assuming no major improvements beyond those currently programmed to occur to system capacity . Fourteen screenlines have been identified for purposes of analyzing travel demand model traffic forecasts in the study area. Nine of the screenlines are used to analyze north/south traffic in the study area and five for purposes of analyzing east/west travel patterns. Figure 3-2.2 shows the screenline locations for the Eastside Corridor study area.



Metro Redline Eastside Extension

Screenline Locations

FIGURE 3-2.2

The number of roadways/freeway covered by individual screenlines varies from 4 facilities to 16 facilities. Table 3-2.3 provides a comparison of estimated year 2010 No-Build AM peak traffic to 1990 AM peak traffic for the 14 screenlines. The travel forecast model indicates an overall growth rate of 16 percent, with an 18 percent growth rate on north/south routes and a 13 percent growth rate on east/west screenlines. Daily traffic growth according to the model is even higher and is close to the 20 percent rate as discussed in Section 3-2.2.1. Peak hour growth is slightly lower due to the lack of capacity during the peak hour, causing traffic shifts out of the peak to the off-peak (commonly called peak spreading). This offers additional support for the 20 percent ambient traffic growth rate used in the intersection analysis. The 20 percent rate is therefore considered to be reasonably conservative for future No-Build forecasts and intersection service levels.

b. Year 2010 No-Build Peak Hour Intersection Conditions

Applying the 20 percent growth factor (over 1990 conditions) to peak hour turning movements at the 72 study area intersections identified for analyses, estimated 2010 No-Build traffic volumes were developed for the morning and evening peak hours. As described previously, morning peak hour analyses were performed only for the nine intersections in the station area of the Little Tokyo station, while PM peak analysis was conducted at all 72 locations.

Intersection capacity utilization analyses were performed for the seventy-two intersections, including the 20 percent growth rate to account for changes between now and 2010. Table 3-2.4 summarizes the results of these analyses and compares them to existing conditions. Review of Table 3-2.4 shows that three intersections are projected to operate at level of service (LOS) "E" or worse in Year 2010 during the morning peak hour without the LPA in operation. They are:

- Mission Street at First Street
- First Street at Alameda Street
- Third/Fourth confluence at Alameda Street

Fifteen intersections are projected to operate at LOS E or worse during the evening peak hour in the 2010 no-project alternative. They are:

- State Street at Marengo Street
- Soto Street at Marengo Street
- Soto Street/I-10/Wabash Street
- Mission Street at First Street
- First Street at Alameda Street
- Third/Fourth confluence at Alameda Street
- Route 101 northbound ramps at Fourth Street
- Boyle Street at Fourth Street
- Lorena Street at Whittier Boulevard
- Soto Street at Whittier Boulevard
- Indiana Street at Whittier Boulevard
- Atlantic Boulevard at First Street/Route 60 westbound ramp
- Atlantic Boulevard at Brooklyn Avenue
- Atlantic Boulevard at Route 60 eastbound on-ramp
- Atlantic Boulevard at Whittier Boulevard

TABLE 3-2.4: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- EXISTING AND 2010 NO BUILD (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD			
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
1. Echandia St. at Brooklyn Ave.			0.243	A			0.291	A
2. Boyle St. at Brooklyn Ave.			0.410	A			0.493	A
3. State St. at Brooklyn Ave.			0.628	B			0.753	C
4. State St. at I-10 WB Ramps			0.441	A			0.529	A
5. State St. at I-10 EB Ramps			0.554	A			0.665	B
6. St. Louis St. at Brooklyn Ave.			0.474	A			0.568	A
7. State St. at Marengo St.			0.789	C			0.948	E
8. I-5 NB Ramp at Brooklyn Ave.			0.440	A			0.528	A
9. I-5 SB Ramp at Brooklyn Ave.			0.340	A			0.408	A
10. Soto St. at Brooklyn Ave.			0.677	B			0.814	D
11. Mott St. at Brooklyn Ave.			0.684	B			0.821	D
12. Lorena St. at Brooklyn Ave.			0.598	A			0.719	C
13. Indiana St. at Brooklyn Ave.			0.515	A			0.619	B
14. Breed St. at Brooklyn Ave.			0.514	A			0.616	B
15. Soto St. at Marengo St.			0.871	D			1.045	F
16. Soto St. at I-10/Wabash St.			0.821	D			0.985	E
17. Soto St. at Fourth St.			0.726	C			0.870	D
18. Mott St. at Fourth St.			0.568	A			0.682	B
19. Euclid St. at Fourth St.			0.504	A			0.605	B
20. Lorena St. at Fourth St.			0.552	A			0.663	B
21. Indiana St. at 4th St./ SR60 WB Ramp			0.684	B			0.821	D
22. Vignes St. at First St.	0.585	A	0.555	A	0.701	C	0.666	B
23. Mission St. at First St.	0.892	D	0.805	D	1.069	F	0.964	E
24. Second St. at Alameda St.	0.517	A	0.498	A	0.621	B	0.597	A
25. First St. at Alameda St.	0.933	E	0.769	C	1.119	F	0.920	E
26. First St. at Central St.	0.579	A	0.595	A	0.694	B	0.714	C
27. 3rd/4th Confluence at Alameda St.	1.569	F	1.049	F	1.883	F	1.254	F
28. Merrick St. at Fourth St.	0.683	B	0.398	A	0.820	D	0.477	A
29. Molino St. at Fourth St.	0.657	B	0.447	A	0.789	C	0.532	A
30. Mateo St. at 6th St./Whittier Blvd.	0.454	A	0.484	A	0.550	A	0.582	A
31. Rte 101 NB Ramps at First St.			0.408	A			0.489	A
32. Rte 101 SB Ramps at First St.			0.434	A			0.521	A
33. Boyle St. at First St.			0.630	B			0.756	C
34. State St. at First St.			0.670	B			0.799	C
35. Rte 101 NB Ramps at Fourth St.			0.529	A			0.635	B
36. Rte 101 SB Ramps at Fourth St.			0.894	D			1.072	F
37. Boyle St. at Fourth St.			0.769	C			0.923	E
38. Soto St. at First St.			0.736	C			0.885	D
39. Mott St. at First St.			0.526	A			0.633	B

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.4: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- EXISTING AND 2010 NO BUILD (CMA Method)

INTERSECTION		EXISTING				2010 NO-BUILD			
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
40. Lorena St. at First St.				0.541	A			0.649	B
41. Indiana St. at First St.				0.556	A			0.666	B
42. Indiana St. at Third St.				0.616	B			0.739	C
43. Soto St. at Sixth St.				0.570	A			0.688	B
44. Lorena St. at 6th St./ Rte 60 WB Ramps				0.596	A			0.716	C
45. Lorena St. at Whittier Blvd.				0.817	D			0.981	E
46. Lorena St. at Seventh St.				0.381	A			0.457	A
47. Rte 60 EB Ramp at Whittier Blvd.				0.494	A			0.592	A
48. S. Boyle St. at Seventh St.				0.544	A			0.654	B
49. Soto St. at Seventh St.				0.724	C			0.869	D
50. S. Boyle St. at Whittier Blvd.				0.629	B			0.755	C
51. S. Soto St. at Whittier Blvd.				0.821	D			0.984	E
52. S. Mott St. at Whittier Blvd.				0.678	B			0.813	D
53. Indiana St. at Whittier Blvd.				0.947	E			1.137	F
54. Rowan St. at Whittier Blvd.				0.392	A			0.470	A
55. Eastern Ave. at Brooklyn Ave.				0.586	A			0.704	C
56. Eastem Ave. at First St.				0.439	A			0.530	A
57. I-710 NB Off Ramp at Ford Blvd.				0.441	A			0.525	A
58. I-710 NB Ramps at Ford Blvd.				0.400	A			0.480	A
59. Atlantic Blvd. at 1st St./ Rte 60 WB Ramp				1.069	F			1.283	F
60. Collegian Ave. at Brooklyn Ave.				0.466	A			0.560	A
61. Atlantic Blvd. at Brooklyn Ave.				0.897	D			1.077	F
62. Atlantic Blvd. at Rte 60 WB On Ramp				0.571	A			0.685	B
63. Atlantic Blvd. at Rte 60 EB Ramps				1.099	F			1.319	F
64. Eastern Ave. at Whittier Blvd.				0.506	A			0.607	B
65. McBride Ave. at Whittier Blvd.				0.533	A			0.640	B
66. Arizona Ave. at Whittier Blvd.				0.660	B			0.792	C
67. Goodrich Ave. at Whittier Blvd.				0.639	B			0.766	C
68. Belden Ave. at Whittier Blvd.				0.445	A			0.534	A
69. Hoefner Ave. at Whittier Blvd.				0.564	A			0.688	B
70. Atlantic Blvd. at Verona St.				0.471	A			0.562	A
71. Atlantic Blvd. at Hubbard St.				0.578	A			0.695	A
72. Atlantic Blvd. at Whittier Blvd.				0.775	C			0.930	E
TOTALS	E&F Intersections		2		4		3		15

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, Inc., 1994.

This compares to four intersections currently at LOS E (based on 1990 traffic data) or worse during the PM peak hour.

3-2.2.2 Locally Preferred Alternative

Station access traffic for each station along the Eastside Extension (LPA) alignment was estimated based on forecasted rail patronage boardings by mode of arrival and departure from the Eastside Corridor patronage forecast model (See Section 3-1). Station access traffic includes park-and-ride and kiss-and-ride auto traffic, and bus traffic consisting of feeder and line haul buses. Passengers using park-and-ride facilities drive to the station, singly or in carpools, park their vehicles at the station and complete their trips by rail. Upon return to the station by rail, they again use their automobiles to return home or to some other destination. This represents one inbound and one outbound trip per park-and-ride patron. Some reduction for more than one person in some cars is assumed. An auto occupancy factor of 1.10 persons per vehicle was applied to estimated station park-and-ride boardings to determine the number of park-and-ride vehicle trips. Therefore, using this assumption, every 100 park-and-ride patrons generates 90 park-and-ride vehicle access trips. This factor is consistent with assumptions developed by SCAG for use in Los Angeles County.

Kiss-and-ride rail patrons are driven to the station to board the Metro Rail and are picked up again upon return to the station. This represents two inbound trips and two outbound trips per day. Similar to the park-and-ride assumption, a rail passenger auto occupancy factor of 1.10 persons per vehicle was applied to the estimated station kiss-and-ride boardings to determine number of kiss-and-ride vehicle trips. This equates to an average of one driver and 1.10 rail passengers in each kiss-and-ride access vehicle.

The number of buses traveling to/from the station was estimated, based on the patronage forecast and service level assumptions for each alternative. Table 3-2.5 summarizes the estimated AM and PM peak period boardings and the resulting estimate of vehicle trips to/from each station for the LPA.

TABLE 3-2.5: LOCALLY PREFERRED ALTERNATIVE PEAK PERIOD BOARDINGS, ALIGHTINGS AND STATION ACCESS VEHICLE TRIPS (YEAR 2010)

STATION	TOTAL DAILY BOARDINGS AND ALIGHTINGS	KISS-AND-RIDE				PARK-AND-RIDE			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		IN	OUT	IN	OUT	IN	OUT	IN	OUT
Little Tokyo	6,957	80	80	160	160	N/A	N/A	N/A	N/A
First/Boyle	9,387	94	94	188	188	N/A	N/A	N/A	N/A
Brooklyn/Soto	7,380	74	74	147	147	N/A	N/A	N/A	N/A
First/Lorena	7,200	88	88	176	176	100	18	35	199
Whittier/Rowan	4,771	88	88	173	173	N/A	N/A	N/A	N/A
Whittier/Arizona	6,939	90	90	178	178	N/A	N/A	N/A	N/A
Whittier/Atlantic	23,268	185	185	367	367	207	36	73	412
TOTAL	65,902	699	699	1,389	1,389	307	54	108	611

Source: Parsons, Brinckerhoff, Quade & Douglas, 1993; updated by Meyer, Mohaddes Associates, 1994, based on MTA and ICF Kaiser patronage model data.

Station access traffic was distributed to the roadway system for each station area based on trip distribution characteristics developed from the patronage forecast model. The resulting station access traffic volume turning movements at study area intersections were added to the 2010 No-Build background traffic and intersection capacity analyses were performed. Table 3-2.6 summarizes the results of the intersection capacity analyses of critical intersections for the LPA, using Level of Service E to identify intersections with unacceptable levels of service, both with and without the project. Project impacts are also identified in terms of increase in volume/capacity ratio due to the project. For this study, an intersection is considered to be significantly affected if project traffic is projected to cause a deterioration in level of service to E or worse or results in an increase in the V/C ration of 0.02 or more at an intersection projected to operate at LOS E or worse under No-Build conditions. Significant impacts are shown on the table in bold and are shaded.

For the LPA, a review of Table 3-2.6 shows 16 intersections are projected to operate at LOS E or worse during one or both peak hours. Compared to Year 2010 No-Build scenario, one additional intersection is projected to operate at LOS E or worse.

Compared to No-Build conditions, four intersections are projected to be significantly affected by the LPA station traffic based on the significance criteria presented earlier. They are:

- Whittier Boulevard at Lorena Street
- Whittier Boulevard at Indiana Street
- Whittier Boulevard at Arizona Avenue
- Whittier Boulevard at Atlantic Boulevard

3-2.2.3 Initial Operable Segments

Two initial operable segments are being analyzed as part of the FEIS/FEIR. IOS-1 consists of two stations, one at Little Tokyo and one at First/Boyle. IOS-2 is similar to the IOS analyzed in the AA/DEIS/DEIR, with a total of four stations, terminating at First/Lorena. A park-and-ride lot is programmed for the First/Lorena station, therefore, both park-and-ride and kiss-and-ride vehicle trip impacts are analyzed at that location.

a. IOS-1: First/Boyle

Table 3-2.7 summarizes the estimated daily boardings/alightings and the resulting estimate of park-and-ride and kiss-and-ride vehicle trips to/from each station along IOS-1.

TABLE 3-2.6: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- LPA (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/LPA				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.243	A			0.291	A			0.301	A		0.010
2. Boyle St. at Brooklyn Ave.			0.410	A			0.493	A			0.507	A		0.014
3. State St. at Brooklyn Ave.			0.628	B			0.753	C			0.764	C		0.011
4. State St. at I-10 WB Ramps			0.441	A			0.529	A			0.536	A		0.007
5. State St. at I-10 EB Ramps			0.554	A			0.665	B			0.670	B		0.005
6. St. Louis St. at Brooklyn Ave.			0.474	A			0.568	A			0.576	A		0.008
7. State St. at Marengo St.			0.789	C			0.948	E			0.957	E		0.009
8. I-5 NB Ramp at Brooklyn Ave.			0.440	A			0.528	A			0.529	A		0.001
9. I-5 SB Ramp at Brooklyn Ave.			0.340	A			0.408	A			0.420	A		0.012
10. Soto St. at Brooklyn Ave.			0.677	B			0.814	D			0.840	D		0.026
11. Mott St. at Brooklyn Ave.			0.684	B			0.821	D			0.852	D		0.031
12. Lorena St. at Brooklyn Ave.			0.598	A			0.719	C			0.804	D		0.085
13. Indiana St. at Brooklyn Ave.			0.515	A			0.619	B			0.776	C		0.157
14. Breed St. at Brooklyn Ave.			0.514	A			0.616	B			0.626	B		0.010
15. Soto St. at Marengo St.			0.871	D			1.045	F			1.048	F		0.003
16. Soto St. at I-10/Wabash St.			0.821	D			0.985	E			0.995	E		0.010
17. Soto St. at Fourth St.			0.726	C			0.870	D			0.876	D		0.006
18. Mott St. at Fourth St.			0.568	A			0.682	B			0.691	B		0.009
19. Euclid St. at Fourth St.			0.504	A			0.605	B			0.606	B		0.001
20. Lorena St. at Fourth St.			0.552	A			0.663	B			0.742	C		0.079
21. Indiana St. at 4th St./ Rte 60 WB Ramp			0.684	B			0.821	D			0.880	D		0.059
22. Vignes St. at First St.	0.585	A	0.555	A	0.701	C	0.666	B	0.707	C	0.671	B	0.006	0.005

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.6: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- LPA (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/LPA				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
23. Mission St. at First St.	0.892	D	0.805	D	1.069	F	0.964	E	1.069	F	0.964	E	0.000	0.000
24. Second St. at Alameda St.	0.517	A	0.498	A	0.621	B	0.597	A	0.629	B	0.615	B	0.008	0.018
25. First St. at Alameda St.	0.933	E	0.769	C	1.119	F	0.920	E	1.123	F	0.927	E	0.004	0.007
26. First St. at Central St.	0.579	A	0.595	A	0.694	B	0.714	C	0.697	B	0.720	C	0.003	0.006
27. 3rd/4th Confluence at Alameda St.	1.569	F	1.049	F	1.883	F	1.254	F	1.883	F	1.265	F	0.000	0.011
28. Merrick St. at Fourth St.	0.683	B	0.398	A	0.820	D	0.477	A	0.820	D	0.483	A	0.000	0.006
29. Molino St. at Fourth St.	0.657	B	0.447	A	0.789	C	0.532	A	0.790	C	0.537	A	0.001	0.005
30. Mateo St. at 6th St./Whittier Blvd.	0.454	A	0.484	A	0.550	A	0.582	A	0.555	A	0.583	A	0.005	0.001
31. Rte 101 NB Ramps at First St.			0.408	A			0.489	A			0.504	A		0.015
32. Rte 101 SB Ramps at First St.			0.434	A			0.521	A			0.550	A		0.029
33. Boyle St. at First St.			0.630	B			0.756	C			0.791	C		0.035
34. State St. at First St.			0.670	B			0.799	C			0.847	D		0.048
35. Rte 101 NB Ramps at Fourth St.			0.529	A			0.635	B			0.643	B		0.008
36. Rte 101 SB Ramps at Fourth St.			0.894	D			1.072	F			1.076	F		0.004
37. Boyle St. at Fourth St.			0.769	C			0.923	E			0.932	E		0.009
38. Soto St. at First St.			0.736	C			0.885	D			0.893	D		0.008
39. Mott St. at First St.			0.526	A			0.633	B			0.656	B		0.023
40. Lorena St. at First St.			0.541	A			0.649	B			0.725	C		0.076
41. Indiana St. at First St.			0.556	A			0.666	B			0.763	C		0.097
42. Indiana St. at Third St.			0.616	B			0.739	C			0.757	C		0.018
43. Soto St. at Sixth St.			0.570	A			0.688	B			0.694	B		0.006

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.6: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- LPA (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/LPA				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
44. Lorena St. at 6th St./ Rte 60 WB Ramps			0.596	A			0.716	C			0.733	C		0.017
45. Lorena St. at Whittier Blvd.			0.817	D			0.981	E			1.002	F		0.021
46. Lorena St. at Seventh St.			0.381	A			0.457	A			0.476	A		0.019
47. Rte 60 EB Ramp at Whittier Blvd.			0.494	A			0.592	A			0.592	A		0.000
48. S. Boyle St. at Seventh St.			0.544	A			0.654	B			0.654	B		0.000
49. Soto St. at Seventh St.			0.724	C			0.869	D			0.874	D		0.005
50. S. Boyle St. at Whittier Blvd.			0.629	B			0.755	C			0.755	C		0.000
51. S. Soto St. at Whittier Blvd.			0.821	D			0.984	E			0.993	E		0.009
52. S. Mott St. at Whittier Blvd.			0.678	B			0.813	D			0.813	D		0.000
53. Indiana St. at Whittier Blvd.			0.947	E			1.137	F			1.165	F		0.028
54. Rowan St. at Whittier Blvd.			0.392	A			0.470	A			0.537	A		0.067
55. Eastern Ave. at Brooklyn Ave.			0.586	A			0.704	C			0.721	C		0.017
56. Eastern Ave. at First St.			0.439	A			0.530	A			0.545	A		0.015
57. I-710 NB Off Ramp at Ford Blvd.			0.441	A			0.525	A			0.525	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.400	A			0.480	A			0.503	A		0.023
59. Atlantic Blvd. at 1st St./ Rte 60 WB Ramp			1.069	F			1.283	F			1.300	F		0.017
60. Collegian Ave. at Brooklyn Ave.			0.466	A			0.560	A			0.561	A		0.001
60. Collegian Ave. at Brooklyn Ave.			0.466	A			0.560	A			0.561	A		0.001
61. Atlantic Blvd. at Brooklyn Ave.			0.897	D			1.077	F			1.085	F		0.008

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.6: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- LPA (CMA Method)

INTERSECTION		EXISTING				2010 NO-BUILD				FUTURE W/LPA				PROJECT IMPACTS	
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
62. Atlantic Blvd. at Rte 60 WB On Ramp				0.571	A			0.685	B			0.693	B		0.008
63. Atlantic Blvd. at Rte 60 EB Ramps				1.099	F			1.319	F			1.334	F		0.015
64. Eastern Ave. at Whittier Blvd.				0.506	A			0.607	B			0.656	B		0.049
65. McBride Ave. at Whittier Blvd.				0.533	A			0.640	B			0.688	B		0.048
66. Arizona Ave. at Whittier Blvd.				0.660	B			0.792	C			0.929	E		0.137
67. Goodrich Ave. at Whittier Blvd.				0.639	B			0.766	C			0.844	D		0.078
68. Belden Ave. at Whittier Blvd.				0.445	A			0.534	A			0.606	B		0.072
69. Hoefner Ave. at Whittier Blvd.				0.564	A			0.688	B			0.786	C		0.098
70. Atlantic Blvd. at Verona St.				0.471	A			0.562	A			0.787	C		0.225
71. Atlantic Blvd. at Hubbard St.				0.578	A			0.695	A			0.752	C		0.057
72. Atlantic Blvd. at Whittier Blvd.				0.775	C			0.930	E			1.076	F		0.146
TOTALS	E&F Intersections		2		4		3		15		3		16		
	Significantly affected intersections														4

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, Inc., 1994.

TABLE 3-2.7: SUMMARY OF PEAK PERIOD BOARDINGS, ALIGHTINGS AND STATION ACCESS VEHICLE TRIPS -- IOS-1: FIRST/BOYLE (YEAR 2010)

STATION	TOTAL DAILY BOARDINGS & ALIGHTINGS	KISS-AND-RIDE				PARK-AND-RIDE			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		IN	OUT	IN	OUT	IN	OUT	IN	OUT
Little Tokyo	6,464	76	76	152	152	N/A	N/A	N/A	N/A
First/Boyle	14,566	171	171	340	340	N/A	N/A	N/A	N/A
TOTAL	21,030	247	247	492	492	N/A	N/A	N/A	N/A

Source: Parsons, Brinckerhoff, Quade & Douglas, 1993; updated by Meyer, Mohaddes Associates, 1994, based on MTA and ICF Kaiser patronage model data.

Table 3-2.8 summarizes the intersection capacity analysis for critical intersections for IOS-1. When compared to No-Build conditions, no intersections are anticipated to be significantly affected by station access traffic.

TABLE 3-2.8: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- IOS-1: FIRST/BOYLE (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/ IOS-1				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.243	A			0.291	A			0.308	A		0.017
2. Boyle St. at Brooklyn Ave.			0.410	A			0.493	A			0.517	A		0.024
3. State St. at Brooklyn Ave.			0.628	B			0.753	C			0.772	C		0.019
4. State St. at I-10 WB Ramps			0.441	A			0.529	A			0.541	A		0.012
5. State St. at I-10 EB Ramps			0.554	A			0.665	B			0.673	B		0.008
6. St. Louis St. at Brooklyn Ave.			0.474	A			0.568	A			0.568	A		0.000
7. State St. at Marengo St.			0.789	C			0.948	E			0.962	E		0.014
8. I-5 NB Ramp at Brooklyn Ave.			0.440	A			0.528	A			0.528	A		0.000
9. I-5 SB Ramp at Brooklyn Ave.			0.340	A			0.408	A			0.408	A		0.000
10. Soto St. at Brooklyn Ave.			0.677	B			0.814	D			0.814	D		0.000
11. Mott St. at Brooklyn Ave.			0.684	B			0.821	D			0.821	D		0.000
12. Lorena St. at Brooklyn Ave.			0.598	A			0.719	C			0.719	C		0.000
13. Indiana St. at Brooklyn Ave.			0.515	A			0.619	B			0.619	B		0.000
14. Breed St. at Brooklyn Ave.			0.514	A			0.616	B			0.616	B		0.000
15. Soto St. at Marengo St.			0.871	D			1.045	F			1.045	F		0.000
16. Soto St. at I-10/Wabash St.			0.821	D			0.985	E			0.985	E		0.000
17. Soto St. at Fourth St.			0.726	C			0.870	D			0.870	D		0.000
18. Mott St. at Fourth St.			0.568	A			0.682	B			0.682	B		0.000
19. Euclid St. at Fourth St.			0.504	A			0.605	B			0.605	B		0.000
20. Lorena St. at Fourth St.			0.552	A			0.663	B			0.663	B		0.000
21. Indiana St. at 4th St./ Rte 60 WB Ramp			0.684	B			0.821	D			0.821	D		0.000
22. Vignes St. at First St.	0.585	A	0.555	A	0.701	C	0.666	B	0.707	C	0.671	B	0.006	0.005

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.8: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- IOS-1: FIRST/BOYLE (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/ IOS-1				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
23. Mission St. at First St.	0.892	D	0.805	D	1.069	F	0.964	E	1.069	F	0.964	E	0.000	0.000
24. Second St. at Alameda St.	0.517	A	0.498	A	0.621	B	0.597	A	0.629	B	0.614	B	0.008	0.017
25. First St. at Alameda St.	0.933	E	0.769	C	1.119	F	0.920	E	1.123	F	0.926	E	0.004	0.006
26. First St. at Central St.	0.579	A	0.595	A	0.694	B	0.714	C	0.697	B	0.719	C	0.003	0.005
27. 3rd/4th Confluence at Alameda St.	1.569	F	1.049	F	1.883	F	1.254	F	1.883	F	1.265	F	0.000	0.011
28. Merrick St. at Fourth St.	0.683	B	0.398	A	0.820	D	0.477	A	0.820	D	0.483	A	0.000	0.006
29. Molino St. at Fourth St.	0.657	B	0.447	A	0.789	C	0.532	A	0.790	C	0.537	A	0.001	0.005
30. Mateo St. at 6th St./Whittier Blvd.	0.454	A	0.484	A	0.550	A	0.582	A	0.555	A	0.583	A	0.005	0.001
31. Rte 101 NB Ramps at First St.			0.408	A			0.489	A			0.513	A		0.024
32. Rte 101 SB Ramps at First St.			0.434	A			0.521	A			0.571	A		0.050
33. Boyle St. at First St.			0.630	B			0.756	C			0.841	D		0.085
34. State St. at First St.			0.670	B			0.799	C			0.884	D		0.085
35. Rte 101 NB Ramps at Fourth St.			0.529	A			0.635	B			0.643	B		0.008
36. Rte 101 SB Ramps at Fourth St.			0.894	D			1.072	F			1.075	F		0.003
37. Boyle St. at Fourth St.			0.769	C			0.923	E			0.935	E		0.012
38. Soto St. at First St.			0.736	C			0.885	D			0.885	D		0.000
39. Mott St. at First St.			0.526	A			0.633	B			0.633	B		0.000
40. Lorena St. at First St.			0.541	A			0.649	B			0.649	B		0.000
41. Indiana St. at First St.			0.556	A			0.666	B			0.666	B		0.000
42. Indiana St. at Third St.			0.616	B			0.739	C			0.739	C		0.000
43. Soto St. at Sixth St.			0.570	A			0.688	B			0.688	B		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.8: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- IOS-1: FIRST/BOYLE (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/ IOS-1				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
44. Lorena St. at 6th St./ Rte 60 WB Ramps			0.596	A			0.716	C			0.716	C		0.000
45. Lorena St. at Whittier Blvd.			0.817	D			0.981	E			0.981	E		0.000
46. Lorena St. at Seventh St.			0.381	A			0.457	A			0.457	A		0.000
47. Rte 60 EB Ramp at Whittier Blvd.			0.494	A			0.592	A			0.592	A		0.000
48. S. Boyle St. at Seventh St.			0.544	A			0.654	B			0.654	B		0.000
49. Soto St. at Seventh St.			0.724	C			0.869	D			0.869	D		0.000
50. S. Boyle St. at Whittier Blvd.			0.629	B			0.755	C			0.755	C		0.000
51. S. Soto St. at Whittier Blvd.			0.821	D			0.984	E			0.984	E		0.000
52. S. Mott St. at Whittier Blvd.			0.678	B			0.813	D			0.813	D		0.000
53. Indiana St. at Whittier Blvd.			0.947	E			1.137	F			1.137	F		0.000
54. Rowan St. at Whittier Blvd.			0.392	A			0.470	A			0.470	A		0.000
55. Eastern Ave. at Brooklyn Ave.			0.586	A			0.704	C			0.704	C		0.000
56. Eastern Ave. at First St.			0.439	A			0.530	A			0.530	A		0.000
57. I-710 NB Off Ramp at Ford Blvd.			0.441	A			0.525	A			0.525	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.400	A			0.480	A			0.480	A		0.000
59. Atlantic Blvd. at 1st St./ Rte 60 WB Ramp			1.069	F			1.283	F			1.283	F		0.000
60. Collegian Ave. at Brooklyn Ave.			0.466	A			0.560	A			0.560	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			0.897	D			1.077	F			1.077	F		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.8: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- IOS-1: FIRST/BOYLE (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/ IOS-1				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.571	A			0.685	B			0.685	B		0.000
63. Atlantic Blvd. at Rte 60 EB Ramps			1.099	F			1.319	F			1.319	F		0.000
64. Eastern Ave. at Whittier Blvd.			0.506	A			0.607	B			0.607	B		0.000
65. McBride Ave. at Whittier Blvd.			0.533	A			0.640	B			0.640	B		0.000
66. Arizona Ave. at Whittier Blvd.			0.660	B			0.792	C			0.792	C		0.000
67. Goodrich Ave. at Whittier Blvd.			0.639	B			0.766	C			0.766	C		0.000
68. Belden Ave. at Whittier Blvd.			0.445	A			0.534	A			0.534	A		0.000
69. Hoefner Ave. at Whittier Blvd.			0.564	A			0.688	B			0.688	B		0.000
70. Atlantic Blvd. at Verona St.			0.471	A			0.562	A			0.562	A		0.000
71. Atlantic Blvd. at Hubbard St.			0.578	A			0.695	A			0.695	B		0.000
72. Atlantic Blvd. at Whittier Blvd.			0.775	C			0.930	E			0.930	E		0.000
TOTALS: E&F Intersections		2		4		3		15		3		15		
TOTALS: Significantly affected intersections														0

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, Inc., 1994.

b. IOS-2: First/Lorena

Table 3-2.9 summarizes the estimated daily boardings/alightings and the resulting estimate of park-and-ride and kiss-and-ride vehicle trips to/from each station along IOS-2. Table 3-2.10 summarizes the intersection capacity analysis for critical intersections based on IOS-2. When compared to No-Build conditions, two intersections are anticipated to be significantly affected by station access traffic:

- Whittier Boulevard at Lorena Street and
- Whittier Boulevard at Indiana Street.

TABLE 3-2.9: SUMMARY OF PEAK PERIOD BOARDINGS, ALIGHTINGS AND STATION ACCESS VEHICLE TRIPS -- IOS-2: FIRST/LORENA (YEAR 2010)

STATION	TOTAL DAILY BOARDINGS AND ALIGHTINGS	KISS-AND-RIDE				PARK-AND-RIDE			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		IN	OUT	IN	OUT	IN	OUT	IN	OUT
Little Tokyo	6,714	79	79	157	157	N/A	N/A	N/A	N/A
First/Boyle	9,038	106	106	211	211	N/A	N/A	N/A	N/A
Brooklyn/Soto	5,710	67	67	133	133	N/A	N/A	N/A	N/A
First/Lorena	9,916	116	116	233	233	132	23	47	264
TOTAL	31,378	368	368	734	734	132	23	47	264

Source: Parsons, Brinckerhoff, Quade & Douglas, 1993; updated by Meyer, Mohaddes Associates, 1994, based on MTA and ICF Kaiser patronage model data.

3-2.2.4 Summary of Impacts

The proposed Year 2010 project (LPA) would increase the number of intersections operating at LOS E by one, compared to the Year 2010 No-Build conditions. In comparison to the No-Build alternative, the LPA is forecast to have a significant affect at four intersections:

- Whittier Boulevard/Lorena Street
- Whittier Boulevard/Indiana Street
- Whittier Boulevard/Atlantic Boulevard
- Whittier Boulevard/Arizona Avenue

IOS-1 is not expected to significantly affect any intersections. IOS-2 is forecast to have significant effects at two intersections:

- Whittier Boulevard/Lorena Street
- Whittier Boulevard/Indiana Street

TABLE 3-2.10: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- IOS - 2: FIRST/LORENA
(CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/ IOS #2				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.243	A			0.291	A			0.301	A		0.010
2. Boyle St. at Brooklyn Ave.			0.410	A			0.493	A			0.508	A		0.015
3. State St. at Brooklyn Ave.			0.628	B			0.753	C			0.765	C		0.012
4. State St. at I-10 WB Ramps			0.441	A			0.529	A			0.536	A		0.007
5. State St. at I-10 EB Ramps			0.554	A			0.665	B			0.670	B		0.005
6. St. Louis St. at Brooklyn Ave.			0.474	A			0.568	A			0.576	A		0.008
7. State St. at Marengo St.			0.789	C			0.948	E			0.957	E		0.009
8. I-5 NB Ramp at Brooklyn Ave.			0.440	A			0.528	A			0.529	A		0.001
9. I-5 SB Ramp at Brooklyn Ave.			0.340	A			0.408	A			0.418	A		0.010
10. Soto St. at Brooklyn Ave.			0.677	B			0.814	D			0.839	D		0.025
11. Mott St. at Brooklyn Ave.			0.684	B			0.821	D			0.849	D		0.028
12. Lorena St. at Brooklyn Ave.			0.598	A			0.719	C			0.843	D		0.124
13. Indiana St. at Brooklyn Ave.			0.515	A			0.619	B			0.827	C		0.208
14. Breed St. at Brooklyn Ave.			0.514	A			0.616	B			0.625	B		0.009
15. Soto St. at Marengo St.			0.871	D			1.045	F			1.048	F		0.003
16. Soto St. at I-10/Wabash St.			0.821	D			0.985	E			0.994	E		0.009
17. Soto St. at Fourth St.			0.726	C			0.870	D			0.876	D		0.006
18. Mott St. at Fourth St.			0.568	A			0.682	B			0.691	B		0.009
19. Euclid St. at Fourth St.			0.504	A			0.605	B			0.607	B		0.002
20. Lorena St. at Fourth St.			0.552	A			0.663	B			0.728	C		0.105
21. Indiana St. at 4th St./ Rte 60 WB Ramp			0.684	B			0.821	D			0.899	D		0.078
22. Vignes St. at First St.	0.585	A	0.555	A	0.701	C	0.666	B	0.707	C	0.671	B	0.006	0.005

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.10: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- IOS - 2: FIRST/LORENA (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/ IOS #2				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
23. Mission St. at First St.	0.892	D	0.805	D	1.069	F	0.964	E	1.069	F	0.964	E	0.000	0.000
24. Second St. at Alameda St.	0.517	A	0.498	A	0.621	B	0.597	A	0.629	B	0.615	B	0.008	0.018
25. First St. at Alameda St.	0.933	E	0.769	C	1.119	F	0.920	E	1.123	F	0.927	E	0.004	0.007
26. First St. at Central St.	0.579	A	0.595	A	0.694	B	0.714	C	0.697	B	0.719	C	0.003	0.005
27. 3rd/4th Confluence at Alameda St.	1.569	F	1.049	F	1.883	F	1.254	F	1.883	F	1.265	F	0.000	0.011
28. Merrick St. at Fourth St.	0.683	B	0.398	A	0.820	D	0.477	A	0.820	D	0.483	A	0.000	0.006
29. Molino St. at Fourth St.	0.657	B	0.447	A	0.789	C	0.532	A	0.790	C	0.537	A	0.001	0.005
30. Mateo St. at 6th St./Whittier Blvd.	0.454	A	0.484	A	0.550	A	0.582	A	0.555	A	0.583	A	0.005	0.001
31. Rte 101 NB Ramps at First St.			0.408	A			0.489	A			0.505	A		0.016
32. Rte 101 SB Ramps at First St.			0.434	A			0.521	A			0.554	A		0.033
33. Boyle St. at First St.			0.630	B			0.756	C			0.800	D		0.044
34. State St. at First St.			0.670	B			0.799	C			0.854	D		0.055
35. Rte 101 NB Ramps at Fourth St.			0.529	A			0.635	B			0.643	B		0.008
36. Rte 101 SB Ramps at Fourth St.			0.894	D			1.072	F			1.076	F		0.004
37. Boyle St. at Fourth St.			0.769	C			0.923	E			0.932	E		0.009
38. Soto St. at First St.			0.736	C			0.885	D			0.893	D		0.008
39. Mott St. at First St.			0.526	A			0.633	B			0.654	B		0.021
40. Lorena St. at First St.			0.541	A			0.649	B			0.757	C		0.108
41. Indiana St. at First St.			0.556	A			0.666	B			0.795	C		0.129
42. Indiana St. at Third St.			0.616	B			0.739	C			0.764	C		0.025
43. Soto St. at Sixth St.			0.570	A			0.688	B			0.693	B		0.005

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.10: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- IOS - 2: FIRST/LORENA (CMA Method)

INTERSECTION	EXISTING				2010 NO-BUILD				FUTURE W/ IOS #2				PROJECT IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
44. Lorena St. at 6th St./ Rte 60 WB Ramps			0.596	A			0.716	C			0.739	C		0.023
45. Lorena St. at Whittier Blvd.			0.817	D			0.981	E			1.008	F		0.027
46. Lorena St. at Seventh St.			0.381	A			0.457	A			0.483	A		0.026
47. Rte 60 EB Ramp at Whittier Blvd.			0.494	A			0.592	A			0.592	A		0.000
48. S. Boyle St. at Seventh St.			0.544	A			0.654	B			0.654	B		0.000
49. Soto St. at Seventh St.			0.724	C			0.869	D			0.873	D		0.004
50. S. Boyle St. at Whittier Blvd.			0.629	B			0.755	C			0.755	C		0.000
51. S. Soto St. at Whittier Blvd.			0.821	D			0.984	E			0.992	E		0.008
52. S. Mott St. at Whittier Blvd.			0.676	B			0.813	D			0.813	D		0.000
53. Indiana St. at Whittier Blvd.			0.947	E			1.137	F			1.160	F		0.023
54. Rowan St. at Whittier Blvd.			0.392	A			0.470	A			0.470	A		0.000
55. Eastern Ave. at Brooklyn Ave.			0.586	A			0.704	C			0.710	C		0.006
56. Eastern Ave. at First St.			0.439	A			0.530	A			0.534	A		0.004
57. I-710 NB Off Ramp at Ford Blvd.			0.441	A			0.525	A			0.525	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.400	A			0.480	A			0.480	A		0.000
59. Atlantic Blvd. at 1st St./ Rte 60 WB Ramp			1.069	F			1.283	F			1.283	F		0.000
60. Collegian Ave. at Brooklyn Ave.			0.466	A			0.560	A			0.560	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			0.897	D			1.077	F			1.077	F		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.571	A			0.685	B			0.685	B		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 3-2.10: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- IOS - 2: FIRST/LORENA (CMA Method)

INTERSECTION		EXISTING				2010 NO-BUILD				FUTURE W/ IOS #2				PROJECT IMPACTS	
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
63. Atlantic Blvd. at Rte 60 EB Ramps				1.099	F			1.319	F			1.319	F		0.000
64. Eastern Ave. at Whittier Blvd.				0.506	A			0.607	B			0.607	B		0.000
65. McBride Ave. at Whittier Blvd.				0.533	A			0.640	B			0.640	B		0.000
66. Arizona Ave. at Whittier Blvd.				0.660	B			0.792	C			0.792	C		0.000
67. Goodrich Ave. at Whittier Blvd.				0.639	B			0.766	C			0.766	C		0.000
68. Belden Ave. at Whittier Blvd.				0.445	A			0.534	A			0.534	A		0.000
69. Hoefner Ave. at Whittier Blvd.				0.564	A			0.688	B			0.688	B		0.000
70. Atlantic Blvd. at Verona St.				0.471	A			0.562	A			0.562	A		0.000
71. Atlantic Blvd. at Hubbard St.				0.578	A			0.695	A			0.695	B		0.000
72. Atlantic Blvd. at Whittier Blvd.				0.775	C			0.930	E			0.930	E		0.000
TOTALS	**E&F Intersections**		2		4		3		15		3		15		
	Significantly affected intersections														2

Source: Meyer, Mohaddes Associates, Inc., 1994.

3-2.3 CUMULATIVE IMPACTS

The analysis of potential impacts of the proposed project (LPA) was based on traffic volume and patronage projections for Year 2010. The levels of travel demand reflected in the forecasts are based on a set of 2010 socio-demographic projections which were developed for the region by SCAG. The projections were developed based on anticipated patterns of growth and development in population and job opportunities within the region between now and 2010. As such, these forecasts provide the "cumulative" traffic conditions projected for the study area and the surrounding region. The potential impacts identified represent cumulative impacts based on region-wide levels of growth and development of infrastructure anticipated to occur by 2010.

3-2.4 MITIGATION

3-2.4.1 <u>Whittier/Lorena Intersection (for LPA and IOS-2)</u>

Based on the critical movement intersection analysis conducted for the FEIS/FEIR, the critical traffic movements at this intersection in the future will be the northbound through movement, the southbound left-turn movement, the eastbound left-turn movement and the westbound through movement. Based on forecast intersection operating conditions, the appropriate mitigation measure at this location would be a second left-turn lane in the eastbound direction. This would accommodate rail station access traffic as well as other left-turning vehicles.

The curb-to-curb width at this intersection on the west leg (i.e., the eastbound approach) is 58.5 feet and the right-of-way width is 82 feet. In order to provide the dual left-turn lane eastbound with all lanes at City of Los Angeles standards, a curb-to-curb width of at least 66 feet is required. This would require widening of the roadway on both the east and west approaches by 7.5 feet (or 3.75 on each side). This widening could be accomplished by narrowing the 12-foot sidewalks to 8.25 feet, which is below the generally accepted City standard of 10 feet. To maintain City standards for lane widths and sidewalks, 3.5 feet of additional right-of-way would be required and may require taking existing structures; therefore, to implement this improvement would require 8.25 foot sidewalks on the east and west approaches, rather than the City standard of 10 foot sidewalks. This measure would result in the loss of some on-street parking on the south side of Whittier Boulevard east of Lorena Street.

Due to the pedestrian/sidewalk impacts and necessary property acquisitions associated with this mitigation, there are no feasible mitigation measures for this impact.

3-2.4.2 <u>Whittier/Indiana Intersection (for LPA and IOS-2)</u>

Based on the critical movement intersection analysis conducted for the FEIS/FEIR, the critical movements at this location are the northbound left-turn movement, the southbound through movement, the eastbound through movement and the westbound left-turn movement. Because there are no exclusive left-turn lanes in either the east or westbound directions, the left-turn movements become critical due the need for all left-turning vehicles to wait for opposing traffic to clear. While waiting for clearance in opposing traffic, they block one through lane and utilize a larger proportion of intersection capacity.

Based on forecast intersection operating conditions, the appropriate mitigation measure is to add a westbound left-turn lane. Because Whittier Boulevard has an existing curb-to-curb width of 64 feet east of Indiana and 58 feet west of Indiana, this mitigation measure can be accomplished via restriping Whittier Boulevard on the east and west approaches. It is not anticipated that widening would be required; however, one or two parking spaces which are currently designated for loading would be removed on the south side of Whittier east of Indiana.

For the LPA, the future volume/capacity ratio at this location would drop from 1.165 before mitigation to 1.140 after mitigation, thereby reducing the impacts of the project to a level of insignificance.

- **Alternative Mitigation Measure**

An alternative mitigation measure would be to provide enhanced local shuttle/transit services focused on the First/Lorena Station via Indiana and Lorena Streets. Such a mitigation measure would preclude the need to add lanes via restriping or to remove parking on-street.

It is estimated that a minimum of 10 to 20 project-related peak hour vehicle trips would need to be shifted to transit to reduce this impact to a level of insignificance.

3-2.4.3 Whittier/Arizona Intersection (LPA only)

Based on the critical movement intersection analysis conducted for the FEIS, the critical movements at the intersection would be the northbound through movement, the southbound left-turn movement, the eastbound through movement and the westbound left-turn movement. Since there are no east or westbound left-turn lanes, the turn movements in those directions take up additional east/west capacity due to the need for all left-turning vehicles to wait for through traffic to clear.

Based on forecast intersection operating conditions, the appropriate mitigation at this location is to add east and westbound left-turn lanes. The curb-to-curb width at this location on the east and westbound approaches is 56 feet. Given this street width, the left-turn lanes could be provided via restriping without the need for widening. This mitigation measure would result in the loss of approximately 10 on-street parking spaces on Whittier Boulevard (approximately six on the west side of Arizona and four on the east side).

With this mitigation measure, the future volume/capacity ratio at this location would drop from 0.929 before mitigation to 0.692 after mitigation, thereby fully mitigating the impacts of the project.

3-2.4.4 Whittier/Atlantic Intersection (LPA only)

Based on the intersection analysis, the critical traffic movements at this intersection are the northbound through movement, the southbound left-turn movement, the eastbound through movement and the westbound left-turn movement. With the addition of future traffic, the eastbound, westbound and southbound left-turn volumes range from 250 to 300 vehicles per hour during the peak period. The proposed mitigation measure at this location is therefore the addition of dual left-turn lanes in the east/west and southbound directions. To maintain existing lane configurations (i.e., two through lanes plus a functional right-turn lane in each direction), widening of approximately nine feet on Whittier Boulevard and seven feet on Atlantic Boulevard would be required, and the MTA will own property on two of the four quadrants at this intersection.

With this mitigation measure, the future volume/capacity ratio at this location would drop from 1.076 before mitigation to 0.937 after mitigation, thereby fully mitigating the impacts of the project.

3-3 PARKING

With implementation of the Red Line Eastern Extension, parking demand at major destinations such as the Los Angeles Central Business District (LACBD) would be expected to decrease, because some of the automobile trips would be diverted to transit. Conversely, there is the potential for increased parking demand at or in the vicinity of rail stations. Construction of the Locally Preferred Alternative (LPA) would also result in the temporary or permanent loss of on- and off-street parking. Therefore, parking is relevant to the LPA in three ways:

- Operation of the LPA and Metro system would reduce the need for parking in the major destination areas (e.g., the LACBD) that it serves.

- Parking loss due to construction may affect local land uses.

- Rail patrons driving to and parking at a station may require increased parking in the local station vicinity.

To evaluate current parking conditions in the vicinity of the station areas along the LPA, a survey of parking spaces and usage was conducted. The survey covered the potential impact area around each rail station.

Data collected during the parking survey included such information as the number of parking spaces, whether they were on- or off-street, whether they were metered or non-metered, parking control and parking restrictions, if any. Detailed information related to the survey of parking spaces and usage is included in Section 3.15 of the report, Social, Economic, and Environmental Impact Assessment Methodology, (November 1992, incorporated herein by reference).

3-3.1 EXISTING PARKING CONDITIONS

The parking surveys were primarily conducted during July 1992 with an updated field survey conducted in March 1994. Based on observations of the study area parking conditions, the surveys focused on local station area vicinities within an approximate two-block radius of station entrances, considered to be the normal park-and-ride walking distance. The parking surveys were conducted during midday (between 9:00 AM and 3:00 PM) to capture peak parking utilization. The survey included only public parking spaces (both on-street and off-street spaces) and did not include private "business" spaces. "Business" spaces are provided for the exclusive use of patrons and, therefore, are not considered as public parking spaces. In general, private spaces that would be removed as part of the project would also include the removal of the connected land use or business. Therefore, there would be minimal parking impact from private parking space losses; because, not only would the spaces be removed, but the demand for those spaces would no longer exist.

A total of 4,489 parking spaces were included in the surveys within the LPA station vicinity areas. Off-street public parking spaces were found in the vicinity of two proposed stations, Brooklyn/Soto and Whittier/Arizona. Table 3-3.1 summarizes current parking supply and utilization for each station area.

TABLE 3-3.1: PARKING SURVEY & UTILIZATION SUMMARY (1992)

TRANSIT STATION	PARKING SPACE TYPE[a]			NUMBER OF PARKING SPACES UTILIZED AT PEAK TIME OF DAY[b]			PERCENT OF PARKING SPACES UTILIZED AT PEAK TIME OF DAY[b]		
	On-Street	Off-Street	Total	On-Street	Off-Street	Total	On-Street	Off-Street	Total
Little Tokyo	302	-	302	134	-	134	44%	-	44%
First/Boyle	453	-	453	275	-	275	61%	-	61%
Brooklyn/Soto	768	25	793	600	19	600	78%	78%	78%
First/Lorena	646	-	646	323	-	323	50%	-	50%
Whittier/Rowan	592	-	592	395	-	395	67%	-	67%
Whittier/Arizona	694	194	888	376	30	406	54%	16%	46%
Whittier/Atlantic	815	-	815	452	-	452	56%	-	56%
TOTAL	4,270	219	4,489	2,555	49	2,604	60%	22%	58%

Notes: [a] "Public" spaces only. Does not include "business" spaces.
[b] Surveyed during the Midday period (9 AM to 3 PM), July 20 to July 22, 1992.

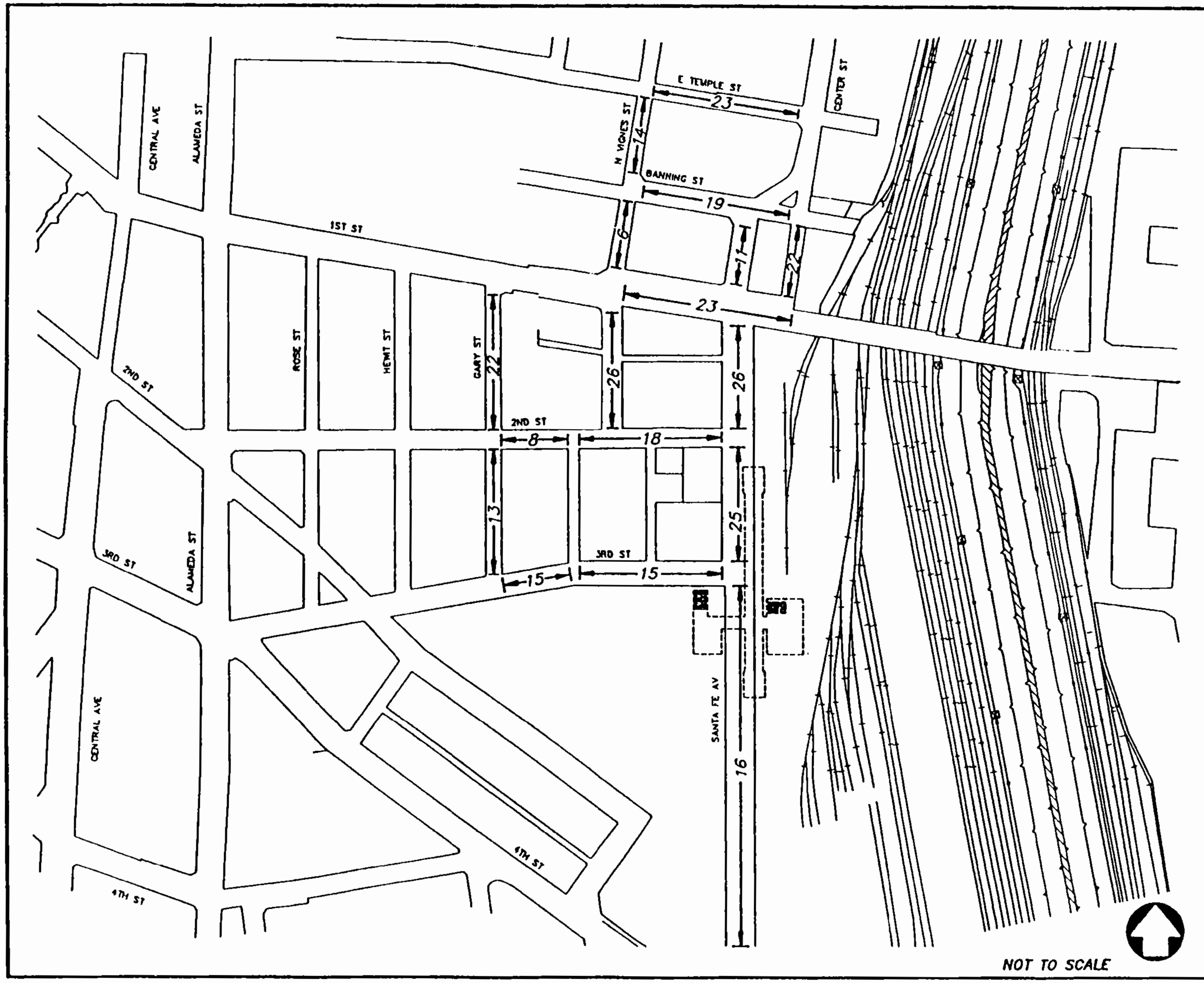
Source: Parsons, Brinckerhoff, Quade & Douglas, 1993; updated by Meyer, Mohaddes Associates, 1994.

The utilization numbers and percentages shown in the table reflect the highest utilization observed during any single hour of the survey period between 9:00 AM and 3:00 PM. Therefore, the utilization represents the peak existing parking demand. The information for on-street parking spaces has been summarized and illustrated in figures for each station area vicinity. Figures 3-3.1 through 3-3.7 illustrate the station areas, approximate station entrance locations, and number of on-street parking spaces for the surveyed locations.

Based on the survey results, the utilization of total parking spaces at individual station areas along the LPA ranges from approximately 44 percent to 78 percent, with the highest utilization observed at the Brooklyn/Soto Station. Average parking utilization for all the stations combined is approximately 58 percent of the supply. As illustrated in the table, the observed utilization of off-street public parking spaces was very low, approximately 22 percent. Other general observations from the parking survey are:

- The ratio of parking spaces surveyed adjacent to residential versus commercial land uses ranges from less than 25 percent at Little Tokyo Station to more than 65 percent at Brooklyn/Soto Station. For all stations combined, the proportion of parking spaces adjacent to residential uses is approximately 50 percent. Stated another way, approximately one-half of all surveyed spaces are primarily for adjacent residences.

- The majority of metered on-street spaces, especially those located near commercial establishments, are limited to either one-hour or two-hour parking duration. Typically, park-and-ride patrons would want to park their vehicles for longer than two hours; therefore, the metered spaces surveyed are not likely to be used by park-and-ride patrons. The metered parking spaces account for a minor portion (approximately 6.5 percent) of the total number of parking spaces surveyed, however.



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

LITTLE TOKYO
STATION VICINITY

Figure 3-3.1
On-Street Parking
Spaces Surveyed

Los Angeles County
Metropolitan Transportation
Authority

OSPI-LTO.DWG 6-19-94

METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

FIRST/BOYLE
STATION VICINITY

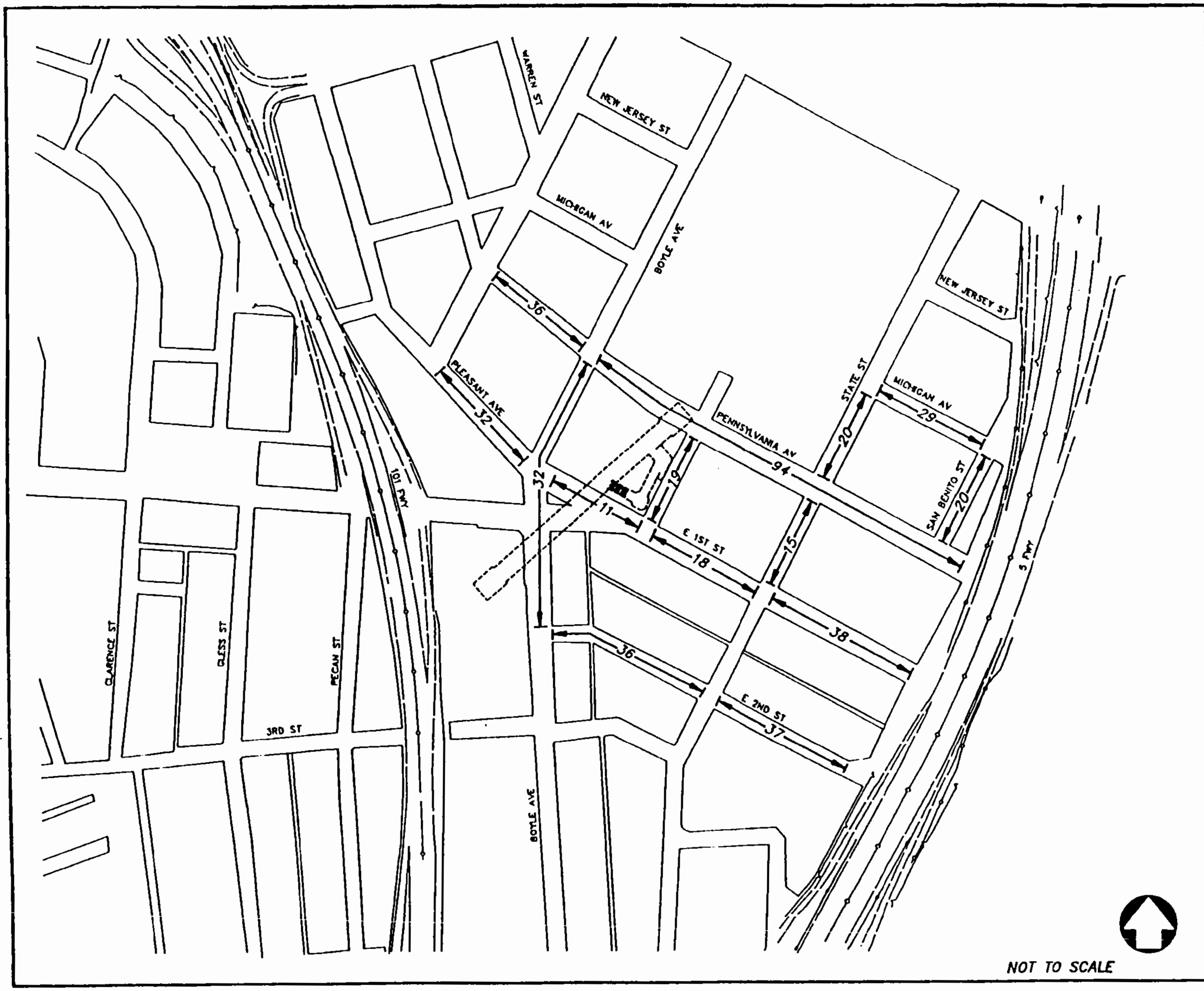
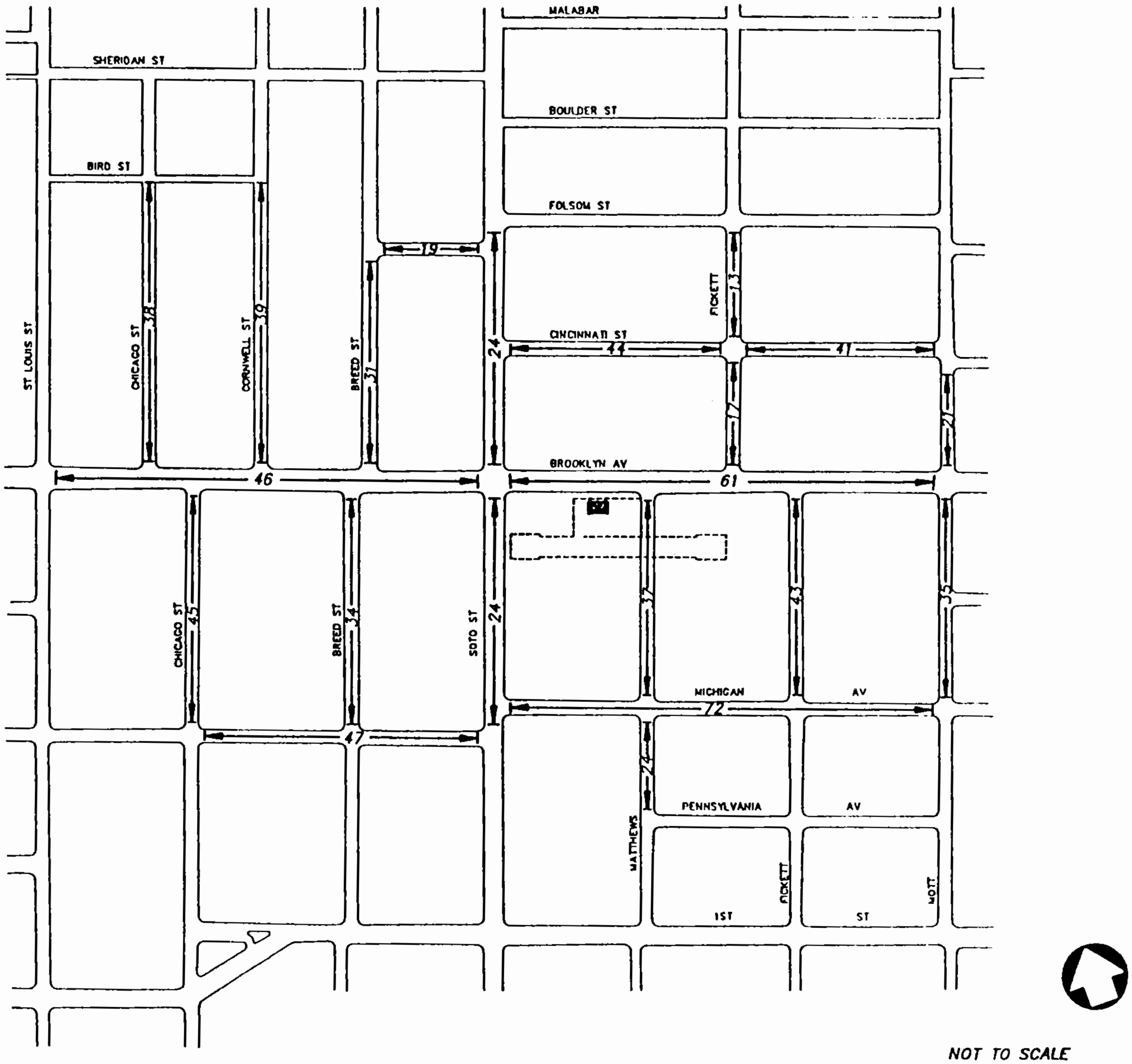


Figure 3-3.2
On-Street Parking Spaces Surveyed

Los Angeles County Metropolitan Transportation Authority

OSP2-FBO.DWG 4-19-94



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

BROOKLYN/SOTO
STATION VICINITY

Figure 3–3.3
On–Street Parking
Spaces Surveyed

Los Angeles County
Metropolitan Transportation
Authority

QSP3-850.DWG 4-19-94

METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

FIRST/LORENA STATION VICINITY

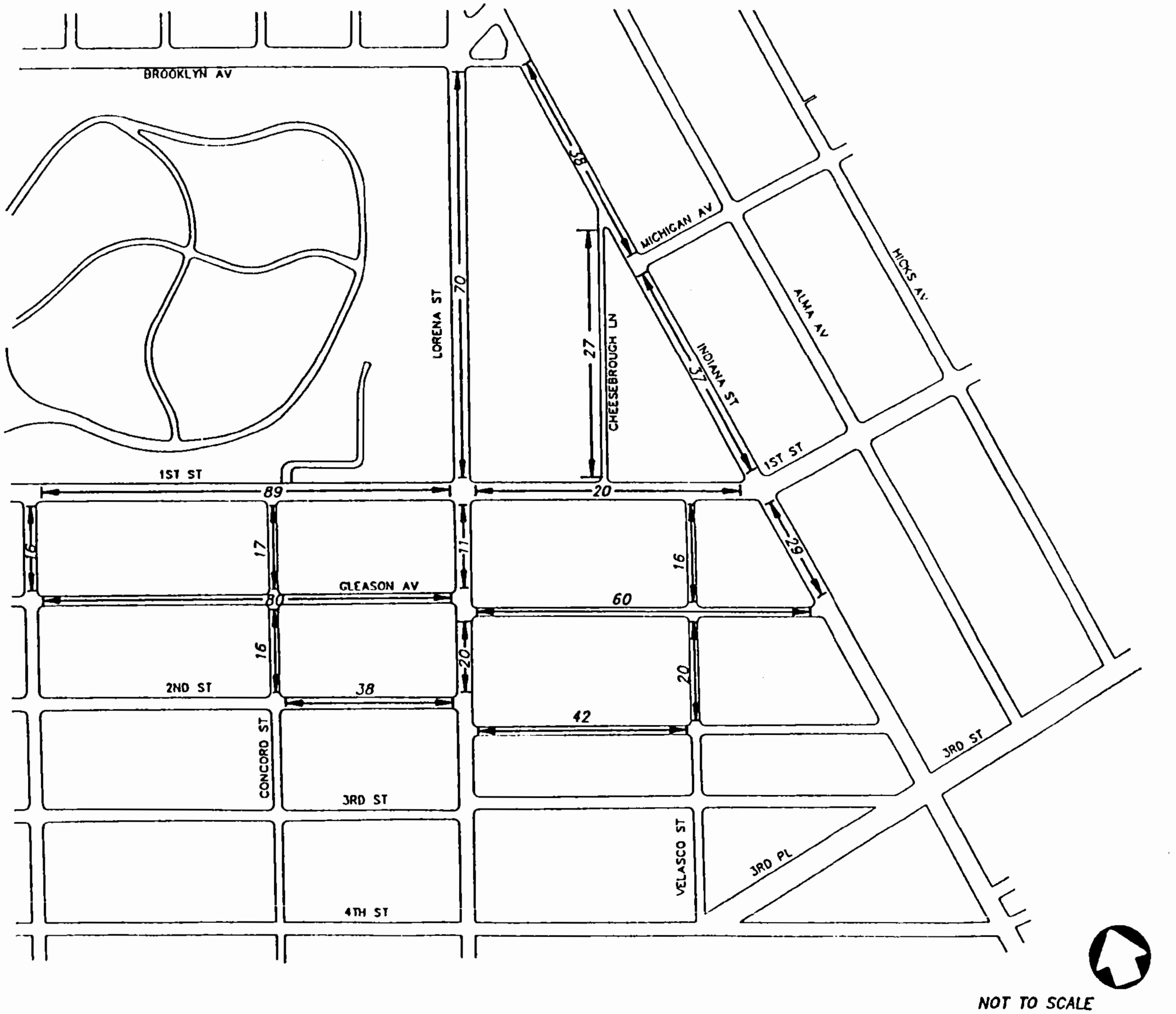


Figure 3-3.4
On-Street Parking Spaces Surveyed

Los Angeles County Metropolitan Transportation Authority

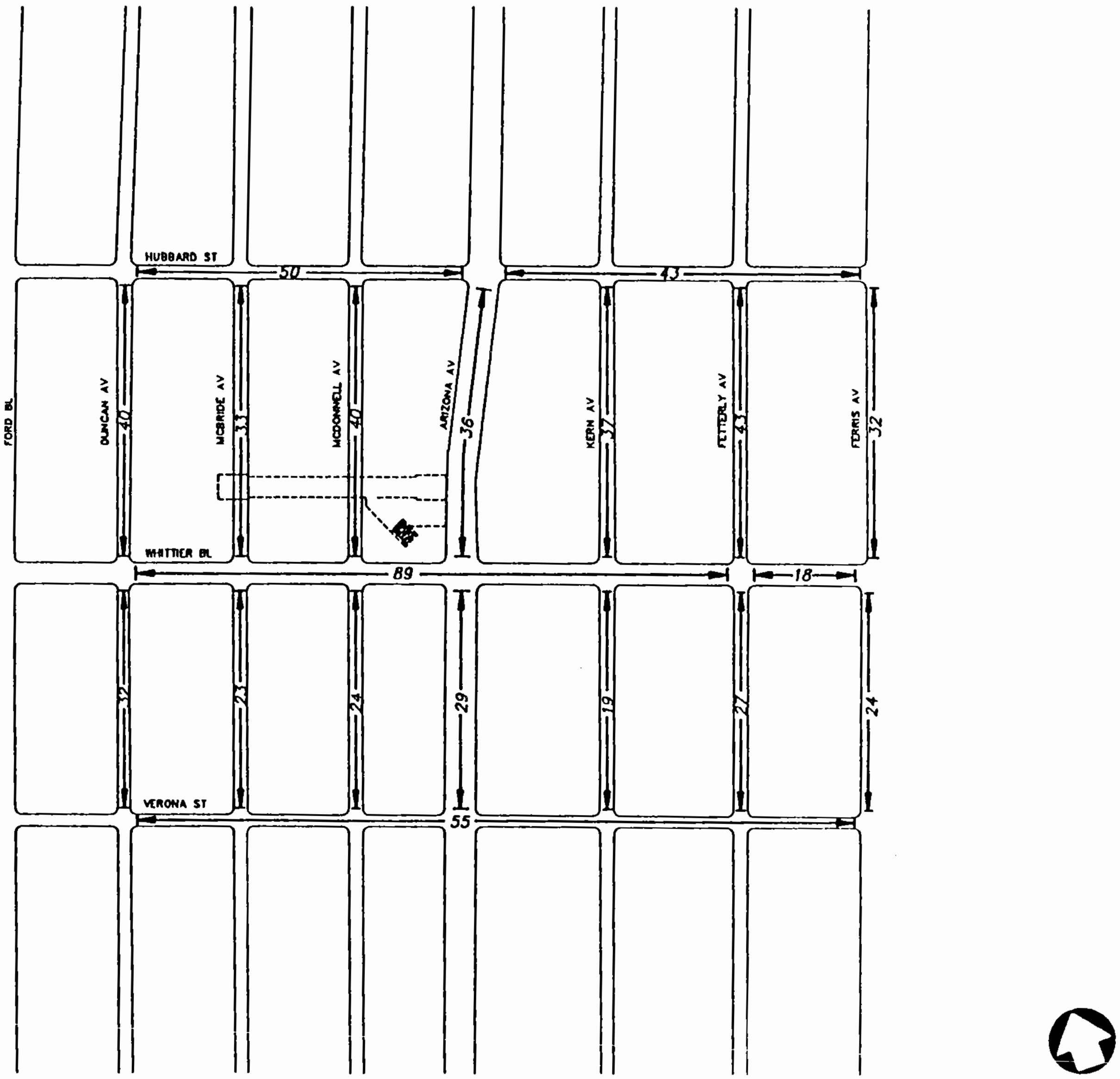
METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ROWAN
STATION VICINITY

Figure 3-3.5
On-Street Parking Spaces Surveyed

Los Angeles County Metropolitan Transportation Authority

OSPS-WRO.DWG 4-19-94



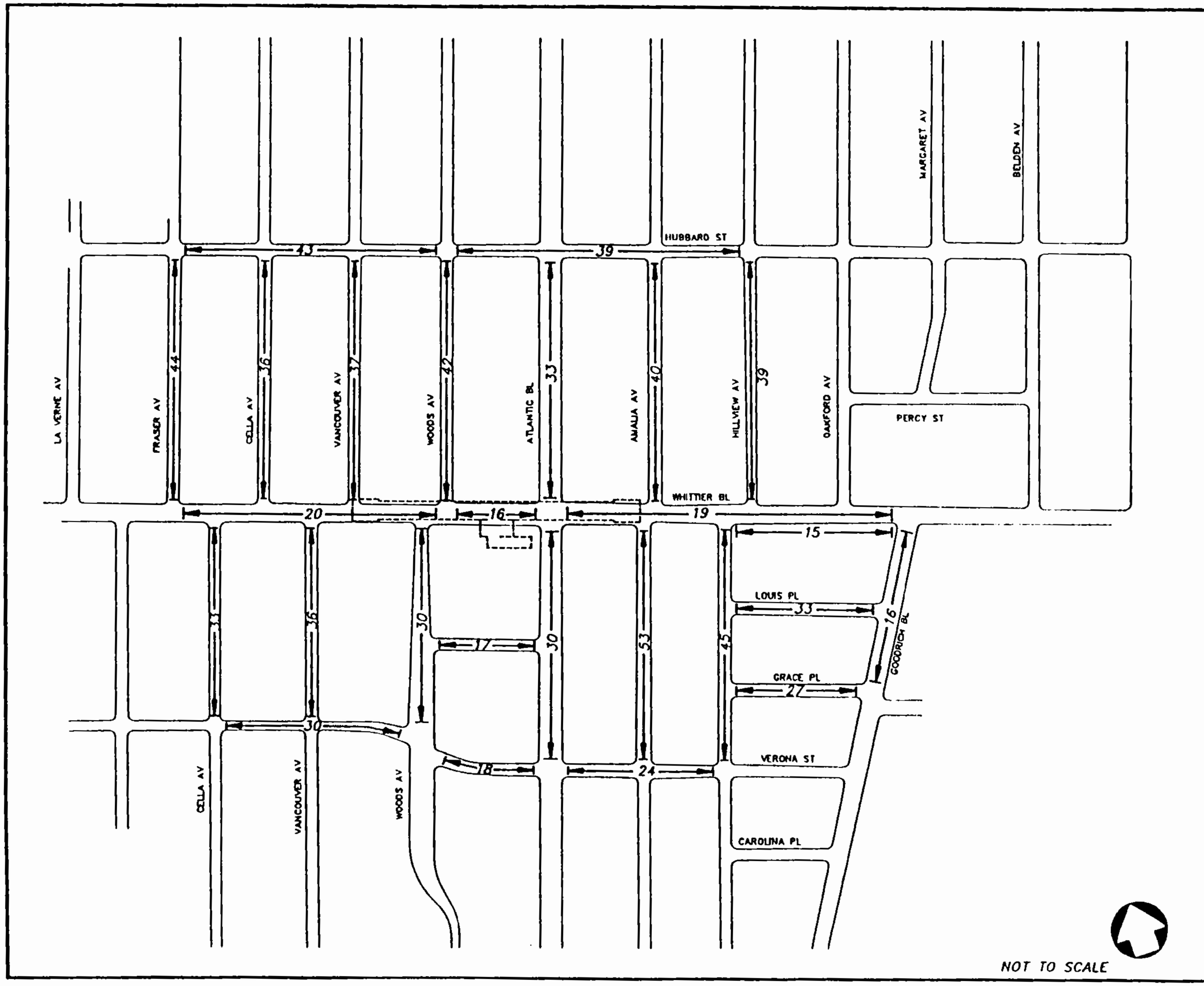
METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ARIZONA
STATION VICINITY

Figure 3–3.6
On–Street Parking
Spaces Surveyed

Los Angeles County
Metropolitan Transportation
Authority

OSP8-WAR.DWG 4-19-94



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ATLANTIC STATION VICINITY

Figure 3-3.7
On-Street Parking Spaces Surveyed

Los Angeles County Metropolitan Transportation Authority

OSP7-WAT.DWG

4-8-94

3-3.2 FUTURE BASELINE PARKING CONDITIONS

Since potential project parking impacts would not occur all at once (i.e., construction of stations would be sequenced), the analysis of future baseline parking conditions varies based on the projected time period that the impact would occur. Future parking demand has been estimated using a one percent per year growth factor, consistent with the traffic growth rate discussed in Section 3.2. Future baseline parking forecasts have been estimated as follows:

- Construction period parking conditions have been estimated based on the forecast construction time period for each station. Future baseline parking conditions for the first four LPA stations (Little Tokyo, First/Boyle, Brooklyn/Soto and First/Lorena) have been forecast using a seven percent parking growth factor, representing parking demand increases that are expected to occur between the year of the parking survey (1992) and the estimated mid-point of construction for these four stations (1999).

  Parking demand for the final three LPA stations (Whittier/Rowan, Whittier/Arizona and Whittier/Atlantic) has been estimated using a 15 percent growth factor, representing parking demand increases that are expected to occur between 1992 and 2007, the projected mid-point of construction for those three stations.

- Long-term future No-Build parking demand has been estimated using an 18 percent growth factor, representing parking demand increases between 1992 and 2010.

It is assumed that, to the extent redevelopment occurs within the study area, development would be required to supply adequate off-site parking so that the number of parking supply would not be reduced in the future. However, for a worst-case analysis, it is not anticipated that significant additional public parking would be developed within the study area.

Table 3-3.2 summarizes the future baseline parking forecasts for both the construction period and the year 2010 conditions. Utilization numbers and percentages shown in the table reflect the existing and projected highest observed peak hour at each station. Review of Table 3-3.2 shows that parking demand in the Brooklyn/Soto station area at the mid-point of construction is estimated to equal or exceed 80 percent of supply, i.e., 84 percent. Typically, when the parking utilization approaches 80 to 85 percent of the parking supply, drivers begin to perceive that parking is "full." The remaining stations are projected to experience parking demand below 80 percent between now and the year 2010.

For the year 2010, the Brooklyn/Soto station again is expected to experience parking utilization over 80 percent, although the Whittier/Rowan station is expected to be near but below 80 percent.

TABLE 3-3.2: NO-BUILD PARKING CONDITIONS

STATION	TOTAL EXISTING SPACES	EXISTING CONDITIONS (1992)		PROJECTED MID-POINT OF CONSTRUCTION (YEAR)	CONSTRUCTION PERIOD NO-BUILD (1999 or 2007)		LONG-TERM NO-BUILD (2010)	
		PEAK UTILIZATION	PERCENT UTILIZED		PEAK UTILIZATION	PERCENT UTILIZED	NUMBER UTILIZED	PERCENT UTILIZED
Little Tokyo	302	134	44%	1999	143	47%	158	52%
First/Boyle	453	275	61%	1999	294	65%	325	72%
Brooklyn/Soto	793	619	78%	1999	662	83%	730	92%
First/Lorena	646	323	50%	1999	345	53%	381	59%
Whittier/Rowan	592	395	67%	2007	454	77%	466	79%
Whittier/Arizona	888	406	46%	2007	467	53%	479	54%
Whittier/Atlantic	815	452	56%	2007	520	64%	533	65%
Total	4,489	2,604	58%		N/A	N/A	3,072	68%

Note: N/A -- Total does not apply since years of analysis vary by station.

Source: Meyer, Mohaddes Associates, Inc., 1994.

3-3.3 CONSTRUCTION-RELATED PARKING IMPACTS

Construction of the LPA would entail the elimination of some existing on-street and off-street parking spaces in the vicinity of stations. In addition, additional parking demand would occur due to construction workers. The following sections describe the analysis of construction-related parking losses and the parking demand anticipated from construction workers. Anticipated off-street parking losses are discussed first, followed by on-street parking losses. Demand for parking by construction workers is then analyzed.

3-3.3.1 Construction-Related Off-Street Parking Loss

Construction of the LPA would eliminate some existing on-street parking spaces in the vicinity of stations due to construction activity. Some spaces would be removed when decking is installed and again when streets are restored (See Section 4-18.1). Other spaces would be removed for the full four-year construction period.

In most cases, not only would the parking be removed, but also the associated buildings that use the parking. Overall, minimal parking impacts occur when both the parking spaces and the associated demand for those parking spaces are removed.

A total of approximately 383 off-street spaces are forecast to be removed. The associated land uses for 369 of those spaces are also anticipated to be removed. Therefore, the net impact of off-street parking loss is expected to be 14 spaces spread over two stations. Table 3-3.3 illustrates the estimated loss of off-street parking spaces by station, including those with and without removal of associated land uses.

TABLE 3-3.3: CONSTRUCTION-RELATED, OFF-STREET BUSINESS PARKING LOSS

STATION	SPACES TO BE REMOVED -- LAND USE REMOVED	SPACES TO BE REMOVED -- LAND USE REMAINS	TOTAL SPACES REMOVED
Little Tokyo	6	0	6
First/Boyle	19	4	23
Brooklyn/Soto	52	0	52
First/Lorena	28	0	28
Whittier/Rowan	28	0	28
Whittier/Arizona	88	10	98
Whittier/Atlantic	148	0	148
Total	369	14	383

Source: Meyer, Mohaddes Associates, Inc., 1994.

Two stations are expected to lose some off-street business parking without removal of the associated land uses:

- First/Boyle - 4 spaces lost during decking and street restoration in a parking lot east of Boyle Avenue and south of First Street (currently serving a laundromat).

- Whittier/Arizona - 10 spaces lost during entire construction period in lot north of Whittier Boulevard, between McBride Avenue and McDonnell Avenue.

Loss of the other off-street spaces would have a minimal impact on overall parking availability, because the land uses associated with these spaces would also be removed.

3-3.3.2 <u>Construction-Related On-Street Parking Loss</u>

Some on-street spaces would also be removed due to the project. Most of these spaces would be lost for either six months (due to decking and street restoration) or the full four year construction period, with a small percentage removed permanently. Table 3-3.4 illustrates the on-street parking removal by station and by duration.

The data in the table show that approximately 267 on-street spaces are expected to be removed at each of the LPA stations for varying time periods. The station with the highest expected parking loss is Whittier/Rowan with approximately 52 on-street spaces removed, while the lowest impacts are expected at Whittier/Arizona and Brooklyn/Soto with approximately 24 spaces removed for each. In summary, the following on-street parking loss due to the construction of the LPA is expected:

- During deck placement and subsequently during street restoration - 267 spaces removed.

- Remainder of four year construction period - 186 spaces removed (each station affected).

- Permanent removal - 9 spaces removed (First/Boyle Station affected). At this location, 11 new spaces are proposed as part of the Mariachi Plaza project, however.

Figures 3-3.8 through 3-3.14 illustrate on-street parking loss by duration and by street location for each station.

3-3.3.3 <u>Construction Worker Parking Impacts</u>

Construction worker parking demand will result from each phase of the construction process, including relocation of buried utility lines, demolition (where applicable), excavation and station construction. Workers will require parking at each station, with the amount of parking required depending on the type of construction operation. The relocation of utility lines and demolition will require less parking than either excavation or station construction. Both excavation and station construction are estimated to require up to 50 worker automobiles per shift. To analyze the worst case impacts of construction worker parking, it was assumed that there could be a shift change during the peak hour of local parking demand, resulting in 50 inbound workers and 50 outbound workers. Since these construction phases will not occur simultaneously, the maximum worker population at any one time is estimated to be 50 workers.

TABLE 3-3.4: CONSTRUCTION-RELATED PARKING SPACE LOSS SUMMARY

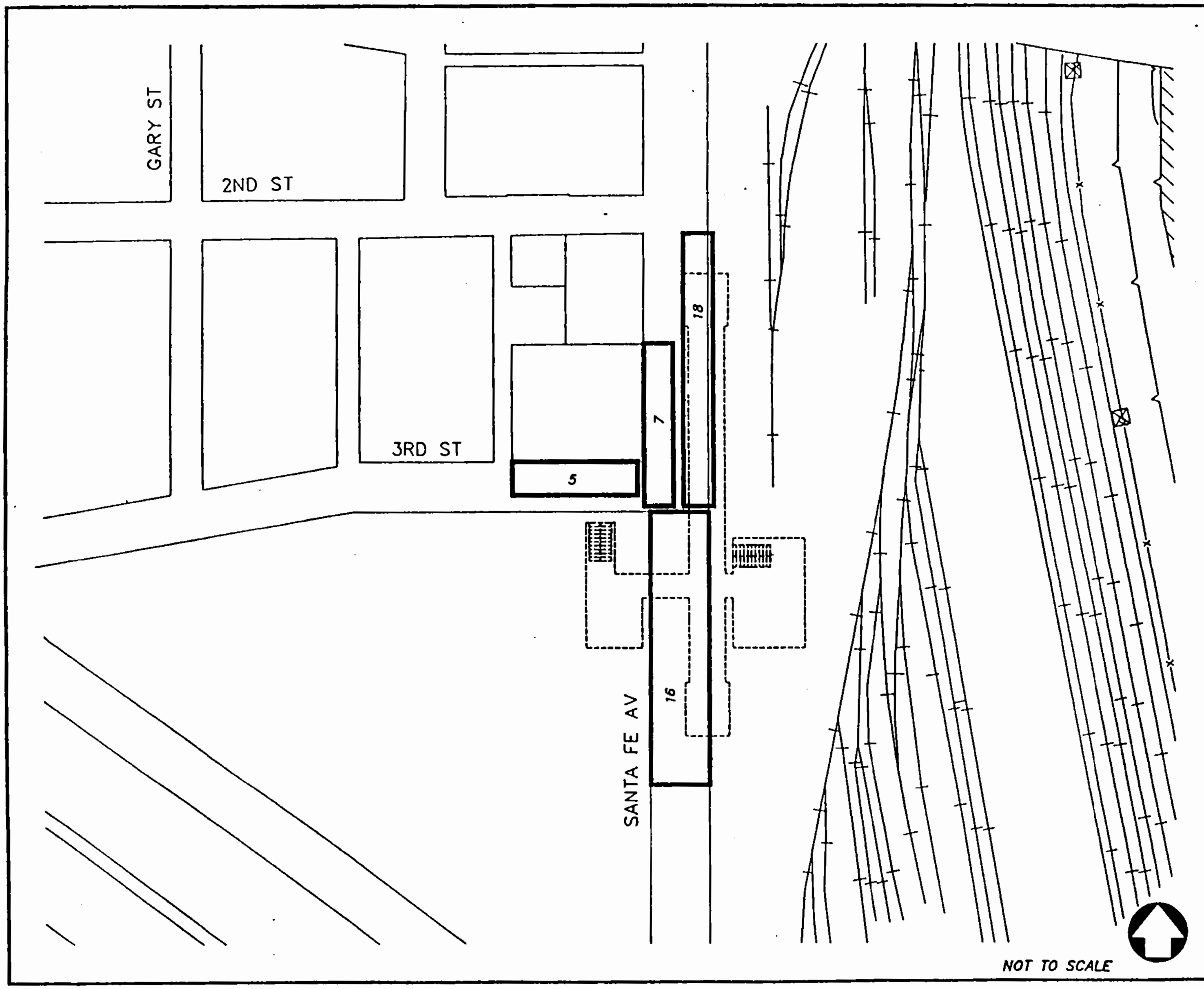
STATION	STREET SEGMENT	LOCATION (BETWEEN WHICH STREETS)	ON-STREET SPACES REMOVED BY DURATION		OFF-STREET SPACES REMOVED
			During Decking Installation and Street Restoration[a]	Remainder of Construction Period	
Little Tokyo	Santa Fe Ave.	2nd St. and 3rd St.	25	25	
	Santa Fe Ave.	South of 3rd	16	16	
	Third St.	Vignes St. and Santa Fe Ave.	5	5	
Subtotal			*46*	*46*	
First/Boyle	Pennsylvania Ave.	Echandia St. and Bailey St.	7	7	
	Bailey St.	1st and Pennsylvania	12	12	
	Pleasant St.[b]	Boyle Ave. and Bailey St.	9[b]	9[b]	
	Boyle Ave.	South of 1st St.	6	6	
	Bodie St.	South of 1st St.	10	10	
Subtotal			*44*	*44*	*4*
Brooklyn/Soto	Soto St.	Brooklyn Ave. and Michigan	3	3	
	Matthews St.	Brooklyn Ave. and Michigan	15	15	
	Fickett St.	Brooklyn Ave. and Michigan	6	6	
Subtotal			*24*	*24*	*25*
First/Lorena	1st Street	Concord St. and Cheesbrough	44	0	
Subtotal			*44*	*0*	
Whittier/Rowan	Whittier Blvd.	Townsend Ave. and Gage Ave.	38	23	
	Rowan Ave.	Whittier Blvd. and Verona St.	8	8	
	Eastman Ave.	Whittier Blvd. and Verona St.	6	6	
Subtotal			*52*	*37*	
Whittier/Arizona	Whittier Blvd.	McDonnell Ave. and Arizona	4	4	
	Duncan Ave.	Whittier Blvd. and Hubbard St.	2	2	
	McBride Ave.	Whittier Blvd. and Hubbard St.	6	6	
	McDonnell Ave.	Whittier Blvd. and Hubbard St.	7	7	
	Arizona Ave.	Whittier Blvd. and Hubbard St.	5	5	
Subtotal			*24*	*24*	*10*
Whittier/Atlantic	Whittier Blvd.	Vancouver Ave. and Atlantic	22		
	Atlantic Blvd.	Whittier Blvd. and Louis Pl.	6	6	
	Oakford Ave.	Whittier Blvd. and Percy St.	5	5	
Subtotal			*33*	*11*	
Total All Stations			267	186	39

Note: [a] Duration of loss varies from 3 to 3.5 months at beginning of construction and from 3 to 3.5 months at end for purposes of installing and removing decking.
[b] Nine spaces are permanently lost due to the project at this station; however, the current Mariachi Plaza design calls for 11 parking spaces in the same location.

Source: Meyer, Mohaddes Associates, 1994.

METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

LITTLE TOKYO
STATION VICINITY



LEGEND

LOSS		
46	(solid box)	TEMPORARY PARKING REMOVAL (4 YEAR CONSTRUCTION PERIOD)
0	(dash-dot box)	TEMPORARY PARKING REMOVAL (DURING DECKING AND STREET RESTORATION)
0	(dashed box)	PERMANENT PARKING REMOVAL

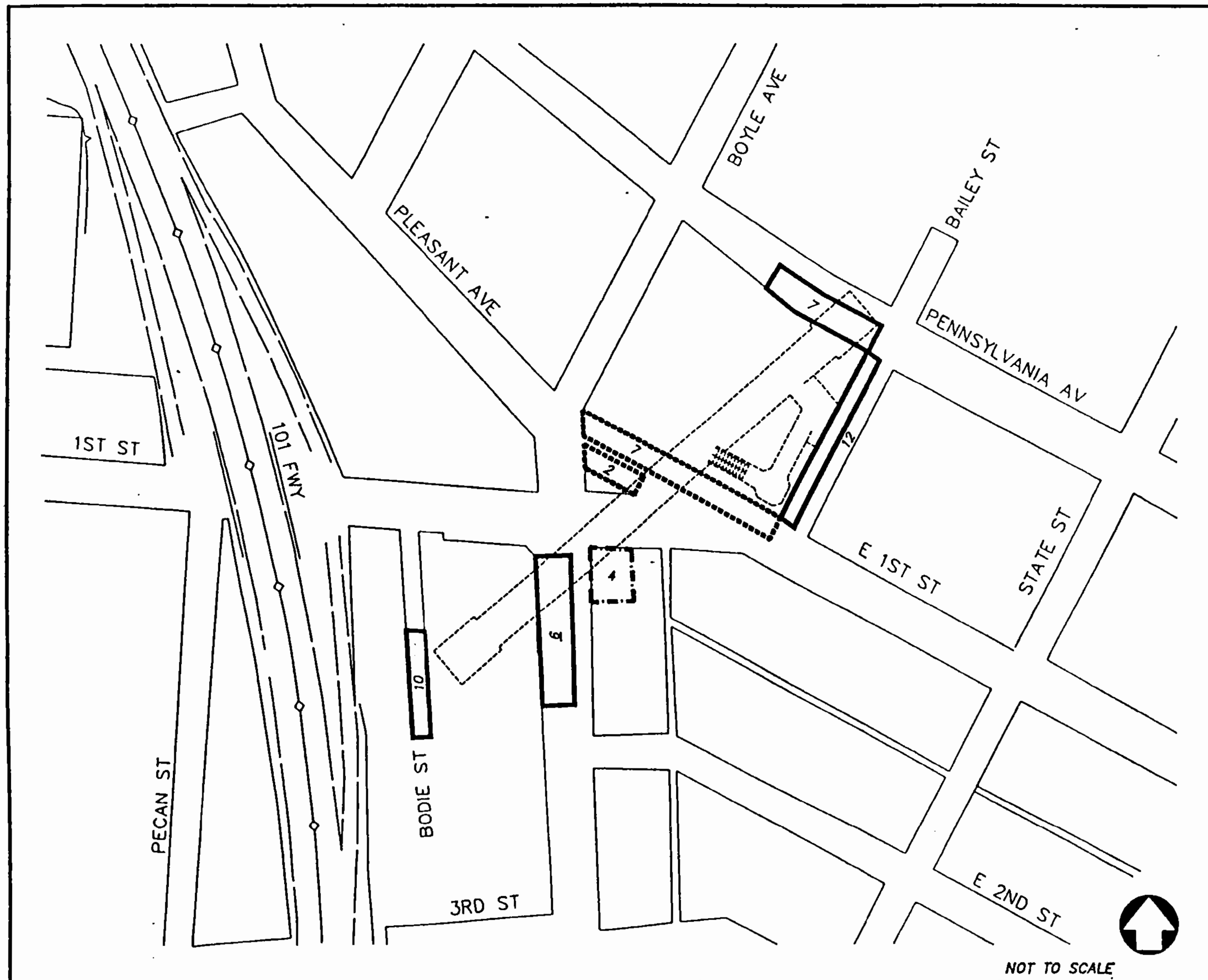
TOTAL PARKING REMOVAL = 46 ON-STREET SPACES

Figure 3-3.8
Estimated
Parking Loss

Los Angeles County
Metropolitan Transportation
Authority

METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

FIRST/BOYLE STATION VICINITY



LEGEND

LOSS		
35	(solid box)	TEMPORARY PARKING REMOVAL (4 YEAR CONSTRUCTION PERIOD)
4	(dash-dot box)	TEMPORARY PARKING REMOVAL (DURING DECKING AND STREET RESTORATION)
9	(dotted box)	PERMANENT PARKING REMOVAL

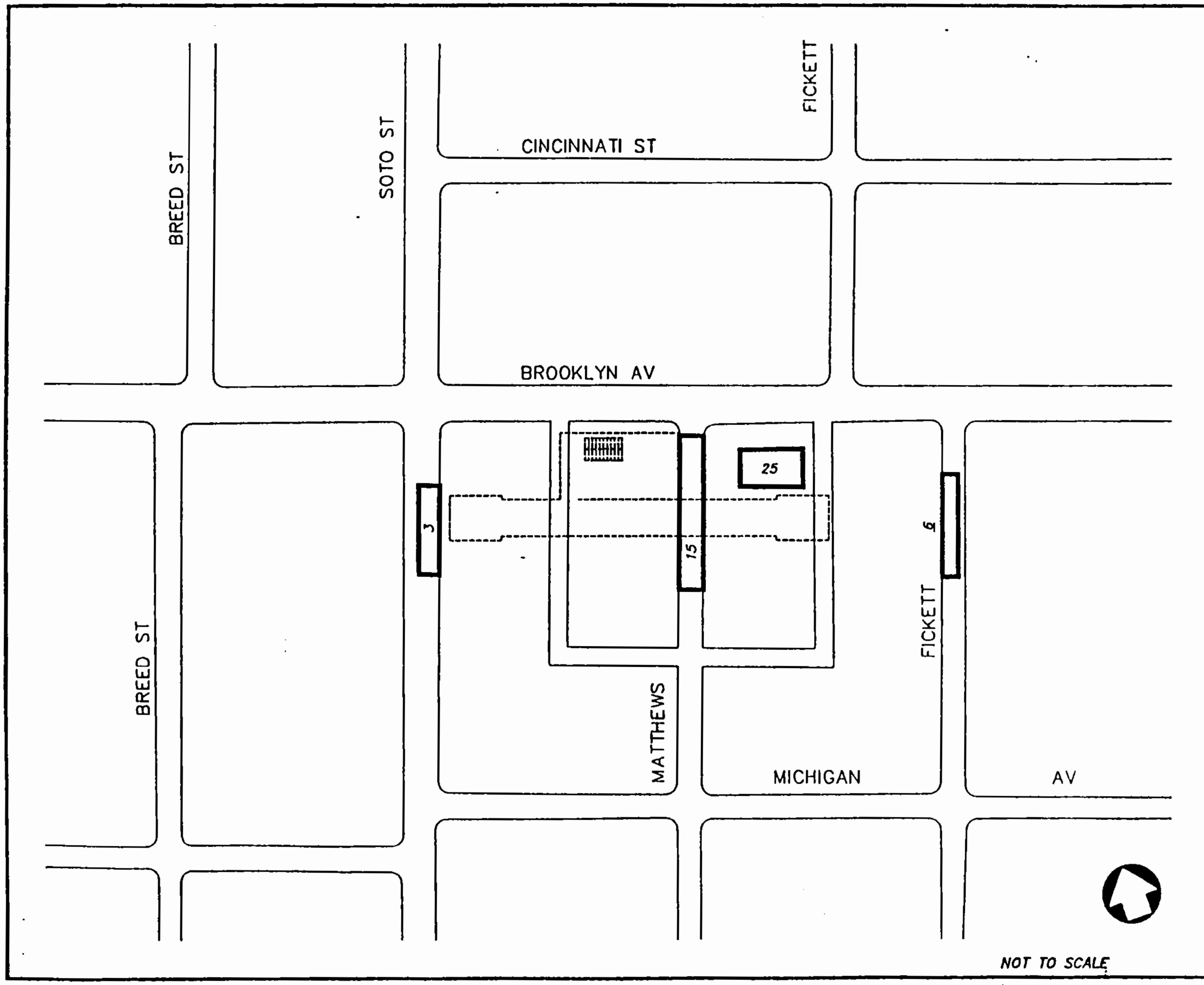
TOTAL PARKING REMOVAL = 44 ON-STREET SPACES
4 OFF-STREET SPACES

Figure 3-3.9
Estimated Parking Loss

Los Angeles County Metropolitan Transportation Authority

METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

BROOKLYN/SOTO STATION VICINITY



LEGEND

LOSS		
49	(solid box)	TEMPORARY PARKING REMOVAL (4 YEAR CONSTRUCTION PERIOD)
0	(dash-dot box)	TEMPORARY PARKING REMOVAL (DURING DECKING AND STREET RESTORATION)
0	(dashed box)	PERMANENT PARKING REMOVAL

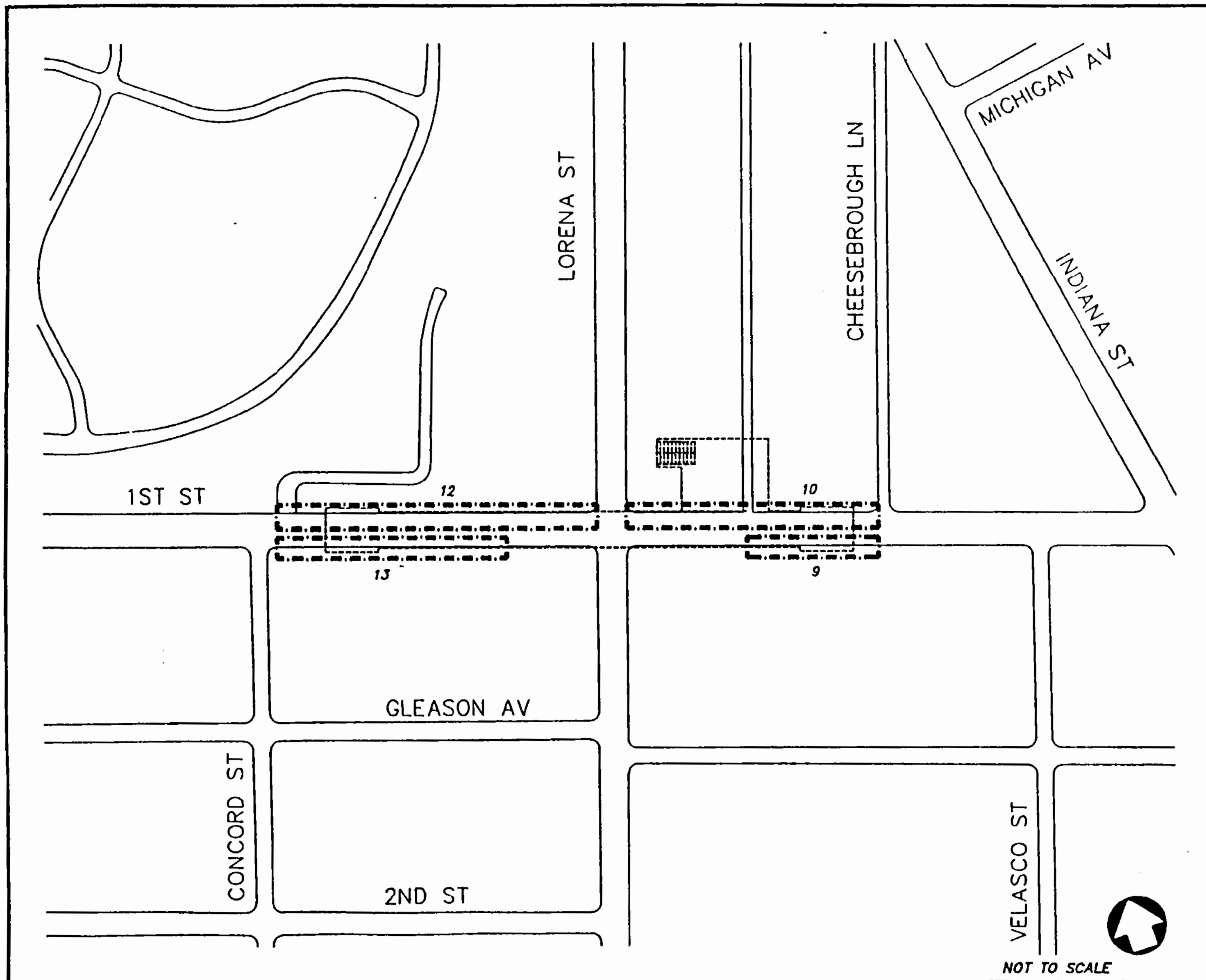
TOTAL PARKING REMOVAL = 24 ON-STREET SPACES
25 OFF-STREET SPACES

Figure 3–3.10
Estimated Parking Loss

Los Angeles County Metropolitan Transportation Authority

METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

FIRST/LORENA STATION VICINITY



LEGEND

LOSS		
0	(solid box)	TEMPORARY PARKING REMOVAL (4 YEAR CONSTRUCTION PERIOD)
44	(dash-dot box)	TEMPORARY PARKING REMOVAL (DURING DECKING AND STREET RESTORATION)
0	(dashed box)	PERMANENT PARKING REMOVAL

TOTAL PARKING REMOVAL = 44 ON-STREET SPACES

Figure 3-3.11
Estimated Parking Loss

Los Angeles County Metropolitan Transportation Authority

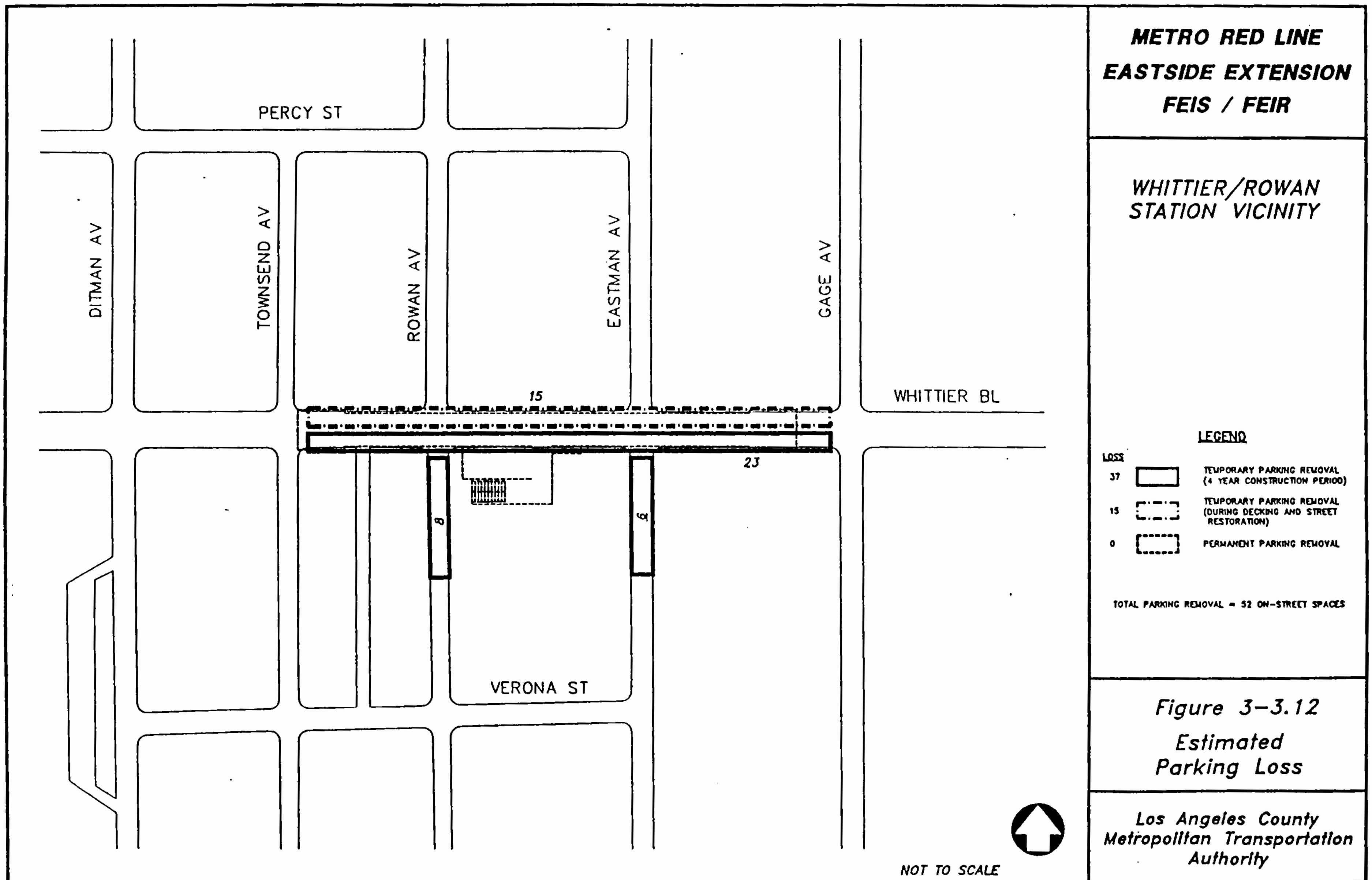
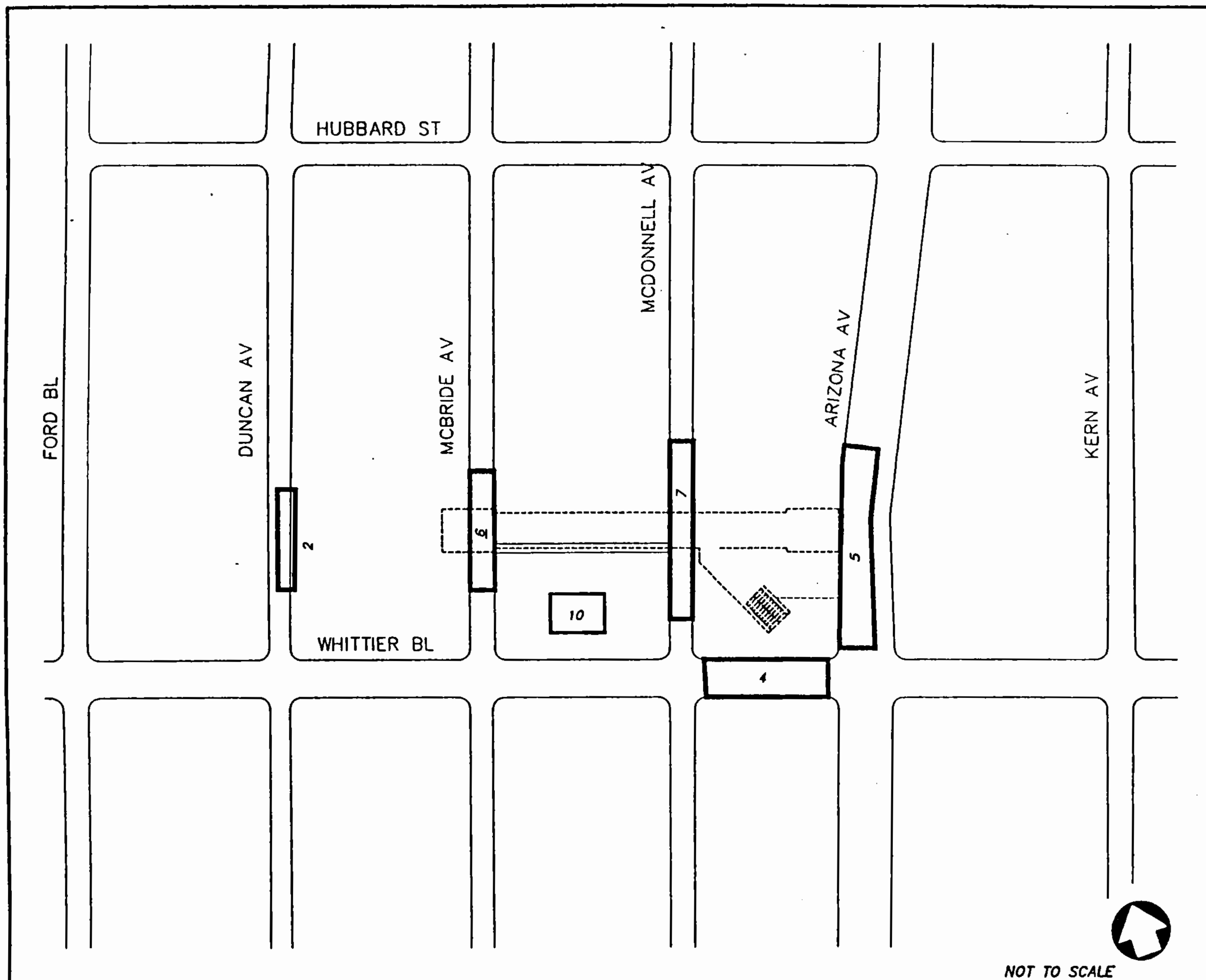


Figure 3-3.12
Estimated Parking Loss

Los Angeles County Metropolitan Transportation Authority



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ARIZONA
STATION VICINITY

LEGEND

LOSS		
34	(solid box)	TEMPORARY PARKING REMOVAL (4 YEAR CONSTRUCTION PERIOD)
0	(dash-dot box)	TEMPORARY PARKING REMOVAL (DURING DECKING AND STREET RESTORATION)
0	(dashed box)	PERMANENT PARKING REMOVAL

TOTAL PARKING REMOVAL = 24 ON-STREET SPACES
10 OFF-STREET SPACES

Figure 3-3.13
Estimated
Parking Loss

Los Angeles County
Metropolitan Transportation
Authority

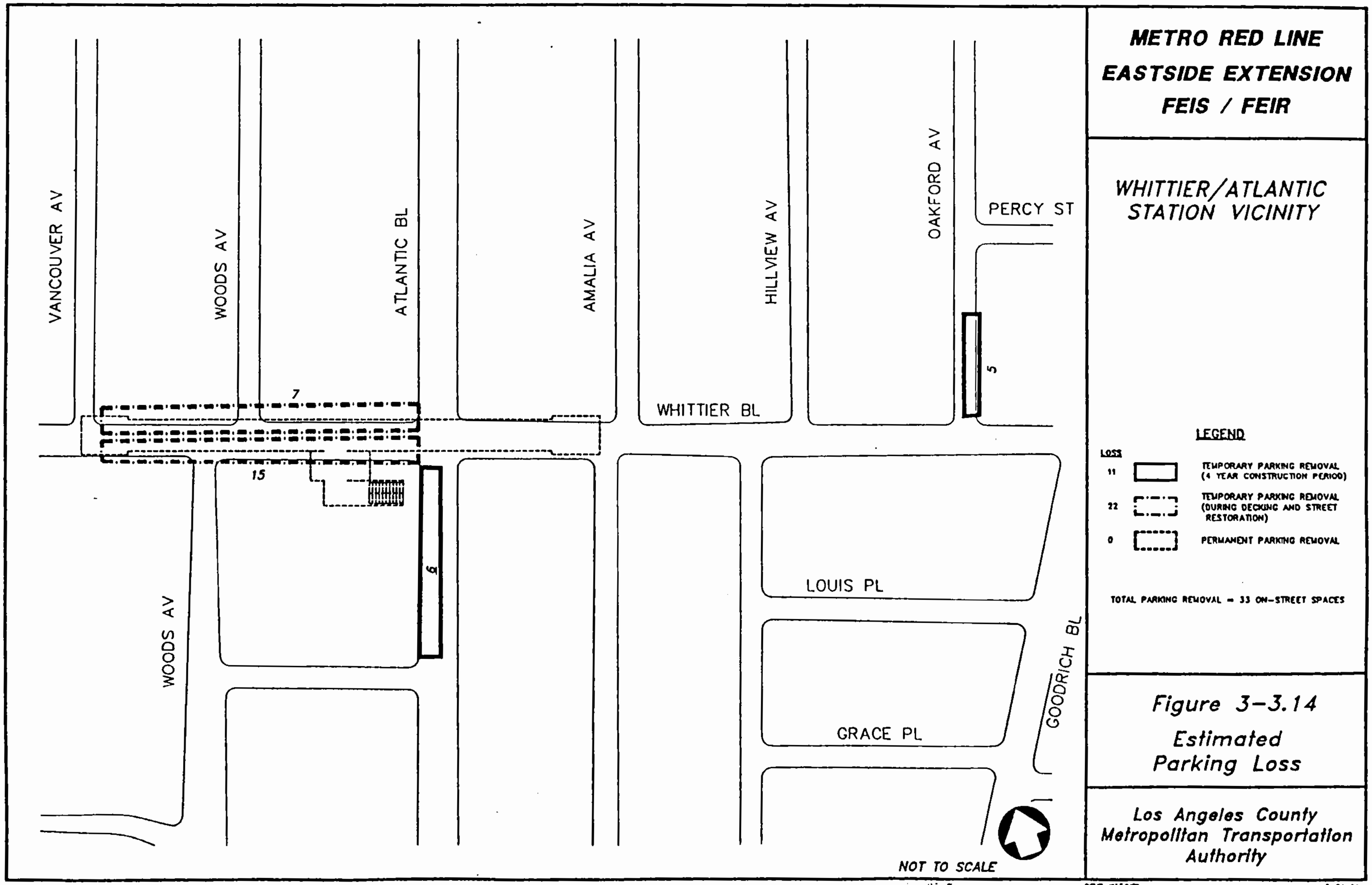


Figure 3-3.14
Estimated Parking Loss

Assuming that 75 percent of the workers overlap temporarily during shift change, there could be a maximum parking demand of 75 vehicles (50 workers leaving, 50 workers arriving, 75 percent overlap). This situation would only occur for very short periods. Throughout most of the day, the maximum worker parking demand would be 50 vehicles. Typically, worker parking demand would be lower because this represents a worst case assumption of short-term peak construction activity.

3-3.3.4 <u>Summary of On- and Off-Street Parking Affected by Project Construction</u>

Table 3-3.5 summarizes construction-related parking impacts estimated for each station. Impacts due to both construction-related parking loss as well as increased demand due to workers are summarized.

No standard criteria have been established either through CEQA or by local jurisdictions, to define when a parking loss becomes significant. Eighty percent parking utilization is, however, often used as a description of when parking demand is nearing effective capacity. Beyond this level of utilization, it becomes more difficult to find convenient parking and motorists are forced to search for parking near their destination. Therefore, for purposes of this analysis, a significant parking impact under CEQA is defined for any station area where the project will cause parking utilization to exceed 80 percent, or where it causes any loss of parking or increased demand where utilization will already exceed 80 percent.

The results of the analysis, as displayed in Table 3-3.5 indicate that one station area, Brooklyn/Soto, is expected to experience a parking shortage in the future due to general growth before the project. Before the project, parking occupancy around that station is forecast at 84 percent utilization.

With the loss of parking estimated due to project construction by time period, two stations are forecast to experience parking demand exceeding 80 percent. Those locations are:

- Brooklyn/Soto - parking utilization of 90 percent during construction.
- Whittier/Rowan - parking utilization ranging from 82 to 84 percent during construction.

With the addition of construction worker parking demand, three stations are expected to be significantly affected with parking utilization rates exceeding 80 percent. Those stations are:

- First/Boyle - parking utilization ranging from 82 to 83 percent with worker parking demand.
- Brooklyn/Soto - parking utilization of 96 percent with worker parking demand.
- Whittier/Rowan - parking utilization of 82 to 84 percent with worker parking demand.

TABLE 3-3.5: CONSTRUCTION-RELATED PARKING IMPACTS

STATION	EXISTING			CONSTRUCTION PERIOD FUTURE NO-BUILD		PARKING LOSS		PEAK UTILIZATION WITH LOSS OF PARKING		WORKER PARKING DEMAND	PEAK UTILIZATION WITH LOSS OF PARKING AND WORKER PARKING DEMAND	
	1992 Existing Supply	1992 Peak Utilization	1992 Percent Utilization	Peak Utilization	Percent Utilization	During Decking & Street Restoration	Remainder Construct. Period	During Decking & Street Restoration	Remainder Construct. Period		During Decking & Street Restoration	Remainder Construct. Period
Little Tokyo	302	134	44%	143	47%	46	46	56%	56%	50	75%	75%
First/Boyle	453	275	61%	294	65%	39	35	71%	70%	50	83%	82%
Brooklyn/Soto	793	619	78%	662	83%	49	49	90%	90%	50	96%	96%
First/Lorena	646	323	50%	345	53%	44	0	57%	53%	50	66%	58%
Whittier/Rowan	592	395	67%	454	77%	52	37	84%	82%	50	93%	91%
Whittier/Arizona	888	406	46%	467	53%	34	34	55%	55%	50	61%	61%
Whittier/Atlantic	815	452	56%	520	64%	33	11	66%	65%	50	73%	71%
TOTALS	4,489	2,604	58%	N/A	N/A	297	219	N/A	N/A	N/A	N/A	N/A

N/A -- Total does not apply since years of analysis vary by station.

Source: Meyer, Mohaddes Associates, 1994.

It is important to note that all estimates of parking supply and parking loss are approximate values. The exact number of spaces available may vary slightly from the values shown due to the mix of large and small vehicles using on-street spaces. This is especially true for unmarked curbside parking. Where no vehicles were observed and no parking stripes are provided, the parking supply was estimated using an assumption of one space per 20 linear feet of curb (excluding red zones, driveways, and fire hydrants). A vehicle mix with a significant proportion of larger vehicles (trucks, vans, etc.) or smaller vehicles (compact cars, motorcycles) may result in an effective supply that is slightly larger or smaller than the estimates indicate. For environmental analysis purposes, however, the estimated supply values are sufficient to provide a realistic evaluation of impacts.

3-3.4 LONG-TERM OPERATION-RELATED PARKING IMPACTS

In addition to construction period parking impacts, the other type of potential project-related parking impact is from the additional parking demand due to park-and-ride patrons once the system is operational. Parking facilities are planned for terminal stations of IOS-2 and the LPA, specifically at the First/Lorena station and the Whittier/Atlantic station. Up to 500 spaces are anticipated at the First/Lorena station and up to 1,200 spaces are expected for the Whittier/Atlantic station. To provide these maximum numbers of spaces, multi-story parking structures would be required. Surface parking is programmed to be provided at these two stations initially.

Construction of multi-story parking structures for provision of additional spaces beyond those that can be accommodated by surface facilities would depend upon the ultimate need, as the Red Line system matures over time, for such facilities and the availability of funding to construct these structures.

It should be noted that the provision of multi-story parking at the two terminal stations and the number of spaces ultimately provided for by such facilities could be offset by each or some combination of the following factors:

- Joint development of shared parking facilities,
- Implementation of expanded feeder bus lines beyond those identified earlier in this Chapter, should the demand for such service increase become evident,
- Implementation of employer provided and other public/private shuttle bus and jitney services linking the station to major employment, shopping, residential and institutional destination,
- Programs to increase reverse commute and off-peak transit ridership,
- Development of park-and-ride facilities elsewhere, and
- Increased availability and utilization of other on-street and off-street public or private parking.

System operation-related impacts on station area parking can result from the "spillover" of rail patron parking into the surrounding neighborhood. Spillover may result from a shortage of parking at the park-and-ride stations and/or demand for parking at stations where no parking facility is planned. In general, park-and-ride spillover is not anticipated at stations with parking facilities (First/Lorena and Whittier/Atlantic) since the number of parking spaces to be provided was based on a parking demand analysis using the Red Line patronage forecasting model. The number of spaces was then proposed to fully serve the forecast demand, as described below.

3-3.4.1 Estimation of LPA Long-Term Park-and-Ride Facility Demand

To estimate peak park-and-ride parking facility demand, the number of park-and-ride person trips were first converted to vehicle trips by applying an auto occupancy factor of 1.10 (park-and-ride person trips and vehicle trips are shown in Section 3-1.4 and Section 3-2.2.2). The 1.10 factor is consistent with assumptions developed by the Southern California Association of Governments (SCAG) for estimating auto occupancy in Los Angeles County. Based on this factor, 243 vehicular park-and-ride trips during the AM peak hour and approximately 2,450 vehicular park-and-ride trips daily are forecast at the Whittier/Atlantic station. These numbers were derived as follows:

- 267 AM peak hour park-and-ride patron trips ÷ 1.10 persons per vehicle = 243 trips
- 2,691 daily park-and-ride patrons trips ÷ 1.10 persons per vehicle = 2,446 trips

Next, it was assumed that approximately 85 percent of the AM peak hour trips would arrive and park throughout the day. In addition, it was assumed that approximately 35 percent of the remaining daily park-and-ride trips (occurring outside the AM peak hour) would also need to be accommodated. Based on these factors, the peak park-and-ride parking demand at the Whittier Boulevard/Atlantic Boulevard Station is forecast to be approximately 980 parking spaces. This number is derived as follows:

- 243 AM peak hour vehicle trips X 85% = 207 parked vehicles
- 2,203 daily vehicle trips (remainder of the day) X 35% = 771 parked vehicles
- 207 parked vehicles in AM peak + 771 parked vehicles in the remainder of the day = 978 parked vehicles

The proposed number of parking spaces at this park-and-ride station is 1,200. This capacity covers the 978 approximate demand with excess capacity to cover the variability of traffic forecasts and parking demand forecast methodology.

MTA will establish a program with electrical suppliers to accommodate electrical vehicle parking at MTA transit facilities. The program will provide for battery charging within stations with park-and-ride lots.

3-3.4.2 Estimation of IOS-2 Long-Term Park-and-Ride Facility Demand

Park-and-ride facilities are proposed to be provided for IOS-2 at the First/Lorena Station. The number of proposed parking spaces for that station is up to 500. The park-and-ride person trips estimated from the patronage model are approximately 171 during the AM peak period and 1,261 daily park-and-ride access trips. Using similar methodology to estimate peak parking demand, as described above, estimated peak parking demand is approximately 479 parking spaces.

3-3.4.3 Long-Term Operation-Related Parking Impacts at Stations with No Park-and-Ride Facilities

Where parking facilities are planned (Whittier/Atlantic and First/Lorena), no parking spillover impacts are anticipated, because the number of spaces proposed at these stations is based on a parking demand analysis using the patronage forecasting model. At the remaining stations, however, it is possible that some unplanned, informal park-and-ride activities may result in parking intrusion in the immediately adjacent neighborhoods. To analyze this potential impact, the travel demand model was run both with and without assumed parking constraints at each station.

Model runs with parking constraints assumed that no parking would be physically available at the constrained stations; therefore, all rail patrons are assumed to arrive by modes other than park-and-ride. Model runs without parking constraints, however, assumed that unlimited parking would be available at the unconstrained stations. Therefore, the differences in the forecast patron demand between the constrained and unconstrained model runs represent the potential worst-case parking demand at each station.

Table 3-3.7 displays the results of the comparison of the constrained and unconstrained model runs for LPA stations that would not have proposed parking facilities. The estimated daily park-and-ride demand shown in the table is based on the difference between the constrained and unconstrained model forecasts.

TABLE 3-3.7: ESTIMATED LPA PARK-AND-RIDE IMPACTS WHERE NO PARKING FACILITIES ARE PLANNED

STATION	ESTIMATED PARK-AND-RIDE DEMAND (VEHICLES)		2010 NO-BUILD PARKING UTILIZATION		RESULTING 2010 PEAK PARKING UTILIZATION WITH PROJECT	
	DAILY	PEAK HOUR	SPACES	PERCENT	SPACES	PERCENT
Little Tokyo	382	134	158	52%	292	97%
First/Boyle	121	42	325	72%	446	98%
Brooklyn/Soto	145	51	708	92%	853	>100%
Whittier/Rowan	350	123	466	79%	816	>100%
Whittier/Arizona	305	107	479	54%	784	88%

Source: Meyer, Mohaddes Associates, based on patronage forecasts produced by ICF Kaiser, 1994.

The highest hour is based on the assumption that approximately 35 percent of total daily demand would occur at the highest single hour of parking demand. This factor is based upon the First/Lorena and Whittier/Atlantic station analyses which indicate peak hour demand of 35 percent of daily park-and-ride demand. The Institute of Transportation Engineers Technical Council on Transit Station Access published a report which indicates that 20 percent of daily vehicle demand can be assumed as peak hour demand. Compared to that factor, the 35 percent assumption is considered to be conservative.

The analysis results in the table indicate that informal park-and-ride activity in the vicinity of stations where no parking facility is planned would have a significant affect on local parking availability. It is important to note, however, that this analysis represents a very conservative, worst-case scenario; because the unconstrained patronage forecasting model runs did not include any constraints on park-and-ride activity at any station. In reality, it is anticipated that a portion of the rail patrons would use other means of gaining access to LPA stations if they find that local parking is not readily available.

Due to the potential for this spillover parking impact, however, mitigation measures are required to reduce the possible impact of rail system parking demand from causing parking intrusion problems in adjoining neighborhoods.

3-3.4.4 IOS-1 Long-Term Operation-Related Parking Impacts

Potential long-term operation-related parking impacts due to IOS-1 are different than those described previously in this section because no parking facility is planned for the terminal station of IOS-1 (First/Boyle). Using the assumptions described above (35 percent of daily demand equals peak parking demand), IOS-1 would generate a peak local parking demand of approximately 733 vehicles at the First/Boyle terminal station. This is based on the difference between the constrained and unconstrained daily model runs, factored by 35 percent to reflect the peak parking demand. This level of parking would produce a significant effect without appropriate parking mitigation measures.

3-3.5 PARKING MITIGATION

3-3.5.1 Construction Related Parking Mitigation

Parking utilization is projected to exceed 80 percent of supply in the First/Boyle and Brooklyn/Soto station areas due to loss of parking from construction. Parking utilization is projected to exceed 80 percent of supply in the Whittier/Rowan station area due to loss of parking combined with worker parking demand. Replacement parking is therefore required for construction-related parking impacts at these three stations. These impacts should be mitigated to pre-project levels, or to the minimum acceptable level of 80 percent utilization, whichever is higher.

Therefore, at a minimum, the following replacement parking will be provided:

- First/Boyle - Provide enough new spaces or park enough workers off-site to bring utilization levels to 80 percent. This equals a minimum of 14 replacement spaces during decking/street restoration and 9 during the remainder of the construction period.

- Brooklyn/Soto - Provide enough new spaces and/or park enough workers off-site to bring utilization to pre-project levels (84 percent). This equals 99 spaces.

- Whittier/Rowan - Provide enough new spaces or park enough workers off-site to bring utilization to 80 percent. This equals a minimum of 77 spaces during decking/street restoration and 65 spaces for the remainder of the construction period.

The exact location and design of such parking will be determined by MTA in cooperation with affected land owners and through the station area planning effort that is on-going. MTA acquired property may be used, or land may be leased for these parking spaces.

In addition, all other station locations should be regularly monitored during the period of construction to determine if parking conditions change considerably, thereby requiring mitigation. Parking utilization should also be monitored in the vicinity of the remaining stations during construction to determine if parking loss and/or construction worker parking demand affect local residents or businesses. Although the parking demand analysis indicates that parking utilization is not expected to exceed 80 percent at the remaining stations, conditions should be monitored in case conditions change or more parking demand is experienced then expected based on this analysis.

3-3.5.2 Operations-Related Parking Mitigation

Long term operation-related parking impacts would primarily occur at stations where parking facilities are not proposed. The impacts would be in the form of rail patron use of local parking. MTA supports employer-sponsored rideshare and transit incentive programs to reduce potential parking usage, consistent with Regulation XV of the South Coast Air Quality Management District and the MTA and County of Los Angeles Congestion Management Plans.

The following measures have been identified to mitigate potential parking impacts in the LPA study area. Many of these measures would require participation of public agencies and private parties to implement.

- Conduct periodic studies of potential parking intrusion in neighborhoods adjacent to station areas. If intrusion is determined to be occurring, establish preferential parking districts within residential neighborhoods adjacent to the station areas.

- Provide bicycle parking at all stations to accommodate modes of transportation alternative to the automobile.

- Include preferential parking for carpools and vanpools at park-and-ride facilities.

- The City and County of Los Angeles should provide a mix of metered and unmetered curb spaces in commercial areas adjacent to the stations in order to reserve some on-street spaces for short term use by customers of commercial establishments.

- The City and County of Los Angeles should provide parking enforcement against potential parking intrusion into adjacent private commercial parking.

CHAPTER 4: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter evaluates the environmental setting, impacts and mitigation measures associated with the alternatives identified in Chapter 2. For a discussion of transit, transportation and parking impacts and mitigation, see Chapter 3.

4-1 LAND USE AND DEVELOPMENT

4-1.1 REGIONAL SUMMARY

The Locally Preferred Alternative (LPA) is located in the eastern part of the greater Los Angeles basin and extends eastward from downtown Los Angeles to Atlantic Boulevard in East Los Angeles, traversing the City of Los Angeles and unincorporated Los Angeles County. The LPA is not expected to have a significant growth inducing effect under CEQA on the amount of regional development in the greater Los Angeles area; it may, however, influence the redistribution of regional growth.

4-1.2 STUDY AREA

4-1.2.1 Existing Land Uses

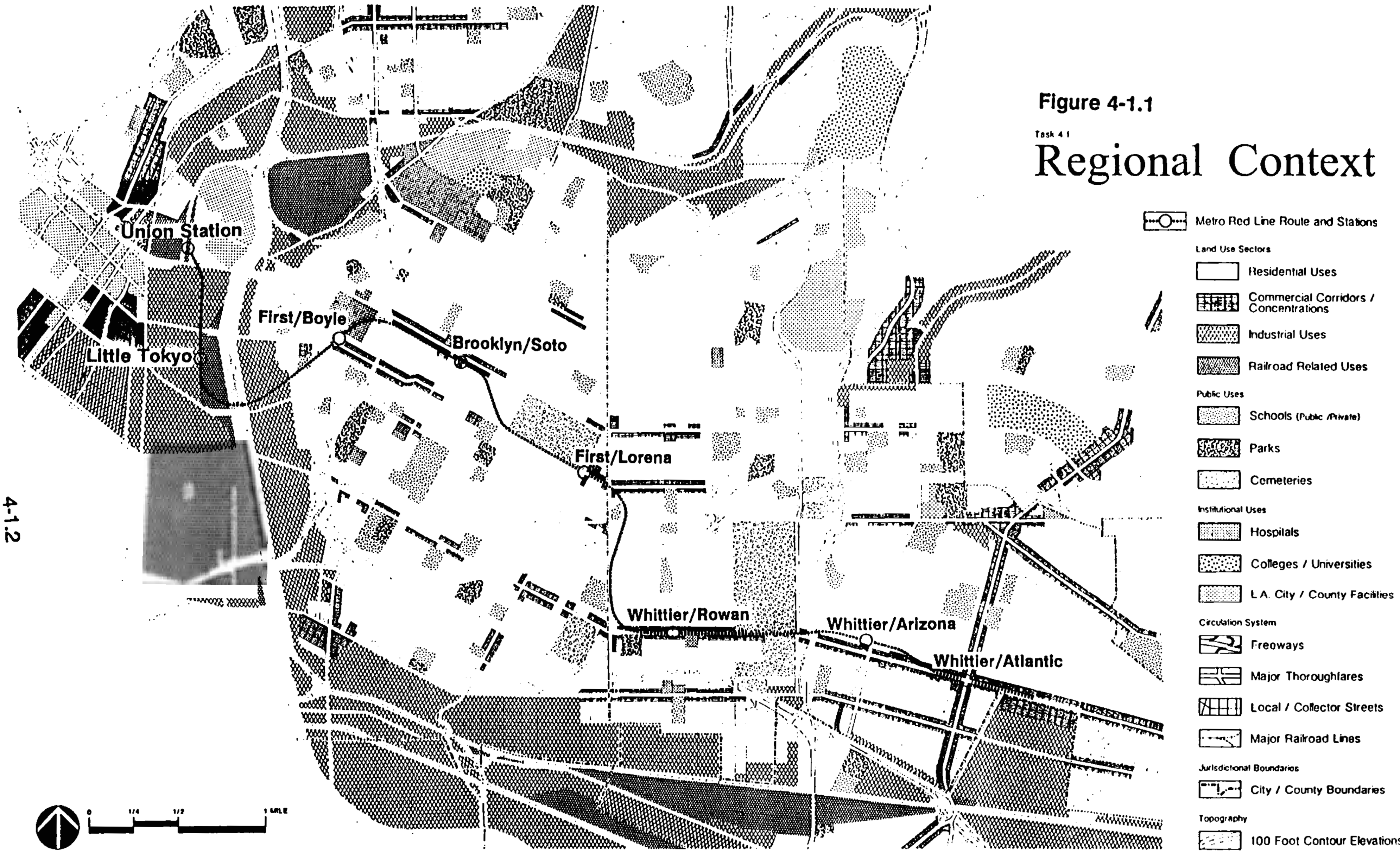
The Eastside Corridor study area is bounded by the I-10 freeway to the north, the I-5 freeway to the south, Garfield Avenue to the east and Alameda Street to the west. The LPA would be within the Boyle Heights and Central City North communities of the City of Los Angeles and the unincorporated Los Angeles County community of East Los Angeles.

The predominant land use in the study area is medium density residential, although scattered areas of high-density and single-family housing exist. Commercial areas are principally along Atlantic Boulevard and the major east-west streets of Brooklyn Avenue, First Street, Fourth Street and Whittier Boulevard. Commercial areas largely consist of "mom and pop" stores and neighborhood retail. Commercial activity extends along Atlantic Boulevard from the I-5 freeway to the Route 60 freeway. Along Brooklyn Avenue, commercial areas are concentrated between the I-5 freeway and Evergreen Avenue, between Indiana Street and Nevada Avenue and between the I-710 freeway and Mednick Avenue. Most commercial uses along First Street are located between Boyle Avenue and Soto Street and Indiana Street and Eastman Avenue. Along Whittier Boulevard, commercial activity extends from the I-5 freeway to Simmons Avenue, with the largest concentration located east of the I-710 freeway to Atlantic Avenue and between Goodrich Boulevard and Sadler Street (the Commerce Center). Generalized land uses for the area are shown in Figure 4-1.1.

Figure 4-1.1

Task 4.1

Regional Context



4-1.2.2 General Plan Summaries

General plans establish the framework and direction for future growth and development of a jurisdiction by describing the types and distribution of the necessary land uses to support a projected population, usually within a 20-year time frame. General plans typically include: (1) objectives for desired land uses within specified planning areas in the jurisdiction and (2) programs intended to achieve these objectives.

The City of Los Angeles is divided into 35 Community Planning Areas, each with a set of objectives regarding long-term intensity and desired land uses. The LPA would traverse the Boyle Heights and Central City North community plan areas of the City of Los Angeles.

The County of Los Angeles General Plan is also defined by community plan areas. The LPA would pass through the Los Angeles County unincorporated community of East Los Angeles. Figure 4-1.2 illustrates the jurisdictional boundaries of the community plan areas in the study area. The following sections examine the community and city plans for the areas affected by the project.

a. Central City North Community Plan

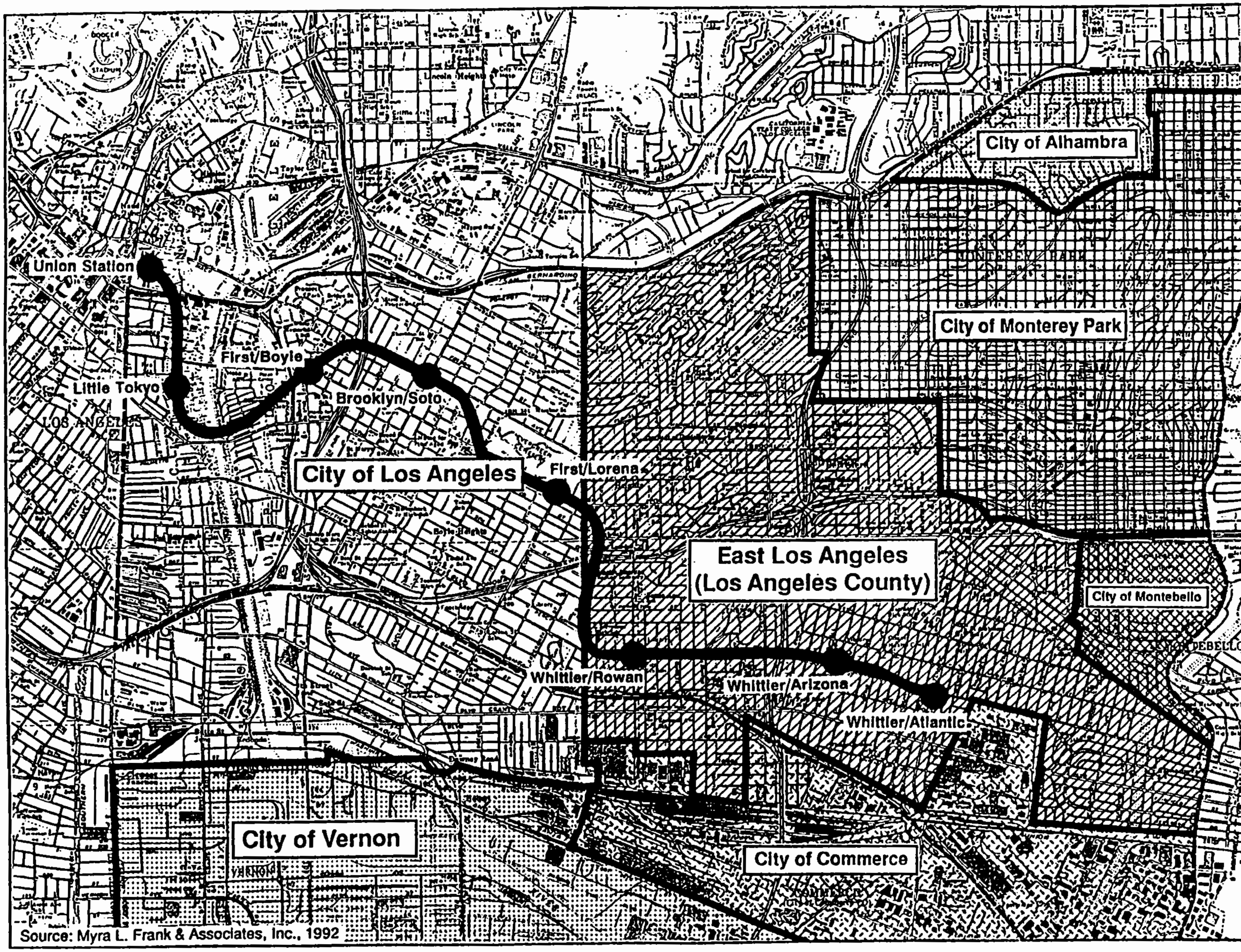
The Central City North Community Plan was adopted by the Los Angeles City Council in February, 1979 and has been amended through January 5, 1988. The Central City North planning area lies west of and adjacent to Boyle Heights, bordered by North Broadway and Lilac Street to the north, Alameda Street to the west, the Los Angeles River to the east and 25th Street to the south. With the exception of high-density, multi-family housing and commercial uses north of North Main Street, the area is designated for predominantly heavy industrial uses.

The Central City North area consists of seven neighborhood areas, each with its own program and objectives for land uses. The LPA would originate from Union Station in the Government Services neighborhood and proceed south, with a station near the Metro Rail yard, which is within the Little Tokyo East neighborhood.

The community plan for the Government Services area proposes to continue development of government facilities in the area and to redevelop Union Station to accommodate tourist-oriented commercial and cultural facilities and a transportation center, combining a variety of rail and bus services. The plan for the Little Tokyo East area proposes industrial activities and government service facilities of an industrial or service character and proposes to establish residential uses under specific plan guidance.

b. Boyle Heights Community Plan

The Boyle Heights Community Plan was adopted by the Los Angeles City Council on August 14, 1979 and has been amended to March 1991. The Boyle Heights community is approximately six square miles, located between the I-10 freeway to the north, 25th Street to the south, Indiana Street to the east and the Los Angeles River to the west. Within the study area portion of the community (between the I-10 and I-5 freeways), the community plan designations predominantly include low-to-medium density, multi- and single-family residences with community



Jurisdictional Boundaries

Figure 4-1.2

EASTSIDE CORRIDOR AA/DEIS/DEIR

commercial along the major east-west streets, particularly Brooklyn Avenue, First Street, Fourth Street and Whittier Boulevard. Designated areas of light and heavy industrial uses exist south of Olympic Boulevard and east of the I-5 freeway.

Major land use policies of the plan are: (1) to conserve and improve the area as a low- to medium-density residential community, (2) to support viable commercial development and (3) to upgrade the quality of service systems, public utilities and the overall environment. The plan population capacity is estimated at 98,322 persons. In 1990, the Boyle Heights population was 94,558.

Following the enactment of AB 283, which mandated that the City of Los Angeles make its zoning and community plan land use designations consistent with each other, the City of Los Angeles down-zoned the area contained within the Boyle Heights Community Plan. As a result, areas formerly zoned for high-density residential uses (R4 and R5) were rezoned to medium-density residential (R2 and R3) with the exception of a few institutional uses that retained their high density residential zoning. According to the Boyle Heights Community Plan, an R3 Medium-Density zoning category permits a maximum residential density of 40 dwelling units per acre. Despite this down-zoning, this area still exhibits one of the highest residential densities in the region.

c. Los Angeles County General Plan

The general goals and policies and land use elements of the County of Los Angeles General Plan were adopted by the Los Angeles County Board of Supervisors on November 25, 1980 and updated through December 29, 1987. The county planning area encompasses all unincorporated land within the Los Angeles County basin. The portion of the plan area relevant to the study area is approximately four miles east of downtown Los Angeles and is located between Indiana Street to the west, the Union Pacific railroad and Telegraph Road to the south, Valley Boulevard to the north and Garfield Avenue and Gerhart Avenue to the east. The plan area is surrounded by the City of Los Angeles to the north and west, the City of Commerce to the south, the City of Montebello to the southeast and the City of Monterey Park to the northeast. Predominant land use designations in the land use element of this area are low- to medium-density, multi-family and single-family housing with community commercial along such major streets as Brooklyn Avenue, First Street, Whittier Boulevard and Atlantic Boulevard.

Through its land use policies, the County General Plan seeks to preserve stable residential areas; locate low and moderate income housing within easy commuting range of multi- and single-purpose centers with high concentrations of employment; encourage residential infill at densities compatible with and slightly higher than those of surrounding uses; promote neighborhood commercial facilities that provide convenience goods and services and complement community character through appropriate scale, design and locational controls; promote improved economic and employment opportunities for youth, ethnic/racial minorities, women, the handicapped and the elderly; stimulate more intensive use of industrial sites, especially in areas requiring revitalization; emphasize development of an improved public transportation system that will support urban revitalization; and foster community identity and improve environmental quality through the compatible interrelation of a system of centers, major transportation facilities and open space areas.

4-1.2.3 Redevelopment Areas

The Community Redevelopment Agency (CRA) of the City of Los Angeles has designated two revitalization areas within the Boyle Heights Community. Boyle Heights I, adopted in 1978, is bordered by the I-10 freeway on the north, Soto Street on the east, First Street on the south and the U.S. 101 freeway to the west. Boyle Heights II, adopted in 1980, is bordered by the SR 60 freeway on the north, Olympic Boulevard on the south, Indiana Street on the east and Euclid Avenue on the west. CRA's primary objectives in both Boyle Heights I and II are residential rehabilitation and construction of new affordable units. The CRA provides funds for community improvements such as home repair loans and new or reconstructed sidewalks, curbs, gutters and street trees.

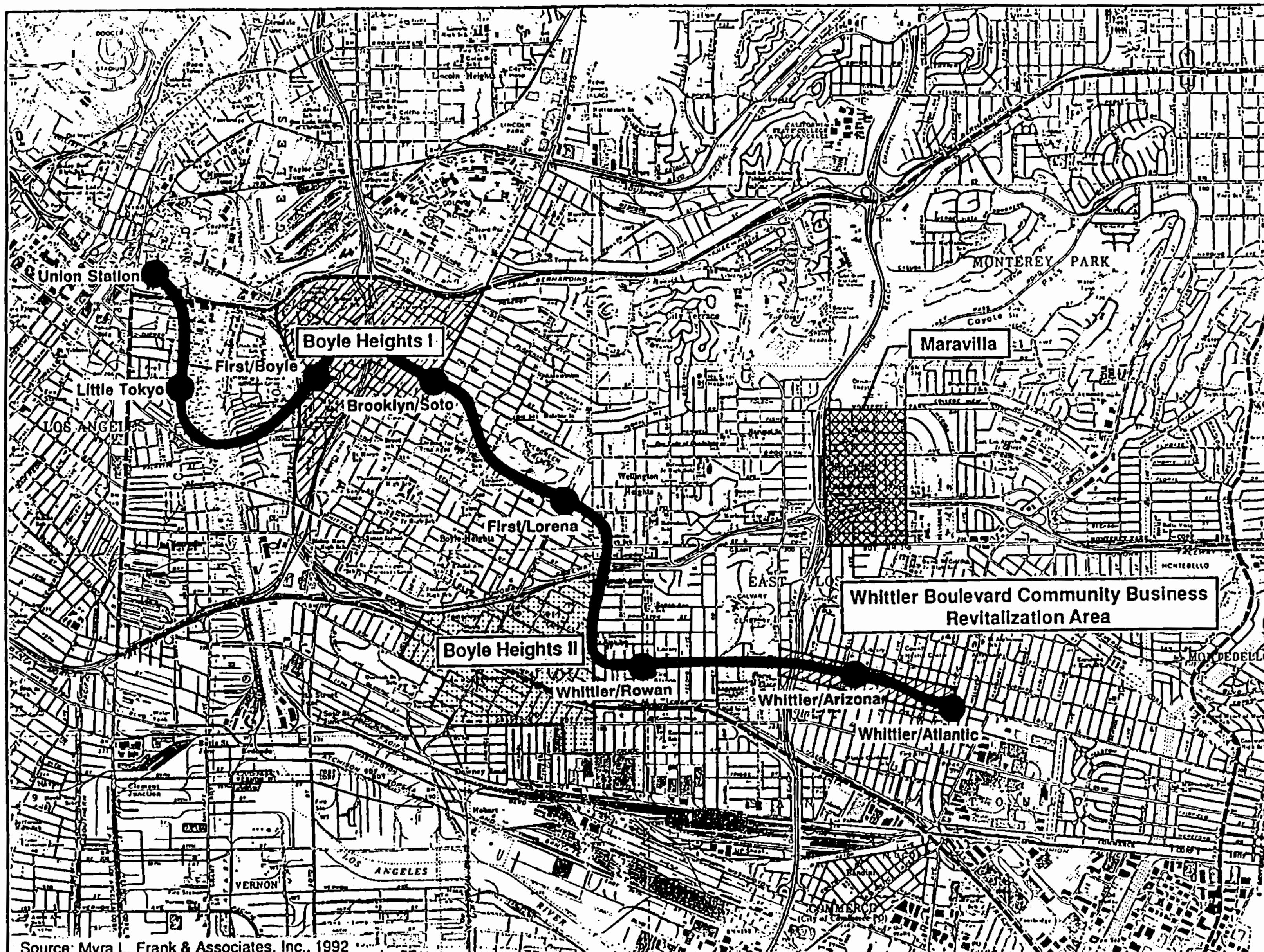
CRA currently is conducting a redevelopment feasibility study for the Boyle Heights and El Sereno areas of the City of Los Angeles. Since 1992, the CRA has been working with an Eastside Citizens Advisory Committee to examine existing physical and economic conditions of the Boyle Heights and El Sereno communities and to identify potential areas for revitalization. The result of this process was the Eastside Neighborhoods Revitalization Study, which was completed in June 1993. The study includes the following guiding principles and objectives for the Eastside area: conservation and rehabilitation of existing residential and business resources; enhancement of the physical environment; development of underutilized properties at a scale and intensity to be consistent with the existing character of the community; and empowerment of the community in planning, implementation and benefits of revitalization efforts.

In East Los Angeles, the Community Redevelopment Commission of Los Angeles County has designated the area bounded by Third Street, Mednick Street, Floral Drive and Ford Boulevard as the Maravilla Redevelopment Project Area. The Community Redevelopment Commission's goals for the area are business expansion, employment retention and public improvements, such as sidewalk repair and street trees. In addition, 400 housing units have been built in the area since 1973. The Commission also identifies areas as Community Business Revitalization Areas, in which public improvements, technical aid and financial assistance are provided to merchants' associations or to the local chamber of commerce. Whittier Boulevard between Eastern Avenue and Atlantic Boulevard is designated as a Community Business Revitalization area. Figure 4-1.3 illustrates the redevelopment and revitalization areas in Boyle Heights and East Los Angeles.

4-1.2.4 Revitalization/Enterprise Zones

a. Eastside Economic Incentive Program Area (Enterprise Zone)

In 1984, the State of California authorized designation of the Eastside Economic Incentive Program Area to stimulate business retention and development of employment opportunities. The Eastside Economic Incentive Area covers eight square miles, bounded roughly by the Los Angeles River to the west, the City of Vernon to the south, the unincorporated Los Angeles County to the East and north of Huntington Drive. Subsequently, the City of Los Angeles and the State have created additional land use and tax credit incentives for this area. The LPA would travels across the core of the Eastside Economic Incentive Area.



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

Redevelopment/ Revitalization Areas

Figure 4-1.3

EASTSIDE CORRIDOR AA/DEIS/DEIR

The owners of Union Station have presented to the City of Los Angeles a proposal to develop the Alameda District, an area of approximately 70 acres surrounding Union Station and located in the Eastside Economic Incentive Area. The Alameda District Plan, when completed, is expected to focus economic resources and employment in this area. The LPA would provide access to the Alameda District Plan area from the Eastside Corridor.

b. The Los Angeles Revitalization Zone

In January 1993, the State of California and the City of Los Angeles created the Los Angeles Revitalization Zone. This area covers most of the Eastside Corridor study area. The Eastside Economic Incentive Area is included in the Revitalization Zone. This program offers a series of tax incentives and technical assistance to private businesses adversely affected by the April 1992 civil disturbances.

c. Empowerment Zone and Enterprise Communities

The City of Los Angeles is currently preparing plans for an Empowerment Zone and Enterprise Community, which would tentatively include areas within the Boyle Heights and Central City North neighborhoods of the City of Los Angeles. These federally financed programs, developed by the Department of Housing and Urban Development, would allow up to $100 million in spending within the Empowerment Zone and $3 million within the Enterprise Community for social programs such as job training and child care. Businesses within the Empowerment Zone would receive tax breaks, such as payroll reduction on taxes of workers who live within the zone.

4-1.3 STATION INFLUENCE AREAS

Geographic areas within a 0.4 mile radius of proposed LPA rail stations, described as station influence areas, were defined to review station-area land use impacts. The criterion of 0.4 miles was established to correspond to a walking time of less than 12 minutes to a station entrance, the assumed time and distance that a majority of people are willing to walk to gain access to a fixed rail transit station. A walk distance of 10 minutes, associated with a one-third mile distance from a station entrance, was used in previous Metro Rail studies. On the eastside, however, a larger geographic boundary was defined because a larger percentage of the population is dependent upon public transit and therefore, is likely to walk additional minutes to gain access to a rail transit station. (Section 4-4.1 Station Area Demographics/Growth, discusses characteristics of the transit-dependent population.)

Los Angeles County Assessor parcel maps were used to identify parcels within the 0.4 mile radius of station sites and a database of 1991 Los Angeles County Assessor records was used to determine the land use characteristics and size of each parcel. Land use codes were collapsed into the following categories: residential, commercial-retail, commercial (without retail), industrial, institutional, cemeteries and vacant lots. Using this method, land use and zoning information was compiled for each station influence area.

4-1.3.1 Land Use and Zoning

The mix of land uses in station influence areas varies from station to station. Figure 4-1.4 illustrates existing total building square feet for residential, commercial, industrial and institutional land uses within each LPA station influence area. Except for the Little Tokyo station, residential land uses comprise the greatest amount of building square feet in each influence area. The area surrounding the Little Tokyo station is primarily comprised of industrial land uses, including the train yards. Industrial uses are also prevalent in the area surrounding the Whittier/Atlantic station. Among the station influence areas, the Whittier/Atlantic station area exhibits the most balanced mix of residential, commercial and industrial land uses. The First/Lorena station influence area exhibits the highest number of commercial building square feet, since this area includes the retail activity along Brooklyn Avenue near Indiana Street. The First/Lorena station influence area is also tied with the Brooklyn/Soto station area for the largest number of residential building square feet. Throughout the LPA station influence areas, institutional land uses consist of large lots with smaller building areas. Appendix 5 shows existing land uses around each LPA station.

Zoning dictates the city's and county's policies for future land use development and growth. The amount of residential, commercial and industrially zoned land (lot size) in each station influence area is summarized and illustrated in Figure 4-1.5. The majority of land in the station influence areas is zoned for residential uses, with the exception of the Little Tokyo station area, which is zoned primarily for industrial uses. The Whittier/Atlantic station also demonstrates a large amount of industrially zoned land, since it captures the northern portion of the City of Commerce, a largely industrial city.

4-1.3.2 SCAG Growth Projections for Station Influence Areas

The Southern California Association of Governments (SCAG) predicts varying amounts of housing and employment growth throughout the study area by the year 2010. (Section 4-4.1, Station Area Demographics/Growth, identifies the existing and SCAG projected year 2010 number of population, housing and employment for each of the station influence areas.) Figure 4.1-6 graphically represents the number of existing and projected housing units and Figure 4.1-7 the number of existing and projected employees by station influence area.

Among the LPA station influence areas, SCAG predicts that the largest absolute increase in housing between 1990-2010 would occur in the Little Tokyo station influence area (964 units), although the projected year 2010 total number of housing units in the Little Tokyo area (1,903 units) would be considerably less than the other station areas. The First/Boyle, Brooklyn/Soto and First/Lorena station influence areas are predicted to exhibit moderate levels of housing growth, from 400 to 500 units; and the Brooklyn/Soto station area would still exhibit the largest total number of units (5,053 units) of all station areas. SCAG predicts that the station influence areas located along Whittier Boulevard would experience little to moderate residential growth, with increases of 272 units (Whittier/Rowan), 285 units (Whittier/Arizona) and 360 units (Whittier/Atlantic). Figure 4.1-6 illustrates 1990 and SCAG projected year 2010 housing units.

FIGURE 4-1.4

EXISTING BUILDING SQUARE FEET BY LAND USE IN STATION INFLUENCE AREAS

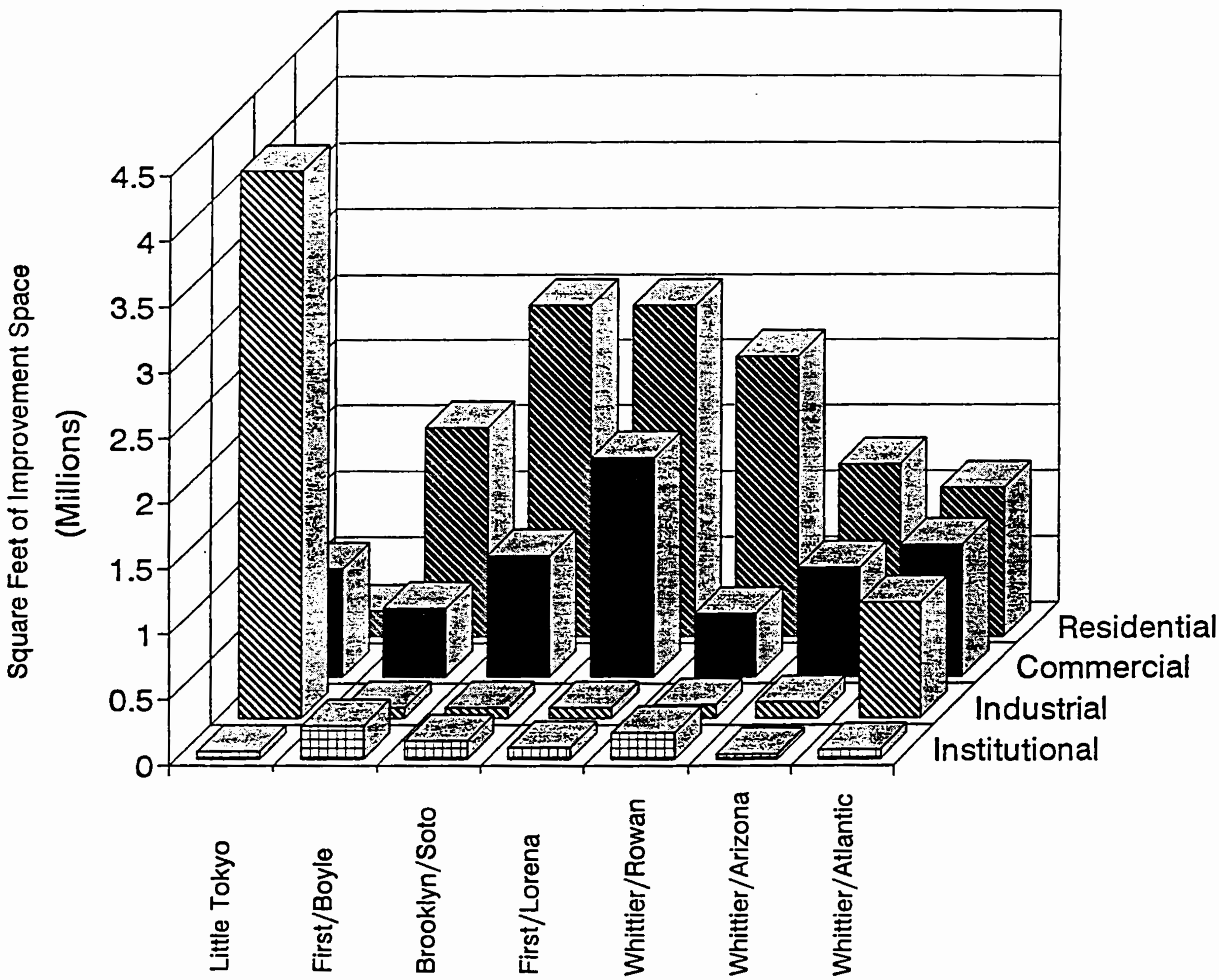


FIGURE 4-1.5

SQUARE FEET OF LAND BY ZONING CLASSIFICATION
IN STATION INFLUENCE AREAS

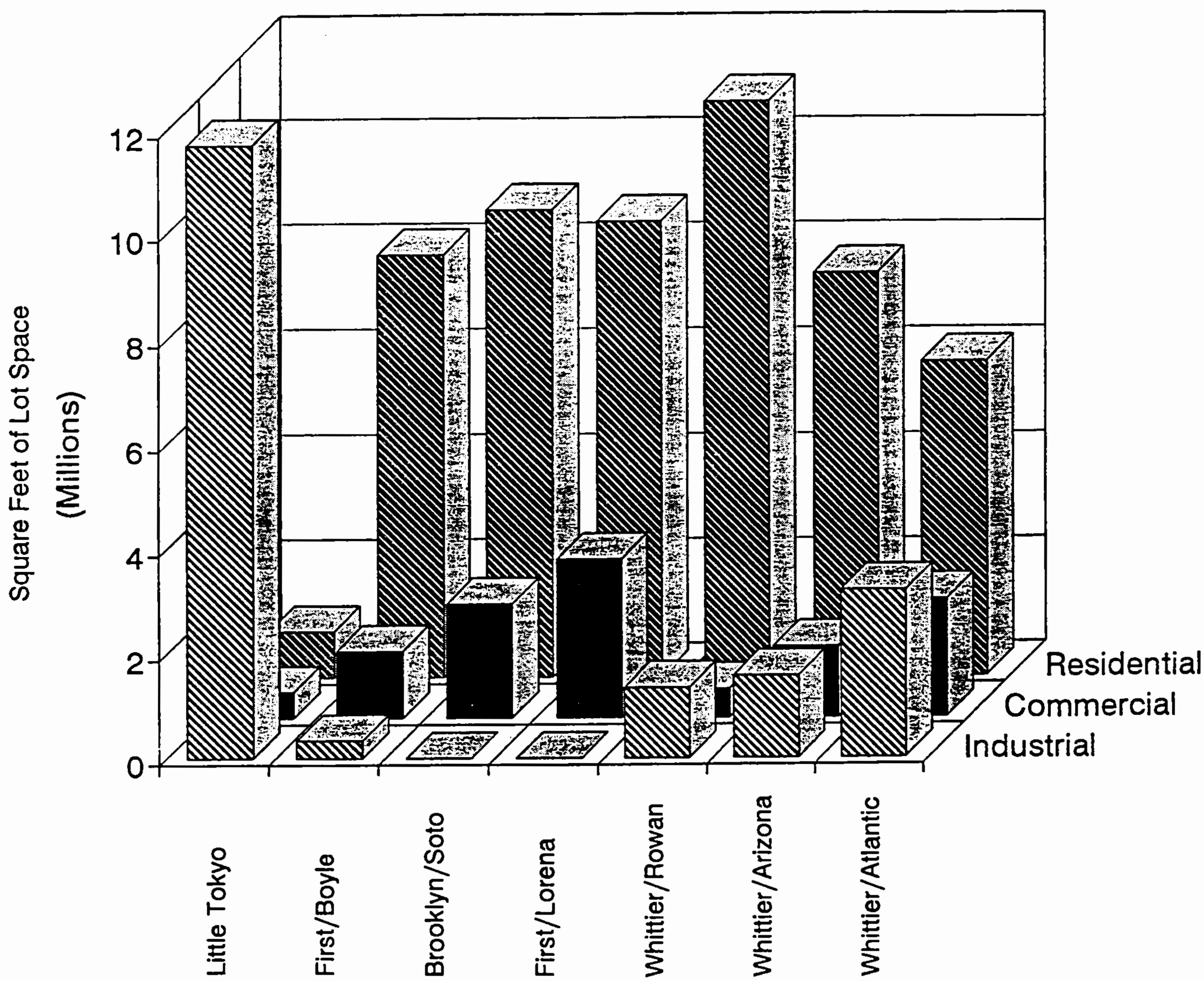


FIGURE 4-1.6

SCAG PROJECTED HOUSING GROWTH: 1990-2010
(STATION INFLUENCE AREAS)

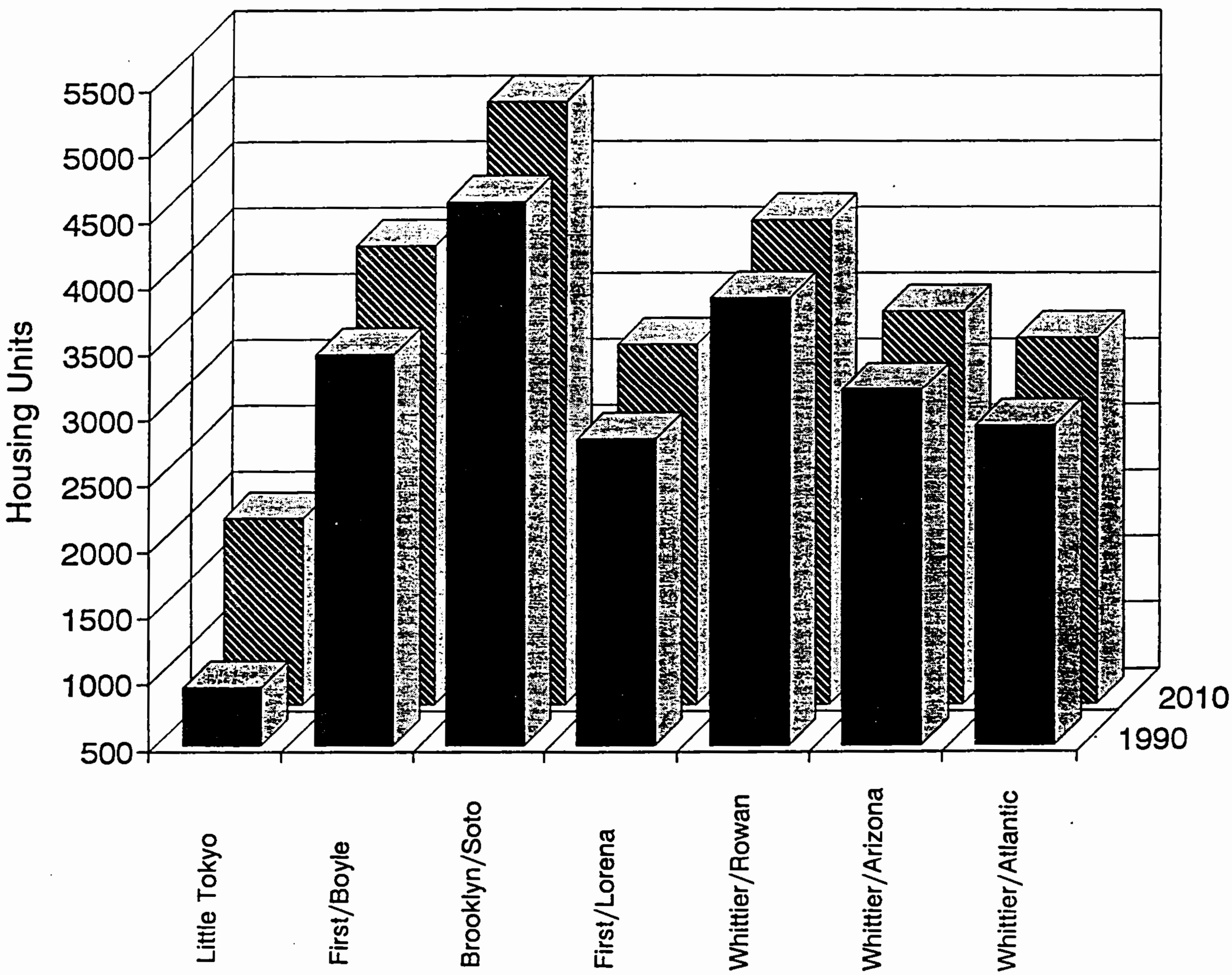
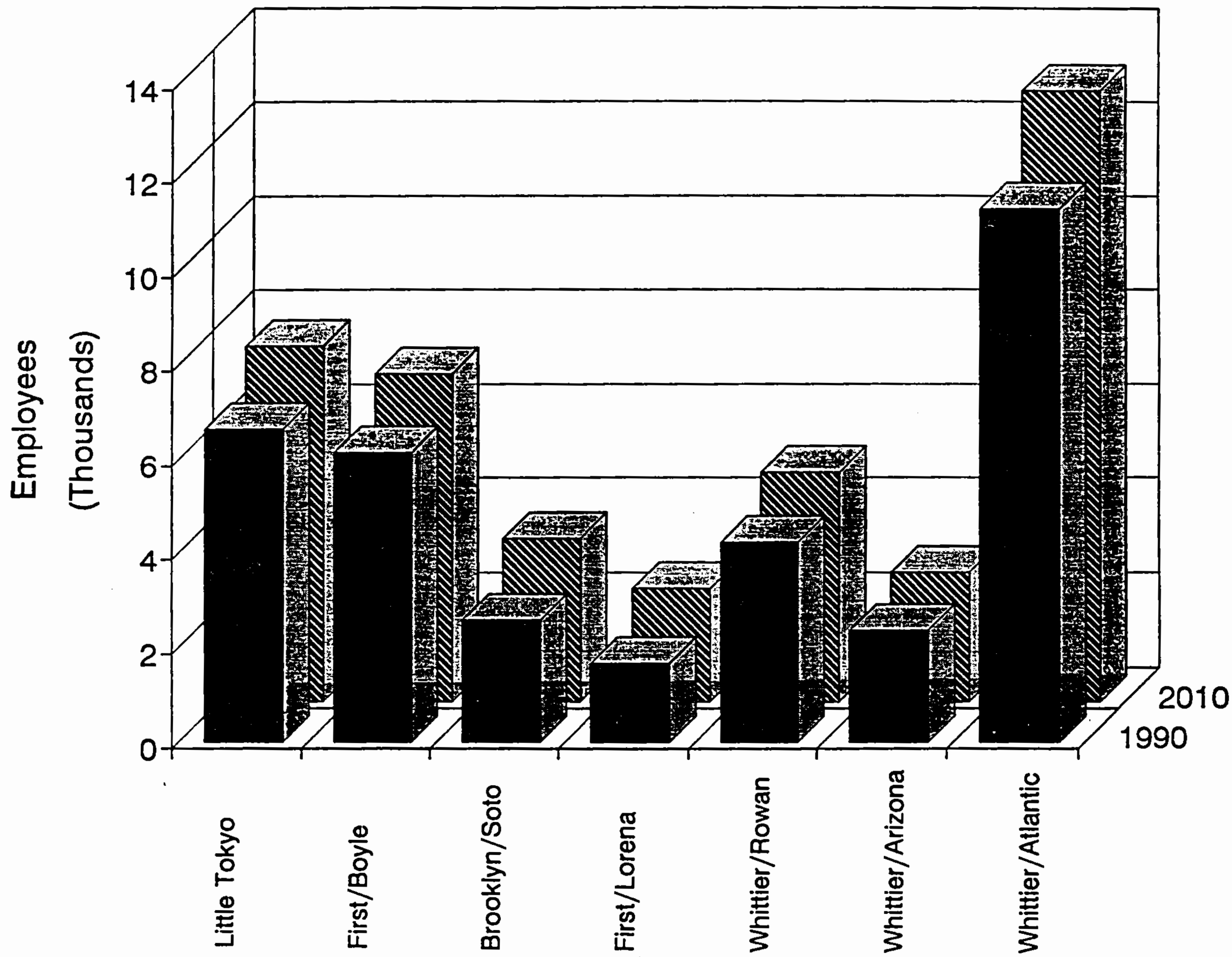


FIGURE 4-1.7

SCAG PROJECTED EMPLOYMENT GROWTH: 1990-2010 (STATION INFLUENCE AREAS)



Among the LPA station influence areas, SCAG predicts that the largest increase in employment between 1990-2010 would occur in the southeast portion of the study area, in the vicinity of the high intensity commercial/retail node of Whittier and Atlantic Boulevards. The largest employment growth is projected to occur at Whittier/Atlantic (1,657 employees), which contains the largest existing employment pool of the station influence areas. Medium levels of growth, from 600 to 800 additional employees, are expected at the Little Tokyo, First/Boyle, Brooklyn/Soto, First/Lorena and Whittier/Rowan station influence areas. In total, by the year 2010, the Whittier/Atlantic station area is expected to provide the largest number of jobs (12,956), followed by the Little Tokyo (7,530) and First/Boyle (6,951) station areas. Figure 4-1.7 shows existing (1990) and projected (2010) employment for the LPA station influence areas.

4-1.4 INFLUENCE OF RAIL

The experiences of other cities with major rapid transit systems suggest that the strength of the underlying commercial market conditions and the role of the public sector are critical in determining the ultimate economic land use influences that may be attributed to a rail system. Without a strong existing market, the land use effects of a transit system may be limited. Similarly, the level of public-sector support and the effectiveness of associated public policies will be decisive in determining the ultimate influence of rail within individual station influence areas. Bearing these factors in mind, the discussion that follows establishes the land use context and assesses the potential influence rail may have on future residential and non-residential development within each station influence area.

4-1.4.1 Little Tokyo Station

As shown in Figure 4-1.4, the Little Tokyo station influence area is predominately industrial, with 79 percent of the total building square feet used for industrial activities. This station area contains the largest amount of industrial and the smallest amount of residential land uses among the LPA station influence areas.

As indicated in Figure 4-1.5, nearly three-quarters of the land in the Little Tokyo station influence area is zoned for light industrial uses (M1 and M2), and 11 percent is zoned for commercial activities (C1, C2 and CM). This influence area contains the second smallest amount of residentially zoned and the least amount of commercially zoned land among the LPA station influence areas.

As presented in Figure 4-1.6, SCAG forecasts high levels of residential growth (964 dwelling units) in the Little Tokyo station influence area, representing significant additional development pressures on residentially zoned land in an area with high residential density. SCAG predicts moderate levels of employment growth (885) in the Little Tokyo station area by the year 2010, as shown in Figure 4-1.7.

Land use policies of the Central City North Community Plan seek to promote the expansion of industrial activities and government facilities in the Little Tokyo station influence area and provide residential uses under specific plan guidance.

Because of a low amount of residentially zoned land and SCAG's high projected housing growth in the Little Tokyo station influence area, the establishment of rail service at this location could result in a potentially significant impact under CEQA by accelerating the trend towards further residential densification in excess of the station area's capacity to accommodate projected residential growth. Housing growth associated with rail could conflict with the goals of the Central City North Community Plan to focus planning efforts on the expansion of industrial activities and government facilities in the station influence area. Mitigation measures designed to alleviate such development pressures are described in Section 4-1.7.

The ultimate influence of rail on future residential development in the Little Tokyo station influence area will largely be determined by the vitality of the local residential real estate market, as well as the effectiveness and scope of policies which public sector agencies bring to bear in the land use decision-making process.

Because of a sufficient pool of existing non-residential land in the Little Tokyo station influence area, introduction of rail service could have a potentially beneficial influence by supporting future commercial development and by serving as a catalyst for existing commercial and industrial markets, particularly in the vicinity of East First Street and Santa Fe Avenue. The influence of rail on industrial uses in the station influence area would be consistent with the land use goals of the Central City North Community Plan which promote the expansion of industrial activities.

4-1.4.2 First/Boyle Station

As shown in Figure 4-1.4, land uses in the First/Boyle station area are primarily residential. Residential building square feet represent 65 percent of the total building square feet in the station influence area. As indicated in Figure 4-1.5, more than 80 percent of the land in the station influence area is zoned for medium-density residential uses (RD1.5, RD2, RD3, R2 and R3), and 12 percent is zoned for commercial facilities (C1 and C2).

As illustrated in Figure 4-1.6, SCAG forecasts moderate levels of residential development (502 dwelling units) at the First/Boyle station, representing additional development pressures on residential land uses in a station influence area characterized by high existing residential densities. According to Figure 4-1.7, SCAG projects moderate levels of employment growth (814) at the First/Boyle station by the year 2010.

Land use policies of the Boyle Heights Community Plan seek to prevent further high-density residential development and promote viable commercial development compatible with surrounding residential neighborhoods. The Boyle Heights Community Plan indicates the presence of community sensitivity towards additional residential growth in the plan area. Within Boyle Heights Revitalization Area I, the Community Redevelopment Agency's primary objective is residential rehabilitation and construction of new affordable units. The CRA also provides funds for community improvements such as home repair loans and new or reconstructed sidewalks, curbs, gutters and street trees.

Because of existing high residential densities and low amounts of vacant land in the First/Boyle station influence area, the provision of rail service could result in a potentially significant impact under CEQA by accelerating the trend towards further residential densification in excess of the station area's capacity to accommodate projected residential growth. The presence of several freeway corridors and a large institutional land use constitutes an additional constraint to future residential development in the First/Boyle station influence area. The share of residential growth attributable to the rail system could potentially conflict with the goal of the Boyle Heights Community Plan to prevent further high-density residential development in the station influence area, an objective that is underscored by generalized community sensitivity to the construction of additional multi-family units in the Boyle Heights area. Mitigation measures designed to alleviate such development pressures are described in Section 4-1.7. The ultimate influence of rail on future residential development in the First/Boyle station influence area will largely be determined by the vitality of the local residential real estate market, as well as the effectiveness and scope of policies which public sector agencies bring to bear in the land use decision-making process.

Introduction of rail service at First/Boyle station could result in a potentially beneficial influence by serving a densely populated residential environment. Because of a sufficient pool of existing non-residential land in the First/Boyle station influence area, the provision of rail service could result in a potentially beneficial influence by supporting future commercial development and invigorating existing commercial and industrial markets, particularly along First Street. The influence of rail on commercial activities in the station influence area would be consistent with the land use goals of the Boyle Heights Community Plan to promote viable commercial development that is compatible with surrounding residential neighborhoods.

4-1.4.3 Brooklyn/Soto Station

As shown in Figure 4-1.4, the Brooklyn/Soto station influence area is primarily residential in character. Residential land uses comprise 69 percent and commercial land uses comprise 25 percent of existing building square feet in the station influence area. Containing more than 2.5 million square feet of residential land uses, the Brooklyn/Soto station area has one of the largest amounts of existing residential building square feet among the station influence areas.

Figure 4-1.5 indicates that more than three quarters of the land in the Brooklyn/Soto station influence area is zoned for medium-density residential uses (RD1.5, RD2, R2 and R3), while 21 percent is zoned for commercial uses (C1, C2 and C4).

As presented in Figure 4-1.6, SCAG forecasts moderate levels of residential growth (416 dwelling units) for the Brooklyn/Soto station influence area by the year 2010, representing additional demand for new housing in the station area. SCAG projects moderate amounts of employment growth (870) by 2010, as shown in Figure 4-1.7.

Land use policies of the Boyle Heights Community Plan seek to prevent further high-density residential development and promote viable commercial development compatible with surrounding residential neighborhoods. The Boyle Heights Community Plan indicates the presence of community sensitivity towards additional residential growth in the plan area. Within the Boyle Heights Revitalization Area I, the Community Redevelopment Agency's primary objective is residential rehabilitation and construction of new affordable units. The CRA also provides funds for community improvements such as home repair loans and new or reconstructed sidewalks, curbs, gutters and street trees.

The introduction of rail service could complement projected residential development in the Brooklyn/Soto station influence area and would serve a densely populated residential urban environment. Because of a sufficient pool of existing non-residential land in the Brooklyn/Soto station influence area, the provision of rail service could result in a potentially beneficial influence by supporting future commercial development in the station influence area and acting as a catalyst for existing commercial retail markets, particularly along the high intensity commercial corridor of Brooklyn Avenue. The influence of rail on commercial activities in the station influence area would be consistent with the land use goals of the Boyle Heights Community Plan which promote viable commercial development that is compatible with surrounding residential neighborhoods.

4-1.4.4 First/Lorena Station

As indicated in Figure 4-1.4, the First/Lorena station area is characterized primarily by residential land uses, which represent 58 percent of the total building square feet in the station influence area. The First/Lorena station contains some of the largest amounts of existing residential and commercial land uses among the station influence areas.

As shown in Figure 4-1.5, more than three quarters of the total land area of the First/Lorena station influence area is zoned for medium-density residential uses (R2 and R3), and more than one quarter is zoned for commercial facilities (C2 and C3). The First/Lorena station influence area contains the largest amount of commercially zoned land among the station influence areas.

As indicated in Figure 4-1.6, SCAG forecasts moderate levels of residential growth (407 dwelling units) for the First/Lorena station influence area, representing additional development pressures on residential land uses in a station influence area with the lowest existing residential density among the station influence areas. SCAG predicts moderate levels of employment growth (750) at the First/Lorena station by the year 2010, as shown in Figure 4-1.7.

Land use policies of the Boyle Heights Community Plan seek to prevent further high-density residential development and promote viable commercial development compatible with surrounding residential neighborhoods. The Boyle Heights Community Plan indicates the presence of community sensitivity towards additional residential growth in the plan area.

The presence of rail service at the First/Lorena station could complement projected residential growth in the station influence area. Because of a sufficient pool of existing non-residential land in the First/Lorena station influence area, the provision of rail service could result in a potentially beneficial influence by supporting future commercial development and reinforcing existing commercial markets, particularly the Mercado shopping/restaurant complex located on the north side of First Street, between Lorena Street and Cheesebroughs Lane, and the business area on First Street east of Indiana Street. The influence of rail on commercial activities in the station influence area would be consistent with the land use goals of the Boyle Heights Community Plan which promote viable commercial development that is compatible with surrounding residential neighborhoods.

4-1.4.5 Whittier/Rowan Station

As indicated in Figure 4-1.4, the Whittier/Rowan station influence area is predominately residential in character. Residential land uses comprise nearly three quarters of the total building square feet in the station influence area.

Eighty-five percent of the land in the Whittier/Rowan station influence area is zoned for medium density residential uses (RD1.5, R2 and R4). Figure 4-1.5 illustrates that the Whittier/Rowan station influence area has the largest amount of residentially zoned land and some of the lowest amounts of commercially zoned land among the station influence areas.

As shown in Figure 4-1.6, SCAG forecasts low levels of residential growth (272 dwelling units) at the Whittier/Rowan station, representing minor additional development pressures in a station influence area characterized by some of the lowest existing residential densities (17 dwelling units/acre) among the station influence areas. SCAG predicts moderate levels of employment growth (605) for the station influence area by the year 2010, as indicated in Figure 4-1.7.

Relevant County of Los Angeles General Plan land use policy objectives include the location of low- and moderate-income housing in easy commuting range of employment centers; the promotion of residential infill at densities compatible with and slightly higher than those of surrounding uses; the stimulation of neighborhood commercial uses; and the development of an improved public transportation system that would promote urban revitalization.

The provision of rail service at the Whittier/Rowan station could complement projected residential growth in the station influence area. The presence of rail service could result in a potentially beneficial influence at the Whittier/Rowan station by providing direct access to community institutional uses, such as Salazar Park and the East Los Angeles Doctor's Hospital. Because of a sufficient pool of existing non-residential land in the Whittier/Rowan influence area, the establishment of rail would support future commercial development and stimulate existing commercial markets, particularly along Whittier Boulevard. The introduction of rail into the station influence area would support the land use goals of the County of Los Angeles General Plan to stimulate neighborhood commercial uses and develop an improved public transportation system that would promote urban revitalization.

4-1.4.6 Whittier/Arizona Station

As shown in Figure 4-1.4, the Whittier/Arizona station influence area is characterized by a mixture of residential and commercial land uses. Residential and commercial land uses comprise 57 percent and 36 percent of existing building square feet in the station influence area, respectively.

Nearly three quarters of the land in the station influence area is zoned for medium-density residential uses (R2, R3 and R4), and 12 percent is zoned for commercial uses (C2, C3 and C4), as indicated in Figure 4-1.5.

As presented in Figure 4-1.6, SCAG forecasts low levels of residential growth (285 dwelling units) at the Whittier/Arizona station by 2010, representing minor additional development pressures in a station influence area characterized by one of the lowest existing residential densities among the station influence areas. SCAG predicts low levels of employment growth (382) in the Whittier/Arizona station influence area by the year 2010, as shown in Figure 4-1.7.

Relevant County of Los Angeles General Plan land use policy objectives include the location of low- and moderate-income housing within easy commuting range of employment centers; the promotion of residential infill at densities compatible with and slightly higher than those of surrounding uses; the stimulation of neighborhood commercial uses; and the development of an improved public transportation system that would promote urban revitalization.

The provision of rail service at the Whittier/Arizona station could complement projected residential growth in the station influence area. Because of a sufficient pool of existing non-residential land in the Whittier/Arizona station influence area, introduction of rail service could result in a potentially beneficial influence by supporting future commercial development in the station area and acting as a catalyst for existing commercial and industrial markets, particularly along the intensively developed commercial portion of Whittier Boulevard. Introduction of rail into the area would support the land use goals of the County of Los Angeles General Plan to stimulate neighborhood commercial uses and develop of an improved public transportation system that would promote urban revitalization.

4-1.4.7 Whittier/Atlantic Station

As shown in Figure 4-1.4, the Whittier/Atlantic station influence area is characterized by a mixture of residential, commercial and industrial land uses, which comprise 37, 33 and 29 percent of the existing building square feet in the station influence area, respectively.

More than one half of the land in the station influence area is zoned for medium-density residential uses (R2, R3 and R4), and the remaining area is zoned industrial (M1 and M2) and commercial (C2 and C3), as presented in Figure 4-1.5. The Whittier/Atlantic station influence area contains the third largest amount of industrially zoned land among the station influence areas.

As shown in Figure 4-1.6, SCAG predicts moderate levels of residential growth (360 dwelling units) at the Whittier/Atlantic station, translating into future development pressures on existing residential land uses in the station influence area. As indicated in Figure 4-1.7, SCAG forecasts high levels of employment growth (1,657) at the Whittier/Atlantic station by the year 2010, representing one of the largest increases of projected employment among the station influence areas.

For the southeast quadrant of the Whittier/Atlantic station influence area located in the City of Commerce, the City of Commerce General Plan seeks to preserve stable residential areas; preserve and upgrade the existing commercial area at Commerce Center to serve business and residential populations; and diversify industrial uses south of Whittier Boulevard. Within that part of the Whittier/Atlantic station influence area located in the County of Los Angeles, the land use policies of the County of Los Angeles General Plan include the location of low- and moderate-income housing in easy commuting range of employment centers;

the promotion of residential infill at densities compatible with and slightly higher than those of surrounding uses; the support of neighborhood commercial uses providing convenience goods and services; and the development of an improved public transportation system that would promote urban revitalization.

The presence of rail service at Whittier/Atlantic could complement projected residential growth in the station influence area. Because of a sufficient pool of existing non-residential land in the Whittier/Atlantic station area, the provision of rail service could result in a potentially beneficial influence by supporting future commercial and industrial development in the area and stimulating existing commercial and industrial markets, particularly along and south of Whittier Boulevard. The influence of rail in the station area would be consistent with the land use goals of the City of Commerce General Plan to preserve and upgrade the existing commercial area at Commerce Center and diversify industrial uses south of Whittier Boulevard, and would support County of Los Angeles General Plan objectives to encourage neighborhood commercial uses and develop an improved public transportation system that would promote urban revitalization.

4-1.5 SUMMARY OF STATION INFLUENCE AREA IMPACTS

The influence of the LPA on residential land uses in the Eastside Corridor could result in potentially significant impacts under CEQA in two station influence areas, due to insufficient capacities to accommodate projected levels of residential growth: Little Tokyo and First/Boyle stations. The potentially accelerated residential densification associated with rail could conflict with the land use goals and priorities of the Central City North Community Plan and the Boyle Heights Community Plan. Because sufficient amounts of nonresidential land exist to accommodate future employment in every station influence area, the influence of rail on non-residential land uses is judged to be beneficial.

4-1.6 CUMULATIVE IMPACTS

Inasmuch as the previous discussion is based on land use projections (housing and employment) emanating from a regional planning body (SCAG), this section has evaluated the cumulative impacts associated with the Eastside Corridor identified in this FEIS. As currently identified, relatively few urban development projects are known and would represent only a small portion of total SCAG projections (the size and type of related projects identified in the Eastside Corridor study area are discussed in Chapter 2, Section 2-7, Related Projects).

4-1.7 MITIGATION

In the First/Boyle station influence area, the Los Angeles City Planning Department and the City of Los Angeles could: (1) review the community plan designation and area zoning for portions of the station influence area and make changes to allow for additional residential development and (2) focus growth around station areas through the application of urban design strategies.

At the Little Tokyo station, the City of Los Angeles Planning Department and the City of Los Angeles could rezone portions of the station influence area to accommodate projected residential land use demand.

The Los Angeles County Metropolitan Transportation Authority (MTA), through its Planning and Community Transportation Linkages programs, will devise station specific planning, urban design, economic analysis and local employment and business participation strategies to integrate the LPA into the existing urban and community context. The MTA will develop a coordinated strategy, with other public agencies, to integrate the goals, objectives, revitalization and economic development opportunities as reflected in existing community plans and revitalization studies. The potential for collaborative efforts between MTA and private parties also will be assessed. The MTA will also formulate a land use-transportation-housing plan that would maximize the potential for new housing opportunities at transit station locations or along transit corridors. Furthermore, the MTA will build upon the strategies identified in the Community Linkages program to develop urban design strategies at stations leading to the preparation of station area master plans. The station area analyses would establish, in cooperation with community groups, local representatives and the local planning agency, a framework for integration of the transit facility within the urban context. The goals of these planning assessments will be to:

- promote mobility and ridership;
- Assure that the introduction of the station is coordinated with other economic and revitalization efforts;
- Identify potential strategies for using land acquired for the rail system to achieve economic revitalization goals for the community; and
- Work with local jurisdictions to ensure that proper densities and land uses are encouraged.

4-2 ECONOMIC AND FISCAL IMPACTS

4-2.1 EMPLOYMENT

4-2.1.1 Setting

A total of 87,100 people are employed within the Eastside Corridor study area. Approximately 35 percent of the people that work in the area are employed in the services industry, the largest industry category. Approximately one-third of the employees work in the manufacturing/ wholesaling industry. The third largest number of employees, approximately 20 percent, work in the retail trade industry.

4-2.1.2 Impacts

Construction of the Locally Preferred Alternative (LPA) would produce benefits to the local and regional economies in the form of: (1) direct employment, or new construction jobs and (2) indirect economic activity, or increased expenditures in other sectors of the economy. Construction activity, however, could result in adverse impacts as well: impeded vehicular and pedestrian access could reduce revenues for local retail businesses located adjacent to cut-and-cover construction sites. In addition, some commercial properties would be acquired, resulting in relocation or possible displacement of businesses. These impacts are discussed in detail in Section 4-18.7 (Business Disruption) and 4-3 (Land Acquisition and Displacement). Operation of the LPA would generate jobs and could increase customer patronage for businesses located near stations.

a. Direct Employment Impacts During Construction

The No-Build Alternative would not generate employment for the local or regional economy. The LPA would generate between 2,500 and 3,000 jobs annually over an estimated ten-year construction period.

Table 4-2.1 presents annual construction cost estimates and annual construction jobs for the LPA and initial operable segment construction periods. The number of jobs produced by construction activity was derived from estimates of total construction costs, which are based on anticipated capital expenditures for rail stations, guideways and systems, excluding rail fleet procurement and right-of-way acquisition. These estimates assume annual construction salaries (construction full-time equivalents, or FTEs) of $50,000 to $60,000.

b. Indirect Economic Benefits During Construction

In addition to direct construction benefits, the LPA would produce indirect economic benefits as a result of construction spending. Using a 1.74 regional multiplier, which is consistent with the 1991 Southern California Association of Governments (SCAG) Input/Output Model, the Los Angeles metropolitan area would receive approximately $1.1 billion in additional economic benefits from construction of the LPA. The 1.74 multiplier indicates that for each dollar invested in new rail construction, another 74 cents would be spent in the region in the form of additional income, employment and economic output.

TABLE 4-2.1: ANNUAL CONSTRUCTION COST ESTIMATES (1994 THOUSAND DOLLARS) AND ESTIMATED CONSTRUCTION EMPLOYMENT

ALTERNATIVE	ANNUAL CONSTRUCTION COST ESTIMATES[a]	ESTIMATED ANNUAL NUMBER OF CONSTRUCTION JOBS
No-Build	0	0
LPA[b]	$149,300	2,500 to 3,000
IOS-1 (First/Boyle)	73,900	1,200 to 1,500
IOS-2 (First/Lorena)	151,400	2,500 to 3,000

Note: [a] Annual estimates for the initial segments were derived by dividing the total IOS-1 and IOS-2 construction costs by five years. The annual costs presented, therefore, represent averages.
[b] Annual estimates for the LPA were derived by dividing the total LPA construction cost by 10 years. Annual costs presented, therefore, represent averages.

Source: Metro Red Line Project Segment 3 Eastside Extension Financial Plan (construction subtotal plus applicable contingencies), EMC/RCC, March 2, 1994; Cordoba Corporation, 1994.

Table 4-2.2 shows indirect expenditure estimates associated with the LPA and initial segment construction periods. These indirect benefits are expressed in total amounts (1994 dollars) for the ten-year and five-year construction periods.

TABLE 4-2.2: ESTIMATED TOTAL INDIRECT BENEFITS FOR FULL-LENGTH AND INITIAL SEGMENT CONSTRUCTION (IN 1994 THOUSAND DOLLARS)

ALTERNATIVE	TOTAL CONSTRUCTION COST ESTIMATES	TOTAL INDIRECT BENEFITS
No-Build	0	0
LPA	$1,492,800	$1,104,700
IOS-1 (First/Boyle)	369,400	273,400
IOS-2 (First/Lorena)	757,200	560,300

Source: Metro Red Line Project Segment 3 Eastside Extension Financial Plan (construction subtotal plus applicable contingencies), EMC/RCC, March 2, 1994; Cordoba Corporation, 1994.

4-2.1.3 Cumulative Impacts

The LPA would benefit the regional economy via indirect economic gains due to the rail construction activities. These indirect gains would translate into additional income, employment and economic outputs in other sectors of the regional economy. Table 4-2.2 quantifies those indirect benefits for the LPA and the initial segments.

4-2.1.4 Mitigation

The preferred alternative would generate economic benefits in the form of additional employment and indirect expenditures. Therefore, no mitigation measures would be required. Sections 4-3 (Land Acquisition and Displacement) and 4-18.7 (Business Disruption) discuss mitigation measures for businesses adversely affected by construction-related activity.

4-2.2 MINORITY BUSINESS PARTICIPATION

4-2.2.1 DBE and M/WBE Participation

The planning, design, construction and operation of the LPA would present an opportunity for minority business participation at MTA. As part of its existing practices and procedures, MTA has Disadvantaged Buisiness Enterprise Programs to encourage broad-based business participation in its mass transit procurement programs. The DBE and Minority and Women Business Enterprise (M/WBE) Programs were designed by MTA to comply with both state and federal laws that were passed to ensure that businesses are not discriminated against in procurement practices on the basis of gender, race, color, national origin, age or disability.

Disadvantage Business Enterprises (DBEs) are owned by socially and economically disadvantaged individuals. For its DBE Program, MTA reviews all businesses interested in participating in its DBE Program and evaluates each case to ensure that they meet the federal eligibility criteria set forth by U.S. Department of Transportation regulations.

Federally-funded contracts or procurements over $25,000 require DBE participation goals. These goals are determined by evaluating the existing pool of disadvantaged businesses and determining those businesses that provide the specific service or task.

For locally funded projects, MTA has also developed a program to encourage Minority and Women Business Enterprise participation (M/WBE). In support of its DBE and M/WBE objectives, MTA offers a series of programs designed to encourage participation. These are summarized as follows:

- **Metro Transit Bond Guarantee Program** (TBGP) - Offers additional financial assistance to the DBE and M/WBE contractors seeking to secure performance bonds. Workshops are conducted during the year to inform the contracting community of the opportunities available through TBGP.

- **MTA Department of Vendor Relations** - The role of the Vendor Relations department is to serve as a liaison between vendors and MTA staff. The department provides ombudsman, outreach, and recruitment activities, and provides training workshops or seminars on issues such as ethics, certification and lobbyist registration. A monthly newsletter, Metro Business Outlook, is published with updated information on contract and procurement opportunities.

- **Transportation Business Advisory Council** (TBAC) - TBAC is an advisory council made up of business men and women from more than 20 minority and women professional organizations who are committed to increasing contract and procurement opportunities for the DBE and M/WBE community. TBAC meets once a month to provide input to the MTA's M/W/DBE program. Procurement and contract reports are distributed at every meeting.

- **Outreach Events** - Along with the yearly MTA Vendor Fair, the MTA sponsors outreach workshops in various communities. These events include certification workshops and network sessions with MTA staff and contractors. These workshops have been successful in reaching out to business communities and providing vendors with information on contracting opportunities.

- **Certification Workshops** - Certification workshops are held at MTA offices. These workshops are intended to provide assistance in filling out DBE and M/WBE certification applications.

- **Success Through Excellent Professional Services** (STEPS) - STEPS is geared to assisting small, minority and women-owned firms in the fields of engineering, environmental and design work. The STEPS program consists of a series of seminars administered by RCC and Engineering Management Consultants (EMC). These free, half-day seminars are offered on a monthly basis and cover such topics as the consultant selection process, marketing "do's" and "don'ts," contract teaming considerations, qualification presentations, proposal preparation and interviews.

4-2.2.2 Monitoring and Compliance

In conjunction with ensuring that adequate and ample communication is provided to the minority contracting community in reference to MTA procurement opportunities, MTA also monitors its DBE and M/WBE contracting practices. Bidders are required to list all MBE and WBE subcontractors, suppliers, truckers, manufacturers and or members of joint ventures that they intend to use to meet their goal. Reports include address, type of work to be performed and percentage of M/W/DBE participation in the contract. It is through this report that MTA staff is able to monitor prime contractors and ensure compliance with stated goals.

4-2.3 JOB TRAINING AND DEVELOPMENT

The LPA also represents an opportunity for employment as it relates to the specific disciplines, skills and vocations required for Metro Rail design, construction and operation. The MTA has instituted programs to assist individuals prepare and train for Metro Rail employment.

4-2.3.1 Transportation Occupations Program (TOP)

The Transportation Occupations Program (TOP) is an educational partnership program between MTA and specific schools in the the Los Angeles, Long Beach and Compton school districts. It is geared to assist 11th and 12th grade students consider and prepare for careers in transit-related fields. To this end, TOP offers after-school and weekend classes, both on- and off-campus, which include computer-assisted drafting, technical math, architectural model building and graphic design. Students receive elective credits for these courses and are required to maintain a C+ average, or better, in their regular school curriculum. MTA employees and consultants providing services on the MTA Metro System often serve as guest lecturers. These lectures have included presentations on various aspects of the engineering field, rail transportation planning and architectural design.

In addition, qualified TOP graduates may receive college scholarships and continue to participate in the summer college-internship program. Local engineering firms, construction companies and public agencies actively support the program by offering site supervision for internships paid for by the MTA. In addition to providing scholarships for those who are college-bound, the program furnishes students with required supplies such as drafting kits, computer materials, textbooks and special calculators.

4-2.3.2 Job Development and Training

The policy of the MTA is that a job development and training plan be included in all MTA proposals. A commitment to job development and training is requested from all proposers and bidders seeking to conduct business with the MTA. In order to establish procedures and guidelines for the implementation of this program, the MTA has approved a pilot program. At the conclusion of the pilot program, recommendations will be made to the MTA Board, enforcing the requirement in all contracts.

4-2.3.3 Labor Compliance and Equal Opportunity/Affirmative Action

In accordance with state and federal labor laws, MTA supports equal employment opportunities for all of its practices and contracts. MTA abides by a monitoring and enforcement program for payment of prevailing wages to employees of contractors performing construction, systems installation and related work on MTA awarded contracts. Specifically, MTA ensures that contractors achieve employment goals of 28.3 percent for minorities and 6.9 percent women.[1]

4-2.4 FISCAL IMPACTS

This section reviews the possible loss of tax revenues to local jurisdictions (i.e., the City of Los Angeles and County of Los Angeles) associated with land acquisitions identified in Section 4-3, Land Acquisition/Displacement and Relocation. Potential fiscal impacts also include the costs that may be incurred by public service agencies such as police and fire protection during construction and operation of the system.

4-2.4.1 Setting

Possible property acquisitions for the Locally Preferred Alternative (LPA) would be located within the City and County of Los Angeles. Total tax receipts for the City of Los Angeles in Fiscal Year 1992-93 were $2.4 billion, of which property taxes accounted for an estimated $557 million; licenses, permits, fees and fines accounted for an estimated $315 million and business tax fees accounted for an estimated $273 million. Sales tax revenue for the City of Los Angeles for Fiscal Year 1992-93 was $267 million.[2] Los Angeles County receipts in Fiscal Year 1992-93 were $8.6 billion, with property taxes accounting for $5.2 billion and licenses, permits and franchise fees accounting for $40 million.[3]

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1 Source: MTA Office of Federal Contract Compliance.

2 City of Los Angeles, Controller's Preliminary Financial Report, Fiscal Year Ended June 30, 1993. Rick Tuttle, Controller.

3 County of Los Angeles, California, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 1993. Alan T. Sasaki, Auditor/Controller.

4-2.4.2 Impacts

a. Police and Fire Services

Operation of the LPA is not expected to significantly increase demand on police or fire prevention services operated by the City and County of Los Angeles. System security would be an important component of LPA rail operations (See Section 4-13) and would be the responsibility of the Los Angeles County Metropolitan Transportation Authority (MTA). Selection of the provider of system security services would be determined at a later date. Existing fire protection services in the local jurisdictions and the county, coupled with system-wide fire safety measures, are expected to serve the system adequately. The LPA, therefore, is not expected to have a significant effect on the cost of providing these services.

The No-Build alternative would not affect the cost of police and fire services.

b. Reduction of Tax Revenues

- **Property Tax**

Reductions in tax revenues would not be anticipated for the No-Build alternative. Properties that would be fully acquired for the LPA would reduce the tax bases of the county and city in which the property is located. Properties that would be taken in their entirety by the LPA have been included in the calculation of possible property tax loss. Property taxes are levied on the assessed value of all privately-owned property and are collected by the County of Los Angeles. Generally, the amount levied is one percent of the assessed value of the property. The amount received by the City of Los Angeles is a percentage of taxes collected by the county on properties located within the City of Los Angeles.

Property taxes collected in Fiscal Year 1992-1993 for properties that would be acquired by the LPA have been calculated using the 1993 Los Angeles County Assessor rolls (Damar/TRW-Redi Corporation data base) and are shown in Table 4-2.3 by station area. The property taxes shown in the table may also include special assessment taxes.

The estimated annual property tax loss due to the LPA would total $208,726, of which 89 percent ($185,810) would be lost to the County of Los Angeles and 11 percent ($22,916) to the city. For Initial Operating Segment-1 (IOS-1), which consists of the Little Tokyo and First/Boyle stations, annual property tax loss is estimated to be $25,616. For IOS-2, consisting of the first four stations of the LPA, annual property tax loss is estimated to be $75,021, 70 percent of which would be born by the county. Nevertheless, the anticipated annual property tax loss to the City of Los Angeles and County of Los Angeles would be negligible compared to the city and county's total property tax revenues. The reduction of property tax revenue that would occur as a result of the LPA, therefore, would be insignificant under CEQA.

TABLE 4-2.3: ESTIMATED ANNUAL PROPERTY TAX LOSSES TO THE CITY AND COUNTY OF LOS ANGELES

STATION	1993 PROPERTY TAX[a]	LOSS TO CITY OF LOS ANGELES	LOSS TO COUNTY OF LOS ANGELES
No Build	$0	$0	$0
Little Tokyo[b]	0	0	0
First/Boyle	25,616	8,351	17,265
IOS-1 Subtotal	25,616	8,351	17,265
Brooklyn/Soto	44,680	14,566	30,114
First/Lorena	4,725	0	4,725
IOS-2 Subtotal	75,021	22,916	52,105
Whittier/Rowan	28,115	0	28,115
Whittier/Arizona	46,139	0	46,139
Whittier/Atlantic	59,451	0	59,451
Total LPA	$208,726	$22,916	$185,810

Notes: [a] 1993 annual tax as per Los Angeles County Tax Assessor records for full acquisitions.
[b] There are two station entrance options at this site; neither would permanently reduce property taxes paid to the city or county.

Source: DAMAR/TRW-Redi Corporation; Myra L. Frank & Associates, Inc., 1994

- **Sales Tax**

Sales taxes are collected by the State of California at 7.25 percent of the total sales receipts. Of this amount, six percent is allocated to the State of California, one percent is redistributed to the city and 0.25 percent to the county in which the business is located. In Los Angeles County, an additional one percent is levied as a result of Propositions A and C, yielding a Los Angeles County sales tax rate of 8.25 percent.

Reductions in sales tax would not be anticipated for the No-Build alternative. Business acquisitions associated with the rail alternatives would lower the level of sales taxes received from businesses in cases where the businesses could not relocate within the local jurisdiction. As a result of the LPA, the City of Los Angeles could lose eight businesses and the unincorporated East Los Angeles community could lose 45 businesses. Therefore, the City of Los Angeles, County of Los Angeles and State of California would potentially lose sales tax revenue. If the acquired businesses were able to relocate within their current jurisdictions, sales tax revenue losses would be temporary in nature.

In accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, MTA would provide certain relocation services and payments to businesses on property that is acquired for construction of the LPA. Construction and operation of the rail project would require acquisition of some businesses. Please refer to section 4-3, Acquisition/Displacement and Relocation, for a complete discussion of these policies.

Sales tax revenue losses are considered generally insignificant under CEQA, given the relatively small number of commercial/retail acquisitions. See Section 4-3, Land Acquisition/ Displacement and Relocation, for additional discussion of property acquisitions associated with the LPA.

- **Business License Fees**

Business license fees are generally assessed by individual jurisdictions based on the total number of employees or the annual gross sales receipts of a business. Acquisition of commercial properties would result in lost business license fee revenues. However, under CEQA the loss is not expected to affect significantly the City or County of Los Angeles, since business license fees represent only a small portion of city and county revenues.[4]

4-2.4.3 Cumulative Impacts

Under CEQA, construction and operation of the LPA is not expected to affect significantly the fiscal position of the City or County of Los Angeles. Revenue losses would be temporary for business that relocate within the jurisdiction and could be more than offset by increased development around station areas.

4-2.4.4 Mitigation

a. Police and Fire Services

System security is an important component of MTA operations (See Section 4-13) and would be the responsibility of MTA. Selection of the provider of system security services would be determined at a later date. Current police protection on the first segment of the Red Line is being provided by Transit Police, and costs of transit protection within and in the immediate vicinity of the LPA stations would be paid by the MTA.

b. Tax Revenue Loss

The LPA is expected to induce some level of growth around station areas, enhancing the City and County of Los Angeles and State of California tax revenues, and lost tax revenues are likely to be offset by this new growth.

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[4] 2-1-93 telephone conversation with Los Angeles County Tax Assessor's Office. Staff indicated that the County does not impose a business license fee per se, but does enforce a business license ordinance that recovers the cost of licensing a business for regulatory purposes.

4-3 LAND ACQUISITION/DISPLACEMENT AND RELOCATION

The extension of Metro Rail into the Boyle Heights and East Los Angeles communities would result in the acquisition and displacement of residential and nonresidential land uses in the station areas. This section analyzes the nature and extent of acquisitions that would be required under the Locally Preferred Alternative (LPA); identifies levels of significance of these residential and nonresidential property acquisitions in accordance with CEQA; evaluates cumulative impacts resulting from displacements; and proposes mitigation measures designed to alleviate the effects of these acquisitions and displacements. Federal and state laws require consistent and fair treatment of owners of property to be taken, including just compensation for their property. Uniform and equitable treatment of displaced persons or businesses is also required by these laws. This discussion also addresses the potential impacts associated with the No-Build alternative.

4-3.1 SETTING

Construction of the LPA would require property acquisitions at every station entrance, at the off-street station sites at First/Boyle, Brooklyn/Soto and Whittier/Arizona, at the crossover site at First/Boyle and for construction staging and buffer areas. These acquisitions could increase or decrease during final design and engineering and would not occur all at once; acquisitions would be phased over time subject to designation of an initial operable segment, project funding and the overall project and contract scheduling. It is assumed for this analysis that properties acquired for construction purposes only (i.e. properties that would be necessary only for the duration of the construction period) would be fully and permanently acquired by the MTA, effectively representing a worst-case analysis. During final engineering, MTA may decide to lease parcels required for construction, depending on lease costs, the expected duration of the construction period and the potential to use the property to produce additional transit benefits. A few parcels have been designated for construction easements only, in which case, the MTA would temporarily lease some portion of the parcel during the construction period; these parcels are not defined as acquisitions in this analysis.

The MTA would also require easements of properties under which the tunnel would be constructed. In general, the depth of the tunnel (top of rail to ground surface) would range from 45 feet as it passes under the Los Angeles River to 110 feet as it passes under State Route 60 (Pomona) freeway. Appendix 4 contains profile drawings of the tunnel sections of the LPA.

Appendix 6 shows the areas as currently defined that would be acquired in each station area. A description of land use characteristics encountered in each station area is provided in Section 4-1, Existing Land Use and Development. The population and housing characteristics in each station area are addressed in Section 4-4, Communities/Neighborhoods.

4-3.2 IMPACTS

4-3.2.1 Methodology and Evaluation Criteria

Engineering plans developed during Preliminary Engineering show the location of easements, station boxes, station portals and construction areas as currently defined by the engineering performed to date. These drawings were used to determine the extent of residential and nonresidential acquisitions associated with the LPA. A survey by automobile of the immediate vicinity surrounding each station area was conducted in February and March, 1994. Information obtained from the field survey was supplemented by detailed land use maps indicating the type of land uses within approximately 500 feet of each proposed LPA station. Land use characteristics of parcels subject to property takes were obtained from Damar, a CD-ROM-encoded real estate data base for Los Angeles County produced by TRW-REDI Property Data. Affected land uses were consolidated into the following categories: single-family residential, multi-family residential, commercial/retail, industrial, office, vacant lot, vacant structure, parking lot and public/institutional. Public/institutional land uses include government buildings, churches and utilities.

The estimated number of people who would be displaced from residential dwelling units in each station area was obtained by multiplying the number of residential units to be acquired by the average number of persons per household in that station influence area (defined as a 0.4-mile radius around the station), based on the 1990 Census. Table 4-3.1 shows the estimated number of persons requiring relocation assistance in each station area for the LPA and the two Initial Operable Segments (IOSs).

The estimated number of employees displaced as a result of the project was determined by applying per-square-foot factors to the total building area of properties subject to full takes. The factors used differed by land use type in order to more accurately reflect existing employment densities; for example, a ratio of 1:500 employee-to-building square foot was assumed for retail land uses. The estimated number of employees displaced from retail land uses in a station area could then be determined by dividing the total affected retail building square feet in that station area by 500. Other factors were used to determine the estimated number of employees displaced for office and industrial uses subject to full acquisitions. Characteristic of many businesses in the Eastside Corridor Study Area, several businesses near the LPA are located on the same lot as multi- and single-family residential units, share the same building as residences, or are in small buildings of less than 500 square feet per shop. Application of the building ratios, therefore, may exaggerate the number of employees of businesses connected to residential structures and underestimate the number of employees of businesses housed in very small shops. Use of the ratios also reflects full-time employees; it may underestimate the number of part-time employees who may be displaced. The estimated number of employees who would be displaced by the LPA at each station area is presented in Table 4-3.1.

Non-residential displacements are considered significant under CEQA if the establishments are unique such that there is a relative scarcity of competing services within the area, or if the businesses pose special relocation problems as a result of their size and/or dependency on a particular location for patronage. Housing stock impacts are deemed significant under CEQA if the housing stock decreases such that vacancy rates of the existing housing substantially decline in an area already exhibiting a low vacancy rate. The following discussion examines the land use acquisition impacts associated with the LPA and the IOSs and describes their CEQA significance. Where an impact is determined to be potentially or generally significant, appropriate mitigation measures are referenced at the end of this section.

TABLE 4-3.1: ESTIMATED FULL RESIDENTIAL AND NON-RESIDENTIAL ACQUISITIONS AND DISPLACEMENT BY LPA STATION

STATION	RESIDENTIAL				NON-RESIDENTIAL									
	SFR[a] (UNITS)	MFR[b] (UNITS)	HOUSEHOLD SIZE	EST. PERSONS DISPLACED[c]	COMM / RETAIL	INDUSTRIAL	OFFICE	VACANT LOT	VACANT STRUC-TURE	PARKING LOT	PUBLIC/ INSTI-TUTIONAL	EST. LOT SQUARE FEET	EST. BUILDING SQUARE FEET	EST. EMPLOYEES DISPLACED[d]
Little Tokyo[e]	0	0	5.15	0	0	0	0	0	1	0	0	20,000	0	0
First/Boyle	6	57	3.92	247	2	0	0	6	1	1	0	121,743	49,728	6
Subtotal IOS-1	6	57		247	2	0	0	6	2	1	0	141,743	49,728	6
Brooklyn/Soto	0	81	4.23	343	3	1	3	0	1	2	0	143,208	110,498	46
First/Lorena	0	0	4.19	0	1	1	0	0	0	0	0	55,038	11,960	24
Subtotal IOS-2	6	138		590	6	2	3	6	3	3	0	339,989	172,186	76
Whittier/Rowan	9	16	4.48	112	21	0	2	1	0	0	0	109,712	41,475	67
Whittier/Arizona	1	27	4.26	119	7	1	0	1	0	1	2	158,649	60,806	74
Whittier/Atlantic	1	0	3.92	4	13	0	0	1	1	6	0	221,028	138,863	172
Total LPA (All stations)	17	181		825	47	3	5	9	4	10	2	829,378	413,330	389

Notes: [a] SFR = Single family residential.
[b] MFR = Multi-family residential.
[c] Estimated residential displacement was obtained by multiplying the number of dwelling units subject to full acquisition by the average number of persons per household in each station area, per the 1990 Census.
[d] Estimated employee displacement was calculated using the following factors: office -- 1: 250 square feet; retail -- 1:500 square feet; industrial -- 1:525 square feet Source: The Fiscal Handbook (Burchell and Listokin, 1978).
[e] There are two station entrance options as this site. The acquisition listed in this table is a partial acquisition of approximately 20,000 square feet of a 440,000 square feet industrial lot at the southwest corner of Santa Fe Avenue and Third Street. The second option is use of a site in the Metro Rail Yard.

Source: Myra L. Frank & Associates, Inc., 1994.

4-3.2.2 Locally Preferred Alternative

Under Alternative 9B of the AA/DEIS/DEIR, which contained the greatest numbers of anticipated residential and non-residential acquisitions of all the alternatives studied, 24 to 96 housing units were expected to be acquired, as well as 18 to 27 commercial/retail establishments and 9 to 10 industrial businesses (Table 4-3.1 Eastside Corridor Residential/Non-Residential Acquisitions and Population Displacement by Station and Rail Alternative, pg. 4-3.5, AA/DEIS/DEIR). Up to 3 vacant lots, 10 to 17 parking lots and 1 to 3 public institutions also were expected to be acquired. As defined during preliminary engineering, in order to provide buffer areas between construction activity and residences, as well as furnish sufficient areas for construction staging so as to minimize noise, dust, traffic and hauling effects on the surrounding streets and neighborhoods, the LPA would require more residential and commercial/retail acquisitions than estimated under any of the alternatives studied in the AA/DEIR/DEIS. Table 4-3.1 shows the number of full property acquisitions estimated to be required for the LPA in each station area.

As shown in Table 4-3.1, at the Brooklyn/Soto station, construction of the LPA would require acquisition of the largest number of residential units (81), while at the Whittier/Rowan station, the largest number of businesses (23) would be acquired. In terms of parcel lot space acquired, implementation of the LPA would require acquisition of the greatest amount of space (221,028 square feet) at the Whittier/Atlantic station. (See Appendix 6 for the locations of properties to be acquired.)

a. Residential Displacement

In the absence of mitigation, residential displacement impacts resulting from the LPA are considered generally significant under CEQA. The LPA would result in the acquisition of 17 single-family and 181 multi-family units, or a total of 198 housing units. Characteristic of the Eastside Corridor Study Area, household sizes near the station areas typically range from four to five persons per housing unit. A total of 825 persons are estimated to be displaced as a result of construction of the LPA. No residential acquisitions would occur at the Little Tokyo or First/Lorena stations.

- Little Tokyo Station

No residential acquisitions are anticipated at the Little Tokyo station.

- First/Boyle Station

Residential acquisitions at the off-street First/Boyle station would account for 32 percent of all the housing units acquired for the LPA, or 63 units (6 single-family and 57 multi-family units). Acquisition of these units, located primarily south of First Street, between Bodie Street and Boyle Avenue and north of Bailey Street, between Pleasant and Pennsylvania Avenues, would result in an estimated 247 persons displaced. In addition, two cultural resources (a victorian home and Jewish Wayfarers' Home) would be acquired by the project. (See Section 4-13, Historic, Archaeologic and Cultural Resources).

- Brooklyn/Soto Station

The largest share of the residential displacement would be attributable to the off-street Brooklyn/Soto station, which would require acquisition of 81 housing units, or 41 percent of all the housing units acquired for the LPA, resulting in the displacement of an estimated 343 persons. All of the displacements would occur in apartment buildings and other multi-unit residences located south of Brooklyn Avenue, between Soto and Fickett Streets.

- First/Lorena

No residential acquisitions are anticipated to occur in the First/Lorena station area. MTA recognizes that construction of the First/Lorena station would produce impacts on local housing, particularly the houses on the south side of First Street, between Concord and Lorena streets. Critical impacts (e.g. loss of on-street parking along First Street, which appear a primary source of parking for these residents) would occur on these homes during the placement of piles, deck construction and street restoration. MTA proposes to offer temporary relocation benefits to these residents during these construction periods. Placement of the piles can take three to four days per block. Placement of the deck and street restoration is estimated to take three months each at the beginning and completion of the station excavation (see Section 4-18).

- Whittier/Rowan Station

The Whittier/Rowan station, although in-street, would require taking 25 housing units (9 single-family and 16 multi-family units), or 13 percent of the total units acquired for the LPA, displacing an estimated 112 persons. The acquisitions would occur along the south side of Whittier Boulevard between Townsend and Gage Avenues, in areas needed for the station entrance, construction staging and station right-of-way.

- Whittier/Arizona Station

Twenty-eight housing units would be acquired for the LPA at the off-street Whittier/Arizona station. Twenty-seven multi-family units contained within several apartment buildings and duplexes and one single-family unit, located north of Whittier Avenue, between Duncan and Arizona Avenues would be acquired. An estimated 119 persons would be displaced at this station site.

- Whittier/Atlantic Station

One single-family house on Amalia Street, behind the Great Western Bank, would be acquired for the Whittier/Atlantic station area, displacing an estimated four persons.

Should additional acquisitions of residences be necessary as a result of significant construction impacts (e.g., noise and dust), relocation assistance would be provided to the affected property owners and/or tenants, as discussed in Section 4-3.4.

No residential acquisition and displacement impacts would occur under the No-Build Alternative.

b. Impacts on Housing Stock

The LPA would require the acquisition of 198 housing units (17 single-family and 181 multi-family) from the entire housing stock in Los Angeles County. This section evaluates the impacts that these acquisitions would have on the housing stock for different geographic study areas within the corridor area.

Relocation study areas have been defined for this analysis as geographic areas to which displaced residents could be expected to relocate. Ten areas have been identified and are consistent with (1) the State of California's Government Code Section 7260, et seq. which requires the relocating agency to provide relocation expenses for relocating parties as far as 50 miles from the subject property and (2) the potential to relocate displaced persons within their neighborhood or community to the extent that people desire to relocate to these areas. Study areas evaluated in this section include the City and County of Los Angeles, the City of Los Angeles community of Boyle Heights, the unincorporated community of East Los Angeles and the neighborhood-level station influence areas (a 0.4-mile radius around the stations).

Housing characteristics evaluated for each study area include the 1990 census figures for total housing units, owner-occupied and renter-occupied units, vacant units and vacancy rates. Overcrowding of the housing supply is determined based on the average number of persons per household and the percentage of units with more than two persons per room. The affordability of the housing stock is assessed based on the median housing values and median contract rents; housing affordability is defined as monthly housing expenses which do not exceed 30 percent of the median household income.

Table 4-3.2 provides the existing and post-acquisition figures for total housing units, owner-occupied and renter-occupied units; and vacancy rates for each of the relocation study areas. Table 4-3.3 provides information on the average number of persons per household, overcrowded units, median household incomes, median housing values and median contract rents.

- Regional Analysis

<u>County of Los Angeles</u>

The County of Los Angeles has 3,163,343 housing units, based on the 1990 U.S Census. The housing stock is 46 percent owner-occupied and 49 percent renter-occupied. Vacant units account for 5.49 percent of the housing stock. The average number of persons per household is 2.91. Two percent of the owner-occupied units and 11 percent of the renter-occupied units have more than two persons per room. The county median household income is $34,965. The median housing value is $226,400. The median contract rent is $570.

TABLE 4-3.2: RESIDENTIAL ACQUISITIONS: OCCUPANCY AND VACANCY RATES

JURISDICTION/ STATION INFLUENCE AREA	NUMBER OF RESIDENTIAL ACQUISITIONS			TOTAL HOUSING UNITS			OWNER OCCUPIED UNITS				RENTER OCCUPIED UNITS				NUMBER OF VACANT UNITS		VACANCY RATE (PERCENT)		
	SFR[a]	MFR[b]	TOTAL	1990	AFTER PROJECT	PERCENT ACQUIRED	1990		ACQUIRED BY LPA		1990		ACQUIRED BY LPA		1990	AFTER PROJECT	1990	AFTER PROJECT	CHANGE
							NO.	%	NO.	%	NO.	%	NO.	%					
Regional																			
Los Angeles County	17	181	198	3,163,343	3,163,145	0.01%	1,440,830	46%	6	.0004%	1,548,722	49%	48	.003%	173,791	173,593	5.49%	5.49%	0.00
Los Angeles City	6	138	144	1,299,963	1,299,819	0.01%	479,868	37%	3	.001%	737,537	57%	141	.02%	82,558	82,414	6.35%	6.34%	0.01
Community Areas																			
Boyle Heights[c]	6	138	144	23,236	23,092	0.62%	5,333	23%	3	.06%	17,119	74%	141	.82%	784	640	3.37%	2.77%	0.60
East Los Angeles[d]	11	43	54	29,476	29,422	0.18%	10,729	36%	6	.06%	17,952	61%	48	.27%	795	741	2.70%	2.52%	0.18
Station Influence Areas[e]																			
First/Boyle	6	57	63	3,117	3,054	2.00%	314	10%	3	.96%	2,674	86%	60	2.24%	129	66	4.14%	2.16%	1.98
Brooklyn/Soto	0	81	81	4,633	4,552	1.75%	832	18%	0	0%	3,645	79%	81	2.22%	156	75	3.37%	1.65%	1.72
Whittier/Rowan	9	16	25	3,868	3,843	0.65%	1,171	30%	5	.43%	2,606	67%	20	.77%	91	66	2.35%	1.72%	0.63
Whittier/Arizona	1	27	28	3,235	3,207	0.87%	981	30%	0	0%	2,176	67%	28	1.29%	78	50	2.41%	1.56%	0.85
Whittier/Atlantic	1	0	1	2,909	2,908	0.03%	1,021	35%	1	.10%	1,823	63%	0	0%	65	64	2.23%	2.20%	0.03

Notes: [a] SFR = single-family residential
[b] MFR = multi-family residential
[c] Boyle Heights figures for all housing characteristics are a compilation of figures for the census tracts within the Boyle Heights community.
[d] East Los Angeles figures for all housing characteristics are a compilation of figures for the census tracts within the East Los Angeles community.
[e] Includes only stations where residential acquisitions are expected to occur. Station influence area figures are based on the figures for the census tracts located within the station influence area multiplied by the percentage of the census tract within 0.4 miles of the station.
[░] shaded cells indicate that vacancy rate change would result in a potentially significant impact under CEQA.

Source: 1990 U.S. Census of Population and Housing; Myra L. Frank & Associates, Inc., 1994.

TABLE 4-3.3:
RESIDENTIAL ACQUISITIONS: HOUSEHOLD CHARACTERISTICS

JURISDICTION/ STATION INFLUENCE AREA	AVERAGE NUMBER OF PERSONS PER HOUSEHOLD	MORE THAN TWO PERSONS PER ROOM IN OWNER OCCUPIED UNITS		MORE THAN TWO PERSONS PER ROOM IN RENTER OCCUPIED UNITS		MEDIAN HOUSEHOLD INCOME	MEDIAN HOUSING VALUE	MEDIAN CONTRACT RENT
		NO.	%	NO.	%			
Regional								
Los Angeles County	2.91	31,768	2%	168,929	11%	$34,965	$226,400	$570
Los Angeles City	2.8	11,285	2%	98,208	13%	$30,925	$244,500	$544
Community Areas								
Boyle Heights[a]	4.17	542	10%	4,566	27%	$20,842	$136,895	$396
East Los Angeles[b]	4.13	1,101	10%	4,230	24%	$23,213	$145,045	$434
Station Influence Areas[c]								
First/Boyle	3.92	30	10%	559	21%	$17,031	$137,667	$341
Brooklyn/Soto	4.23	84	10%	1,179	32%	$19,408	$136,939	$411
Whittier/Rowan	4.48	152	13%	632	24%	$21,721	$136,472	$446
Whittier/Arizona	4.26	126	13%	606	28%	$21,995	$143,343	$444
Whittier/Atlantic	3.92	105	10%	438	24%	$23,664	$153,125	$449

Notes: [a] Boyle Heights figures for all housing characteristics except Median Household Income, Median Housing Value and Median Contract Rent are a compilation of figures for the census tracts within the Boyle Heights community; Boyle Heights figures for the Median Household Income, Median Housing Value and Median Contract Rent are based on a weighted average of the Median Household Income, Median Housing Value and Median Contract Rent for the census tracts within the community.

[b] East Los Angeles figures for all housing characteristics except Median Household Income, Median Housing Value and Median Contract Rent are a compilation of figures for the census tracts within the East Los Angeles community; East Los Angeles figures for the Median Household Income, Median Housing Value and Median Contract Rent are based on a weighted average of the Median Household Income, Median Housing Value and Median Contract Rent for the census tracts within the community.

[c] Includes only stations where residential acquisitions are expected to occur; station influence area figures are based on the figures for the census tracts located within the station influence area multiplied by the percentage of the census tract within 0.4 miles of the Station.

Source: 1990 U.S. Census of Population and Housing; Myra L. Frank & Associates, Inc., 1994.

Residential acquisitions associated with the LPA would remove 198 units (17 single-family and 181 multi-family) or 0.01 percent of the total housing supply in the county. When viewed from a county-wide perspective, the vacancy rate of 5.49 percent would virtually remain unchanged after acquisition. The units to be acquired could be considered as lower cost housing.

City of Los Angeles

The City of Los Angeles has 1,299,963 housing units based on the 1990 census. The housing stock is 37 percent owner-occupied and 57 percent renter-occupied. Vacant units account for 6.35 percent of the housing stock. The average number of persons per household is 2.8. Two percent of the owner-occupied and 13 percent of the renter-occupied units have more than two persons per room. The median housing value is $244,500, which the 1993 City of Los Angeles Housing Element describes as unaffordable to most residents of the city, where the median household income is $30,925. The median contract rent of $544 is defined as affordable to households with a median household income of $21,760 or greater. (Affordable is defined as no more than 30 percent of the median household income for rent).

The LPA would require the acquisition of 144 housing units (6 single-family and 138 multi-family) of the total housing stock in the City of Los Angeles, accounting for 0.01 percent of the total housing supply in the city. When evaluated from a city-wide perspective, the acquisitions for the LPA stations in the city would result in a city-wide vacancy rate change of 0.01 percent, from 6.35 to 6.34 percent.

- Community Plan Area Analysis

Boyle Heights

Boyle Heights encompasses the area bordered generally on the north by Marengo Street, on the south by 25th Street, on the east by Indiana Street and on the west by the Los Angeles River. Based on the 1990 census data, Boyle Heights has 23,236 housing units, which represents two percent of the city-wide housing stock. Seventy-four percent of housing supply is renter-occupied. The vacancy rate of 3.37 percent is lower than the city-wide vacancy rate of 6.35 percent, indicating a high demand for available housing in Boyle Heights. The average number of persons per household of 4.17 is well above the city-wide figure of 2.8 persons. The large household size, and the fact that ten percent of the owner-occupied units and 27 percent of the renter-occupied units have more than two persons per room, indicate that there is overcrowding of the housing supply. Compared to the city-wide housing costs, the median housing value of $136,895 and the median contract rent of $396 are relatively low and more affordable in the Boyle Heights community, where the median household income of $20,842 is low. At 22 percent of the median household income, Boyle Heights median contract rents would be defined as affordable by the City of Los Angeles Housing Element.

The LPA would require the acquisition of 144 housing units (6 single-family and 138 multi-family) from the total housing supply in Boyle Heights. These acquisitions would account for 0.62 percent of the total housing stock or 0.06 percent of the owner-occupied units and 0.82 percent of the renter-occupied units in the community, based on tax ownership information. LPA acquisitions would reduce the number of available lower-cost rental housing units in a community which already experiences overcrowding, particularly in renter-occupied units. The vacancy rate in the Boyle Heights community would change by 0.60 from 3.37 percent to 2.77 percent.

East Los Angeles

The unincorporated community of East Los Angeles is bordered on the north by the City of Los Angeles, on the south by the City of Commerce, on the east by the cities of Monterey Park and Montebello and on the west by Boyle Heights in the City of Los Angeles. East Los Angeles had 29,476 housing units, which represented one percent of the housing supply in the county in 1990. Sixty-one percent of the housing was renter-occupied. Based on the 1990 census data, East Los Angeles had a vacancy rate of 2.70 percent, which is about half the county-wide vacancy rate of 5.49 percent. The average number of persons per household of 4.13 in East Los Angeles is larger than the county figure of 2.91. Ten percent of owner-occupied units and 24 percent of renter-occupied units have more than two persons per room, with both figures indicating overcrowding of the housing supply. The median housing value of $145,045 and median contract rent of $434 indicate that the housing costs are relatively low and more affordable to a community with a median household income of $23,213.

The LPA would require the acquisition of 54 units (11 single-family and 43 multi-family), or 0.18 percent of the total housing units in East Los Angeles. The project would take less than one percent of the owner-occupied and renter-occupied units, based on tax ownership information, although the units removed would be lower cost housing. The acquisitions would result in a 0.18 percent change in the vacancy rate for the East Los Angeles community from 2.7 percent to 2.52 percent.

- Station Influence Area Analysis

For purposes of this analysis and as defined in the AA/DEIS/DEIR, significant impacts under CEQA were deemed not to occur where the vacancy rate after acquisition would remain above five percent in the station influence area. Under CEQA, a potentially significant impact was deemed to occur if (1) a station influence area vacancy rate after acquisition would be between three and five percent and the predicted change in vacancy rate is 0.25 or greater or (2) a station area vacancy rate after acquisition would be below three percent and the predicted change in vacancy rate is 0.10 or greater. Application of these criteria are evaluated below for LPA station influence areas with residential acquisitions. Residential acquistions are not anticipated in the Little Tokyo or First/Lorena station areas.

To allow for an analysis of the worst-case impacts, the calculation of vacancy rates after LPA acquisition conservatively assumes that: (1) all units to be acquired are occupied and (2) the residents/tenants of the acquired units would desire to relocate and occupy currently vacant units within the subject station influence areas. Use of 0.4-mile radius station influence area also results in a worst-case estimate of vacancy rate changes because persons displaced by the acquisitions could choose to relocate to other areas in the community, city or county. Moreover, the estimates do not take into account future trends in the housing market that could cause future vacancy rates to increase or decrease. Such trends depend on a number of economic, political and social factors that cannot be accurately predicted.

<u>First/Boyle</u>

The First/Boyle Station influence area has 3,117 housing units according to the 1990 U.S. Census. Eighty-six percent of the units are renter-occupied. The vacancy rate of 4.14 percent is below five percent, which indicates that there is a high demand for available housing. The station influence area has a relatively large average number of persons per household of 3.92 when compared to the city figure of 2.8. Overcrowding is indicated by the fact that ten percent of the owner-occupied units and 21 percent of the renter-occupied units have more than two persons per room. The median housing value of $137,667 and the median contract rent of $341 in the First/Boyle Station influence area are lower and more affordable than the city-wide figures. The median household income of $17,031 is well below the city-wide figure of $30,925.

The LPA would require the acquisition of 63 housing units (6 single-family and 57 multi-family) from the total housing stock in the First/Boyle Station influence area, representing two percent of the housing supply in this area. These acquisitions would diminish the already short supply of relatively low-cost housing in this neighborhood and lower the vacancy rate from 4.14 percent to 2.16 percent, a 1.98 percent change. Based on the criteria, a potentially significant impact under CEQA would occur to the supply of vacant units within in a 0.4-mile radius of the First/Boyle station.

Brooklyn/Soto Station

Based on the 1990 census data, the Brooklyn/Soto Station influence area has 4,633 housing units. Renter-occupied units account for 79 percent of the housing stock. The vacancy rate of 3.37 percent is low, indicating a high demand for available housing. Overcrowding of the housing supply is evident given the large average number of persons per household of 4.23 and the fact that ten percent of the owner-occupied and 32 percent of the renter-occupied units have more than two persons per room. The median housing value of $136,939 and the median contract rent of $411 are lower than the city-wide figures, and the median household income of $19,408 is comparatively low.

The LPA would remove 81 rental housing units from the total housing supply in the Brooklyn/Soto Station influence area. These takes represent 1.75 percent of the total housing supply and 2.22 percent of the renter-occupied units surrounding the station site. The reduction in the vacancy rate from 3.37 percent to 1.65 percent, resulting in a 1.72 change, would cause a potentially significant impact under CEQA to the supply of vacant units in the neighborhoods within a 0.4-mile radius of the Brooklyn/Soto Station. The acquisitions would remove lower cost rental units from the housing stock and occur in an area which is experiencing overcrowding of the housing supply, particularly in renter-occupied units.

Whittier/Rowan Station

Based on the 1990 census data, the Whittier/Rowan Station Area has 3,868 housing units. More than two-thirds of the housing stock is renter-occupied. The vacancy rate is low at 2.35 percent, indicating a high demand for available housing. The average number of persons per household of 4.48 is relatively large when compared to the county figure of 2.91. Thirteen percent of owner-occupied housing units and 24 percent of renter-occupied housing units have more than two persons per room, which indicates there is overcrowding of the housing supply. The median housing value of $136,472 and the median contract rent of $446 are lower and more affordable than the county-wide housing costs. The median household income is $21,721.

The LPA would require the acquisition of 25 housing units (9 single-family and 16 multi-family) which would account for less than one percent of the total housing supply within the Whittier/Rowan station influence area. Less than one percent of the owner-occupied and renter-occupied units would be removed. The acquisitions would result in a 0.63 change in the vacancy rate. However, based on the criteria, since the existing vacancy rate of 2.35 percent is less than three percent, this small change would result in a potentially significant impact under CEQA to the supply of vacant housing in the station influence area. The removal of this housing would diminish the supply of lower cost housing in a residential area where there is overcrowding of the housing stock.

Whittier/Arizona Station

The Whittier/Arizona Station influence area has 3,235 housing units based on the 1990 U.S. Census. Renter-occupied housing represents 67 percent of the housing stock. Based on the vacancy rate of 2.41 percent, the area has a high demand for available housing. The area has an average number of persons per household of 4.26. Overcrowding of the housing supply is reflected in the finding that 13 percent of the owner-occupied units and 28 percent of the renter-occupied units have more than two persons per room. The median household income is $21,995 in the station influence area. Similarly to the median housing costs for East Los Angeles, the median housing value of $143,343 and the median contract rent of $444 for the station influence area are lower and more affordable than the county-wide figures.

The LPA would require the acquisition of 28 units (1 single-family and 27 multi-family), or less than one percent of the total housing supply in the Whittier/Arizona Station influence area. These acquisitions would account for 1.29 percent of the renter-occupied units in the station influence area. Although the LPA would affect a small percentage of the total housing units, the 0.85 percent change to the existing vacancy rate of 2.41 percent would result in a potentially significant impact under CEQA to the vacant housing supply, based on the criteria provided above. These residential acquisitions would diminish the supply of lower cost rental units and would occur in an area where there is overcrowding, particularly in rental units.

Whittier/Atlantic

The Whittier/Atlantic Station influence area has a housing stock of 2,909 units. Nearly two-thirds of the housing is renter-occupied. Vacant housing units account for 2.23 percent of the housing stock, indicating a low vacancy rate and a high demand for available housing. The average number of persons per household of 3.92 is larger than the county-wide figure of 2.91. Ten percent of the owner-occupied units and 24 percent of the renter-occupied units have more than two persons per room. The median housing value of $153,125 and the median contract rent of $449 are slightly higher than the median housing costs for East Los Angeles, but still lower than the county-wide figures. The median household income is $23,664.

The LPA would require acquisition of one single-family, owner-occupied unit, which accounts for 0.03 percent of the total housing supply in the Whittier/Atlantic Station influence area. The 0.03 percent change in the vacancy rate would not result in a significant impact under CEQA to the supply of vacant units in the station influence area.

- Summary of Impacts to Housing Stock

Based on the criteria described above, potentially significant impacts to the housing stock under CEQA would occur at the First/Boyle, Brooklyn/Soto, Whittier/Rowan and Whittier/Arizona station influence areas; and significance levels would depend upon the extent to which the residents desire to be relocated within the subject station influence areas.

c. Non-residential Displacement

In the absence of mitigation, non-residential displacement and employment impacts resulting from the LPA are considered to be potentially significant under CEQA. A micro-scale analysis of individual station areas permits the identification of businesses subject to full acquisitions that could: (1) be considered sensitive by the surrounding community due to the relative scarcity of competing services and (2) pose special relocation problems as a result of their size and/or dependency on a particular location for patronage. Under CEQA, generally significant impacts are judged to occur in the instance where the project would require the full acquisition of such businesses.

- Little Tokyo Station

There are two options for station entrances at the Little Tokyo station. The option assumed for this analysis is a 20,000 square-foot space from a 440,000 square-foot vacant lot, currently the site of an abandoned train freight house that is eligible to the National Register of Historic Places (See Section 4-13.1, Historic Resources). A second option would use space in the Metro Rail Yard.

- First/Boyle Station

At the First/Boyle Station, two commercial businesses would be acquired, displacing approximately six employees. In addition, one vacant structure and associated vacant and parking lots would be acquired. It does not appear that either of these businesses (a gas station and donut shop) pose significant relocation problems or are considered significant community resources under CEQA.

- Brooklyn/Soto Station

Existing commercial retail and office businesses would be acquired at the Brooklyn/Soto station, comprised of two travel agencies, a shoe store, hair salon, beauty supply store, recycling center and large swap meet. Employee displacement is estimated at 46 persons. None of the businesses appears to pose special relocation problems.

- First/Lorena Station

A small restaurant and large hardware store with connecting lumber yard, occupying over 21,000 square feet, would be displaced by the First/Lorena station. An estimated 24 employees would be displaced. The lumber yard may encounter difficulty relocating in the immediate area given its size and the dearth of vacant, large parcels in East Los Angeles. The yard, however, does not appear to use specialized, immobile equipment that would require it to stay in its present location.

- Whittier/Rowan Station

The Whittier/Rowan station area is characterized by small retail shops fronting lots shared with single- and multi-family units. Many of the 21 retail stores that would be displaced are not larger than 1,000 square feet. None of the stores appears to present special relocation problems.

- Whittier/Arizona Station

The eight businesses that would be acquired at the Whittier/Arizona station are located along the north side of Whittier Boulevard and include a dentist office and a bank. Acquisition of the Pan America Bank would decrease the number of financial institutions providing service within the immediate vicinity of the Whittier/Arizona station area. In addition, a large furniture warehouse, located on a 27,000 square-foot lot west of McDonnell Avenue, would be displaced by the project. Given the size of the warehouse, relocation within the immediate area may be difficult. In addition, two public institutions, the East Los Angeles Church of Jehovah's Witness and the California Water Service Company would be acquired, although these do not appear to represent significant relocation problems under CEQA.

- Whittier/Atlantic Station

Of the 13 businesses to be acquired at the Whittier/Atlantic station area, most of the stores are auto body repair or supply stores and small retail shops within the former bowling alley building, between Woods and Atlantic Boulevards on the south side of Whittier Boulevard. In addition to these stores, several fast-food restaurants, a dentist's office and two banks (Great Western Bank and California Federal Bank) would be acquired. In total, an estimated 172 employees are estimated as being displaced. It is not anticipated that the banks would have difficulty relocating in the immediate area, either along or in the vicinity of the Whittier Boulevard corridor or in the City of Commerce. In addition, there are three other banks currently serving the Whittier/Atlantic area (Bank of America, First Interstate and American Savings Bank). It does not appear that any of the businesses in the Whittier/Atlantic station area would encounter significant relocation problems under CEQA. However, given that the Great Western Bank is one of the larger business structures in East Los Angeles, the MTA proposes to work with this bank to determine if the proposed parking structure for this location can be developed via a cooperative agreement to allow for the continued operation of this business at this site.

At any station location, should additional acquisitions of businesses be necessary as a result of significant construction impacts (e.g., noise and dust), relocation assistance would be provided to the affected property owners and/or tenants, as discussed in Section 4-3.4.

Non-residential acquisition and displacement impacts would not occur under the No-Build Alternative.

4-3.3 INITIAL OPERATING SEGMENTS

Initial Operating Segment (IOS-1) (Little Tokyo and First/Boyle stations) would result in a total of 63 residential and 11 non-residential acquisitions. IOS-2 (Little Tokyo, First/Boyle, Brooklyn/Soto, First/Lorena) would produce a total of 144 residential and 23 non-residential acquisitions. Impacts for each IOS would be as described above for each of the stations included in the IOS.

4-3.4 CUMULATIVE IMPACTS

The cumulative impacts associated with the LPA were assessed by comparing the number of acquisitions occurring under the IOS-2 with the number of demolitions occurring between 1990 and 1993 in the Boyle Heights community, as presented in Table 4-3.4. With the exception of the Little Tokyo Station, the IOS-2 stations are located in the Boyle Heights community, and the Little Tokyo station does not involve any acquisition or demolition of structures. In addition, data on annual demolition activity were available from the City of Los Angeles Building and Safety Department, while similar data for the County of Los Angeles were not available.

TABLE 4-3.4: CITY OF LOS ANGELES DEMOLITIONS: 1990-1993 AND IOS-2 ACQUISITIONS -- BOYLE HEIGHTS COMMUNITY PLAN AREA

YEAR	RESIDENTIAL UNITS[a]	GARAGE	COMMERCIAL	INDUSTRIAL
1990	14	4	2	1
1991	9	15	3	0
1992	11	5	4	1
1993	1	7	2	4
1990-1993 Total	35	31	11	6
IOS-2[b]	144	0	9	2

Note: [a] Residential acquisitions include single- and multi-family units.
[b] Excludes vacant lots, vacant structures and parking lots.

Source: City of Los Angeles Building and Safety Department, 1993 and 1994.

In the context of overall demolition activity in Boyle Heights in the previous three years, the acquisition and displacement of residential and non-residential property associated with the construction of the LPA would be potentially significant under CEQA. A decline in the number of residential units resulting from demolition in areas surrounding the station locations would exacerbate the impact of the proposed acquisitions on housing stock.

4-3.5 MITIGATION

4-3.5.1 <u>Residential and Commercial Displacement</u>

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), and as incorporated by the 1991 Intermodal Surface Transportation Efficiency Act, mandates that certain relocation services and payments by the Los Angeles County Metropolitan Transportation Authority (MTA) be made available to eligible residents, businesses and nonprofit organizations displaced by construction and operation of MTA 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) promote confidence in public land acquisition.

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, MTA 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.

MTA would apply acquisition and relocation policies to assure compliance with the Uniform Act and Amendments. All real property acquired by MTA 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 homeowner, renter, business or nonprofit organization displaced as a result of the project would be given advanced written notice and would be informed of the eligibility requirements for relocation assistance and payments. Application by the MTA of the applicable acquisition and relocation programs, policies and procedures would result in relocation impacts deemed to be insignificant under CEQA after mitigation.

The Uniform Relocation Act requires that comparable, decent, safe and sanitary replacement housing which is within a person's financial means be made available before that person may be displaced. In the event that such replacement housing is not available to "re-house" persons displaced by the LPA within the statutory limits for replacement housing payments, the MTA may provide Last Resort Housing in a number of ways, including:

- Rehabilitating or constructing additions to existing replacement dwellings and making them available to the displaced person;
- Constructing new housing to be rented or sold to displaced persons for amounts within their financial means;
- Physically relocating comparable dwellings to replacement site;

- Purchasing existing housing to be rented or sold to displaced persons for amounts within their financial means;

- Removing barriers and/or rehabilitating structures to accommodate handicapped displaced persons when suitable replacement housing is not available;

- Making replacement housing payments in excess of the statutory limits of $22,500 for owner/occupants and $5,250 for renters.

- Offering a direct loan, or other financing techniques, to assist displaced persons in purchasing comparable replacement dwellings.

All eligible displaced persons have freedom of choice in the selection of comparable replacement housing, and MTA will not require any displaced person, without his/her written consent, to accept a replacement dwelling provided by MTA. If a displaced person decides not to accept the replacement housing offered by MTA, the displaced person may secure a comparable replacement dwelling of his/her choice, providing it meets decent, safe and sanitary housing standards.

Although the residences along the south side of First Street, between Concord and Lorena Streets, will not be acquired for the LPA, the MTA will offer temporary relocation benefits to these residents during the placement of piles, deck construction and street restoration. Street decking and restoration could last three months each - at the beginning and upon completion of station excavation - while placement of piles could take three to four days per block.

With regard to business displacement, the MTA will also work with the Great Western Bank to determine if a parking structure could be developed via a cooperative agreement such that the bank could continue operating at its existing site.

Following application of these policies and regulations by the MTA, relocation/displacement impacts are judged to be insignificant under CEQA.

4-3.5.2 Loss of Housing Stock

As part of the Community Transportation Linkages Program, MTA will work with the community, elected officials, local housing agencies and other housing providers to implement a program to replenish the loss of housing stock with family and senior citizen housing to be included in MTA and joint development projects. (For further discussion of the Community Transportation Linkages Program, please see Section 4-1, Land Use and Development).

The program will include the following components:

- Transit based housing development. The MTA will make available sites for joint development projects, including housing. The MTA will not be the developer. Non-MTA sources of public and private funding, as well as development and property management expertise, will be a necessity. Station sites will not become available for joint development until completion of station construction.

Site-specific building programs, density and design concepts, developer selection and development transactions will be developed through the Community Transportation Linkages Program.

- Pre-development financing and housing rehabilitation. A $5,000,000 revolving loan fund will be targeted to assist development of the MTA station sites and adjacent properties. Projects located within the Study Area may also be considered. The intent of the loan fund is to assist community based developers and property owners with financing of administrative, design, legal and other professional services required to obtain funding commitments for construction and permanent financing. Loan repayment will be from construction and permanent loan proceeds.

Criteria for eligibility, funding prerequisites, program administration, underwriting and repayment will be formulated through the Community Transportation Linkages Program.

- Reuse of existing structures. Before demolition of existing residential and other structures which will be acquired for station construction, the MTA will develop a program to offer the structures to community based housing and social service providers as well as other public agencies who can remove the structures from the construction site.

4-3.6 IMPACTS AFTER MITIGATION

With regard to residential and business displacement, there would be no significant impacts under CEQA after mitigation. Implementation and adherence to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and its amendments would provide equitable treatment, compensation and relocation assistance to homeowners, renters, businesses and non-profit organizations displaced by the LPA.

With regard to the loss of housing stock, there would be a potentially significant impact under CEQA after mitigation at the First/Boyle, Brooklyn/Soto, Whittier/Rowan and Whittier/Arizona station influence areas; however, significance levels would depend upon the extent to which the residents desire to be relocated within the subject station influence areas.

4-4 COMMUNITIES/NEIGHBORHOODS

4-4.1 STATION AREA DEMOGRAPHICS

4-4.1.1 Setting

a. Regional Summary

Los Angeles County, with a 1990 population of 8.8 million persons, is the most populous county in the state. It contains almost two-thirds of the population of the Southern California region, which includes Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura Counties; and one-third of the state's population. Since 1980, the county population has grown by 19 percent, from 7.4 million in 1980 to 8.8 million in 1990. According to the Southern California Association of Governments (SCAG), the Central Los Angeles Subregion, which incorporates the City of Los Angeles, had a 1988 population of 2.3 million.

In 1990, over 3.1 million housing units existed in Los Angeles County, according to the 1990 U.S. Census. Over half of the occupied units were owner-occupied. The median value of an owner-occupied unit was $226,400 and median rent was $570 per month. The 1988 housing stock for the Central Los Angeles Subregion was 826,200 units.

b. Local Area Summary

The Locally Preferred Alternative (LPA) would traverse the Boyle Heights and Central City North communities of the City of Los Angeles, and the unincorporated Los Angeles County community of East Los Angeles. According to the 1990 U.S. Census of Population and Housing, 91 percent of these communities' population was Hispanic. The median age of area residents was 26 years. About 30 percent of the housing units were owner-occupied, and vacancy rates were generally low, around three percent. Most of the housing units were single-family houses with an average size of 4.33 persons per household, which is about 40 percent higher than the City and County of Los Angeles averages of 2.9 and 2.8 persons per household, respectively.

c. Station Influence Areas

Demographic information presented in this section was evaluated based on a 0.4-mile area around each station (station influence area) for the LPA and examines existing conditions and projected impacts to communities/neighborhoods within these areas. For a more detailed discussion of growth within the station influence areas, please refer to Section 4-1, Land Use and Development.

4-4.1.2 Impacts

a. Population Growth

According to 2010 population projections developed from SCAG forecasts, the number of people residing in the station influence areas is expected to grow from 2.4 to 29.0 percent between 1990 and 2010, an increase of 404 to 1,282 persons for the Whittier/Rowan and Little Tokyo Stations respectively. The overall population growth for the LPA seven station influence areas is projected to be 6.3 percent. In comparison, the County of Los Angeles' population is expected to increase 18 percent by 2010. Table 4-4.1 and Figure 4-4.1 shows 1990 through 2010 projected growth for population, housing units and employment for the LPA station influence areas. Figure 4-4.1 shows the projected growth levels for each station influence area (For more detail, see Eastside Corridor AA/DEIS/DEIR Social, Economic and Environmental Impact Assessment Methodology Report, January 7, 1993, incorporated herein by reference.)

The degree to which the projected population and housing growth would be accommodated in the station areas is discussed in Section 4-1, Land Use and Development. The impact of residential acquisition upon the existing housing stock and residents is discussed in Section 4-3, Land Acquisition/Displacement and Relocation.

b. Transit-Dependent Populations

The LPA is expected to provide improved accessibility and mobility to the transit-dependent populations residing in the station areas. Transit-dependent populations are defined as youth populations (age 6-18 years), elderly populations (age 65 years and older), persons in households without private transportation and persons in households below poverty level. Transit dependency for the LPA was evaluated according to the station influence areas; no demographic data were analyzed for areas between station influence areas. The source of the data is the 1990 U.S. Census of Population and Housing. Table 4-4.2 shows the representation of transit-dependent populations in each station area for the LPA as well as racial and ethnic information.

- **Populations 6-18 years and 65 and over**

Except for the Little Tokyo Station, all stations would serve areas of significant youth populations (i.e., persons between the ages of 6 and 18), which account for between 2,456 (Whittier/Atlantic) to 4,356 (Brooklyn/Soto) persons, or roughly 19 to 25 percent of all individuals within the station influence areas. In comparison, the youth populations in the City of Los Angeles and the County of Los Angeles are 17 and 18 percent, respectively. The elderly population constitutes between five and nine percent of all individuals within any given station influence area. The elderly populations in both the City and County of Los Angeles are 10 percent. Table 4-4.2 and Figure 4-4.2 illustrate the number of youth and elderly persons within the station influence areas under the LPA. The LPA would offer service to over 20,000 youths and over 6,000 elderly persons within the LPA station influence areas.

- **Households Without Private Transportation**

Station areas for the LPA contain significant numbers of households which are without private transportation. Table 4-4.2 and Figures 4-4.3 show the number of households without private transportation within each station influence area. The percent of households that are without private means of transportation varies from 42 percent (Little Tokyo Station) to 20 percent (Brooklyn/Soto, Whittier/Arizona and Whittier/Atlantic Stations). In comparison, the percentage of households without private transportation is 15 percent in the City of Los Angeles and 11 percent in the County of Los Angeles.

TABLE 4-4.1: 1990-2010 POPULATION, HOUSING AND EMPLOYMENT GROWTH WITHIN LOCALLY PREFERRED ALTERNATIVE STATION INFLUENCE AREAS

Station	Population				Housing (dwelling units)				Employment			
	1990	2010	Absolute Change	Percent Increase	1990	2010	Absolute Change	Percent Increase	1990	2010	Absolute Change	Percent Increase
Little Tokyo	4,424	5,706	1,282	29.0%	939	1,903	964	103. %	6,645	7,530	885	13.3%
First/Boyle	11,703	12,619	916	8.0 %	3,463	3,965	502	14.5 %	6,137	6,951	814	13.3%
Brooklyn/Soto	18,942	19,443	501	3.0 %	4,604	5,053	449	10.0 %	2,581	3,452	871	34.0%
First/Lorena	11,644	12,752	1,108	10.0 %	2,814	3,221	407	14.5 %	1,651	2,401	750	45.4%
Whittier/Rowan	16,963	17,367	404	2.4 %	3,881	4,153	272	7.0 %	4,231	4,836	605	14.3%
Whittier/Arizona	13,454	14,082	628	5.0 %	3,187	3,472	285	9.0 %	2,353	2,735	382	16.2%
Whittier/Atlantic	11,166	11,908	742	7.0 %	2,908	3,268	360	12.4 %	11,299	12,956	1,657	15.0%
TOTAL	88,296	93,877	5,581	6.3%	21,796	25,035	3,239	15.0%	34,897	40,861	5,964	17.1%

Source: PBQ&D, 1992. (PBQ&D 1990 and 2010 projections are based on SCAG GMA1 forecasts.)

FIGURE 4-4.1

PROJECTED GROWTH LEVELS FOR EACH LPA STATION INFLUENCE AREA

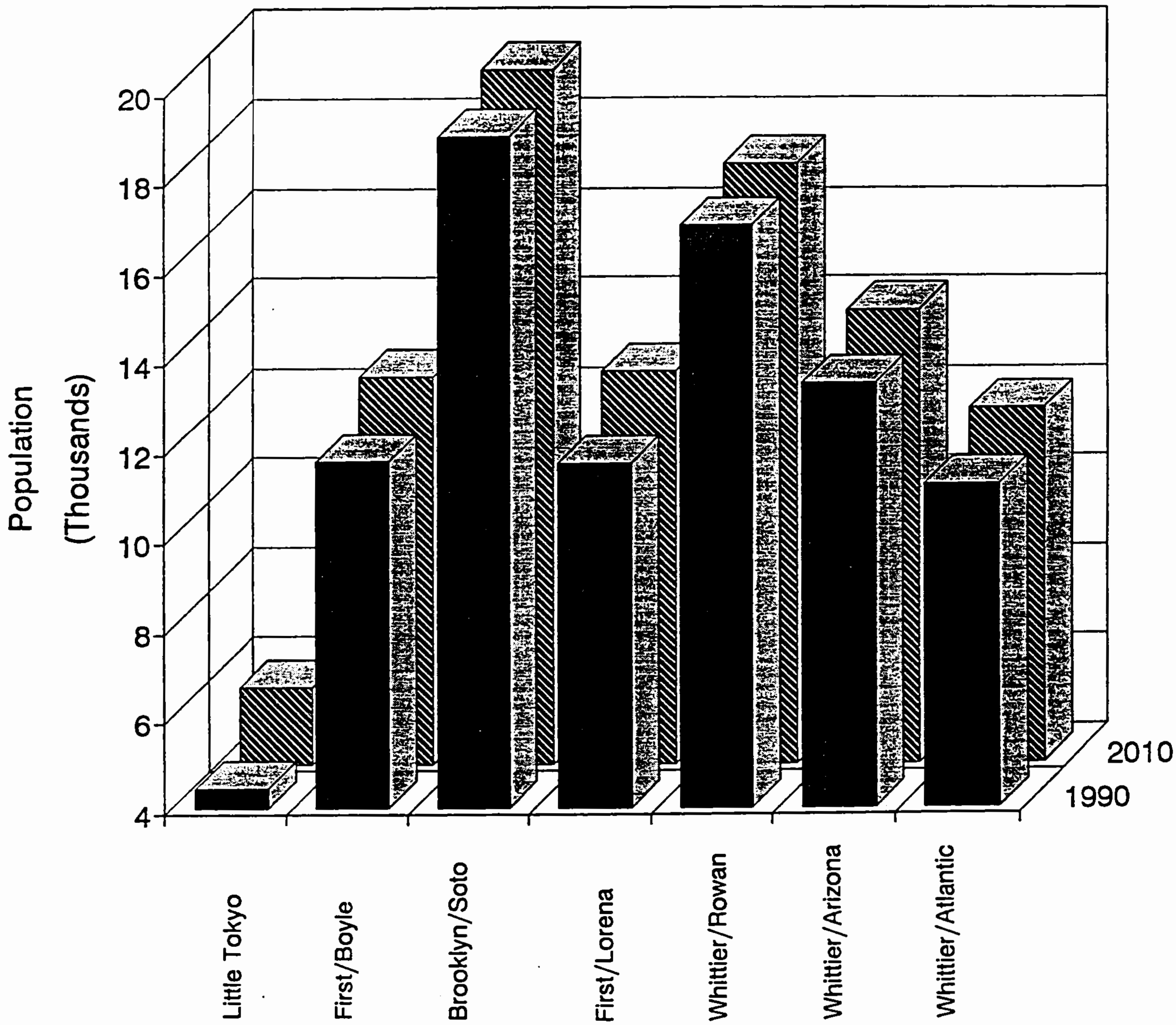


TABLE 4-4.2: TRANSIT-DEPENDENT POPULATIONS AND RACIAL/ETHNIC MINORITIES WITHIN LOCALLY PREFERRED ALTERNATIVE STATION INFLUENCE AREAS

Station	Total Population	6-18 years	Percent	65+ Years	Percent	Households w/out Private Transport	Percent	Households Below Poverty	Percent	Hispanic[a]	Percent	Black, Asian or Other[a]	Percent
CITY AND COUNTY													
City of Los Angeles	3,485,398	592,517	17%	592,517	10%	182,610	15%	182,610	15%	1,394,159	40%	1,638,137	47%
County of Los Angeles	8,863,164	1,595,369	18%	1,595,369	10%	328,850	11%	358,746	12%	3,368,002	38%	3,811,160	43%
STATION AREA													
Little Tokyo	4,424	840	19%	221	5%	351	42%	393	47%	2,787	63%	2,787	63%
First/Boyle	11,703	2,925	25%	1,053	9%	1,077	36%	1,047	35%	9,830	84%	5,500	47%
Brooklyn/Soto	18,942	4,356	23%	1,136	6%	1,386	31%	1,251	28%	17,994	95%	9,471	50%
First/Lorena	11,644	2,678	23%	931	8%	587	21%	615	22%	7,452	64%	7,219	62%
Whittier/Rowan	16,963	4,071	24%	1,187	7%	753	20%	866	23%	16,623	98%	6,445	38%
Whittier/Arizona	13,454	3,228	24%	941	7%	631	20%	789	25%	13,184	98%	9,283	69%
Whittier/Atlantic	11,166	2,456	22%	1,004	9%	570	20%	513	18%	10,607	95%	7,481	67%
TOTAL	88,296	20,554	23%	6,473	7%	5,355	26%	5,474	26%	78,477	88%	48,186	54%

Note: [a] The 1990 U.S. Census considers Hispanic an ethnic category and White, Black, Asian, Native American and Other as racial categories. Hence, a person could be Hispanic and White, or Hispanic and Black, etc. Racial minorities are defined here as non-white persons, or Black, Asian or Other populations, which may or may not include Hispanics.

Source: 1990 U.S. Census of Population and Housing; Cordoba Corporation; and Myra L. Frank & Associates, Inc., 1994.

FIGURE 4-4.2

YOUTH AND ELDERLY POPULATIONS
LPA STATION INFLUENCE AREAS

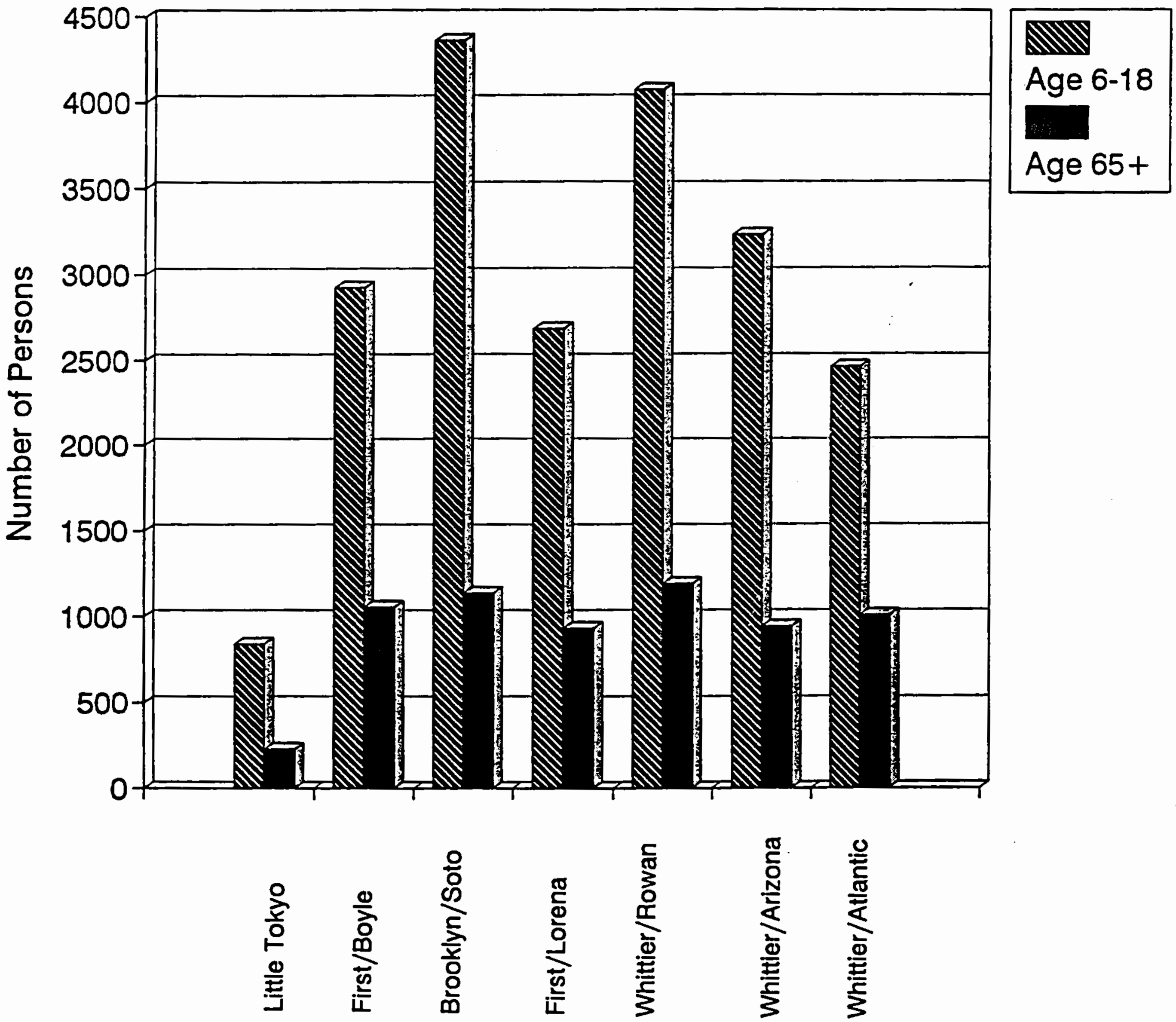
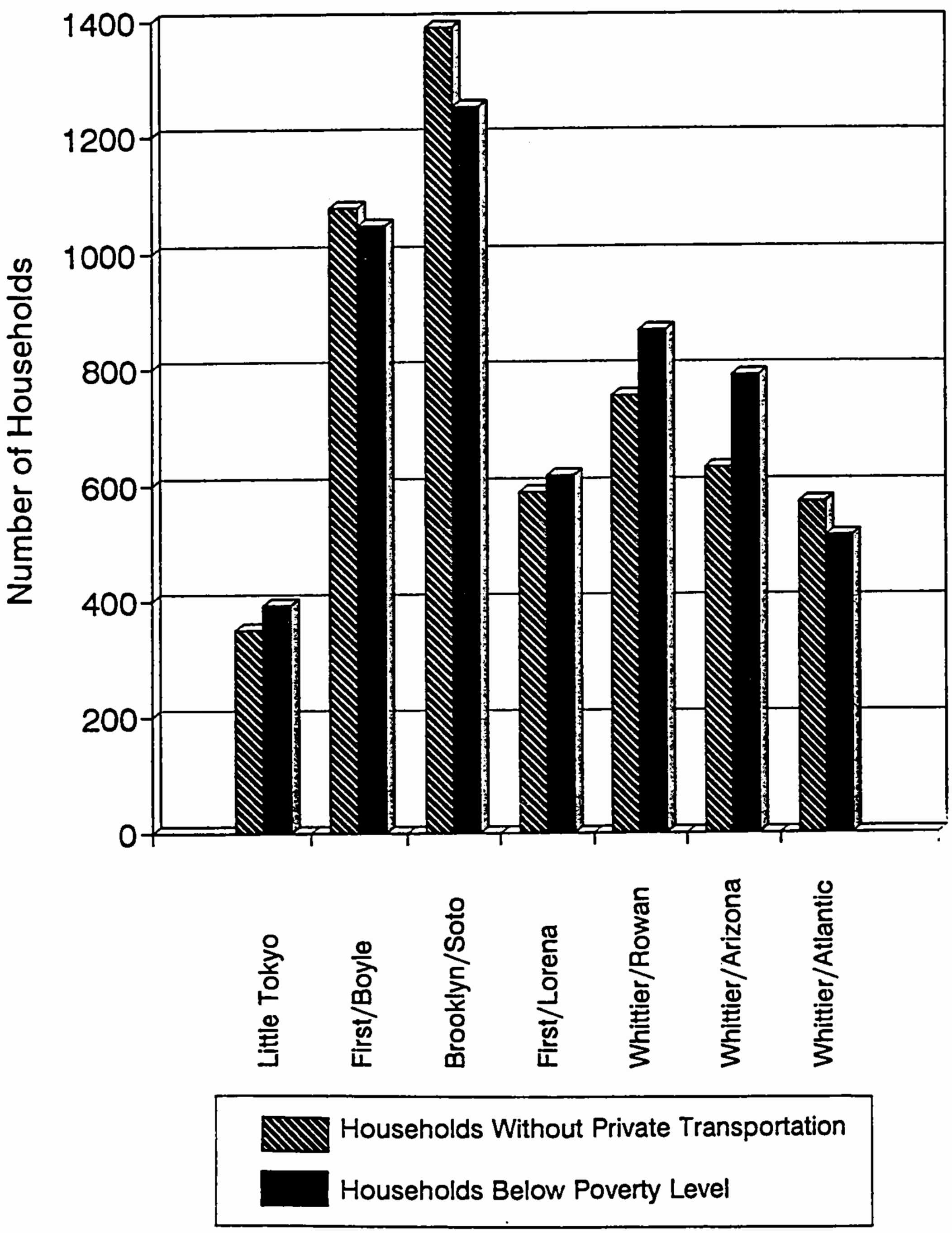


FIGURE 4-4.3

HOUSEHOLDS WITHOUT PRIVATE TRANSPORTATION AND BELOW POVERTY LEVEL
LPA STATION INFLUENCE AREAS



The LPA would offer service to over 5,000 households which are without private transportation within the station influence areas.

- **Households Below Poverty Level**

Table 4-4.2 and Figure 4-4.3 illustrate the number of households below poverty level in each station influence area for the LPA. As the figure shows, the number of households below poverty generally parallels the number of households without private transportation. According to the U.S. Census Bureau, the poverty threshold is revised annually to allow for changes in the cost of living and is defined according to the number of children within a family, age of householder and family size. For the 1990 Census, the average poverty threshold for a family of four persons was $12,674, according to the U.S. Census Bureau. Poverty thresholds were applied on a national basis and were not adjusted for regional, state or local variations in the cost of living.

There are significant numbers of households which are below the poverty level in the LPA station influence areas. All station areas contain more than 300 households below the poverty level; the proportion of households below poverty ranges from 18 (Whittier/Atlantic) to 47 (Little Tokyo) percent of all households in the station areas. The proportion of these households exceeds the proportion for the City of Los Angeles (15 percent of all households are below poverty) and the County of Los Angeles (12 percent of all households are below poverty).

The Brooklyn/Soto and First/Boyle station areas include over 1,000 households below the poverty level. In these station areas, households below the poverty level constitute 28 percent and 35 percent, respectively. The LPA would offer service to 5,474 households below the poverty level within the station influence areas.

- **Minority Populations**

Table 4-4.2 and Figure 4-4.4 illustrate the ethnic and racial populations within the station influence areas for the LPA. All station areas have significant ethnic or racial minority populations. The Hispanic population constitutes the largest ethnic group in the station areas, comprising over 60 percent of the station area populations and over 90 percent in most areas. The largest Black, Asian or Other population is within the Whittier/Arizona station area (9,283). The LPA would offer service to over 78,000 Hispanic persons and over 48,000 racial minorities, or non-white persons (which may or may not include Hispanics)[1].

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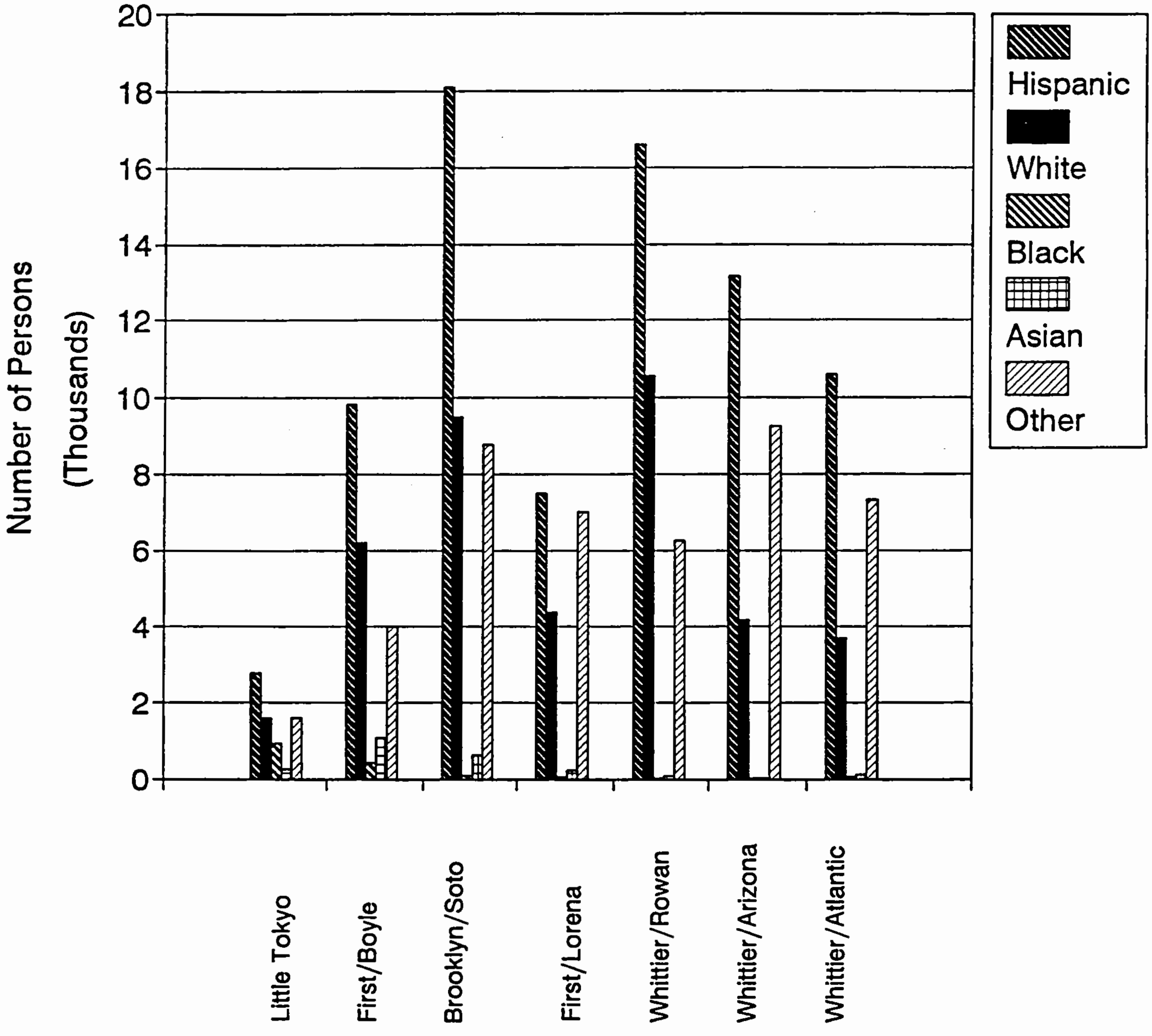
[1] Hispanic is considered an ethnic category while White, Black, Asian and Other are considered racial categories in the 1990 U.S. Census of Population and Housing. Thus, an individual could be Hispanic ethnically and White racially, or Hispanic ethnically and Black racially, etc. Racial minorities, as defined here, include Black, Asian and Other populations and do not include those individuals who considered themselves White racially and Hispanic ethnically in the 1990 Census.

FIGURE 4-4.4

ETHNIC AND RACIAL POPULATIONS
LPA STATION INFLUENCE AREAS



4-4.1.3 Cumulative Impacts

The LPA, in connection with currently planned urban rail, HOV, commuter rail and freeway express bus improvements, would improve mobility for transit-dependent populations throughout the county and Southern California region. Urban rail improvements in place or assumed to be in place by 2010 include: Metro Red Line segments 1, 2, 3 and the Mid-City and San Fernando Valley segments; Metro Blue Line segments to Azusa via Sierra Madre, Union Station to Flower, 7th and Flower to Long Beach, 7th to University of Southern California (USC), Union Station to Glendale; and Metro Green Line from Norwalk to El Segundo, El Segundo to LAX and El Segundo to Torrance. (For a complete listing of transit improvements, see Section 3-1.)

4-4.1.4 Mitigation

LPA impacts to the transit-dependent population would be beneficial; therefore, mitigation would not be necessary.

4-4.2 NEIGHBORHOODS

4-4.2.1 Setting

a. Introduction

Defining neighborhoods is a difficult task. Although literature on the subject is extensive, no one definition has come into widespread acceptance among neighborhood residents, neighborhood activists or academic analysts. Most sociologists however, do agree that neighborhoods are composed of varying geographic scales defined by the inhabitants. For instance, the *immediate neighborhood* is the small cluster of houses right around one's own house. The *homogeneous neighborhood* is the area up to where the market value of housing noticeably changes or where the mix of housing types or values change. The *institution-orientated neighborhood* is the area in which residents share common relationships with a local institution, such as an elementary school, a church, a police precinct or a political ward. The *regional neighborhood* is the entire suburb or township or a district within a big city. The problem with these scales is that they often make a neighborhood's boundaries vague and ill defined. In fact, according to the National Commission on Neighborhoods, neighborhoods are whatever the inhabitants think they are.

The purpose of this section then is not to precisely define what constitutes a neighborhood, but rather to identify those communities/neighborhoods established by the City and County of Los Angeles that contain the LPA station influence areas.

b. Regional Location

The proposed LPA project is situated within the eastern portion of the City and County of Los Angeles encompassing the Central City North and East Los Angeles areas. The Central City North Planning Area is part of the City of Los Angeles's General Plan and is comprised of seven neighborhoods: Figueroa Terrace, Alpine Hill, Chinatown, North Industrial, Government Support, Little Tokyo East and South Industrial. The area is generally bound by Lilac Terrace, Stadium Way and North Broadway to the north, 25th Street to the south, Marview Avenue and Sunset Boulevard to the west and the Los Angeles River to the east.

The East Los Angeles area is comprised of eleven distinct communities, generally recognized as including Highland Park, El Sereno, Lincoln Heights, Boyle Heights, Belvedere, City Terrace, Maravilla, Laguna, Belvedere Gardens, Eastmont and Montebello Park. The area is bounded by the City of Montebello on the east, the Los Angeles River on the west, the cities of Vernon and Commerce on the south and the City of Los Angeles community of El Sereno on the north.

Proposed LPA station sites are located within City of Los Angeles Planning Areas of Central City North and Boyle Heights and the following communities of unincorporated East Los Angeles: Belvedere Gardens, Eastmont and Laguna. The historic development of these neighborhoods and current neighborhood characteristics are briefly described below. (See Sections 4-1 and 4-4.1 for land use and demographic characteristics of these neighborhoods and the areas immediately surrounding proposed station locations.)

c. Little Tokyo East

The Little Tokyo East neighborhood is part of the Central City North Planning Area of the City of Los Angeles and is generally bound by Ducommon Street to the north, 3rd Street to the south, the Los Angeles River to the east and Alameda Street to the west. The neighborhood is essentially a commercial manufacturing, light industrial and warehouse district with some residential units (primarily artist lofts) located within the area.

d. Boyle Heights

Developed in the 1880's as an exclusive community, Boyle Heights was home to some of the richest families in Los Angeles. By the turn of the century, as many Anglos migrated to the west side of town, the area became a primary port of entry for Molokan Russians, Jews, Armenians, Chinese, Japanese and Mexican peoples.

Today, the Boyle Heights community encompasses approximately six square miles. The community is bounded on the west by the Los Angeles River, the City of Los Angeles boundary at Indiana Street on the east, Marengo Street and the San Bernardino Freeway on the north and the City boundary at approximately 25th Street on the south. The ethnic composition of the Boyle Heights community is primarily Hispanic.

e. Belvedere Gardens

The present day community of Belvedere Gardens was originally a 1,000-acre dairy farm which, by the mid-1920's, was subdivided and sold by the Janss Investment Corporation. Today the community is bounded by the Long Beach Freeway on the west, Third Street on the north, Atlantic Boulevard and Goodrich Boulevard on the east and the City of Commerce to the south. The ethnic composition of the Belvedere Gardens area, like much of East Los Angeles, is primarily Hispanic.

f. Eastmont

Eastmont is bordered by Atlantic Boulevard on the west, Whittier Boulevard on the south, the City of Montebello on the east and Pomona Boulevard on the north. The majority of Eastmont residents are Hispanics.

g. Laguna

Laguna is bordered by Indiana Street on the west, Third Street on the north, the Long Beach Freeway on the east and the City of Commerce on the south. Hispanics comprise the majority of the area's population.

4-4.2.2 Impacts

The assessment of potential neighborhood impacts focuses on the following issues, ranging from regional to local:

- the effect of the LPA on the relationship of neighborhoods within the project region to other regions;
- the effect on the relationship among neighborhoods within the region;
- the effect within neighborhoods as defined by the City and County of Los Angeles; and
- the effect on neighborhoods that comprise the immediate vicinity of proposed station locations.

Table 4-4.3 identifies the neighborhoods that would be served by a rail station or stations under the LPA. Figure 4-4.5 illustrates LPA station locations within neighborhoods.

TABLE 4-4.3: STATIONS LOCATED WITHIN CENTRAL CITY NORTH AND EAST LOS ANGELES NEIGHBORHOODS

NEIGHBORHOOD	STATION
Little Tokyo East	Little Tokyo
Boyle Heights	First/Boyle Brooklyn/Soto First/Lorena
Laguna	Whittier/Rowan
Belvedere Gardens	Whittier/Arizona Whittier/Atlantic
Eastmont	Whittier/Atlantic

Source: Myra L. Frank & Associates, Inc., 1993.

a. Impacts During Operation

- **Inter-regional and Intra-regional Effects**

Implementation of the proposed LPA service would provide new transit connections between East Los Angeles and other areas in the Los Angeles region served by the Metro System, and

Neighborhood Boundaries

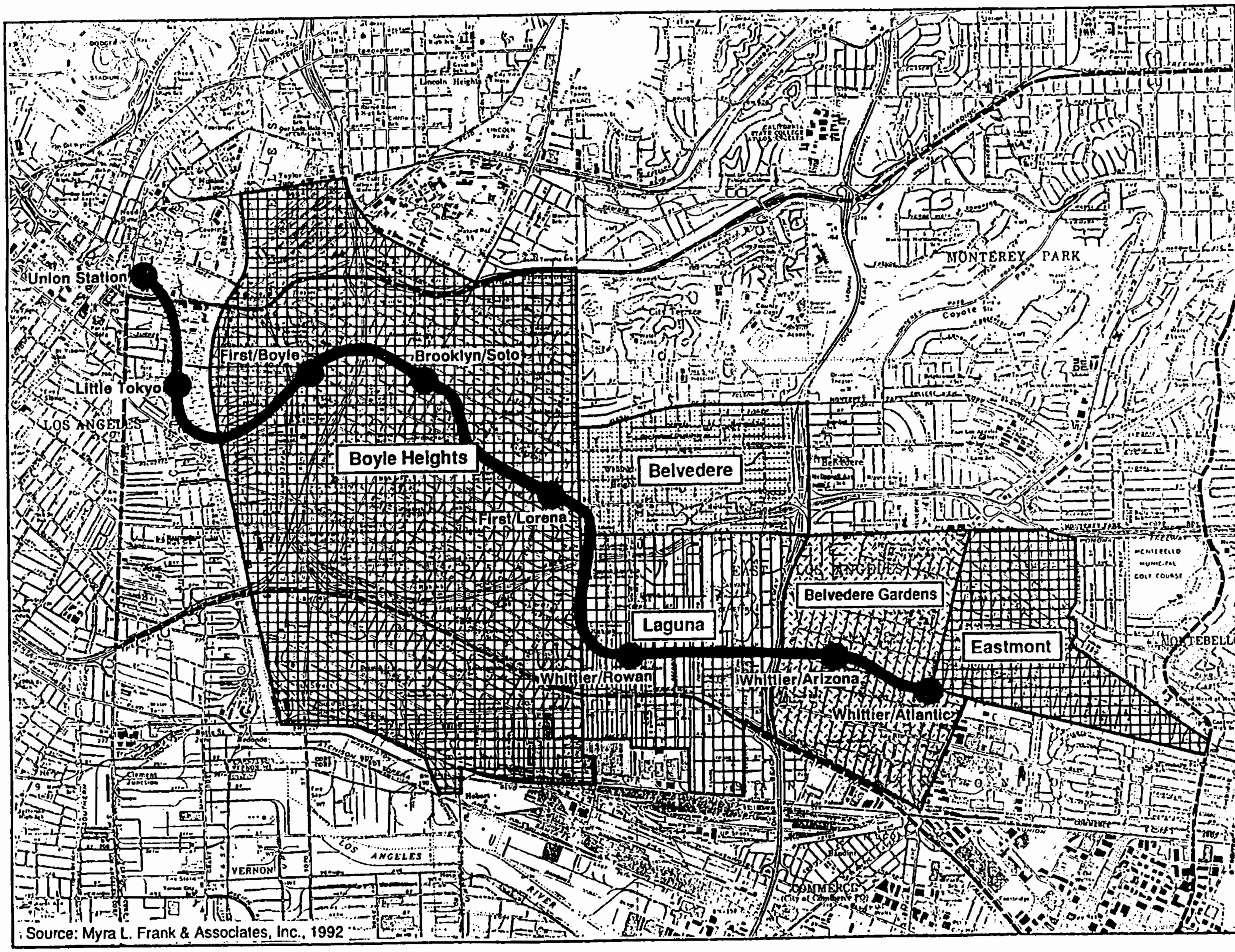


Figure 4-4.5

EASTSIDE CORRIDOR
FEIS/FEIR

among several neighborhoods within East Los Angeles. By improving access, the new transit connections should strengthen the relationship between East Los Angeles and other areas in the Los Angeles region and to a greater extent, should foster a closer linkage among East Los Angeles communities. Unlike freeways or above-ground rail lines, the proposed LPA would connect neighborhoods via an underground tunnel, would not create barriers between neighborhoods and may help to unify certain neighborhoods previously divided by construction of the freeway system.

- **Effects on Los Angeles City and County Communities and Neighborhoods Immediately Surrounding Stations**

Operational effects of the proposed LPA would occur to some degree for all neighborhoods served, but would be more pronounced in communities with a station or stations, with the greatest effects expected in the immediate vicinities of the station(s). As described above, the proposed rail alternative would serve neighborhoods within Central City North and East Los Angeles, with stations located in Little Tokyo East, Boyle Heights, Belvedere Gardens, Eastmont and Laguna. (See Table 4-4.3, above, for a breakdown of station location by neighborhood.)

Improving transit access to neighborhoods along the proposed rail alignment would benefit residents, businesses and community facilities in those neighborhoods. Residents, particularly those who are transit-dependent, would have improved access to jobs, shopping, educational and cultural facilities in other neighborhoods in East Los Angeles and other areas in the Los Angeles region served by the Metro System. Businesses would benefit from improved access for their patrons and could market their goods and services to a larger area. Community facilities would benefit from improved access for their users and could serve a larger area (see Section 4-16 for a discussion of community facilities).

The proposed stations would be designed to serve the needs of their local communities and would support the commercial and residential neighborhood characteristics of the surrounding areas. The stations would not divide neighborhoods in which they are placed, but would form a focus for pedestrian and vehicular activity. This activity would enhance the viability of commercial activity centers near the stations and may enhance the market for residences near or with easy access to the station. The placement of stations may influence the market for surrounding commercial and residential property; however, the project by itself is not expected to sufficiently change market and other conditions necessary to cause significant changes in neighborhoods under CEQA. See Section 4-1, Land Use and Development, for a discussion of the project's potential effects on the type and scale of future development in station areas.

- **Summary of Operational Effects on Neighborhoods**

Changes in neighborhoods can be perceived as both positive and negative, depending on the values of the residents within the neighborhood. Because the project is not expected to adversely affect the cohesiveness of individual neighborhoods or the cohesiveness of neighborhoods within the project region, and because the introduction of a station in and of itself is not expected to significantly alter the general character of a neighborhood (including its social and physical characteristics), under CEQA, the proposed rail alternative is not expected to result in significant adverse impacts on neighborhoods. The LPA would result in beneficial impacts by improving transit access to and from each of the neighborhoods served by the project and by improving connections among the collective neighborhoods of the East Los Angeles region.

b. Impacts During Construction

Construction of the rail alternative could temporarily affect the surrounding neighborhoods and particularly areas in the immediate vicinity of stations. Potential impacts during construction of stations include temporary traffic obstructions and/or detours, noise/vibration impacts and air quality impacts. Station construction impacts would be experienced for intermittent periods with varying durations during the overall 3 to 5 year construction period for each station. A number of factors would affect the potential for significant impacts, under CEQA, on neighborhoods, including construction requirements for the station, the relationship between the construction site and activity centers/residential areas within the neighborhood, the type and schedule of surrounding uses and the implementation of measures to reduce the impact. General construction impacts that may affect neighborhoods are described below. For a description of construction impacts and mitigation, see Section 4-18, Construction Impacts.

Circulation/Access

Station construction activities may affect neighborhood vehicular and pedestrian circulation/access. Motorists and pedestrians may on occasion be inconvenienced by traffic delays during the construction period. Traffic spill-over into adjacent neighborhoods and onto parallel streets may occur during the construction period. In addition, temporary elimination of on-street parking and sidewalk closures may be necessary for movement of construction equipment. Construction activities may require temporary relocation/rerouting of bus stops and lines. Special user groups such as the elderly and disabled may be particularly affected by these impacts. Decreased access may encourage some residents to seek neighborhood services outside of the area. Without mitigation, impacts on neighborhood circulation and access, although temporary, are considered potentially significant under CEQA. See also Section 4-18.2, Construction Traffic and Section 3-3, Parking Impacts.

Noise/Vibration

Noise generated by construction activities and heavy duty trucks used to haul away excavated material may affect adjacent neighborhood communities. Operation of construction equipment and the tunnel boring machine (TBM) may cause ground-borne noise and vibration levels perceptible to adjacent residences and businesses. Operation of the TBM is generally short-term in nature, lasting only a few days. Vibration produced from the TBM is considered to be below building damage levels. For a discussion of construction noise and vibration impacts and mitigation, see Sections 4-18.4 and 4-18.5.

Air Quality

Air quality around station environs may also be affected by construction activities if unmitigated. Reduced air quality resulting from fugitive dust, building demolition, operation of machine equipment and traffic delays may affect adjacent businesses and area residents. For a discussion of air quality impacts and mitigation measures associated with the LPA, see Section 4-18.3.

4-4.2.3 Cumulative Impacts

a. Operation

Beneficial effects on neighborhoods associated with improved transit access would be furthered by other transportation and transit projects planned for the region. These projects, which are described in greater detail in Section 2-1, include freeway gap closures/new freeways, regional high occupancy vehicle (HOV) and transitway network projects, urban rail transit network projects, regional commuter rail and express bus service.

b. Construction

To the extent that other construction projects are planned in the vicinity of proposed station locations, some neighborhoods would be subject to cumulative impacts as a result of construction activities associated with the proposed project and other planned projects. Without mitigation measures, those potential significant cumulative construction impacts under CEQA would be experienced by neighborhoods that are located near both the station location and the location of construction for other planned projects.

4-4.2.4 Mitigation

a. Operation

Operation of the proposed project would result in beneficial impacts on neighborhoods.

b. Construction

See Section 4-18 for a list of mitigation measures for circulation/access, noise/vibration, air quality and other impacts during construction. See Section 3-3 for a list of mitigation measures for parking. In addition, the Los Angeles Metropolitan Transportation Authority (MTA) would coordinate with other jurisdictions and agencies regarding timing of construction activities for projects affected by or that may affect construction of the LPA and initial operable segments.

4-5 VISUAL AND AESTHETICS

4-5.1 INTRODUCTION

This section discusses the visual effects associated with the Locally Preferred Alternative (LPA) which has been modified since it was presented as Alternative 9B in the April 1993 Eastside Corridor AA/DEIS/DEIR (See Chapter 2, Section 2-6, Planning Since Circulation of the DEIS/DEIR). Unlike Alternative 9B, which included aerial guideways across the Los Angeles River and an at- or above-grade station in the Metro Rail Yard, the LPA as described in this document is entirely below-grade, with seven stations placed underground.

Alternative 9B would have resulted in a potentially significant visual impact under CEQA, because the aerial guideway would have obstructed views of the Fourth Street bridge, thereby diminishing the visual qualities of the bridge that contribute to its eligibility as a designated historic resource. Now, with the elimination from the project of an aerial guideway across the Los Angeles River and of the at- or above grade station platform in the Metro Rail Yard, the potentially visually prominent structures associated with the LPA would be bus/parking facilities at the First/Lorena and Whittier/Atlantic stations. Thus, this section focuses on the visual effects of these facilities. (See Section 4-14 for additional discussion of visual effects on historic resources.)

4-5.2 METHODOLOGY

A site survey of the First/Lorena and Whittier/Atlantic station sites and adjacent neighborhoods was conducted in April 1994 to update the Eastside Corridor AA/DEIS/DEIR. The site survey noted the overall visual environment surrounding the station sites, sensitive visual resources, sensitive visual receptors and sensitive views that could be visually affected by the project.

4-5.3 SETTING

The visual environment includes the general land use patterns surrounding the station sites and visual quality in terms of the intactness and unity of the streetscapes. Sensitive visual resources include historic structures, landmarks and important landscaping. Sensitive visual receptors are residents generally located within 200 feet of station sites. Sensitive views are prominent views of historic resources, landmarks and mountain ranges.

The Eastside Corridor is generally a dense urban area, consisting of several distinct, older neighborhoods and many cultural resources and parks (as described in Sections 4-1, 4-4, 4-13 and 4-14). The visual settings for bus/parking facilities at the First/Lorena and Whittier/Atlantic stations are described below.

4-5.3.1 Rail Termini Support Facilities

Bus/parking facilities are planned for the terminal stations of IOS-2 and the LPA, specifically at the First/Lorena and Whittier/Atlantic stations. Up to 500 parking spaces are anticipated at the First/Lorena station, with up to 1,200 spaces at the Whittier/Atlantic station. To provide the bus facilities and maximum number of parking spaces at these stations, multi-story parking structures would be required.

a. First/Lorena Visual Environment

The First/Lorena station would be located on the northeast corner of Lorena and First Streets. The proposed bus/parking facility would be located north of the station entrance, adjacent to Lorena Street. The fenced property is currently occupied by a parking lot and taco stand along First Street, with Boyle Heights Lumber Company located behind. The lumber company is oriented away from First Street. Situated on the property are the lumber company's one and one-half story supply building and associated loading docks, construction equipment, dumpsters, trucks and supply materials. The existing site is not well defined visually. There are no clear edges with the street and the building does not help to orient the viewer to the site (Figure 4-5.1).

The site is bordered on the south by First Street; on the east by the El Mercado, a two-story shopping center, and parking lot; on the north by the Lorena Street entrance to the El Mercado; and on the west by Lorena Street. Evergreen Cemetery is to the west across Lorena Street in the northwest quadrant of the First and Lorena intersection. A pizza restaurant, vacant lot and neighborhood market exist to the south across First Street in the southeast corner of the First and Lorena intersection. Diagonal to the site, in the southwest corner of the intersection is a neighborhood market.

The proposed station is located in a busy neighborhood commercial and residential setting. Painted murals on commercial buildings depict the Hispanic heritage of the area. The intersection of First/Lorena is a key focal point in the visual setting. Single-family and multi-family residences are located along First and Lorena Streets just off the main intersection and behind the commercial uses. The area appears blighted by the graffiti and the poor condition of some buildings. Electrical utility poles and wires, commercial signs and billboards, parking lots and nondescript commercial buildings create a cluttered, poorly defined streetscape.

The Evergreen Cemetery is considered to be a sensitive visual resource because it has a park-like setting and appears eligible for listing in the National Register of Historic Places. (Please see Section 4-14 and 4-15 for further discussion of this resource.) The east lawn across Lorena Street faces the proposed site. This portion of the cemetery is situated on a bluff and covered with trees that tend to block views to and from the cemetery interior. Prominent views of the cemetery are visible to pedestrians standing at the southeast, southwest and northeast corners of the First/Lorena intersection and to motorists traveling westbound on First Street and northbound on Lorena Street. The nearest residences are located more than 200 feet from the proposed station entrance and facility site and do not have direct views to the site.

b. Whittier/Atlantic Visual Environment

Three sites are discussed below for the Whittier/Atlantic station, for purposes of describing the visual setting. The first site would have a station entrance, a bus facility and possibly parking facilities. The second and third sites are candidates only for parking facilities. It is only in the context of potential bus and/or parking facilities that a visual setting would be relevant.

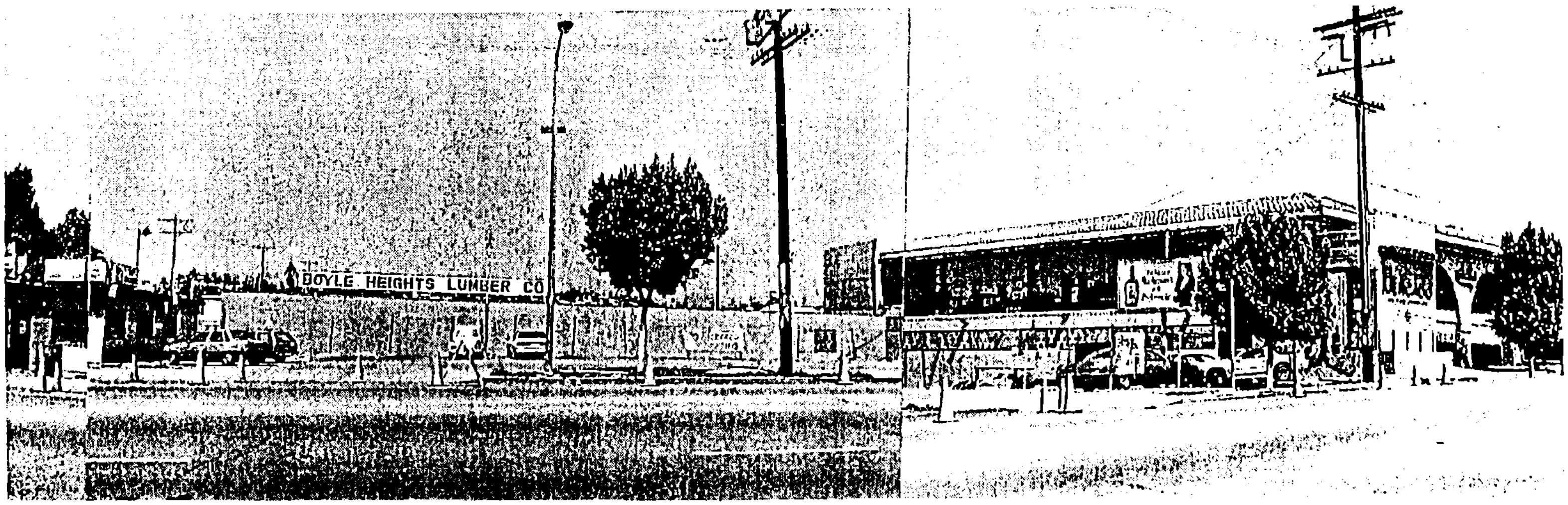


Figure 4-5.1: View of First/Lorena Site looking north from First Street.

- **Site 1 – Southwest Corner of Whittier/Atlantic**

A bus facility and possibly a parking facility may occupy the southern and southwestern portion of the commercial block on the southwest corner of Whittier and Atlantic Boulevards. The site is bordered on the north by Whittier Boulevard, on the south by Louis Place, on the east by Atlantic Boulevard and on the west by Woods Avenue. The western half of the block currently is occupied by one- and two-story auto-related commercial buildings, a bowling alley along Whittier Boulevard, an auto repair shop along Woods Avenue, a vacant lot in the southwest corner of the lot and a parking lot along Louis Place. The Golden Gate Theatre and a fast food restaurant occupy the eastern half of the site. (See Figure 4-5.2.)

The site is blighted by the deteriorated condition of the buildings, exposed mechanical equipment boxes on the auto repair shop roof, littered vacant lots, graffiti and electrical poles and wires. This block of Whittier lacks a unified street front because of the disarray of buildings, the boarded up store fronts, the plethora of commercial signs and security bars on the windows. (See Figure 4-5.3.)

The surrounding visual environment is commercial and residential. There are one- and two-story commercial buildings along Whittier Boulevard and Atlantic Boulevard and residential units along Woods Avenue and Louis Place.

The Golden Gate Theatre is a sensitive visual resource because the building appears eligible for listing on the National Register of Historic Places. (Please see Section 4-14 and 4-15 for further discussion of this resource.) The theater is a massive, multi-story, concrete block structure with a towering annex facing Louis Place. As the tallest structure in the immediate vicinity, the theater is the most visually prominent building at the intersection of Whittier and Atlantic boulevards. The two-story commercial building and auto repair shop on the western portion of the site abut the west side of the theater. The commercial building extends north to Whittier Boulevard overshadowing the theater's frontage, which is set back from the boulevard. The theater's architecturally significant front facade faces Whittier Boulevard. Prominent views of the theater's front facade are visible to pedestrians and motorists traveling east- and westbound on Whittier Boulevard and southbound on Atlantic Boulevard.

A two-story apartment building occupies the northwest corner of Woods Avenue and Louis Place. The apartment windows along Louis Place face the south side of the site. Views from the apartment windows include the vacant lot, parking lots, the auto repair shop and the theater annex.

Two apartment buildings and four single-family houses on the westside of Woods Avenue face the westside of the site. Views from front windows, porches and front yards of these residences include the auto repair shop, vacant lot and the concrete block walls of the theater and annex.

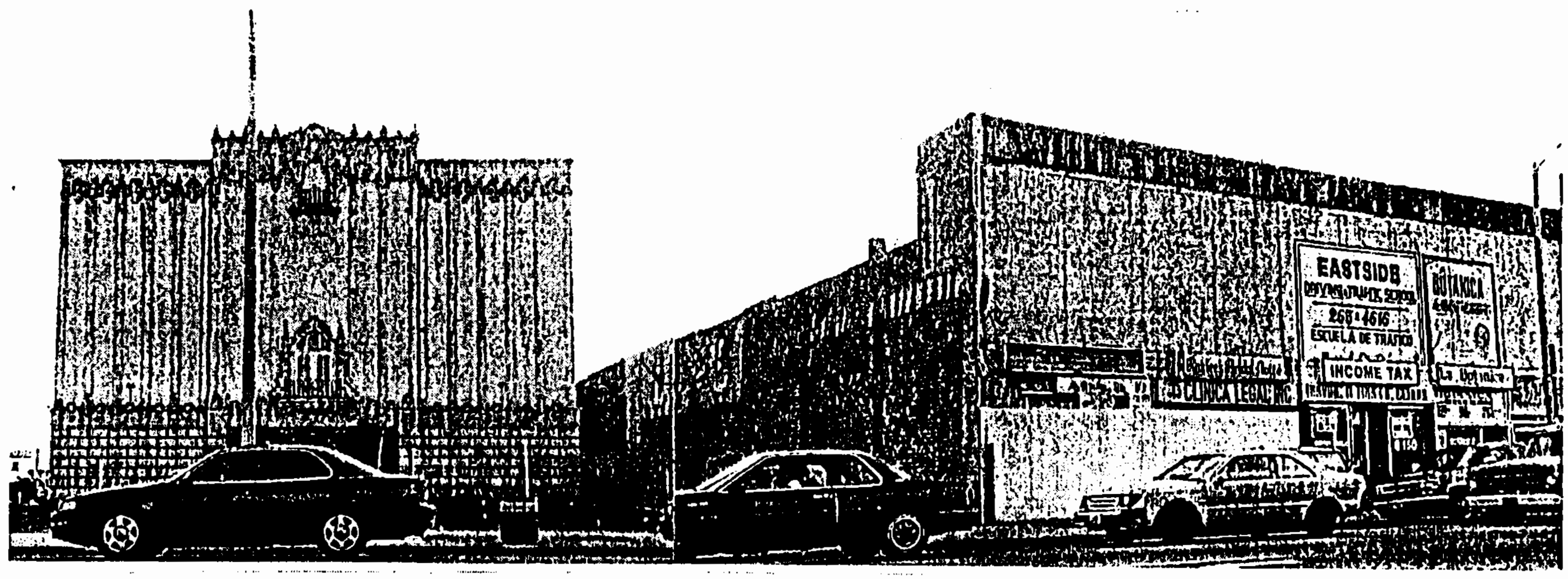


Figure4-5.2: View of Golden Gate Theater, looking south from Whittier Boulevard

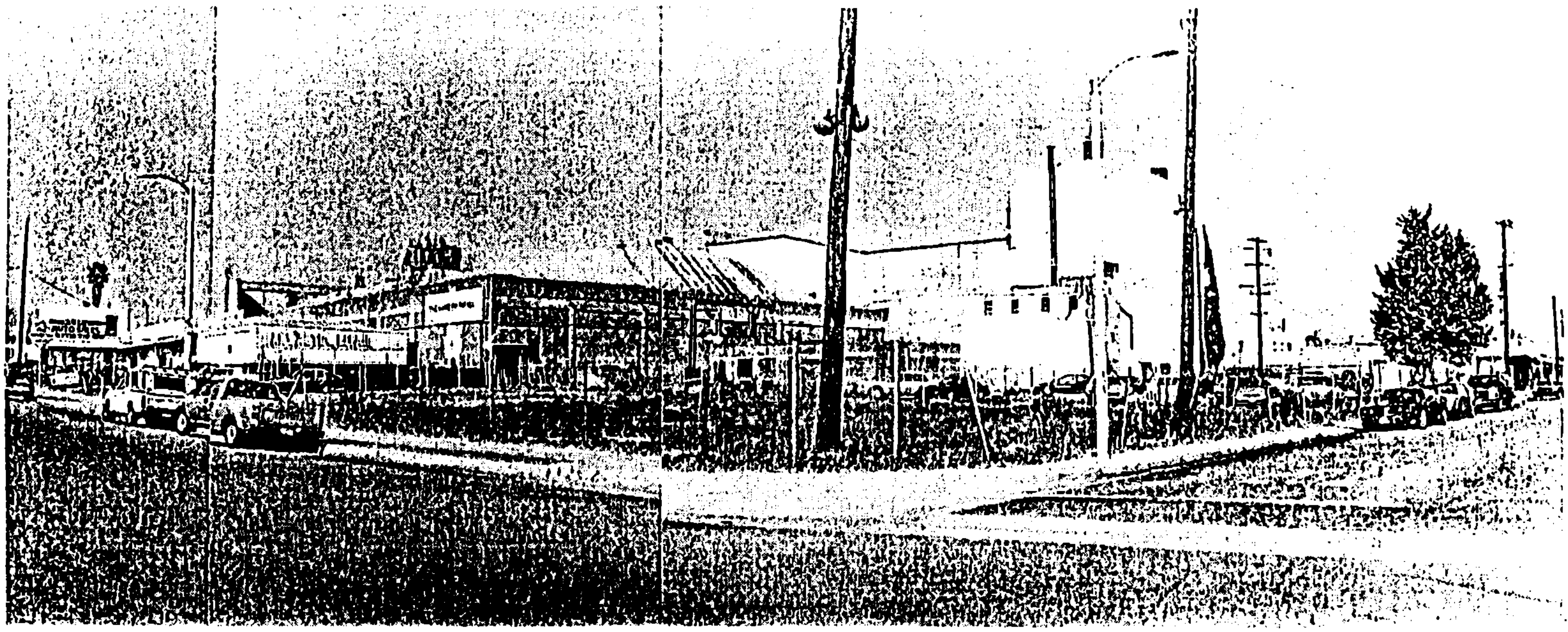


Figure 4-5.3: View from sidewalk on Woods Avenue, looking east.

- **Site 2 -- Northeast Corner of Whittier/Atlantic**

A parking facility is proposed for the narrow commercial block at the northeast corner of Whittier and Atlantic boulevards. The site is bordered on the north by an alley and parking lot, on the south by Whittier Boulevard, on the west by Atlantic Boulevard and on the east by Amalia Avenue. The site is currently occupied by a mini-mall and a two-level parking structure serving the Great Western Bank. Two large billboards situated on the property overhang the mini-mall. (See Figure 4-5.4.)

The visual environment is defined predominantly by the one-, two- and three-story commercial buildings, the plethora of commercial signs and busy street traffic along Whittier and Atlantic boulevards. A coffee shop and two-story apartment building are located behind the property north of the alley and parking lot. The Great Western Bank is located to the east across Amalia Avenue. A two-story First Interstate Bank building is located west of the site in the northwest corner of Whittier/Atlantic boulevards. A gas station and two-story office building are located south of the site in the southeast corner of Whittier/Atlantic boulevards. The Golden Gate Theatre is located southwest of the site in the southwest corner of Whittier/Atlantic boulevards.

As noted above, the Golden Gate Theatre is a sensitive visual resource. Prominent views of the theater's front facade are visible to pedestrians and motorists traveling east- and westbound on Whittier Boulevard and southbound on Atlantic Boulevard and are visible from Site 2.

An apartment building is located 60-70 feet north of the proposed site behind the alley and parking lot. The south side of the apartment building faces the 15-20 feet high block walls at the rear of the mini-mall and Great Western parking structure, billboard signage and electrical poles and wires. Views of these structures are partially blocked by a six-foot high block wall along the southside of the apartment building.

- **Site 3 -- Northeast Corner of Amalia Avenue and Whittier Boulevard**

A parking facility is proposed for the commercial lot in the northeast corner of Amalia Avenue and Whittier Boulevard. The site is bordered on the north by a single-family residential neighborhood, on the south by Whittier Boulevard, on the west by Amalia Avenue and on the east by Hillview Avenue. A five-story Great Western Bank building occupies the southern portion of the site along Whittier Boulevard. The bank building is oriented away from Whittier Boulevard. The central portion of the site is occupied by the bank parking lot and a single-family residence. The northern portion of the site is occupied by a narrow parking lot and entrance driveway serving the bank. (See Figure 4-5.5.) There are tall trees and bushes around the perimeter of the residential property and along a three foot high wall at the northern edge of the property.

The visual environment is predominantly commercial around the southern portion of the site closest to Whittier Boulevard and single-family residential neighborhood around the northern portion of the site. Adjacent land uses include two single-family residences located to the north, opposite the parking lot. Commercial uses are located south of the site across Whittier Boulevard. East of the site, opposite Hillview Avenue, are a Great Western Bank parking lot, an alleyway and three single-family houses. West of the site, opposite Amalia Avenue, is the Great Western Bank parking structure (on Site 2), a parking lot, an apartment building and a single-family house.

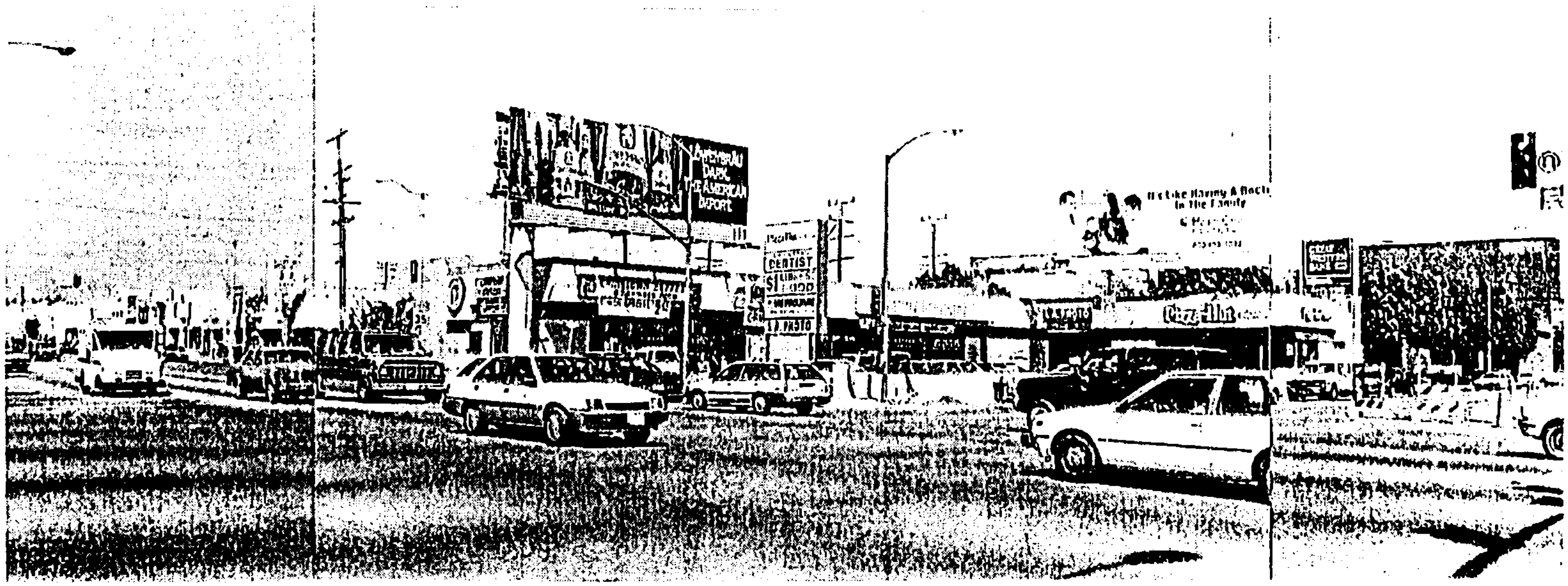


Figure 4-5.4: Looking northeast from the corner of Whittier and Atlantic Boulevards.

Figure 4-5.5: View of proposed site looking south from the north wall adjacent to the southern edge of residential properties north of the site.

Sensitive visual receptors include one single-family residence abutting the northeast corner of the site, one single-family residence abutting the northwest corner of the site and three single-family residences facing the site from the eastside of Hillview Avenue.

Two houses front the streets but have southerly windows and side yards facing the proposed site. Existing views of the site from one house include the bank parking lot and single-family residence surrounded by the bank parking lot. Existing views of the site from another house include the bank parking lot, a five-story building and a single-family house and garage. Security bars on the windows at one house and awnings over the windows at another block views of the site interior. A three-foot high block wall and tall trees along the north edge of the proposed site provide additional screening from these residences. The tall trees also cast shade and shadow on one house on Amalia Avenue.

The front yards of the three single family houses on the eastside of Hillview Avenue are located approximately 60 feet from the eastern edge of the site. Views of the site from the windows and front yards of these houses include the bank parking lot, a five-story building and the single-family house and garage. Tall trees along the eastern edge of the proposed site and security bars on the windows of these residences partially block these views from these residences. During the afternoon hours, the tall trees along the eastern edge of the site and the bank building cast afternoon shade and shadow in the direction of these houses.

4-5.4 VISUAL IMPACTS

The No-Build alternative would not introduce permanent visual changes within the Eastside Corridor. The visual impacts of the IOS's and the LPA are determined by potential changes in the setting for the visual environment, sensitive visual resources and sensitive visual receptors; removal of sensitive visual resources; shade and shadow and light and glare impacts on sensitive visual receptors; and alterations to prominent views.

The rail termini station areas would include permanent park-and-ride and local bus transit interface facilities. They could also be the sites of additional above-ground parking facilities. The introduction of these facilities would alter the appearance of the termini station sites and surrounding areas, as follows:

4-5.4.1 First/Lorena Station

Construction of a parking facility in the northeast corner of First/Lorena streets would require the removal of the Boyle Heights Lumber Co and taco stand and parking lot south of the site. The proposed bus/parking facility would be consistent in use with the surrounding commercial buildings. The facilities would not block prominent views of the Evergreen Cemetery.

The bus/parking facility would not cause shade and shadow or light and glare impacts on residences because it would be located more than 200 feet from these sensitive visual receptors. Situated between intervening structures such as parking lots and commercial buildings, the facilities would not be in direct view of residences.

It is anticipated that the bus/parking facility would improve the visual quality of the commercial block at First and Lorena streets and create a more defined streetscape. Thus, the facility would not have significant adverse impacts on the visual setting.

4-5.4.2 <u>Whittier/Atlantic Station</u>

a. Site 1 -- Southwest Corner of Whittier/Atlantic

A bus and possible parking facility would occupy an "L" shaped portion of the block to the west and south of the Golden Gate Theatre. Construction of the facility would require the removal of the auto-related commercial buildings and auto repair shop. The structure would be lower in height than the theater and would share the same front setback from Whittier Boulevard as the theater.

The bus and possible parking facility could improve the visual quality of the block, because it would replace the blighted uses on the site with a new, more unified construction which would still be consistent in use with the commercial character of the block. The structure would cover the littered vacant lot and deteriorated metal fence.

It is possible that one-/two-story commercial activities would be developed in the setback between the bus/parking facility and Whittier Boulevard as part of the community linkages or joint development programs, which would reduce the apparent size of the facility as seen from the boulevard. Overall, the facility would have a beneficial visual effect on the visual character of the block.

A commercial center has been proposed for the site, although the exact location and design of the development is yet to be determined. A rail terminus facility would take into account any new structures present on the site, i.e., there would be integration of rail facilities with the existing urban context and with potential future development of the site. The proposed station entrance and bus/parking facility, whether they precede or follow retail development on the site, will not preclude preservation of the Golden Gate Theatre. Although the final design of the bus/parking facility is not known at this time, structured parking could be integrated with potential future development or potential restoration of the Golden Gate Theatre.

The bus/parking facility would have no significant adverse effect on the Golden Gate Theatre. It would be consistent with and improve the appearance of the Golden Gate Theatre's commercial setting. The structure would not overshadow the theater because it would share the same front setback from Whittier Boulevard and would be lower in height than the theater. The parking facility would not obstruct prominent views of the theater's architecturally significant front facade.

The bus/parking facility would be visible from the residences to the south and west. However, replacement of the cluttered uses and littered vacant lot with a unified facility should improve views of the block from these residences. The facility would block views of the deteriorated west and south sides of the Golden Gate Theatre from these residences. The facility would not cast shade and shadow on the residences. The facility lighting would be directed onto the site and thus is not anticipated to cause light and glare in the residential area.

b. Site 2 – Northeast Corner of Whittier/Atlantic

The proposed parking facility on the northeast corner of Whittier/Atlantic would introduce a new element into the visual setting. However, the parking would be consistent in character, massing and scale with the surrounding multi-story concrete block commercial buildings and the wide, four lane boulevards. The structure would have no significant adverse visual impact on the visual setting.

The parking would have no significant adverse visual effect on the Golden Gate Theatre and would be consistent with the theater's commercial setting. Located more than 200 feet northeast of the theater across the boulevards, the parking would not overshadow the historic resource nor obstruct prominent views of the theater's architecturally significant front facade.

The parking would have no significant adverse effect on the residents of the apartment building located north of the proposed site. Parking would be consistent in character with the existing commercial setting to the south of the apartments. Furthermore, views of the parking facility would be nearly, if not completely, blocked by the six foot wall along the southside of the apartment building and by the security bars on the apartment windows.

c. Site 3 – Northeast Corner of Amalia Avenue and Whittier Boulevard

A parking facility at the northeast corner of Amalia Avenue and Whittier Boulevard would be consistent with the commercial use of the property and surrounding commercial buildings on Whittier Boulevard. It would be lower in height than the bulky, five-story Great Western Bank building currently on the site.

The parking facility could be significantly higher than the five single-family houses north and east of the site, but again not as tall as the bank building currently within view of the four residences on Hillview Avenue. However, as a possible multi-level structure occupying the northern portion of the site near the residences, the facility would cast shade and shadow during the morning hours on the two houses to the north and during the mid-afternoon hours on the three houses to the east.

4-5.5 CUMULATIVE IMPACTS

IOS-2 and LPA may result in multi-level bus/parking facilities in the northeast corner of First and Lorena Streets and on three properties near the Whittier and Atlantic boulevard intersection. These structures would increase the number of multi-level structures near the intersection.

The MTA will create station-specific conceptual master plans to address area development, station design, station art work and zoning requirements. It is anticipated that the station designs will promote pedestrian-friendly streetscapes along Whittier and Atlantic boulevards and thus, the facilities should have minimal adverse cumulative visual impacts.

4-5.6 MITIGATION MEASURES

4-5.6.1 Operation

Although significant adverse visual impacts are not expected at the rail termini locations, the MTA will create station-specific conceptual master plans to address area development, station design, station art work and zoning requirements. Station sites will include landscaping and art work consistent with the surrounding neighborhood character. The development of station-specific conceptual master plans will be conducted with substantive community input. The MTA will work with the community through the community linkages program and consult with the RAC and SAC to promote neighborhood themes in the designs for the stations and pedestrian amenities. (See Section 5-2 for a discussion of the Review Advisory Committee [RAC] and the Station Area Advisory Committees [SAACs].) In addition, lighting at the rail termini bus and parking facilities would be directed onto the site premises to prevent unnecessary intrusion of light onto residents.

In accordance with the MTA's public art policy, artists will be commissioned to develop art work for each of the Metro Rail East Side Extension stations. A community advisory group and artist selection panel will be formed to ensure community input in the process. Young people in the community will be encouraged to participate in the MTA's Young Artists Program.

The following site-specific mitigation measures are proposed:

- **Whittier/Atlantic Station (Site 1)**

Structures associated with the rail terminus station at the Whittier/Atlantic Station (Site 1) would be designed and placed so as to minimize potential adverse visual effects at the Golden Gate Theatre. The bus and possible parking facility will be visually separated from the surroundings by a wall along Louis Place and Woods Avenue.

- **Whittier/Atlantic Station (Site 3)**

The existing trees along the northside of the proposed parking facility site at the Whittier/Atlantic Station (Site 3) shall be maintained or replaced to provide a visual buffer between two single-family residences to the north and the parking facility.

4-5.6.2 Construction

The MTA A-R-T Community Advisory Group will work in collaboration with the community linkages program and in consultation with the RAC and SAC to develop a construction period arts program in an effort to limit the negative disturbances during construction and to explain to the public the role the project will play in the regional transportation network. The construction period artwork will be displayed along the periphery of the construction site as a vehicle by which to inform the public of the project and to improve the urban streetscape during the construction period.

The program will include special fencing, lighting and landscaping to mark safe passage for pedestrians and vehicles through the construction areas and detours. Artwork will be used to alert pedestrians and motorists of detours, transportation alternatives and information resources. Temporary walkways, barriers, signs and street furniture will create an environment that is both informative and visually appealing to pedestrians and community residents.

Displays along construction barrier walls will describe construction activities, construction technology, project plans, contractors and construction workers. Exhibit panels along pedestrian walkways will illustrate the complete construction and construction schedule. Signs will be used to identify businesses along the construction route, transportation alternatives, and information resources.

Visual impacts to the pedestrian environment will be mitigated by the creation of pedestrian paths, bridges and other landscape or architectural amenities and open space areas. Construction barrier walls will be designed to be compatible with the surrounding environment. See also the construction mitigation measures for Business Disruption, Section 4-18.7.

4-6 AIR QUALITY

The purpose of this section is to describe existing and future air quality conditions in the region and study area and to identify and quantify any potentially significant air quality impacts associated with the operation of the Locally Preferred Alternative (LPA) and Initial Operable Segments (IOSs). See Section 4-18.3 for a discussion of air quality impacts associated with construction of the project.

4-6.1 REGIONAL

The project is located in the South Coast Air Basin (Basin), which is administered by the South Coast Air Quality Management District (SCAQMD). The Basin is a 6600-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino and San Jacinto mountains to the north and east. The Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside and San Bernardino Counties.

The topography and climate of southern California combine to make the Basin an area of high air pollution potential. During the summer months, a warm air mass frequently descends over the cool, moist marine layer. The warm upper layer inhibits vertical mixing of the pollutants in the marine layer. Light winds during the summer further limit ventilation. Sunlight is also needed for the photochemical reactions which produce ozone and nitrogen oxides.

4-6.1.1 Regional Setting

"Air pollution" refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by affecting health, reducing visibility, damaging property or reducing the productivity or vigor of crops or natural vegetation. Some of the more common air pollutants are discussed below.

a. Pollutants for Analysis

Six air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as criteria pollutants of concern nationwide: carbon monoxide, nitrogen oxides, ozone, particulate matter, sulfur oxides and lead. The sources of these pollutants, their effects on human health and their final disposition in the atmosphere vary. In Los Angeles, ambient concentrations of carbon monoxide, hydrocarbons, ozone and lead are predominantly influenced by motor vehicle activity. Emissions of nitrogen oxides come from both mobile and stationary sources, and emissions of particulate matter and sulfur oxides are primarily associated with stationary emission sources.

b. National and State Ambient Air Quality Standards

As required by the Clean Air Act, National Ambient Air Quality Standards (NAAQS) have been established for the six criteria air pollutants: carbon monoxide, nitrogen oxides, ozone, particulate matter smaller than 10 microns (PM_{10}), sulfur oxides and lead. These standards and those established by the State of California (CAAQS) are summarized in Table 4-6.1. The primary standards have been established to protect public health. The secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

TABLE 4-6.1: FEDERAL AND STATE AIR QUALITY STANDARDS

POLLUTANT	AVERAGING PERIOD	CALIFORNIA STANDARD[a]	FEDERAL STANDARD[b]	
			PRIMARY[c]	SECONDARY[d]
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[e]	8 Hours	Reduce visibility below 10 miles	NS	NS

Notes:

[a] 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.

[b] 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.

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

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

[e] 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.

c. Clean Air Act Amendments of 1990

The Clean Air Act Amendments of 1990 (Amendments) direct the EPA to implement environmental policies and regulations that will ensure cleaner air quality. The Amendments affect proposed transportation projects, such as the alternatives in this FEIS/FEIR. According to Title I, Section 101, Paragraph F, of the Amendments, "No federal agency may approve, accept or fund any transportation plan, program or project unless such plan, program, or project has been found to conform to any applicable (state) implementation plan (SIP) in effect under this act." Title I of the Amendments defines conformity as follows:

- Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards; and

- That such activities will not:

  (i) cause or contribute to any new violation of any National Ambient Air Quality Standard (NAAQS) in any area:

  (ii) increase the frequency or severity of any existing violation of any NAAQS in any area; or

  (iii) delay timely attainment of any NAAQS or any required interim emissions reductions or other milestones in any area.

Until the State Implementation Plan is approved, the U.S. EPA has stated that two aspects of conformity that must be demonstrated during this interim period as a part of the environmental review phase of a project include:

- The elimination or reduction of the severity and number of violations of the carbon monoxide standards in the area substantially affected by the project.

- The reduction in annual ozone and carbon monoxide emissions consistent with the deadlines established for each type of designated non-attainment area.

The determination of conformity is to be based on the most recent estimates of pollutant emissions and such estimates are to be determined from the most recent population, employment, travel and congestion estimates as determined by the responsible metropolitan planning organizations or other agency authorized to make such estimates. For this FEIS/FEIR, the Southern California Association of Governments (SCAG) growth forecasts have been used.

d. Monitored Air Quality

Air pollutant levels in the Basin are monitored by a network of sampling stations operated under the supervision of the SCAQMD. Air quality monitoring data were analyzed to assess existing concentrations of carbon monoxide and particulate matter in the project area. The nearest monitoring locations are the Los Angeles Station at 1630 North Main Street and the Pico Rivera

Station at 3713-B San Gabriel River Parkway. The 1988 to 1992 air quality data from these stations are summarized in Table 4-6.2.

The Basin is federally designated as a "serious" nonattainment area for carbon monoxide under the provisions established by the Amendments. As such, it is required to attain the carbon monoxide standard by December 31, 2000. The one-hour National and California Ambient Air Quality Standards were not exceeded between 1988 and 1991 at either the Los Angeles or Pico Rivera monitoring stations. The eight-hour CAAQS was exceeded at the Los Angeles station during four years of the study period; the NAAQS was exceeded during two years. At the Pico Rivera station, the eight-hour CAAQS was exceeded during every year of the study period and the NAAQS was not exceeded. Two exceedances of the federal standard constitutes a violation of the NAAQS; therefore, the NAAQS was violated only at the Los Angeles monitoring station during 1988.

The Basin is federally designated as a nonattainment area for PM_{10}. As such, SCAQMD must submit a plan that will provide for attainment by December 31, 1994, or one that will show that attainment by that date is impractical. The 150 $\mu g/m^3$ 24-hour NAAQS for PM_{10} was exceeded one time at the Los Angeles monitoring station during the study period. The NAAQS for this pollutant is not to be exceeded more than an average of one day per year over a three year period; therefore, no violation was recorded. The CAAQS of 50 $\mu g/m^3$ during a 24-hour period was exceeded at the Los Angeles monitoring station during every study year. The Pico Rivera monitoring station does not measure PM_{10}.

The Basin is federally designated as an "extreme" nonattainment area for ozone. As such, it must reach attainment by November 15, 2010. The NAAQS and CAAQS standard was exceeded at both the Los Angeles and Pico Rivera monitoring stations during every study year.

4-6.1.2 Regional Impacts

The proposed project would affect the total quantities of motor vehicle-related pollutants emitted in the Basin. These changes in "pollutant burdens" (tons of pollutants emitted over time) provide an indication of the change in air quality in the region and are useful in assessing relative changes in the concentrations of carbon monoxide, hydrocarbons and nitrogen oxides. The reduction in pollutant levels has been computed using estimated vehicle miles traveled (VMT) and average travel speed.

The introduction of the LPA or IOSs is predicted to reduce estimated VMT and increase the average travel speed within the region. A reduction in VMT or an increase in travel speed from operation of the Red Line would result in a lower regional auto-related air pollutant burden.

The regional automobile-related air quality benefits from the Locally Preferred Alternative (LPA) and Initial Operating Segments 1 and 2 (IOS-1 and IOS-2) are shown in Table 4-6.3 by pollutant type and in total. This table shows that there would be a decrease in regional auto-related air pollution following implementation of a rail line, as compared to the predicted 2010 auto-related emissions with a project.

TABLE 4-6.2: AIR QUALITY SUMMARY FOR STUDY AREA MONITORING STATION, 1988-1992

AIR POLLUTANT	STANDARD EXCEEDANCE	LOS ANGELES					PICO RIVERA				
		1988	1989	1990	1991	1992	1988	1989	1990	1991	1992
Carbon Monoxide (CO)	Maximum 1-hr Concentration (ppm)	16.0	14.0	13.0	12.0	12.0	14.0	13.0	13.0	11.0	11.0
	Maximum 8-hr Concentration (ppm)	11.4	9.8	9.9	9.0	9.5	9.9	10.7	9.4	9.1	8.6
	Days > 35 ppm (federal 1-hr. standard	0	0	0	0	0	0	0	0	0	0
	Days > 9.5 ppm (federal 8-hr. standard	3	1	1	0	0	1	1	0	0	0
	Days > 20 ppm (state 1-hr. standard)	0	0	0	0	0	0	0	0	0	0
	Days > 9 ppm (state 8-hr. standard)	5	2	1	0	1	3	2	1	1	0
Ozone (O_3)	Maximum 1-hr Concentration (ppm)	0.21	0.25	0.20	0.19	0.20	0.30	0.26	0.19	0.26	0.26
	Days > 0.12 ppm (federal 1-hr. standard)	24	34	32	23	23	67	61	43	48	45
	Days > 0.09 ppm (state 1-hr. standard)	68	76	70	59	57	128	108	85	86	101
Nitrogen Dioxide (NO_x)	Maximum 1-hr Concentration (ppm)	0.54	0.28	0.28	0.36	0.28	0.24	0.31	0.27	0.25	0.27
	Annual Arithmetic Mean (ppm)	0.061	0.055	0.047	0.049	0.40	0.054	0.055	0.050	0.047	0.044
	% AAM Exceeded Federal Std. of 0.053 ppm/year	0	0	0	0	0	0	0	0	0	0
	Days > 0.25 ppm (state 1-hr. standard)	6	1	3	4	1	0	2	2	0	1
Sulfur Dioxide (SO_2)	Maximum 1-hr Concentration (ppm)	0.04	0.03	0.02	0.02	0.05	0.05	0.04	0.04	n/a	n/a
	Annual Arithmetic Mean (ppm)	0.004	0.002	0.002	0.002	0.005	0.005	0.005	0.004	n/a	n/a
	Days > 0.14 ppm (federal 24-hr. standard)	0	0	0	0	0	0	0	0	n/a	n/a
	Days > 0.05 ppm (state 24-hr. standard)	0	0	0	0	0	0	0	0	n/a	n/a
Suspended Particulates (PM_{10})[a]	Number of Samples	37	58	60	57	61	n/a	n/a	n/a	n/a	n/a
	Maximum 24-hr. Concentration ($\mu g/m^3$)	130	137	152	151	137	n/a	n/a	n/a	n/a	n/a
	Samples > 150 ug/m^3 (federal 24-hr. standard)	0	0	1	1	0	n/a	n/a	n/a	n/a	n/a
	Samples > 50 ug/m^3 (state 24-hr. standard)	23	33	31	3	22	n/a	n/a	n/a	n/a	n/a
	Annual Arithmetic Mean ($\mu g/m^3$)	60.8	66.1	53.2	57.1	48.0	n/a	n/a	n/a	n/a	n/a
Lead	Maximum Monthly Concentration ($\mu g/m^3$)	0.22	0.17	0.09	0.21	0.16	0.29	0.19	0.14	0.19	0.15
	Months > 1.5 $\mu g/m^3$ (federal standard)	0	0	0	0	0	0	0	0	0	0
	Months > 1.5 $\mu g/m^3$ (state standard)	0	0	0	0	0	0	0	0	0	0
Sulfates	Max. 24-hr Concentration ($\mu g/m^3$)	26.6	23.0	25.3	29.1	19.4	28.1	32.0	21.1	21.6	17.0
	Samples ≥ 25 $\mu g/m^3$ (state 24-hr. standard)	1	0	0	0	0	1	1	0	0	0

Notes: [a] PM_{10}: Particulate matter > 10 μm aerodynamic diameter
n/a = Pollutant not monitored

Source: California Air Quality Data Summaries 1988 through 1992, California Air Resources Board.

TABLE 4-6.3: REDUCTIONS IN AUTO AIR EMISSIONS (lbs/day)[1]					
ALTERNATIVES	Vehicle Miles Traveled	ROG	CO	NO_x	PM_{10}
Future Without Project	225,843,000	166,220	1,497,300	185,870	104,560
Initial Operating Segment-1	224,139,000	164,970	1,486,000	184,470	103,780
REDUCTION	1,704,000	1,250	11,300	1,400	780
Initial Operating Segment-2	224,128,000	164,960	1,486,000	184,460	103,770
REDUCTION	1,715,000	1,260	11,300	1,410	790
Locally Preferred Alternative	224,070,000	164,920	1,485,600	184,410	103,740
REDUCTION	1,773,000	1,300	11,700	1,460	820
Notes: [1] Based on the California Air Resources Board's BURDEN7F program.					

Source: Terry A. Hayes Associates, 1994

These air pollution savings are small (less that 1 percent) relative to the total Los Angeles regional air pollution problem.

In the areas substantially affected by the LPA, somewhat greater reductions would be expected; however, this more localized benefit cannot be quantified under current transportation modelling protocols. Net savings in air pollution, after consideration of the electrical power needed to power the trains, would depend on regional progress in controlling fixed source pollution from power plants and the types and locations of electrical power sources in use in 2010.

4-6.1.3 Cumulative Impacts

Traffic estimates used for the analysis assumed both standard regional growth and planned major developments. The regional cumulative impact of the project, based on the traffic information provided, is anticipated to demonstrate an improvement in regional air quality.

4-6.1.4 Mitigation

Since operation of the project is expected to improve regional air quality, no mitigation measures would be required.

4-6.2 MICROSCALE ANALYSIS

The analysis of mobile sources, which must be undertaken for a small (microscale) area, applies mathematical models that simulate physical conditions to predict carbon monoxide concentrations at specified receptor locations. Mobile source dispersion models are the basic analytical tools used to estimate carbon monoxide concentrations expected under given conditions of traffic, roadway geometry and meteorology. Pollutants such as PM_{10} and nitrogen oxides are analyzed on a regional level. The California Air Resources Board (CARB) currently has no microscale PM_{10} model to determine tailpipe PM_{10} concentrations.

4-6.2.1 Microscale Setting

Microscale air quality modeling has been performed using the EMFAC7F program and the CAL3QHC, version 2, air quality dispersion model to estimate existing, no build and build carbon monoxide concentrations in the project area. Both of these models have been approved for use by CARB and the SCAQMD.

a. Dispersion Model

The CAL3QHC air quality dispersion model is a modification of the CALINE3 model (CALINE3: A Versatile Dispersion Model for Predicting Air Pollutant Levels Near Highways and Arterial Streets, Report Number FHWA/CA/TL–79/23). CAL3QHC also considers vehicular queuing at intersections. The model has been approved by the EPA for nationwide usage.

The carbon monoxide levels estimated by the model are the maximum concentrations that would be expected to occur at each air quality receptor site analyzed because the assumptions made in using the model include the simultaneous occurrence of all worst case parameters (peak hour traffic conditions, conservative vehicular operating conditions, low wind speeds, low atmospheric temperature, stable atmospheric conditions and the maximizing of wind direction).

b. Air Receptor Locations

Carbon monoxide levels resulting from motor vehicles trips generated by the proposed project on roadways serving the LPA stations have been estimated at 13 locations using the CAL3QHC model. The locations, listed on Table 4-6.4, were selected based on traffic and land use information and would be the most likely locations for project impacts. Many intersections were screened out of the analysis based on a small predicted increase or no predicted increase in future traffic volumes. With improvements in vehicle technology, air quality at these locations would be anticipated to improve. Sensitive receptors have been identified at each location, such as residences, schools and recreational facilities in the vicinity. Receptor heights are five feet above grade, which is the average breathing height for an adult.

TABLE 4-6.4: AIR QUALITY RECEPTOR LOCATIONS

LOCATION NO.	LOCATION
1	Atlantic Boulevard/Whittier Boulevard
2	State Street/Marengo Street
3	Atlantic Boulevard/Route 60 on and off ramps
4	Indiana Avenue/Whittier Boulevard
5	Whittier Boulevard/Arizona Avenue
6	Whittier Boulevard/Lorena Street
7	Atlantic Boulevard/Verona Avenue
8	Whittier Boulevard/Belden Avenue/Goodrich Avenue
9	Boyle Street/State Street/First Street/101 on and off ramps
10	Brooklyn Avenue/Mott Street
11	Brooklyn Avenue/Soto Street
12	First Street/Lorena Street
13	Whittier Boulevard/Rowan Avenue

Source: Terry A. Hayes Associates, 1994.

The following are the parameters considered in the mobile source analysis:

- **Meteorological Conditions**

The transport and concentration of pollutants emitted from motor vehicles are influenced by three principal meteorological factors: wind direction, wind speed and atmospheric stability. The values for these parameters were chosen to maximize pollutant concentrations at each receptor location. The values used for this analysis are:

- o Wind Speed: 1.0 m/s
- o Wind Direction: Worst-case wind angle search
- o Stability Class: F
- o Mixing height: 1000 meters
- o Surface roughness: 140 cm (mixed use)
- o Persistence Factor: 0.7

Peak eight-hour concentrations were obtained by applying a persistence factor of 0.7 to the maximum predicted one-hour values. This persistence factor takes account of the fact that, over an eight hour period traffic volumes fluctuate downwards from the peak and vehicle speeds vary. The persistence factor thus reflects the carbon monoxide concentration that persists during the day between traffic peaks.

- **Analysis Years**

Microscale carbon monoxide analyses have been performed for 1990 and 2010 to determine the existing and design year conditions. For the design year, conditions with both the proposed project and the no build condition (future without the project) have been analyzed to determine project impacts.

- **Traffic Data**

Traffic data for the air quality analysis were derived from traffic counts and other information developed as part of an overall traffic analysis for this FEIS/FEIR using methodology accepted by the EPA, CARB and SCAQMD. The microscale carbon monoxide analysis was based on data for the PM peak traffic period, which is the period when maximum traffic volumes occur on local streets and when the greatest traffic and air quality impacts of the proposed project are expected.

Traffic information used for the air quality analysis includes:

- o Peak hour volumes and speeds
- o Signal timing (total cycle length, red time, lost time)
- o Approach volumes and speeds
- o Number of lanes for each approach

- **Vehicle Emissions**

Vehicular emissions were estimated using the CARB's EMFAC7F mobile source emission factor program. Total emissions are affected by the type of vehicles using the roadway network. The vehicle classification information presented in the traffic section was used to estimate vehicular emissions.

Emission estimates account for three possible vehicle operating conditions: cold-vehicle operation, hot-start operation and hot stabilized operation. CO emissions are greatest when engines are cold (cold-vehicle operation) and when engines are restarted shortly after they were shut off (hot-start operation). Vehicle operating conditions used in this analysis (50 percent cold, 10 percent hot) were based on recommendations from SCAQMD. Emissions are also greatly affected by speed, ambient temperature, vehicle age and mileage distribution. These factors are incorporated into the SCAQMD's CEQA Handbook emission tables.

- **Background Concentrations**

Microscale modeling is used to predict carbon monoxide concentrations resulting from emissions from motor vehicles using roadways immediately adjacent to the location at which predictions are being made. A background carbon monoxide concentration must be added to this value to account for carbon monoxide entering the area from other sources upwind of the location at which predictions are being made and from stationary and mobile sources. An average of 13.2 ppm was used for 1990.

In the carbon monoxide nonattainment areas, background concentrations for future years are estimated by applying factors to the base year background concentrations. These factors are directly proportional to the estimated future year total carbon monoxide emissions within each air quality analysis zone, as estimated by the SCAQMD in a manner consistent with SCAG's most recent transportation plan or program conformity analysis. An average factor of 0.40 was used for the study area. Therefore, the future background concentration with the project was estimated to be 5.2 ppm for one hour and 3.6 ppm for eight hours and the future background concentration without the project is estimated to be 5.4 ppm and 3.8 ppm for the one- and eight-hour periods, respectively.

4-6.2.2 Microscale Impacts

Carbon monoxide concentrations were predicted for the existing and No-Build conditions and for the LPA and the initial operating segments. A comparison of existing conditions with the future No-Build values demonstrates the expected improvement in air quality within the study area. The comparison of the future no build with the build values demonstrates the project's impact on air quality in the immediate vicinity of the corridor study area.

For the build scenario, the LPA and the initial operating segments were evaluated. The existing and future no build predicted carbon monoxide concentrations for one and eight hours are shown on Tables 4-6.5 and 4-6.6. No violations of the one- or eight-hour state or federal standards are predicted for the future no build and build scenarios. Violations of the standards are present in the existing scenario.

a. Existing Pollutant Levels

The maximum predicted existing (1990) carbon monoxide concentrations at each of the receptor locations are listed in Tables 4-6.5 and 4-6.6. The values were obtained using the methodology previously described and are the highest values obtained based upon traffic conditions during the PM peak hour. Of the receptors evaluated, no violations of the state or federal one-hour standards were demonstrated; however, both the state and federal eight-hour carbon monoxide standards were violated at every receptor studied.

b. Future No-Build Considerations

The same microscale modeling procedures that were used to estimate existing conditions were used to estimate the 2010 design no build conditions. These conditions include a traffic growth factor for the area between 1990 and 2010.

The modeling results, which are presented in Tables 4-6.5 and 4-6.6, represent the highest values obtained for all wind angles analyzed. Future emissions levels are expected to decrease due to mandated improvements in vehicular efficiency. The one-hour and eight-hour predicted values are within state and federal standards at all receptor locations.

c. Future Build Conditions

The same modeling procedures used to estimate the 2010 design no build conditions were used to estimate the 2010 design build conditions. The build condition reflects the change in predicted traffic patterns, volumes and speeds due to the project. The modeling results, which are presented in Tables 4-6.5 and 4-6.6, are the highest values obtained for all wind angles. The one-hour and eight-hour predicted values fall below state and federal one- and eight-hour standards.

d. Park-and-Ride Facilities

Park-and-ride facilities are proposed at the First/Lorena and Whittier/Atlantic stations. Parking lots generally exhibit high carbon monoxide concentrations due to the large number of vehicles exiting the facility in cold-start mode, the low speeds at which vehicles travel and, in multi-story structures, the stacking of emission sources.

The estimated demand for peak period parking ranges from 500 at the First/Lorena station to 1,200 spaces at the Whittier/Atlantic station. To determine the air quality impacts of the proposed parking facilities, the CALINE4 methodology was applied to the CAL3QHC model and the results of that modelling effort were added to the results of the mobile emissions analysis to attain a concentration representing the combined effects of mobile emissions and the parking facilities.

As shown in Table 4-6.7, the impacts of the parking facilities added 0.9 ppm to the one-hour carbon monoxide concentrations and 0.6 and 0.7 ppm to the eight-hour concentrations. The total one-hour peak carbon monoxide concentrations are shown below. The analysis demonstrated that no violations of the one- or eight-hour carbon monoxide standard would occur with the addition of any of the proposed park-and-ride facilities.

TABLE 4-6.5: EASTSIDE CORRIDOR ONE-HOUR PM PEAK CO CONCENTRATIONS (ppm)

LOCATION NO.	INTERSECTION	RECEPTOR DESCRIPTION	EXISTING	NO BUILD 2010	BUILD 2010		
					IOS-1	IOS-2	LPA
1	Atlantic/Whittier	Residence southeast of intersection	19.1	7.0	11.2	11.2	11.3
2	State/Marengo	County Hospital north of intersection	16.7	5.5	10.9	10.9	10.9
		Residence southeast of intersection	16.4	6.6	11.2	11.2	11.2
3	Atlantic/Route 60 ramps	Residence near eastbound ramp	16.0	5.4	8.3	8.3	8.3
4	Indiana/Whittier	Residence on Indiana	18.3	8.6	12.2	12.2	12.2
5	Whittier/Arizona	Residence on Arizona south of Whittier	16.5	5.5	8.6	8.6	8.7
6	Whittier/Lorena	Medical office on Whittier	19.7	6.5	11.8	11.9	11.9
7	Atlantic/Verona	Residence on Verona north of Atlantic	16.0	5.4	9.0	9.0	9.3
8	Whittier/Belden/ Goodrich	Medical office on Whittier	16.5	5.5	8.8	8.7	8.8
		Child services on Whittier	16.3	5.4	8.5	8.5	8.5
9	Boyle/State/First/ 101 ramps	Residence on First Street east of State	16.0	5.5	8.1	8.1	8.1
10	Brooklyn/Mott	Residence on Mott north of Brooklyn	17.1	5.7	9.3	9.3	9.3
11	Brooklyn/Soto	Medical clinic on Soto north of Brooklyn	17.1	5.7	9.3	9.3	9.3
12	First/Lorena	Residence on Lorena north of First	17.2	5.6	9.3	9.4	9.4
13	Whittier/Rowan	Medical office on Whittier	16.7	5.5	8.8	8.8	8.8

Notes: Federal one-hour CO standard = 35 ppm
State one-hour CO standard = 20 ppm

Source: Terry A. Hayes Associates, 1994.

TABLE 4-6.6: EASTSIDE CORRIDOR EIGHT-HOUR PM PEAK CO CONCENTRATIONS (ppm)

LOCATION NO.	INTERSECTION	RECEPTOR DESCRIPTION	EXISTING	NO-BUILD 2010	BUILD 2010		
					IOS-1	IOS-2	LPA
1	Atlantic/Whittier	Residence southeast of intersection	13.4	4.9	7.8	7.8	7.9
2	State/Marengo	County Hospital north of intersection	11.8	3.9	7.8	7.8	7.8
		Residence southeast of intersection	11.5	4.6	7.8	7.8	7.8
3	Atlantic/Route 60 ramps	Residence near eastbound ramp	11.3	3.9	5.8	5.8	5.8
4	Indiana/Whittier	Residence on Indiana	12.9	6.0	8.5	8.5	8.5
5	Whittier/Arizona	Residence on Arizona south of Whittier	11.6	3.9	6.0	6.0	6.1
6	Whittier/Lorena	Medical office on Whittier	13.9	4.6	8.2	8.3	8.3
7	Atlantic/Verona	Residence on Verona north of Atlantic	11.3	3.9	6.3	6.3	6.5
8	Whittier/Belden/ Goodrich	Medical office on Whittier	11.6	3.9	6.1	6.1	6.1
		Child services on Whittier	11.5	3.8	5.9	5.9	5.9
9	Boyle/State/First/ 101 ramps	Residence on First Street east of State	11.3	3.9	5.6	5.6	5.6
10	Brooklyn/Mott	Residence on Mott north of Brooklyn	12.0	4.0	6.5	6.5	6.5
11	Brooklyn/Soto	Medical clinic on Soto north of Brooklyn	12.0	4.0	6.5	6.5	6.5
12	First/Lorena	Residence on Lorena north of First	12.1	3.9	6.5	6.5	6.5
13	Whittier/Rowan	Medical office on Whittier	11.8	3.9	6.1	6.1	6.1

Notes: Federal eight-hour standard = 9.0 ppm
State eight-hour standard = 9 ppm

Source: Terry A. Hayes Associates, 1994.

TABLE 4-6.7: TOTAL PARK-AND-RIDE ONE- AND EIGHT-HOUR CO CONCENTRATIONS (ppm)

LOCATION NO.	INTERSECTION	RECEPTOR DESCRIPTION	ONE-HOUR		EIGHT-HOUR	
			IOS-2	LPA	IOS-2	LPA
1	Atlantic/Whittier	Residence southeast of intersection	n/a	11.8	n/a	8.5
12	First/Lorena	Residence on Lorena north of First	10.1	10.1	7.0	7.0

Notes: Federal one-hour standard = 35.0 ppm
State one-hour standard = 20.0 ppm
Federal eight-hour standard = 9.0 ppm
State eight-hour standard = 9 ppm

Source: Terry A. Hayes Associates, 1994.

e. Conformity

The Eastside Metro Rail project is included in the 1991-1997 Regional Transportation Improvement Plan, which has been found to conform with the Clean Air Act (November, 1991). The current (June, 1991) EPA interim conformity guidance requires that "projects which are included in a conforming TIP must not have changed design concept or scope since the TIP from which they were derived was found to conform." The Eastside Metro Rail project definition is not expected to change from what is currently in the 1991-1997 RTIP or what is proposed in the subsequent 1992-1998 RTIP currently in development and, therefore, still conforms with the Clean Air Act.

The federal conformity criteria address states, such as California, that are not operating under an EPA-approved State Implementation Plan (SIP). All projects must then conform with an approved Transportation Improvement Program (TIP), as does the Eastside Corridor project, as noted above. Several additional criteria then apply to determine conformity.

- §51.412 *The conformity determination must be based on the latest planning assumptions.* All assumptions used in the microscale analysis are derived from SCAG's most recently adopted estimates of population, employment, travel, and congestion. Travel forecasts have been based on growth assumptions for 2010.

- §51.414 *The conformity determination must be based on the latest emission estimation model available.* All emissions are based on the most recent version of CARB's emissions estimate model, EMFAC7F.

- §51.416 *The MPO* [metropolitan planning organization] *must make the conformity determination according to the consultation procedures of this rule and the implementation plan revision required by §51.396.* The Southern California Association of Governments will make its conformity determination as stipulated by this rule.

- §51.420 *There must be a currently conforming transportation plan and currently conforming TIP at the time of project approval.* A conforming transportation plan and TIP currently exist.

- §51.422 *The project must come from a conforming transportation plan and program.* The Eastside Metro Rail project is included in the 1991-1997 Regional Transportation Improvement Plan, which has been found to conform with the Clean Air Act (November, 1991).

- §51.424 *The FHWA/FTA project must not cause or contribute to any new localized CO or PM_{10} violations or increase the frequency or severity of any existing CO or PM_{10} violations in CO and PM_{10} nonattainment and maintenance areas.* The microscale CO analysis demonstrates that no CO violations would either contribute to new violations or increase the frequency or severity of existing violations. No EPA model currently exists to estimate localized auto-related PM_{10} concentrations.

- §51.426 *The FHWA/FTA project must comply with PM_{10} control measures in the applicable implementation plan.* The project would comply with all PM_{10} control measures in the implementation plan and in established SCAQMD rules.

When Federal Attainment Plans have been submitted to the EPA and prior to their approval, another conformity criterion applies. The SCAQMD has submitted to the EPA Federal Attainment Plans or Rate of Progress Plans for all criteria pollutants of concern in the South Coast Air Basin. Projects in the South Coast Air Basin are currently subject to the Transitional conformity criteria.

- §51.434 *The FHWA/FTA project must eliminate or reduce the severity and number of localized CO violations in the area substantially affected by the project (in CO nonattainment areas).* No localized CO violations would be experienced in either the future without project scenario or in either of the build scenarios, therefore, this criterion does not apply to the project.

The Southern California metropolitan planning agency, the Southern California Association of Governments, has recommended to the Federal Transit Agency that the Red Line Eastern Extension be found to conform with the federal Clearn Air Act, as indicated in its letter to the MTA dated May 23, 1994 (Figure 4-6.1).

4-6.2.3 Cumulative Impacts

The traffic data used for the air quality analysis include both regional growth and any planned major developments. Therefore the results of the air quality analysis represent the cumulative impacts within the study area.

4-6.2.4 Mitigation Measures

Based on the results of the analysis of impacts arising from the proposed project, it has been determined that no violations of any California or National Ambient Air Quality Standards would occur. Consequently, no specific mitigation measures are required to attain or maintain Ambient Air Quality Standards. However, the final design and operation of the project will include all reasonable measures to reduce the air quality impacts of the selected project alternative, including the use, as appropriate, of transportation system management techniques.

FIGURE 4-6.1: SCAG RECOMMENDATION TO FTA REGARDING FEDERAL CLEAN AIR ACT CONFORMITY

scag
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
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May 23, 1994

MAY 24

Judith A. Wilson
Executive Officer of Planning and Programming
Los Angeles Metropolitan Transportation Authority
818 W. 7th Street, Suite 300
Los Angeles, CA 90017

RE: RED LINE EASTERN EXTENSION CONFORMITY FINDING

Dear Mrs. Wilson:

Thank you for providing SCAG with the opportunity to comment on the Air Quality Section of the Final Environmental Impact Report (FEIR) for the Red Line Extension. Pursuant to your request that we provide comments on the FEIR's air quality section, SCAG has reviewed this section in order to make a recommendation to the Federal Transit Administration (FTA) to use in the preparation of FTA's conformity finding in accordance with the 1993 Environmental Protection Agency's Transportation Conformity Regulations.

The Red Line Extension is included in the 1989 Regional Mobility Plan and the 1993/99 Regional Transportation Improvement Program (RTIP), the conforming transportation plan and program for the SCAG region. Additionally, the Red Line Extension is also included in the proposed 1994 Regional Mobility Element and the 1993/99 RTIP Amendment. SCAG's analysis of the FEIR air quality section indicates that the Red Line Extension is a conforming project in compliance with §93.105(c)(1)(i), §93.121, and §93.131 of the Transportation Conformity Regulations. Therefore, SCAG recommends to the FTA that it also find that the Red Line Extension conforms with the federal Clean Air Act.

We appreciate your inviting our comments during the EIR review process and wish you much success during the implementation phases of the project. If you have any further questions or desire additional information, please call Manuel Gurrola of my staff at (213)236-1907.

Sincerely,

Arnold I. Sherwood

ARNOLD I. SHERWOOD, Ph.D.
Director of Forecasting, Analysis & Monitoring

4-7 AIRBORNE NOISE

The noise impacts for several alignment alternatives and various station options studied for the Eastside Extension were evaluated in the project AA/DEIR/DEIS. The current analysis is for the proposed LPA alignment. The objectives of the noise evaluation are to identify potential impacts that can forseeably be generated by operation of the proposed LPA project and to present appropriate mitigation measures to reduce such impacts. See Section 4-18.4 for a discussion of construction noise impacts.

4-7.1 AIRBORNE NOISE CRITERIA

Table 4-7.1 indicates five generalized categories, as defined in the Rail Construction Corporation (RCC) publication "System Design Criteria & Standards," into which communities along transit corridors can be classified. These categories are used to describe the predominant land uses surrounding noise sensitive receptors. The table indicates the description of the areas and the normal expected range of ambient noise levels for each land use/community category.

TABLE 4-7.1: GENERAL CATEGORIES OF COMMUNITIES ALONG RAIL SYSTEM CORRIDORS

AREA CATEGORY	AREA DESCRIPTION	TYPICAL AMBIENT NOISE LEVEL - DBA (AVERAGE OR L_{50}*)	TYPICAL DAY/NIGHT EXPOSURE LEVELS - L_{DN}
I	Low Density urban residential, open space park, suburban residential or quiet recreation area. No nearby highways or boulevards.	40-50 - day 35-45 - night	Below 55
II	Average urban residential, quiet apartments and hotels, open space, suburban residential, or occupied outdoor areas near busy streets.	45-55 - day 40-50 - night	50-60
III	High Density urban residential, average semi-residential/ commercial areas, parks, museum and non-commercial public building areas.	50-60 - day 45-55 - night	55-65
IV	Commercial areas with office buildings, retail stores, etc., primarily daytime occupancy. Central Business Districts.	60-70	Over 60
V	Industrial areas or Freeway and Highway Corridors.	Over 60	Over 65

Note: *L_{50} is the noise level that is exceeded 50 percent of the time.

Source: "System Design Criteria & Standards Volume 4," Rail Construction Corporation, July 1990.

The land use or area categories are the same as those used by many other transit agencies and are presented in the APTA (American Public Transit Association) publication, "Guidelines for Design of Rapid Transit Facilities." In most cases, experience with the new rail transit systems now in operation and extensions of older rail transit systems has demonstrated that these categories and the associated noise and vibration criteria provide adequate protection of the community. Most neighbors of transit facilities find the noise and vibration acceptable when the criteria are not exceeded.

There are two basic types of airborne noise criteria applicable to transit systems. The first specifies maximum allowable noise levels and the second specifies a noise exposure limit relative to the existing ambient noise level. Maximum allowable noise level criteria are specified in the RCC publication "System Design Criteria & Standards," and are similar to those in Section 2-7.6 of the American Public Transit Association (APTA) Publication, Guidelines for Design of Rapid Transit Facilities. Evaluation of noise impacts based on relative changes in noise exposure are based on generally accepted environmental criteria.

4-7.1.1 RCC "System Design Criteria & Standards"

Because the rail alignment proposed for the LPA is entirely subway, the only possible airborne noise impact from train operation would be due to noise emitted from subway vent shafts and ancillary equipment such as fan shafts, traction power substations, emergency power generation equipment and chiller plants. These potential noise impacts are very localized, because noise is emitted basically from a point rather than along the entire alignment.

The criteria for ancillary equipment and vent shaft noise contained in the RCC "System Design Criteria & Standards" are shown in Table 4-7.2. These guidelines constitute absolute noise criteria by which to evaluate impact potential and relate directly to the Community Area Categories defined in Table 4-7.1. The RCC "System Design Criteria" are also used as a design tool for determining the specific location and extent of control measures necessary to avoid impacts.

TABLE 4-7.2: CRITERIA FOR AIR-BORNE NOISE FROM TRANSIT SYSTEM ANCILLARY FACILITIES AND VENT SHAFTS

AREA CATEGORY	AREA DESCRIPTION	MAXIMUM NOISE LEVEL (DBA)	
		TRANSIENT	CONTINUOUS*
I	Low Density Residential	50	40
II	Average Residential	55	45
III	High Density Residential	60	50
IV	Commercial	65	55
V	Industrial/Highway	75	65

Notes: The criteria are generally applicable at the nearside of the nearest dwelling or occupied building under consideration or at 50 feet from the shaft outlet or other ancillary facility.
*For transformer noise or other sources with tonal components, the criteria are 5 dBA less.

Source: "System Design Criteria & Standards, Volume 4," Rail Construction Corporation, July 1990.

The appropriate level of noise from ancillary equipment and vent shafts depends on the surrounding land use of an area and whether the noise is from transient or continuous operations. This is because transient noises are acceptable at higher levels than continuous noises. For example, the transient noise level limits apply to the train passby noise transmitted from vent shaft openings and the continuous noise level limits apply to steady state fan noise from fan shaft openings.

Another type of noise impact can occur due to vibration transmitted through the ground and into nearby buildings. Groundborne noise and vibration impacts are discussed in the following Section 4-8.

4-7.1.2 State and Local Noise Guidelines

The State of California has enacted regulations intended to control community noise in general; however, none of these regulations explicitly applies to the control of noise emissions from rail rapid transit systems, especially when those transit systems are subway, as is the proposed LPA alignment.

The proposed LPA alignment is within the County of Los Angeles as well as the City of Los Angeles, both of which have complied with the requirements of the California Government Code Section 65302(g) by adopting noise elements to their respective General Plans. These General Plans contain general noise exposure goals to be used by the respective planning departments when considering the compatibility of a proposed development with an existing noise environment. The Noise Element guidelines do not apply directly to the control of noise from transit vehicle operation, but do indicate the communities' general viewpoints on noise.

In conclusion, review of the pertinent state and local standards and ordinances indicate the RCC "System Design Criteria" to be appropriate and sufficient criteria for evaluating airborne noise impacts from the proposed Eastside Extension project.

4-7.2 NOISE MEASUREMENT SITES

To establish a baseline of representative community noise and vibration data for the study area, ambient noise and vibration measurements were made outside representative buildings and in representative areas adjacent to the alignment to provide data on typical existing ambient levels. The data are used to characterize, and thereby classify, the current community environments as described in Section 4-7.1. Determination of the appropriate levels of acceptable noise that would be emitted from the proposed transit system are based in part on this characterization.

Eighteen measurement sites were chosen to characterize the ambient noise levels within the corridor. The measurement site locations are described in Table 4-7.3. The criteria used to select measurement sites were: noise-sensitive land uses, maximum expected impacts from the project and maximum geographical coverage of the study area. Figure 4-7.1 indicates the location of the noise and vibration measurement sites.

4-7.3 EXISTING NOISE ENVIRONMENT

The principal source of existing ambient noise within the alignment study area is motor vehicles, which is typical for urban and suburban environments. This applies to all portions of the LPA. Approximately 50 percent of the alignment is located directly beneath existing major or secondary surface transportation routes. Consequently, a large portion of the community adjacent to the alignment is already exposed to moderate to high levels of noise. On the other hand, approximately 35 percent of the proposed alignment passes underneath quieter residential areas which are away from the main traffic thoroughfares.

TABLE 4-7.3: CHARACTERIZATION OF NOISE AND VIBRATION MEASUREMENT LOCATIONS

SITE NUMBER	CLOSEST RECEPTOR	MAJOR SOURCES [a] OF EXISTING NOISE	APPROXIMATE DISTANCE TO EXISTING SOURCE (FT)
1	120 Center St.	First Street Center Street Local Trucks	270 15 150
2	333 Clarence St.	Clarence St. Fourth Street	15 700
3[b]	Dolores Mission	US 101 Local Sts.	600 15
4	156 Pecan St.	US 101 Pecan St.	200 15
5	125 Boyle Ave.	US 101 First Street Boyle Avenue	500 200 20
6	1718 Pennsylvania	Pennsylvania Ave. First Street US 101 / I-5	15 350 1000
7[b]	1905 Pennsylvania	I-5 State Street	500 50
8	412 Cummings St.	Brooklyn Avenue I-5 Cummings Street	170 350 15
9	251 Breed St.	Brooklyn Avenue Breed Street	150 15
10	322 Mott St.	Brooklyn Avenue Mott Street	350 15
11	217 Saratoga St.	Saratoga Street Michigan Avenue First Street	15 90 530
12[b]	3144 First St.	First St. Fresno St.	25 15
13	121 Alma Ave.	First Avenue Alma Avenue SR-70	190 15 1500
14[b]	R. L. Stevenson Jr. High School	Indiana Ave. Sixth St.	50 20
15[b]	817 Alma Ave.	Whittier Ave. Alma Ave. Indiana Ave.	300 15 300
16[b]	4140 Whittier Blvd.	Whittier Ave. Bonnie Beach Pl.	25 15
17[b]	758 Arizona Blvd.	Arizona Blvd. Whittier Ave.	15 200
18[b]	922 Fraser Ave.	Whittier Ave. Fraser Ave.	180 20

Notes: [a] In relative order of significance
[b] 1992 Measurement site for AA/DEIS/DEIR

Source: Wilson, Ihrig & Associates, Inc, 1994.

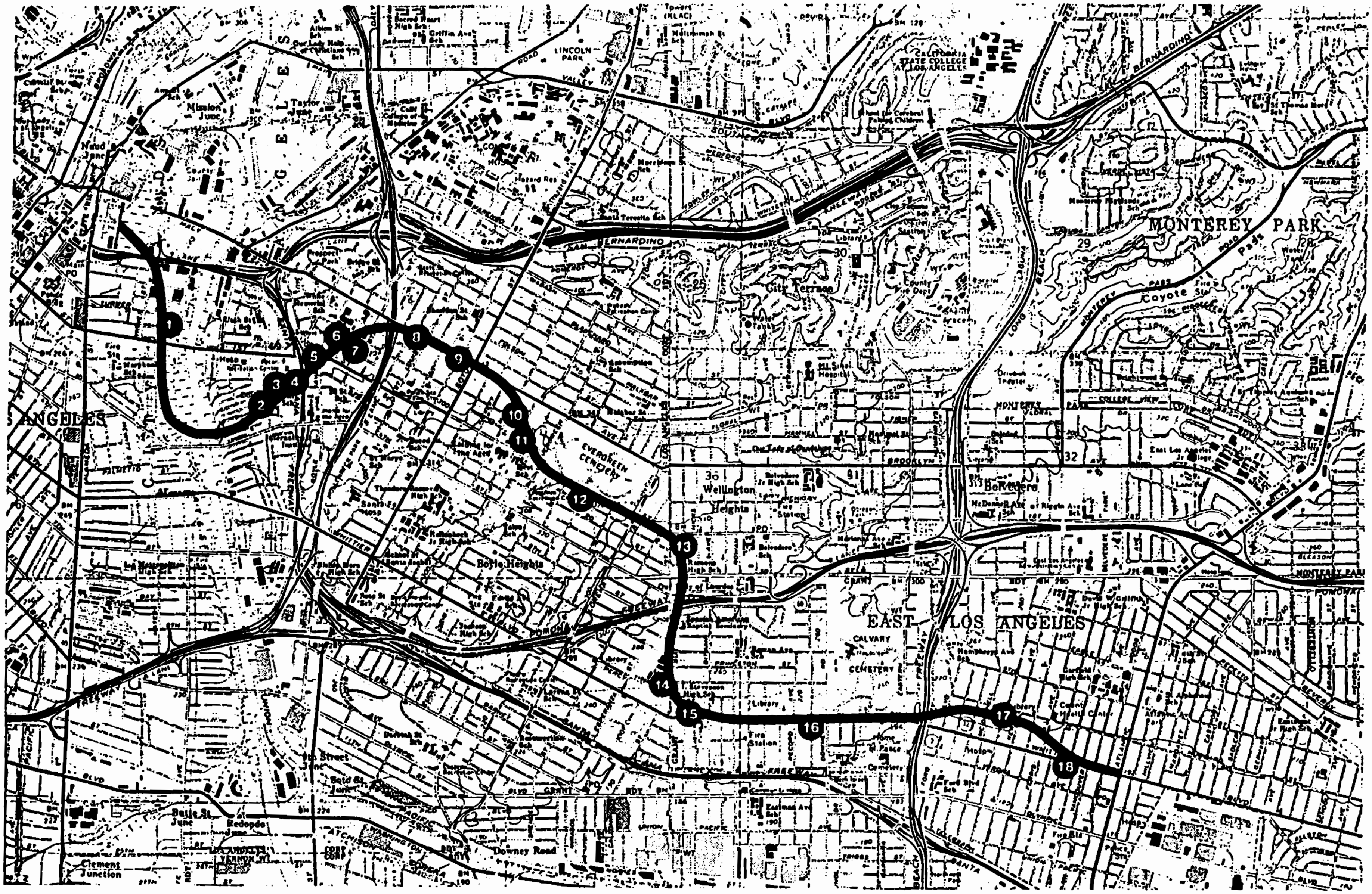


Figure 4-7.1: Location of Ambient Noise and Vibration Measurement Sites along Eastside Extension

Short-term (10 minutes) noise and vibration measurements were made at 14 of the 18 locations, and long-term (one week) noise measurements were made at 16 sites. These measurements provide a complete statistical representation of the existing daily noise environment. The short-term measurements were made during four characteristic periods of the day: daytime (i.e., non-rush hour), rush hour, evening and nighttime.

4-7.3.1 Noise Exposure Measures

There are three commonly encountered noise exposure measures used to characterize the daily cumulative noise exposure environment of locations within a community. The noise exposure measure used herein is L_{dn} (day/night average level). The other two measures encountered in environmental noise studies are CNEL (Community Noise Equivalent Level), and $L_{eq}(24)$, which is the energy equivalent level (i.e., time-weighted average level) for a 24-hour period.

The L_{dn} and CNEL are extensions of the L_{eq} (24), but place emphasis on the time of day by penalizing noise during nighttime hours when people tend to be more sensitive to noise. The L_{dn} adds 10 dB to noise levels between 10:00 PM and 7:00 AM, while the CNEL also adds 5 dB to the noise levels between 7:00 PM and 10:00 PM. However, the L_{dn} and CNEL seldom vary by more than 1 dBA, and are essentially equal measures.

Another noise measure commonly used to evaluate the impact of noise from transit train operation is the L_{eq} (peak) (i.e., peak hour L_{eq}). This is the energy equivalent level for the hour in which that measure was a maximum. Typically the L_{eq} (peak) occurs during rush-hour traffic, but may occur at other times of the day, especially if traffic is heavy enough during rush-hour to slow down significantly.

Table 4-7.1 also indicates another noise measure which is often used to characterize community ambient noise environments. The L_{50} noise level is the level exceeded 50% of the time, corresponding to the median noise level in a particular setting over time. The table shows the range of typical L_{50} noise to be expected in each of the community area categories.

4-7.3.2 Existing Noise Levels

The measured ambient noise data are summarized in Table 4-7.4. As indicated, some of the ambient noise measurements were made in 1992 during preparation of the Eastside Corridor AA/DEIS/DEIR. In addition to serving as documentation of the existing ambient noise levels, the ambient noise data, in conjunction with the type of land use, assist in classifying the various community areas of the Eastside Corridor by the categories presented in Table 4-7.1.

Land use in the area of the Los Angeles River, between Santa Fe Avenue on the west and Mission Road on the east, is primarily railroad yards and industrial. The ambient noise environment in the area is consistent with an industrial setting. There are live/work studios at the corner of Center Street and Banning Street which are the only sensitive receptors in the area.

The noise environment for this area is characterized by measurement site (MS) No. 1. The area is classified as Category V.

TABLE 4-7.4: AMBIENT NOISE LEVELS AT MEASUREMENT LOCATIONS

SITE NUMBER	SURROUNDING LAND USES	AIRBORNE NOISE			APTA CRITERIA AREA CATEGORY[a]
		L_{EQ} (PEAK) (DBA)	L_{50} (DBA)	L_{DN} (DBA)	
1	Multi-Family Residential/ Industrial	63	60-62 - day 55-57 - night	68[b]	V
2	Multi-Family Residential/ Industrial	65	55-57 - day 54-57 - night	65	V
3[c]	Multi-Family Residential/ Church / School	65	58-62 - day 52-58 - night	66	III
4	Single-Family Residential/ Freeway	68	62-64 - day 61-63 - night	70	V
5	Single & Multi-Family Residential / Freeway	71	63-65 - day 58-60 - night	71	V
6	Single & Multi-Family Residential / Hospital	63	55-57 - day 54-56 - night	65	III
7[c]	Single-Family Residential	69	57-62 - day 50-58 - night	64	III
8	Single & Multi-Family Residential / Commercial	65	59-61 - day 57-59 - night	67	III/IV
9	Single-Family Residential/ Commercial	67	59-61 - day 53-56 - night	67	III/IV
10	Single & Multi-Family Residential	65	57-59 - day 48-50 - night	64[2]	II/III
11	Single-Family Residential/ School	63	51-53 - day 48-52 - night	63	II
12[c]	Single-Family Residential/ Commercial / Cemetery	70	57-66 - day 44-52 - night	71	III/IV
13	Single & Multi-Family Residential	64	55-57 - day 51-53 - night	63	II
14[c]	Single-Family Residential/ School / Commercial	68	60-66 - day 50-55 - night	70	III/IV
15[c]	Single-Family Residential	65	52-58 - day 49-52 - night	64	II/III
16[c]	Commercial	70	60-67 - day 46-55 - night	71	IV
17[c]	Single-Family Residential/ Commercial	70	58-64 - day 48-57 - night	69	III/IV
18[c]	Single & Multi-Family Residential / Commercial	63	53-60 - day 47-53 - night	65	III/IV

Notes:
[a] Refer to Table 4-7.1
[b] Estimated based on short-term measurement data
[c] 1992 measurement for AA/DEIS/DEIR
L_{50} Noise level exceeded 50 percent of the time (median level)
L_{eq} An average of noise levels (energy equivalent) at a location over time. L_{eq} is considered a useful measure of an area's typical noise exposure over a long period of time and is usually based on the dBA level.
L_{dn} A measure of day/night level, L_{dn} is an extension of the L_{eq} but places greater emphasis on nighttime hours when people are typically home. Noise levels between 10 P.M. and 7 A.M. are weighted to account for the greater intrusiveness of noise during nighttime hours.
L_1 Vibration level exceeded 1 percent of the time
N/A = Not available

Source: Wilson, Ihrig & Associates, Inc., 1994.

Between Mission Road and US-101 the area is a mixture of light industry, warehouses and some single, but mostly multiple, family residences. Three major thoroughfares (Fourth Street, First Street and Brooklyn Avenue) traverse the area in an east-west direction, carrying significant amounts of motor vehicle traffic. South of First Street are apartments (MS No. 2), a city park and the Mission Dolores (MS No. 3), which has a school. There are also occasional small retail establishments. On Gless Street and Pecan Street there are single-family residences (MS No. 4). This part of the area is primarily classified Category III for the residential buildings, Category IV where there are commercial buildings and Category V for the homes within 400 feet of US-101. The entire area has a somewhat high ambient noise level with L_{dn} ranging from 65 dBA to 70 dBA. The major noise sources in this area are US-101 and the east-west thoroughfares.

The area between US-101 and I-5 is traversed by the three major thoroughfares. There are commercial establishments on these major streets with primarily single-family residences and some apartments on side streets. There are also churches and a hospital in the area. The ambient noise environment of this area is characterized by noise data for MS Nos. 5, 6 and 7. It is high for those areas near the freeway, with L_{dn} in excess of 70 dBA (MS No. 5) and moderate in the residential areas off the major streets with, L_{dn} below 66 dBA (MS Nos. 6 and 7). Within 300 to 400 feet of either freeway (depending on shielding) the area is classified as Category V; otherwise the area is Category IV along the main thoroughfares and Category III on the side streets. The major noise sources in the area are US-101, I-5 and the east-west thoroughfares.

Between I-5 and Fickett Street, the alignment runs parallel to Brooklyn Avenue approximately 150 feet to the south. The land use directly over the alignment is mostly single-family homes and apartment buildings. Along Brooklyn Avenue, which is a major east-west thoroughfare, the land use is primarily commercial with some second floor apartments. Due to the residential character of this area, it is classified as Category III away from Brooklyn Avenue and on or near Brooklyn Avenue the area would be Category IV because of the commercial land use. The ambient noise environment of this area is characterized by noise data for MS Nos. 8 and 9. The L_{dn} level is 67 dBA which, although slightly higher than normal for Category III, is consistent with the proximity of the area to Brooklyn Avenue.

Past Fickett Street the alignment turns south towards First Street passing beneath many single-family homes, some apartments and the Roosevelt Community Adult School on Saratoga Street. The area between Fickett Street and Savannah Street is classified as Category II away from Brooklyn Avenue and Category III closer to Brooklyn Avenue, where ambient noise is higher. The noise in the area is due primarily to local traffic, although traffic on Brooklyn Avenue and First Street also contributes. The noise environment in this area is quieter, as represented by MS Nos. 10 and 11, and has an L_{dn} of 63 to 64 dBA.

Past Savannah Street the alignment passes directly beneath buildings on the north side of First Street until Evergreen Avenue, and then runs beneath First Street until Indiana Street. This area is primarily residential with two churches, a medical office, a bank and some commercial activity interspersed. On the north side of First Street between Evergreen Avenue and Concord Street is the Evergreen Cemetery and between Concord Street and Lorena Street is the L. A. County Crematory. Both of these include buildings for memorial services. The area is classified Category III. The ambient noise level is high, and is characterized by MS No. 12 which has an L_{dn} of 71 dBA.

As the alignment passes Indiana Street it curves south but extends out east of Alma Avenue before coming back towards Indiana Street with which it aligns at Lanfranco Street. It passes beneath a medical office and some commercial establishments along First Street near Indiana and then many single and multi-family residences on Alma Avenue, Hicks Avenue and Third and Fourth Streets. There is a music and art school on Third Street at Alma Avenue. Past Fourth Street it goes underneath the Pomona Freeway (SR-60) and then passes beneath an apartment building on the north side of Fifth Street at Indiana and a church on the south side of Fifth Street at Indiana. It aligns with Indiana Street at Lanfranco. The areas on or near Indiana Street, that is, First Avenue between Indiana and Alma, and Indiana between Fifth Street and Lanfranco, have high noise levels due to traffic on Indiana Avenue and are classified as Category III. Alma Avenue, Hicks Avenue and Third Street are quieter, as depicted by MS No. 13 (L_{dn} of 63 dBA), and are classified as Category II. Fourth Street and Fifth Street are both within 400 feet of SR-60 and are therefore Category V.

Past Lanfranco Street the alignment runs beneath Indiana Street until Hubbard Street, at which point it curves east cutting underneath Percy Street, Alma Avenue and Hicks Avenue before aligning with Whittier Boulevard at Ditman Avenue. The section along Indiana Street has a high ambient noise level due to traffic on that thoroughfare, as characterized by MS No. 14 (L_{dn} of 70), and is classified as Category III. The side streets such as Percy Street, Alma Avenue and Hicks Avenue are generally quieter as represented by MS No. 15 with L_{dn} of 64 dBA, and are classified as Category II away from Indiana Street and Whittier Boulevard.

For the remainder of the alignment along Whittier Boulevard the land use is primarily commercial (MS No. 16; L_{dn} of 71 dBA) and therefore Category IV. Off Whittier Boulevard there are single-family residences characterized by MS No. 17 with L_{dn} of 69 dBA along Arizona Avenue and some quieter areas along smaller side streets such as Fraser Street (MS No. 18) with an L_{dn} of 65 dBA. Both of these areas are classified Category III because they are residential and away from Whittier Boulevard.

4-7.4 IMPACTS

Since the rail alignment proposed for the LPA is subway, the only possible airborne noise impact from train operation would be from ancillary facilities and vent shafts or from motor vehicles in the vicinity of the station.

4-7.4.1 Ancillary Facility and Vent Shaft Noise Impacts

The magnitude of noise impact from vent shafts and ancillary equipment depends on surrounding land use and the local ambient noise environment. This type of equipment and facilities, if located in primarily residential and/or quiet neighborhoods, has a greater potential for causing noise impacts and would require more mitigation to eliminate impacts than when located in commercial or other less sensitive areas. The off-street stations in noncommercial areas have a greater potential for ancillary and vent shaft noise impact, because they are located in primarily residential areas.

The extent of vent shaft or ancillary equipment noise impacts tends to be very localized. For the Eastside Extension LPA alignment, the two main sources of this type of noise are the noise of trains running in the subway, which is emitted from vent shafts, and ventilation fan noise. Both of these noise sources would be located at stations. Specific vent locations are not known at this stage of the design; the larger fan vents tend to be located at both ends of subway stations. The stations that have the highest potential for impact due to vent shaft and fan noise are: First/Boyle, Brooklyn/Soto, First/Lorena and Whittier/Arizona.

4-7.4.2 Motor Vehicle Traffic Noise Impacts

One of the major existing noise sources in the Eastside Extension LPA noise study area, as in most communities, is motor vehicle traffic. This factor will largely govern the future levels of ambient noise in the community. In order to produce noticeable changes in a community's noise environment, changes in motor vehicle traffic patterns must be substantial. No major traffic changes in the region are projected. Consequently, the future year 2010 ambient noise environment in the community is expected to remain very similar to the current conditions.

Five of the seven proposed stations are located either in or near predominantly residential areas. Automobiles carrying Metro patrons to and from stations (i.e., kiss-and-ride) may leave arterials to gain access to the station entrances. Table 4-7.5 indicates, by station, the residential streets that might be affected by these vehicles.

TABLE 4-7.5: RESIDENTIAL STREETS POTENTIALLY AFFECTED BY STATION-RELATED AUTOMOBILE TRAFFIC NOISE

STATION	POTENTIALLY AFFECTED RESIDENTIAL STREETS	BETWEEN
Little Tokyo Station	None	N/A
First/Boyle Station	Bailey Street Pennsylvania Avenue	First St. and Pennsylvania Ave. Boyle Ave. and State St.
Brooklyn/Soto Station	Mathews Street Michigan Avenue Fickett Street	Brooklyn Ave. and Michigan Ave. Soto Street and Fickett St. Brooklyn Ave. and Michigan Ave.
First/Lorena Station	None	N/A
Whittier/Rowan Station	Rowan Avenue Eastman Avenue Verona Street	Whittier Blvd. and Verona St. Whittier Blvd. and Verona St. Rowan Ave. and Eastman Ave.
Whittier/Arizona Station	Hubbard Street McDonnell Avenue	McDonnell Ave. and Arizona Blvd. Whittier Blvd. and Hubbard St.
Whittier/Atlantic Station	Louis Place Woods Avenue	Atlantic Blvd. and Woods Ave. Whittier Blvd. and Louis Pl.

Source: Wison, Ihrig & Associates, Inc., 1994.

Bus routes serving the LPA stations have been located so that they would not substantially affect the streets identified in Table 4-7.5. Traffic volumes on these streets, however, are expected to increase, at times substantially, during the morning and evening rush hours due to kiss-and-ride vehicles. Since many of these streets are not major thoroughfares, current traffic volumes are low. For evaluation purposes, it should be noted that a doubling of the free-flowing traffic volume on major thoroughfares, where traffic is the major source of noise, would result in a three dBA increase in noise levels, while five times greater traffic volume would result in a seven dBA increase in noise.

For many of the streets identified in Table 4-7.5, the current traffic volume is not sufficient to be the dominant noise source. Thus, greatly increased traffic volumes during rush hour periods would likely result in increases on the order of three to seven dBA in the peak-hour ambient noise at residences along some of these street. This is a significant noise impact under CEQA without mitigation.

A critical area related to possible traffic-related noise impacts is the proposed station entrance and bus/parking facility site at Whittier/Atlantic on the southwest corner of the intersection. This site has residences on two sides of the property (along Woods Avenue and Louis Place). Of particular concern is the number of buses entering the station bus facility, estimated at approximately 50 per hour during peak periods. Due to concerns regarding noise impacts on this residential area, the proposed entrance for the buses has been placed on Atlantic Boulevard rather than Woods or Louis Place. In addition, a noise wall is proposed for the southern and western portions of this bus facility.

4-7.5 CUMULATIVE IMPACTS

There are no foreseeable projects anticipated for the LPA alignment study area that would be constructed by the project horizon year of 2010 that would substantially increase the airborne noise. Some of the proposed station sites would have the potential for future development (primarily Brooklyn/Soto) after stations were completed and the Metro was in operation. If such development were commercial, additional motor vehicle traffic could use nearby residential streets, thus creating a potential for noise impacts. Such impacts would be evaluated in separate environmental documents as plans were proposed. Consequently, there would be no cumulative impacts associated with the proposed LPA.

4-7.6 MITIGATION

To lessen noise impacts, vent shafts and fan vents should be located at least 50 feet from residences, if possible, especially in quieter residential neighborhoods. The RCC System Design Criteria will be used during the final engineering phase of the project to design appropriate noise mitigation for airborne noise from vent shafts and ancillary equipment. Table 4-7.2 indicates the noise limits to be applied to vent shaft noise (train noise from the subway), which is transient, and limits to ancillary equipment noise (fans), which is primarily continuous. Ancillary and vent shaft train noise that does not exceed the applicable noise limits would not cause a significant impact. It is expected that ancillary facility and vent shaft noise impacts will be mitigated to result in no significant impacts under CEQA.

Automobile traffic noise on residential streets near the First/Boyle, Brooklyn/Soto, Whittier/Rowan, Whittier/Arizona and Whittier/Atlantic stations could be reduced by adopting traffic control plans that would discourage non-local traffic on these streets. MTA will work with the city and county departments of transportation and with the community to development such plans for these stations.

Mitigation of noise from the bus/parking facility at the Whittier/Atlantic station entrance site (on the southwest corner of Whittier/Atlantic) includes the placement of the bus entrance on Atlantic Boulevard and a noise wall for the southern and western portions of this bus facility.

4-8 GROUNDBORNE NOISE AND VIBRATION

The objectives of the groundborne noise and vibration evaluation are to identify potential impacts that can foreseeably be generated by the operation of proposed LPA project and present appropriate mitigation measures to reduce such impacts. (See Section 4-18.5 for a discussion of construction period groundborne noise and vibration.) Operation of rail transit systems results in groundborne vibration which is transmitted from the subway to any nearby buildings via the intervening geologic strata. The groundborne vibration originates at the interface between the transit vehicle wheels and the rail on which the train rides. The vibration transmitted through the ground enters a nearby building (e.g., residence) through its foundation and causes the building structure (floors, ceilings and walls) to vibrate as the train passes.

The building vibration may be perceptible to occupants of the building as motion of the floor or possibly chair, if a person is sitting, if the level of vibration is of sufficient magnitude. However, the groundborne vibration from transit trains is of such a low level that there is virtually no possibility of damage to buildings. In addition to building vibration, the motion of building surfaces (e.g., floor) due to groundborne vibration may also cause perceptible noise (heard as a "rumbling" sound) inside buildings, if high enough compared with the interior background ambient noise. This is referred to as groundborne noise, because the noise is caused by ground vibration emitted from the tunnel structure as the subway train passes.

If the groundborne noise and/or vibration are high enough, they can be a substantial annoyance and cause significant impacts under CEQA. Mitigation of groundborne noise and vibration is achieved by use of special track support systems that increase the amount of vibration isolation between the track and subway structure.

4-8.1 GROUNDBORNE NOISE AND VIBRATION CRITERIA

Traditionally, criteria were specified only for the control of airborne and groundborne noise. More recently, criteria for groundborne vibration in terms of single number vibration velocity levels (re: 1.0 micro in/sec) have been developed and applied to new rail transportation systems and extensions of existing systems in order to avoid significant impacts under CEQA from groundborne noise and vibration. The same community area categories used to determine appropriate airborne noise evaluation criteria (refer to Table 4-7.1) are also used to determine groundborne noise and vibration criteria.

4-8.1.1 RCC "System Design & Criteria Standards"

Table 4-8.1 presents the RCC "System Design Criteria" appropriate for evaluating the maximum groundborne noise for various types of buildings in terms of noise level in dBA. These criteria apply to occupied areas inside of buildings. Groundborne noise that complies with these design goals would not be inaudible in all cases, but should be low enough that no significant intrusion or annoyance would occur.

TABLE 4-8.1: CRITERIA FOR MAXIMUM GROUNDBORNE NOISE FROM TRAIN OPERATIONS*

A. Residences and Buildings with Sleeping Areas				
COMMUNITY AREA CATEGORY		MAXIMUM PASSBY GROUNDBORNE NOISE LEVEL		
		SINGLE FAMILY DWELLINGS	MULTI-FAMILY DWELLINGS	HOTEL/ MOTEL BUILDINGS
I	Low Density Residential	30 dBA	35 dBA	40 dBA
II	Average Residential	35	40	45
III	High Density Residential	35	40	45
IV	Commercial	40	45	50
V	Industrial/Highway	40	45	50

B. Special Function Buildings	
TYPE OF BUILDING OR ROOM	MAXIMUM PASSBY GROUNDBORNE NOISE LEVEL (DBA)
Concert Halls and TV Studios	25
Auditoriums and Music Rooms	30
Churches and Theaters	35
Hospital Sleeping Rooms	35-40
Courtrooms	35
Schools and Libraries	40
University Buildings	35-40
Offices	35-45
Commercial Buildings	45-55

Source: "System Design Criteria & Standards Volume 4," Rail Construction Corporation, July 1990.

Table 4-8.2 presents the RCC "System Design Criteria" appropriate for evaluating the maximum groundborne vibration for various types of buildings in terms of vibration velocity level in dB (re: 1.0 micro in/sec). These criteria apply to the vertical vibration of floor surfaces within buildings. Groundborne vibration that complies with the design criteria would not be imperceptible in all cases; however, the level would be sufficiently low so that no significant intrusion or annoyance should occur. In most cases, vibration from street traffic, other occupants of a building or other sources will create intrusion that is equivalent to or greater than that caused by transit train passbys if the levels of groundborne noise and vibration from transit trains do not exceed the RCC "System Design Criteria".

TABLE 4-8.2: CRITERIA FOR MAXIMUM GROUNDBORNE VIBRATION FROM TRAIN OPERATIONS*

A. Residences and Buildings with Sleeping Areas			
COMMUNITY AREA CATEGORY	MAXIMUM PASSBY VIBRATION VELOCITY LEVEL (DB RE 10^{-6} IN/SEC)		
	SINGLE FAMILY DWELLINGS	MULTI-FAMILY DWELLINGS	HOTEL/ MOTEL BUILDINGS
I Low Density Residential	70	70	70
II Average Residential	70	70	70
III High Density Residential	70	70	75
IV Commercial	70	75	75
V Industrial/Highway	75	75	75

B. Special Function Buildings	
TYPE OF BUILDING OR ROOM	MAXIMUM PASSBY VIBRATION VELOCITY LEVEL (DB RE 10^{-6} IN/SEC)
Concert Halls and TV Studios	65
Auditoriums and Music Rooms	70
Churches and Theaters	70-75
Hospital Sleeping Rooms	70-75
Courtrooms	75
Schools and Libraries	75
University Buildings	75-80
Offices	75-80
Commercial & Industrial Buildings	75-85
Vibration-Sensitive Industrial or Research Facility	60-70

Note: *Criteria apply to the vertical vibration of the floor surfaces within the buildings.

Source: "System Design Criteria & Standards Volume 4," Rail Construction Corporation, July 1990.

4-8.1.2 State and Local Guidelines

There are no local or state criteria for groundborne noise and vibration. Consequently, the RCC "System Design Criteria" are sufficient to evaluate these impacts.

4-8.2 PREDICTION METHODOLOGY AND SOILS TESTING

The predicted levels of groundborne noise and vibration for the alternatives studied in the Eastside Extension AA/DEIR/DEIS were based on vibration data then available for the Metro Red Line MOS-1 startup operations and available soil vibration propagation data. The soil vibration propagation data used for predicting groundborne noise and vibration in the AA/DEIS/DEIR were from other areas of the metropolitan Los Angeles area that appeared to have similar soil characteristics as those in the Eastside Extension Corridor study area.

Generally, the deeper the tunnel, the lower the levels of groundborne noise and vibration from subways, because the tunnel is farther away and soils tend to be stiffer with depth. Local soil strata will also have a major effect on the noise and vibration levels at a particular location.

The prediction of groundborne noise and vibration for the LPA are based on soil vibration propagation tests performed along the proposed LPA alignment, as part of the Preliminary Engineering design of the system, and based on geological soil boring tests performed for the LPA alignment design. The geologic soil boring and analysis (as documented in the Preliminary Engineering Program - Eastside Extension Metro Red Line Project, 14 February 1994) determined that the LPA alignment tunnel would be founded primarily in alluvial soils. There are also limited segments of the LPA alignment that would be founded in the stiffer Fernando and Puente formations (which include claystone, siltstone and standstone).

Vibration propagation tests for the Preliminary Engineering design on the Eastside Extension project were performed in the younger and older alluvium soil strata. Of the five tests, four tests were performed in the older alluvium and one was performed in the younger alluvium. The results of the vibration propagation tests indicate a difference between the younger and older alluvium with the younger alluvium producing slightly higher levels of groundborne noise and vibration.

Groundborne noise and vibration predictions for the LPA alignment were made based on the propagation test data used in conjunction with the geologic mapping ("Geology and Exploration Map for the Eastside Extension, February 1994), which indicate anticipated soil type along the alignment. The amount of vibration propagation testing performed for the Eastside Extension LPA alignment is sufficient for refining the groundborne noise and vibrations predictions (as contained in the AA/DEIS/DEIR) for the purpose of an environmental analysis and for determining a preliminary design for mitigation where necessary.

Additional vibration propagation tests should be performed during Final Engineering to determine the expected range of propagation characteristics for each soil type, especially the younger alluvium. Furthermore, more accurate mapping of the two soil types should be performed during Final Engineering to determine the boundaries of each soil region.

4-8.3 EXISTING VIBRATION LEVELS

Existing exterior vibration sources include automobiles, trucks, buses, freight trains, nearby mechanical equipment, and, on a local scale, pedestrians. Most of the vibration sources, except stationary mechanical equipment operating continuously, create transient vibration levels. The observed level of vibration at a particular location is the summation of the vibrations created by all the various sources, near and far. This is analogous to ambient community noise which represents the summation of many noise sources.

As for the subjective response, human sensitivity to vibration varies with frequency and, therefore, frequency must generally be taken into consideration when assessing annoyance due to vibration. However, the principal vibration components from transit trains and the noise levels generated by the vibration of building surfaces fall in the frequency range in which human sensitivity is approximately proportional to velocity amplitude. Thus, the overall vibration velocity level is a good single-number indicator of human response to vibration. Generally, overall vibration velocities less than 70 dB (re: 1 micro-inch/sec) are considered to be imperceptible or just barely perceptible.

The vibration level data in the study area were taken simultaneously with, and at the same locations as, the short-term noise level data. The vibration velocity levels obtained were statistically analyzed in the same manner as the measured noise levels. Table 4-8.3 presents a summary of the measured maximum vibration levels. The maximum level is considered that which is exceeded 1 percent of the time (L_1). Figure 4-8.1 indicates the location of the measurement sites.

Review of the data obtained shows that the maximum vibration velocity levels due to existing sources range from 44 to 63 dB. These vibration velocity levels are typical of commercial and residential areas with moderate to high volumes of vehicular traffic and are all below the level of perceptibility.

4-8.4 IMPACTS

The groundborne noise and vibration impact analysis for the Eastside Extension LPA is based on an evaluation of the proposed alignment's impact on the existing environmental conditions. The noise and vibration study area for the LPA alignment contains several noise and vibration sensitive areas involving numerous receptors that would, without mitigation, be adversely affected by groundborne noise and vibration from transit train operations on the proposed subway alignment.

The areas that would be affected by groundborne noise and vibration are primarily those that are either entirely residential or mixed commercial/residential. There are also individual receptors that would be affected in the LPA noise and vibration study area including: hospitals, churches, medical offices, schools, libraries and offices. Prior to mitigation, projected groundborne noise and vibration would adversely affect a total of approximately 322 receptors with significant impacts under CEQA.

Table 4-8.4 indicates the number of receptors, by type and alignment segment affected by the LPA alignment. The area with the greatest number of affected receptors is between the Brooklyn/Soto station and First/Lorena station. This area is primarily residential. A total of 303 residential receptors would be affected along the entire alignment. Other receptors affected by the LPA alignment would be one hospital, three schools, one library, six places of worship, one fire station and various offices buildings.

Appropriate vibration reduction measures (e.g., special resilient rail fasteners or "floating slab trackbed") would be used to reduce groundborne noise and vibration. The mitigation measures would be required for both tracks (i.e., inbound as well as outbound tracks). If the groundborne noise and vibration mitigation measures indicated are implemented, there would be no remaining significant groundborne noise and vibration impacts under CEQA.

TABLE 4-8.3: EXISTING AMBIENT VIBRATION LEVELS AT MEASUREMENT LOCATIONS

SITE NUMBER	SURROUNDING LAND USES	APTA CRITERIA AREA CATEGORY[a]	GROUND VIBRATION L_1[b] (DB)[c]
1	Multi-Family Residential/ Industrial	V	60
2	Multi-Family Residential/ Industrial	V	61
3[d]	Multi-Family Residential/ Church/School	III	59
4	Single-Family Residential/ Freeway	V	63
5	Single & Multi-Family Residential/Freeway	V	63
6	Single & Multi-Family Residential/Hospital	III	51
7[d]	Single-Family/Residential	III	58
8	Single & Multi-Family Residential/Commercial	III	57
9	Single-Family Residential/ Commercial	III	55
10	Single & Multi-Family Residential	II	50
11	Single-Family Residential/ School	II	47
12[d]	Single-Family Residential/ Commercial/Cemetery	III/IV	44
13	Single & Multi-Family Residential	II	55
14[d]	Single-Family Residential/ School/Commercial	III/IV	N/A
15[d]	Single-Family Residential	II/III	56
16[d]	Commercial	IV	N/A
17[d]	Single-Family Residential/ Commercial	III/IV	N/A
18[d]	Single & Multi-Family Residential/Commercial	III/IV	N/A

Notes: [a] Refer to Table 4-7.1
[b] Based on 10-minute sample
[c] Ground vibration levels are in decibels (referenced to 1 micro-inch/sec)
L_1 Vibration level exceeded 1 percent of the time
N/A = Not available
[d] 1992 measurement sites for AA/DEIS/DEIR

Source: Wilson, Ihrig & Associates, Inc., 1994

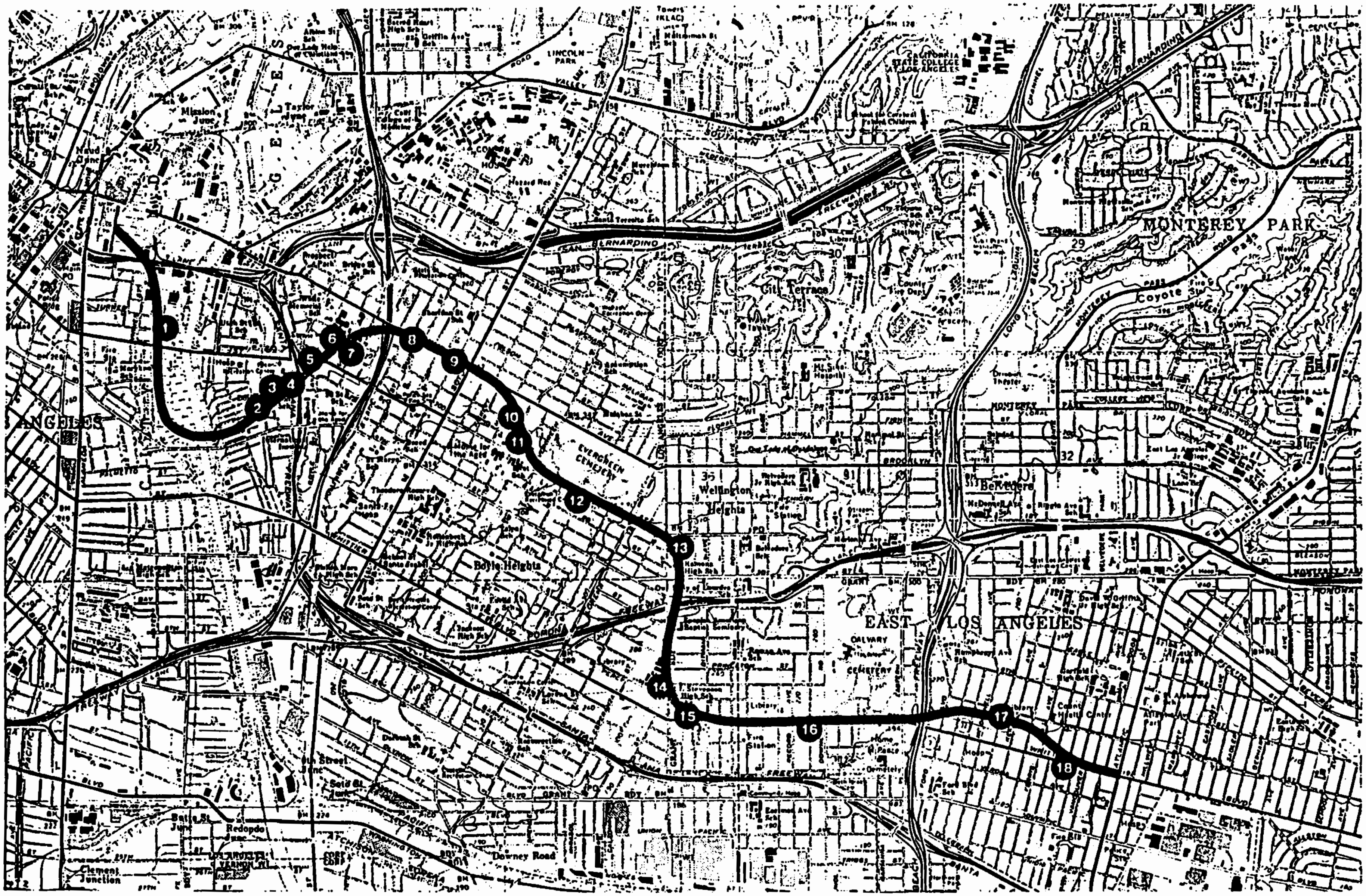


Figure 4-8.1: Location of Ambient Noise and Vibration Measurement Sites along Eastside Extension

TABLE 4-8.4: PREDICTED GROUNDBORNE NOISE AND VIBRATION IMPACTS BEFORE AND AFTER MITIGATION FOR LPA

Segment	Union Station to Little Tokyo Station	Little Tokyo Station to First/Boyle Station	First/Boyle Station to Brooklyn/Soto Station	Brooklyn/Soto Station to First/Lorena Station	First/Lorena Station to Whittler/Rowan Station	Whittler/Rowan Station to Whittler/Arizona Station	Whittler/Arizona Station to Whittler/Atlantic Station	Whittler/Atlantic Station and Tail Track	Total
Before Mitigation	None	25 Res. Bldgs. Dolores Mission Church Pico Garden Church Dolores Mission School 1 Club	46 Res. Bldgs. L.A. City Fire Station No. 2 Talmud Torah Temple	126 Res. Bldgs. Konko Church Mt. Cornell Baptist Church Rafu Chuo Gakuen School 1 Med. Office (3000 E. 1st Street) 1 Community Bldg.	69 Res. Bldgs. Los Angeles Art & Music School Cladic Seminary Community Health Center (3945 Whittler Blvd.)	25 Res. Bldgs. East Los Angeles Doctor's Hospital Los Angeles County Public Library (4264 Whittler Blvd.) Medical Offices 4075 & 4082 Whittler Blvd.) 1 Bus. Office	12 Res. Bldgs	None	303 Res. Bldgs 1 Fire Station 1 Hospital 1 Music School 6 Churches 1 Library 2 Schools 4 Med. Offices 1 Bus. Office 1 Comm. Bldg. 1 Club
After Mitigation	N/A	None	None	None	None	None	None	N/A	None

Source: Wilson Ihrig & Associates, Inc., 1994.

4-8.5 CUMULATIVE IMPACTS

There are no foreseeable projects anticipated for the LPA alignment study area that would be constructed by the project horizon year of 2010 that would create perceptible groundborne noise and/or vibration. Consequently, there would be no cumulative impacts associated with the proposed LPA.

4-8.6 MITIGATION

4-8.6.1 General Mitigation Measures

The mitigation measures indicated below are standard design features used through out the Metro Rail system. They will be applied to the proposed Eastside Extension portion of the system and are included in the determination of predicted groundborne noise and vibration for the LPA alignment in the preceding impacts discussion.

- Use of continuous welded rail instead of jointed rail to reduce vibration from the steel/wheel rail interface.
- Use of rail vehicles with lightweight trucks rather than heavier trucks in order to provide minimum unsprung mass.
- Use of resiliently mounted direct fixation fasteners as a rail support system.
- Use of special grinding and truing equipment to maintain the smoothness of the wheel/rail interface. This standard maintenance feature will be done based on specified vehicle miles of service.

4-8.6.2 Specific Mitigation Measures

Where the general mitigation measures listed above are not adequate to reduce the predicted groundborne noise and vibration to be within the criteria levels, appropriate vibration reduction measures would be used to reduce impacts. For the proposed LPA alignment, these measures would include special resilient rail fasteners or floating slab trackbed. In almost all cases, these mitigation measures will be required for both tracks (i.e., inbound as well as outbound tracks).

Approximately 6,400 alignment-feet (i.e., both tracks) of special resilient rail fasteners and 9,200 alignment-feet of floating slab trackbed are indicated by the analysis as being necessary to reduce impacts. During final engineering, additional testing and analysis may refine the mitigation requirements further where appropriate.

4-9 GEOTECHNICAL/SUBSURFACE/SEISMICITY

This section has been summarized from the *Geotechnical Investigation for: Preliminary Engineering Program Eastside Extension Metro Red Line Project* prepared by GeoTransit Consultants. For purposes of discussion, the alignment was divided into a western and eastern segment with the division occurring approximately where the Locally Preferred Alternative (LPA) crosses the Santa Ana Freeway (U.S. 101).

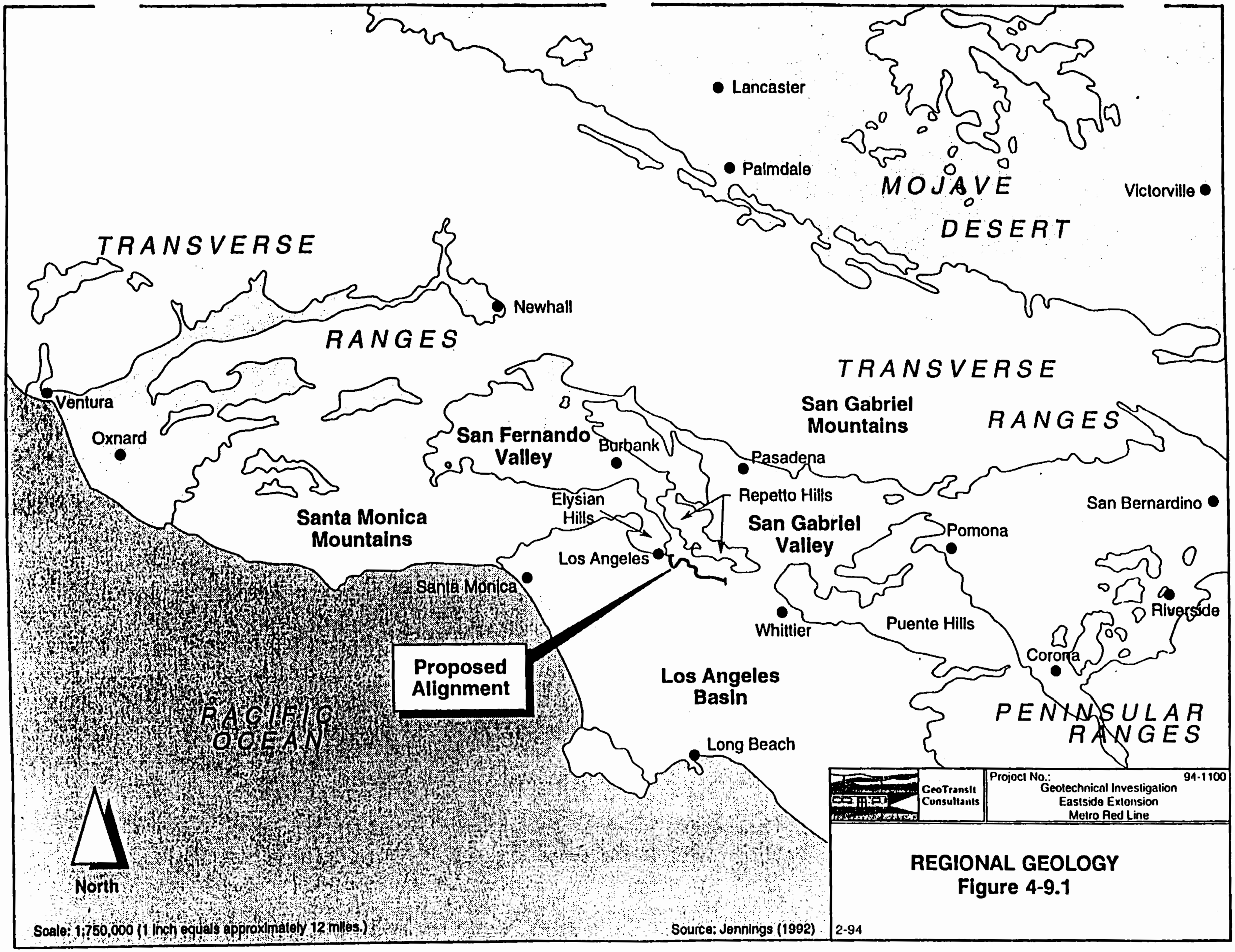
4-9.1 GEOLOGY/SUBSURFACE CONDITIONS/GAS

4-9.1.1 Regional Geology

The Locally Preferred Alternative (LPA) would be located in the Los Angeles Basin at the junction between the Transverse Range and Peninsular Range geomorphic provinces in Southern California (Figure 4-9.1). The Los Angeles Basin is bounded to the north/northeast by the Elysian and Repetto Hills which are a northwest extension of the Peninsular Ranges trending northwest from Baja California. The Peninsular Ranges are largely defined by right-lateral strike-slip faulting and associated folding parallel to their trend. The Los Angeles Basin is also bounded to the north by the east-west oriented San Gabriel, Verdugo and Santa Monica Mountains which form the western part of the Transverse Ranges, which extend across Southern California from the Colorado Desert to Point Arguello. The western Transverse Ranges are uplifted by northward-dipping thrust faults along their southern margin. The hilly terrain of the study area appears to result from folding and faulting in a zone of convergence between these major sets of structures.

The bedrock consists of a wide variety of Precambrian to Mesozoic (see Table 4-9.1) igneous and metamorphic basement rocks and a partial cover of Mesozoic to early Tertiary sedimentary and volcanic strata. The oldest strata exposed in the southern and western Repetto Hills near the proposed alignment are those of the Puente Formation, which consists primarily of siltstone, claystone and sandstone. Puente Formation strata are overlain by deposits of the Pliocene-age Fernando Formation, which generally grade upward from siltstone near the base to conglomerate near the top. Above the Fernando Formation are the Tertiary marine sediments and lesser volcanic rocks that were deposited in the developing Los Angeles basin during Miocene and Pliocene time and compose much of the folded and faulted, northwest-trending hills of the present coastal plain. Deformation of Miocene and Pliocene marine deposits in the Repetto Hills has been accompanied during Pleistocene time by deposition of alluvium from the Transverse Ranges to the north. Cycles of alluvial deposition, continued deformation and partial erosion have left a fringe of uplifted and dissected alluvial fans and terraces on the flanks of the hills. Most of the proposed LPA tunnel would be in these alluvial deposits.

The geologic structure and ongoing tectonic activity in the Repetto and Elysian Hills is still under investigation. Speculation in the wake of the 1987 Whittier Narrows earthquake suggests that a northeast to north-trending extension of the Whittier fault has produced thrust-fault offsets of well-consolidated bedrock at depths that are expressed in the weaker near-surface materials of the Repetto and Elysian Hills by folding and/or faulting.



REGIONAL GEOLOGY
Figure 4-9.1

TABLE 4-9.1: GEOLOGIC TIME SCALE

ERA	PERIOD	EPOCH	AGE IN YEARS
Cenozoic	Quaternary	Historic Holocene Pleistocene	0-200 0-11,000 11,000-2 million
	Tertiary	Pliocene Miocene Oligocene Eocene Paleocene	2-5 million 5-24 million 24-38 million 38-58 million 58-66 million
Mesozoic	Cretaceous Jurassic Triassic		66-141 million 141-205 million 205-240 million
Paleozoic	Permian Pennsylvanian Mississippian Devonian Silurian Ordovician Cambrian		240-290 million 290-320 million 320-360 million 360-410 million 410-438 million 438-500 million 500-570 million
Pre-Cambrian			Older than 570 million

Notes: Age in years is arbitrarily rounded. In the Quaternary Period, times are aligned with usage in California seismicity practices.

Data modified from AGI Data Sheet 1.1 and USGS Geologic Names Committee, 1980; Decade of North American Geology Geologic Time Scale, Geologic Society of America, 1983; American Heritage Dictionary, 1982; Fault Rupture Zones in California, Special Publication 42, California Division of Mines and Geology.

Source: LeRoy Crandall and Associates, 1991.

4-9.1.2 Local Geology

a. Local Topographic Conditions

The proposed LPA begins near Union Station in the pre-channelization flood plain of the Los Angeles River. Where the alignment trends northeastward and crosses the U.S. 101 freeway, the alignment leaves the floodplain and crosses a series of low alluvial terraces that form the southwestern margin of the City Terrace area. These alluvial terraces are incised by local drainage channels and appear to be offset by an escarpment that extends eastward near the proposed station at First/Boyle. The eastern portion of the LPA would traverse wide drainage channels and the lowest alluvial terraces in the series until the proposed station at Whittier/Arizona, where it enters an extensive alluvial fan surface that slopes southward from the Repetto Hills.

b. Surficial Deposits

A variety of surficial alluvial deposits underlies the entire LPA alignment. These deposits are differentiated into two units: Young Alluvium of Holocene age and Old Alluvium of Pleistocene age. Most of the alignment would be through Old Alluvium, which begins at the eastern edge of the Los Angeles River Narrows. The Los Angeles River Narrows is roughly described as the historic river floodplain through the Hollywood and Elysian Hills down to the coastal plain. The alignment would be mostly in Young Alluvium within the narrows itself. Young Alluvium is also found within drainage courses eroded into the Old Alluvium and overlying Old Alluvium at the east end of the alignment.

Within the Los Angeles River Narrows, the young alluvial deposits are most commonly granular. These sediments consist largely of sand and gravel with interbedded lenses of gravel, cobbles and boulders. The largest clasts (rock fragments) range up to four feet in size (Converse Consultants, 1981) with frequent intervals of coarse gravel to large cobbles frequently present. The clasts are primarily composed of granitic and metamorphic rock types and are unweathered and durable. Locally, the base of the alluvium in the Narrows area is characterized by a zone of boulders and cobbles overlying the bedrock (Converse and others, 1984). This condition was found south of Union Station, where clasts up to three feet in size were encountered. Fine-grained beds are relatively uncommon in the Young Alluvium.

The Old Alluvium deposits generally appear to be finer grained than the Young Alluvium in the Narrows area. These deposits primarily consist of sands and gravels with varying amounts of slit and/or clay. Cobbly zones and possibly some small boulders were encountered in borings taken along Whittier Boulevard between Downey Street and the Long Beach Freeway (I-710), along Indiana Street between Whittier Boulevard and the Pomona Freeway (SR-60) and in the vicinity of the proposed First/Boyle Station. As with the Young Alluvium, clasts are composed mostly of granitic and metamorphic rock types. Intervals of fine-grained strata generally consisting of up to 20-foot thick silt and clay deposit mixed with variable amounts of fine to coarse sand and some gravel are frequently interbedded in the Old Alluvium.

c. Bedrock

The bedrock consists of deposits from the Fernando and Puente Formations. The Fernando Formation typically consists of siltstone or mudstone and well bedded sandstone (Lamar, 1970). Bedrock strata of the Pliocene Fernando Formation crop out both to the north of the alignment in the City Terrace area of the southern Repetto Hills, and to the northwest of the Los Angeles River Narrows along the south base of the Elysian Hills. The Puente Formation consists of well-bedded siltstone, claystone and very fine sandstone (Lamar, 1970). The older Miocene Puente Formation is exposed to the north of the Fernando Formation exposures and underlies much of the Elysian and Repetto Hills. Both of these formations are covered by alluvium over most of the alignment. Where exposed, the contact is often difficult to locate accurately because the lithologic change between the formations can be gradational (Lamar, 1970). For this reason, no distinction is made between the two formations, i.e., the formations are labelled together as the Fernando/Puente Formation.

Bedrock was encountered at various depths along the western half of the alignment (generally west of the First/Lorena Station). Bedrock should be anticipated to periodically occur in the tunnel envelope to the west of the Brooklyn/Soto Station. Bedding planes have variable inclinations, ranging from less than 20 degrees to near vertical. Existing geologic maps (Lamar, 1970; Dibblee, 1989) and other subsurface geologic data (LeRoy Crandall, 1979) indicate that near the alignment, bedding planes are inclined moderately to steeply in a southerly direction and are locally overturned. Numerous folds with axes that trend east-west to west-northwest are present in the Repetto Hills area.

Overall, the bedrock materials range from very soft to soft according to criteria provided by the Bureau of Reclamation in their "Engineering Geology Field Manual"; however, there were some exceptions: a 4.5-foot thick zone consisting of hard, cemented, calcareous siltstone beds (each up to 1/2-inch thick) was encountered between Union Station and the Little Tokyo Station. The available literature indicates that cemented beds, lenses and nodules, locally up to two feet thick, may be present elsewhere along the alignment (Lamar, 1970; Converse, Davis and Associates, 1975; LeRoy Crandall and Associates, 1979; Converse and others, 1981 and 1984). An interval of uncemented conglomeratic sandstone interbedded with siltstone was encountered below approximately nine feet of siltstone at a depth of 98 feet in the vicinity of the First/Boyle Station. The sandstone is fine to coarse grained with gravel-sized clasts from approximately 1/4-inch to 1 1/4 inch in size and is iron-oxide stained.

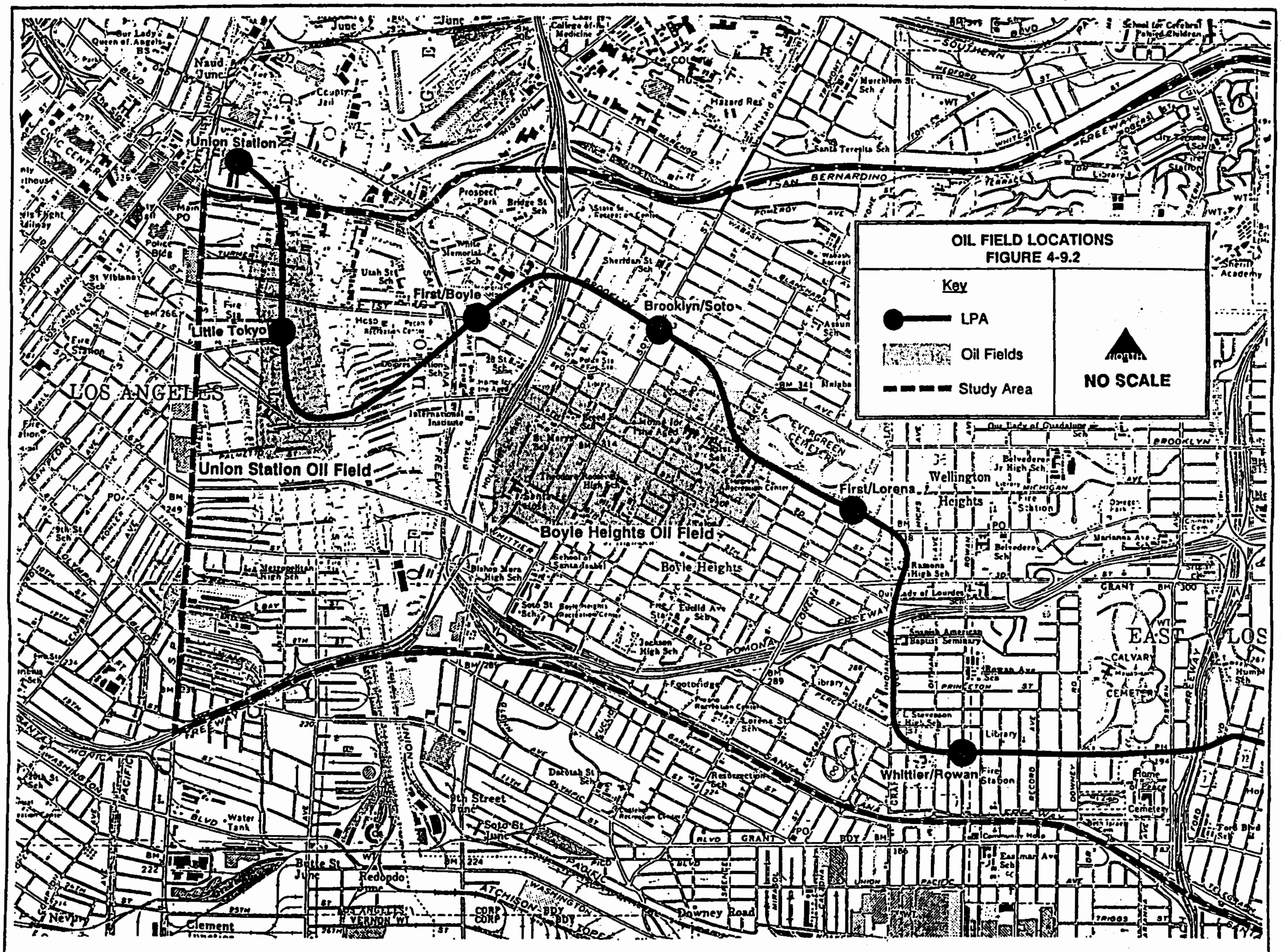
The bedrock is typically dark olive gray when fresh and brownish when weathered. Within the Los Angeles River Narrows, the bedrock generally appears to be fresh. Elsewhere along the LPA alignment, the weathering zone locally extends to a depth of 58 feet below the ground surface.

d. Subsurface Gas

The potential accumulation of methane and other gases within oil fields in the Los Angeles Basin has been documented. Because the proposed LPA alignment would traverse the known boundaries of the Union Station and Boyle Heights Oil Fields (see Figure 4-9.2), the potential for encountering toxic and/or explosive gases, particularly methane and hydrogen sulfide (H_2S), exists along the Eastside Extension segment.

The following discussion describes the field exploration and laboratory testing program conducted during the Preliminary Geotechnical and Stage II Environmental Site Assessment investigations completed by GeoTransit Consultants (1994). The field investigations involved 58 borings along the entire LPA and installation of monitoring wells, nested wells and piezometers within selected borings. These wells were used to sample groundwater, determine groundwater depth and perform gas monitoring and sampling.

Soil, groundwater and gas samples collected during field investigation were tested at California-certified hazardous waste testing laboratories. Soil samples were taken in each boring and those with high Flame Ionization Detector and/or Photo Ionization Detector readings were selected for laboratory testing. These instruments are not compound specific in that they will detect many compounds simultaneously, giving a more or less additive result. A Photo Ionization Detector does not detect methane. Groundwater samples were collected from monitoring wells and gas samples were collected from within well casings. A detailed discussion of the results from these investigations can be found in the *Geotechnical Investigation for Preliminary Engineering*


OIL FIELD LOCATIONS
FIGURE 4-9.2
Key
LPA
Oil Fields
Study Area
NO SCALE
Union Station
Little Tokyo
First/Boyle
Brooklyn/Soto
First/Lorena
Whittier/Rowan
Union Station Oil Field
Boyle Heights Oil Field
LOS ANGELES
EAST LOS
Boyle Heights
Wellington Heights
SAN BERNARDINO
9th Street Junc
Soto St Junc
Butte St Junc
Redondo Junc
Downey Road
Clement Junction

Program Eastside Extension Metro Red Line Project and the *Draft Stage II Environmental Site Assessment Eastside Extension Metro Red Line Project* prepared by GeoTransit Consultants (1994). These documents are hereby incorporated by reference.

The results of the studies discussed above indicate that hydrogen sulfide has been identified at locations along the alignment from Union Station to between Temple Street and the Little Tokyo Station, where a geologic barrier may exist that would impede movement of groundwater and hydrogen sulfide contamination to the south of the Union Station area. Areas where methane has been identified include the portions of the alignment that traverse the known Union Station and Boyle Heights Oil Fields (approximately between Union Station and the Fourth Street/Santa Fe Avenue intersection, and along Brooklyn Avenue between Saint Louis and Mathews streets, respectively). Subsurface gas is described in greater detail in Section 4-9.1.3.

e. Groundwater Level

Please refer to Section 4-10.3 (Groundwater) for a discussion of hydrogeology and groundwater impacts and mitigation.

4-9.1.3 Impacts

No impacts are anticipated as a result of the No-Build alternative.

a. Landform Alteration

The proposed LPA stations and tunnel would be underground and would not be visible from the surface except at station entrances and other ancillary facilities (e.g., vents and emergency exits). Once construction is complete and the project becomes operational, under CEQA, no significant long-term impacts to existing landforms are expected.

b. Subsidence Related Issues

- **Subsidence**

Subsidence of the land surface can result from several causes, including withdrawal of groundwater and oil. Yerkes reports that ground subsidence in the Los Angeles City Oil Field (located north of the Eastside Corridor) was 0.066 feet per year during the years 1968-71 (Yerkes, 1977). Vertical movement of the land surface would become a hazard for the project if it were to occur within a relatively small geographic area and result in differential settlements below structures. However, no ground subsidence has been recognized at the Union Station or Boyle Heights Oil Fields. There is no evidence that ground subsidence currently is occurring anywhere within the project area. A sensitive structure survey would be required to determine the susceptibility of individual buildings along the alignment.

- **Cut-and-Cover Excavations for Proposed Station Sites**

Construction of stations would involve excavation of earth materials in a rectangular area 601 to 944 feet long by roughly 60 feet wide to depths ranging from 60 to 85 feet below ground surface. Surface constraints in the form of preexisting surrounding structures, improvements and utilities often require that the walls of the excavation be cut vertically. Slopes of this angle in granular alluvial soils will slough and cave, particularly when they become either excessively wet or dry. Mitigation measures for these conditions are provided in Section 4-9.1.4.

- **Mining for Tunnels**

As discussed above, boulders may be encountered within the entire western segment and portions of the eastern segment. Large boulders to four feet in size and hard interbeds in the bedrock would likely reduce tunnel shield machine (TSM) advance rates. As a result, these boulders and interbeds may be broken up at the tunnel face or on the mucking conveyor.

In addition to large boulders, tunneling partly or fully in alluvium along the alignment would encounter raveling and running (caving in) conditions because of the predominantly granular nature of the alluvium. Slow raveling conditions (dewatered or above groundwater silty sand and clayey sand) should not be a major concern in properly conducted shielded mechanical excavations, provided the initial lining supports are applied in a timely fashion. Fast raveling conditions and running/flowing conditions can be anticipated in cobbles, gravels, gravelly sand and poorly graded sands above or below groundwater, or well-graded sand below groundwater. Fast ravelling and running/flowing conditions are anticipated over a major portion of the tunnel within alluvium. In some cases the disturbed zone can reach close enough to the ground surface to result in localized distress to roads or structures from subsidence.

c. Excavated Materials Handling

The volumes of excavated material are estimated by station and tunnel segment in Section 4-18 (Construction Impacts). Subsoils would be removed by tunnel excavating machines and cut-and-cover or open-cut excavation techniques at stations. These subsoils would consist largely of Young Alluvium and Old Alluvium which were deposited in the Los Angeles Basin over geologic time. Generally this material consists of clean, unconsolidated silt, sand and gravel. This type of soil, considered non-hazardous and classified as Group 3 soil, is considered salable. As with the majority of the material to be excavated in the Eastside Corridor project, this soil is expected to be inert and suitable for disposal as Class III waste. If the construction contractor were unable to sell or otherwise use Group 3 excavated materials, it could be hauled to Class III disposal sites.

At some locations, the soil may contain naturally occurring hydrocarbons or manufactured hydrocarbons or chemicals that may leach into the subsoil from underground storage tanks. Portions of the alignment may pass through areas of heavy hydrocarbons, possibly almost tar-like in consistency. These soils may be classified as hazardous and are usually disposed of in Class I landfills. Hazardous waste is discussed further in Section 4-9.2.

d. Subsurface Gas

As discussed earlier, hydrogen sulfide is likely to be present from Union Station to near the Little Tokyo Station and methane along those portions of the alignment that traverse the Union Station and Boyle Heights Oil Fields (see Figure 4-9.2).

Hydrogen sulfide gas is a by-product of many industrial processes and can be found in petroleum refineries and mines and is particularly associated with sour (high) sulfur oil fields. The latter is the likely source of hydrogen sulfide observed within the Union Station Oil Field, rather than industrial activities. At high levels, the gas inhibits the human body's ability to process oxygen. Methane is an odorless and flammable gas that is also found in petroleum fields. Table 4-9.2 lists the health standards associated with hydrogen sulfide and methane.

TABLE 4-9.2: HEALTH AND PHYSICAL HAZARD QUALITIES OF SUBSURFACE GAS

Compound	PEL[a]	IDLH[b]	LEL[c]	Warning Concentration[d]	Comments
Hydrogen Sulfide	10 ppm	300 ppm	40,000 ppmv (4% by volume)	0.13 ppmv	Colorless gas with a strong odor of rotten eggs; toxic.
Methane	–	–	50,000 ppmv (5% by volume)	–	Odorless gas in pure form, in oil fields often has an odor due to other compounds in the gas; flammable and explosive.

Notes:
[a] PEL: Permissible Exposure Limit. 8 CCR 5155 and OSHA limit as found in 29 CFR 1910.1000.
[b] IDLH: Immediately Dangerous to Life or Health
[c] LEL: Lower Explosive Limit
[d] Warning Concentration is the odor detection threshold of the substance.

Source: Engineering-Science, Inc., 1992.

Previous studies conducted on other projects (El Monte busway, Metro Pasadena Line, Gateway Center) have identified soil and groundwater contamination with petroleum hydrocarbons and hydrogen sulfide in the vicinity of Union Station. The following discussion highlights the results of the subsurface gas studies conducted for the LPA.

Studies on soil samples taken from within the two oil fields at or adjacent to the LPA tunnel envelope exhibited significant (exceeding 10 ppm above background levels) organic vapor analyzer (OVA) readings, indicating the potential presence of volatile organic compounds. OVA is a trademark of the Foxboro Corporation. The maximum OVA reading was greater than 1,000 ppm above background from Boring PE-30 (Commercial Street/Vignes Street). In addition, strong sulfur odors, possibly from the presence of hydrogen sulfide, were documented in borings within the Union Station Oil Field. The sulfur odor was observed at depths ranging from 30 to 80 feet (GeoTransit Consultants, 1994). The tunnel envelope in this area lies within the depth range of sulfur odor.

Monitoring of air spaces immediately above water samples taken from the Union Station Oil Field exhibited hydrogen sulfide concentrations of 2.9 to 46 parts per million (ppm) as displayed in Table 4-9.3 (GeoTransit Consultants, 1994). Figure 4-9.3 shows the location of these sample sites.

TABLE 4-9.3: MEASURED HYDROGEN SULFIDE AND METHANE CONCENTRATIONS

Boring	Location	Depth[a] (feet)	Hydrogen Sulfide (ppm)	Methane (ppmv)
PE-31	On Jackson 260 feet east of Center Street	40	11.5	57 ppmv
PE-30	On Commercial 115 feet east of Vignes Street	35	2.9	26,000 - 360,000
EB-22 (screened above the water table)	On Docommun Street 280 feet west of Center Street.	35 45	30 24	8.2
EB-22/1 (screened below the water table)	On Docommun Street 280 feet west of Center Street.	Near Well Head	4	20,000 - 720,000
PE-29	On Docommun Street 215 feet east of Vignes Street	35	46	55,000 - 110,000

Note: [a] Depths are approximate.

Source: GeoTransit Consultants, 1994.

As can be seen from the Table, several of the boring locations exhibited levels over the permissible exposure limit (PEL) of 10 ppm; however, these levels were below the 300 ppm IDLH (Immediately Dangerous to Life or Health) standard. A separate measurement from a gas sample taken from the well casing of Boring EB-22/1 had a hydrogen sulfide concentration of 19,000 ppm volume (ppmv). This higher measurement may be partially a result of the hydrogen sulfide becoming concentrated within the confined volume of the well casing. Well casings provide a path of least resistance and a volume to collect soil gases. These observations suggest that hydrogen sulfide may be released from or through the groundwater.

In addition to being potentially present above the groundwater table within the area of concern, hydrogen sulfide may also be present within areas that would be dewatered during construction, as a result of hydrogen sulfide occupying the voids created by dewatering. This possibility must be taken into account during the final design, construction and operation of the facilities within the Union Station area.

High concentrations of methane were detected at a number of monitoring wells within the Union Station Oil Field (see Table 4-9.3). As with hydrogen sulfide, these high concentrations of methane may be partially a result of gas becoming concentrated within the confined volume of the well casing. The results indicate that methane may potentially exceed the lower explosion limit (LEL) of 50,000 ppmv, in a confined space such as a well casing, over a wide area within the Union Station Oil Field. There is also the potential for encountering localized methane within the Boyle Heights Oil Field. This is supported by a Flame Ionization Detector (FID) reading of 1,000 ppm at the head of the well screened from 65 to 80 feet below ground surface (BGS) in the area east of the First Street/Jullian Street intersection (GeoTransit Consultants, 1994).

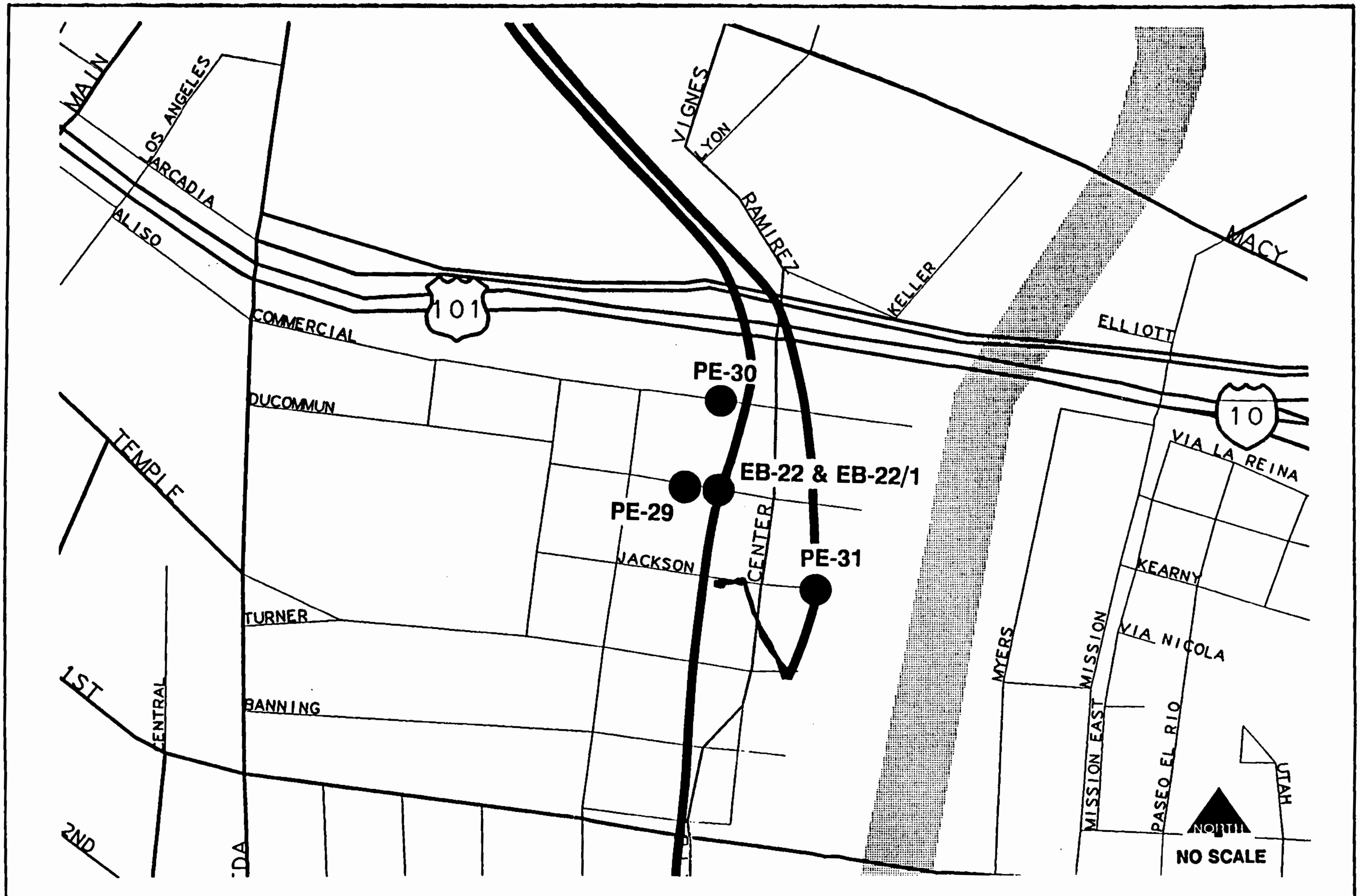


Figure 4-9.3	**Boring Locations**

The above findings indicate a significant potential for accumulation of high (above standard) concentrations of methane and hydrogen sulfide during tunnel construction between Union Station and somewhere north of the Little Tokyo Station where the geologic barrier may occur. However, the rate and amount of accumulation of these gases in a tunnel (larger volume) would be significantly less than the rate and amount of accumulation observed in the well casings. In addition, the tunnel construction (concrete, caulking, liners, etc.) would act as an impediment (imperfect) to the migration of soil gas, whereas a well is by intent and design open to the soil environment. In addition, the tunnel would be mechanically ventilated to exhaust/dilute contaminants.

Without proper mitigation, there is also the potential for the accumulation of these gases within the completed tunnel.

e. Corrosivity

The results of soluble sulfate content tests in samples and sulfate content test in groundwater samples indicate that subsurface materials are predominately mildly to moderately corrosive to concrete. A sample taken from Whittier Boulevard at Ferris Avenue was found to be severely corrosive (soluble sulfate content greater than 2,000 ppm).

Additional studies have shown that most of the subsurface materials are moderately to extremely corrosive to metals.

f. Groundwater

Groundwater related impacts are addressed in Section 4-10.3.

4-9.1.4 Cumulative Impacts

Long-term accumulations of naturally occurring gasses along the LPA within the Union Station and Boyle Heights Oil Fields are considered possible following project construction and would require mitigation as discussed below. No other cumulative impacts are anticipated.

4-9.1.5 Mitigation

a. Landform Alteration

As no significant impacts to landforms are expected to occur, no mitigation is necessary.

b. Subsidence Related Issues

- **Sensitive Structures Survey**

During final design, a survey will be conducted to locate structures adjacent to tunnel and surface excavations that would require special construction stabilization in response to potential geotechnical construction impacts.

- **Cut-and-Cover Operations for Proposed Station Sites**

To prevent sloughing or caving of the soils and possible distress to surrounding structures from loss of support, special shoring is required. Based on local practice in the Los Angeles area with subsurface geotechnical conditions similar to those encountered within the LPA station areas, soldier piles and lagging walls with tie backs and/or internal bracing (struts and wales) are the most likely shoring system. After completion of cut-and-cover excavations for station sites, reinforced concrete slabs would be placed for base, intermediate and roof levels along with exterior perimeter walls. The slab and side walls would provide adequate support against lateral soil and groundwater pressures as well as imposed vertical loads. Consistent with other environmental considerations (e.g. historical structures, land use and acquisitions), small or inexpensive structures located adjacent to proposed excavations may be removed if efforts to protect such structures would be more expensive than the structures themselves. In some areas, temporary shoring would be combined with limited excavation stages and controlled groundwater removal to minimize earth movements and allow excavation next to existing structures. A pre-construction survey will be completed to determine if underpinning is necessary for any adjacent structures. Underpinning may also be required if poor soil conditions are encountered. Underpinning consists of installing concrete piles beneath a structure to provide additional foundation support. The piles would extend below the structure through the zone of influence of the excavation.

In lieu of pier or pile underpinning, there are two ways to provide additional foundation strength: (1) chemical grouting (using approved non-toxic grouts) in sandy soils to prevent soil runs and strengthen soil in critical areas, with grout injected from the surface under existing foundation elements and (2) compaction grouting in sands, silts and clays. This can be effective in lifting and supporting lightly loaded structures. Again, the grouting is carried out from the surface.

- **Mining for Tunnels**

To support the proposed tunnels through soft ground reaches, a shield would be used in conjunction with the tunnel shield machine (TSM) and all excavation would take place within the shield. Immediately after tunneling, precast concrete liners would be installed to ensure support and stability. These measures are designed to prevent the possibility of a tunnel caving event reaching the surface and affecting overlying facilities or structures. A permanent support system of cast-in-place concrete segments would be installed inside of the precast concrete liners. Stabilization of the granular soil zones near and around the tunnel crown may be accomplished by utilizing chemical grouting.

c. Excavation Material Handling

Impacts associated with excavation material handling fall into the categories of air quality (dust), truck traffic, noise, energy consumption and water quality. Mitigation measures associated with these impacts are discussed in Sections 4-18 (Construction Impacts - Traffic, Air Quality, Noise and Vibration), 4-10 (Water Resources) and 4-12 (Energy). Mitigation measures related to contaminated soil are discussed in Section 4-9.2.4.

Surface accumulations of sediment from excavation and excavated materials handling activities would not be allowed to reach significant volumes. As part of their contractual obligation, construction contractors will be required to immediately clean up any and all contamination generated as a result of contractor or subcontractor activities. Periodic cleaning of streets and sidewalks in the construction area would be required to regularly remove the more nominal, day-to-day operational spills activity.

d. Subsurface Gas

The avoidance of safety hazards from hazardous/explosive gas in tunnels would be a primary element in project planning and construction efforts. While it is impossible in this document to discuss in detail the controls that would be instituted, the following general measures will be observed.

MTA anticipates that certain sections of the LPA within the oil fields will be classified as "gassy or extrahazardous" (8 CCR 8422(a)). Actual classification of the tunnel will be made by CAL/OSHA as specified in 8 CCR 8422(d). As a result, equipment and operations in the tunnel will comply with requirements given in 8 CCR 8425.

- **Construction**

Additional test borings will be made in advance of the LPA heading per 8 CCR 8427 to identify upcoming hazardous conditions. This should help delineate the boundaries and extent of subsurface gas.

Methods will be used for locating uncharted oil and gas wells before such wells are encountered and ruptured by a tunnel excavator. Ground penetrating radar from the surface or impulse radar scanning from the tunnel face would be used to detect any ferrous metals in the path of the excavator. In coordination with the California Division of Oil and Gas, MTA will establish procedures to safely plug and abandon any oil or gas well encountered. The use of radar techniques to identify abandoned wells along with well abandonment procedures will be included in the construction contracts.

MTA will provide available underground gas documentation and interpretations by qualified experts to those bidding on the construction contracts involving tunneling or station construction. In addition, MTA will include in bid documents for tunneling or station construction the requirements that, prior to commencing underground work, the contractor provide all employees involved in underground construction work with at least eight hours of training in dealing with the hazards created by subsurface gas, including safety precautions and emergency procedures to be followed when working underground. In addition, periodic emergency drills and simulated rescues will be staged to reinforce the training. These procedures will be implemented through the Metro Rail Project "Construction Safety and Security Manual."

In tunnels classified "gassy" or "potentially gassy," MTA will require that all equipment at the face meet CAL OSHA requirements for permissible or Class I Division II equipment. The tunneling machines will have gas sensors that automatically stop operations at pre-set levels and all workers in the tunnels will, at all times, have self-contained self-rescuers (breathing apparatus).

To detect unknown geologic faults, groundwater or subsurface gas pockets that the project may cross, MTA will assign a trained and qualified geologic technician under the direction of a certified engineering geologist to monitor the working faces of the tunnel. The engineering geologist would inspect and log the tunnel geology to obtain accurate information about, and timely interpretation of, geologic conditions encountered during construction. MTA will use this information to map the location of ground water, gassy ground and geologic faults, and will modify the tunnel design to accommodate these factors.

Based on the results of the geologic evaluation of tunnels, MTA will review its plans for incorporating adequate backup power supplies and will utilize fixed or mobile generators to supply emergency power for the ventilation and dewatering pumps in critical areas.

MTA has specified the use of membrane clamps and seals on grout holes and grout pipes to ensure that the membrane surrounding the tunnel is properly sealed and closed off after grouting. Conduit seals and collars will be installed on any penetrations. MTA has included detailed procedures for installing membrane in contract specifications.

MTA will comply with Title 8, Subchapter 5, Groups 1 and 2 of the Electrical Safety Orders, CAC and other applicable special orders, as may be issued by the California Division of Occupational Safety and Health. In addition, MTA will coordinate final design and construction of the LPA with the California State Division of Occupational Safety and Health, which has responsibility for compliance with state orders on safety of subsurface tunneling through hazardous material.

MTA will continue to ensure ongoing coordination with local fire departments and invite key personnel underground during construction to familiarize them with the tunnel.

MTA will locate gas probes and abandon them in a safe manner. MTA has established procedures for backfilling the borings after there is no further need to monitor the probe. A separate group, responsible to the Construction Manager, will collect, reduce and interpret gas data.

<u>Monitoring</u>

MTA will monitor measurements taken by gas probes and the ventilation air in the tunnel before and during construction. Automatic and manual gas monitoring equipment will be provided for the heading and return air provided in the tunnels where mechanical excavators are being used. The monitoring equipment will shut down the mechanical excavators under specific defined conditions.

Audible and visual warning devices will be installed on tunnel excavating machines and in the tunnels to alert employees when detectors have identified the presence and levels of methane and hydrogen sulfide gas. In addition, records of gas tests and air flow measurements will be available at the surface and to the California Division of Industrial Safety/Mining and Tunneling Unit.

Ventilation

An adequately sized collection and ventilation system will be installed to prevent the buildup of hazardous gas concentrations anywhere in the tunnel. Ventilation in the tunnel will comply with 8 CCR 8437 and 8 CCR 5155, to control both fire hazards and health hazards from the anticipated contaminants. MTA will coordinate final design and construction with the California State Division of Safety and Health, which has responsibility for compliance with state orders on safety of subsurface tunneling through hazardous materials. The applicable controlling provisions of the California Administrative Code (Title 8, "Industrial Relations," Chapter 4: "Division of Industrial Safety [Division]," and Subchapter 20: "Tunnel Safety Orders") are among the most stringent tunnel safety orders in the country.

The design of tunnels includes a high-density polyethylene (HDPE) membrane, one-tenth of an inch thick, to prevent the entry of hydrocarbons (including methane gas) into the tunnel. Procedures have been developed for sealing potential leaks in the membrane by the use of collars, clamps and gaskets.

Contractors will submit to MTA and implement a detailed ventilation plan similar to that required by the federal Mine Safety Health Administration. An emergency ventilation system of fans and controls will be provided by MTA to bring in fresh air and also to exhaust gases when required. The system will have explosion relief mechanisms, will be fireproof and shall be capable of reducing hydrogen sulfide emissions to acceptable levels. A vapor recovery system may be required. In addition, the main ventilation flow will be reversible.

Fresh air will be delivered in adequate quantities to all underground work areas. The supply will be sufficient to prevent hazardous or harmful accumulation of dust, fumes, vapors or gases and will not be less than 200 cubic feet per man per minute at a velocity of sixty linear feet per minute. The exhaust of the ventilation systems may have to be treated by thermal destruction and masking of hydrogen sulfide with deodorizers and neutralizing scents.

Spark Control

Smoking and other sources of ignition will be prohibited. Welding, cutting and other spark-producing operations will be done only in atmospheres containing less than 20 percent of the lower explosive limit and under the direct supervision of qualified persons.

Gas Control

For areas known to contain gas, MTA will install gas barrier membranes in all concrete tunnel sections and in the stations. Where needed, collection wells will be sunk ahead of the tunnel excavation machines so gas can be pumped out.

Safety and Security

A project specific emergency plan, which will include tunnel rescue teams and equipment, will be developed and coordinated with the City of Los Angeles and County of Los Angeles Fire Departments.

The overall project Construction Safety and Security Manual will be prepared by a California professional safety engineer and a certified industrial hygienist. The manual will be prepared in consultation with CAL/OSHA to address and control all foreseeable occupational safety and health hazards. A certified industrial hygienist will provide oversight and evaluation of health related air monitoring data during construction.

Refuge chambers or alternate escape routes will be provided in accordance with requirements of the California Division of Industrial Safety. Workers will be provided with emergency rescue equipment and trained in its use. In all tunnels classified "gassy" or "potentially gassy", equipment, procedures and schedules for air testing will be utilized in accordance with established tunnel safety orders of California OSHA.

Presence of Tar

If tar is encountered during borings, studies would be completed to define precisely the vertical and horizontal extent of tar sands. These borings would also include in-site measurements of gas content and soil expansion material. Laboratory testing of tar sand samples from the borings would be conducted to provide information on their strength and deformation characteristics at different temperatures, confining pressures, strain rates and street levels. Based on data derived from the above tests, specific excavation, shoring and foundation design criteria will be formulated to ensure short- and long-term stability of project facilities in tar and sand areas. Conversely, once the location of shallow tar sands is precisely known, it may prove more economical to increase tunnel depth or change station locations to avoid problem areas.

- **Operations**

MTA will provide natural ventilation, ventilation created by train movements and under-platform exhaust systems that will operate continuously during revenue service.

Control of gas hazards during the operational phase of the section will be accomplished through a combination of engineering and administrative practices. Gas infiltration into structures results when air pressure in the tunnel is less than (or negative) that of the surrounding earth. Engineering design will minimize this pressure differential by maintaining the tunnel and station structures at a small positive pressure, and/or using soil gas extraction systems to provide a greater negative pressure outside of the tunnel and structures, resulting in minimal gas flow into the protected structures. Feasible methods of sealing the structure against gas infiltration (polymeric liners, caulking seams and cracks) will also be employed.

The effectiveness of the gas control design will be evaluated using permanent, approved gas monitors throughout areas of the LPA subject to gas infiltration. These monitors will be continuously supervised, will provide warnings to MTA operators and when necessary, will automatically activate additional controls, or in the extreme, shut down the section.

MTA will institute procedures for control room activation by the operator of emergency ventilation fans. MTA has designed an automatic system for the control room so that, if the alarm should warn of increasing levels of hazardous gas and the appropriate actions required of a human operator do not occur within 30 seconds, a computerized sequence of events will be initiated to activate the required fans, blowers and vents of the regular ventilation system, etc.

MTA will continue to institute a system for collecting and testing air samples from underground areas of Metro Rail to monitor flammable and toxic gases before harmful or explosive concentrations could accumulate. The collection tubes for the system will sample gases from stations, tunnels, cross passages, equipment rooms, exhaust ducts and other high or low areas where hydrocarbon or hydrogen sulfide gases are likely to collect. The tubes are located so that the gas monitoring data could help identify the source of gas intrusion, should one occur.

MTA has examined its construction designs and has incorporated sufficient planning to accommodate the special needs of the handicapped patron to use emergency egresses with as little assistance from employees or other patrons as can reasonably be expected. MTA has set up a Fire/Life Safety Committee to review this issue during final design for the project.

All MTA operators will receive appropriate training to allow them to recognize and correctly respond to abnormal conditions due to gas infiltration.

A discussion of hydrogen sulfide contaminated groundwater is discussed in Section 4-10.3.

e. Corrosivity

Noncorrosive concrete and metal protection will be required for underground structures in areas where corrosive groundwater or soil could otherwise cause tunnel liners or station walls to deteriorate.

f. Groundwater

Please refer to Section 4-10.3 for a discussion of groundwater mitigation measures.

4-9.2 PREEXISTING HAZARDOUS WASTE

This section has been summarized from the *Draft Stage II Environmental Site Assessment Eastside Extension Metro Red Line Project* prepared by GeoTransit Consultants. The study evaluated potential contamination along the LPA alignment, assessed their potential impacts on the planned tunnel and station construction and made conceptual recommendations for potential remedial options.

4-9.2.1 Setting

Prior to the Stage II Report, a Stage I Environmental Site Assessment for the Eastside Extension was prepared by GeoTransit Consultants (1994). This report included a review of available historic site use data (based on aerial photos and Sanborn Maps), various data/reports from governmental and regulatory agencies and available environmental/geotechnical reports for the Union Station area and vicinity. A detailed site reconnaissance of the alignment and its vicinity was also conducted. The regulatory data base that was reviewed included: the National Priorities List of the U.S. Environmental Protection Agency (NPL); California Department of Health Services Expenditure Plan for the Hazardous Substance Clean Up Bond Act of 1984 (SEP); Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS); California Regional Water Quality Control Board; Underground Storage Tank Leak List (LUST); and California Integrated Waste Management Board, Solid Waste Information System (SWIS).

In addition, a preliminary assessment of soil and groundwater contamination was completed during the boring program undertaken for the Preliminary Geotechnical Investigation. The findings of the Stage I Environmental Assessment identified the following:

- Potential sources of the soil and groundwater contamination include commercial/industrial activities and the Union Station and Boyle Heights Oil Fields (see Figure 4-9.2).

- The Union Station site is on the Federal Comprehensive Environmental Response, Compensation and Liability System (CERCLIS) list. Previous studies have revealed the presence of petroleum hydrocarbons, volatile and semi-volatile organic compounds and hydrogen sulfide in the soil and groundwater.

- A total of 18 sites in the vicinity of the alignment have been identified as having the potential to affect the construction of tunnels and stations due to their past site usage (see Table 4-9.4 and Figure 4-9.4). These included four active leaking underground storage tank sites.

These findings were used to develop a methodology for the Stage II Environmental Assessment, which included a field investigation involving drilling additional borings, installing additional monitoring wells, sampling groundwater, monitoring groundwater levels and gas monitoring and sampling. In addition, a chemical testing program was performed on selected soil, groundwater and gas samples.

Based on the results of the field and chemical testing program, four areas with soil and groundwater contamination and/or toxic and combustible gases were identified, including:

- the Union Station area (from Union Station to somewhere between Temple Street and the Little Tokyo Station);
- the portion of the alignment crossing the Boyle Heights Oil Field;
- the Whittier/Rowan Station area in the vicinity of a Thrifty gasoline station which is on the active LUST list; and
- the Whittier Boulevard/South Eastern Avenue intersection area in the vicinity of a Shell gasoline station which is on the active LUST list.

4-9.2.2 <u>Impacts</u>

The potential for encountering preexisting hazardous waste materials is present during any construction project, particularly within an urban area. Hazardous waste impacts would occur when project activities expose humans and/or wildlife to hazardous wastes or increase the likelihood of hazardous waste migration. As discussed above, four areas have been identified that may affect tunnel and station construction. Although more detailed investigations on the four identified areas will be required, major findings are as follows:

TABLE 4-9.4: POTENTIAL SITES OF CONCERN

#	Location	Potential Environmental Concern
1	Arco Station 5200 Whittier Boulevard	Known Leaking Underground Storage Tanks (USTs)
2	Shell Station 4411 Whittier Boulevard	Known Leaking USTs
3	Calvary Cemetery 4201 Whittier Boulevard	Known Leaking USTs
4	Thrifty Station 3981 Whittier Boulevard	Known Leaking UST
5	Goodyear Auto Garage 5156 Whittier Boulevard	Hydraulic Lifts
6	Closed Service Station 4224 Whittier Boulevard	USTs
7	Romero's Auto Service 3801 E. Fifth Street	USTs
8	East of Ramona High School	Unknown Area
9	Closed Service Station 3454 First Street	USTs
10	Adjacent to an Abandoned Oil Well in the Boyle Heights Oil Field	Known Crude Oil Presence
11	Closed Service Station 2400 Brooklyn Avenue	USTs
12	Los Angeles Fire Station No.2 1962 E. Brooklyn Avenue	USTs
13	Mobile Station 1750 First Street	USTs
14	Railroad Yard	Industrial Use Area
15	Little Tokyo Station	Adjacent to MTA Switch Yard
16	Manley Oil Company/Union Oil Tank Farm Jackson Street/Center Street	Known fuel hydrocarbon presence
17	Area South of Union Station	Known soil/groundwater contamination
18	Union Station Area	Known soil/groundwater contamination

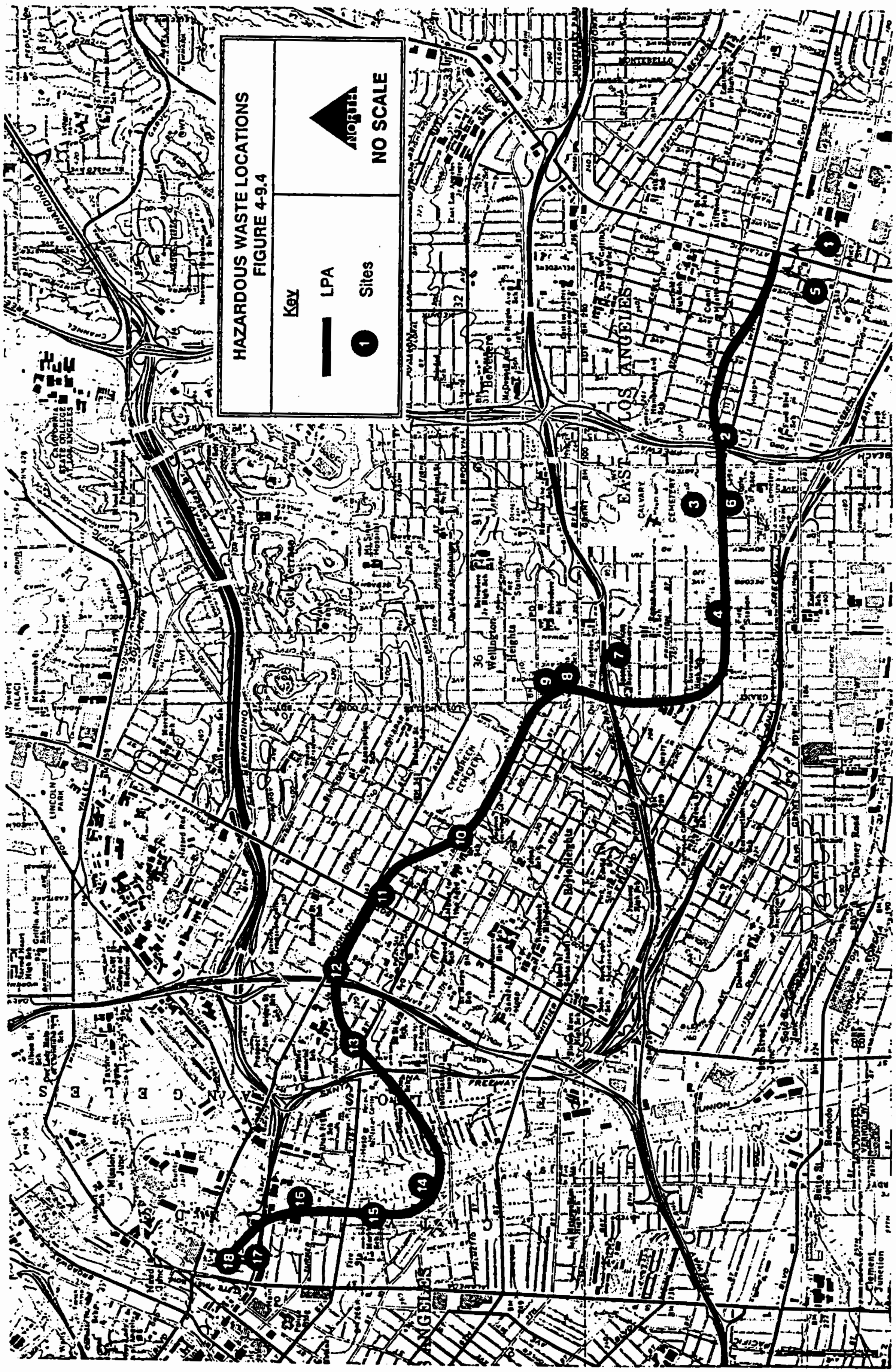
Source: GeoTransit Consultants, 1994.

a. Union Station Area

Please see Sections 4-9.1 and 4-10.3 for a discussion of impacts associated with subsurface gas and contaminated groundwater and subsurface gas at Union Station, respectively. There is also the potential to encounter contaminated soil in the Union Station area.

b. Boyle Heights Oil Field

Results from tests taken from the Boyle Heights Oil Field indicate that there may be localized petroleum hydrocarbon contamination of soils. Impacts of methane within the oil field are discussed in Section 4-9.1.3.


HAZARDOUS WASTE LOCATIONS
FIGURE 4-9.4
Key
LPA
Sites
NORTH
NO SCALE

c. Whittier/Rowan Station

Results from chemical tests performed on samples taken in this area indicate that soils in the area are contaminated with benzene and toluene at levels that exceed published threshold levels. This contamination appears to be associated with leaking underground storage tanks (USTs) located at a Thrifty gas station. Further investigation during the final design effort will be needed in order to determine the limits of contamination.

d. Whittier Boulevard/South Eastern Avenue Intersection Area

Chemical tests on soil samples indicate contamination with small amounts of total petroleum hydrocarbons and volatile organic compounds at shallow depths, possibly associated with leaking USTs at a nearby Shell gas station. Additional evaluation by borings within the tunnel envelope will be needed during the final design effort.

Investigative testing as shown above indicate that further work addressing hazardous waste issues is warranted and such investigation will be performed during final design.

4-9.2.3 Cumulative Impacts

Cumulative impacts of the proposed construction activities are comprised of those impacts from other projects which add to existing hazardous wastes or impacts of the proposed construction activities which add to the amount of existing hazardous waste.

Proposed construction activities are not likely to present a significant cumulative impact under CEQA if conducted in accordance with applicable hazardous waste laws, statutes and regulation in conjunction with use of sound hazardous waste detection and management practices.

4-9.2.4 Mitigation

As described earlier in Section 4-9.1.5, additional monitoring and nested wells are proposed for the Union Station Oil Field to define the limits of groundwater and hydrogen sulfide contamination and along the alignment through the Boyle Heights Oil Field. Additional borings and testing are also recommended in the Whittier/Rowan Station area and in the vicinity of the Whittier Boulevard/South Eastern Avenue intersection area.

These further hazardous waste studies will be performed prior to construction to clarify on a site-specific basis potential impacts during construction and identify necessary mitigation. Any required remediation plan will be implemented prior to construction. An Emergency Response Plan will also be developed should unanticipated hazardous waste conditions be encountered in the field.

Soil containing contamination may be disposed of at Class III or Class II landfills. Soil containing hazardous levels of contamination may be disposed of at a Class I facility. A second alternative is treatment or recycling of the contaminated or hazardous soil. Certain facilities are capable of accepting hydrocarbon contaminated soils. Treatment/recycling facilities usually remediate the soil and use the finished product for applications as fill materials, asphaltic pavement, or asphaltic sealant.

Remediation options for contaminated soil include biomediation, soil vapor extraction, landfill disposal, thermal desorption, chemical treatment recycling and off-site remediation. The appropriateness of each option would depend on a number of factors such as volume and extent of contamination, schedule, available space, permit review and approval requirements from regulatory agencies. Final selection of the most appropriate methods will require further evaluation. Treatment or recycling is the preferred action because it relieves the MTA of the long term liability incurred with land disposal. Furthermore, current law requires waste minimization efforts to be employed whenever possible, and treatment/recycling meets those goals.

4-9.3 FAULTS AND SEISMICITY

4-9.3.1 Regional Faults

The proposed alignment is located in an area of high seismic-potential that has experienced ground shaking from numerous large earthquakes in historical time. The earthquakes are being generated by periodic slip across San Andreas and Peninsular Ranges fault systems and on the thrust faults of the Transverse Ranges. The area is underlain by the Elysian Park seismic zone, the postulated source of the 1987 Whittier Narrows earthquake. The seismic zone is thought to be a concealed, deep thrust fault that in part expresses itself at the surface as the Elysian Hills and Repetto Hills.

Faults may be considered active, potentially active or inactive. According to the California Division of Mines and Geology (CDMG), the term "active" applies to any fault that has moved within Holocene time (i.e., the past 11,000 years). Such activity is recognized by displacement of Holocene-age sediments or by direct association with seismic activity. The term "potentially active" applies to a fault that has been active during Pleistocene time (i.e., the past 2 to 3 million years preceding the Holocene). Such faults may have remained active during Holocene time, but direct geologic evidence for continued activity is not available.

The closest documented active faults to the alignment are the Hollywood-Santa Monica Fault, the Raymond Fault and possibly an extension of the Whittier fault. The Hollywood-Santa Monica fault is located at the southern base of the Santa Monica Mountains about five miles northwest of the alignment. The Raymond fault passes through the northern part of the Repetto Hills into the south Pasadena-San Marino area to the east, and is about five miles north of the alignment at its closest point. A fault that is postulated to be the extension of the Whittier fault to the northeast of the Montebello and Monterey Park Hills area is located approximately four miles northeast of the alignment (Treiman, 1991; Bullard and Lettis, 1993). Other active and potentially active faults that are within 30 miles of the alignment are listed in Table 4-9.5 and shown in Figure 4-9.5 . The San Andreas fault has been included in the table for comparative purposes.

The Hollywood and Raymond faults, and the postulated extension of the Whittier Fault each have the potential for a Maximum Credible Earthquake (MCE) of magnitude 7.5. The peak ground surface acceleration associated with the MCE on any one of these faults is estimated to range from 0.6 to 0.75g along the LPA.

It should be stated that the last three earthquakes in the Los Angeles area (Whittier Narrows, Landers and Northridge) of greater than 5.8 magnitude have occurred on previously unknown faults.

TABLE 4-9.5: ESTIMATED SEISMIC CHARACTERISTICS OF PRINCIPAL FAULTS

Faults	Approximate Distance from Alignment[1] (miles)			Magnitude of Maximum Credible Earthquake[2]	Age of Most Recent Displacement[3]
	West End	Center	East End		
Chino	30	27	24	7.5	Late Quaternary
Cucamonga	31	29	27	7	Holocene
Hollywood	5	7	9	7.5	Holocene
Malibu Coast	22	24	27	7.5	Holocene
Newport-Inglewood	8	9	10	7	Historic (1933)
Northridge	20	23	26	7.5	Late Quaternary; Holocene
Palos Verdes Hills	18	18	19	7	Late Quaternary; Holocene
Raymond	5	5	7	7.5	Holocene
San Andreas	33	33	33	8	Historic (1857)
San Gabriel	16	16	16	7.5	Late Quaternary; Holocene
Santa Monica	9	12	15	7.5	Late Quaternary; Holocene
San Fernando	16	18	20	7.5	Historic (1971)
Sierra Madre	11	12	12	7.5	Late Quaternary; Holocene
Verdugo	8	10	12	6.75	Late Quaternary; Holocene
Whittier	8	5	4	7.5	Late Quaternary; Holocene

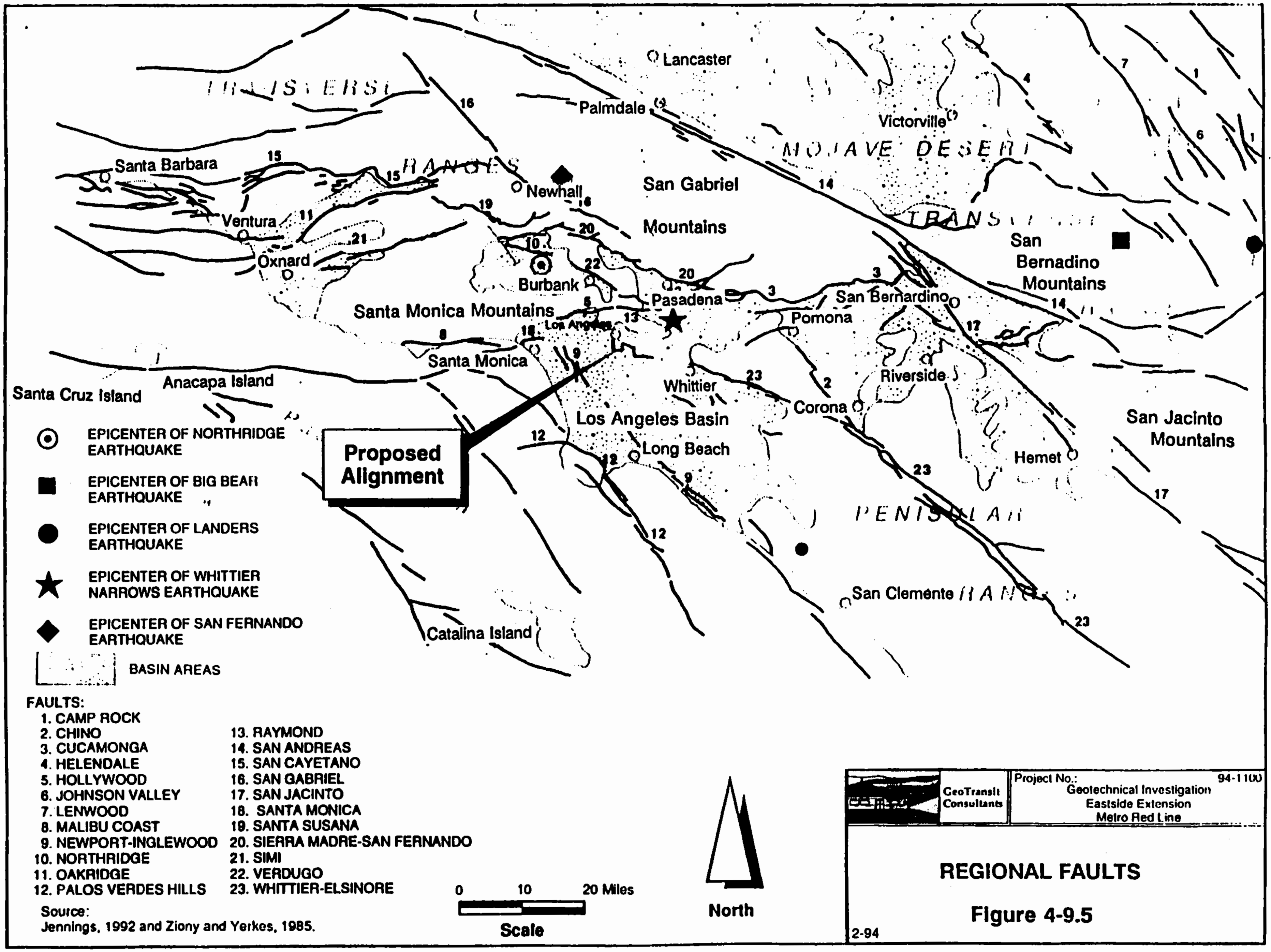
Notes:
(1) Distance measurements are based on fault traces shown in Jennings (1992) and Treiman (1991).
(2) Maximum Credible Earthquake Magnitudes Mualchin and Jones (1992).
(3) Age of Most Recent Displacement from Jennings (1992) except where noted; multiple ages apply to separate fault segments; "Late Quaternary" is the past 700,000 years; Holocene is the past 11,000 years.

Source: GeoTransit, 1994.

4-9.3.2 Local Faulting

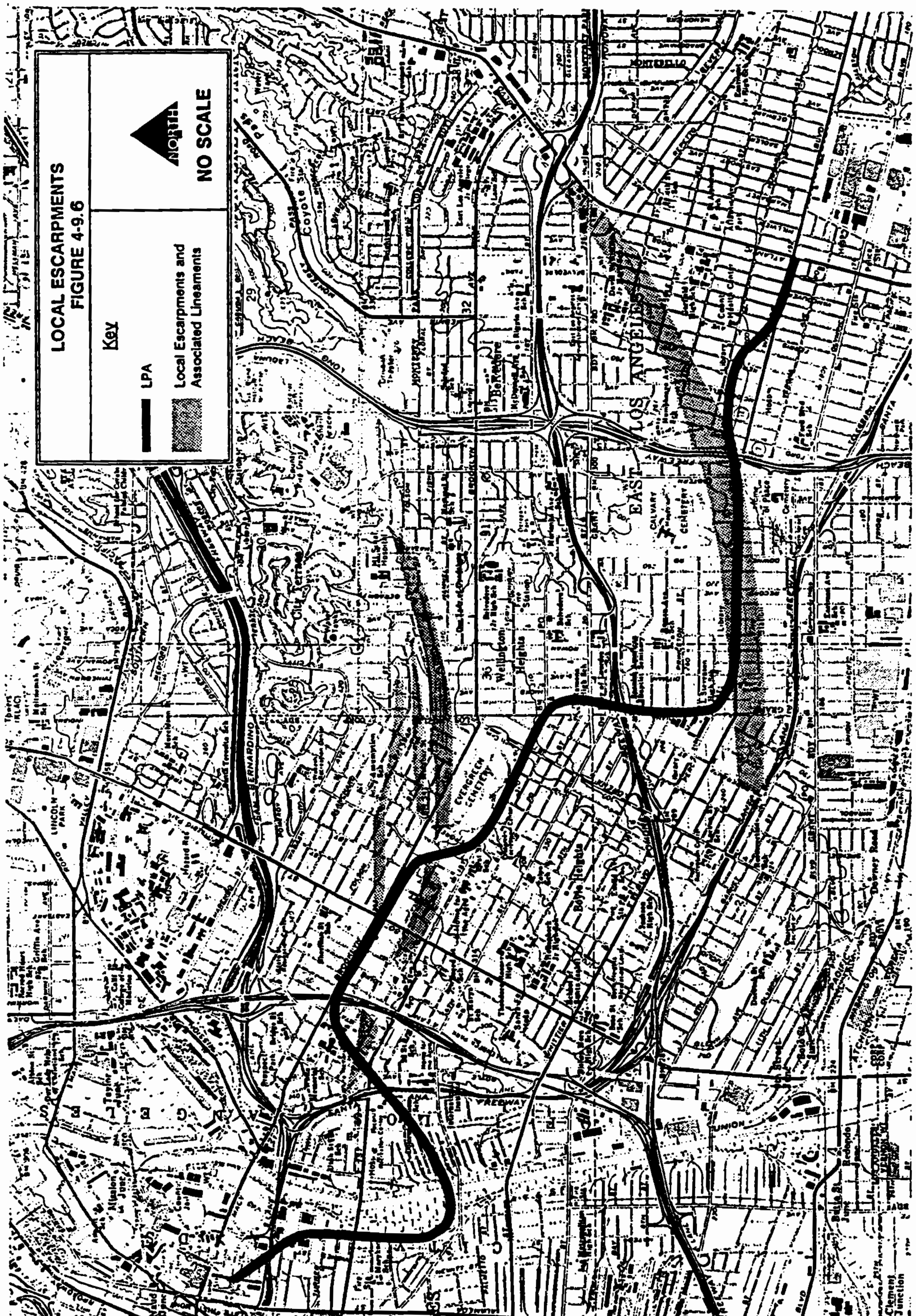
There are two escarpments crossing the alignment which may have been formed by tectonic faulting: (1) the Coyote Pass escarpment and (2) an unnamed escarpment located approximately 1.3 miles south of the Coyote Pass escarpment (see Figure 4-9.6). The Coyote Pass escarpment corresponds to the Coyote Pass Fault identified by the Department of Water Resources (1961). For a more detailed discussion of local faulting, please refer to the *Geotechnical Investigation for: Preliminary Engineering Program Eastside Extension Metro Red Line Project* prepared by GeoTransit Consultants (1994).

The first topographic escarpment, which forms the southern margin of the City Terrace area in the Repetto Hills, is as much as 80 feet high with an east-west trend. The escarpment is highest along the southern edge of the heights of City Terrace and diminishes to an indistinct feature that is less than 20 feet high near its intersection with the tunnel alignment. The escarpment can be traced as an intermittent feature from near the channel of the Los Angeles River in the west to the southern base of the Monterey Park Hills near Atlantic Boulevard in the east. This escarpment and its associated lineaments cross the proposed LPA at three locations, in the vicinity of the First/Boyle and Brooklyn/Soto Station and near the intersection of Michigan Avenue and Saratoga Street.



REGIONAL FAULTS

Figure 4-9.5


LOCAL ESCARPMENTS
FIGURE 4-9.6
Key
LPA
Local Escarpments and Associated Lineaments
NORTH
NO SCALE

The southerly topographic escarpment may correspond to a second fault. The escarpment crosses the alignment near Whittier Boulevard and Eastern Avenue and continues in a westerly direction directly south of Whittier Boulevard. The Whittier/Rowan Station overlies the escarpment. The escarpment is obscure having little to no topographic expression. In the vicinity of the proposed LPA, the escarpment is the transition from mostly dissected older alluvial deposits to the northwest to comparatively undissected younger alluvial deposits to the southeast. No investigation of the southerly escarpment for the preliminary geotechnical investigation was performed.

Geologic studies following the 1987 Whittier Narrows earthquake (M 5.9) attribute these and similar escarpments in the Elysian Park and Repetto Hills of central and eastern Los Angeles to ongoing folding and faulting. Seismologic, geodetic and geomorphic analyses indicate that the escarpments could result from either surface faulting or near-surface folding of weakly consolidated materials that overlie movements on deeply buried (or "blind") thrust faults (Davis and others, 1989). If continuous folds or faults extend northwestward from the Repetto Hills area, across the floodplain of the Los Angeles River and into the Elysian Hills, the LPA tunnel alignment would cross one of these features at as many as four locations along its length. Additional studies are being performed to delineate and characterize these possible faults and to assess their seismic characteristics. The preliminary results of a trenching and boring program underway at the Coyote Pass escarpment suggest that this feature is a fold rather than a fault.

4-9.3.3 Seismicity

Moderate to large earthquakes can be expected to occur in the region during the life of the project. In the event that a nearby fault were to slip and produce a major earthquake, very strong ground motions could affect the alignment.

An earthquake computer search (Blake, 1992) was performed to locate historical earthquake epicenters with respect to the alignment. A search radius of 150 miles from the approximate mid-point of the alignment was selected in order to include the larger magnitude earthquakes that have occurred in Southern California. The largest historical event was the 1857 Fort Tejon earthquake (estimated M 7.9) on the San Andreas fault, about 125 miles northwest of the proposed alignment. The epicenter of the closest moderate-sized historical earthquake was that of the 1987 Whittier Narrows earthquake (M 5.9), with an epicenter about 6.5 miles east-northeast of the approximate center of the alignment. This earthquake occurred on a previously unknown northeast-dipping buried thrust fault that has since been named the Elysian Park seismic zone (Mualchin and Jones, 1992). More recently, a M 6.8 earthquake occurred on January 17, 1994 on a previously unknown buried thrust fault dipping south beneath the alluvium of the San Fernando Valley. The epicenter of this earthquake was about 24 miles northwest of the alignment. Early records of ground accelerations released by the California Division of Mines and Geology for a strong ground motion instrument at City Terrace indicates maximum free field accelerations of 0.32g horizontal and 0.13g vertical for the January 17, 1994 earthquake.

4-9.3.4 Liquefaction Potential

Liquefaction is a phenomenon in which saturated soils (typically silts or sands) undergo a temporary loss of strength during vibrations caused by earthquakes. In extreme cases, the soil particles become suspended in groundwater and the soil deposits become mobile with fluid-like behavior. The factors known to influence liquefaction potential include: grain size, relative density of soil, groundwater level, degree of saturation, confining pressures and the intensity and duration of the ground shaking.

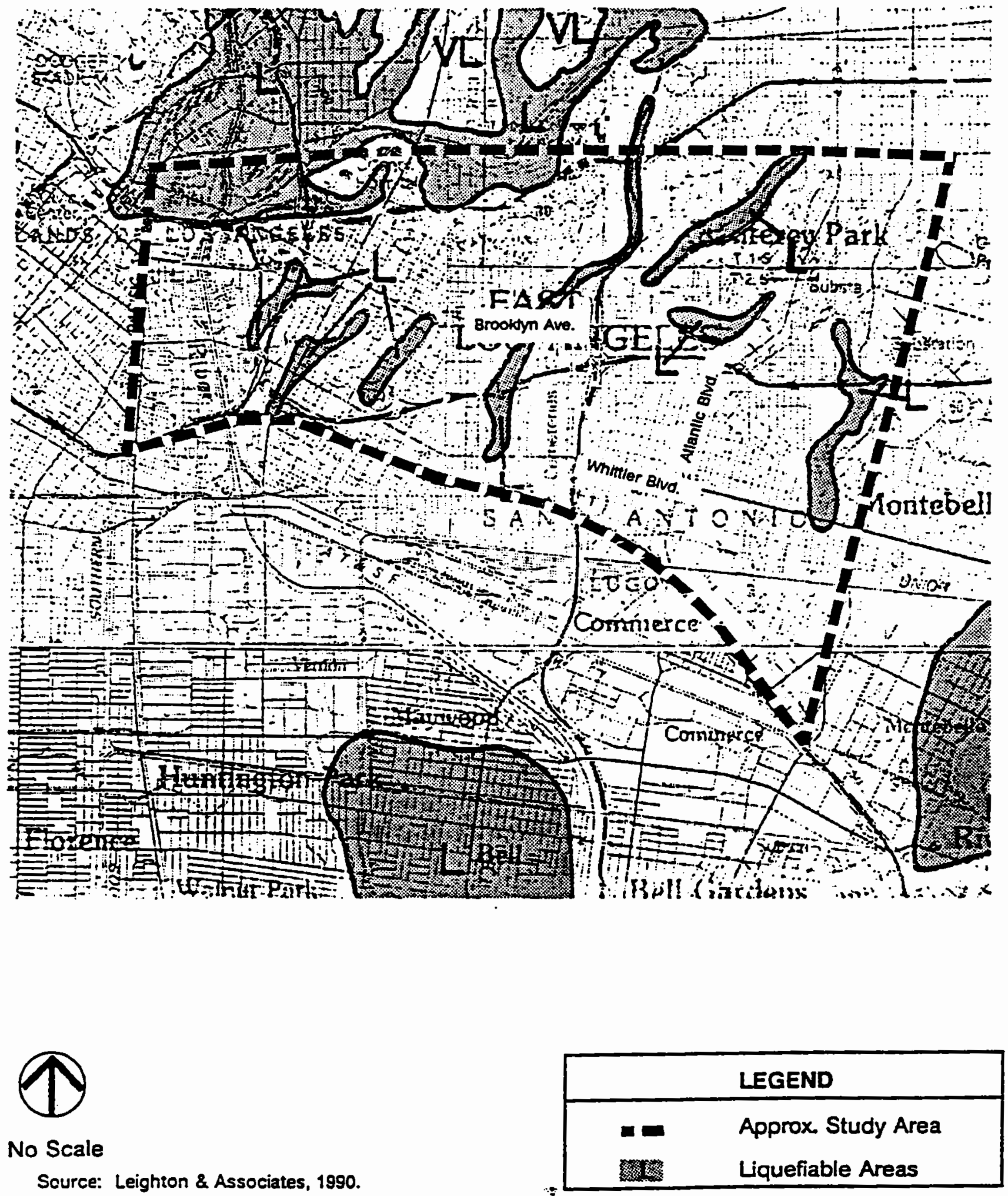
Within the project limits, several areas with relatively shallow groundwater have been identified by various agencies as being potentially liquefiable. The CDMG Special Publication 99 (California Department of Conservation, 1988), which provided earthquake planning scenarios for a major earthquake on the Newport-Inglewood fault zone, has identified some areas in the vicinity of the Los Angeles River, north of the San Bernardino Freeway (I-10). with medium liquefaction susceptibility. The U.S. Geologic Survey Professional Paper 1360 (U.S. Geological Survey, 1985), which presents articles on the earthquake hazards in the Los Angeles region indicates that the area west of the Los Angeles River near Union Station has a moderate to high liquefaction potential. The alignment also crosses some areas east of the Los Angeles River that have been identified as potentially liquefiable in the Los Angeles County Seismic-Safety Element Map (County of Los Angeles Department of Regional Planning, 1990). Figure 4-9.7 identifies the areas designated as liquefiable in the Los Angeles County Safety Element.

A site-specific liquefaction potential evaluation was performed for an anticipated peak ground acceleration of 0.7g associated with a MCE of magnitude 7.5 on the Raymond and Hollywood faults and the postulated extension of the Whittier Fault. Groundwater was conservatively assumed to be at a depth of 30 feet within the western segment (west of the Santa Ana Freeway) and greater than 150 feet over the eastern portion of the alignment (east of Lorena Street). The results of the liquefaction evaluation indicate, that within the western tunnel segment (west of the Santa Ana Freeway), 3-5 foot thick potentially liquefiable sand layers occur in the vicinity of the Los Angeles River and the Santa Ana Freeway. Between approximately the Golden State Freeway and the First Street/Evergreen Avenue intersection, pockets of potentially liquefiable sand layers (2 to 11 feet thick) were detected in borings. Liquefaction is not considered likely for the alignment east of Lorena Street, provided the groundwater levels remain relatively deep as currently observed.

The liquefiable layers identified above appear to be localized and occur within or below the tunnel zone. Therefore, potential impacts of liquefaction would not likely be significant and may only include localized loss of support around the tunnel, and settlements on the order of a few inches.

4-9.3.5 Impacts

The possible impacts of seismic activity in the Eastside Corridor include seismic ground shaking, flooding or seiches, landslides, ground rupture, differential settlement and liquefaction.



LIQUIFIABLE ZONES
Figure 4-9.7

a. Seismic Ground Shaking

The Eastside Corridor, like all of Southern California, is in a seismically active area and would be subject to severe ground motions during an earthquake on a nearby fault. Maximum peak ground acceleration generated during the MCE is anticipated to be between 60 to 75 percent gravity (0.60 to 0.75 g). This level of ground shaking is a significant potential impact under CEQA.

With little yet understood about the tectonic development of the escarpments, MTA can presently do little more than speculate about the potential effects of possible future tectonic activity associated with the escarpments on the proposed tunnel alignment. Other studies conducted along the Coyote Pass escarpment have hypothesized that there has been approximately 80 feet and 2,000 feet (25 meters and 300 meters) of vertical and horizontal fault displacement, respectively, during the past 140,000 years. These figures yield average vertical and horizontal tectonic rates of slip of about 0.2 mm and 4 mm per year. If the escarpment in the City Terrace area is a portion of a larger, 6 mile-long fault, then future activity along this fault could generate earthquakes as large as magnitude 6.5 or 7. Earthquakes of magnitude 6.5 or 7 can result in as much as 6.5 feet of surface displacement per event (Bonilla and others, 1984).

Additional studies involving additional borings and trenching are currently being completed along the Coyote Pass escarpment to test this hypothesis. At the time of this writing, the preliminary results of a trenching and boring program underway at the Coyote Pass escarpment suggest that this feature is a fold rather than a fault. Similar studies will be necessary to examine the second escarpment.

b. Seiches

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. These waves can top dams or reservoirs and flood down gradient areas. Review of the Los Angeles Topographic Quadrant (photorevised in 1981) indicates that no major water-retaining structures are located immediately up-gradient of the project area. The risk of flooding from a seismically-induced seiche is considered very low.

c. Earthquake-Induced Flooding

Earthquake-induced flooding is caused by failure of dams or other water-retaining structures due to earthquakes. Based on a review of a Los Angeles County Flood and Inundation Hazards Map prepared by Leighton, the western portions of the project area around the Los Angeles River are in the Hanson Dam inundation area (Leighton & Assoc., 1990). This is also a potential flood zone for several smaller reservoirs, including Elysian Park and Devils Gate Dam. However, Hanson Dam is a flood control dam and usually only has water during periods of intense rain. Since Hanson Dam does not function as a full-time water retention facility and since the other reservoirs potentially feeding the inundation zone are small, the potential threat from seismically-induced flooding is considered very low.

d. Landslides

Seismically-induced landslides and other slope failures are common occurrences during or soon after earthquakes. The majority of the Eastside Corridor is located in relatively flat terrain, except the northeast corner, which laps onto the south margin of the Repetto Hills. No landslides have been mapped in the Repetto Hills. The potential for seismically-induced landslides is considered very low.

e. Surface Fault Rupture

Additional studies are being performed to delineate and characterize the possible faults and to assess their seismic characteristics. The preliminary results of a trenching and boring program underway at the Coyote Pass escarpment suggest that this feature is a fold rather than a fault. The LPA does not fall within an Alquist-Priolo Special Study Zone.

f. Liquefaction

Liquefaction is the transformation of submerged granular soils into a liquid-like mass due to excess pore pressure developed in response to earthquake ground shaking. Soils most susceptible to liquefaction are low-density sands and silty sands that are within 50 feet of the surface and in areas of high ground water. Local zones of potentially liquefiable layers, 2 to 11 feet thick, exist within and below the tunnel envelope. These liquefiable layers, however, appear to be localized and occur within or below the tunnel zone. Therefore, potential impacts of liquefaction may not be significant and may only include localized loss of support around the tunnel, and settlements on the order of a few inches. Additional investigation during Final Engineering is necessary to perform a proper evaluation of the liquefaction potential in areas of gravelly and cobbly alluvium. These areas include the portion of alignment from Union Station to the vicinity of 4th Street and the areas within the limits of the First/Boyle and Little Tokyo stations.

4-9.3.6 Cumulative Impacts

No cumulative seismicity impacts are anticipated.

4-9.3.7 Mitigation

A detailed fault study program, including additional geologic mapping, borings, trenches and geophysical surveys, to evaluate faulting, folding and potential seismic activity in connection with the Coyote Pass escarpment and a similar escarpment to the south, will be completed to determine the potential impacts of these escarpments on the LPA tunnel design. The program should include extended lines of borings at various locations across the escarpment to better characterize the geometry of folding, trenches on the escarpment and across inferred offset stream channels to search for both evidence of near-surface faulting and deposits that might permit an understanding of the timing of tectonic activity, and geophysical studies to delineate possible offset bedrock at depth.

In addition, mitigation of seismic ground shaking impacts would be achieved through project design and construction. For instance, internal structural elements of the Metro Rail project considered "life critical" (that is, facilities whose structural failure during an earthquake would endanger many lives) would be designed and built to resist strong ground motions approximating the maximum credible earthquake (0.75g), the largest seismic event reasonably expected to occur in the project region. Life critical LPA facilities include such high occupancy structures as stations and tunnels. System facilities considered to represent lower risk to life and safety in the event of structural failure include the maintenance yard and other at-grade, low occupancy structures. Articulated design features might include using joints in the tunnel structures where they pass through soil/rock interfaces or where they enter the station boxes.

If faults are discovered during tunnel construction, MTA would determine if the fault is potentially active or inactive, using criteria established in a contingency plan. Where an active fault is encountered, the standard concrete tunnel liner would be replaced by a specially reinforced cast-in-place concrete tunnel liner or a welded steel lining as appropriate. The system will be designed to withstand the maximum credible earthquake of magnitude 7.5.

As is typically done during final design, additional detailed geotechnical work would be completed for those portions where liquefaction or densification may be possible, to define fully the horizontal and vertical extent of loose granular soils above and below the water table. Should soils subject to liquefaction or densification be found, more conservative site preparation and foundation design measures will be taken. Depending on the specific conditions encountered, such measures could include compaction of soils, permanent lowering of the water table, special foundations such as pilings or additional underpinnings and boring the tunnels below less dense soil into the more dense soil.

4-10 WATER RESOURCES

4-10.1 SURFACE WATERS

4-10.1.1 Setting

The Los Angeles River is the only surface water resource in the project area. Through the project area, the river generally follows a north-south course, and is located approximately 0.5 miles east of Union Station.

The Los Angeles River is a component of the Los Angeles County flood control and water conservation system. It was constructed in cooperation with the United States Army Corps of Engineers (USCOE) beginning in the late 1930's. Through the project area, the river has concrete bottom and sides. In cross-section, it is trapezoidal in shape, with a trapezoidal low-flow channel. In the project area at the top of the slopes, the river is approximately 250 feet wide and 25-30 feet deep. The low-flow channel is 28 feet in width. The river flow is partially regulated by the Sepulveda, Pacoima, Big Tujunga, Hansen and Devil's Gate Dams; and by several spreading grounds, reservoirs and debris basins. It is also subject to diversions from Big Tujunga Creek, Arroyo Seco and other domestic and irrigation diversions.

a. Watershed Description

The County of Los Angeles Department of Public Works operates or receives data from 81 water-stage recording stations. The nearest stream gaging station to the project area is Station Number F34D-R, located at the Los Angeles River 472 feet downstream of Firestone Boulevard, approximately nine miles south of Union Station, as the river flows. The drainage area for this station is 596 square miles.

b. Water Quality and Flow Characteristics

The Los Angeles River is a flood control facility emptying into the San Pedro Bay via Long Beach. It was not constructed to serve as a conveyance structure for domestic water supplies and its water is not of sufficient quality for the domestic water supply.

For water year (October 1 through September 30) 1989-1990, the discharge volume through the recording station near Firestone Boulevard totalled 108,675-acre feet.

c. Erosion and Debris Control

Each year, eroded materials in various forms (trees, rocks, sand, etc.) flow out of the mountain watersheds of Los Angeles County. To control the entrance of these materials into the area's flood control facilities, the County of Los Angeles Department of Public Works maintains a series of debris basins in canyon mouths, and upstream stabilization structures in selected watersheds.

- **Debris Basins**

The purpose of a debris basin is to entrap the debris flows emanating from canyons. The basins allow the relatively debris-free water to pass into flood control channels. From 1989 to 1990, there were 115 debris basins in Los Angeles County, providing a total capacity of approximately 7,613,700 cubic yards.

- **Stabilization Structures**

Stabilization structures are constructed to control erosion in natural canyons. They serve to prevent downcutting by stabilizing alluvium deposits. In addition, they store debris generated by the watershed and serve to stabilize side banks, reducing side slope sloughing and bank erosion. The Department of Public Works maintains 225 stabilization structures in 47 major watersheds.

- **Emergency Structures**

Emergency structures (rail and timber crib type) have been constructed to entrap the debris inflow from burned watersheds. They serve to protect improvements (roads, channels, residences, etc.) located immediately downstream of the watershed. There are 39 emergency structures in Los Angeles County, with a total capacity of 349,500 cubic yards.

- **Sediment Removal From Reservoirs**

Sediment deposition reduces the storage capacities in reservoirs and adversely affects flood control and water conservation efforts. Sediment removal is periodically necessary and is generally an expensive effort due to large quantities, the need to deal with water inflows and in several cases, remote locations and limited accessibility for equipment.

4-10.1.2 Impacts

a. Construction Impacts

- **Water Quality**

Potential water quality impacts resulting from construction would primarily be associated with sediment loadings on the storm water and/or surface water (Los Angeles River) systems. Sediment sources would include unstabilized, exposed soil at excavations, drainage from stockpiles of excavated materials and dewatering activities.

Tunnelling operations and cut-and-cover construction of stations required for the LPA would involve dewatering (removal of water from area soils) before and during construction. If warranted, when dewatering activities occur, they would be limited to the immediate excavation area by using such methods as compressed air, cement or approved chemical grouting, freezing, slurry shields or earth pressure balance shields where local geologic or other constraints dictate, thus avoiding potential ground subsidence or differential settlement of adjacent structures. Moreover, by confining groundwater control activities to the immediate area of excavation, the proposed project would avoid potential adverse impacts on flora caused by a lowered water table. Water from dewatering would be discharged into the storm drain system which, in turn, drains into the Los Angeles River

The application of impervious surfaces resulting from facility (such as park & ride and kiss & ride lots) paving and construction would increase runoff and associated contaminants (oil, grease) discharged to area storm water systems and surface waters. However, the additional amounts of the types of pollutants that would enter runoff would be negligible and would not constitute a significant environmental impact under CEQA.

- **Erosion**

Subsurface tunneling activities along the LPA would not cause any surface erosion. Minor surface erosion is possible at the station excavation sites where soil is exposed. The project is not expected to result in significant impacts related to erosion.

- **Sedimentation**

Sedimentation of the Los Angeles River resulting from dewatering activities is not expected to occur, since treatment would remove solids and suspended solids from the groundwater.

b. Operational Impacts

During normal operations of the LPA, only minimal amounts of water associated with groundwater seepage or rain runoff would be anticipated in the tunnels and stations. As discussed further in Section 4-10.2, water could enter into the tunnels at Union Station and the Little Tokyo Station during a 100-year or greater flood. This water would be treated, as required, prior to discharge into the storm drain system. Because the LPA would provide a tunneling structure below the Los Angeles River, pollutants entering the tunneling structure are not anticipated to enter surface waters.

4-10.1.3 Cumulative Impacts

No cumulative impacts to surface water quality related to induced growth that could be attributable solely to the LPA are anticipated. Some development will occur within the urban area with or without the project.

4-10.1.4 Mitigation

a. Construction Phase

- **Water Quality**

A Notice of Intent (NOI), along with a permit application and detail plans, will be submitted to the RWQCB by the LACMTA during the final design period and prior to construction activity. The NOI will discuss how soil disturbances associated with construction may affect storm water runoff. Contaminated runoff from large paved areas such as parking lots and construction sites will be minimized through the installation of oil/water separators with siltation basins.

Any amount of discharge as a result of dewatering required for the project will be conducted in conformance with all applicable requirements of the Regional Water Quality Control Board (RWQCB) Order No. 91-092 "General National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharge of General Water to Surface Water in Los Angeles River and Santa Clara River Basins and Monitoring" and Reporting Program No. C1-7067. The monitoring of treated discharge water and filing of water quality monitoring reports will help ensure the continued effectiveness of waste water treatment procedures and equipment. Careful and periodic coordination with the RWQCB will be undertaken during the preliminary engineering and final design processes.

- **Erosion**

Mitigation measures addressing subsidence in relation to tunnel and station construction are found in Section 4-9.

- **Sedimentation**

Spoil from tunneling activities will be stored in the tunnel staging area and trucked to appropriate sites in order to minimize sedimentation. Spoil material will not be stored near water drainage facilities to prevent increased sedimentation in the drainage system. In addition, it is recommended that measures be adopted to prevent accumulation of large amounts of spoil material, and that spoil piles be kept low and/or graded to minimize erosion.

b. Operation

During the operation of the system, water that may enter in tunnel structures and surface runoff from impervious areas will be treated before being discharged into the drainage system, therefore having no adverse impacts. As discussed above, treatment methods will include the use of oil/water separators with siltation basins. Additional methods for treating contaminated water are discussed in Section 4-10.3.4.

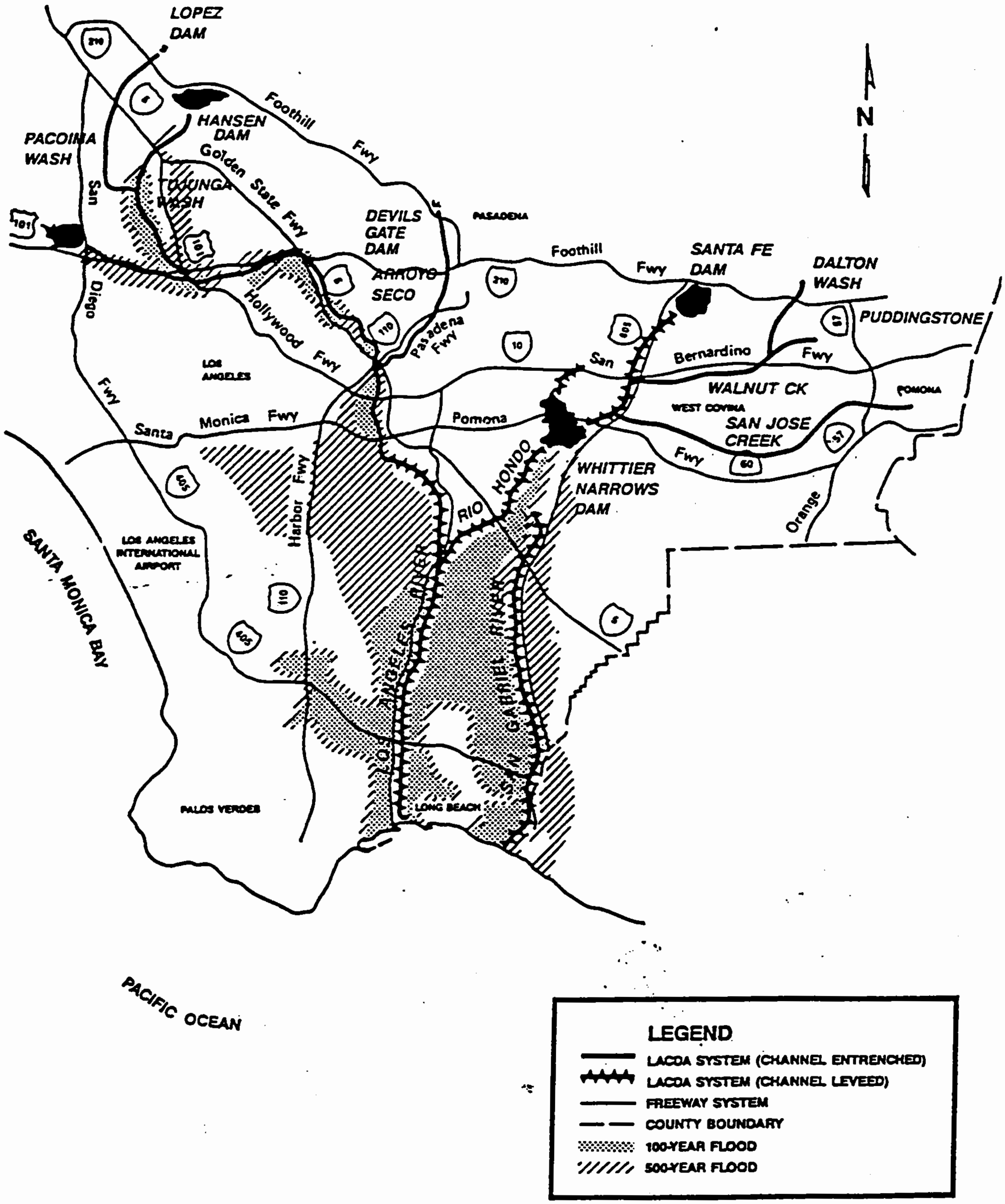
4-10.2 FLOODPLAINS

4-10.2.1 Setting

The current Flood Insurance Rate Map (FIRM) for Los Angeles County indicates that the project area is within Zone C, which is defined as "areas of minimal flooding."

According to a USCOE report, heavy storms in 1980 revealed that the Los Angeles County Drainage Area (LACDA) flood control system is seriously deficient in some areas of the main Los Angeles and Rio Hondo channels. On the Los Angeles River, problems were greatest downstream from downtown and the project area. This report recommended improvement of the Rio Hondo channel south from the Whittier Narrows Dam to its intersection with the Los Angeles River and then continuing southward on the Los Angeles River to San Pedro Bay.

According to the USCOE report, in the project vicinity, the area immediately west of the Los Angeles River is in a 100-year flood zone. This area may include Union Station, the proposed Little Tokyo station and the non-revenue rail lead from Union Station to the Yard. The potential for flooding diminishes to a 500-year flood zone as distance increases to the west. Areas immediately east of the Los Angeles River in the project area are either within a 500-year flood zone or are not within a flood zone (see Figure 4-10.1). Flood descriptions (100-year flood and 500-year flood) refer to their statistical projected frequency. For example, a 100-year flood



Source: US Army Corps of Engineers, 1987

	Areas in the Los Angeles County Drainage Area threatened by 100- and 500- year floods	Figure 4-10.1

is the size flood that has a one percent chance of occurring each year. A 500-year flood has a 0.2 percent chance of happening in any year.

USCOE maps show average flood depths for relatively large areas to estimate dollar damage to assist in determining the cost effectiveness of alternative flood control improvements considered in the LACDA study. FEMA's FIRM considers more specific flood depths for smaller areas in order to make certain that the rates one would pay are consistent with the risk one would face. Hence, between the two, the USCOE maps are likely to be more conservative, or identify greater risks, when compared to FEMA's maps.

The Department of Transportation Order 5650.2, titled "Floodplain Management and Protection," prescribes "policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs and budget requests." The order does not apply to areas within Zone C (areas of minmal flooding). The order requires that attention be given and findings made in environmental review documents to specific issues:

- Examine any risk to or resulting from the proposed transportation facility.
- Examine the impacts upon natural and beneficial floodplain values.
- Examine the degree to which the action provides direct or indirect support for development in the floodplain.

4-10.2.2 Impacts

As mentioned above, the Eastside Corridor currently lies within Zone C of the existing Los Angeles County FIRM and, as such, is not subject to USDOT Order 5650.2. If the appropriate FIRM map had been updated to reflect the USCOE study, the following findings would have been made under USDOT Order 5650.2:

- There is a potential for flooding associated with the LPA facility and mitigation can be applied to reduce these risks.

- Construction of the LPA would not substantially affect natural and beneficial floodplain values.

- Construction of the Little Tokyo Station would support potential development in the recently defined USCOE floodplain area.

a. Construction Impacts

The LPA alignment has a tunnel underneath the Los Angeles River and would not pose any potential obstruction to water flow in the river and therefore, would not result in significant impacts under CEQA on flood control capacity.

b. Operational Impacts

The USCOE report shows the area (Union Station and Little Tokyo Station) west of the Los Angeles River as being a potential flood hazard. Should a flood occur in the area, water would enter the tunnel by way of Union Station and the Little Tokyo Station. Mitigation will be necessary to reduce potential flooding in the tunnel and station areas.

4-10.2.3 Cumulative Impacts

Downstream from the project area, the USCOE is currently proposing to increase the flood control capacity for the Rio Hondo River and the Los Angeles River south of where it intersects the Rio Hondo River, a total of approximately 21 miles. USCOE proposes to improve the levees by constructing parapet walls. Construction of the parapet walls would provide the needed protection at a relatively low cost. This approach also doesn't require additional right-of-way and thus has limited environmental impacts. These lower portions of the Los Angeles and the Rio Hondo Rivers are also in a 100-year flood zone. This proposed improvement of the lower Los Angeles and Rio Hondo Rivers would increase the flood control capacity downstream of the proposed Eastside Corridor study area. No cumulative impacts are expected as a result of the LPA and the USCOE Los Angeles River/Rio Hondo River flood control capacity improvement project.

4-10.2.4 Mitigation

a. Construction Phase

Mitigation of potential impacts on the Los Angeles River are not required because the LPA alignment crossing under the river will consist of tunneling activities and pose little impact on the river. However, crossing the Los Angeles River will require consultation with the USCOE.

b. Operational Phase

Mitigating the impact of flooding in the tunnels at Union Station could be done by the use of sand bags or other feasible options.

The Little Tokyo Station could be protected against flooding by constructing the entrances, emergency exits and ventilation shafts above the 100-year flood level. Additional flood control techniques will be examined and implemented during final design of the LPA.

4-10.3 GROUNDWATER

4-10.3.1 Setting

a. Geologic

The LPA alignment is located in the Los Angeles Forebay area of the Central Basin along the Coastal Plain of Los Angeles County. The forebay area extends generally in a semiconcentric fan-like pattern around the Los Angeles River. The LPA area is underlain by the Lakewood and San Pedro (lowest formation) formations. The Lakewood formation is exposed on the surface of the La Brea and Montebello Plains, and extends underneath the Recent Alluvium on the Downey Plain. The aquifer in the Lakewood formation consists of sand, sandy clay, clay and gravel that range in thickness of 0 feet to 100 feet and extends to depths of 100 feet to 375 feet (250 feet below sea level). This formation, which includes the Exposition, Gardena and Gage aquifers, ranges from 0 to more than 220 feet thick in the southern part of the area.

The Exposition aquifer consists of as many as three separate sand and gravel members that have a maximum thickness of 80 feet and varies in depth from 100 to 160 feet.

The Gardena aquifer covers most of the Los Angeles Forebay area, has sand gravel members that range in thickness from 0 feet to 60 feet and extends to a maximum depth of 290 feet (100 feet below sea level).

The Gage aquifer which for the large part has been eroded and replaced by the Gardena aquifer consists of sand and sandy clay with some gravel with thickness of 5 feet to 100 feet and extends to a depth of 375 feet (250 feet below sea level). The Gage aquifer is the basal member of the Lakewood formation and rests on the underlying San Pedro formation.

The San Pedro formation is the lowest of the formations in the Los Angeles Forebay area. The aquifers in the San Pedro formation consist of various amounts of sand, sandy clay, clay, gravel and gravelly sand that range in thickness of 0 feet to 430 feet and extends to depths of 475 feet (350 feet below sea level) to 1,600 feet (1,440 feet below sea level). This formation contains the Hollydale, Jefferson, Lynwood, Silverado and Sunnyside aquifers and is about 1,050 feet thick in the Los Angeles Forebay area.

The Silverado aquifer is found throughout most of the Los Angeles Forebay area and is the most significant aquifer for public supply. This aquifer is protected from contamination from the surface by overlying low permeability strata. The aquifer consists of gravelly sand with some interbedded clay that range in thickness of 20 feet to 150 feet and extends to a maximum depth of 1070 feet (880 feet below sea level).

The Hollydale aquifer consists of sand and sandy clay with some gravel layers that range in thickness from 0 feet to 60 feet and extends to a maximum depth of 475 feet (350 feet below sea level).

The Jefferson aquifer consists of sand with some gravel and clay members that range in thickness from 0 feet to 70 feet and extends to a maximum depth of 640 feet (450 feet below sea level).

The Lynwood aquifer is present over all of the Los Angeles Forebay area where the San Pedro formation occurs. This aquifer consists of sand and gravel with clay members that range in thickness from 20 feet to 130 feet and extends to a maximum depth of 720 feet (600 feet below sea level).

The Sunnyside aquifer is found over most of the forebay area and consists of mainly sand with interbedded clays that range in thickness of 50 feet to 430 feet and extends to depths of 1,600 feet (1,440 feet below sea level).

b. Groundwater Supply and Quality

The groundwater supply within Los Angeles County is consumed mainly by municipal use and moderately by industrial and irrigation (limited use) purposes. The storage capacity of the Coastal Plain is estimated to be 31,730,000 acre-feet with a useable capacity of 2,363,000 acre-feet.

c. Groundwater Recharge

Injection barriers which consist of injection water wells along the Coastal Plain of Los Angeles County are used by the local water agencies to control the sea water intrusion created by an overdrawn water table. This process of injected surface water not only prevents sea water intrusion, but also contributes to the fresh water supply in the basin and thereby mitigates overdraft of water supplies.

d. Groundwater Level

Groundwater aquifers would be expected to be approximately 150 to 200 feet below the ground surface. Surface water sources can contribute to the groundwater level as revealed by well data in the vicinity of the Los Angeles River.

Analysis from the preliminary geotechnical investigation indicates that groundwater levels along the western segment (west of U.S. 101) were between 30 to 40 feet below ground surface (BGS) between Union Station and First Street, 70 to 80 feet BGS south of First Street and 50 to 60 feet east of the Los Angeles River. A study in this area in 1983 identified groundwater levels up to 55 feet higher than current levels measured in the vicinity of the Little Tokyo Station.

Along the eastern portion of the alignment, groundwater is estimated to be approximately 20 to 60 feet BGS between the First/Boyle Station and the intersection of First Street and Fresno Street (west of the First/Lorena Station). East of this area, available regional data suggest that groundwater is deeper than approximately 150 feet BGS. Perched groundwater may be encountered anywhere along the eastern segment.

e. Water Quality

Groundwater in the overall Coastal Plain of Los Angeles County generally contains localized concentrations of chloride, sulfate, total dissolved solids, iron and manganese that are considered too high for domestic use; and concentrations of total dissolved solids and chloride considered unacceptable for irrigation use.

Sampling of area water wells is conducted on an annual basis, on a selected scheduling, by the County of Los Angeles Department of Public Works, City of Los Angeles Department of Water and Power and the State of California Department of Water Resources. All of the water well samples are active production wells used either for municipal supply, irrigation or for industrial purposes and represent a general portrayal of basin water quality conditions. The samples taken are analyzed for major minerals, total dissolved solids, electrical conductivity, pH, phosphate, iron, manganese, fluoride and/or boron. Review of the most recent data for water wells in the project area (at the Fourth Street/Atlantic Boulevard intersection, Calzona Street/I–5 interchange, Whittier Boulevard between Downey Road and Eastern Avenue and McBride Avenue/ Whittier Boulevard) revealed that well water is generally of sufficient quality for domestic use.

Laboratory analyses of samples collected near Union Station indicate that groundwater quality is generally poor compared to drinking water standards. Local extreme concentrations of sulfate, sulfide and chloride were interpreted as contamination by oil field brine. Studies conducted for the LPA have identified hydrocarbon and hydrogen sulfide contamination within the vicinity of Union Station. Please see Section 4-9.2 (Pre-existing Hazardous Waste) for a discussion of contamination within these two oil fields. Groundwater quality data is scarce for the remainder of the Eastern Extension Corridor.

4-10.3.2 Impacts

a. Dewatering

The principal engineering problems encountered in tunneling and excavation are often related to groundwater. Groundwater entering an excavation can impede operations and reduce the strength of surrounding soils. Relatively shallow groundwater could be encountered during construction in the younger and older alluvial sediments in the vicinity of the Los Angeles River, from Union Station to near the Little Tokyo Station and in the vicinity of the First/Boyle Station. Dewatering prior to and during excavation of these two stations may be required.

Groundwater flows entering tunnels and surface excavations can be large, especially in areas of shallow groundwater where construction takes place below the water table. Inflows could be controlled by gravity flow to sump and pump systems, by direct pumping to lower the water table or by other approved methods.

During the operations phase, groundwater dewatering activities and subsequent discharge would not occur and no impacts on groundwater are anticipated.

b. Groundwater Contamination

Predominant groundwater contamination is in the vicinity of Union Station. Groundwater is above the tunnel invert and is contaminated with hydrocarbons and dissolved hydrogen sulfide. Thus, groundwater from dewatering operations prior to and during tunnel construction will require treatment for these hydrocarbons and dissolved hydrogen sulfide.

c. Permit Issues

The proposed project would be subject to Order No. 91-092, "General National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements For Discharges of Groundwater to Surface Waters in Los Angeles River and Santa Clara River Basins," adopted by CRWQCB on July 22, 1991. It is also likely that a monitoring and reporting program similar to that required for the Wilshire/Normandie Station (Monitoring and Reporting Program No. CI-7067, dated August 26, 1991) would also be required. Order No. 91-092 specifies discharge limitations of specific constituents for both maximum daily and average monthly (30 day) discharge. Monitoring Program No. CI-7067 delineates the minimum frequency of constituent analysis and reporting submittals. These permit and monitoring requirements would prevent impacts on groundwater water quality.

Prior to excavation and construction, negotiations with the California Department of Water Resources (CDWR) and the Central and West Basin Water Replenishment District (CWBWRD) would be initiated regarding water rights and pumping assessment. It is expected that coordination with CDWR and CWBWRD would provide sufficient oversight to prevent environmental impacts due to over-withdrawing groundwater from the project area.

4-10.3.3 Cumulative Impacts

No cumulative groundwater impacts have been identified.

4-10.3.4 Mitigation

a. Dewatering

Additional piezometers (an instrument for measuring pressure or compressibility) and monitoring wells are recommended to further define geohydrological settings along the LPA and to resolve the data discrepancy between groundwater levels observed in 1983 versus those currently observed in the vicinity of the Little/Tokyo Station. In addition, field pump tests would be performed in the areas that require pre-construction dewatering for tunnel and station construction, to determine groundwater quality and to help design suitable dewatering systems and treatment systems, if required. Typical measures used to mitigate groundwater are discussed below.

To avoid the engineering and environmental problems associated with excavating or tunneling in soils below the perched or permanent water table, it would be necessary to remove water (dewatering) from these materials before and possibly during construction. This is generally done by advancing slotted pipes into the saturated soils and then pumping or allowing water to flow from the pipes, thus lowering the water table locally. The feasibility, design and cost of the dewatering system will depend upon the hydraulic head and level of groundwater contamination, if any. Alternatively, groundwater may be removed by pumping from shallow ditches or sumps within an excavation. When any dewatering activities occur, they would be limited to the immediate excavation area, thus avoiding potential ground subsidence or differential settlement of adjacent structures. At times, alternatives to dewatering may be appropriate, such as freezing, utilizing impervious materials or slurry wells.

Additional provisions to enhance TSM face stability and to reduce potential settlement during tunneling within groundwater include:

- With dewatering, use of an open shield fitted with breasting doors and poling plates (or movable hood and jack systems) for excavation face control and to help mitigate the potential for, and effects of cave-ins.
- The use of a shield with a pressure regulated trap door.
- The use of a suitable earth pressure balance (EPB) machine.
- Stabilization of the granular soil zones near and around the tunnel crown by utilizing chemical grouting.

Tunneling beneath the groundwater table, where the area cannot be dewatered (using the conventional methods described above) because of environmental or structural constraints, can be accomplished by either using compressed air (in case of a high water head), slurry or earth pressure balancing shields or other similar methods. The use of any one of these methods would keep both water inflow as well as ground loss to a minimum.

The slurry method employs a separate chamber behind the tunnel boring machine cutting head which is then isolated via a bulkhead from the boring machine that provides the rotation and thrust. The groundwater becomes a slurry mixture in the chamber which is then pumped (via pipes passing through the watertight bulkhead) to the discharge area where the mixture is treated as required.

The earth pressure balancing method is similar to the slurry method employing a pressurized chamber separated by a bulkhead.

The finished tunnel walls are erected inside of the outer walls of the shield. These walls extend behind the machine itself. A seal is provided within the outer walls of the shield. This seal provides a watertight connection between the shield walls and the finished tunnel walls.

Another method involves pressurizing the work area behind the tunnel face. The excavated soils are removed via a pressure lock.

Breasting doors, poling plates and quick setting chemical grouting can also be used to prevent cave-ins and surface subsidence. These are employed in front of and prior to the finished tunnel wall construction.

b. Groundwater Contamination

Potential remedial options for contaminated groundwater include the use of hydrogen peroxide to treat hydrogen sulfide, filtration of colloidal sulfur or suspended solids, siltation basins, oil water separators and active carbon for removal of VOCs. Treated water would than be discharged into a nearby storm drain. Perched contaminated groundwater encountered along the Eastside Corridor should be profiled and drummed and disposed at appropriate land fills.

c. Permit Issues

Dewatering and subsequent discharge required for the LPA will be conducted in conformance with all applicable requirements of the Regional Water Quality Control Board (RWQCB) Order No. 91-092 and Monitoring and Reporting Program No. C1-7067. Coordination with the California Department of Water Resource (CDWR) and the Central and West Basin Water Replenishment District (CWBWRD) regarding water rights and pumping activities will occur prior to excavation and construction.

The remediation process described above for contaminated groundwater will require a National Pollutant Discharge Elimination System (NPDES) permit issued by the RWCQB. The monitoring of treated discharge water and periodic filing of water quality monitoring reports will be a requirement of the NPDES permit.

4-11 NATURAL RESOURCES AND ECOSYSTEMS

4-11.1 SETTING

4-11.1.1 Vegetation and Wildlife

The Los Angeles region is primarily urbanized and dominated by paved surfaces and landscaping. Typical of a Mediterranean climate, the region is arid with highly seasonal rainfall occurring primarily in winter. Native vegetation in the East Los Angeles area has been largely replaced by urban landscaping and intrusive exotic species (i.e., naturalized plants and animals, not indigenous to the area, that compete with native species). Remnants of native vegetation occur on some hillsides within the Los Angeles Coastal Plain. In undeveloped but disturbed urban areas, flora consist of native and non-native species that are tolerant of disturbances.

A survey was performed at each of the proposed LPA stations. Vegetation was limited to landscaping at each station site. Landscaping species observed at the station sites included elm, palms, oleander and magnolia.

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

4-11.1.2 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 (NDDB) lists species considered sensitive by the scientific community, although this listing offers no legal protection. The NDDB identifies the location and status of a species at each recorded observation.

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.

4-11.1.3 Threatened and Endangered Species

The NDDB listed two species, the San Diego horned lizard (*Phrynosoma coranatum blainvillei*) and the Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*), as having occurred in the vicinity of the Eastside Corridor. The San Diego horned lizard inhabits coastal sage scrub and chaparral, preferring friable, rocky or shallow soils. Neither coastal sage scrub nor chaparral occur at the LPA station sites. The Los Angeles sunflower occurs in freshwater and coastal salt marshes and is presumed to be extinct in California (California Native Plant Society, 1988). Marsh habitat was not observed at the station sites.

These two species are not anticipated to occur in the vicinity of the proposed project due to the lack of suitable habitat.

4-11.2 IMPACTS

The Eastside Corridor is highly urbanized and has been for many years. Consultation of the NDDB and a survey conducted for the proposed project area indicate that no state or federally listed sensitive species are found within the project boundaries. The No-Build and LPA are not expected either to create or affect any habitats for sensitive species and therefore, under CEQA, would not result in any significant impacts to biological resources.

The LPA would result in impacts that would be limited to the removal of some existing landscaping and common urban vegetation during construction of the stations. Under CEQA, this is not a significant impact to biological resources. The habitat provided by such vegetation can be found throughout the Los Angeles Basin.

4-11.3 CUMULATIVE IMPACTS

The proposed project would not have cumulative impacts on biological resources.

4-11.4 MITIGATION MEASURES

No mitigation measures are necessary.

4-12 ENERGY

Previous Metro Rail energy consumption analyses have demonstrated that the differences between rail and no build alternatives are not significant enough to warrant detailed analyses. For example, the 1987 *Los Angeles Rail Rapid Transit Project DEIS/DEIR* showed a savings of approximately 3,000 billion BTU with rail transit compared to a base consumption level of 643,635 billion BTU. Consequently, This discussion focuses on identifying opportunities for energy conservation during operation of the system.

4-12.1 PROPULSION ENERGY CONSERVATION

The Locally Preferred Alternative would utilize the following energy conserving measures for the train propulsion:

The LPA would implement "chopper" (semiconductor) traction motor speed controls instead of conventional "cam" (mechanical) speed controls. Although somewhat heavier and bulkier, the "chopper" control technology offers significant energy benefits.

Trains used for the LPA would recapture some of the energy used to stop trains through regenerative electrical braking, a generally proven technique. Typically, significant kinetic energy is wasted when a rail train decelerates. This energy would otherwise be dissipated into the subway as heat which requires additional ventilation and cooling. Regenerative braking pumps energy back into the traction power system so that one train's braking energy can serve another train's acceleration.

A variety of other measures would improve propulsion energy efficiency. A special aluminum-clad steel "third rail" would conduct electricity more efficiently than the conventional steel rail. An automatic control system for train speed which promotes coasting has been implemented in prior Red Line segments and would be included for the LPA and IOSs. Rail vehicles would be designed and operated so that they are switched off whenever not in service. The traction system would be designed so that it can eventually be integrated with any adjacent future electrical transit systems, such as trolley buses and light rail systems.

4-12.2 STATION DESIGN

Every aspect of the station design would be reviewed to minimize lighting, heating, ventilating and air conditioning loads. Passenger areas within stations would be designed so that lights can be turned off during off-service hours. Air conditioning requirements would be minimized by utilizing the piston effect of the trains to facilitate warm air exchange . Cold water, instead of warm water, would be used to wash the vehicles. The track layout would be designed to minimize non-revenue vehicle movements. All major facilities except the car washing facility would have electric meters to monitor energy consumption and conservation.

4-12.3 CUMULATIVE IMPACT

The energy conservation measures for the Locally Preferred Alternative also apply to the other rail transit, bus fleets and fixed facilities that would serve the entire Los Angeles region. These area-wide measures would conserve large quantities of energy throughout the regional transit network.

In addition, the Locally Preferred Alternative, in coordination with other regional public transportation improvements, would help to reduce dependency on single-occupant vehicles (SOVs). Coordination with these other improvements include schedule coordination, modal interface between the various modes (heavy rail, light rail, commuter rail, express bus, local bus) as well as more widespread use of efficient Transportation Demand Management (TDM) options.

4-13 SAFETY AND SECURITY

4-13.1 SETTING

Safety and security measures are already in place to serve current bus transit operations and related pedestrian activities near existing bus stops within the Eastside Corridor. The services required for the Locally Preferred Alternative (LPA) would be very similar to these. Existing safety and security measures include transit police surveillance, non-uniformed police inspectors on transit buses and at major transfer nodes, and an emergency radio system to ensure quick response to emergencies.

4-13.2 IMPACTS

Safety refers to the prevention of accidents to the riding public, employees or others present near Metro Rail facilities. Such accidents may be caused by events such as fires, faulty equipment or improper boarding and alighting of the rail vehicles. Fire/life safety deals with emergency preparedness for all types of major incidents, including fires or other major disasters. Fire/life safety considerations involve preventive design criteria and those which provide protection for people and property in the event an emergency should occur.

Security refers to the prevention of unlawful acts resulting in harm to persons or damage to property. In a broader sense, it also implies freedom from threats or uncertainty about the likelihood of threatening acts. Crime and anti-social behavior are potential problems in any public environment.

The LPA would carry with it the potential for safety and/or security incidents along the rail alignment and near and within the rail stations. Such incidents would potentially occur at rail subway stations and their station entrances, park-and-ride lots and amenities located at street level. Of particular concern would be the safety and security of passengers on board LPA trains.

The No-Build alternative would not result in safety and/or security impacts.

4-13.3 CUMULATIVE IMPACTS

There are no cumulative impacts with regard to safety and security associated with the LPA and other related projects in the area.

4-13.4 MITIGATION

By the time the LPA opens for revenue service, Metro Rail safety and security procedures will have been tested for several years along the first two minimum operable segments (Segment 1 and Segment 2). Also, recent Blue Line experience with passenger safety at rail station platforms and associated security measures at several existing park-and-ride lots along the Long Beach-to-Los Angeles corridor may also be transferable to the LPA rail system.

Similar to the program developed for the first two operable segments of Metro Rail and the proposal for the Mid-City Segment, the following mitigation measures would be taken to ensure the safety and security of LPA rail transit operations. It is expected that the potential for adverse safety and security effects would be reduced to an acceptable level as a result of the mitigation measures discussed below.

- Design station entrances and surrounding areas so that there would be minimal conflicts involving bus and auto traffic generated by LPA, passenger access and egress and general auto or pedestrian traffic. Use clear, explicit signs and create a high level of visibility between pedestrians and vehicle drivers.

- In the stations, provide adequate lighting, slip-resistant walking surfaces, open and well-lit station entrances and fail-safe train control apparatuses.

- Develop operational design criteria to focus on protection of people and property through adequate emergency exits, standby electrical power and emergency response and communications systems. Communications systems would include closed circuit television monitors, a public address system and emergency telephones.

- Use non-combustible materials or materials with low combustibility to the maximum extent possible. Where low-combustion materials are used, they would also be low-smoke and non-toxic fume producing.

- In all facility designs, incorporate fire sprinklers and stand pipes, smoke/gas detectors and alarm systems throughout the stations; and adequate tunnel and station ventilation systems. Adequate exits and other emergency provisions such as safety evacuation walkways and tunnel cross-passages would also be provided.

- Install appropriate security provisions at all stations. Station interiors would be open and clearly lighted; clear sight lines would be maintained; and low ceilings, excessive use of columns and darkened areas would be avoided. Designs will seek to eliminate blind spots or potential hiding places for vandals and criminals. Access paths to the streets (inclusive of stairs, escalators and elevators) would receive particular attention. Stair passages would generally be kept straight and wide enough so that their entire lengths can be readily seen, thus reducing conflicts with activities by other potential users of the public space.

- Provide intercoms on each train cab so that patrons can use them to report disturbances to the train operator. The train operator would then alert transit security people to board and/or otherwise intercept any suspects at the next station. Transit police would also be assigned to routine patrols on board the trains and within the station areas.

- Develop and implement emergency response procedures for operating personnel and local agencies, including periodic and extensive training.

- Augment the transit police force and security staff for LPA operations as new stations are added to the subway network. Similar to the proposed additions associated with the Mid City Metro Rail segment, the security force would work cooperatively with other local law enforcement agencies. LPA design criteria involving interagency law enforcement would include extensive communications systems, as well as detection and alarm response apparatuses.

- A well-trained and adequate police force will be provided to assure passenger safety to the fullest extent possible.

4-14 HISTORIC/ARCHAEOLOGICAL/PALEONTOLOGICAL RESOURCES

4-14.1 HISTORIC RESOURCES

4-14.1.1 Setting

Historic Resources were evaluated for significance under criteria based on two overlapping legislative sources: the National Historic Preservation Act of 1966 (NHPA), which includes criteria for eligibility to the National Register of Historic Places; and the California Environmental Quality Act, as amended in 1992, which includes criteria for eligibility to the California Register of Historical Resources. Essentially, all resources which have been determined eligible for the National Register are also eligible for the California Register, but the latter also provides for the inclusion of additional resources that have been identified by historic resources surveys or that have been designated as a result of a local landmark ordinance. A detailed description of the historic context, field methodology, results and individual historic resource inventory forms are contained in the *Request for Determination of Eligibility Report* completed for this project.

In addition, criteria to assess project impacts on historic resources is different under Section 106 of the NHPA than under CEQA. Because of these similarities and yet differences, the setting for historic and archaeological resources is included in this chapter, while the impacts section is divided between this chapter for properties only significant under CEQA and Chapter 4.15: Section 106 Compliance for properties eligible for both the National and California Register.

a. CEQA Compliance

By passage of Assembly Bill No. 2881 in September 1992, Section 21084 of the California Public Resources Code (CEQA) was amended to categorize projects that may cause a substantial adverse change in the significance of an historical resource as projects that may have a significant effect on the environment. Historic resources were defined as any resource listed, or determined to be eligible for listing, in the newly established California Register of Historical Resources. According to CEQA, a resource may be listed as an historical resource in the California Register if it:

- meets National Register of Historic Places criteria A through D, or;
- has been determined eligible for, or listed in the National Register of Historic Places, or;
- it is a State Historical Landmark designated after No. 770 and potentially if it was designated before No. 770, or;
- it is a Point of Historical Interest, or;
- has been determined significant by the State Historic Resources Commission, including: individual resources; contributors to historic districts; significant resources identified in qualifying historical resources surveys; locally designated historical resources, districts or landmarks, i.e. City of Los Angeles Historic-Cultural Monuments; or having been designated under any municipal or county ordinance, i.e. in an historic preservation overlay zone.

Since 21084.1 is a relatively new law, review procedures for identification of qualifying historical resources are still being defined. To anticipate this review process, resources which would qualify under CEQA but not Section 106 have been identified and effects analyzed in this section according to CEQA criteria.

b. Identification of Historic Properties

A complete description of background research and field investigation results are contained in the *Request for Determination of Eligibility Report* completed for this project. The study area or Area of Potential Effects (APE), was established in order to identify significant historic properties along the project. The APE was defined to satisfy the requirements of both Section 106 of the NHPA and CEQA.

Within the APE of the ten original alternatives, a total of 73 historic properties were identified as listed on, determined eligible to, or appearing eligible for inclusion in the National Register of Historic Places, and therefore qualifying for compliance under both Section 106 and CEQA. In addition, a total of 70 other historical resources were identified which would potentially qualify for inclusion in the California Register of Historic Places, and therefore would require compliance under CEQA, but not under Section 106.

For the LPA, the historic architectural survey evaluated 42 significant individual resources and one district within the APE. One building is still listed in the National Register of Historic Places. One property was previously listed in the National Register, but a partial demolition precipitated its decertification. Two structures were previously determined eligible for the National Register as part of the Caltrans Historic Bridge inventory. As a result of the survey for the LPA for this project, eighteen properties (including the remaining building on the previously listed property) were found to appear to meet the criteria for listing in the National Register and two buildings were found conditionally eligible. One district and seventeen other properties were found not to meet the criteria for listing in the National Register, but would appear to qualify for the California Register of Historical Resources. Three other properties appear ineligible for either the National or California Register, but are of local interest as unaltered examples of buildings more than fifty years of age. All other remaining buildings, structures and objects within the APE have either lost substantial integrity of their historic fabric through alteration or relocation, or are less than 50 years of age, and possess no other overriding significance.

- <u>Historic properties previously listed in the National Register</u>
  - Union Passenger Terminal, 800 North Alameda Street, Los Angeles.
- <u>Historic properties formerly listed in the National Register</u>
  - Golden Gate Theatre/Vega Building, 5170-5188 Whittier Boulevard, East Los Angeles, Unincorporated Los Angeles County. (See also *appears eligible* listings.)

- Historic properties previously determined eligible for listing in the National Register through a consensus determination by a federal agency and the State Historic Preservation Officer.

  - First Street Viaduct, 900-1100 Blocks of East 1st Street, Los Angeles.
  - Fourth Street Viaduct, 900-1700 Blocks of East 4th Street, Los Angeles.

- Historic properties found to appear eligible for listing in the National Register as a result of this survey and requiring a consensus determination from the State Historic Preservation Officer.

  - Greybar Electric Co. Warehouse, 201-213 South Santa Fe Avenue, Los Angeles.
  - Craig Co. Wholesale Grocery, 215-243 South Santa Fe Avenue, Los Angeles.
  - AT&SF Outbound Freight House, 970 East 3rd Street, Los Angeles.
  - Simon Gless Farm House, 131 South Boyle Avenue, Los Angeles.
  - Jewish Home for Wayfarers, 127 South Boyle Avenue, Los Angeles.
  - Walter & Lillie Webb Residence, 125 South Boyle Avenue, Los Angeles.
  - Hotel Mount Pleasant, 103-105 North Boyle Avenue, Los Angeles.
  - Ralph H. Tombs Residence, 1814 Pennsylvania Avenue, Los Angeles.
  - Congregation Talmud Torah, 247 North Breed Street, Los Angeles.
  - Alfred W. Guest Cottage, 319 North Mathews Street, Los Angeles.
  - Rev. Edwin S. Chase Residence, 2423 Michigan Avenue, Los Angeles.
  - Brooklyn Theatre, 2524 Brooklyn Avenue, Los Angeles.
  - Charles W. Fisher Residence, 334 North Fickett Street, Los Angeles.
  - Evergreen Cemetery/Ivy Chapel, 204 South Evergreen Street, Los Angeles.
  - Siewert/Johnson Mortuary, 3827 Whittier Boulevard, East Los Angeles, Unincorporated Los Angeles County.
  - Boulevard Theatre, 4549 Whittier Boulevard, East Los Angeles, Unincorporated Los Angeles County.
  - United Artists Theatre, 5136 Whittier Boulevard, East Los Angeles (Unincorporated).
  - Golden Gate Theatre, 5170-5188 Whittier Boulevard, East Los Angeles, Unincorporated Los Angeles County.

- Historic properties found to be conditionally eligible for listing in the National Register as a result of this survey pending reversal of alteration.

  - Luna & Harry Patty Residence, 2533 Michigan Avenue, Los Angeles. If its original windows or period facsimiles were replaced, it would appear eligible to the National Register.

  - 2-Story, Shingle/Queen Anne Residence, 118 South Alma Avenue, East Los Angeles, Unincorporated Los Angeles County. If its original windows or period facsimiles were replaced and bay restored, it would appear eligible to the National Register.

- Properties found not to meet the criteria for listing in the National Register as a result of this survey and requiring a consensus determination from the State Historic Preservation Officer. These properties should be considered, however, for inclusion in the California Register of Historical Resources.

  - Brooklyn Avenue (Chavez Avenue) Thematic Brick Block District[1]
  - George B. Kellick Block, 1832 East 1st Street, Los Angeles
  - Tenement House for O. J. Beeson, 1719 Pleasant Avenue, Los Angeles
  - Felhandler Block and Bakery[2], 2100-2102 East Brooklyn Avenue, Los Angeles
  - Beer Brothers Block[2], 2116-2118 East Brooklyn Avenue, Los Angeles
  - Jacob Simon Block[2], 2132-2138 East Brooklyn Avenue, Los Angeles
  - Saylin Block[2], 2200-2206 East Brooklyn Avenue, Los Angeles
  - Segal Block & Dance Hall[2], 2228-2232 East Brooklyn Avenue, Los Angeles
  - Rosen Block & Lodge[2], 2334 East Brooklyn Avenue, Los Angeles
  - Brooklyn Hotel[2], 2418-2420 East Brooklyn Avenue, Los Angeles
  - Roy W. Elliot Residence, 2423 Michigan Avenue, Los Angeles
  - Apartments for Elija S. Ginsburg, 334 North Mathews Street, Los Angeles
  - Eugene P. Fallis Residence, 338 North Mathews Street, Los Angeles
  - Residence for Fred Gottschalk, 329 North Fickett Street, Los Angeles
  - Lowenthal Stores[2], 2626-2632 East Brooklyn Avenue, Los Angeles
  - William J. Dinneen Residence, 2719 Michigan Avenue, Los Angeles
  - G. E. Platt Dairy House, 3464 East 1st Street, Los Angeles
  - Cladic Seminary; El Sinai, 508-512 South Indiana Street, East Los Angeles

- Properties found not to meet the criteria for listing in either the National or the California Register, but of local interest.

  - Aliso Village (Extension at Clarence & 3rd), 1401 East 1st Street, Los Angeles
  - George and J. Hollis House, 3310 East 1st Street, Los Angeles
  - Patrick Dooley House, 3318 East 1st Street, Los Angeles

4-14.1.2 Impacts

The following section summarizes the impact evaluation completed for historic properties found ineligible for the National Register of Historic Places but appearing eligible for the California Register of Historical Resources. Impacts on National Register eligible properties are discussed in Chapter 4.15: Section 106 Compliance.

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1 The Brooklyn (Chavez) Avenue Brick Block Thematic District falls within the boundaries, but is distinct from, City of Los Angeles Historic Cultural Monument #590, the Brooklyn Avenue Neighborhood Corridor, designated March 8, 1994.

2 Each of these historic resources was evaluated both individually and as part of the Brooklyn Avenue Thematic District.

By passage of Assembly Bill No. 2881 in September 1992, Section 21084 of the Public Resources Code (CEQA) was amended to categorize projects that may cause a substantial adverse change in the significance of an historical resource as projects that may have a significant effect on the environment.

Generally, the emphasis in the impacts analysis is on permanent, long-term impacts to historic resources. Construction impacts are generally temporary in nature, with the exception of permanent alteration or demolition of a structure. Otherwise, short-term disruptions to access, increases in noise and other temporary construction effects are not considered significant in the following impacts analysis. Because the depth of the tunnel (from top of rail to ground surface) would generally range from 45 feet as it passes under the Los Angeles River to approximately 110 feet as it passes under State Route 60 (Pomona Freeway), the potential for settlement of structures at the surface appears negligible and is not further considered.

Impacts on historic structures can be direct or indirect. Right-of-way acquisition, visual impacts at station entrances and noise and vibration impacts were the primary considerations in making effect determinations. Changes in the immediate environment of the resource, such as access and visibility that have not previously existed, were also considered.

Noise and vibration impact evaluations rely on information presented in Sections 4.7 and 4.8. If the groundborne noise and vibration mitigation measures indicated in Section 4.8.4 are implemented, there would be no significant groundborne noise and vibration impacts on any properties, including those of historic nature. Mitigation measures include welded rails, lightweight truck rail vehicles, special resilient rail fasteners, special grinding and truing equipment and floating slab trackbed. Vibration impacts during construction are anticipated to be well below the threshold of damage to fragile historic structures (95 dB), according to current Federal Transit Administration (FTA) standards. Construction mitigation (Section 4.18.21) minimizes vibration impacts by using an auger to pre-drill holes for soldier piles, rather than pile driving. For reference purposes, Table 4-14.1 indicates distances from the proposed center of the rail to the nearest portion of each historical resource.

TABLE 4-14.1: DISTANCES FROM CENTER OF THE RAIL TO HISTORIC RESOURCES

HISTORIC NAME	APPROXIMATE DISTANCES (IN FEET)		
	HORIZONTAL	VERTICAL	TOTAL
Union Passenger Terminal	0	40	40
First Street Viaduct	0	60	60
Greybar Electric Co. Warehouse	70	60	90
Craig Co. Wholesale Grocery	70	60	90
AT&SF Outbound Freight House	50	60	70
Fourth Street Viaduct	60	40	70
Aliso Village	0	60	60
Simon Gless Farm House	60	70	90
Jewish Home for Wayfarers	30	70	80
Walter & Lillie Webb Residence	20	80	80
Hotel Mount Pleasant	110	80	130
George B. Kellick Block	190	80	200

Continued

TABLE 4-14.1: DISTANCES FROM CENTER OF THE RAIL TO HISTORIC RESOURCES

HISTORIC NAME	APPROXIMATE DISTANCES (IN FEET)		
	HORIZONTAL	VERTICAL	TOTAL
Tenement House for O.J. Beeson	0	80	80
Ralph H. Tombs Residence	110	90	220
Falhandler Block and Bakery	0	50	50
Beer Brothers Block	80	50	90
Jacob Simon Block	50	50	70
Saylin Block	10	50	50
Segal Block & Dance Hall	0	60	60
Congregation Talmud Torah	0	60	60
Rosen Block & Lodge	0	50	60
Brooklyn Hotel	10	50	50
Alfred W. Guest Cottage	200	50	200
Rev. Edwin S. Chase Residence	340	50	340
Apartments for Elija S. Ginsburg	40	50	70
Eugene P. Fallis Residence	0	50	50
Brooklyn Theatre	20	50	50
Residence for Fred Gottschalk	90	50	100
Luna & Harry Patty Residence	310	50	310
Charles Fisher Residence	30	50	60
Lowenthal Stores	110	60	120
William J. Dinneen Residence	0	50	50
Evergreen Cemetery & Ivy Chapel	20	50	50
George and J. Hollis House	40	70	80
Patrick Dooley House	40	70	80
G. E. Platt Dairy House	80	90	120
Shingle/Queen Anne Residence	70	90	110
Cladic Seminary; El Sinai	0	90	90
Siewart/Johnson Mortuary	30	50	60
Boulevard Theatre	20	50	60
United Artists Theatre	20	60	60
Golden Gate Theatre	130	60	140

Source: Myra L. Frank & Associates, April 1994.

For visual impacts, or changes in the character of the environment around the resource, the determination is qualitative, based on the existing environment and the potential for change. Since the project is in tunnel configuration for its entire length, potential visual impacts are limited to station entrances and parking garages. The Visual & Aesthetics impacts section of this document (Section 4.5.2) found no significant adverse effects near any historical resources.

Potential impacts of the LPA that could cause a substantial adverse change in the significance of an historical resource are, therefore, limited to right-of-way acquisition. For a discussion of right-of-way acquisition impacts on National Register eligible historic resources, see Section 106 Compliance, Section 4.15. The following three properties appearing eligible for the California Register of Historical Resources would be affected by right-of-way acquisition to facilitate station construction:

- First/Boyle Station
  - Tenement House for O. J. Beeson, 1719 Pleasant Avenue, Los Angeles: This two-story Craftsman style apartment building, also known as the "Famous Apartments" was constructed in 1911 and has survived with no apparent alterations.
- Brooklyn/Soto Station
  - Apartments for Elija S. Ginsburg, 334 North Mathews Street, Los Angeles: This two-story Spanish Colonial Revival fourplex was designed by Joseph Goldberg and constructed in 1928 by the Falb Brothers.
  - Eugene P. Fallis Residence, 338 North Mathews Street, Los Angeles: This two-story American Foursquare was constructed in 1903, but its integrity has been compromised by partial enclosure of the porch area.

Each of these three buildings would be demolished prior to cut and cover construction. Although there is currently no review process in effect to actively place historical resources on the California Register, each of these buildings would have a high probability of qualifying under its criteria (c)(3) for each "embodies the distinctive characteristics of a type". Demolition of each of these three buildings would cause a substantial adverse change to its significance, and, therefore the project would have a significant effect on the environment according to Section 21084.1 of the Public Resources Code.

4-14.1.3 <u>Cumulative Impacts</u>

The three buildings to be demolished are rather typical examples of their respective architectural styles, and many other examples are still common throughout the eastern portion of Los Angeles. The demolition of these three will not significantly deplete the number of representative examples and therefore will not result in a significant cumulative impact.

4-14.1.4 <u>Mitigation</u>

In order to mitigate the demolition of the Tenement House for O. J. Beeson, the Apartments for Elija S. Ginsburg and the Eugene P. Fallis Residence, photographic documentation of the exterior and interior of each building will be undertaken by the MTA. The documentation will be archived with the Los Angeles Public Library Department for future reference.

It is recommended that vibration monitoring equipment be installed near sensitive uses to ensure that during construction activity, vibration remains well below the 95 dB threshold for damage to fragile historic buildings.

A Memorandum of Agreement (MOA) was executed for the Metro Rail Project in November 1983 by the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, the Urban Mass Transportation Administration (now the Federal Transit Administration [FTA]) and the Southern California Rapid Transit District (now the Metropolitan Transporation Authority [MTA]), and the MOA is still in effect. As requested by the SHPO, the project has developed design guidelines to ensure compatibility of station plans with adjacent historic resources. In accordance with the conditions of the MOA, every attempt shall be made by the MTA to ensure that new construction would be compatible with the remaining historic properties in terms of scale, massing, color and materials employed and station entrances shall be designed for compatibility with the existing urban environment.

As part of the preparation for construction, during final design of the LPA, the MTA will conduct a survey of sensitive structures. Sensitive structures would be fitted with geotechnical instrumentation and monitored during construction. If required, grouting would also be used to minimize the potential for soil settlement around the tunnel alignment and station boxes.

4-14.2 ARCHAEOLOGICAL RESOURCES

4-14.2.1 Cultural Setting

A literature review was completed using records of the California Archaeological Inventory Regional Information Center. Because the areas to be affected were developed prior to environmental concerns and regulation, virtually no archaeological investigations, with the exception of the downtown/Union Station area, have been completed along the LPA. Previous archaeological studies conducted at or near Union Station indicate that buried, intact prehistoric and historic deposits exist in-situ beneath and in the vicinity of Union Station. These deposits date to the original Los Angeles Chinatown and to a previous Native American village. The extent of archaeological deposits is unknown at this time. The area to the east of Union Station has not been studied for prehistoric remains.

The LPA traverses some of the oldest settlement areas in Los Angeles. The western portion includes neighborhoods that date back to the mid and late 19th century. All of these areas have been disturbed for dense commercial and residential development. Although there are significant historic architectural surveys in this area, no systematic archaeological studies have been undertaken.

An Historical and Archaeological Evaluation of the seven station areas was completed for this project. The results of this report did not indicate any known sites listed on or eligible for the National Register of Historic Places; however it did indicate levels of probability for prehistoric and historical sites for each station.

The research includeded review of archaeological site records and excavation reports, historical maps and literature and prior environmental documents to predict sensitive areas within the construction footprints of the seven station locations. The archaeological study does not address standing structures, but some of the older buildings may be associated with subsurface remains which would qualify as significant archaeological resources. These vestiges might include foundations, cellars, or other architectural and structural evidence; trash pits; privies; wells; or other discrete features important by reason either of their structure or their contents.

Each of the stations has low probability for prehistoric sites, but reasonable potential for historical sites. They are summarized as follows:

a. **Little Tokyo** - relatively low potential. Earliest land use was agricultural, with subsequent development largely industrial and wholesale commercial. Some potential for ethnic workingman occupation and railroad discards.

b. **First/Boyle** - possibly highest potential of the stations. There were adobes, locations unknown. The 1858 Andrew Boyle House, later part of the Jewish Home and ultimately the Japanese Home for the Aged, was demolished as late as 1987, but remnants of its brick tunnel which connected a wine cellar to the bluff may still be intact. The complex ultimately included at least 11 structures, including a synagogue, scattered broadly over a very old and historic property.

c. **Brooklyn/Soto** - possibly the second most sensitive of the seven stations, with a high potential for encountering historic resources. A house directly within the impact zone was present by 1906, and possibly a cigar factory. The area is within the core of the historic Jewish settlement in Boyle Heights, and any subsurface deposits may have research potential.

d. **First/Lorena** - Lorena street was not cut through until after 1884, and was settled first by small dwellings.

e. **Whittier/Rowan** - Moderate potential for encountering remains of small shops and dwellings.

f. **Whittier/Arizona** - Historical maps do not depict this area around the turn of the century, implying little if any development. By 1921, there were modest dwellings fronting Arizona and McDonnell. There is a relatively low potential for encountering historic values at this location.

g. **Whittier/Atlantic** - The station area was vacant until the street was cut through after 1926. The settlement pattern at that time included shops lining Whittier, with dwellings on the side streets. Relatively low potential for significant remains.

4-14.2.2 Impacts

Any process of site preparation or construction, including demolition, grading, trenching, utility relocation, laydown, or other activity which disturbs the present surface of the earth may affect cultural resources below the surface. Artifacts are subject to transport, relocation, or scattering which destroys their associations and research potential; exposure of deposits or features makes them subject to unauthorized collection.

The significance of an impact depends upon: (a) whether the resource is important, i.e., eligible to the National Register of Historic Places (NRHP) or the California Register; and (b) whether the adverse effect can be reduced to a level of insignificance by mitigating measures. Where preservation by avoidance is not technically or economically feasible, mitigation of impacts on archaeological properties is usually accomplished by scientific data recovery, analysis and reporting.

4-14.2.3 Cumulative Impacts

Because of the paucity of prehistoric and historic investigations in the project vicinity, each cultural deposit could potentially provide important information.

4-14.2.4 Mitigation

Prior to the initiation of each construction contract, a pre-construction meeting should be held with all resident engineers, inspectors, contractors' representatives and foremen to review the procedures to be followed regarding the presence of archaeological and/or paleontological monitors, collecting of artifacts, reporting discoveries and communications.

As far as management or treatment plans can be formulated at this stage, at the very least, monitoring should be provided full time at the First and Boyle and Brooklyn and Soto station locations, from the time when any demolition approaches the present surface down to that horizon which may reasonably be expected to yield cultural remains. Work at the other station locations may be supervised on a part-time or spot-check basis until evidence of cultural remains is observed.

When any potentially significant archaeological evidence is observed, work will be halted in that immediate vicinity and the procedures set forth in the MOA (1983) and the Treatment Plan (WESTEC 1985) will be followed. Briefly, these stipulate that the resource be identified and assessed for its significance; if the remains are deemed to be significant, specific recommendations for the mitigation of impacts will be developed and implemented on a case-by-case basis.

4-14.3 PALEONTOLOGICAL RESOURCES

4-14.3.1 Setting

Paleontological resources of the Metro Red Line Eastside Corridor include fossil remains, fossil sites, associated geologic and geographic site data and the fossil-bearing rock units. Previous studies on the paleontological resources of the corridor were conducted by Lander (1988) and RMW Paleo Associates (1993). Surficial geologic mapping of the corridor by Dibblee (1989) indicates the entire corridor is immediately underlain by older and younger alluvium. The younger alluvium consists of unconsolidated nonmarine (floodplain) deposits of silt, sand and gravel, whereas the older alluvium consists of poorly consolidated nonmarine (floodplain) deposits (Dibblee, 1989). The younger alluvium is not differentiated from the underlying older alluvium in geotechnical boring logs from the corridor (Converse Consultants West (CCW], 1992; GeoTransit Consultants [GTC], 1994). These boring logs indicate a thin surficial cover of artificial fill, though not mapped by Dibblee (1989), overlies the alluvium in most of the corridor (CCW, 1992; GTC, 1994). Surficial geologic mapping (Dibblee, 1989) and subsurface (boring) data (GTC, 1994) indicate tunneling and cut-and-cover excavation for station boxes will encounter the alluvium in all tunnel segments and station boxes; the lower marine member of the Fernando Formation, which underlies the alluvium, will be encountered by tunneling between Union Station and the Little Tokyo Station site and between the First/Boyle and Brooklyn/Soto Station sites. Cut-and-cover excavation for the First/Boyle Station box could encounter this rock unit at the northeastern end of the station box. The lower member of the Fernando Formation consists of claystone, siltstone, silty sandstone and sandstone (GTC, 1994).

A literature review, including a review of environmental review documents prepared for the Eastside Corridor, was completed and an archival search was conducted at the Natural History Museum of Los Angeles County (LACM) to document the occurrence of previously recorded fossil sites from the alluvium and the lower member of the Fernando Formation in and near the corridor. Numerous previously recorded fossil sites occur in the corridor vicinity. Many of these sites were uncovered as a result of construction-related excavation for other projects, including earlier segments of the Metro Red Line. The fossil remains from these sites have been critical in determining the ages of their respective rock units and confirming the marine or nonmarine origin of the rock units; in documenting the species that existed during deposition of the sediments comprising these rock units; and in reconstructing the late Cenozoic (Pliocene and Pleistocene) geologic, climatic and paleontological history of the Los Angeles basin. The paleontologic resources of the Eastside Corridor and vicinity are described below by rock unit.

a. Alluvium

A partial elephant limb bone was uncovered in the alluvium by tunneling for the Metro Rail Red Line Segment 1 tunnel 200 to 400 feet west of the eastern portal and at a depth of 35 to 55 feet under the southeastern quadrant of the intersection of Alameda and Macy Streets, immediately north of Union Station (Lander, 1993a, -b; Morton, 1992). The area of the site is mapped as younger alluvium by Dibblee (1989).

Fossil remains of an otherwise unidentifiable land mammal were recovered at a depth of 30 feet as a result of the paleontological resource impact mitigation program conducted during cut-and-cover excavation of the Metro Red Line Wilshire/Normandie Station box (Lander, 1993a, -b). The area of the site is mapped as older and younger alluvium by Dibblee (1991).

An elephant tusk was recovered at a depth of 45 feet as a result of the paleontological resource impact mitigation program conducted during cut-and-cover excavation of the Metro Red Line Wilshire/Western Station box (Lander, 1993a, -b) . The area of the site is mapped as older and younger alluvium by Dibblee (1991).

Horse limb and toe bones were uncovered in the alluvium by tunneling for the Metro Rail Red Line Hollywood/Vermont tunnel at a depth of 47 feet under the northwestern quadrant of the intersection of Hollywood Boulevard and Western Avenue (Hollywood/Western Station site) (Lander, 1994). The area of the site is mapped as older alluvium by Dibblee (1991).

A fossil site (LACM 1755) is present north of 12th Street between Hill and Olive Streets, just west of the Little Tokyo Station site. This site yielded horse remains at a depth of 43 feet (Jefferson, 1991). The area of the site is mapped as younger alluvium by Dibblee (1991).

Numerous other LACM fossil sites in the alluvium occur in the metropolitan Los Angeles area at greater distances south and west of the corridor (Jefferson, 1991; Miller, 1971; Reynolds, 1987; Westec Services, Inc., 1983) and include the sites at the La Brea tar pits and vicinity. These sites have yielded a diversity of extinct late Pleistocene (Ice Age) continental vertebrates, primarily large land mammals. Some of these sites occurred within 5 feet of the surface.

The land mammal remains from these sites have been critical in establishing the late Pleistocene age (Rancholabrean North American Land Mammal Age; 10,000 to 280,000 years ago; see Jefferson, 1991, 1992; Lander, 1994) and nonmarine origin of the alluvium.

Based on these fossil occurrences from the alluvium in the corridor vicinity, the alluvium within the proposed depth of tunneling and cut-and-cover excavation in the corridor is considered to have a moderate potential for containing as-yet unrecorded fossil sites and additional fossilized land mammal remains.

Additional identifiable fossil remains from the alluvium, which spans the end of the Pleistocene, would be highly important scientifically, particularly if they could be used in refining previous estimates of the age of the alluvium, documenting the depth of the Pleistocene/Holocene boundary in areas underlain by the younger alluvium, or in accurately reconstructing the climate and habitats that existed in the metropolitan Los Angeles area at the end of the Pleistocene, about 10,000 years ago. The end of the Pleistocene is marked by the world-wide extinction of most large land mammal species. Moreover, there is a potential for the recovery of remains representing rare species, geologic or geographic range extensions and/or more complete specimens for some species than have been found previously in the alluvium.

b. Lower Member, Fernando Formation

Numerous studies have reported a number of previously recorded (including California Institute of Technology; LACM; University of California, Los Angeles; U.S. National Museum) fossil sites found in the lower member of the Fernando Formation during excavation for building foundations just west of the Little Tokyo Station site. These sites were discovered at or very near the intersections of 4th Street and Broadway, 5th and Hope Streets, 5th Street and Grand Avenue, 6th and Flower Streets and 6th and Hope Streets, along Hope Street north of 6th Street and in the 3rd Street tunnel between Figueroa and Hill Streets. These sites yielded abundant remains representing a diversity of Pliocene marine megainvertebrate species, primarily snails and clams. Soper and Grant (1932) listed 167 species of marine megainvertebrates (e.g., coral, clams, snails and sea urchins), one species of marine vertebrate (shark) and one bird species from these sites. Lander (1987) reported another recorded fossil site (LACM IP-1058), which also yielded the remains of marine snails and clams, from the intersection of 7th and Hope Streets.

The fossil remains from the fossil sites in the lower member of the Fernando Formation in the Metro Red Line vicinity have been critical in establishing the Pliocene age of the member and the shallow-marine origin for the sediments comprising the member (see Soper and Grant, 1932). The composite fossil assemblage from these fossil sites suggests a cooler marine climate existed during the Pliocene than now exists along the Los Angeles County coast (Soper and Grant, 1932). The fossil assemblages from the lower member of the Fernando Formation and the underlying and overlying rock units have been critical in documenting the transition from deep-water marine to nonmarine conditions associated with the final withdrawal of the Pacific Ocean from the Los Angeles Basin during the late Miocene to late Pleistocene.

Westec Services, Inc. (1983) reported marine megainvertebrate remains (shells) from the lower member of the Fernando Formation in borings drilled for the Metro Red Line. Subsequently, abundant shells representing a diversity of marine megainvertebrate species, primarily snails and clams, were uncovered during cut-and-cover excavation of the 5th/Hill (Pershing Square) and 7th/Flower Station boxes (Lander, 1990a, 1991) and a shark tooth was found during cut-and-cover excavation of the Wilshire/Alvarado (Westlake) Station box (Lander, 1990b). Fossiliferous rock samples from a number of strata exposed during excavation of the 5th/Hill Station box yielded abundant remains representing over 240 (including many extinct) species of marine megainvertebrates. In addition, 67 species of marine vertebrates (e.g., sharks, rays, fish, turtles and seals) were also identified (Lander, 1991). The remains, primarily seeds, of land plants were also recovered. Some of the species had not been recorded previously from the lower member of the Fernando Formation and include a new species of clams (scallop), the first Pliocene record of the fish *Leurocflossus* (smoothtongue) and the Portuguese shark (*Centrosymnus coelolepis*). The occurrence of the latter species is consistent with previous inferences regarding the existence of a cooler marine climate in the Los Angeles Basin area during the Pliocene than during the Holocene.

Boring logs from the Eastside Corridor indicate the occurrence of fossil remains, including the shells of marine snails and clams, between the Union Station and the Little Tokyo Station site and from between the First/Boyle and Brooklyn/Soto Station sites (GTC, 1994). Some of the fossil-bearing strata probably will be encountered during tunneling (see GTC, 1994).

Based on these fossil occurrences from the lower member of the Fernando Formation in the corridor and vicinity, the lower member within the proposed depth of tunneling and cut-and-cover excavation in the corridor is considered to have a high potential for containing as-yet unrecorded fossil sites and additional fossilized megainvertebrate remains.

Additional identifiable fossil remains from the lower member of the Fernando Formation would be highly important scientifically, particularly if they could be used in refining previous estimates regarding the age of the member or in more accurately reconstructing the marine climate and environments that existed in the metropolitan Los Angeles area during the Pliocene, about 2 million to 5 million years ago. Moreover, there is a potential for the recovery of remains representing rare species, geologic or geographic range extensions and/or more complete specimens for some species than have been found previously in the lower member.

4-14.3.2 Impacts

No adverse impact on the paleontological resources of the corridor would occur as a result of the No-Build alternative because there would be no construction-related earth-moving activity.

Construction-related tunneling and cut-and-cover excavation for station boxes and other structures in the corridor have a moderate potential for encountering fossil remains at as-yet unrecorded fossil sites in the alluvium and a high potential for encountering fossil remains at recorded and as-yet unrecorded fossil sites in the lower member of the Fernando Formation. The accompanying disturbance and possible loss of fossil remains, fossil sites and associated geologic and geographic site data as the result of these construction-related earth-moving activities and of unauthorized fossil collecting by construction workers would be a potentially significant impact. The impacts associated with cut-and-cover excavation could be mitigated to an insignificant level by the recovery of fossil remains and associated site data from the excavation sites. Impacts associated with tunneling, however, could not be mitigated to an insignificant level because of the difficulty in recovering fossil remains and associated site data from the tunnels. As a result, unavoidable impacts would remain.

No adverse impact on the paleontological resources of the corridor would occur as a result of project operation because there would be no additional earth-moving activity.

4-14.3.3 Cumulative Impacts

Construction-related tunneling and cut-and-cover excavation for station boxes and other structures in the corridor, in combination with other past, current and future developments in the corridor vicinity, could contribute to the progressive loss of fossil remains, as-yet unrecorded fossil sites and associated geologic and geographic site data. This loss would be a significant cumulative impact. However, if project-related impacts were properly mitigated, earth-moving activities could result in beneficial effects, including the recovery of fossil remains and associated site data that would not have been recovered without the project.

4-14.3.4 Mitigation Measures

The following mitigation measures will reduce the significant adverse impacts of cut-and-cover excavation and unauthorized fossil collecting on the paleontologic resources of the corridor to an insignificant level. The measures will allow for the recovery of fossil remains and, along with associated geologic and geographic site data, for their preservation in a museum repository, where they will be available for future study by qualified investigators. These measures, however, will not reduce the impacts of tunneling to an insignificant level because of the difficulty in recovering fossil remains and associated site data. The measures will be in compliance with Society of Vertebrate Paleontology (SVP, 1991) guidelines for mitigating significant adverse construction-related environmental impacts on paleontological resources and with mitigation requirements in MTA Section 01170 ("Archaeological and Paleontological Coordination").

1. Prior to any earth-moving activity in the corridor, the services of a paleontological resource management consulting firm will be retained by the MTA to manage a paleontological resource impact mitigation program. The contracted firm will have experience in conducting similar monitoring and resource recovery programs in areas underlain by rock units containing large and small land mammal remains. Such programs will have included the excavation and proper removal of large mammal specimens and the collection and processing of large samples of fossiliferous rock for smaller vertebrate fossil remains and smaller marine megainvertebrate remains.

2. The mitigation program manager will prepare a treatment plan with a discovery clause to allow for the recovery and processing of an unusually large or productive fossil occurrence that cannot be recovered and/or processed without diverting program personnel from their own tasks. The treatment plan will specify the procedures and, if possible, the costs associated with rock sample recovery and processing or large

specimen recovery and preparation; and identification, curation and storage of such an occurrence. The discovery clause will specify when and how the treatment plan would be initiated.

3. Mitigation program personnel will meet with appropriate project personnel at each excavation site to instruct project personnel on their responsibilities and the procedures to be implemented if fossil remains are encountered, particularly when program personnel are not onsite.

4. A paleontological construction monitor will inspect cut-and-cover excavation at each excavation site on a half-time basis once excavation has encountered the alluvium below the artificial fill. If fossil remains are encountered by excavation at the site, monitoring of excavation will be increased.

5. Monitoring will consist of inspecting excavations and spoils for larger fossil remains. If larger fossil remains are encountered by excavation, the monitor will have the authority to temporarily divert excavation around the fossil site until the remains have been examined, evaluated with respect to importance and removed, if warranted, before excavation is allowed to proceed through the site. To ensure excavation is not delayed, the monitor, if warranted, will have project personnel assist in moving the remains to an adjacent location for later transport to a laboratory facility (see below).

6. The monitor will spot check the spoils generated by tunneling. If fossil remains are encountered, the rate of spot checking will be increased.

7. If the monitor is not onsite when fossil remains are encountered, excavation will be diverted around the fossil site until the field supervisor or monitor is called to the site, examines the remains, determines their importance, removes the remains if warranted and allows excavation to proceed through the site.

8. As part of the monitoring task, the monitor will test screen undisturbed sediment or spoils for smaller fossil remains. If smaller fossil remains are found by test screening, the monitor will flag the fossil site to ensure the site is not disturbed by excavation, evaluate the site by additional test screening and if determined sufficiently productive, recover a sample (not to exceed 6,000 pounds at each excavation site) of the undisturbed sediment or spoils from the fossil site for processing. To ensure excavation is not delayed, the monitor, if warranted, will have the project personnel assist in moving the sample to an adjacent location for later transport to a laboratory facility (see below).

9. Any fossil site discovered as the result of monitoring will be plotted on a map of the construction site.

10. Following the completion of monitoring at each excavation site, the program manager will develop a storage maintenance agreement with a local museum to accept the fossil collections from the corridor.

11. Any recovered fossil remains or fossiliferous rock sample will be transported to a laboratory facility for processing, preparation, identification and curation. The specimens and associated geologic and geographic site data will be accessioned into the designated museum repository for permanent storage.

12. The program manager will prepare a final report of findings summarizing the results of the mitigation program and presenting an inventory describing the scientific importance of any recovered fossil remains. The report will be submitted to the MTA and the museum repository and will signify completion of the program.

4-15 SECTION 106 COMPLIANCE

4-15.1 INTRODUCTION

Section 106 of the National Historic Preservation Act of 1966, as amended, requires that federal agencies take into account the effects of their projects on properties in or eligible for inclusion in the National Register of Historic Places. In accordance with this law and with the guidelines for its implementation promulgated by the President's Advisory Council on Historic Preservation (Council or ACHP), the Federal Transportation Administration (FTA) and the Los Angeles County Metropolitan Transportation Authority (MTA) have undertaken an analysis of historic resources that could be affected by this project.

Section 106 requires both the identification of National Register eligible properties and the application of the Criteria of Effect and Adverse Effect according to ACHP guidelines 36 CFR Part 800. Because of overlap with California Environmental Quality Act compliance, the results of the eligibility determinations are included in Chapter 4.14.1. The results of the application of the effect criteria on eligible properties is discussed below.

4-15.2 COORDINATION WITH THE STATE HISTORIC PRESERVATION OFFICE

In accordance with guidelines of the Advisory Council on Historic Preservation [36 CFR Part 800], FTA and MTA have consulted with the California State Office of Historic Preservation (SHPO) on various aspects of compliance with Section 106 for the Metro Rail project since 1983.

Compliance with Section 106 involves delineation of an Area of Potential Effects (APE). The APE was originally developed under SHPO agreement as part of the June 1983 Draft SEIS/SEIR. It was then refined after the November 1987 Draft SEIS/SEIR as part of the May 1988 Addendum. The APE definition used for the Locally Preferred Alternative (LPA) is consistent with that used in previous surveys for the Metro Rail project.

For historic and architectural resources, it includes all parcels located above off-street tunnel configurations, when the tunnel is less than 200 feet deep; and all parcels within 200 feet of any station area, cut-and-cover or open cut construction area or proposed acquisition. Whenever reasonable, property lines or street rights-of-way were used to establish the APE boundary. In cases of very large parcels or open space, a 200-foot distance (rather than the parcel limits) was used to create the APE boundaries. For archaeological resources, it is the area which would be disturbed during construction of the undertaking.

A request for determination of eligibility and finding of effect as summarized in this document have been submitted to the SHPO for review and concurrence. Similar documentation has been provided to the ACHP. Letters of concurrence from the SHPO and the ACHP are anticipated prior to distribution of the federal Final EIS and will be included as Figures 4-15.1 and 4-15.2.

4-15.3 IDENTIFICATION OF HISTORIC PROPERTIES

A complete description of background research and field investigation results are contained in the *Request for Determination of Eligibility Report* completed for this project.

FIGURE 4-15.1
LETTER OF CONCURRENCE FROM THE SHPO

To be included upon receipt from State Historic Preservation Officer.

FIGURE 4-15.2
LETTER OF CONCURRENCE FROM THE ACHP

To be included upon receipt from Advisory Council on Historic Preservation.

For the LPA, the historic architectural survey evaluated 42 significant individual resources and one district within the APE. One building is still listed in the National Register of Historic Places. One property was previously listed in the National Register, but a partial demolition precipitated its decertification. Two structures were previously determined eligible for the National Register as part of the Caltrans Historic Bridge inventory. As a result of this survey, eighteen properties (including the remaining building on the previously listed property) were found to appear to meet the criteria for listing in the National Register and two buildings were found conditionally eligible. One district and twenty other properties were found not to meet the criteria for listing in the National Register. All other remaining buildings, structures and objects within the APE have either lost substantial integrity of their historic fabric through alteration or relocation, or are less than 50 years of age, and possess no other overriding significance. The historic properties requiring compliance with Section 106 are listed below. Additional information about ineligible properties is included in Chapter 4.14.1.

- <u>Historic properties previously listed in the National Register</u>

    - Union Passenger Terminal, 800 North Alameda Street, Los Angeles (Map Reference #1), one of the last great American railroad depots, was listed on November 13, 1980. Its Spanish Colonial Revival and Streamline Moderne design was by the prominent Los Angeles architectural firm of John and Donald B. Parkinson.

- <u>Historic properties formerly listed in the National Register</u>

    - Golden Gate Theatre, 5170-5188 Whittier Boulevard, East Los Angeles, Unincorporated Los Angeles County (Map Reference #42), was formerly listed in the National Register with its companion Vega Building, but was decertified after the Vega Building was demolished in 1992. The remaining theater building appears eligible in its own right (See *Appears Eligible* listings.

- <u>Historic properties previously determined eligible for listing in the National Register through a consensus determination by a federal agency and the State Historic Preservation Officer.</u>

    - First Street Viaduct, 900-1100 Blocks of East 1st Street, Los Angeles. This Neo-Classical style bridge engineered by Merrill Butler in 1927-28 was determined eligible for inclusion in the National Register in 1986 as a result of the Caltrans Historic Bridge Survey.

    - Fourth Street Viaduct, 900-1700 Blocks of East 4th Street, Los Angeles. The Fourth Street Viaduct was determined eligible for inclusion in the National Register of Historic Places in 1986 as a result of the Caltrans Historic Bridge Survey. The Gothic Revival style bridge utilizes an unusual fixed hinge design, was the first to use cast aluminum lanterns. Engineered by Merrill Butler, it was constructed in 1930-31 by Fisher, Ross MacDonald & Kahn, Inc. and the Raymond Concrete Oil Co.

- Historic properties found to appear eligible for listing in the National Register as a result of this survey and requiring a consensus determination from the State Historic Preservation Officer.

  - Greybar Electric Co. Warehouse, 201-213 South Santa Fe Avenue, Los Angeles, at the local level of significance under Criterion C, as a good example of an Art Deco and PWA Moderne style commercial office building designed by Harry T. Miller. Built in 1934, its contextual period of significance is 1930-1945.

  - Craig Co. Wholesale Grocery, 215-243 South Santa Fe Avenue, Los Angeles, at the local level of significance under Criterion C, as a rare example of an industrial warehouse designed by the master architectural firm of Morgan & Walls. Built in 1907, its contextual period of significance is 1893-1913.

  - AT&SF Outbound Freight House, 970 East 3rd Street, Los Angeles, at the local level of significance under A with its association with the development of the Atchison, Topeka & Santa Fe Railway in Los Angeles, and under Criterion C, as one of the last extant examples of a railroad freight shed in Los Angeles, for its Neoclassical design by Harrison Albright, and for its concrete craftsmanship by Carl Leonardt. Built in 1906, its contextual period of significance is 1894-1913.

  - Simon Gless Farm House, 131 South Boyle Avenue, Los Angeles, at the local level of significance under Criterion C as a good example of a Queen Anne style farmhouse and under Criterion A for its association with the settlement patterns of the Jewish Community by serving as the first Jewish Home for the Aged in Boyle Heights. Originally built in 1886-1887, its contextual periods of significance are the 1887-93 boom period and from about 1910 to 1922.

  - Jewish Home for Wayfarers, 127 South Boyle Avenue, Los Angeles, at the local level of significance under Criterion A, for its association with the settlement patterns of the Jewish Community in Los Angeles. Built in 1938, its contextual period of significance is 1930-1945.

  - Walter & Lillie Webb Residence, 125 South Boyle Avenue, Los Angeles, at the local level of significance under Criterion C, as a good example of a Shingle Style residence with Queen Anne and Classical Revival details, designed by early Los Angeles master architect James H. Bradbeer. Built in 1892, its contextual period of significance is the 1880s boom, roughly 1886-1893.

  - Hotel Mount Pleasant, 103-105 North Boyle Avenue, Los Angeles, at the local level of significance under Criterion A for its association with the early commercial development of Los Angeles as a grocery (1876) and hotel (1894); under Criterion B for its association with several Los Angeles pioneers, grocers Lambourn & Turner and Boyle Heights developer George Cummings; and under Criterion C, as an increasingly rare example of a Queen Anne and Richardsonian Romanesque style commercial building featuring cast iron supports. Its period of significance from 1876 to 1898 is related to its construction history in stages and development from a grocery to hotel.

- Ralph H. Tombs Residence, 1814 Pennsylvania Avenue, Los Angeles, at the local level of significance under Criterion C, as a good example of a hipped roof cottage with Colonial Revival details. Built about 1900, its contextual period of significance is 1893-1913.

- Congregation Talmud Torah, 247 North Breed Street, Los Angeles, at the local level of significance under Criterion A for its association with the settlement patterns of the Jewish community in Los Angeles and as one of the locations for the filming of the first sound film, The Jazz Singer; and under Criterion C, as a rare example of a Byzantine Revival Influence synagogue design by Abraham Edelman & A. C. Zimmerman. Built in 1922, its contextual period of significance is 1914-1929. It has also been designated as City of Los Angeles Historic-Cultural Monument #359.

- Alfred W. Guest Cottage, 319 North Mathews Street, Los Angeles, at the local level of significance under Criterion C, as a good example of an early settlement era, vernacular, hipped-roof cottage. Built about 1885, its contextual period of significance is 1848-1884.

- Rev. Edwin S. Chase Residence, 2423 Michigan Avenue, Los Angeles, at the local level of significance under Criterion C, as a good example of a late nineteenth century cottage, for its high degree of craftsmanship by builder E. E. Harriman, its unusual curved interior porch wall, and its exceptionally high retention of integrity and excellent condition for a residence in Los Angeles nearly a century old. Built in 1896, its contextual period of significance is 1893-1913.

- Brooklyn Theatre, 2524 Brooklyn Avenue, Los Angeles, evaluated in the Historic Resources Inventory of the State Office of Historic Preservation as level 3, appearing eligible for inclusion in the National Register of Historic Places. This Classical Revival style theater was designed by L. A. Smith. Built in 1925, its contextual period of significance is 1914-1929.

- Charles W. Fisher Residence, 334 North Fickett Street, Los Angeles, at the local level of significance under Criterion C, as a good example of a Tudor Revival style residence and for the quality of its design early in the career of one of Southern California's most influential architects, Arthur B. Benton, when Benton was still in association with W. C. Aiken. Built in 1894, its contextual period of significance is 1893-1913.

- Evergreen Cemetery/Ivy Chapel, 204 South Evergreen Street, Los Angeles, at the state level of significance under Criterion A for its association with the early development of public health practices in Los Angeles, as well as the development of local assimilation of the Chinese community. Also under Criterion C, as a good example of an early cemetery and quality of designs of its mausoleums, crematorium and the Gothic Revival Chapel designed by Arthur B. Benton in 1903. Laid out in 1877, its period of significance spans several contextual periods from 1848 to 1929. It has also been designated as City of Los Angeles Historic-Cultural Monument #496.

- o Siewert/Johnson Mortuary, 3827 Whittier Boulevard, East Los Angeles, Unincorporated Los Angeles County, at the local level of significance under Criterion C, as a rare example of the Streamline Moderne style with Gothic Revival details designed for use as a mortuary. Its period of significance is 1930-1945.

- o Boulevard Theatre, 4549 Whittier Boulevard, East Los Angeles, Unincorporated Los Angeles County, at the local level of significance under Criterion C, as a good example of a Moderne style Theater designed by Balch & Stanberry. Built in 1935, its contextual period of significance is 1930-1945.

- o United Artists Theatre, 5136 Whittier Boulevard, East Los Angeles (Unincorporated), at the local level of significance under Criterion C, as an increasingly rare example of a Zig Zag Moderne style theater designed by the prominent Los Angeles architectural firm of Walker & Eisen in association with C. A. Balch. Built in 1931, its contextual period of significance is 1930-1945.

- o Golden Gate Theatre, 5170-5188 Whittier Boulevard, East Los Angeles, Unincorporated Los Angeles County, formerly listed in the National Register until its companion Vega Building was demolished in 1992, the Golden Gate Theatre remains eligible at the local level of significance under Criterion C, as an excellent example of a Spanish Churrigueresque theater building designed by the Balch Brothers. Built in 1927, its contextual period of significance is 1914-1929.

- Historic properties found to be conditionally eligible for listing in the National Register as a result of this survey pending reversal of alteration.

    - o Luna & Harry Patty Residence, 2533 Michigan Avenue, Los Angeles, if its original windows or period facsimiles were replaced, it would appear eligible at the local level of significance under Criterion C, as a fine example of a Queen Anne residence. Built in 1891, its contextual period of significance is the 1880s boom, roughly 1886-1893.

    - o 2-Story, Shingle/Queen Anne Residence, 118 South Alma Avenue, East Los Angeles, Unincorporated Los Angeles County, if its original windows or period facsimiles were replaced and bay restored, it would appear eligible at the local level of significance under Criterion C (Potentially), as a good example of a Shingle/Queen Anne style residence. Its period of significance is the 1880s boom period, roughly 1886-1893.

4-15.4 APPLICATION OF THE CRITERIA OF EFFECT

Any effects on historic properties listed in or determined eligible for the National Register must be reviewed for compliance with Section 106 using the rules and regulations found in 36 CFR Part 800 regarding criteria of effect and adverse effect. These criteria were developed by the Advisory Council on Historic Preservation and are defined as follows:

Criterion of Effect:

"An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting or use may be relevant depending on a property's significant characteristics and should be considered." [Section 800.9(a)]

Criteria of Adverse Effect:

"An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association. Adverse effects on historic properties include, but are not limited to:

(1) Physical destruction, damage, or alteration of all or part of the property;

(2) Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;

(3) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;

(4) Neglect of the property resulting in its deterioration or destruction; and

(5) Transfer, lease, or sale of the property." [Section 800.9 (b)]

Applicable exceptions to the Criteria of Adverse Effect are as follows:

"Effects of an undertaking that would otherwise be found to be adverse may be considered as being not adverse for the purpose of these regulations:

When the undertaking is limited to the transfer, lease or sale of historic property, and adequate restrictions or conditions are included to ensure preservation of the property's significant historic features." [Section 800.9(c)]

4-15.4.1 Finding of No Effect

The project is in a tunnel configuration in the vicinity of the historic properties listed below. The depth of the tunnel (from top of rail to ground surface) would generally range from 45 feet as it passes under the Los Angeles River to approximately 110 feet as it passes under State Route 60 (Pomona Freeway). As a result of the tunnel depth and boring techniques, there will be no surface construction activity in the vicinity of these historic properties thereby precluding any physical damage, destruction, or alteration; the subsurface configuration also precludes the possibility of the introduction of visual elements; and, proposed special resilient rail fasteners and floating slab trackbed would mitigate audible elements, namely groundborne noise and vibration, to insignificant levels (Section 4.8.4). The remaining Criteria of Adverse Effect regarding neglect and transfer, lease, or sale are not applicable for the portions of the project in tunnel configuration and outside station area construction activity. Historic properties for which the project would have no effect because of its subsurface configuration are:

- o Union Passenger Terminal, 800 North Alameda Street, Los Angeles
- o First Street Viaduct, 900-1100 Blocks of East 1st Street, Los Angeles
- o Fourth Street Viaduct, 900-1700 Blocks of East 4th Street, Los Angeles
- o Congregation Talmud Torah, 247 North Breed Street, Los Angeles
- o Shingle/Queen Anne Residence, 118 South Alma Avenue, East Los Angeles
- o Mortuary, 3827 East Whittier Boulevard, East Los Angeles

A open-cut station will be constructed in the vicinity of the historic properties listed below. No acquisition of any historic property would be required, therefore no physical destruction, damage or alteration would occur. The station boxes will be closed following construction, therefore the property would not be isolated or permanent alteration of its setting. The design of the new station entrance will conform to the guidelines specified in the November 1983 Memorandum of Agreement for this project, therefore the introduction of visual elements would be compatible; significant audible construction noise and vibration would be temporary; operational vibration effects would be negligible based on the proposed mitigation of special resilient fasteners or floating slab trackbed; any atmospheric elements would only be generated during construction activity and would be temporary; no neglect, transfer, lease or sale of any of the history properties below would occur as a result of this undertaking. Therefore, there would be no permanent effect on any of the historic properties below.

- Little Tokyo Station
  - o Greybar Electric Co. Warehouse, 201-213 South Santa Fe Avenue, Los Angeles
  - o Craig Co. Wholesale Grocery, 215-243 South Santa Fe Avenue, Los Angeles
- First/Boyle Station
  - o Simon Gless Farm House, 131 South Boyle Avenue, Los Angeles
  - o Hotel Mount Pleasant, 103-105 North Boyle Avenue, Los Angeles
  - o Ralph H. Tombs Residence, 1814 Pennsylvania Avenue, Los Angeles
- Brooklyn/Soto Station
  - o Alfred W. Guest Cottage, 319 North Mathews Street, Los Angeles
  - o Luna & Harry Patty Residence, 2533 Michigan Avenue, Los Angeles
  - o Charles Fisher Residence, 334 North Fickett Street, Los Angeles
- First/Lorena Station
  - o Evergreen Cemetery & Ivy Chapel, 204 South Evergreen Street, Los Angeles
- Whittier/Arizona Station
  - o Boulevard Theatre, 4549 East Whittier Boulevard, East Los Angeles

- Whittier/Atlantic Station

  - United Artists Theater, 5136 East Whittier Boulevard, East Los Angeles

4-15.4.2 Finding of No Adverse Effect with Conditions

The effects of the undertaking would be limited to the transfer, lease, or sale of the following historic properties. Adequate restrictions or conditions to ensure preservation of each property's significant historic features have been included in stipulations to the Memorandum of Agreement for this project for buildings to be temporarily moved, and in a preservation covenant for properties to be acquired but not altered.

These stipulations and covenants are currently under review by the SHPO as part of the consultation process with MTA. Summary documentation has also been submitted to the ACHP for its review and comment. These findings would complete the Section 106 process for the LPA.

Pending SHPO concurrence and no objection from the ACHP, the effects of the undertaking on the following properties would be *No Adverse Effect* according to the conditions set forth in 36 CFR 800.9(c)(3):

- 5 AT&SF Outbound Freight House, 970 East 3rd Street, Los Angeles [Acquisition and No Alteration--Little Tokyo Station: Options 1 and 2]

- 9 Jewish Home for Wayfarers, 127 South Boyle Avenue, Los Angeles [Acquisition and temporarily move off lot during construction]

- 10 Walter & Lillie Webb Residence, 125 South Boyle Avenue, Los Angeles [Acquisition and temporarily move off lot during construction]

- 27 Brooklyn Theatre, 2524 East Brooklyn Avenue, Los Angeles [Acquisition and No Alteration]

- 42 Golden Gate Theatre, 5170-5188 East Whittier Boulevard, East Los Angeles [Acquisition and No Alteration]

a. AT&SF Outbound Freight House, 970 East 3rd Street, Los Angeles

- Description and Significance of Property with a Finding of No Adverse Effect

The Atchison, Topeka and Santa Fe Railway Outbound Freight House, located at the southwest corner of 3rd Street and Santa Fe Avenue, was built in an elongated rectangular plan to facilitate loading of railway cars. It is 1260 feet in length and 40 feet in width, with an additional 10 foot width of overhang above the Santa Fe Avenue loading area. The office portion at the 3rd Street end is 2 stories in height for a distance of 180 feet, and the balance of the building is one story in height. The reinforced concrete building features a steel-truss shed roof supported on steel posts. It is essentially utilitarian in design, with the Santa Fe Avenue facade relentlessly punctuated with loading door openings, each protected by steel roll down doors. Apparent alterations to the structure have been replacement of all windows and some of these doors,

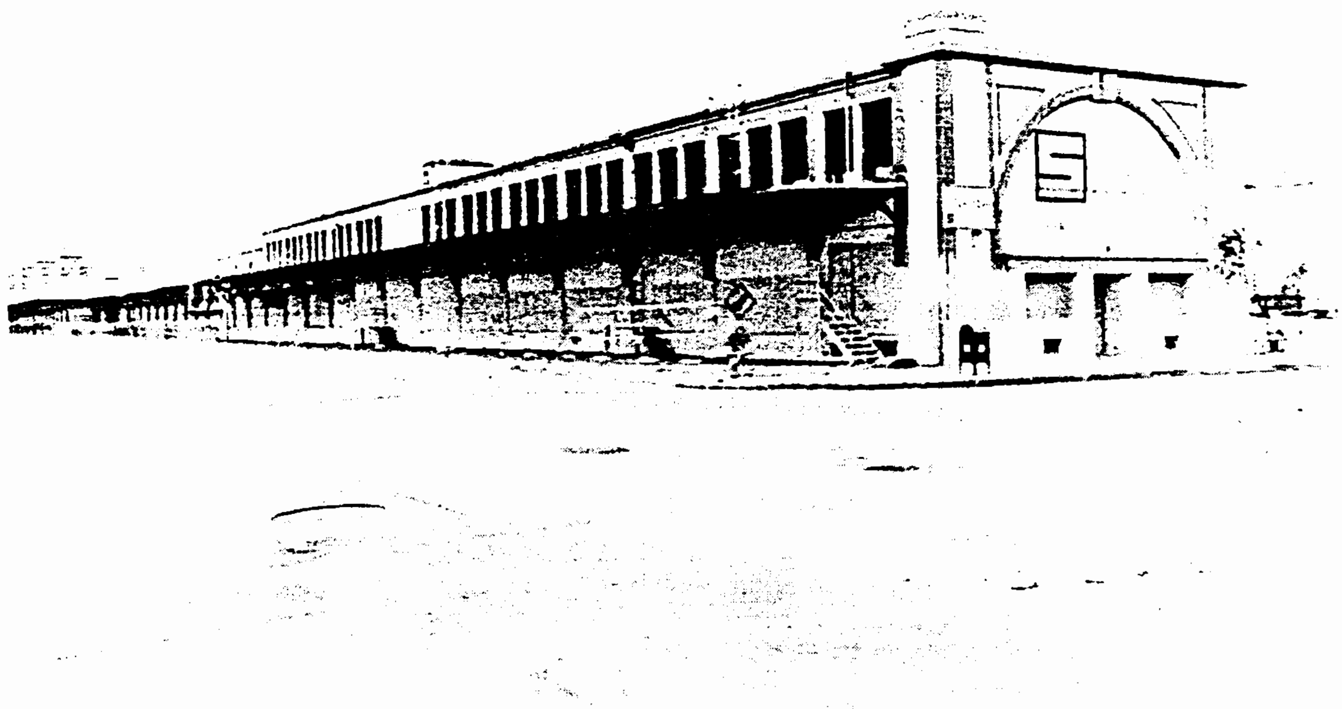


Figure 4-15.3: Atchison, Topeka & Santa Fe Railway Outbound Freight House, 970 East 3rd Street, Los Angeles.

particularly along the north end, with cinder block enclosures. The only architecturally distinct features occur at the 3rd Street, or north, facade where the office was originally located. Here a Neoclassical design of arch with keystone and narrow cornice has accentuated the otherwise plain concrete wall surface.

The Atchison, Topeka & Santa Fe Railway Outbound Freight House was constructed in 1906 to accommodate the majority of goods shipped out of Los Angeles on rail by AT&SF. AT&SF commissioned architect Harrison Albright to design the building and contracted reinforced concrete specialist Carl Leonardt to build it for an estimated cost of $150,000. The structure appears to have retained its architectural integrity with the exception of the filling of several of its loading docks with cinder blocks. It was originally paired with the now demolished AT&SF Railway Inbound Freight House directly across Santa Fe Avenue. It now stands as the last remaining historic reference to the AT&SF Railway along Santa Fe Avenue in Los Angeles since the Moorish Revival Santa Fe La Grande Depot at the northeast corner of 3rd and Santa Fe was demolished in 1946 and the roundhouse at the northeast corner of 4th and Santa Fe has also been razed. It would appear to be eligible for the National Register under Criterion A for its association with the Atchison, Topeka & Santa Fe Railway and the development of railroad operations in Los Angeles and also under Criterion C on the condition that its integrity be restored, because it is one of Harrison Albright's last extant designs in Los Angeles, for the quality of its construction by Carl Leonardt, and as one of the last extant railroad freight sheds in Los Angeles.

Architect Harrison Albright (1866-1933) enjoyed a brief but successful career in Los Angeles during the early part of the twentieth century, with large commissions also completed in San Diego. Educated at the Pierce College of Business Spring Garden Institute, Philadelphia, he began his practice in that eastern city and Ogontz, PA from 1886 to 1891, and then in Charlestown, West Virginia until 1905. At Charlestown he designed the Capitol Annex, Marshall College dormitory and Library Annex and four buildings at the West Virginia State Insane Asylum at Huntington, W. Va. In 1905, he established himself in Los Angeles and practiced here until retirement in 1925. His best known works in Los Angeles were: the Citizen's National Bank Building (1905) at the southwest corner of 3rd and Main; the Homer Laughlin Building Annex now known as the Grand Central Market; the Clark Hotel (1912) at 412-426 South Hill Street; and the Consolidated Realty Building (1907-00) at the southwest corner of 6th and Hill. For commissions built in San Diego, he designed the U. S. Grant Hotel (National Register), the Public Library, Tinkham and Union Office Buildings for John D. Spreckels, and Spreckels own mansion at Coronado Beach. Albright also designed many buildings for Atchison, Topeka and Santa Fe Railway, included roundhouses and freight stations in several cities, and the passenger station in Ash Forks, Arizona.

Carl Leonardt was perhaps Los Angeles's most prominent contractor from the early 1890s until about 1920, and was without peer among reinforced concrete specialists. Born in Germany in 1855, he received his schooling in cement chemistry in that country. He arrived in Los Angeles in 1887, just prior to recognition of the advantages of reinforced concrete construction. Carl Leonardt's expertise and ingenuity in reinforced concrete construction ushered Los Angeles into a new age of building techniques and helped shape that city's growth and expansion into a major metropolitan area. Leonardt was awarded most of the major concrete commissions at that time, including Hamburger's Department Store (later May Company) at 8th and Hill; the Orpheum Theater on Broadway; LA County General Hospital; the old Hall of Records; Van Nuys Hotel at 4th and Main; Pacific Electric Railway Building at 6th and Main; and much of the cities infrastructure including bridges and sidewalks. Outside Los Angeles, he constructed the U. S. Grant Hotel in San Diego (National Register) and the Hotel Green in Pasadena.

- Application of Exceptions to Criteria of Adverse Effect

The MTA is proposing to acquire the parcel at the southwest corner of Santa Fe Avenue and Third Street adjacent to the Little Tokyo Station which would be located under Santa Fe Avenue. The parcel consists of 9.8 acres, most of which is currently vacant except for the AT&SF Outbound Freight House which extends for over 1200 feet from Third Street to Fourth Street on the eastern edge of the property and fronting on Santa Fe Avenue. The MTA would use the vacant portion of this parcel as a storage and laydown area for the contractor constructing the Little Tokyo Station and adjoining tunnel segments.

There are two options for a station entrance. Under Option 1 of the Little Tokyo Station, the AT&SF Outbound Freight House would be acquired, and the station entrance would be located adjacent to the west (rear) of the historic building. To provide passenger access to the station, a tunnel would be dug under the historic building to the station under Santa Fe Avenue. Construction of the passenger access tunnel will be undertaken in such a way that it would not damage or cause the alteration of the AT&SF Outbound Freight House. The contractor would be required to confine all construction traffic to a safe distance from the AT&SF Outbound Freight House to avoid accidental damage. The design of the new station entrance will conform to the guidelines specified in Part IV.A. of the November 1983 Memorandum of Agreement.

Option 2 of the Little Tokyo Station would also acquire the AT&SF Outbound Freight House property, and use the vacant portion of the parcel to the rear of the building as a temporary construction lay-down area, but in this option the station entrance would be located across (east of) Santa Fe Avenue in the Metro Rail yard. There would be no need to demolish or alter any portion of the historic building. The contractor would be required to confine all construction traffic to a safe distance from the AT&SF Outbound Freight House to avoid accidental damage.

For both options, the conditions regarding transfer, lease, or sale of the AT&SF Outbound Freight House have been detailed in a series of preservation stipulations and covenants pending SHPO concurrence.

b. Jewish Home for Wayfarers, 127 South Boyle Avenue, Los Angeles

- Description and Significance of Property with a Finding of No Adverse Effect

This two-story frame and stucco building features some unusual Moderne detailing to accentuate the Boyle Avenue elevation. Most dramatic are the use of fluted piers: a pair reaching two-story height at the corners; a broad pair extending a single-story in height and acting as an entrance surround; and a narrow pair in the second story, just above the centrally located main entrance. The regularly spaced second-story windows have a vertical emphasis and are a casement type with transom above. The central window of the second story features a unique opening design with a single Deco influence triangular peak. The roof line above this window peak re-emphasizes the design by a slight parapet between the piers. The entire composition is topped by an unusual relief course of inverted curved waves, alternating in size and giving the effect of a fully open, scalloped, theatrical curtain. The building is a simple rectangle in plan, housing a total of fourteen units. It appears to have undergone only minimal alterations to the exterior, in the form of easily reversible security bars and a Regency style awning.

The Jewish Home for Wayfarers was constructed in 1938 as a hotel/nursing home for temporary occupants drawn to the then large Jewish population of Boyle Heights. The building was constructed for an estimated cost of $20,000 by H. Freeman according to a Moderne design by David C. Coleman, with Joseph Goldberg serving as the Home's agent. The Jewish Home for Wayfarers was established in October 1928 in Los Angeles by Dr. George J. Saylin. Until 1928, indigent Jewish transients were housed at the Jewish Sheltering Home for the Aged at 4th and Boyle. In addition to housing, the Home provided clothing, employment service and medical attention. Jacob Simon was its first president and Hyman Finerman was president in 1938 when this building, the organization's first non-temporary shelter, was erected. Changes in demographics in Boyle Heights are reflected in the primary tenants using this building. In the mid 1940s-1950s it was owned by the White Memorial Hospital and used as a "rooming house".

In the 1970s-1986 the building was known as the "Caballeros de Dimas-Al Ang Building" and was used by the predominantly Spanish population. In 1986 it was purchased by a Japanese family, and became the Japanese Home for the Aged. Although the Moderne design elements are unusual, the building should be considered for inclusion in the National Register under

Figure 4-15.4: Jewish Home for Wayfarers, 127 South Boyle Avenue, Los Angeles.

Criterion A, for its association with the history of the Jewish population in Los Angeles and as evidence of the demographic changes in the Boyle Heights Community.

- Application of Exceptions to Criteria of Adverse Effect

The cut-and-cover construction of the First and Boyle Station would require acquisition of this property, a temporary move of the building off the lot during construction activities, and a return to its original setting after construction of the station is completed. Construction may require grading of part of the property, however, the site topography will be returned to its original condition before the building is returned.

The MTA, acting on behalf of the FTA, shall ensure that the property is moved in accordance with the approaches recommended in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History), in consultation with the SHPO, by a professional mover who has the capability to move historic structures properly. The MTA shall ensure that the Jewish Home for Wayfarers is properly secured and protected from vandalism and weather damage during the period it is unoccupied.

The conditions regarding transfer, lease, or sale of the Jewish Wayfarer's Home following construction have been detailed in a series of preservation stipulations and covenants pending SHPO concurrence.

c. Walter & Lillie Webb Residence, 125 South Boyle Avenue, Los Angeles

- Description and Significance of Property with a Finding of No Adverse Effect

This one-and-one-half-story Shingle style residence, which also incorporates Queen Anne and Classical Revival features, was built in a rectangular plan. The main facade features a dominant front-facing gable with gambrel peak and an offset porch area accentuated by an ornamented pediment. The "triangular" appearance of the main facade, characteristic of the Shingle style, is further emphasized by the size of windows and their placement at the various levels; large voids at the extremities of the entrance level, three evenly spaced moderate width windows on the second floor and a pair of vertically oriented vent openings just below the peak. Fixed transom windows are located above the picture windows and door at the ground floor level. Two Queen Anne cutaway bay windows are located at the southeast corner of the main facade and at the northern facade. Decorative features include the slender wooden porch supports, spindlework porch railing, sunburst motif in the knee braces and modillions under the roof overhangs. The exterior wall surface is covered with narrow clapboard siding. The building has been altered by the addition of security bars to the windows and doors, a dormer, a rear unit and concrete porch flooring. A four-foot high plaster wainscoting was added to the exterior wall surface.

The residential building located at 125 S. Boyle Avenue was originally built as a single family dwelling for Walter L. and Lillie T. Webb in 1892. Walter L. Webb was a partner in a series of engraving and stationery firms, including Hanna & Webb, Weadon & Webb and the Webb-Peckham Company. In 1897 he served as a member of the Board of Education. The Webbs commissioned Los Angeles architect J. H. Bradbeer to design their house and it was constructed at a cost of $1,900. By 1900, the assessed improvement value of the property had depreciated to $450 but by 1902 increased by $250, probably due to the rear addition. The building appears eligible for the National Register under Criterion C, because: it embodies the characteristics of the Shingle style, an increasingly rare style in Los Angeles; it is the work of a master architect, James H. Bradbeer; and it has retained its integrity. Bradbeer designed many important residences in Los Angeles at the end of the nineteenth century, in the Moorish Revival style for Charles Boothe (1893) at 824 S. Bonnie Brae and in the Queen Anne style for Frank Finlayson (1892) at 1981 Bonsallo and Helen Kimball (1895) at 1016 W. 23rd. His designs with Ferris include: the Queen Anne/Shingle style Farmdale School (1894), now at 2839 Eastern Ave.; Governor Stephens Mansion (1892), 1146 W. 27th; De Paun House (1894), 1120 W. 27th; Randolph Miner House (1898), 2301 Scarff; Earnest Bruck Residence (1895), 1038 W. 24th; George Deming House (1895), 1042 W. 24th; and two L.A. monuments (1893-94), at 2653 (the Cockins House) and at 2703 S. Hoover.

Figure 4-15.5: Walter & Lillie Webb Residence, 125 South Boyle Avenue, Los Angeles

- Application of Exception to Criteria of Adverse Effect

The cut-and-cover construction of the First and Boyle Station would require acquisition of this property, a temporary move of the building off the lot during construction activities, and a return to its original setting after construction of the station is completed. A blast relief shaft would be permanently located in the front of the Webb Residence property. A blast relief shaft consists of a grating set flush to the ground and has no above-ground vertical elements. It will be placed in an unobtrusive location, probably the sidewalk, and will not alter the characteristics of the property which qualify it for inclusion in the National Register of Historic Places. If the blast relief shaft must be located on the property, it will be designed in accordance with Part IV. B. of the November 1983 Memorandum of Agreement.

The MTA, acting on behalf of the FTA, shall ensure that the property is moved in accordance with the approaches recommended in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History), in consultation with the SHPO, by a professional mover who has the capability to move historic structures properly. The MTA shall ensure that the Webb Residence is properly secured and protected from vandalism and weather damage during the period it is unoccupied.

The conditions regarding transfer, lease, or sale of the Webb Residence following construction have been detailed in a series of preservation stipulations and covenants pending SHPO concurrence.

d. Brooklyn Theatre, 2524 Brooklyn Avenue, Los Angeles

- Description and Significance of Property with a Finding of No Adverse Effect

This two-story theater, lofts and apartment building was originally designed in a Renaissance Revival style, but has undergone significant alterations, particularly to the first floor store windows. The exterior walls are constructed of brick and in a 130 x 150 foot rectangular plan. The roofline and fenestration of the second floor emphasize the separation of function within the building. The smaller, western portion of the north elevation features a pair of rectangular windows recessed within an arrangement of a curved hood molding supported on capitals, with a cartouche above the window. The western portion is topped by a bracketed frieze with heavily ornamented plasterwork. The eastern portion of the north elevation purposely lacks any sense of curvature, with the window openings immediately topped by a bracketed frieze, only with minimal ornamentation in the form of a central cartouche and medallions in the outer panels. The ground floor frontage has been altered nearly beyond recognition. In another apparent alteration to the eastern portion, the original marquee was removed, thereby exposing the sloped back nature of the roof on this side. The building was sandblasted in 1954, and the brick repainted.

The Brooklyn Theatre located at 2524 Brooklyn Avenue in the Boyle Heights neighborhood of Los Angeles was evaluated in the Historic Resources Inventory of the State Office of Historic Preservation as appearing eligible for inclusion in the National Register of Historic Places. It was designed for West Coast Theaters, Inc. by L. A. Smith, and constructed in 1925 by David Lazar for an estimated construction cost of $50,000. The building originally housed stores and apartments, in addition to the theater. It has undergone significant alterations, including removal of the original marquee in 1948 and sandblasting in 1954. The addition to the rear of the theatre, originally built on a different lot but now on the same parcel, does not contribute to the theatre's eligibility. Architect L. A. Smith was noted throughout the 1920s for his numerous designs of motion picture theaters in many neighborhoods in the greater Los Angeles area, including: the Beverly Theatre (1925) at 206 N. Beverly Drive, Beverly Hills; the Rialto Theatre (1925), at the northwest corner of Fair Oaks Avenue and Oakley Street, South Pasadena; the Vista Theatre (1923) at 4451 Sunset Boulevard, Silver Lake; the Highland Theatre (1924), 5600 Pasadena Avenue, Highland Park; the Taber Theater (1924) 2615 Temple Street, Echo Park; the Bard Theater (1925), 4409 West Adams Boulevard; the Manchester Theatre (1925), 316 W. Manchester Avenue; the Uptown Theatre (1925), 3272 W. Olympic Boulevard; Belmont Theatre (1925) 128 S. Vermont, Bimini Hot Springs and; many others for the West Coast Theaters, Inc. and Hollywood Theaters, Inc. chains.

- Application of Exception to Criteria of Adverse Effect

The construction of the Brooklyn/Soto Station would require acquisition of this property for a construction shaft on the rear 44 feet of this 150 foot parcel. The depth of the Brooklyn Theatre building is only 70 feet, so that the construction shaft would be 20 feet from its rear wall, and would not result in its alteration. A non-historic building located on the same parcel to the rear

Figure 4-15.6: Brooklyn Theatre, 2524 East Brooklyn Avenue, Los Angeles.

of the theater would, however, be demolished. The contractor would be required to confine allsubsequent construction traffic to a safe distance from the *Brooklyn Theatre* to avoid accidental damage.

The conditions regarding transfer, lease, or sale of the Brooklyn Theatre following construction have been detailed in a series of preservation stipulations and covenants pending SHPO concurrence.

e. Golden Gate Theatre, 5170-5188 East Whittier Boulevard, East Los Angeles

- Description and Significance of Property with a Finding of No Adverse Effect

The Golden Gate Theatre is an outstanding example of the Spanish Churrigueresque style of architecture, made all the more imposing by the sheer verticality of the main facade. The entrance to the theatre is contained within three contiguous arched openings, all set within a slightly projecting central bay. A heavily rusticated base is located on either side of the entrance area. A course of Churrigueresque ornament crowns the top of the rusticated base; a series of half-round narrow piers are then thrust upward; and are crowned in turn by another course of even more elaborate Churrigueresque ornament. The protruding entrance bay features a

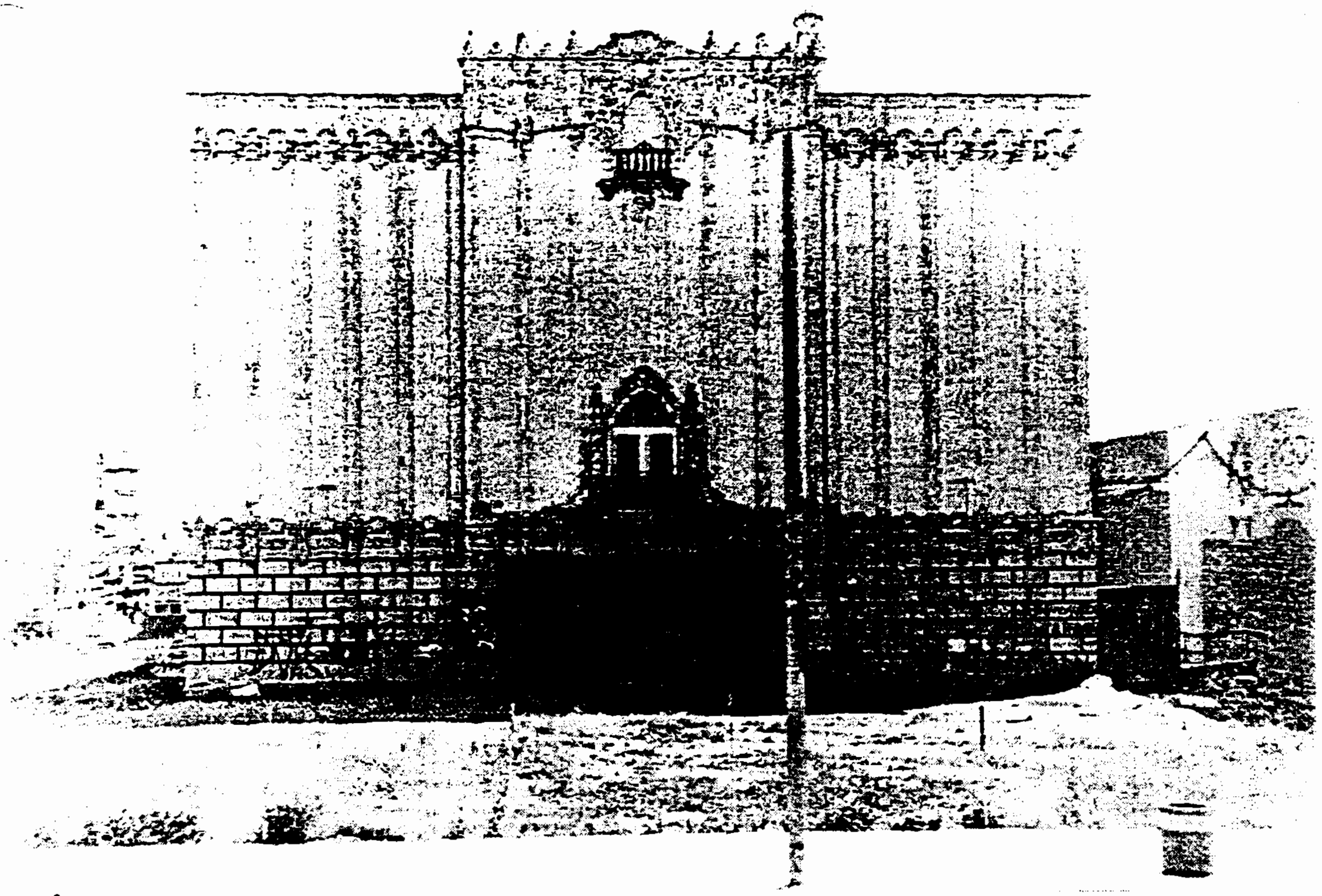


Figure 4-15.7: Golden Gate Theatre, 5170-5188 East Whittier Boulevard, East Los Angeles.

balcony above the entrance with Churrigueresque surrounds, and a corresponding niche just below the roofline. The roofline itself, particularly the entrance bay, is dominated by a wide course of Churrigueresque ornament, with finials projecting above. The building is virtually devoid of ornament along the sides, probably because of its original courtyard orientation within the Vega Building, however the dramatic mass and sheer verticality of the Whittier Boulevard (north) elevation more than compensates for this lack.

The Golden Gate Theatre was formerly listed on the National Register of Historic Places along with its companion retail stores--The Vega Building. The Vega Building was damaged by the 1987 Whittier earthquake and was demolished in 1992, leaving only the detached theater building on the property. This remaining portion, however, still appears eligible for inclusion in the National Register under Criterion C, as it embodies the characteristics of the Spanish Churrigueresque style and because its design possess high artistic values. Gebhard & Winter did not qualify their remarks about the Golden Gate Theatre when they wrote in 1985: "The entrance to the theater is one of the finest examples of the Spanish Churrigueresque to be found in Southern California." It was designed for the Vega Corporation in 1927, by the Balch Brothers who were also responsible for the design of the apartments for Edward C. Williams at 920 South Hobart (1927) and the Gore Market at 4315-41 Beverly Boulevard (1930). The subsequent partnership of Balch and Stanbury designed the El Rey Theatre at 5519 Wilshire Boulevard (1928); the Fox Theatre, Pomona (1931); the Boulevard Theatre, 4549 Whittier Boulevard; the Metro Goldwyn Mayer Film Exchange Building at 1620 Cordova Street (1929); and the Powell Apartments at 520 South Hobart Blvd. (1928).

- Application of Exception to Criteria of Adverse Effect

The construction of the Whittier/Atlantic Station would require permanent acquisition of the entire block located between Whittier Boulevard, Atlantic Boulevard, Woods Avenue and Louis Place, which includes the Golden Gate Theatre parcel. No demolition or alteration of the Golden Gate Theatre is required for the construction of the station. Although plans are not finalized, a four- to six-story parking garage may be built adjacent to the theater at some time in the future, as well as potential joint development commercial facilities. Any facilities built adjacent to the theater will meet the design compatibility provisions in Part IV. A. and B. of the November 1983 Memorandum of Agreement.

The conditions regarding transfer, lease, or sale of the Golden Gate Theatre following construction have been detailed in a series of preservation stipulations and covenants pending SHPO concurrence.

4-15.5 CONCLUSIONS

The above information has been prepared to support determinations of effect for the undertaking. It represents the best information available as of April 21, 1994. Findings of both eligibility and effects are subject to change following the completion of the review process by the State Historic Preservation Officer and Advisory Council on Historic Preservation.

4-16 COMMUNITY FACILITIES/PARKLANDS/CEMETERIES

4-16.1 ENVIRONMENTAL SETTING

Community Facilities discussed in the following section include police and fire protection, schools, libraries, medical facilities, churches, parks, cemeteries, recreational facilities and other community facilities. A study area was drawn to encompass community facilities potentially affected by the Locally Preferred Alternative (LPA), generally within a 0.4-mile radius of the stations. Please refer to Figure 4-16.1 and Table 4-16.1 for a list and locations of community facilities within the study area.

4-16.1.1 Law Enforcement

Law enforcement within the East Los Angeles area is provided by City of Los Angeles Police Department (LAPD) and by Los Angeles County Sheriffs' Department (LACSD). The Hollenbeck Station of the LAPD is located at 2111 East First Street. The Station serves communities located west of Indiana Street within the City of Los Angeles. The East Los Angeles Sheriff's Station is located at 5019 East Third Street and serves the unincorporated East Los Angeles community. The Station is located outside of the 0.4-mile radius of the LPA stations.

4-16.1.2 Fire Protection

Fire protection and prevention services within East Los Angeles are provided by the City and County of Los Angeles. Two City of Los Angeles Fire Department (LAFD) stations serve the East Los Angeles portion of the City of Los Angeles. They are: Station 2, located at 1962 East Brooklyn Avenue and Station 25 located at 2927 Whittier Boulevard. LAFD Station 25 is located outside of the 0.4-mile study area. Station 3 of the Los Angeles County Fire Department (LACFD) is located at 930 South Eastern Avenue and is also located outside the 0.4-mile radius of the LPA stations.

4-16.1.3 Schools

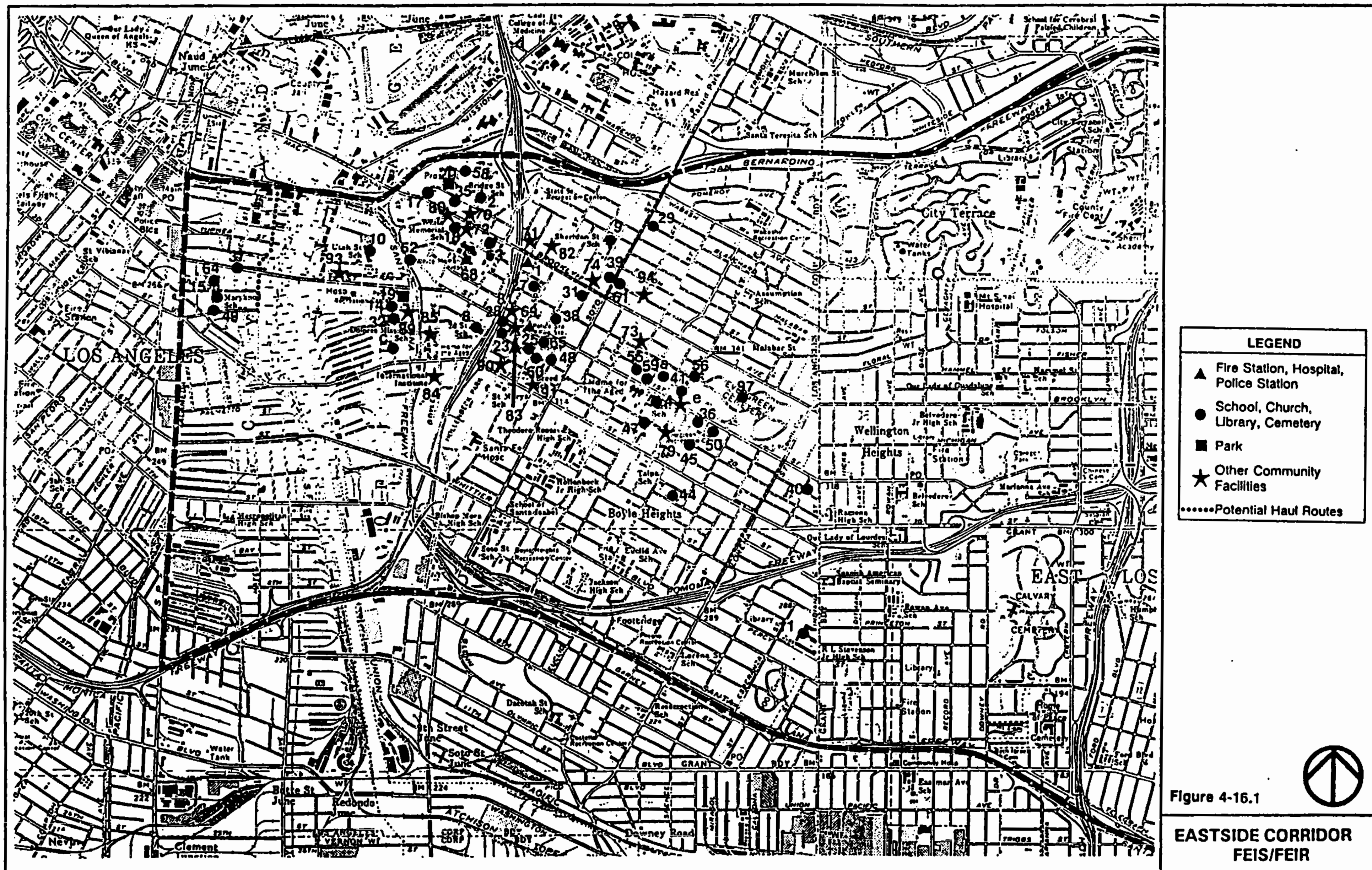
Schools located within the 0.4 mile study area are operated by the Los Angeles Unified School District (LAUSD), Los Angeles Archdiocese and other private organizations. Please refer to Table 4-16.1 for a full listing of schools within the station study areas. Unless otherwise specified, elementary levels range from grades 1 to 6, and senior high levels from 10 to 12.

4-16.1.4 Libraries

The Benjamin Franklin Library located at 2200 East First Street and operated by the Los Angeles Public Library is located within the 0.4-mile study area.

4-16.1.5 Hospitals

There are three hospitals located within the 0.4-mile study area. East Los Angeles Doctors Hospital is located at 4060 Whittier Boulevard and has a capacity of 128 beds. Los Angeles Community Hospital is located at 4081 East Olympic Boulevard and has a capacity of 140 beds. White Memorial Medical Center is located at 1720 Brooklyn Avenue and has a capacity of 366 beds.



COMMUNITY FACILITIES LOCATED WITHIN A 0.4-MILE RADIUS OF LOCALLY PREFERRED ALTERNATIVE STATIONS

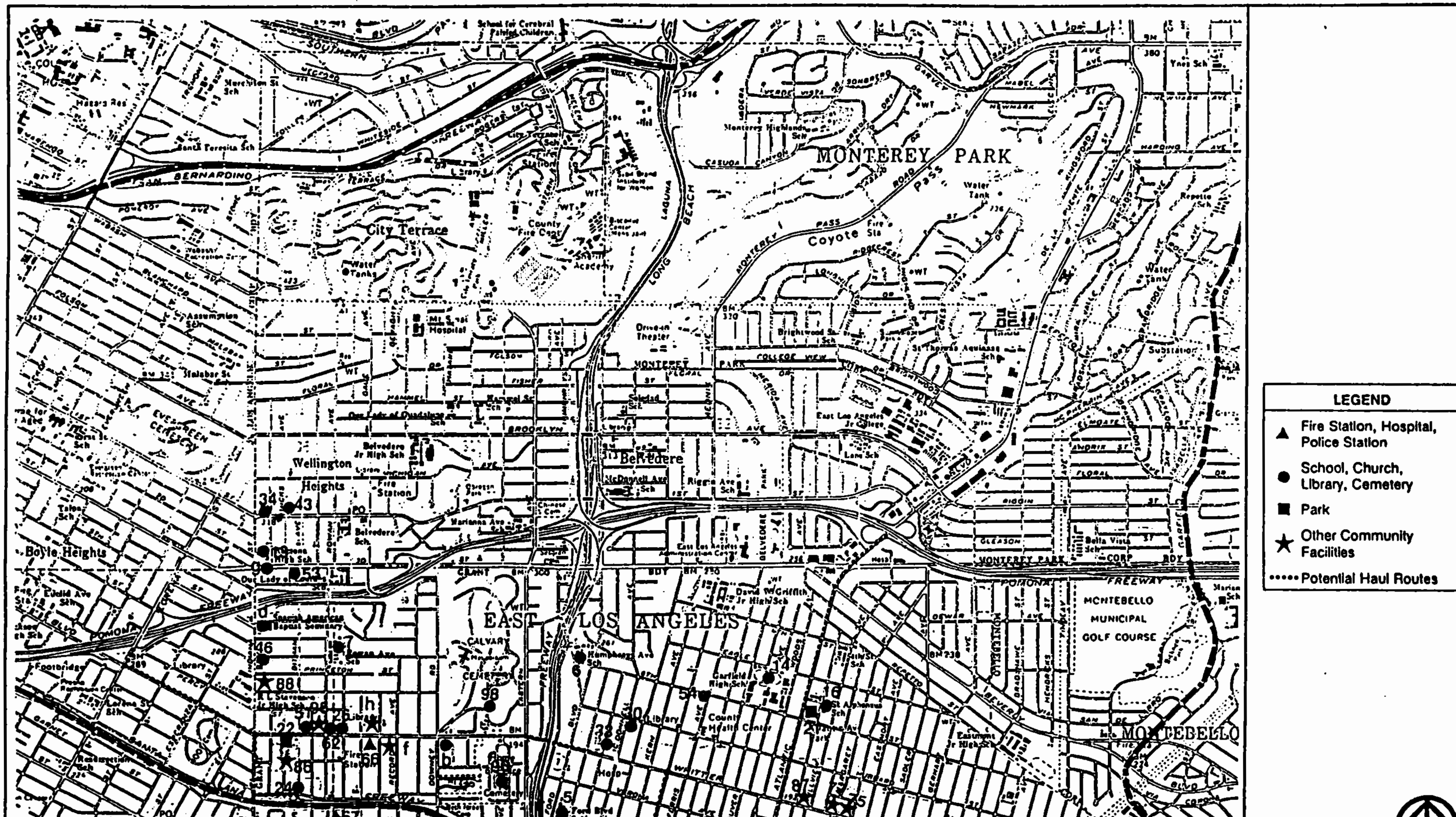


Figure 4-16.1

EASTSIDE CORRIDOR FEIS/FEIR

COMMUNITY FACILITIES LOCATED WITHIN A 0.4-MILE RADIUS OF LOCALLY PREFERRED ALTERNATIVE STATIONS

TABLE 4-16.1: COMMUNITY FACILITIES LOCATED WITHIN A 0.4-MILE RADIUS OF LOCALLY PREFERRED ALTERNATIVE STATIONS

MAP NO.	LOCATION OF FACILITY	CLOSEST STATION	APPROXIMATE DISTANCE TO STATION (FEET)
CITY OF LOS ANGELES FIRE DEPARTMENT			
1	Fire Station 2, 1962 E. Brooklyn Ave.	1st/Boyle	1,500
LOS ANGELES UNIFIED SCHOOL DISTRICT (LAUSD) SCHOOL DISTRICT ELEMENTARY SCHOOLS			
2	Bridge Street School, 605 N. Boyle Ave.	1st/Boyle	1,600
3	Eastman Avenue School, 4112 E. Olympic Ave.	Whittier/Rowan	1,800
4	First Street School, 2820 E. 1st St.	Brooklyn/Soto	1,700
5	Ford Boulevard School, 1112 S. Ford Blvd.	Whittier/Arizona	1,000
6	Humphreys Avenue School, 500 S. Humphreys Ave.	Whittier/Arizona	1,900
7	Rowan Avenue School, 600 S. Rowan Ave.	Whittier/Rowan	1,400
8	Second Street School, 1942 E. 2nd St.	1st/Boyle	700
9	Sheridan Street School, 416 N. Cornwell St.	Brooklyn/Soto	1,300
10	Utah Street School, 255 N. Clarence St.	1st/Boyle	1,600
LOS ANGELES UNIFIED SCHOOL DISTRICT (LAUSD) JUNIOR HIGH SCHOOLS			
11	Robert Louis Stevenson Junior High School, 725 S. Indiana St.	Whittier/Rowan	1,600
LOS ANGELES UNIFIED SCHOOL DISTRICT (LAUSD) HIGH SCHOOLS			
12	James A. Garfield High School, 5101 E. 6th St.	Whittier/Atlantic	1,700
13	Ramona High School, 231 S. Alma Ave.	1st/Lorena	1,200
PRIVATE SCHOOLS			
14	Dolores Mission School, 170 S. Gless St.	1st/Boyle	800
15	Maryknoll School, 222 Hewitt St.	Little Tokyo	1,000
16	Saint Alphonsus, 552 S. Amalia Ave.	Whittier/Atlantic	1,900
17	San Antonio de Padua, 1500 E. Bridge St.	1st/Boyle	1,800
18	White Memorial Adventist School, 1605 New Jersey Ave.	1st/Boyle	1,000
CITY OF LOS ANGELES DEPARTMENT OF PARKS AND RECREATION			
19	Pecan Recreation Center, 127 S. Pecan St.	1st/Boyle	700
20	Prospect Park, Echandia & Judson St.	1st/Boyle	2,000
COUNTY OF LOS ANGELES DEPARTMENT OF PARKS AND RECREATION			
21	Atlantic Avenue Park, 570 Atlantic Ave.	Whittier/Atlantic	1,900
22	Ruben F. Salazar Park, 3864 Whittier Blvd.	Whittier/Rowan	300
CHURCHES			
23	Bethesda Tabernacle Church, 4522 E. Brooklyn Ave.	1st/Boyle	800
24	Bethnay Cong Church, 816 S. Ditman Ave.	Whittier/Rowan	400
25	Boyle Heights Latin American Church of the Nazarene, 213 S. Breed St.	Brooklyn/Soto	2,000

Note: Facilities with 350 feet of a station are highlighted.

Continued

TABLE 4-16.1: COMMUNITY FACILITIES LOCATED WITHIN A 0.4-MILE RADIUS OF LOCALLY PREFERRED ALTERNATIVE STATIONS

MAP NO.	LOCATION OF FACILITY	CLOSEST STATION	APPROXIMATE DISTANCE TO STATION (FEET)
26	Center Christ, 4009 Whittier Blvd.	Whittier/Rowan	0
27	Calvary Baptist Church, 206 S. Saint Louis St.	1st/Boyle	1,900
28	Christian Council of Hispanic Pentecostal Church, 1917 E. 1st St.	1st/Boyle	800
29	Church of God of Prophecy, 2446 Houston St.	Brooklyn/Soto	1,800
30	Church of Jesus Christ of Latter-Day Saints, 718 S. McDonnell Ave.	Whittier/Arizona	500
31	Congregation Talmud Torah Temple, 247 N. Breed St.	Brooklyn/Soto	500
32	Dolores Mission, 171 S. Gless St.	1st/Boyle	800
33	East Los Angeles Church of Jehovah's Witnesses, 752 S. McBride Ave.	Whittier/Arizona	0
34	El Aposento Alto, 3505 Michigan Ave.	1st/Lorena	1,300
35	El Divino Salvador Presbyterian, 1540 Bridge St.	1st/Boyle	1,900
36	Evergreen Baptist Church, 2923 E. 2nd St.	1st/Lorena	1,900
37	Los Angeles Hompa Hongwanji Buddhist Temple, 815 E. 1st St.	Little Tokyo	800
38	Iglesia Bautista Unida, 132 N. Chicago	Brooklyn/Soto	1,300
39	Iglesia de Dios, 406 N. Soto St.	Brooklyn/Soto	500
40	Iglesia Evangelica, 3501 Gleason Ave.	1st/Lorena	580
41	Konko Church of Los Angeles, 2924 E. 1st St.	Brooklyn/Soto	2,100
42	La Puerta Abierta, 5017 E. Olympic Blvd.	Whittier/Atlantic	1,600
43	La Trinidad Methodist Church, 3565 1st St.	1st/Lorena	1,200
44	Latin American Free Methodist Church, 3626 E. 5th St.	1st/Lorena	1,600
45	Latin American Free Methodist Church, 3012 E. 2nd St.	1st/Lorena	1,500
46	La Iglesia de Dios, 3613 Lanfranco St.	Whittier/Rowan	2,100
47	Los Angeles Japanese Baptist Church, 2935 E. 2nd St.	1st/Lorena	2,000
48	Los Angeles Panol Community Center, 2302 E. 2nd St.	Brooklyn/Soto	1,800
49	Maryknoll Chapel, 222 Hewitt St.	Little Tokyo	1,100
50	Mount Carmel Missionary Baptist Church, 3064 E. 1st St.	1st/Lorena	1,400
51	New Beginning Christian Fellowship, 3919 Whittier Blvd.	Whittier/Rowan	100
52	Our Lady Queen of Martyrs (Armenian Rite), 1339 Pleasant Ave.	1st/Boyle	1,600
53	Paraiso Spanish Congregation, 3684 E. 3rd St.	1st/Lorena	1,700
54	Primera Iglesia Bautista Del Sur, 601 Ferris Ave.	Whittier/Arizona	1,600
55	Rissho Kosei-Kai of Los Angeles Buddhist Church, 118 N. Mott.	Brooklyn/Soto	1,700

Note: Facilities with 350 feet of a station are highlighted.

Continued

TABLE 4-16.1: COMMUNITY FACILITIES LOCATED WITHIN A 0.4-MILE RADIUS OF LOCALLY PREFERRED ALTERNATIVE STATIONS

MAP NO.	LOCATION OF FACILITY	CLOSEST STATION	APPROXIMATE DISTANCE TO STATION (FEET)
56	Roca de Salvacion, 122 S. Evergreen Ave.	1st/Lorena	2,000
57	San Francisco Church, 4800 E. Olympic Blvd.	Whittier/Arizona	1,600
58	Spanish American Seventh Day Adventist, 1815 Bridge St.	1st/Boyle	1,500
59	Tenrikyo Mission Headquarters in America, 2727 E. 1st St.	Brooklyn/Soto	1,500
60	Tenrikyo Southern Pacific Church, 219 N. Chicago	Brooklyn/Soto	900
61	Victory Outreach, 420 N. Soto St.	Brooklyn/Soto	700
62	Iglesia Evangelica Rey de Gloria Church, 3961 Rowan Ave.	Whittier/Rowan	100
63	White Memorial Seventh Day Adventist Church, 401 N. State St.	1st/Boyle	1,000
64	Zenshuji Soto Mission, 123 S. Hewitt St.	Little Tokyo	1,100
CITY OF LOS ANGELES PUBLIC LIBRARY			
65	Benjamin Franklin, 2200 E. 1st St.	Brooklyn/Soto	1,400
HOSPITALS			
66	East Los Angeles Doctors Hospital, 4060 Whittier Blvd.	Whittier/Rowan	100
67	Los Angeles Community Hospital, 4081 E. Olympic Blvd.	Whittier/Rowan	1,800
68	White Memorial Medical Center, 1720 Brooklyn Ave.	1st/Boyle	700
LOS ANGELES POLICE DEPARTMENT			
69	Hollenbeck Division, 2111 E. 1st St.	1st/Boyle	2,100
OTHER COMMUNITY FACILITIES			
70	Bridge Children's Center, 648 Echandia St.	1st/Boyle	1,900
71	Brownson Senior Citizens Center, 1805 E. Brooklyn Ave.	1st/Boyle	1,100
72	Brownstone House (CYO) Teen Club, 1508 Brooklyn Ave.	1st/Boyle	1,600
73	Center for Law and Justice, 2606 E. 1st St.	Brooklyn/Soto	1,600
74	Chernow House, 207 N. Breed St.	Brooklyn/Soto	500
75	Children's Sexual Abuse Project, 5427 E. Whittier Blvd.	Whittier/Atlantic	700
76	Cleland House, 5127 E. Olympic Blvd.	Whittier/Atlantic	1,500
77	Department of Public Social Services, 5427 E. Whittier Blvd.	Whittier/Atlantic	700
78	El Centro Human Services Corporation, 972 S. Goodrich Blvd.	Whittier/Atlantic	1,000

Note: Facilities with 350 feet of a station are highlighted.

Continued

TABLE 4-16.1: COMMUNITY FACILITIES LOCATED WITHIN A 0.4-MILE RADIUS OF LOCALLY PREFERRED ALTERNATIVE STATIONS

MAP NO.	LOCATION OF FACILITY	CLOSEST STATION	APPROXIMATE DISTANCE TO STATION (FEET)
79	Evergreen Japanese Bilingual Outreach Center, 2923 E. 2nd St.	1st/Lorena	2,000
80	Family Care Center, 1701 E. Brooklyn Ave.	1st/Boyle	1,100
81	Good Friends Club (Senior Citizens Center) Hollenbeck Youth Center, 2015 E. 1st St.	1st/Boyle	1,500
82	House of Ruth, 605 N. Cummings St.	Brooklyn/Soto	1,600
83	Immigration Services Department, 2130 E. 1st St.	Brooklyn/Soto	1,800
84	International Institute, 435 S. Boyle St.	1st/Boyle	1,500
85	Japanese Retirement Home, 325 S. Boyle St.	1st/Boyle	800
86	Joseph Vasquez Senior Citizens Center (Salazar Park), 3864 Whittier Blvd.	Whittier/Rowan	400
87	Legal Aid Foundation, 5228 Whittier Blvd.	Whittier/Atlantic	0
88	Plaza Community Center, 648 S. Indiana St.	Whittier/Rowan	1,600
89	Proyecto Pastoral Dolores Mission, 171 S. Gless St.	1st/Boyle	800
90	Residential Alcohol Treatment Program for Latinas, 327 N. Saint Louis St.	1st/Boyle	1,800
91	Social Security Office (Boyle Heights), 240 N. Breed St.	Brooklyn/Soto	500
92	State Department of Rehabilitation Employment, 5400 E. Olympic Blvd.	Whittier/Atlantic	1,600
93	Utah Children's Center, 1367 Via Las Vegas St.	1st/Boyle	1,400
94	Variety Boys and Girls Club, 2530 Cincinnati St.	Brooklyn/Soto	500
95	Community Health Foundation of East Los Angeles, Inc., 3945 Whittier Blvd.	Whittier/Rowan	0
CEMETERIES			
96	Home of Peace Memorial Park and Mausoleum (Religious), 4334 Whittier Blvd.	Whittier/Arizona	2,000
97	Evergreen Cemetery (Private), 204 N. Evergreen Ave.	1st/Lorena	0
98	New Calvary Cemetery (Religious), 4201 Whittier Blvd.	Whittier/Rowan	1,600
Note: Facilities with 350 feet of a station are highlighted.			

Source: For a full listing of sources used to compile this table, please refer to Eastside Corridor Alternatives Analysis/Draft Environmental Impact Report/Draft Environmental Impact Statement Social, Economic and Environmental Impact Assessment Methodology Report, Los Angeles County Metropolitan Transportation Authority (MTA), January 7, 1993.

4-16.1.6 Parks

Parks and recreational facilities within the 0.4-mile study area are operated by the City and County of Los Angeles. There are two parks operated by the City of Los Angeles. Pecan Recreation Center is located at 127 South Pecan Street. Prospect Park is located at Echandia Street and Judson Street. Two parks located within the study area are operated by the County of Los Angeles.

Atlantic Avenue Park is located at 570 Atlantic Avenue. Ruben F. Salazar Park is located at 3864 Whittier Boulevard.

4-16.1.7 Cemeteries

There are three cemeteries located within the 0.4-mile study area. The New Calvary Cemetery is located at 4201 Whittier Boulevard. Home of Peace Memorial Park and Mausoleum is located at 4334 Whittier Boulevard. Evergreen Cemetery is located at 204 N. Evergreen Avenue.

4-16.1.8 Churches

There are 43 churches located within the 0.4-mile study area. Please refer to Table 4-16.1 above for a complete listing of names and addresses.

4-16.1.9 Other Social Service Facilities

There are 26 other social services located within the 0.4-mile study area. For a complete listing of names and addresses, please refer to Table 4-16.1 above.

4-16.2 IMPACTS

Under the No-Build Alternative, community facilities would not be directly affected. As population levels within the area begin to increase however, accessibility may decline due to congestion in the area and an already strained local and regional transportation network (See Chapter 1).

Under the LPA, essentially two types of impacts could affect community facilities: (1) those associated with operation of the rail system and (2) those associated with construction of the rail system.

4-16.2.1 Operation

Operation of the proposed project would result in beneficial effects on community facilities in the vicinity of the proposed project.

a. Beneficial Effects During Operation

Beneficial effects would result primarily from improved transit access to all types of community facilities within the study area, with the exception of police and fire services. Police protection is primarily employed by squad car and to a lesser degree by foot. Fire services utilize heavy equipment which must be transported by truck and are therefore less likely to use the system. Table 4-16.2 identifies the number of each type of facility that may realize the benefits of improved transit access from the LPA, i.e., within a 0.4-mile radius of an LPA station.

TABLE 4-16.2: NUMBER OF COMMUNITY FACILITIES BENEFICIALLY AFFECTED BY LOCALLY PREFERRED ALTERNATIVE

SCHOOLS	PARKS	CHURCHES	HOSPITALS	LIBRARIES	CEMETERIES	OTHER FACILITIES	TOTAL
17	4	42	3	1	3	26	96

Source: Myra L. Frank & Associates, Inc., 1994.

The LPA would operate seven days per week, 20 hours per day. Trains would generally run during peak-hours (6:00 AM to 9:00 AM and 3:00 PM to 6:00 PM) every 2.7 minutes and every 4.0 minutes during off-peak hours (5:00 AM to 6:00 AM, 9:00 AM to 3:00 PM and 6:00 PM to 1:00 AM). For a complete discussion of LPA operating characteristics, please refer to Section 2-3.4.

b. Hospitals

Medical care within the East Los Angeles community is primarily provided by four facilities: County USC Medical Center (not located within 0.4 mile study area), East Los Angeles Doctors Hospital, White Memorial Medical Center and Los Angeles Community Hospital. In addition, there are a number of small clinics and related medical offices located adjacent to or near these facilities. Patrons using the LPA would benefit from increased access to medical facilities located near station areas or within walking distance. Of the seven stations proposed under the LPA, two would directly serve hospitals within the community.

The First/Boyle station would serve the White Memorial Medical Center as well as other related medical offices. The station entrance would be located on Bailey Street between Pennsylvania Avenue and First Street approximately 700 feet from the main hospital building. The facility could be easily reached by patrons of the system and area residents, particularly persons dependent on public transportation.

The Whittier/Rowan station would serve the East Los Angeles Doctors Hospital as well as related medical offices and would be located approximately 100 feet west of the hospital along Whittier Boulevard. Operation of the LPA is not expected to affect County USC Medical Center or the Los Angeles Community Hospital. The LPA would neither improve nor diminish service to these facilities.

c. Schools

The number of private schools benefiting from the LPA is difficult to determine since they tend to draw from large geographic areas, sometimes from neighboring cities or counties. Students living and attending private schools located near the LPA would directly benefit from increased access.

Implementation of the LPA would also contribute to overall student safety, since many students would be removed from the street network, potentially decreasing the likelihood of pedestrian/auto related accidents.

d. Parks

Transit dependency within East Los Angeles is twice the County average. Operation of the LPA would increase accessibility to parks and recreational facilities located within the 0.4 mile study area. The Whittier/Rowan station would be located approximately 300 feet directly east of Salazar Park which is operated by the County of Los Angeles Department of Parks and Recreation. Patrons using the system would be allowed convenient access to this park's facilities.

e. Adverse Effects During Operation

Adverse impacts on community facilities during operation of the proposed project would result from noise/vibration from passing trains prior to mitigation. Significant impacts are not projected to occur, particularly after mitigation. Table 4-16.3 below lists community facilities located within the 0.4-mile study area potentially affected by noise and vibration impacts before mitigation. Table 4-16.4 lists community facilities located outside of the 0.4-mile study area that are adjacent to or under the LPA tunnel section which may be affected by noise and vibration before mitigation. Please see Section 4-7 and Section 4-8 for a discussion of Noise and Vibration impacts and mitigation measures.

TABLE 4-16.3: COMMUNITY FACILITIES LOCATED WITHIN 0.4- MILE STUDY AREA POTENTIALLY AFFECTED BY NOISE AND VIBRATION BEFORE MITIGATION

MAP NO.	LOCATION OF FACILITY
LOS ANGELES CITY FIRE DEPARTMENT	
1	Fire Station 2, 1962 East Brooklyn Avenue
PRIVATE SCHOOLS	
14	Dolores Mission School, 170 South Gless Street
CHURCHES	
31	Talmud Torah Temple, 247 North Breed Street
32	Dolores Mission Church, 170 South Gless Street
41	Konko Church, 2924 East 1st Street
50	Mount Carmel Missionary Baptist Church, 118 North Mott
HOSPITALS	
66	East Los Angeles Doctors Hospital, 4060 Whittier Boulevard
OTHER COMMUNITY FACILITIES	
95	Community Health Center of East Los Angeles, 3945 Whittier Boulevard

Source: Wilson, Ihrig and Associates, Inc., 1994

TABLE 4-16.4: COMMUNITY FACILITIES LOCATED UNDER OR ADJACENT TO TUNNEL SECTION OF LOCALLY PREFERRED ALTERNATIVE STATIONS

MAP NO.	LOCATION OF FACILITY
LOS ANGELES UNIFIED SCHOOL DISTRICT (LAUSD)	
a	Rafu Chuo Gakuen School, 202 North Saratoga Street
LOS ANGELES COUNTY LIBRARY	
b	El Camino Real Library, 4264 Whittier Boulevard
CHURCHES	
c	Pico Garden Church, 320 South Gless Street
d	Cladic Seminary; El Sinai, 3626 East 5th Street
OTHER COMMUNITY FACILITIES	
e	Medical Offices, 3000 East 1st Street
f	East Los Angeles Medical Clinic, 4075 Whittier Boulevard
g	Los Angeles Art and Music School, 3624 East 3rd Street
h	Medical Offices, 4082 Whittier Boulevard.

Source: Wilson Ihrig and Associates Inc., 1994

4-16.2.2 Construction

The line section of the LPA would be constructed entirely underground employing a tunnel shield machine method and would vary in depth from 45 feet to 110 feet. Construction of the tunnel would not significantly affect community facilities within the 0.4-mile study area.

Construction of stations and crossovers for the LPA would employ either a cut-and-cover or open-cut method and are discussed in detail in Section 4-18. Potential impacts on community facilities during construction of stations and crossovers include temporary traffic obstructions/detours, construction noise/vibration and air quality impacts. These impacts, which are described in greater detail in Section 4-18, would be experienced for intermittent periods with varying durations during the three to five year construction period for each station. Under CEQA, the potential for significant construction impacts on a community facility increases as the distance between that facility and the station location decreases. In addition to distance, a number of factors would affect the levels of impacts, including construction requirements for the station, geological characteristics in the area between the station and the facility, structural characteristics of the community facility, the type and schedule of community facility activities and the implementation of measures to reduce the impact. Recognizing the highly variable potential for significant impacts under CEQA, a conservative estimate of 350 feet from station locations was used to identify facilities that may be subject to some level of impacts. Within this area, the potential for significant impacts under CEQA would be greater for closer facilities, with the greatest potential expected at facilities adjacent to a station site. Facilities potentially affected by LPA station construction are highlighted above in Table 4-16.1.

Table 4-16.5 below shows the number of community facilities within the 300-foot distance from an LPA construction site.

TABLE 4-16.5: NUMBER OF COMMUNITY FACILITIES WITHIN 300 FEET OF LPA CONSTRUCTION SITES

SCHOOLS	PARKS	CHURCHES	HOSPITALS	CEMETERIES	OTHER FACILITIES	TOTAL
0	1	4	1	1	2	9

Source: Myra L. Frank and Associates, Inc., 1994.

a. Schools

Construction of the LPA is not expected to significantly affect school facilities located within the study area. There are no schools located within the immediate station areas (300 feet), and tunnel construction activities, because they would be performed entirely underground, would not result in impacts.

During construction, children may pass by construction sites while on their way to school, presenting an important safety concern. Although construction sites would be secured, the possibility of intrusion does exist and could result in injury. Children are of special concern and therefore, construction sites in the vicinity of schools must be considered areas of above-normal sensitivity. In addition, truck haul routes located on streets used by children going to and from school may affect student safety. Potential truck haul routes are discussed below and shown in Figure 4-16.1.

The LAUSD is the primary public education provider in the study area. Schools operated by the LAUSD are operated based on a catchment or feeder system, which as its name implies, is designed to "catch" or "feed" students from the elementary to high school level. The system basically operates by assigning a geographic boundary for each school, which determines what elementary, junior and senior high school a child will attend. Accordingly, students residing in a particular neighborhood would be required to attend the designated school for the area. Catchment area size varies from the elementary to high school level, with high school areas encompassing as much as several miles. Schools most likely affected by construction would include those institutions whose catchment areas are situated within station locales or where haul routes are located adjacent to designated school pedestrian routes. Table 4-16.6 below shows LPA stations located within LAUSD school catchment areas.

Catchment areas as mentioned earlier, refer to those precincts where children are required to attend a specific school. As shown in Table 4-16.6 below, all seven LPA stations would be situated within or border LAUSD elementary school catchment areas. The Whittier/Rowan station would border the Eastman Avenue School and Rowan Avenue schools catchment areas. Students attending either of these schools typically would not be required to pass by any station construction site. Construction of stations are not expected to significantly affect these elementary schools because stations are located at the extremities of catchment areas.

Truck haul routes may also affect student safety during construction of the LPA. Excavated material from station and crossover construction would be transported from station sites to landfills (locations to be determined). Truck haul routes would employ the most direct route to freeways and would be concentrated on the arterial street network. To the extent feasible, routes would be directed away from schools.

TABLE 4-16.6: LPA STATIONS LOCATED WITHIN LAUSD CATCHMENT AREAS			
STATION	ELEMENTARY	JUNIOR HIGH SCHOOL	HIGH SCHOOL
Little Tokyo	Utah Street School	Hollenbeck	Belmont
First/Boyle	Second Street School	Hollenbeck	Roosevelt
Brooklyn/Soto	Sheridan Street School	Hollenbeck	Roosevelt
First/Lorena	First Street School Belvedere School	Belvedere Stevenson	Roosevelt
Whittier/Rowan	Rowan Avenue School Eastman Avenue School	Stevenson	Garfield
Whittier/Arizona	Ford Boulevard School	Griffith Belvedere	Garfield
Whittier/Atlantic	Fourth Street School	Griffith Belvedere	Garfield

Source: Los Angeles Unified School District, 1994.

Elementary Schools

- **First/Boyle**

A small portion of students attending Second Street School may be affected by potential use of the First/Boyle station haul route. The haul route calls for trucks to access the Golden State Freeway (I-5) (located approximately 500 feet west of the station site) via First Street. Students living south of Pleasant Avenue and First Street between Echandia Street and Boyle Avenue would be required to cross the haul route at First Street and Boyle Avenue.

- **Brooklyn/Soto**

Construction of the Brooklyn/Soto station would utilize two haul routes: route one would proceed north along Soto Street before gaining access to the San Bernardino Freeway (I-10); route two would proceed west along Brooklyn Avenue before gaining access to the Golden State Freeway (I-5). The Sheridan Street School building would be located approximately 600 feet from Soto Street and 800 feet from Brooklyn Avenue. Utilization of either of the two routes may affect student safety, because students attending the school would be required to cross either Soto Street or Brooklyn Avenue.

- **Whittier/Arizona**

The proposed Whittier/Arizona station would also employ two potential haul routes. Route one would follow Whittier Boulevard west and then proceed south along Eastern Avenue to the Eastern Avenue on-ramp at the Long Beach Freeway (I-710). Route two would proceed south along Arizona Avenue and then west at Olympic Boulevard before gaining access to the Long Beach Freeway (I-710). The proposed Olympic Boulevard route would pass directly adjacent to the Ford Boulevard School and may pose potential safety concerns to students attending the school. In addition, students crossing Whittier Boulevard in order to access the school site to the south may also be affected by the Whittier Boulevard route.

- **Whittier/Atlantic**

Atlantic Boulevard would be used as a potential haul route during construction of the Whittier/Atlantic station. Trucks leaving the construction site would either travel north along Atlantic Boulevard before gaining access to the Pomona Freeway (SR-60) or south to the Santa Ana Freeway (I-5). Atlantic Boulevard is located within the Fourth Street School catchment area. Students attending the school would be required to cross Atlantic Boulevard in order to access the school site and may be affected by truck traffic in the area.

Junior and Senior High Schools

Junior and senior high school catchment areas are large; therefore, the likelihood of students passing near station construction areas or haul routes is greater and may affect student safety. Stations located within LAUSD Junior and Senior High School catchment areas are shown in Table 4-16.4 above. Although potential haul routes would be located within Junior and Senior High school catchment areas, routes are located away from schools and do not pass directly in front of LAUSD Junior or Senior High schools.

- **Whittier/Atlantic**

Students attending Garfield High School may be affected by truck traffic generated by construction of the Whittier/Atlantic station. As mentioned above, trucks utilizing Atlantic Boulevard would either travel north to the Pomona Freeway (SR-60) or south to the Santa Ana Freeway (I-5). Trucks traveling north along Atlantic Boulevard would be located approximately 300 feet from the school building and may pose potential safety concerns to students crossing Atlantic Boulevard.

Private Schools

Construction of the LPA may affect some students attending private schools located within the study area. Because private schools generally do not have specified school walk routes, the number of pedestrian/auto related accidents may be affected by increased traffic resulting from station construction. The Whittier/Atlantic station haul route may affect students attending Saint Alphonsus School. The potential haul route would be located approximately 600 feet west of the school building along Atlantic Boulevard. Trucks would either travel north along Atlantic Boulevard and access the Pomona Freeway (SR-60) or south to the Santa Ana Freeway (I-5).

b. Parks

No parks would be acquired for the project. The proposed alignment however, would pass approximately 45 feet below the southeast corner of Pecan Recreation Center operated by the City of Los Angeles. Although no significant effects under CEQA are expected to result because of the project, a right-of-way easement would be required from the Department of Parks and Recreation. Appropriate permits would be obtained by the MTA.

During construction of the Whittier/Rowan station, patrons of the Ruben F. Salazar Park operated by the County of Los Angeles Department of Parks and Recreation may be temporarily inconvenienced by increased traffic and noise in the area. Construction of the station would be performed within Whittier Boulevard extending from South Ditman Avenue to Gage Avenue and would employ a cut-and-cover construction method. Construction activities are expected to last three to five years.

c. Hospitals

Hospital facilities located within the study area would not be significantly affected by construction activities, with the exception of the East Los Angeles Doctors Hospital. White Memorial Medical Center may be temporarily inconvenienced by construction activities taking place at the First/Boyle station. The station would be located diagonally across the First/Boyle intersection, terminating at the north end of Pennsylvania Avenue just prior to entering the hospital parking lot. Periodically, construction activities may necessitate closure of the parking lot entrance located along Pennsylvania Avenue. During the construction period, access along Boyle Avenue and First Street would be maintained; however, ambulance response times may increase somewhat due to congestion in the area.

Activities associated with construction of the Whittier/Rowan station would take place approximately 40 feet from the East Los Angeles Doctors Hospital. Noise generated by construction activities may inconvenience the hospital. Low-level vibration may also periodically occur during passing of the tunnel shield machine (TSM) or during construction activities. Construction of the station box and crossover would be performed in a cut-and-cover configuration within Whittier Boulevard, extending from South Ditman Avenue to Gage Avenue. For various stages of deck construction, traffic flow along Whittier Boulevard would be limited to two lanes (one lane in each direction) and would be shifted from one side to the other. Emergency vehicles may experience some response delays and access and entry problems due to increased traffic and machinery in the area. The construction period is expected to last approximately three to five years.

d. Churches

Construction of the Whittier/Rowan station would be performed within Whittier Boulevard and would extend from Townsend Avenue to Gage Avenue. A cut-and-cover construction method would be used. Construction of the station is expected to last approximately three to five years. During construction of the station box, and particularly during soil removal the potential for impacts to sensitive receptors such as churches would exist. The Iglesia Evangelica Rey de Dios church and the Center Christ Church may be affected by noise and vibration while the station is being constructed. The New Beginning Christian Fellowship may be affected by noise generated during the construction period.

The Whittier/Arizona station would be constructed off-street in order to lessen impacts to commercial establishments located along Whittier Boulevard and would extend from Arizona Street to McBride Avenue. Construction equipment employed would include heavy machinery. A construction staging area would be needed by the contractor to store supplies and operate equipment, requiring acquisition of the East Los Angeles Church of Jehovah's Witnesses located at 752 McBride Avenue. Under the California Government Code, Chapter 16, Section 7260 et seq., "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970," the church would be entitled to certain relocation assistance as set forth by the law. The MTA would follow all applicable rules and regulations. For a more detailed discussion of property acquisitions and relocation assistance policies, please refer to Section 4-3 Land Acquisition/Displacement and Relocation.

e. Cemeteries

Cemeteries located within the study area would not be significantly affected by construction of the LPA. During selection of the LPA, the MTA Board modified the alignment to avoid passing under Evergreen Cemetery. Evergreen Cemetery is licensed by the Cemetery Board of the State of California Department of Consumer Affairs and therefore, falls within the regulations set forth in the Cemetery Act of 1991. Construction of the station would not effect the cemetery as defined by the Act. According to Section 8560 of the Act, "After dedication...and as long as the property remains dedicated to the cemetery purpose, no railroad, street, road, alley, pipeline, pole line or other public thoroughfare or utility shall be laid out, through, over, or across any part of it without the consent of the cemetery authority owning and operating it, or of not less than two-thirds of the owners of interment plots." In addition, the MTA also moved the First/Lorena station east along First Street in order to avoid an existing cemetery driveway entrance. Construction of the First/Lorena Station would occur directly adjacent to the cemetery grounds; however, these activities would not significantly affect the cemetery. The station would be located within First Street, extending from Concord Street to Cheesebroughs Lane and would employ a cut-and-cover construction method.

f. Other Community Facilities

The proposed Whittier/Atlantic station would extend along Whittier Boulevard from Vancouver Avenue to Amalia Avenue. A cut-and-cover construction technique is proposed for the station box and crossover with construction expected to last from three to five years. The station would also serve as the eastern terminus of the LPA and would be the retrieval site of the TSM. The Legal Aid Foundation is not expected to be substantially affected by construction of the Whittier/Atlantic station, although noise generated by the construction activities may periodically inconvenience the establishment.

Noise and vibration generated by construction of the Whittier/Rowan station may periodically inconvenience the Community Health Foundation of East Los Angeles; however, construction activities are not expected to significantly affect the facility's ability to operate. The facility is primarily operated on an appointment basis. The facility is accessible from both Whittier Boulevard and Rowan Avenue and contains sufficient off-street parking. Construction of the station would be performed within Whittier Boulevard and would extend from Townsend Avenue to Gage Avenue. Construction of the station is expected to last from three to five years.

g. Police and Fire

Although no police or fire protection facilities are located within 300 feet of station locations, traffic increases/obstructions from construction activities could result in increased police, fire and paramedic response time.

4-16.3 CUMULATIVE IMPACTS

To the extent that other construction projects are planned in the vicinity of proposed station locations, some community facilities would be subject to cumulative impacts as a result of construction activities associated with the proposed project and other planned projects. Section 2-9, Related Projects, identifies projects planned for construction in the vicinity of the LPA and Section 4-18, Construction Impacts, identifies the potential for significant cumulative construction impacts under CEQA. Without mitigation measures, those potentially significant cumulative construction impacts would be experienced by community facilities that are located near both the station location and location of construction for other planned projects.

4-16.4 MITIGATION

For a discussion of mitigation impacts during the construction period, please refer to the following sections: 3-3, Parking; 4-18.2, Traffic; 4-18.3, Air Quality; and 4-18.4 and 4-18.5, Noise and Vibration. Mitigation measures for noise and vibration impacts during operation of the project include the use of a floating slab trackbed and special resilient rail fasteners (see Sections 4-7 and 4-8 for further discussion). During the construction period one lane in either direction will be maintained during station construction. Additional mitigation measures are discussed below.

4-16.4.1 Schools

During the construction period, the MTA/RCC will implement standard construction safety procedures at all station locations. The RCC will coordinate with Los Angeles Department of Transportation (LADOT) officials in implementing traffic signage alerting pedestrians and motorists well in advance of construction sites and equipment. Signage will be provided on all arterials beginning 1,000 feet before station sites; where lane closures are required signage will be provided 2,000 feet before station sites.
The RCC will develop preferred haul route plans for each construction package which entails removal of excavated material. The haul route plans shall also avoid utilizing streets on which schools are located. In the case of a potential haul route past a school, such as Atlantic Boulevard north of the Atlantic/Whittier station, where there are no nearby alternative arterial streets which provide access to east-west freeways, trucks shall be prohibited from hauling past the schools during normal school hours. (See also Section 4-18.2.) The RCC will provide crossing guards within the vicinity of all station construction sites and along truck haul routes, as needed and appropriate. A floating slab designed to reduce noise and vibration generated during passing of trains will be installed to mitigate impacts to the Dolores Mission School and Rafu Chuo Gakuen School.

4-16.4.2 Police and Fire

The Los Angeles Police Department, Los Angeles County Sheriff's Department, Los Angeles Fire Department and Los Angeles County Fire Department will be given detailed construction plans before and during the construction period. Traffic management plans detailing temporary street closures and other restrictions that may be necessary while the project is being built will also be provided. In addition, RCC will continue coordination with these agencies throughout the construction period. Special rail fasteners designed to reduce noise and vibration generated during passing of trains will be installed to mitigate impacts to Station 2 of the Los Angeles City Fire Department.

4-16.4.3 Hospitals

Traffic plans will be coordinated with the White Memorial Medical Center and Los Angeles Doctors Hospital officials both before and during station construction in order to ensure adequate access to hospital facilities. Advanced planning should reduce impacts to facilities located within the station areas.

Possible alternate east/west emergency vehicle access routes to East Los Angeles Doctors Hospital would include Olympic Boulevard or 3rd Street; possible north/south alternate access would include Herbert Avenue. Alternate north/south access points such as Echandia Street or State Street may be preferable for emergency vehicles serving White Memorial Medical Center. Ambulances approaching from east/west directions may chose to use Brooklyn Avenue in order to avoid congestion along First Street. Prior to construction of the Whittier/Rowan station, a survey will be performed to ensure that vibration created during construction would not affect the East Los Angeles Doctors Hospital's equipment. In addition, a floating slab designed to reduce noise and vibration generated during passing of trains will be installed to mitigate impacts to the facility.

4-16.4.4 Churches

The MTA will provide relocation assistance to the East Los Angeles Church of Jehovah's Witnesses during construction of the Whittier/Arizona station. A floating slab and or special resilient fasteners designed to reduce noise and vibration generated during passing of trains will be installed to mitigate impacts to the Dolores Mission Church, Pico Garden Church, Cladic Seminary; El Sinai, Talmud Torah Temple, Konko Church and Mount Carmel Baptist Church.

4-16.4.5 Other Community Facilities

Pedestrian access to the Legal Aid Foundation would be maintained at all times during construction of the Whittier/Atlantic station. Soundwalls fronting the Community Health Foundation of East Los Angeles will be provided during construction. In addition, a floating slab designed to reduce noise and vibrations during passing of trains will be installed to mitigate impacts to the Community Health Foundation of East Los Angeles, East Los Angeles Medical Clinic, medical offices and Los Angeles Art and Music School.

4-16.4.6 Libraries

Special rail fasteners designed to reduce noise and vibration impacts generated during operation of trains will be installed to mitigate impacts to the El Camino Real library, operated by the Los Angeles County Public Library.

4-17 SECTION 4(F) EVALUATION

Section 4(f) of the Department of Transportation Act of 1966 (49 USC 1653, now 49 USC 303) declares a national policy that special effort be made to preserve the natural beauty of the countryside, including public park and recreation lands, wildlife and waterfowl refuges and historic sites. This section reports on studies carried out under the U.S. Department of Transportation regulation concerning 4(f) protected resources. The following sections update information about 4(f) impacts presented in the Alternatives Analysis/Draft Environmental Impact Statement/Draft Environmental Impact Report (AA/DEIS/DEIR) for the Los Angeles Eastside Corridor, circulated in April 1993.

4-17.1 SELECTION OF THE LOCALLY PREFERRED ALTERNATIVE

The AA/DEIS/DEIR for the project considered nine transit alternatives for providing service in this corridor, as well as the No-Build alternative. In June 1993, the Los Angeles County Metropolitan Transportation Authority (MTA) completed the AA/DEIS/DEIR process by selecting Alternative 9B (modified) as the Locally Preferred Alternative (LPA). The LPA is fully described in Chapter 2 of this document, including the steps taken to develop, evaluate and make design location decisions throughout the corridor. These design location decisions modify the LPA adopted in June 1993 in ways that reduce environmental impacts, including 4(f) use of protected properties.

4-17.2 SECTION 4(F) PROPERTIES

Section 4(f) "use" occurs when protected land is permanently acquired for a transportation project, when a temporary use of protected land is considered adverse or when there is a constructive use of protected land. The LPA would require the use of land from five historic properties. In three instances, the use would affect land adjacent to the historic structure, but not the structure itself. In two instances, the structure would be relocated to another site during the construction period and restored to its historic site after construction is complete.

Based upon a complete archival survey, no significant archaeological resources would be affected by the LPA. However, historic archaeological values of five historic properties to be "used" will be monitored during the construction period.

The project would include a tunnel section under a park. However, given the depth of the tunnel section, the absence of any noise, vibration or visual impacts at the surface and the fact that no alteration of the surface would occur, this is not considered a "use" within the intent of Section 4(f). No wildlife or waterfowl refuges would be affected. The following sections evaluate historic, archaeological and park resources as they relate to Section 4(f).

After reviewing the 4(f) report, the Federal Transit Administration (FTA) may determine that: 1) there is no prudent or feasible alternative to using 4(f) properties identified in this section; and 2) the project includes all possible planning to minimize harm to parks, recreation areas, wildlife and waterfowl refuges and historic sites resulting from the use. With this determination, Section 4(f) permits the Secretary of Transportation to approve a project for federal funding participation or other federal undertaking that requires the use of publicly owned land from a park; recreation area; wildlife and waterfowl refuge of national, state or local significance; or any land from a historic site of national, state or local significance. The U.S. Department of Interior is being consulted regarding 4(f) properties.

4-17.3 SECTION 4(F) HISTORIC STRUCTURES

In addition to the requirements of Section 4(f), Sections 106 and 110 of the National Historic Preservation Act, as amended, require that federal agencies take into account the effects of their projects on historic and cultural resources. In accordance with Section 4(f), Sections 106 and 110, Executive Order 11593 and the guidelines promulgated by the Advisory Council on Historic Preservation (ACHP), the FTA and the MTA have undertaken an affirmative search for historic resources that could be affected by the project.

As part of the AA/DEIS/DEIR process, MTA surveyed over 144 properties that could be potentially affected by the project alternatives. Seventy-three historic properties either in or eligible for inclusion in the National Register of Historic Places (National Register eligible properties) and within the area of potential effect for any of the nine proposed transit alternatives were evaluated in accordance with the Criteria of Effect and Adverse Effect in the AA/DEIS/DEIR. The Locally Preferred Alternative identified by MTA potentially affects 23 National Register eligible properties, where 18 have no 4(f) use and where 5 have 4(f) use and 4(f) evaluations are presented.

4-17.3.1 Historic Properties with No 4(f) Use

During the Section 4(f) evaluation, it has been determined that there will be no Section 4(f) use, either actual or constructive, of 18 National Register eligible properties that are within the Area of Potential Effect (APE) of the Locally Preferred Alternative (LPA). Table 4-17.1 lists all the historic properties within the APE with no 4(f) use.

TABLE 4-17.1: HISTORIC STRUCTURES WITH NO 4(F) USE

NUMBER	LOCATION	HISTORIC NAME
1	800 North Alameda Street Los Angeles	Union Passenger Terminal
2	900-1100 Blocks of E. 1st Street Los Angeles	First Street Viaduct
3	201-203 South Santa Fe Avenue	Greybar Electric Co. Warehouse
4	215-243 South Santa Fe Avenue	Craig Co. Warehouse Grocery
6	900-1700 Blocks of E. 4th Street Los Angeles	Fourth Street Viaduct
8	131 South Boyle Avenue Los Angeles	Simon Gless Farmhouse
11	103-105 North Boyle Avenue Los Angeles	Hotel Mount Pleasant
14	1814 Pennsylvania Avenue Los Angeles	Ralph H. Tombs Residence
20	247 North Breed Street Los Angeles	Congregation Talmud Torah

Continued

TABLE 4-17.1: HISTORIC STRUCTURES WITH NO 4(F) USE

NUMBER	LOCATION	HISTORIC NAME
23	319 North Mathews Street Los Angeles	Alfred W. Guest Cottage
29	2533 Michigan Avenue Los Angeles	Luna & Harry Patty Residence
30	334 North Fickett Street Los Angeles	Charles Fisher Residence
33	204 South Evergreen Street Los Angeles	Evergreen Cemetery & Ivy Chapel
37	118 South Alma Avenue County of Los Angeles	Shingle/Queen Anne Residence
39	3827 East Whittier Boulevard County of Los Angeles	Mortuary
40	4549 East Whittier Boulevard County of Los Angeles	Boulevard Theater
41	5136 East Whittier Boulevard County of Los Angeles	United Artists Theater

Note: Numbers in the first column refer to locations on the Area of Potential Effect Map in the Eligibility Report.

Source: Myra L. Frank & Associates, Inc., 1994.

4-17.3.2 Historic Properties with 4(f) Use

The following historic properties listed in Table 4-17.2 would be used by the LPA. Sections that follow describe the property, the proposed use of the property by the LPA, the feasibility and prudence of alternatives that avoid 4(f) involvement and the measures to mitigate project-related impacts on these historic properties.

TABLE 4-17.2: HISTORIC STRUCTURES WITH 4(F) USE

NUMBER	LOCATION	HISTORIC NAME
5	970 East Third Street	AT&SF Outbound Freight House
9	127 South Boyle Avenue	Jewish Home for Wayfarers
10	125 South Boyle Street	Walter & Lillie Webb Residence
27	2524 East Brooklyn Avenue	Brooklyn Theater
42	5170-5188 East Whittier Blvd.	Golden Gate Theater

Note: The numbers refer to the Historic Resources Maps in the Determination of Eligibility Report, which shows all the significant historic resources that could be affected by this project.

Source: Myra L. Frank & Associates, Inc., 1994.

a. AT&SF Outbound Freight House

- Description and Significance of Affected Property: The Atchison, Topeka and Santa Fe (AT&SF) Railway Outbound Freight House is located at the southwest corner of Third

Street and Santa Fe Avenue. Constructed of reinforced concrete in 1906, it is 1260 feet in length and 40 feet in width, with a 10-foot overhang above the Santa Fe Avenue loading area. The office portion at the Third Street end is two stories in height for approximately 180 feet, and the balance of the building is one story high. The building is essentially utilitarian in design, with the Santa Fe Avenue facade relentlessly punctuated with loading door openings, each protected by a steel roll-down door. Apparent alterations to the structure have been replacement of all windows and some of the doors, particularly at the north end. The only architecturally distinct features occur at the Third Street, or north, facade where the office was originally located. Here a Neoclassical design of arch with keystone and narrow cornice has accentuated the otherwise plain concrete surface.

The AT&SF Outbound Freight House is significant for its association with the AT&SF railway and the development of railroad operations in Los Angeles. It was built to handle the majority of goods shipped out of Los Angeles by AT&SF. It stands as the only remaining historic reference to the AT&SF Railway along Santa Fe Avenue, once the site of the Santa Fe depot at the northeast corner of Third and Santa Fe, the Inbound Freight House at the southeast corner of Third and Santa Fe and the roundhouse at 4th and Santa Fe. The Outbound Freight House is also notable as one of Harrison Albright's last extant designs in Los Angeles, for the quality of its construction by reinforced concrete specialist Carl Leonhardt and as one of the last remaining railroad sheds in Los Angeles.

- Application of Section 4(f) Criteria for Use: The entrance to the Little Tokyo station is proposed to be located on the southwest corner of Third Street and Santa Fe Avenue. The AT&SF Outbound Freight House would be located approximately 50 feet east of the entrance to the Little Tokyo station. In order to connect the station entrance with the station, a subterranean pedestrian tunnel would be constructed under the AT&SF Outbound Freight Building from the station box located under Santa Fe Street to the proposed station entrance. The tunnel would be hand mined, similar to the way cross-tunnels are excavated, and the depth to the top of tunnel would be approximately 16 feet below grade. There is a 20-foot by 40-foot substructure under the Third Street end of the building. Construction of the pedestrian tunnel would not require replacement of these substructures because the tunnel would be approximately 130 feet south of Third Street.

  The AT&SF Outbound Freight House is located on a 9.8-acre parcel. The Freight House effectively forms the eastern boundary of the parcel with a building 40 feet wide and 1260 feet long fronting on Santa Fe Avenue. The Freight House is the only structure standing on the parcel, which is otherwise vacant. The remainder of the parcel would be used by MTA for contractor storage of equipment and building supplies during the construction period. The Freight House building will not be altered or used either during construction or operation. Protection of the structure will be required of the contractor during the construction period and while the underground connection between the station entrance and the station is constructed.

- Alternatives that Would Avoid Use: There are two alternative station locations that have been studied, one of which has been eliminated and the other one of which remains as an option. The original location of the station entrance for Little Tokyo station was on the northwest corner of Third Street and Santa Fe Avenue, on the site of the Craig Company

Wholesale Grocery (215-243 South Santa Fe Avenue). The Craig Company building has been found eligible for the National Register of Historic Places. Locating the entrance to the station on this site would require demolition of the Craig Company building and would create a 4(f) use. This site has been removed from consideration.

The other alternative would be to locate the Little Tokyo station entrance on the east side of Santa Fe Avenue, in the Metro Rail yard itself, just south of the Maintenance-of-Way building. This site is not as desirable as the west side of Santa Fe Avenue because it is more constrained by other uses, it is not as visible to the Little Tokyo community and it is farther removed from normal pedestrian flows than the west side of the street. It is technically feasible to locate the station entrance in the Metro Rail yard, but it is not considered prudent to do so because of potential security issues for yard operations.

- Measures to Minimize Harm: The entrance as proposed on the west side of Santa Fe Avenue, and the west side of the Freight House, would not require the alteration or demolition of the historic structure. The station entrance has not been designed, but the functional elements would consist of escalators, stairs and an elevator to take patrons to the underground connection with the station. These elements are subject to the design constraints already embodied in the Memorandum of Agreement for the Metro Rail project, which require minimizing visual impacts on historic structures through sensitive design of above-ground elements.

  MTA does not have any plans to use the AT&SF Freight House for transportation purposes. However, transfer, lease or sale of the structure and of the rest of the parcel may be subject to the Preservation Stipulations signed by MTA, FTA, SHPO and the Advisory Council on Historic Preservation. These Stipulations are reproduced in Appendix 7.

  In addition, the MTA has agreed to require protection of the structure during the construction period by the contractor. Contract specifications requiring such protection will be part of the contractor's contract.

- Coordination with Other Agencies: The SHPO and the ACHP are reviewing historic resources documentation.

- Determination: FTA, in consultation with the SHPO and the Advisory Council on Historic Preservation, may determine that there is no feasible alternative to the taking of property and the installation of a station entrance adjacent to this historic structure. All efforts to minimize harm have been taken.

b. Jewish Home for Wayfarers

- Description and Significance of Affected Property : The Jewish Home for Wayfarers is a two-story frame and stucco building that features some unusual Moderne detailing on the Boyle Avenue elevation. Most dramatic are the use of fluted piers: a pair reaching two-story height at the corners, a broad pair extending single-story in height and acting as an entrance surround and a narrow pair in the second story, just above the central entrance. The central window of the second story features a unique opening design with a single Deco influence triangular peak. The entire composition is topped by an unusual relief course of inverted curved waves, alternating in size and giving the effect of a fully open, scalloped, theatrical curtain.

This structure, built in 1938, is the first non-temporary shelter constructed for indigent Jewish transients, although the organization had been in existence since 1928. Its tenants over the years have mirrored the demographic changes in Boyle Heights. In the 1950s it was used by White Memorial Hospital as a rooming house. By the mid-1970s it had become the "Caballeros de Dimas-Al Ang Building" for the predominantly Hispanic population. In 1986, it was purchased by a Japanese family and had become the Japanese Home for the Aged. Although its design elements are unusual, the building is significant for its association with the Jewish population in Los Angeles and as evidence of the demographic changes in the Boyle Heights community.

- Application of Section 4(f) Criteria for Use: The Jewish Home for Wayfarers would be within 16 feet of the excavation for the crossover at the western end of the First/Boyle station. The excavation for the crossover would be almost 80 feet deep at this point. In order to give the contractor sufficient room to circulate construction equipment on the site, MTA is proposing to temporarily move the structure off the site during the construction period and then return it. Temporarily moving the structure would also create an on-site passageway between Boyle Street and Bodie Street for construction vehicles, thereby minimizing the need to circulate around residential areas in order to enter and leave the site. In addition, moving the structure has the advantage of reducing the potential for settlement during construction because of the building's proximity to the very deep excavation for the First/Boyle station and crossover.

- Alternatives that Would Avoid Use : The First/Boyle station was originally located along First Street, in the studies that were done for the AA/DEIS/DEIR. This location was dictated by the curve of the line segment crossing the river on aerial structure from the station in the yard (now the Little Tokyo station). After the LPA was selected, a number of additional location studies were performed for the Little Tokyo station. A subway location, rather than an above ground location, was determined to be preferable for cost and operational reasons. Shifting to a subterranean Little Tokyo station resulted in a subterranean river crossing, which in turn allowed a much reduced set of curves leaving the Little Tokyo station, crossing the river and entering the First/Boyle station. Consequently, the above-ground First/Boyle station entrance stayed in essentially the same place as the one in the AA/DEIS/DEIR, but the subterranean station rotated on its axis in a counter-clockwise direction.

  One way to avoid impacts to the Jewish Wayfarer's Home would be to move the station, either rotating the station clockwise on its axis or shifting it to the north. Rotating the station clockwise would put it back where it was in the AA/DEIS/DEIR, with lengthy, unnecessary curves under the river. Moving the station north would move into the White Memorial Hospital property, which would create adverse construction impacts in that location. In addition, either alternative is constrained because of the tangent track required prior to the curves both east and west of the station.

The other alternative that would avoid use of the Jewish Wayfarers Home would be to eliminate the crossover track at the First/Boyle station. This crossover was added to the station during preliminary engineering in response to an operating criterion that single track operation would not extend headways beyond 10 minutes. Elimination of the crossover would move the end of the station box to the intersection of First and Boyle Streets, about 120 feet away from this property. That alternative is considered imprudent because it would require an operation of the system in violation of current operating criteria.

- Measures to Minimize Harm: The original alignment of track between the Little Tokyo station and the First/Boyle station created adverse visual impacts on the historic First and Fourth street bridges because of the proximity of the aerial Metro Rail structures to the bridges. Shifting the alignment under the river has eliminated those impacts and has reduced acquisitions on the east side of the river for the portal structure. Therefore, rotating the station to its current location has reduced impacts on other historic resources.

  Rather than demolishing the Jewish Home for Wayfarers, the MTA is proposing to relocate the structure for the duration of the construction period (up to five years), maintain and protect it during that period while it is on a temporary site and restore it to its historic location and setting after construction is completed. These commitments are contained in the Preservation Stipulations MTA is proposing.

  In addition, because the site of the Jewish Home for Wayfarers has been near documented sources of human activity for over 100 years, the MTA has also agreed to adopt an Identification Study and Treatment Plan for significant archaeological data and historic archaeological data that may be uncovered during grading of this site. The Identification Study and Treatment Plan will be consistent with that adopted in Part II of the November 1983 Memorandum of Agreement for Union Station and Campo de Cahuenga.

- Coordination with Other Agencies: The SHPO and the ACHP are reviewing historic resources documentation.

- Determination: FTA, in consultation with the SHPO and the Advisory Council on Historic Preservation, may determine that there is no feasible alternative to the temporary taking and relocation of the Jewish Home for Wayfarers. All efforts to minimize harm have been taken; preservation stipulations have been proposed to protect this property during the construction period, to restore it to its historic setting and to ensure that the transfer, lease or sale of this property will include protection of those elements of the property that contribute to its eligibility for the National Register of Historic Places. Planning to minimize harm to significant archaeological resources has been incorporated into the project in the form of an Identification Study and Treatment Plan.

c. Walter and Lillie Webb Residence

- Description and Significance of Affected Property: This Shingle style residence, which also incorporates Queen Anne and Classical Revival features, was built for Walter L. and

Lillie T. Webb in 1892. Walter Webb was a partner in a series of engraving and stationery firms and a member of the Board of Education. The Webbs commissioned Los Angeles architect J.H. Bradbeer to design their house. The building is eligible for the National Register because: it embodies the characteristics of the Shingle style, an increasingly rare style in Los Angeles; it is the work of a master architect who designed many important residences in Los Angeles at the end of the nineteenth century; and it has retained its integrity.

- Application of Section 4(f) Criteria for Use: The Walter and Lillie Webb Residence is located immediately to the north of the Jewish Home for Wayfarers. The excavation for the crossover track for the First/Boyle station would occur under a portion of the structure. The MTA is proposing to move the structure temporarily to another site and to restore the structure to its historic location after the construction is complete.

- Alternatives that Would Avoid Use: The alternatives that would avoid use of this property are the same as for the Jewish Home for Wayfarers, i.e. rotate the station clockwise so that it is under First Street, shift the station north or eliminate the crossover at this location. None of these is considered prudent or feasible for the reasons discussed above.

- Measures that Would Minimize Harm: The measures to minimize harm to this property are the same as for the Jewish Home for Wayfarers. The MTA is proposing Preservation Stipulations to protect this property during and after the construction period. It will also adopt an Identification Study and Treatment Plan to protect significant archaeological and historic archaeological resources that may occur on this site.

- Coordination with Other Agencies: The SHPO and the ACHP are reviewing historic resources documentation.

- Determination: FTA, in consultation with the SHPO and the Advisory Council on Historic Preservation, may determine that there is no feasible alternative to the temporary taking and relocation of the Walter and Lillie Webb residence. All efforts to minimize harm have been taken; preservation stipulations have been proposed to protect this property during the construction period, to restore it to its historic setting and to ensure that the transfer, lease or sale of this property will include protection of those elements of the property that contribute to its eligibility for the National Register of Historic Places. Planning to minimize harm to significant archaeological resources has been incorporated into the project in the form of an Identification Study and Treatment Plan.

d. Brooklyn Theater

- Description and Significance of Affected Property: The Brooklyn Theater was designed for West Coast Theaters, Inc. by L.A. Smith, and constructed in 1925. The building originally housed stores and apartments, in addition to the theater. It has undergone significant alterations, including removal of the original marquee in 1948 and sandblasting in 1954. The building to the rear of the theater, originally built on a separate lot but now on the same parcel, does not contribute to the theater's eligibility. The theater was evaluated in the Historic Resources Inventory of the State Office of Historic Preservation as appearing eligible for the National Register of Historic Places. Architect L.A. Smith was noted throughout the 1920's for his numerous designs of motion picture theaters in many neighborhoods in the greater Los Angeles area.

- Application of Section 4(f) Criteria for Use: The Brooklyn Theater is located on an L-shaped parcel that fronts on the north to Brooklyn Avenue and on the east to Fickett Street. The historic theater building faces onto Brooklyn Avenue. To the south of the theater is another structure that is not connected physically with the theater building, but which is under the same ownership. The theater is currently being used for a swap meet. The structure to the rear, facing onto Fickett Street, may provide storage facilities for the swap meet.

  The MTA would acquire the entire property and demolish the structure to the rear in order to construct the tunnel exiting the east end of the Brooklyn/Soto station. The historic theater will not be altered or demolished because of station and tunnel construction. The tunnel will be constructed by cut-and-cover method at this location, approximately 30 feet south of the Brooklyn Theater building to a depth of approximately 60 feet.

  Although this is technically a "use" of the Brooklyn Theater property, the portion of the property that would be physically used does not contribute to the important characteristics of the property that made it eligible for the National Register of Historic Places. It appears that the two parcels were originally separate, although research has not shown exactly when they became joined into a single ownership. The two structures are physically separate, except for an upper story walkway. Demolishing the warehouse type structure to the rear would not affect the Brooklyn Theater building or its visual setting from Brooklyn Avenue. The rear structure is not visible from Brooklyn Avenue.

- Alternatives that Would Avoid Use: The AA/DEIS/DEIR reviewed a number of locations for the Brooklyn/Soto station. A station in Brooklyn Avenue was considered. Brooklyn Avenue is approximately 58 feet wide at this point, with 10 to 12 foot sidewalks and a very high volume of pedestrian traffic using the retail outlets in the vicinity. Construction of the station box would require at least 60 feet of width and would likely reduce sidewalk widths on both sides of the street. It was determined that, given the width of Brooklyn Avenue and the deleterious effects that construction in the street would have on this vigorous Latino marketplace, an off-street station location was preferable to reduce impacts on local businesses. The southeast corner of Brooklyn and Soto was selected for the station location in order to take advantage of a significant amount of vacant land previously occupied by a grocery market and its associated parking. The other quadrants of this intersection are more built up and would require more acquisitions.

- Measures to Minimize Harm: The theater structure will be properly braced and secured during construction of the tunnel, to protect it from damage during the construction period. The transfer, lease or sale of the theater will be subject to the Preservation Stipulations proposed by MTA. These stipulations are reproduced in Appendix 7.

- Coordination with Other Agencies: The SHPO and the ACHP are reviewing historic resources documentation.

- Determination: FTA, in consultation with the SHPO and the Advisory Council on Historic Preservation, may determine that there is no feasible alternative to the acquisition of the Brooklyn Theater parcel and the demolition of an unrelated structure adjacent to the Brooklyn Theater. The adjacent structure is not eligible for the National Register of Historic Places nor does it contribute to the characteristics of the Brooklyn Theater's setting that make it eligible for the National Register. All efforts to minimize harm have been taken; preservation stipulations have been proposed to protect this property during the construction period, to restore it to its historic setting and to ensure that the transfer, lease or sale of this property will include protection of those elements of the property that contribute to its eligibility for the National Register of Historic Places.

e. Golden Gate Theater

- Description and Significance of Affected Property: The Golden Gate Theater is an outstanding example of the Spanish Churrigueresque style of architecture, made all the more imposing by the sheer verticality of the main (north) facade. A course of Churriqueresque ornament crowns the top of a rusticated base and is reproduced in even more elaborate ornament at the roofline. The building is virtually devoid of ornament along the sides, probably because of its original courtyard orientation within the Vega Building.

  The Golden Gate Theater was formerly listed in the National Register of Historic Places, along with it companion retail stores-- the Vega Building. The Vega Building was damaged by the 1987 Whittier earthquake and demolished in 1992, leaving only the detached theater building on the property. This building still appears eligible to the National Register, as it embodies the characteristics of the Spanish Churrigueresque style and because its design possesses high artistic values. It was designed for the Vega Corporation in 1927 by the Balch Brothers, who together and with others designed numerous theaters and apartment buildings in the Los Angeles area in the 1920s.

- Application of Section 4(f) Criteria for Use: The Whittier/Atlantic station entrance would be located on the southwest corner of the Whittier/Atlantic intersection, on the parcel containing the Golden Gate Theater, approximately 35 feet from the north facade of the theater. Above-ground elements of the station entrance would consist of stairs, escalators and an elevator to provide access to the underground station. MTA has no plans to use the theater building itself, which is currently empty. Construction of the station entrance would not require alteration or demolition of any portion of the theater building.

  A parking structure and bus drop-off facilities may also be provided on this block, which stretches from Woods Avenue on the west to East St. Louis Place on the south.

- Alternatives that Would Avoid Use: Of the four corners available at this intersection, the southwest corner contains the greatest amount of underutilized land for the station entrance and for end-of-line bus and auto facilities. The other four corners are occupied with functioning businesses that would have to be displaced.

- Measures to Minimize Harm: The theater will not be altered or destroyed to construct the station or station-related facilities. The station and related facilities will adjoin the theater, but will not block the views of the north facade, which is the important elevation. The only above-ground element in front of the theater will be the elevator to the station. Otherwise, the station entrance will be incorporated into a plaza area in front of the theater. Bus and parking facilities will be located to the south and west of the theater. Design of above-ground facilities is covered by provisions in the existing Memorandum of Agreement for the Metro Rail project.

  The MTA has proposed to Preservation Stipulations to apply to the transfer, lease or sale of this property. Preservation stipulations are reproduced in Appendix 7.

  In addition, the MTA has agreed to require protection of the theater during construction by the contractor. Specifications requiring such protection will be part of the contractor's contract.

- Coordination with Other Agencies: The SHPO and ACHP are reviewing historic resources documentation.

- Determination: FTA, in consultation with the SHPO and the ACHP, may determine that there is no feasible alternative to taking property and constructing a station entrance and bus/auto parking facilities adjacent to the National Register eligible Golden Gate Theater. All efforts to minimize harm have been taken; preservation specifications will be incorporated into construction contracts and preservation stipulations regarding the Golden Gate Theater have been signed.

4-17.4 ARCHAEOLOGICAL RESOURCES

No significant archaeological resources have been identified within the Area of Potential Effect for the LPA. However, since the project is located within one of the oldest settlement areas in Los Angeles, there is a potential for disturbing archaeological resources during the construction process. In recognition of that possibility, the MTA has agreed to adopt an Identification Study and Treatment Plan that will be consistent with that adopted in Part II of the November 1983 Memorandum of Agreement for Union Station and Campo de Cahuenga.

4-17.5 PARK AND RECREATION RESOURCES

The LPA would not require the use of any park or recreational resource. It would pass under the southeast corner of Pecan Playground, at a depth of approximately 40 feet to top of rail. This portion of the tunnel section is located between Little Tokyo and First/Boyle Stations, just west of the U.S. 101 Freeway. The project will be constructed without altering the ground surface and there are no plans for above-ground elements such as vents, blast relief shafts or emergency exits to be located in this park area. Because of the depth of the tunnel, the absence of noise and vibration effects and the fact that the surface will not be altered by the project, this is not considered a 4(f) "use," either actual or constructive.

4-18 CONSTRUCTION IMPACTS

Construction impacts would occur with the Locally Preferred Alternative (LPA) and not with the No Build Alternative. Initial planning and environmental analysis for the extension of the Metro Red Line into East Los Angeles must consider the potential construction impacts resulting from project implementation. Key impact areas include community impacts, traffic, parking, air quality, noise and vibration, utilities and business disruption. Construction impacts are discussed in this section and in previous sections including Parking (Section 3-3), Economics Impacts (Section 4-2), Land Acquisition/Displacement and Relocation (Section 4-3), Communities/Neighborhoods (Section 4-4), Geotechnical/Subsurface/Seismicity (Section 4-9), Water Resources (Section 4-10), Historical, Archaeological and Paleontological Resources (Section 4-14) and Community Facilities/Parklands/Cemeteries (Section 4-16). Construction impacts would be temporary, generally limited to a 36 to 60-month construction period for a segment (e.g., initial operable segment).

4-18.1 CONSTRUCTION METHODS

Although construction impacts would be relatively short-term and generally limited to a 36 to 60-month construction period, they were an important determining factor in selecting an alignment that best fits the needs of the East Los Angeles community, especially the use of off-street stations.

General construction methods for the LPA would consist of the following elements:

- Cut-and-cover or open-cut construction for underground stations, crossovers and other special structures (e.g., emergency exits and vent structures). Open-cut construction would be used at the Little Tokyo, Brooklyn/Soto and Whittier/Arizona stations. The portion of the First/Boyle station that lies off-street would also utilize open-cut construction. The other under-street stations (First/Lorena, Whittier/Rowan and Whittier/Atlantic) would use a cut-and-cover construction technique.

- Tunnel Shield Mining (TSM) tunneling for line segments between stations.

To provide a clear understanding of potential construction impacts, these construction elements are discussed in the following sections.

Because the underground stations would be located in built-up urban areas, their construction would need to take into consideration impacts on vehicular and pedestrian traffic, influences on adjacent structures, effects on buried utilities and the necessity of final restoration of the street surfaces. The construction methods for off-street stations would be similar to those constructed on-street. Off-street stations would require additional acquisition of private property. However, off-street stations would reduce potential impacts to commercial and retail business, vehicular and pedestrian traffic and utility relocation by shifting much of the construction activities out of the street right-of-way.

4-18.1.1 Station Construction Methods

The Design Criteria and Standards used for the LPA stations are consistent with the latest Metropolitan Transporation Authority/Rail Construction Corporation (MTA/RCC) Metro Red Line System Design Criteria and standard documents. Standard modular double-end and single-end mezzanine subway stations, with double-height public space over the platforms, have been developed for use on the Eastside.

Different modular design elements include functions such as ancillary, platform mezzanine, crossover or a combination of the above. Different modules are combined based on the needs of individual stations. Longer stations are required if a crossover is located adjacent to the station. The length of each of the stations is dependent upon the modular components included and is shown in Table 4-18.1.

TABLE 4-18.1: STATION LENGTHS

Station	Length in Linear Feet
Little Tokyo	610
First/Boyle (with crossover)	902
Brooklyn/Soto	610
First/Lorena (with crossover)	902
Whittier/Rowan (with crossover)	902
Whittier/Arizona	610
Whittier/Atlantic (with crossover and tail track)	944

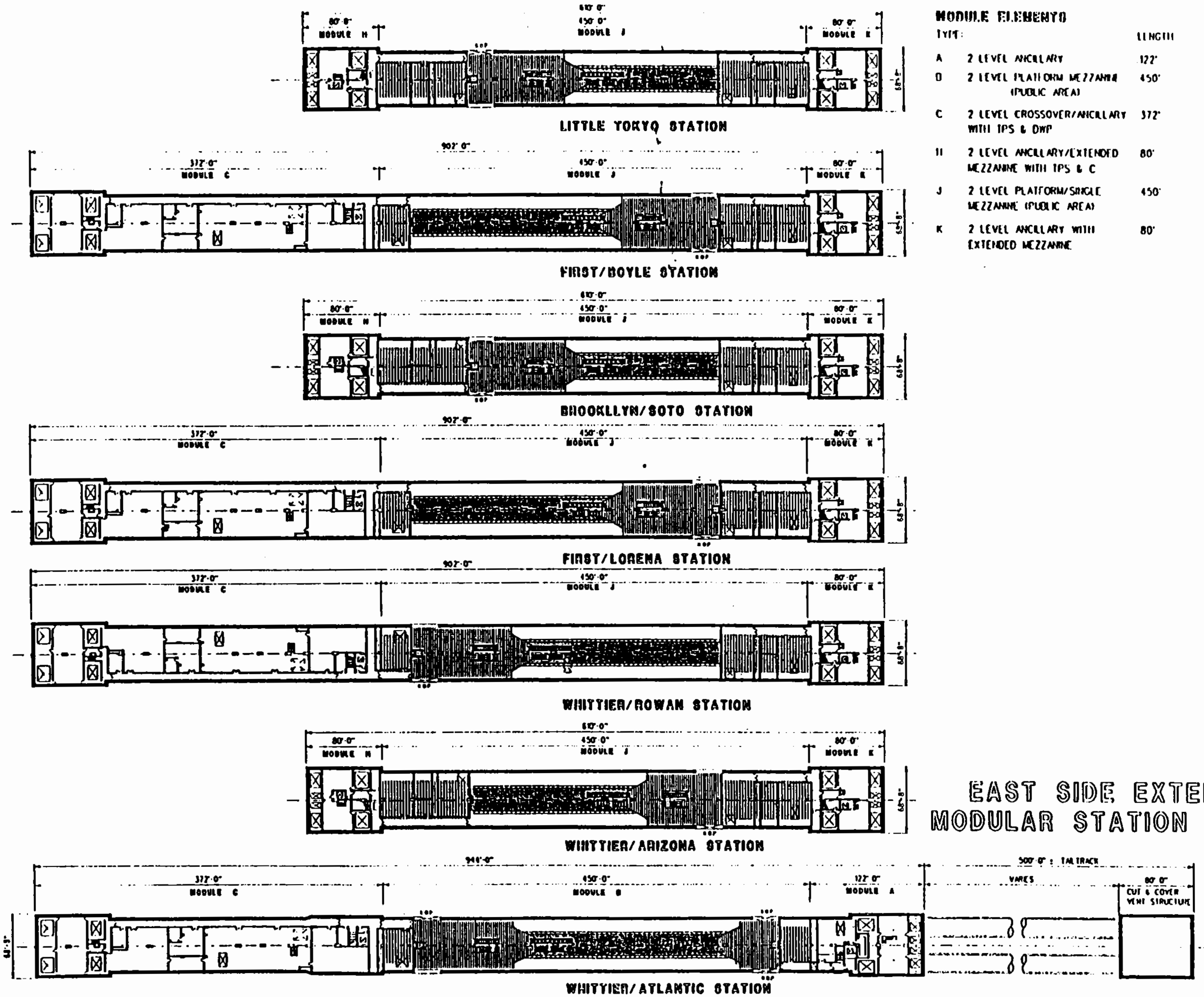
Source: Engineering Management Consultant, Rail Construction Corporation, 1994.

The underground stations of the Metro Red Line Project would be constructed by cut-and-cover/open-cut methods. The depth of underground stations and the resulting station excavations would be as shallow as possible, consistent with a minimum earth cover, allowance for utilities, the structural thicknesses required for the several levels of slabs and the interior vertical heights dictated by clearance requirements. Based on Preliminary Design, depths for the station excavations vary between approximately 60 and 85 feet. The width of station excavations would depend on the platform and trackway widths and the calculated thickness of the station's exterior structural walls. The widths of construction are further augmented by the thickness of the excavation support systems installed. The widths of LPA station excavations would be approximately 60 feet. Prototypical stations are shown in Figure 4-18.1.

a. Pre-Construction Considerations

Several pre-construction activities are discussed below, including vehicular and pedestrian traffic, building data, geotechnical conditions and underground utilities.

FIGURE 4-18.1: PROTOTYPICAL MODULAR DESIGN



MODULE ELEMENTS

TYPE:		LENGTH
A	2 LEVEL ANCILLARY	122'
B	2 LEVEL PLATFORM MEZZANINE (PUBLIC AREA)	450'
C	2 LEVEL CROSSOVER/ANCILLARY WITH TPS & DWP	372'
H	2 LEVEL ANCILLARY/EXTENDED MEZZANINE WITH TPS & C	80'
J	2 LEVEL PLATFORM/SINGLE MEZZANINE (PUBLIC AREA)	450'
K	2 LEVEL ANCILLARY WITH EXTENDED MEZZANINE	80'

EAST SIDE EXTENSION
MODULAR STATION DESIGN

11-5-93

- **Final Design and Contract Packaging**

During final design, the precise design elements of the LPA would be developed, reflecting, among other subjects, the final geotechnical investigations. Final design would in turn lead to determinations of contract packaging. Different contracts would be let to construct different portions of the LPA. For example, separate contracts may be let to construct the different stations and tunnel line sections. Utility and demolition work at the various stations would also come under separate contracts.

- **Vehicular and Pedestrian Traffic**

Construction of the LPA would temporarily interfere with the normal flow of traffic, causing some lanes and streets to be closed to vehicles for various durations. As shown in Table 4-18.2, several streets would be closed during the duration (estimated 3 to 4 years) of station construction. As discussed later in this chapter, some streets would be subject to lane and night closures. During final design, site and street specific Worksite Traffic Control Plans would be developed in cooperation with the City of Los Angeles Department of Transportation and Los Angeles County to accommodate required pedestrian and traffic movements. To the extent practical, traffic lanes will be maintained in both directions, particularly during peak traffic hours.

TABLE 4-18.2: STREET CLOSURES FOR THE FULL CONSTRUCTION PERIOD BY LPA STATION (Estimated Three to Four Years per station)

Station	Construction Period Street Closures
Little Tokyo	• Santa Fe Avenue between the south side of Second Street and approximately 75 feet south of the station – Temporary detour would be provided.
	• Third Street at Santa Fe Avenue – Temporary turnaround would be provided.
First/Boyle	• Pennsylvania Avenue from Bailey to approximately 100 feet west of Bailey – RCC would need to coordinate with White Memorial Hospital for access to parking lot.
	• Bodie Street south of First Street.
	• Pleasant Avenue from Boyle to First with the creation of Mariachi Plaza.
Brooklyn/Soto	• Mathews Street from Brooklyn to 250 feet south of Brooklyn.
	• Alley east of Soto Street from 140 feet south to 250 feet south of Brooklyn.
	• Alley east of Mathews Street from 140 feet south to 250 feet south of Brooklyn.
First/Lorena	• Alley east of Lorena Street from First to approximately 340 feet north of First Street.
	• Driveway access south side of First Street between Concord and Cheesebrough's Lane – RCC would coordinate with residents and businesses.
Whittier/Rowan	• Alley west of Rowan from Whittier to approximately 175 feet south of Whittier.
	• Eastman Avenue between the south side of Whittier Boulevard and the alley south of Whittier.
Whittier/Arizona	• Alley north of Whittier between McBride Avenue and Arizona Boulevard – RCC would coordinate with businesses for access to rear of buildings.
	• McDonnell Avenue between the alley north of Whittier Boulevard and approximately 150 feet north of the alley.
	• McBride Avenue between the alley north of Whittier Boulevard and approximately 150 feet north of the alley.
Whittier/Atlantic	• Oakford Drive between Whittier Boulevard and alley north of Whittier.

Source: Engineering Management Consultant, Rail Construction Corporation, 1994.

Roadway widths in East Los Angeles are relatively narrow. Therefore, the on-street stations' cut-and-cover construction would overlap the sidewalks by varying amounts. In such cases, a program to direct pedestrian traffic movement will be instituted, including the following elements:

- Maintenance of reasonable access to commercial establishments,
- Provision of signs for commercial establishments,
- Telephone hot line for construction information and
- Daily cleaning of work area.

- **Building Data**

A pre-construction structural survey would be completed prior to construction to determine the integrity of existing buildings . Consideration of adjacent buildings with respect to the excavation for underground stations is necessary to determine whether to underpin their foundations or whether the normal excavation support system is more suitable than underpinning. Building data would help determine whether tie-backs might be used or if only internal bracing is necessary. Concern for the integrity of the adjacent structures would also influence excavation and bracing procedures. Where sub-sidewalk vaults occur within the outline of the station construction, these vaults must be removed.

- **Pre-Construction Business Survey**

Public affairs and construction staff from the Rail Construction Corporation would contact and interview individual businesses, allowing for knowledge and understanding of how these businesses carry out their work. This survey identifies business usage, delivery and shipping patterns and critical times of the day or year for business activities. It helps the Rail Construction Corporation develop Worksite Traffic Control plans, identify alternative access routes and make efforts during construction to maintain critical business activities.

- **Geotechnical Conditions**

Subsoil conditions would determine whether the excavation support system used in previous Red Line construction, such as soldier piles and timber lagging, can be used or whether a closed type, such as interlocking sheet piling or concrete diaphragm wall, should be employed. Geological characteristics would be reviewed to determine how the excavation support system would be installed and whether the support system would be installed in pre-drilled holes or whether trench excavation should be used.

Soil types can also affect the type of bracing selected. Sands and soft clays, for instance, can preclude the use of tie-backs. Excavation in soft clays will often limit successive depths of excavation below installed braces resulting in more tiers of bracing than would be employed in more competent material such as dense sand. For a more detailed discussion of geotechnical conditions in the Eastside Corridor refer to Section 4-9, Geotechnical/Subsurface/Seismicity.

- **Underground Utilities**

Subject to other constraints, the LPA underground stations have been located to avoid to the extent possible conflicts with the space occupied by utilities. For instance, the Little Tokyo Station has been located to avoid a 12-foot reinforced concrete arch. Shafts for the First/Boyle Station have been designed to avoid a large telephone duct bank located under the westerly sidewalk of Boyle Avenue, and a notch has been designed into the top of the First/Lorena Station to avoid relocating a six foot storm drain and 10 inch sanitary sewer located under Lorena Street.

In certain instances, the positioning of the station or the location of station entrances and vent shafts would require that conflicting utilities be relocated to clear the way for the station structures. This relocation to a new permanent location that would not be affected by the station construction work is generally performed prior to the construction of the subway station. The construction equipment required for utility restoration is identified in section 4-18.1.3.

Utilities, such as high-pressure water mains and gas lines, which could represent a potential hazard during cut-and-cover and open-cut station construction and that are not to be permanently relocated away from the work site, would be removed from the cut-and-cover or open-cut area temporarily to prevent accidental damage to the utilities, to construction personnel and to the adjoining community. These utilities would be relocated temporarily by the station contractor at the early stages of the operations and reset in essentially their original locations during the final backfilling above the constructed station. Utilities that need not be relocated, either permanently or temporarily, are uncovered during the early stages of excavation. These buried utilities, with the possible exception of sewers, are generally found within several feet of the street surface. They can be reinforced, if necessary, and supported by hanging from deck beams. Utility relocation is discussed further in section 4-18.1.1 C, Deck Installation.

b. Support of Adjacent Structures

The first step in construction of an underground station is to support the foundations of buildings adjacent to the station excavation. This process is called underpinning. In lieu of underpinning, the support of adjacent structures can be accomplished by use of excavation support systems, which in conjunction with proper excavation and bracing procedures, can serve as protection for the adjacent structures. The excavation support systems include interlocking sheet piling, reinforced concrete cylinders, soldier piles and timber lagging. During construction, MTA will monitor adjacent buildings for movement and, if movement is detected, take action to control the movement.

Present indications are that a soldier pile and timber lagging sheeting system would be selected for virtually all of the stations. This is due to the absence of major structures along the alignment, the soil conditions known to exist along the route and the economy of the soldier pile and timber lagging system. Soldier piles can also be installed between existing major utility lines, thereby avoiding the need to shift or relocate them.

To install the soldier piles and timber lagging for the support of the excavation, it is necessary to auger out the holes for the placement of the piles. This process is shown in Figure 4-18.2. The pre-drilling of holes is necessary to reduce project noise levels that would otherwise occur with pile driving.

The contractor would first occupy one side of the street to install one line of soldier piles as shown in Figure 4-18.3. The amount of street width that this equipment requires would reduce the lanes of traffic that can be kept open. At this stage, the traffic would still use the existing pavement.

After installation of soldier piles on both sides of the street for the under-street stations, the contractor would proceed with installation of deck beams, installation of the deck and excavation and bracing as shown in Figure 4-18.4. Decking would not be used for the off-street stations (except for that portion of the First/Boyle station that crosses First and Boyle streets) nor at the Little Tokyo station. The equipment required for installation of the soldier piles is identified in section 4-18.1.3.

c. Deck Installation

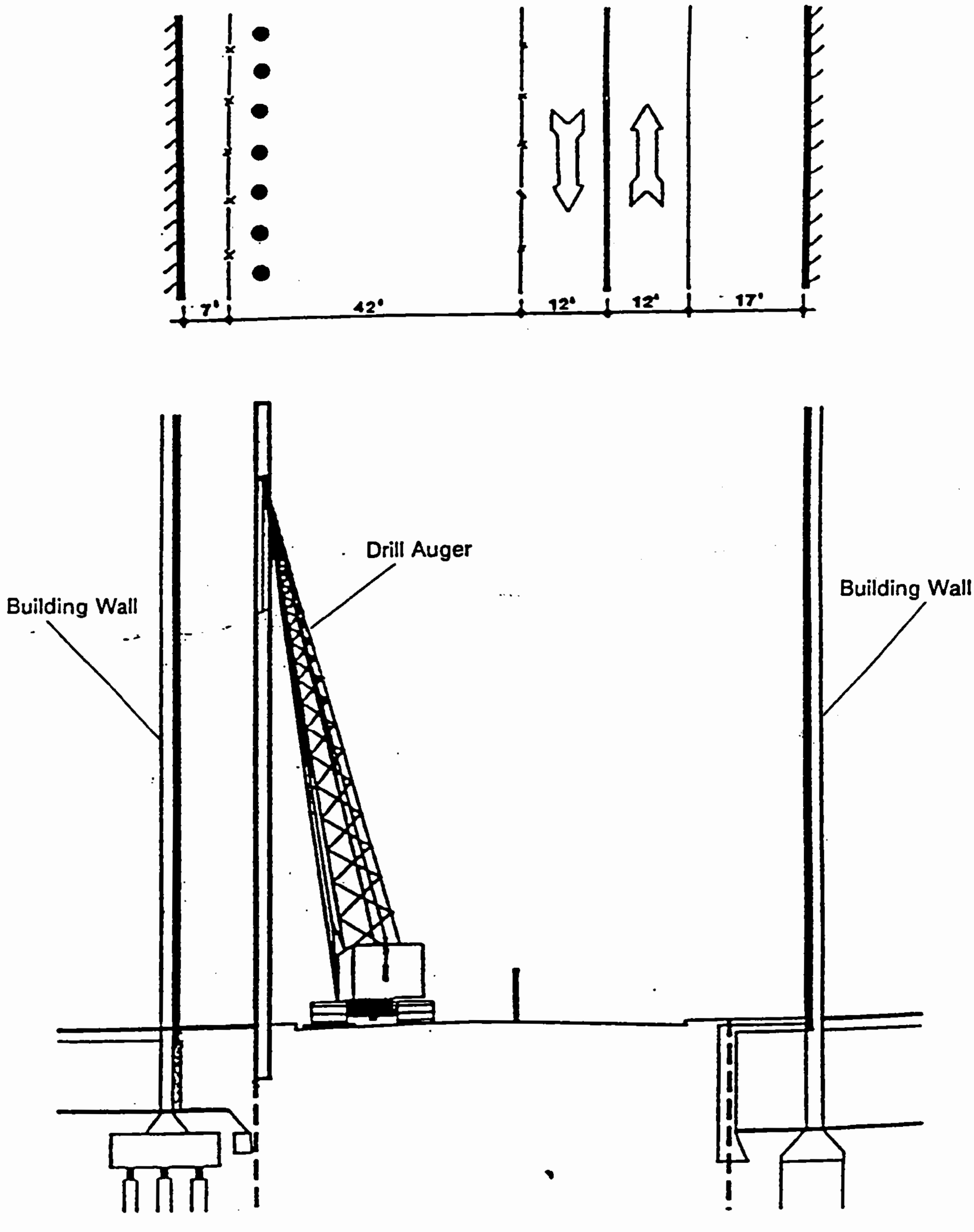
Deck installation would require lane and night street closures at several of the stations (see Table 4-18.3). To satisfy the traffic flow and the contractor's operations, the under-street cut-and-cover stations would be decked.

TABLE 4-18.3: TEMPORARY LANE AND NIGHT STREET CLOSURES

Station	Temporary Lane and Night Street Closures	Estimated Total Duration [a] (months)
First/Boyle	• First Street between Boyle and Bailey	3 - 4
	• Boyle Avenue from First to approximately 150 feet south of First	3 - 4
First/Lorena	• First Street between Concord Street and Cheesebrough's Lane	6
	• Lorena Street at First Street	6
	• Cheesebrough's Lane at First	6
Whittier/Rowan	• Whittier Boulevard between Townsend Avenue and Gage Avenue	6
	• Rowan Avenue at Whittier	6
Whittier/Atlantic	• Whittier Boulevard between Vancouver Avenue and Goodrich Boulevard	7
	• Atlantic Boulevard at Whittier Boulevard	7
	• Vancouver Avenue at Whittier Boulevard	7
	• Woods Avenue at Whittier Boulevard	7
	• Amalia at Whittier Boulevard	7
	• Hill View Avenue at Whittier Boulevard	7

Notes: [a] Length of time given is the total for both at the beginning of decking and at the end for street restoration. Durations given are estimates.

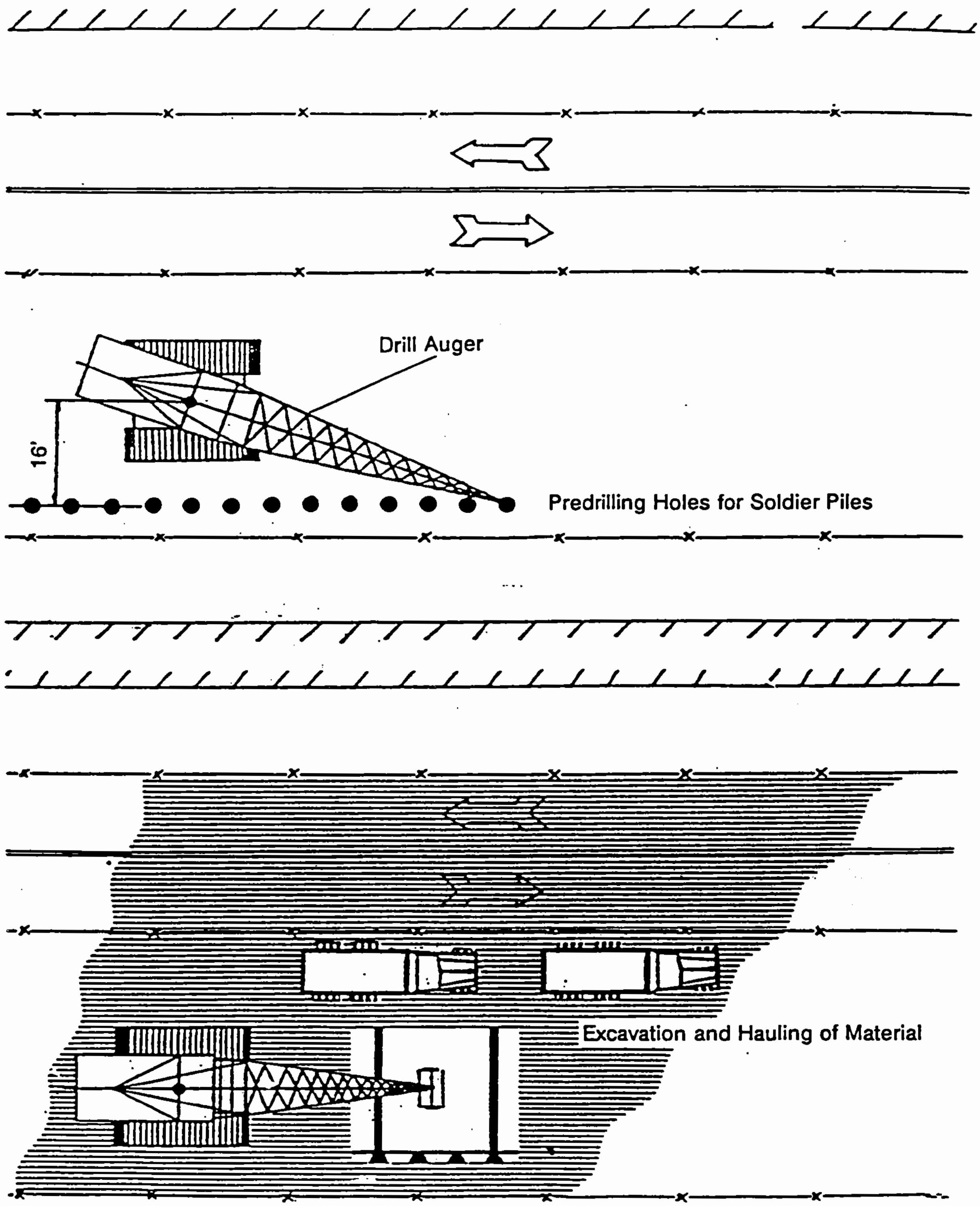
Source: Engineering Management Consultants, Rail Construction Corporation, 1994.



Source: RCC/Parsons Brinckerhoff Quade & Douglas, Inc.

Figure 4-18.2

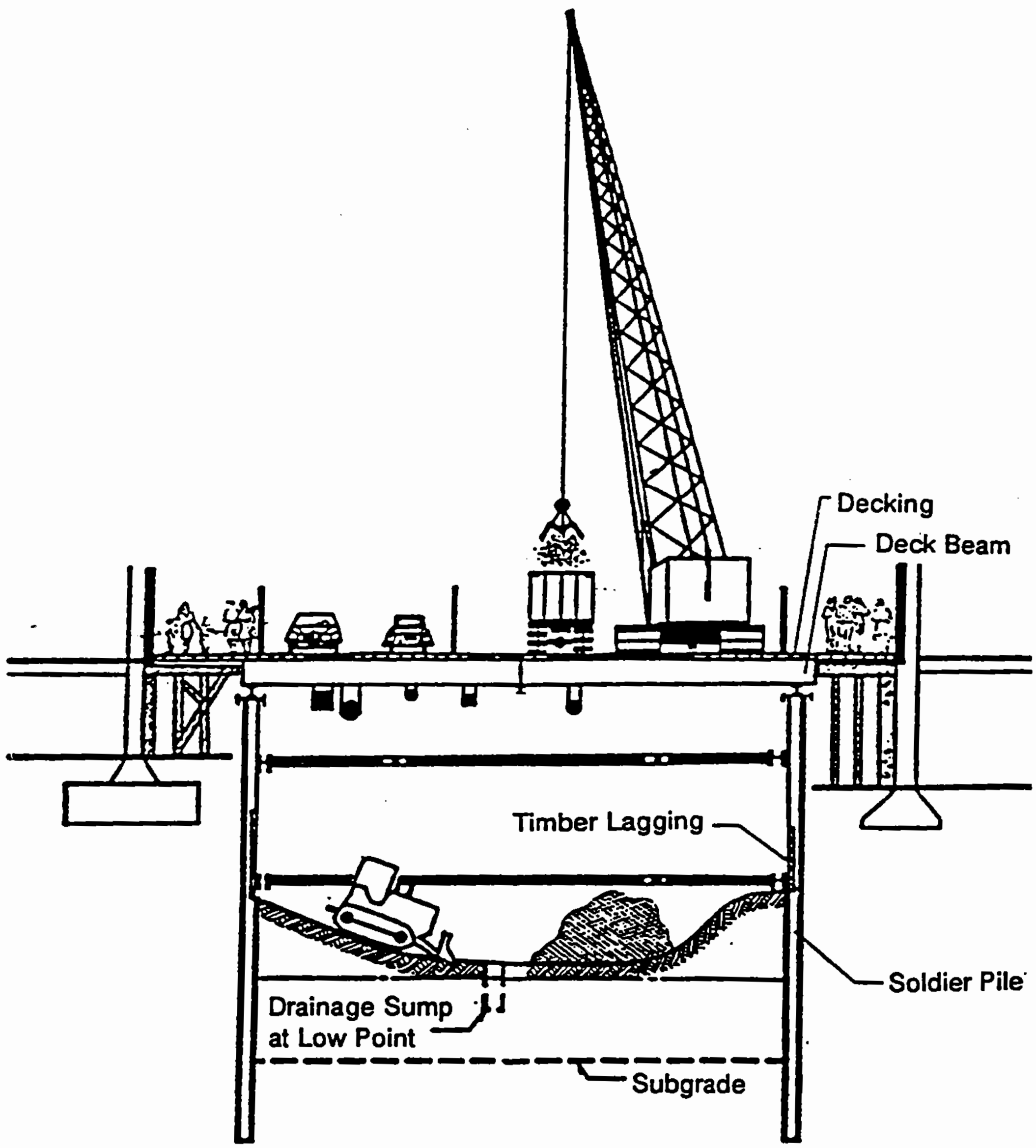
Installation of Soldier Piles



Source: RCC/Parsons Brinckerhoff Quade & Douglas, Inc.

Figure 4-18.3

Maintenance of Traffic During Pile Installation



Source: RCC/Parsons Brinckerhoff Quade & Douglas, Inc.

Figure 4-18.4

Excavation and Bracing

Decking would be installed in progressive stages. Lateral trenches are excavated across the street at each soldier pile location to permit installation of deck beams. These trenches are generally excavated during the nighttime and covered to permit normal traffic flow during the day. When a sufficient number of deck beams have been installed, a shallow excavation of approximately eight feet in between the deck beams is made. This shallow excavation is for the purpose of uncovering the buried utilities as well as to provide room for continuing the excavation below the erected decking. Decking will be set flush with the existing street or sidewalk levels.

Decking at cross-streets would be installed in stages to allow at least half of the existing lanes to be maintained. After installation of the deck, full cross-street traffic can be maintained for the duration of construction.

As deck beams are installed, the utilities that can remain in the trench area (e.g., telephone, traffic, electric) are cradled and picked up and hung from the deck beams. Sewer lines may show up at this shallow depth and likewise would be hung from the deck beams during the initial excavation stage. They also may be deeper and uncovered fully after additional depth of excavation has been accomplished. Sometimes heavy utilities such as large sewer pipes are supported by an auxiliary set of beams spanning between sheeting systems rather than hanging them from the deck beams.

When utilities cannot be relocated outside the excavation or when they are being moved, there is a small chance of damaging utilities during excavation and causing a utility outage that can last for a few minutes to a few days. Most of the risk of hitting utilities is caused by actual utility locations being different from those shown on construction drawings. Utility service is returned as quickly as possible after an outage.

d. Excavation and Bracing

With the decking installed and the utilities supported, the major excavation work can proceed. The method of removing the material for hauling away from the job site is a choice made by the contractor. A typical operation would be for bulldozers and/or overhead loaders to move the material to a central pickup point or several such points, where a clam shell bucket from a crane or a vertical or diagonal conveyor belt can hoist the material and place it into waiting trucks or a loading hopper.

e. Contractor's Work Area

The most economical and least time consuming condition for cut-and-cover construction is one that permits the contractor to use equipment operating at street level. Auger drills and bucket excavators are employed for installation of excavation support systems. Clam shell buckets are used for excavation, and high capacity trucks carry the material away for disposal or reuse. Flat bed carriers transport materials to the work site. Cranes lower rebar and other materials into the open trench. Ready-mix trucks bring concrete to the job and dump either by chutes to the pour area or into buckets for cranes to lower to the concreting locations. Cranes are required for the lowering and lifting of other construction materials into the station excavation.

Acquisitions required for construction staging at each station are described in section 4-3, Land Acquisition/Displacement & Relocation. These acquisitions are intended to accomplish a number of goals, including: (1) reducing the staging and construction equipment in streets, (2) providing a noise buffer to adjacent properties and (3) allowing construction material to be stored off-street.

In addition, the acquisitions identified would also allow improved truck circulation around several of the stations (First/Boyle, Brooklyn/Soto, Whittier/Rowan and Whittier/Arizona), thus minimizing truck traffic through residential neighborhoods. For example, by acquiring property south of the Brooklyn Avenue between Soto and Fickett Streets, construction vehicles would be able to traverse the Brooklyn/Soto station site and exit at either Fickett or Soto. The same strategy would be used for the Whittier/Arizona station. Acquisitions north of Whittier Boulevard would allow construction vehicles to traverse the site and exit at Duncan Street or Arizona Boulevard. At the First/Boyle station, Bodie Street (located at the western end of the station) would be closed during construction to allow construction vehicles access to and from the site.

Equipment employed for cut-and-cover/open-cut station construction is typically heavy duty high volume machinery. Such equipment requires certain amounts of space when standing still, more for swinging, and additional for maneuvering. Equipment required for station construction is identified in Section 4-18.1.3.

Because of the width of street surface that the contractor would occupy to perform the cut-and-cover construction operations, the flow of traffic along the street would be limited and would be shifted from one side of the street to the other for various stages of deck construction. It has been determined that during the duration of cut-and-cover work, approximately two lanes (one lane in each direction) of traffic can be kept open the majority of time, although full street closure at night would be required for placement of the deck support beams.

Intersecting street traffic would have intermittent reductions in traffic lanes to no more than half the present number while decking is installed and later when decking is removed and the street restored. During the period when all the decking is in place at the intersections, full cross-street lanes of traffic can be maintained.

Table 4-18.4 identifies the estimated number of cubic yards of material to be removed during excavation for each station, as well as the estimated number of truck trips required to haul the material. It has been assumed that each truck would haul 20 cubic yards of material. Excavation of the station area is estimated to take six to eight months per station. (Removal of tunnel excavation material would also occur at various stations along the LPA -- See Section 4-18.1.2 below.)

The timing of the estimated maximum number of daily truck trips shown in Table 4-18.4 would be dependent on environmental considerations (e.g., noise, traffic, air quality, business disruption) at each station. Trucks could potentially operate from 8 to 24 hours a day. Los Angeles Department of Transportation (LADOT) and Los Angeles County permitting procedures may limit the hours of on-street truck operations.

TABLE 4-18.4: ESTIMATED AMOUNTS OF EXCAVATED MATERIALS FOR STATION CONSTRUCTION

Station	Estimated Cubic Yards[a]	Estimated Maximum Number of Daily Truck Trips[b]	Estimated Number of Total Truck Loads[b]
Little Tokyo	112,800	150	5,600
First/Boyle	218,900	150	11,000
Brooklyn/Soto	105,700	150	5,300
First/Lorena	200,600	150	10,000
Whittier/Rowan	156,300	150	7,900
Whittier/Arizona	109,300	150	5,500
Whittier/Atlantic	190,900	150	9,500

Note: [a] This column includes an estimated 1.3 expansion factor for the soil due to handling.
[b] It has been assumed that each truck could haul up to 20 cubic yards.

Source: Engineering Management Consultants, Rail Construction Corporation, 1994.

f. Construction of Station Structure

The construction sequence for the station structure is shown in Figure 4-18.5. The station floor, also known as the invert or base slab, would be installed first. Invert slabs are generally poured in alternate sections so that the placement of reinforcing steel and the pouring of concrete do not interfere with each other.

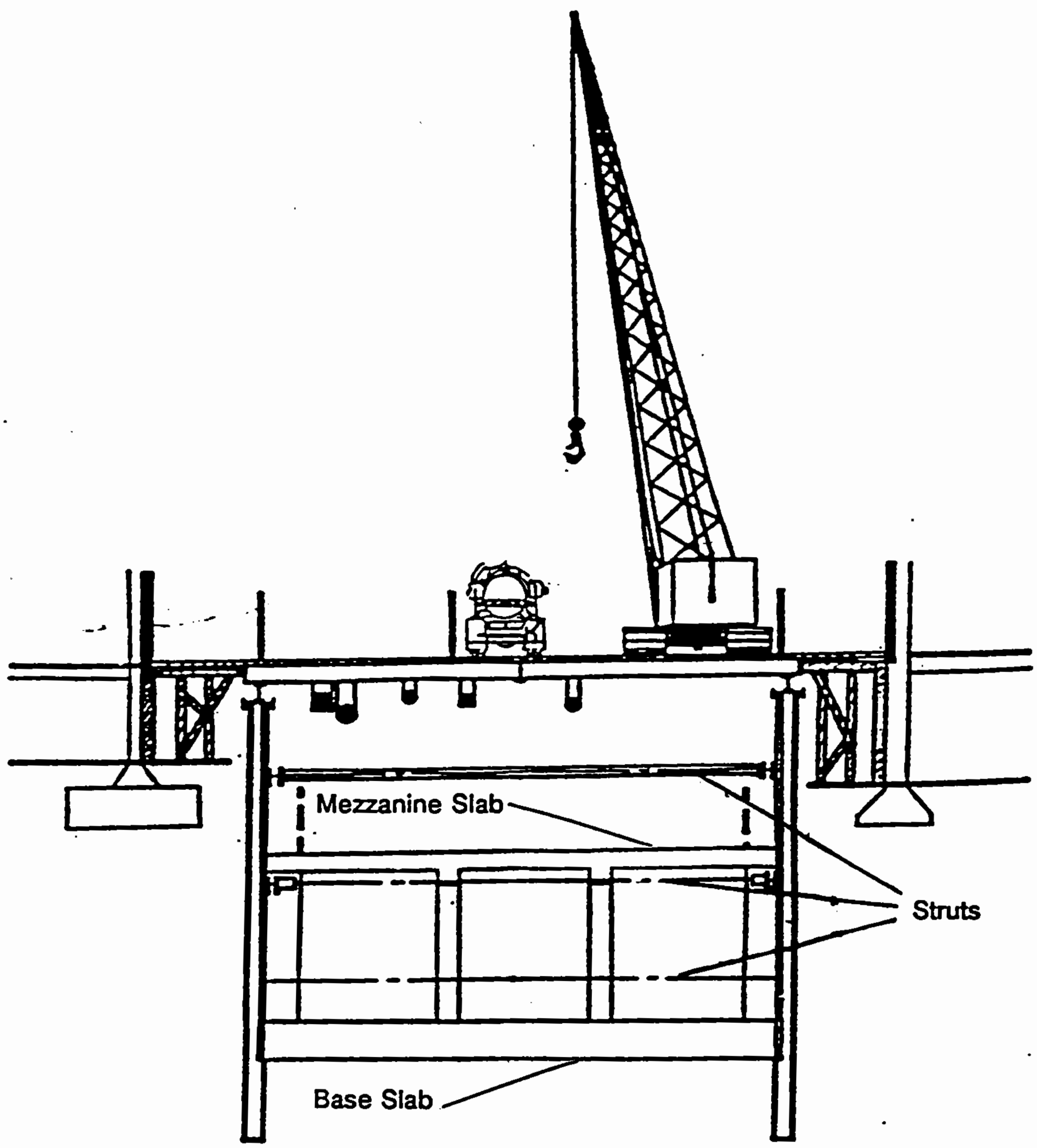
After a reasonable length of continuous base slab has been completed, the installation of exterior walls and any interior column elements can proceed up to the underside of slab level that is to be supported by the walls and/or columns. Thus, the wall and the column pour lifts might be to an upper track level, a mezzanine level or a roof level. The suspended slabs then are poured. Slabs are poured as the columns and intermediate floor and roof wall pours progress.

Station entrance locations are generally used as access points to the underground station during the construction process. Exterior entrances would be constructed after the station structure has been completed.

g. Street Restoration/Site Restoration

After the station structure has been completed and the roof slab allowed to cure for a specified period, the backfilling operation can begin. This process is shown in Figure 4-18.6. Where the sub-sidewalk vaults have been demolished and a structural concrete closure wall, of necessity, provided, the vault space is filled with compacted backfill. Prior to the backfilling operation, the continuous sidewalk decking would be removed.

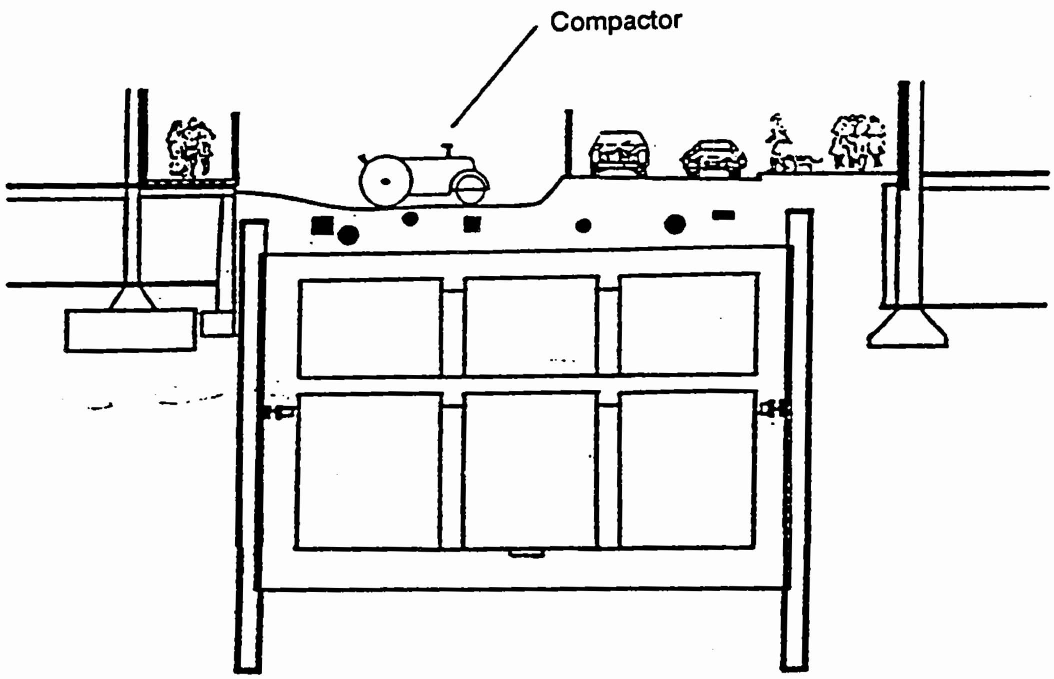
During the backfilling operations, the utilities would be restored to their permanent locations. Where sidewalks have been demolished because of the cut-and-cover construction, they would be restored.



Source: RCC/Parsons Brinckerhoff Quade & Douglas, Inc.

Figure 4-18.5

Structure Installation and Bracing and Removal



Source: RCC/Parsons Brinckerhoff Quade & Douglas, Inc.

Figure 4-18.6

Backfilling and Surface Restoration

After backfilling on one side of the street, the permanent street would be installed to accommodate two or three lanes of traffic. Traffic then would shift to the paved side of the street so that the contractor can complete the remaining backfilling and utility restoration work and can restore the sidewalk and the remainder of the street pavement.

With the restoration of roadway pavement and restoration of vehicular traffic, the surface work on the structure would be completed and continuing activity involving station finishes and equipment installations can continue beneath the surface with minimal disruption to street use by vehicles and pedestrians. Site restoration at the off-street stations would be accomplished in the same manner. Because these stations are off-street, they would not require the same level of street restoration or utility work. Only the cross streets at the off-street stations would require restoration.

4-18.1.2 Line Construction

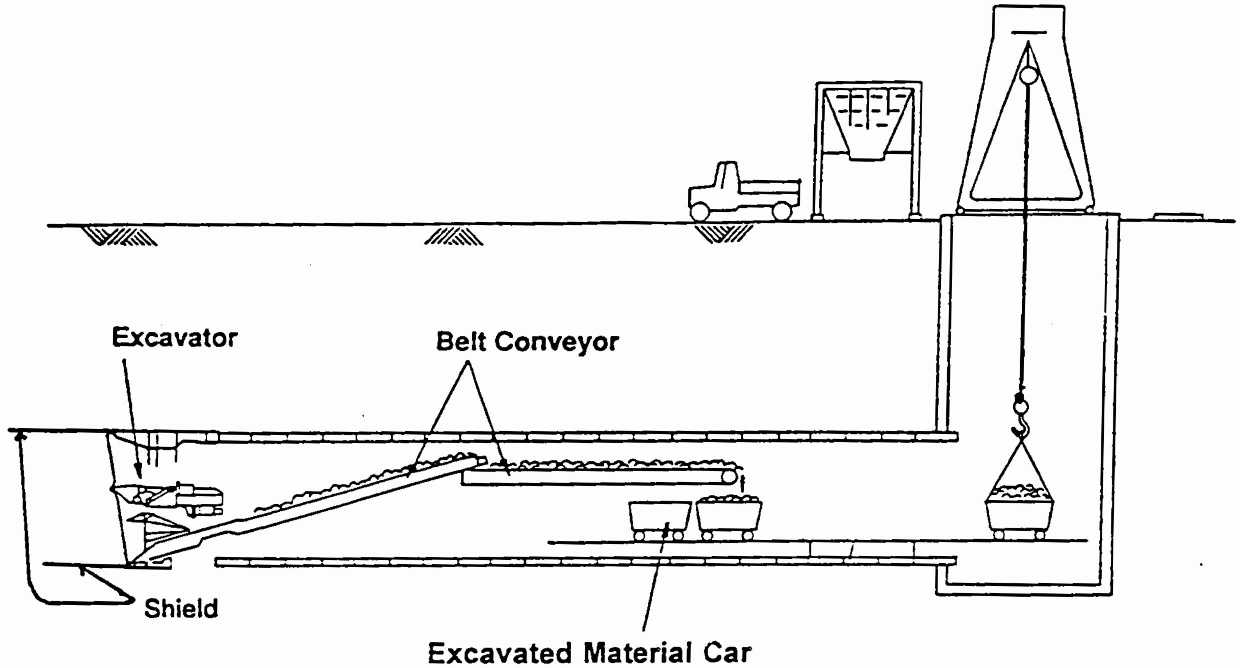
The line sections of the Metro Red Line Project would be constructed principally by tunnel shield machine methods. Twin tunnels would vary in depth from 45 feet to approximately 110 feet. In general, the twin tunnels would be in the conventional side by side configuration. Cross-passages would be mined between the tunnels at approximate 750-foot intervals along the line to provide passenger access to the adjacent tunnel in the event of a safety-related incident requiring passenger evacuation. Construction equipment required for tunnel construction is identified later in Section 4-18.1.3.

Certain special structures would be constructed by cut-and-cover methods. These include crossovers (which allow the trains to switch tracks along the line), emergency exits and ventilation shafts. In addition, drop hole location in the street areas would be provided to allow for concreting of the tunnel line sections. Other covered openings in street areas to meet state codes and safety requirements may need to be installed during construction.

a. The Mined/Excavated Tunnels

The twin mined/excavated tunnels connecting each station along the line would be constructed using mechanized tunnel shield mining (TSM) techniques that continuously support the ground during the tunneling operation. A typical TSM machine is shown in Figure 4-18.7. At the rear of these machines are tunnel liner erection devices that erect precast concrete segments. These segments make up the temporary lining of the tunnels in the form of rings of precast concrete between three to four feet wide and approximately 20 feet internal diameter. These rings serve to carry the earth and rock loading during the installation of the permanent tunnel lining.

The TSM machines would be placed in the ground generally at station or crossover structure excavations and driven to the next station or crossover by thrusting against the previously placed tunnel liner rings. When the TSM reaches the next station or crossover, it could: (1) be removed, (2) be skidded through the station excavation to commence tunneling of the next section, (3) tunnel through in advance of station excavation or (4) be lifted out using heavy mobile cranes and placed at the next tunnel section in order to avoid interfering with the construction of the station.



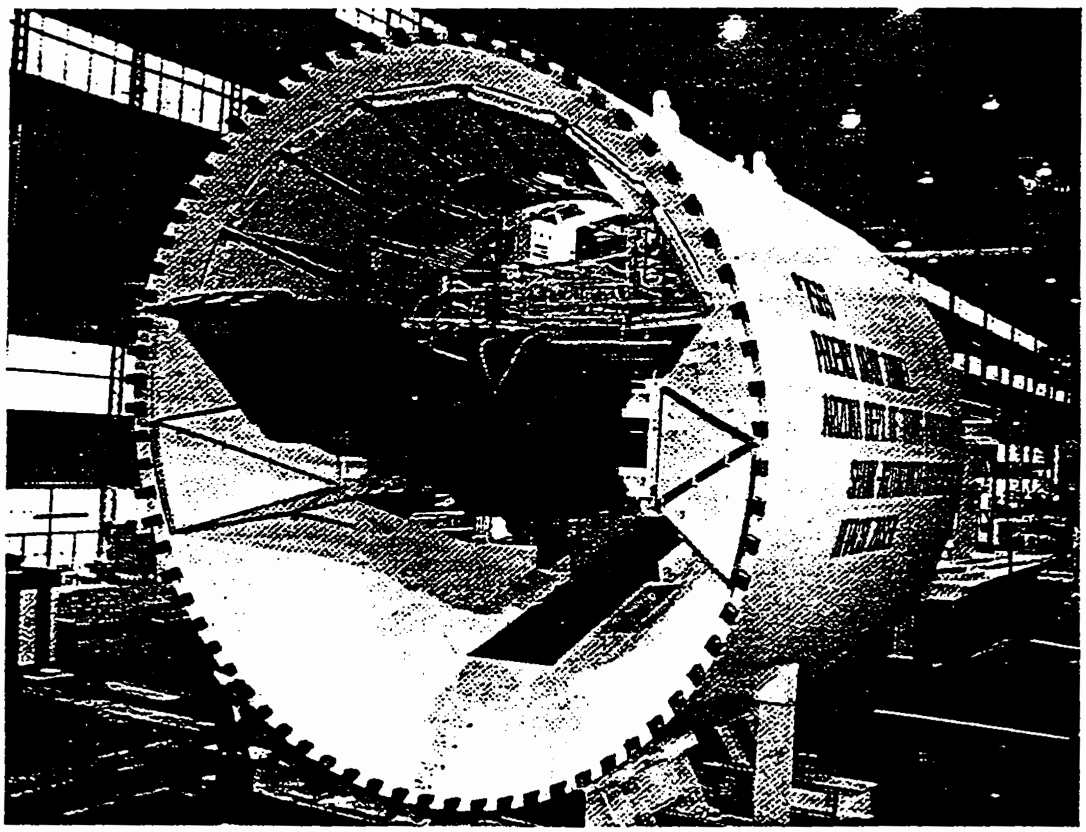


Figure 4-18.7

Tunnel Shield Machine (TSM)

Source: RCC/Parsons Brinckerhoff Quade & Douglas, Inc.

A tunnel staging site would be required at the starting point of each tunnel drive for tunnel liner storage; spoil removal, storage and loading facilities; and construction personnel facilities and offices. These sites would be either separated or combined with the station staging sites utilizing the acquisitions discussed in section 4-3. A shaft would also be required for lowering the TSM machine into the ground and for spoil removal. This shaft typically is built in a location that later would become a portion of a station or crossover. Table 4-18.5 provides estimates by line segment of the cubic yards of material and the total and maximum daily number of truck trips that could required for its removal. The actual number of trucks and trips would depend upon contract packaging and the location of excavated material removal site(s) (See section 4-18.1.2.b below).

TABLE 4-18.5: ESTIMATED AMOUNTS OF EXCAVATED MATERIAL BY TUNNEL SEGMENT

Tunnel Section	Estimated Cubic Yards[a]	Estimated Maximum Number of Daily Truck Trips[b]	Estimated Number of Total Truck Loads[b]
Union Station - Little Tokyo	104,600	300	5,200
Little Tokyo - First/Boyle	191,300	300	9,600
1ST/Boyle - Brooklyn/Soto	129,700	300	6,500
Brooklyn/Soto - First/Lorena	165,700	300	8,300
First/Lorena - Whittier/Rowan	227,300	300	11,400
Whittier/Rowan - Whittier/Arizona	197,200	300	9,900
Whittier/Arizona - Whittier/Atlantic	86,400	300	4,300

Note: [a] This column includes an estimated 1.3 expansion factor for the soil due to handling.
[b] It has been assumed that each truck could haul up to 20 cubic yards.

Source: Engineering Management Consultant, Rail Construction Corporation, 1994.

The timing of the estimated maximum number of daily truck trips shown in Table 4-18.5 would be dependent on environmental considerations (e.g., noise, traffic, air quality, business disruption) at each station. Trucks could potentially operate from 8 to 24 hours a day. LADOT and Los Angeles County permitting procedures may limit the hours of on-street truck operations.

The permanent lining would then be poured using the drop holes discussed above. This lining includes the high-density polythylene (HDPE) and cast-in-place concrete with rebar. The HDPE membrane would be fastened to the temporary lining and the rebar installed. The lower half of the permanent lining (invert) is then poured. Several months later, the top half (crown) is poured. The emergency evacuation walkway is then poured along the sides of each tunnel to provide a safe evacuation route for passengers clear of the trainways. Cross-passages between the twin tunnels would be constructed by hand mining methods from openings formed in the tunnel liners. In addition, tunnel openings to ventilation shafts and low-point drainage sumps would be constructed. Following these activities, the track bed construction and other finishing work would be completed.

b. Initial Operable Segments

In the event that funding constraints lengthen the construction period for the entire LPA, two less expensive subsets, known as Initial Operable Segments (IOSs), have been developed for environmental review. The determination of which Initial Operable Segment (IOS) is chosen would be based, among other factors, on available funding. The IOS chosen would ultimately determine which construction activities occur at each station and the sequence and direction of tunneling for each tunnel section. Therefore, it has been assumed that the following construction sites and activities may occur at each LPA station:

- A tunnel staging site for placing the TSM into the ground, the removal of tunnel spoil and storage of tunnel liners.
- Temporary access to salvage tunnel mining machines.
- Tunnel concreting using a temporary shaft.

c. Crossovers

Crossover structures are generally located immediately adjacent to stations and, like the stations, would be constructed by cut-and-cover or open-cut (for the off-street location at the First/Boyle station) methods. Accordingly, the design and construction requirements that are applicable to stations would be applicable to the crossovers. Crossovers are planned for the First/Boyle, First/Lorena, Whittier/Rowan and Whittier/Atlantic stations.

Crossover structures are approximately 375 feet long and consist of a concrete box approximately 60 feet wide. At several locations, traction power substations or other ancillary equipment and facilities would be located on the top level above the crossover, since a considerable amount of underground space is available between the top of the crossover boxes and the ground surface.

d. Line Ventilation Shafts

Between certain stations on the line, temporary or permanent cut-and-cover emergency ventilation shafts would be constructed to house ventilation fans used for extracting smoke from the tunnels in the event of fire. These shafts are generally required on sections of the line more than a mile between stations. Their exact location would be determined during final design.

The vent structure is generally a 50-foot-wide, three-cell horizontal concrete box at tunnel depth joining openings in the top of the tunnels to a vertical shaft penetrating the ground in a convenient location. Ventilation fans and their control equipment would be housed in this horizontal concrete box.

e. Emergency Exit Shafts

Due to the distance between the two tunnels from Union Station to the Little Tokyo station, cross passages between the two tunnels cannot be provided. In order to meet Fire/Life/Safety requirements for emergency exit, four emergency exit shafts (exits) were located during preliminary engineering. Along the right or outbound track, one would be located south of Ducommun Street west of Center Street and the other south of Temple Street west of Center. Along the left or inbound track one would be located south of Commercial Street east of Center Street and the other would be located east of Center Street north of Banning Street. Their exact locations would be determined during final design pending completion of the final geotechnical investigation.

4-18.1.3 Construction Equipment

The type, number and hours used for the necessary construction equipment are shown in Table 4-16.6.

4-18.1.4 Construction Schedule

The construction schedule for the LPA will depend upon the available funding and the identification of the Initial Operable Segment. Contract packaging will be defined during final design, which also will affect the ultimate construction schedule. General construction timing by phase is provided in Table 4-18.7.

4-18.1.5 Mitigation

A community construction coordination program would be established to enable an interchange between the RCC and the affected community regarding construction impacts and possible mitigations/solutions. The program would include dedicated personnel to deal with construction coordination.

During final design, site and street specific Worksite Traffic Control Plans would be developed in cooperation with the City of Los Angeles Department of Transportation and Los Angeles County to accommodate required pedestrian and traffic movements. To the extent practical, traffic lanes will be maintained in both direction, particularly during peak traffic periods. Decking at the under-street cut-and-cover stations will be installed flush with the existing street or sidewalk levels. This will allow full cross-street traffic to be maintained for the duration of construction.

Where the on-street stations' cut-and-cover construction would overlap the sidewalks, a program to direct pedestrian traffic movement will be instituted, including the following elements:

- Maintenance of reasonable access to commercial establishments.
- Provision of signing for commercial establishments.
- Telephone hot line for construction information.
- Daily cleaning of work area.

A pre-construction structural survey will be completed to determine the integrity of existing buildings prior to construction. During construction, MTA will monitor adjacent buildings for movement and, if movement is detected, take action to control the movement.

TABLE 4-18.6: ESTIMATED DAILY USE OF CONSTRUCTION EQUIPMENT BY CONSTRUCTION PHASE AND TYPE OF EQUIPMENT[a]

EQUIPMENT BY PHASE	UNDERGROUND STATION		BORED TUNNELS	
	Number Used per Shift	Time (hrs/day)	Number Used per Shift	Time (hrs/day)
RELOCATION OF BURIED UTILITY LINES (per station)[b]				
Excavator/backhoe	2	8	See excavation & construction sections below	
Trencher	2	8		
Truck	3	8		
Worker automobile	10	N/A		
Generator/compressor	1	8		
Cement truck	2	8		
Paver (street restoration)	1	8		
Roller (street restoration)	1	8		
Power compactor (street restoration)	1	8		
DEMOLITION (per station)[b]				
Crawler dozer/loader	1	8	See excavation & construction sections below	
Pavement breaker	1	8		
Rubber-tired loader/bob cat	2	8		
Truck	10	8		
Worker automobile	16	N/A		
Excavator/backhoe	1	8		
Generator/compressor	1	8		
EXCAVATION (per station)				
Crawler dozer/loader	1	24[c]	1	24[c]
Pile drilling rig	2	24[c]	2	24[c]
Water pump	4	24[c]	4	24[c]
Rubber-tired loader/bob cat	2	24[c]	1	24[c]
Pavement breaker	1	16[c]	N/A[d]	N/A
Excavator/backhoe	2	24[c]	2	24[c]
Conveyer system	1	24[c]	1	24[c]
Tunnel Mining Machine[e]	N/A	N/A	1	24[c]
Excavated material ("muck") locomotive (w/cars)[e]	N/A	N/A	1	24[c]
Dump Truck (20 yards)	20	24[c]	35	24[c]
Truck (delivery)	10	24[c]	10	24[c]
Worker automobile	50	N/A	60	N/A
Crane	2	24[c]	2	24[c]
Generator/compressor	2	24[c]	2	24[c]
Shotkrete machine	1	24[c]	N/A	N/A
Fork lift	1	24[c]	N/A	N/A
CONSTRUCTION (per station)				
Concrete Pump Truck	2	16[c]	2	16[c]
Cement Truck (9.5 yards)	22 max.	16[c]	22 max.	16[c]
Pavement breaker	1	16[c]	N/A	N/A
Crawler Crane	1	24[c]	2	24[c]
Compactor (for street restoration)	1	8	N/A	N/A
Roller (for street restoration)	1	8	N/A	N/A
Welder	4	24[c]	2	24[c]
Truck (delivery)	12	24[c]	10	16[c]
Worker automobile	50	N/A	50	N/A
Generator/compressor	2	24[c]	2	24[c]
Excavator/backhoe	1	8	N/A	N/A
Crawler dozer/loader	1	8	1	24[c]
Paver (for street restoration)	1	8	N/A	N/A

Notes:
- [a] This table provides an estimate of the equipment that may be used on any given day during construction of the Eastern Extension. The amount or type of equipment used may be different than that shown, and typically less equipment will be used for shorter periods of time. In addition, rarely will all equipment types be used at the same point in time. Estimates are provided, however, to evaluate the possible worst-case impacts that may be present over the course of the construction period.
- [b] Although expected to occur only rarely, street closures or double shifts (16 hrs.) may be necessary for demolition activities.
- [c] 24-hour or 16-hour use of this equipment may not be possible due to the location of the station in relation to adjoining land uses. Should the use of the equipment be limited (e.g., not used at night, used only for one shift, not used during peak traffic hours), the overall construction period would need to be extended.
- [d] N/A = Not Applicable
- [e] One per tunnel

Source: Rail Construction Corporation, Engineering Management Consultant, Myra L. Frank & Associates, 1994.

TABLE 4-18.7: GENERAL CONSTRUCTION SCHEDULE BY CONSTRUCTION PHASE

Construction Phase	Typical Duration (months)
Final Design	18 - 24
Pre-construction survey	6 - 12
Utility relocation	6
Contract award	4 - 6
Tunnel line sections	would depend upon length of line segment and other factors
Soldier piles	3 - 4
Deck placement	2 - 3
Site demolition (off-street stations)	2 - 3
Station excavation	7 - 9
Station construction	24 - 36
Site restoration	1 - 2
Follow-on contracts	12 - 18
Notes:	

Source: Engineering Management Consultants, Rail Construction Corporation, 1994.

A pre-construction business survey will be completed. This survey will identify business usage, delivery and shipping patterns and critical times of the day or year for business activities. It will help the Rail Construction Corporation develop Worksite Traffic Control plans, identify alternative access routes and make efforts during construction to maintain critical business activities.

Soldier piles will be installed using an auger to pre-drill the holes. No pile driving will occur.

Mitigation measures for particular impact categories such as traffic, noise and air quality are discussed in the mitigation sections following each subject area.

4-18.2 TRAFFIC

4-18.2.1 Setting

The existing traffic conditions in the LPA study area were presented earlier in Section 3-2.1.

4-18.2.2 Impacts

The construction of the LPA would result in varying types of traffic impacts depending upon the type and duration of construction activity. In some locations, where in-street construction would interfere with non-critical or low-volume roadways, the streets would be closed for the entire construction period. In other locations, streets may be closed temporarily during nighttime hours or lanes may be closed temporarily. In addition to construction impacts due to changes in existing street geometrics, the traffic generated by construction workers and trucks hauling excavated material may also cause traffic impacts. The determination as to where these impacts may be significant under CEQA is based on the magnitude, location and duration of the impacts, as discussed below.

a. Street Closures for Full Construction Period

Some street closures during the full construction period are proposed in the vicinity of the stations for the duration of the construction period (3 to 4 years), as summarized earlier in Table 4-18.2. The impacts of these street closures are described by station area.

- **Little Tokyo**

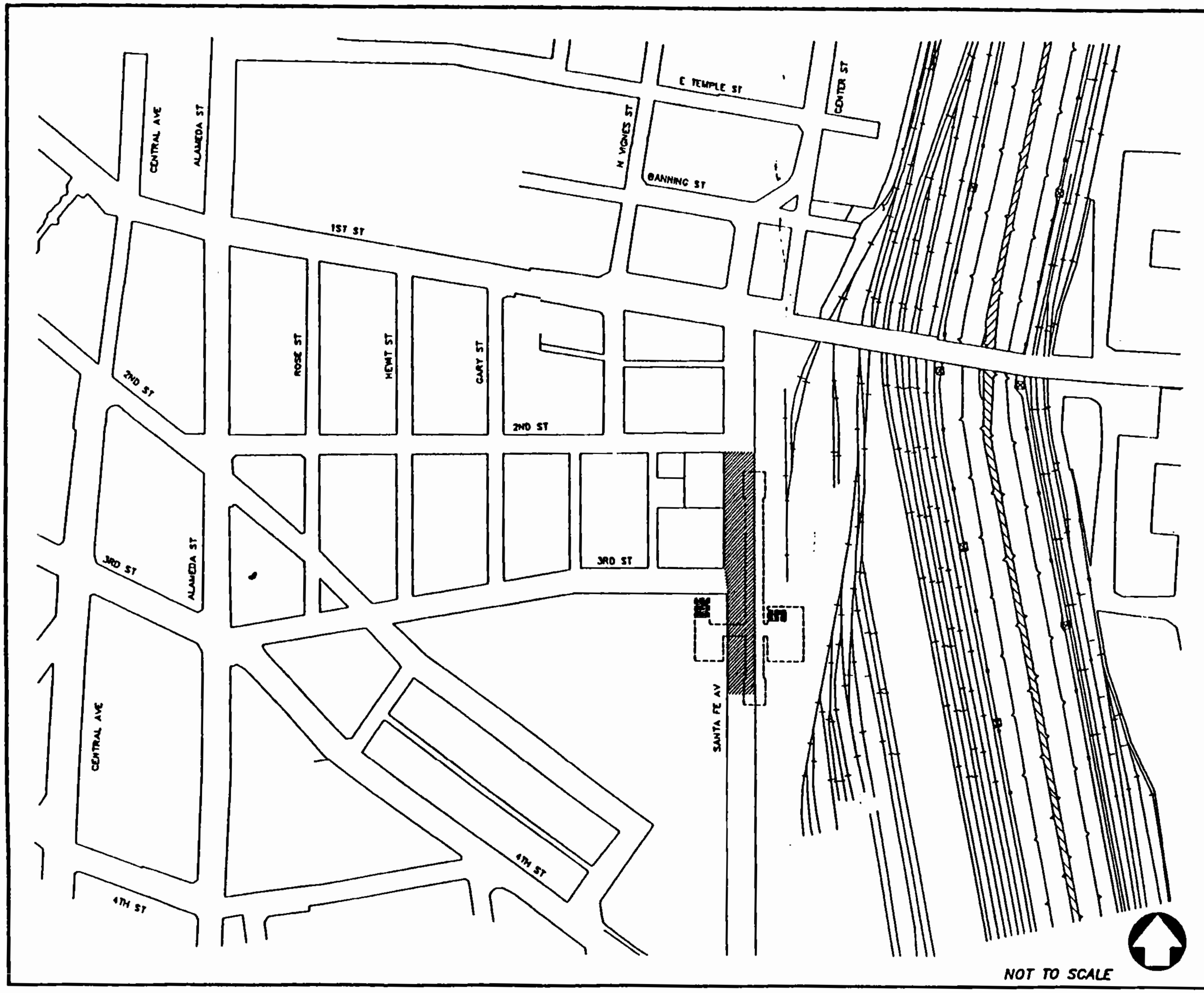
Santa Fe Avenue would be closed between the south side of Second Street to about 75 feet south of the station. Third Street would be closed at Santa Fe Avenue. Figure 4-18.8 illustrates the street closures and the detour routes to which traffic is likely to be diverted. Traffic on Santa Fe Avenue would be detoured to the west of the station construction area via First or Second Streets, north of the site, and via Fourth Street, south of the site. The volume of traffic on Santa Fe Avenue is about 7,500 vehicles per day. Distributing that amount of traffic onto the available detour routes would not result in a significant impact under CEQA on those detour routes. Third Street traffic bound for Santa Fe Avenue would also be detoured around the construction site, either via Second Street to the north or Traction Avenue to the south. Third Street is a low-volume local street at its eastern end near Santa Fe Avenue with a volume of only 400 vehicles per day, since it terminates at Santa Fe and is a one way westbound street beginning at Alameda Street. The detouring of traffic from this section of Third Street to alternate routes will not cause a significant impact under CEQA.

- **First/Boyle**

Street closures during the full construction period in the vicinity of the First/Boyle station include Pennsylvania Avenue, west of Bailey Street, Pleasant Avenue, between Boyle Avenue and First Street (Mariachi Plaza) and Bodie Street, south of First Street. These closures, as well as the nighttime closure areas on First Street and Boyle Avenue, are illustrated on Figure 4-18.9.

METRO RED LINE EASTSIDE EXTENSION FEIS / FEIR

LITTLE TOKYO STATION VICINITY



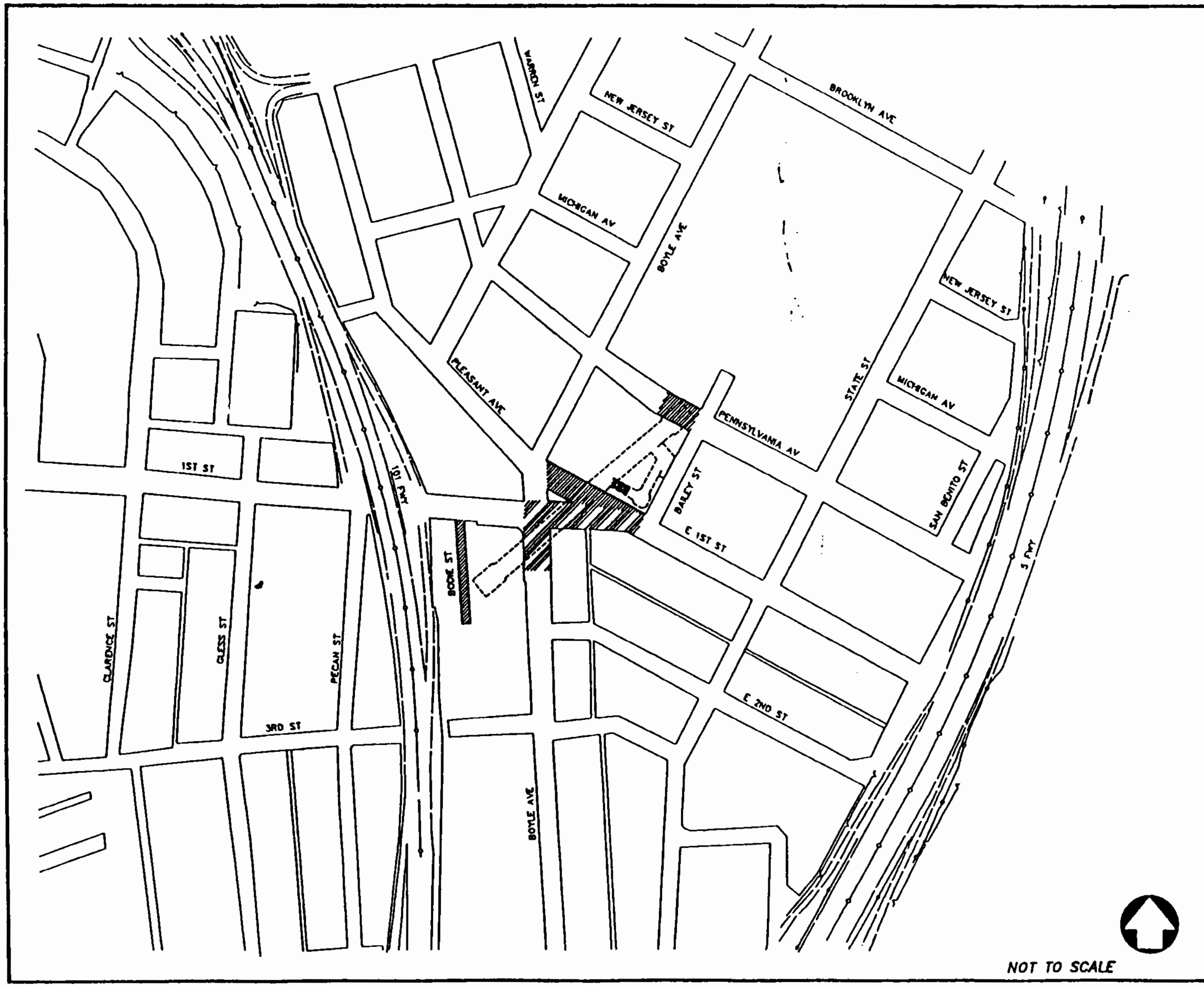
LEGEND

- LONG TERM STREET CLOSURE (ESTIMATED 3-4 YEARS)
- TEMPORARY LANE AND NIGHT STREET CLOSURE

Figure 4-18.8
Construction Street Closures

Los Angeles County Metropolitan Transportation Authority

CLS1-LTO.DWG 4-19-94



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

FIRST/BOYLE
STATION VICINITY

LEGEND

LONG TERM STREET CLOSURE (ESTIMATED 3-4 YEARS)

TEMPORARY LANE AND NIGHT STREET CLOSURE

Figure 4-18.9
Construction
Street Closures

Los Angeles County
Metropolitan Transportation
Authority

CLS2-FBO.DWG 4-19-94

Through traffic on Pennsylvania Avenue between Bailey Street and Boyle Avenue would be detoured to the south to First Street to cross the construction zone. RCC will work with representatives of White Memorial Hospital during final design of the LPA to insure that local access to the Hospital will be maintained from Pennsylvania Avenue, to the maximum extent possible. The detouring of approximately 500 vehicles per day from Pennsylvania Avenue is not expected to cause a significant impact under CEQA on First Street or Boyle Avenue, but reinforces the need to maintain all existing lanes on those two streets during the construction period (other than nighttime closures for decking installation). The closure of Pleasant Avenue is planned as part of the Mariachi Plaza development and is not expected to cause any significant impacts under CEQA. Bodie Street, which will be closed south of First Street, is a low-volume dead end street, which only serves as a local access street to the parcels on which the station is to be located. Existing traffic would not be displaced by this street closure, since the existing land uses along Bodie Street will have been displaced for LPA construction.

- **Brooklyn/Soto**

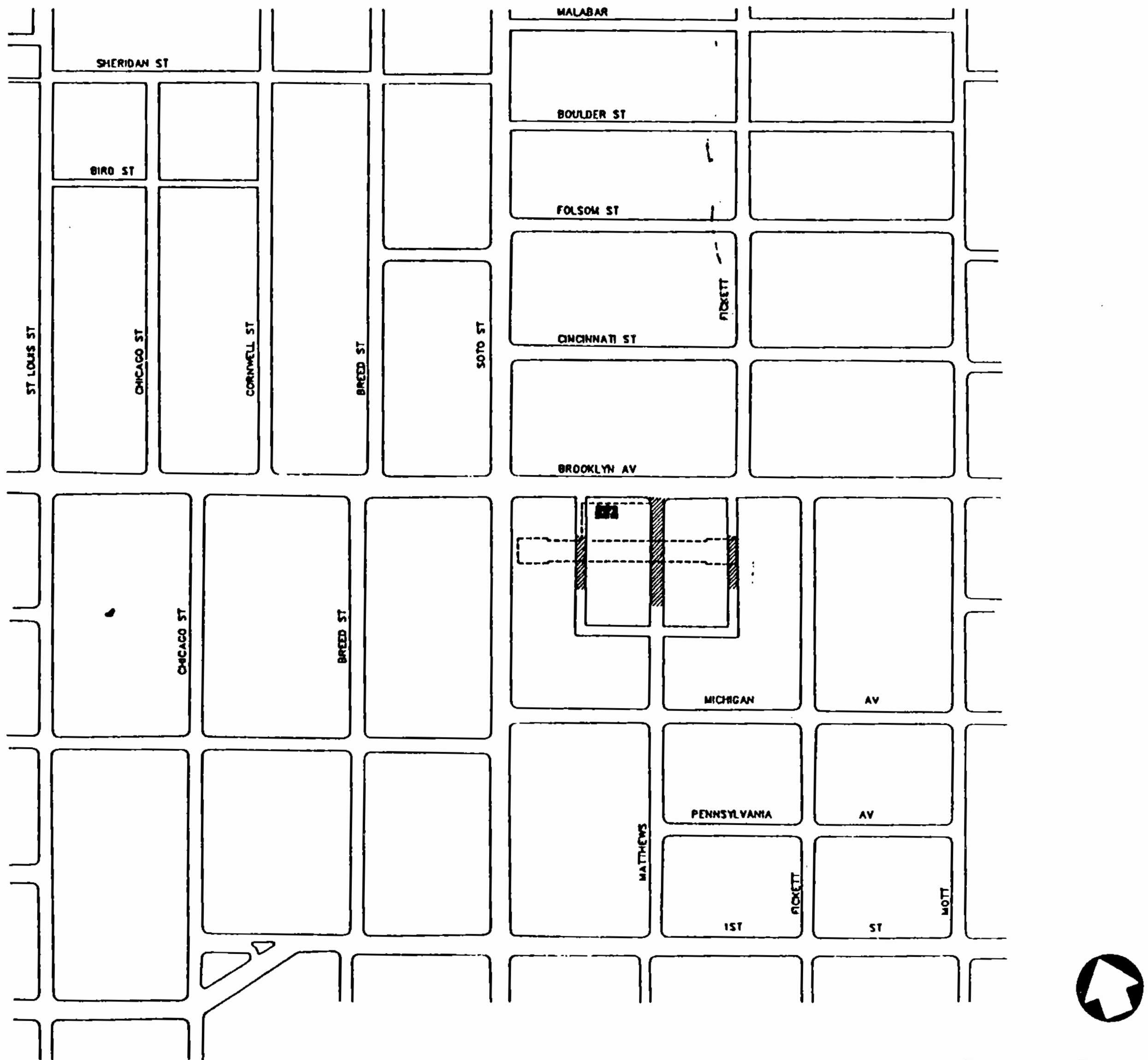
One local street and two alleys would be closed during the construction of the Brooklyn/Soto station. Matthews Street would be closed at Brooklyn Avenue to a point approximately 250 feet south. The alleys on either side of Matthews Street would also be closed where they cross the station construction area, as illustrated in Figure 4-18.10. Local traffic which currently utilizes these streets/alleys would be rerouted to Michigan Avenue to the south. No significant traffic impacts under CEQA are anticipated.

- **First/Lorena**

No public streets would be closed during the full construction period in the First/Lorena station area, as illustrated on Figure 4-18.11. A north-south alley running parallel between Lorena Street and Cheesbrough Lane will be closed at First Street, to a point approximately 340 feet north. Driveway access to businesses along the south side of First Street, between Concord Street and Cheesbrough Lane, will be restricted during the construction period. These closures will not cause any significant traffic impacts under CEQA. The closure of the alley will need to include a provision for a turnaround for any vehicles that reach the closure travelling southbound from Indiana Street. Parking for the residences and businesses along the south side of First Street can also be reached via the east-west alley behind those lots. The increased usage of this alley could require that its pavement be improved to accommodate the additional traffic satisfactorily.

- **Whittier/Rowan**

Eastman Avenue would be closed at Whittier Boulevard, south to the east-west alley parallel to Whittier Boulevard. The alley west of Rowan Avenue would also be closed during the full construction period at Whittier Boulevard to a point approximately 175 feet south of Whittier. Figure 4-18.12 illustrates these street closures and the temporary nighttime closure of Whittier Boulevard itself.



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

BROOKLYN/SOTO
STATION VICINITY

LEGEND

LONG TERM STREET CLOSURE (ESTIMATED 3-4 YEARS)

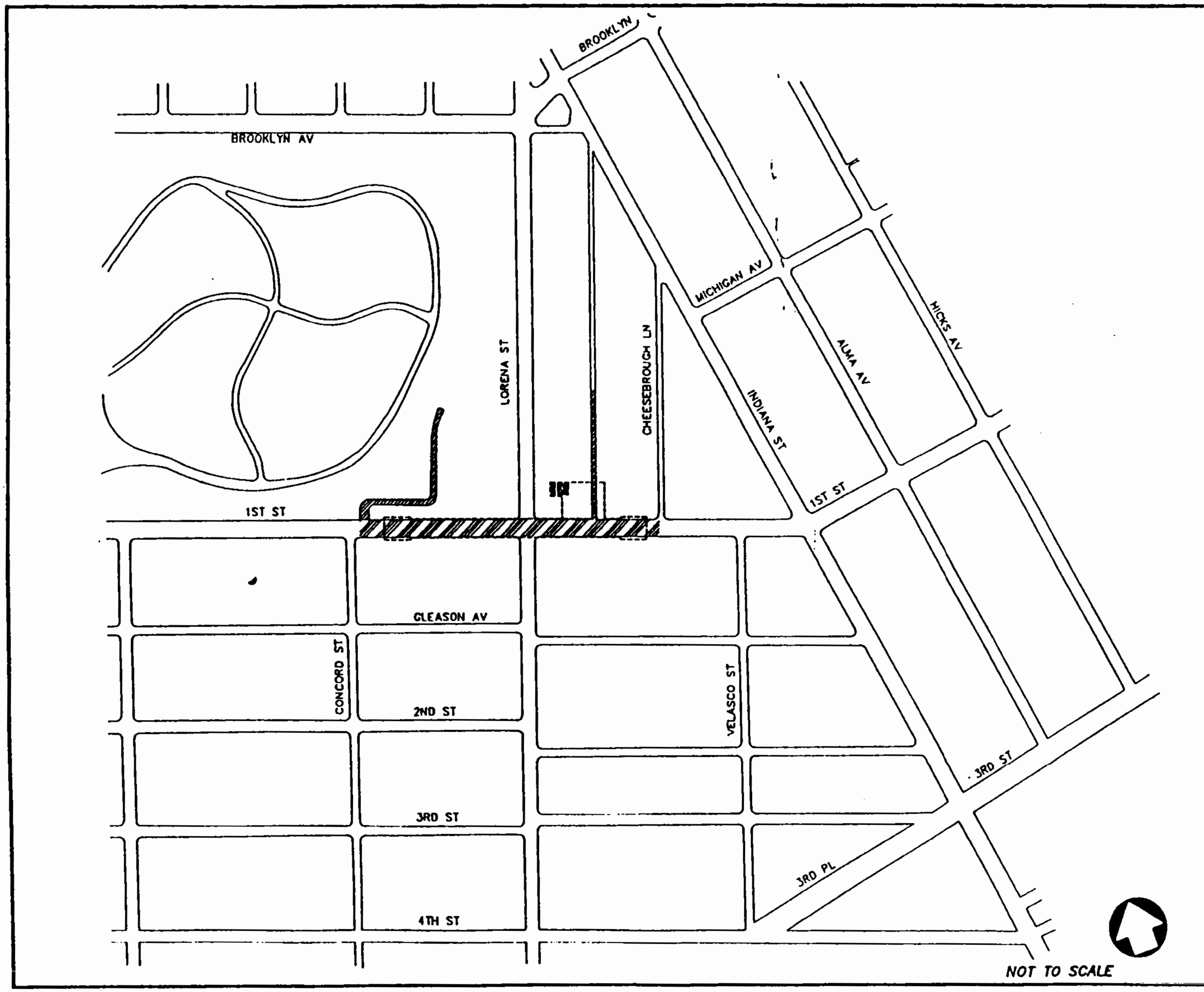
TEMPORARY LANE AND NIGHT STREET CLOSURE

Figure 4-18.10
Construction
Street Closures

Los Angeles County
Metropolitan Transportation
Authority

METRO RED LINE EASTSIDE EXTENSION FEIS / FEIR

FIRST/LORENA STATION VICINITY



LEGEND

- LONG TERM STREET CLOSURE (ESTIMATED 3-4 YEARS)
- TEMPORARY LANE AND NIGHT STREET CLOSURE

Figure 4-18.11

Construction Street Closures

Los Angeles County Metropolitan Transportation Authority

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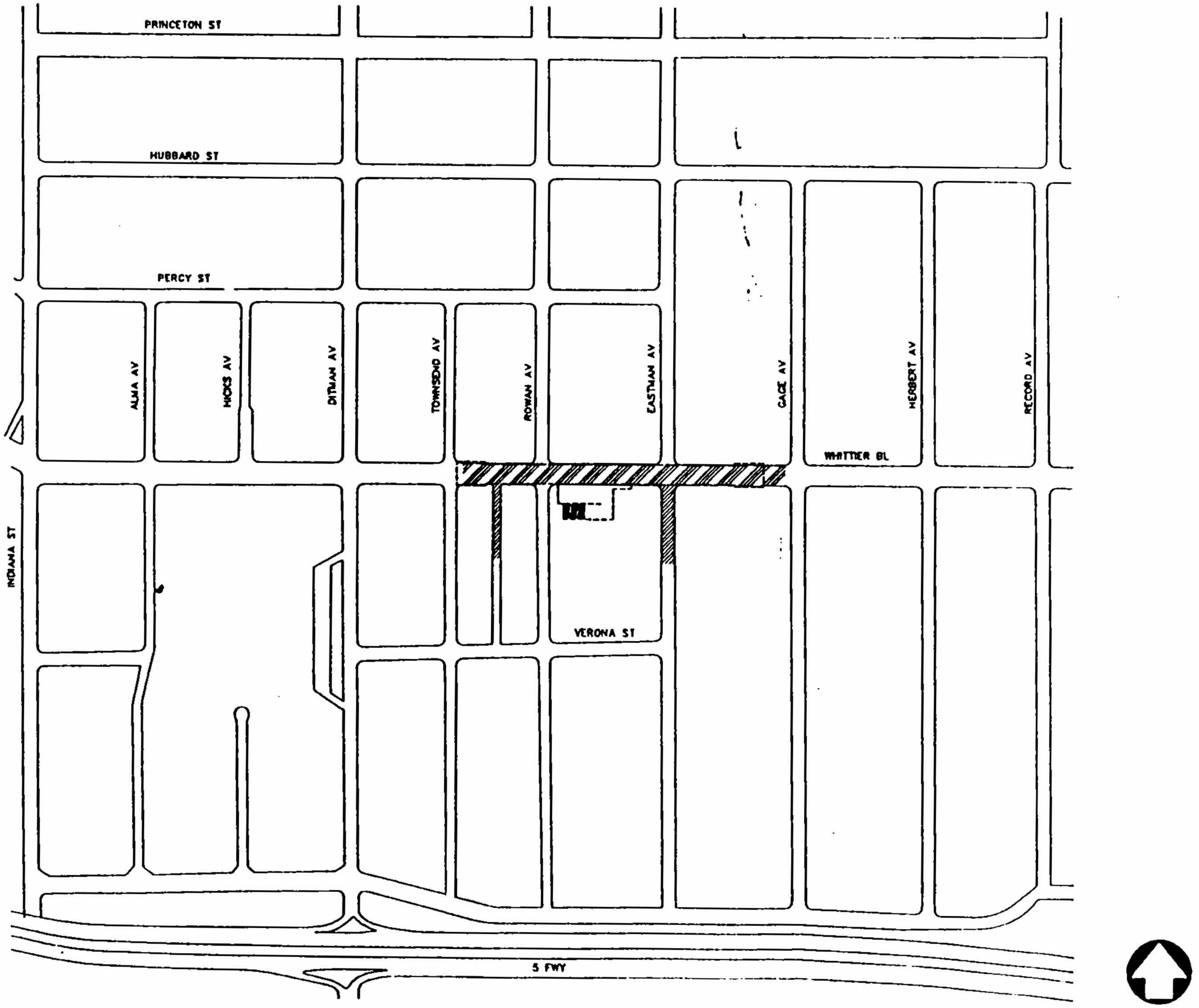


METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ROWAN
STATION VICINITY

LEGEND

LONG TERM STREET CLOSURE (ESTIMATED 3-4 YEARS)

TEMPORARY LANE AND NIGHT STREET CLOSURE

Figure 4-18.12
Construction Street Closures

Los Angeles County Metropolitan Transportation Authority

CLSS-WRO.DWG 6-19-00

The closure of the alley would divert a limited number of local trips to Rowan or Townsend Avenues and would not cause any significant impacts under CEQA. The closure of Eastman Avenue, which currently carries about 500 vehicles per day, would result in the diversion of these vehicles to Rowan and Gage Avenues, which carry about 1,000 and 500 vehicles per day, respectively. It is likely that a greater percentage of the traffic would shift to Rowan than Gage, since Verona Street provides a connection between Eastman and Rowan, but no such connection exists between Eastman and Gage, north of Dennison Street. If two-thirds of the Eastman Avenue traffic shifts to Rowan Avenue, this would increase the volume on Rowan by 350 vehicles per day and would not cause a significant traffic impact under CEQA. The diversion of approximately 150 vehicles per day to Gage Avenue from Eastman would similarly not cause a significant impact.

- **Whittier/Arizona**

Two local streets and one block of alley would be closed during the duration of construction, as illustrated in Figure 4-18.13. The alley to be closed extends between McBride Avenue and McDonell Avenue, behind the businesses which front on Whittier Boulevard. A mitigation measure in the Business Disruption Section, 4-18.7, states that the Whittier/Arizona station should be moved to the north to keep the alley open. Both McBride and McDonell Avenues would be closed from the alley to a point approximately 150 feet north. Turnarounds will be provided so that traffic on these two low-volume local streets can turn around to reach Hubbard Street for egress from the neighborhood. No significant impacts under CEQA are anticipated from these street closures.

- **Whittier/Atlantic**

The only street closure during the full construction period at this station site would be Oakford Avenue, north of Whittier Boulevard. As illustrated on Figure 4-18.14, traffic on Oakford can use Percy Street and Belden Avenue to reach Whittier Boulevard. The diversion of the small amount of traffic currently on Oakford to this detour route will not cause a significant traffic impact under CEQA.

b. Temporary Lane and Night-Time Street Closures

Streets and street segments, which will be closed for the entire three to four year duration of the project to facilitate construction, were identified in the previous section. However, with the cut-and-cover method, the construction of most on-street stations and some segments of off-street stations, will occur directly beneath arterial streets which are vital to access and traffic circulation of the station area. Traffic flow on these streets can not be disrupted for the entire duration of the project. Therefore, as described in Section 4-18.1.1.c, decking will be installed to maintain vehicular traffic flow on these streets during the construction period while work will be proceeding below. Deck installation will require lane and night-time street closures at the under-street stations. Four station sites (First/Boyle, First/Lorena, Whittier/Rowan and Whittier/Atlantic) will be affected by temporary lane and night closures. These temporary lane and night-time street closures and their estimated duration at each station site are listed in Table 4-18.3. Duration of the decking activities ranges from 3 to 3 1/2 months as the deck is installed and 3 to 3 1/2 months as the street is restored.

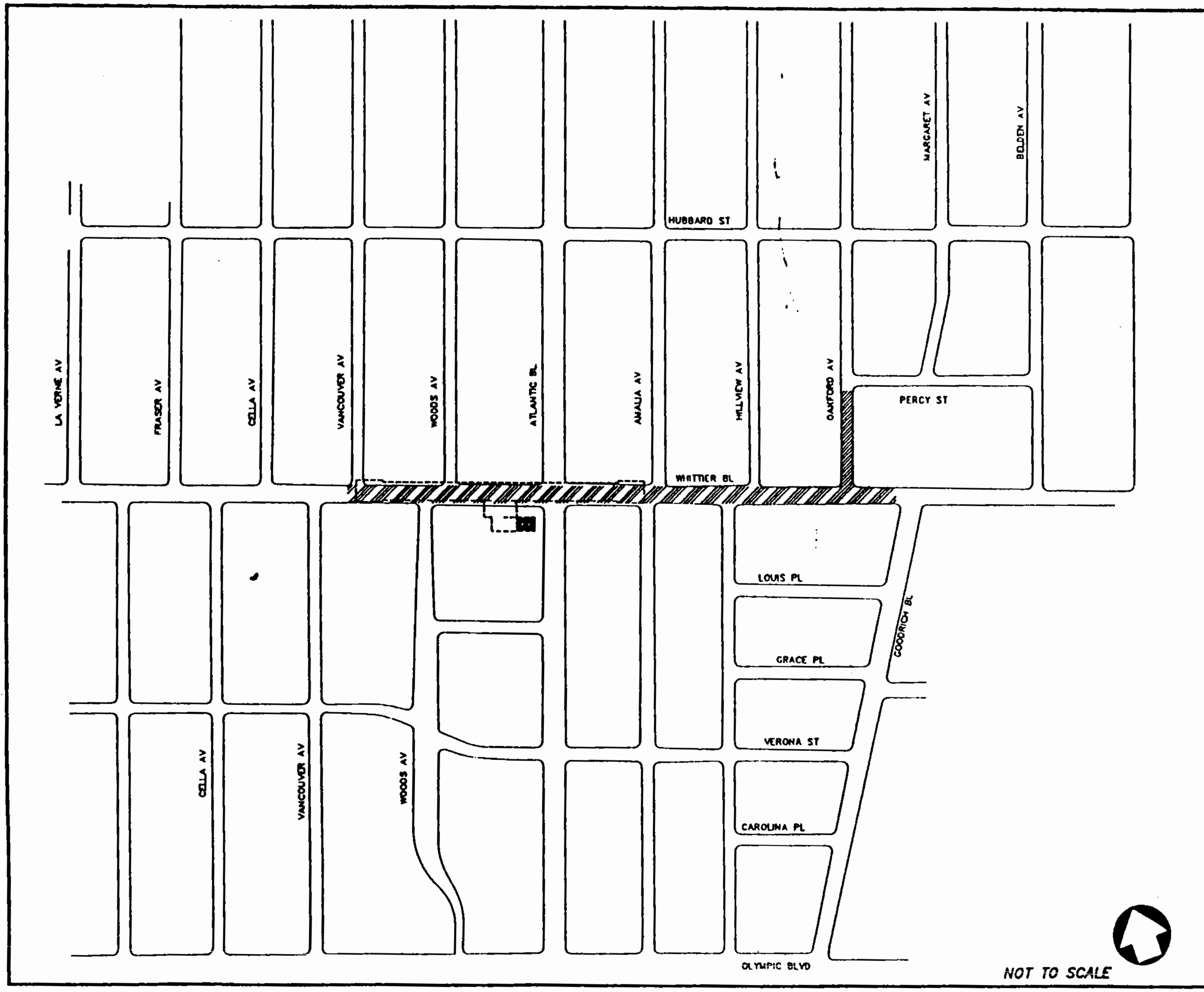
METRO RED LINE EASTSIDE EXTENSION FEIS / FEIR

WHITTIER/ARIZONA STATION VICINITY

Figure 4-18.13
Construction Street Closures

Los Angeles County Metropolitan Transportation Authority

CLS8-WAR.DWG 4-19-94



METRO RED LINE
EASTSIDE EXTENSION
FEIS / FEIR

WHITTIER/ATLANTIC STATION VICINITY

LEGEND

LONG TERM STREET CLOSURE (ESTIMATED 3-4 YEARS)

TEMPORARY LANE AND NIGHT STREET CLOSURE

Figure 4-18.14
Construction Street Closures

Los Angeles County Metropolitan Transportation Authority

CLS7-WAT.DWG 4-19-94

Some general impacts will be common at all locations; these are described below. Other more specific impacts and recommended mitigation measures follow, listed by station area.

There will be overall impacts to the efficiency of traffic flow on decked streets. The decking will be set flush with the existing street. However, traffic operation will be impaired and capacity will be reduced somewhat on decked sections as a result of such items as: rougher driving surfaces, slower speeds, narrower lanes and lateral clearances, visual distractions and physical obstructions related to construction activity, irregular lane markings, or minor elevation changes at the points where the decking will join the existing street.Most of the streets impacted by temporary lane closures are four-lane arterials with two-way left turn medians and/or left turn pockets at intersections. Temporary closure of two of the lanes for deck installation or construction equipment will cause a 50 percent reduction in traffic capacity. In some cases it may be possible to maintain three lanes, thereby limiting the capacity impacts to one direction only. As will be discussed, most of these arterials have peak hour traffic volumes, which can not be handled with only one lane, without significant delay and adverse impacts. Therefore, to the extent practical, traffic lanes will be maintained in service during peak hours. Temporary lane reductions should be for short periods of time and should be limited to night time and off-peak periods to minimize impacts. When only one lane of traffic is maintained, left-turns (and right-turns if heavy pedestrian activity exists) should be prohibited at the main intersections to avoid lane blockages.

Complete closures of major arterials should be avoided, if possible. If full closures are absolutely necessary, they should be limited to night time only. In such cases, through traffic on these arterials should be detoured only via other arterial streets to avoid impacts to residential neighborhoods. Decking at cross streets will be installed in stages to allow at least half of the existing lanes to be maintained. After installation of the deck, full cross street traffic can be maintained for the duration of construction. Therefore, it is not anticipated that any cross streets will be closed entirely at any time.

During final design, site and street specific Worksite Traffic Control Plans will be developed in cooperation with the City of Los Angeles Department of Transportation and Los Angeles County to accommodate required pedestrian and traffic movements.

The following paragraphs describe specific conditions with temporary lane and night closures at each station site:

- **Little Tokyo**

Although this is an "on-street" station, no temporary lane and night closures are planned in this area. The only street closure, at Santa Fe Avenue between Second and Third Streets, will be for the entire duration of the project as discussed previously and shown in Figure 4-18.8.

- **First/Boyle**

This station is oriented diagonally in relation to the street grid system and crosses Pennsylvania Avenue, Pleasant Avenue, First Street and Boyle Avenue. Figure 4-18.9 shows the segments of streets which will experience temporary or full-construction-period closures. Relatively minor street segments such as Pennsylvania Avenue west of Bailey Street and Pleasant Avenue between Boyle and Bailey, can be closed for the duration of the project, without significant impacts, as discussed earlier. In contrast, due to their importance to the circulation system, traffic flow will be maintained on First Street and Boyle Avenue during the three to four year construction period. During the cut and cover construction, the segments of Boyle Avenue and First Street, which are above the station area, will be decked to maintain traffic flow and satisfy contractor's operations. These segments will, however, require temporary closures or lane reductions for deck installation procedures and contractor operations for a period of 3-4 months at the beginning of decking and at the end for street restoration.

Most of the decking operation is expected to occur at night. Lane closures should be limited to night time and off peak periods, and full closures should be limited to night time only. Night time traffic is minimal and lane closures are not expected to cause any significant impacts. The heaviest traffic volume during the PM peak hour on First Street, which has two lanes in each direction, ranges between 900 and 1,000 vehicles per hour (vph), eastbound. Similarly, the heaviest PM peak hour volume on Boyle Avenue, which also has two lanes in each direction, is over 600 vph, northbound. These peak hour volumes can not be handled in only one lane of traffic, without significant delay. Therefore, adverse impacts will result, especially on First Street, if lane closures are not limited to night and off-peak periods.

One circulation issue specific to this area is the lack of continuous east-west streets as immediate alternates to First Street, due to the interruption created by the 101 Freeway. Therefore, it is recommended that at least one lane of traffic in each direction be maintained on First Street at all times, or at a minimum the entire intersection not be closed at the same time. If it will be necessary to close all lanes of First Street for any period of time, it is recommended that the segment of Boyle Street south of First be kept open so First Street traffic can be detoured around the closure via State Street and Second and/or Third streets to Boyle Avenue and back up to First Street. Similarly, if it is necessary to close the entire width of Boyle Street, it is recommended that the intended section of First Street be left open so traffic can be detoured around the closure, since other alternative east-west streets are not available as far north as Brooklyn Avenue. If it is absolutely necessary to close the entire intersection, through traffic on First Street should be detoured around the construction area using Soto Street, Brooklyn Avenue and Mission Street. Similarly, through traffic on Boyle Avenue should be detoured using Fourth Street, Soto Street and Brooklyn Avenue.

- **Brooklyn/Soto**

No temporary lane and night closures are planned for this "off-street" station area. The only street closures will be for the entire duration of the project, as discussed in the previous section and shown in Figure 4-18.10.

- **First/Lorena**

This is an "on-street" station with virtually the entire station area located below First Street. The cut and cover construction of this station will be accomplished by excavating First Street between Concord Street and Cheesbrough Lane. Figure 4-18.11 shows the segments of streets which will experience temporary or full-construction-period closures. Temporary closures which are expected to occur intermittently over six months, at the beginning of construction and at the end for site restoration, include: First Street between Concord Street and Cheesbrough Lane, Lorena Street at First Street and Cheesbrough Lane at First Street.

During the cut and cover construction, the segment of First Street which is above the station area will be decked to maintain traffic flow and satisfy contractor's operations. This segment will, however, require temporary closures or lane reductions for deck installation procedures, and contractor operations.

Most of the decking operation is expected to occur at night. Lane closures should be limited to night time and off peak periods, and full closures should be limited to night time only. Night time traffic is minimal and lane reductions are not expected to cause any significant impacts. It is recommended that at least one lane of traffic in each direction be maintained at all times on First Street and on Lorena Street at First Street during the day.

The heaviest PM peak hour traffic volume on First Street, which has two lanes in each direction, ranges between 800 and 900 vph, eastbound. Similarly the heaviest PM peak hour volume on Lorena Street, which also has two lanes in each direction, is at 600-700 vph, northbound. These peak hour volumes can not be handled in only one lane of traffic, without significant delay. Therefore, adverse impacts will result, especially on First Street, if lane closures are not limited to night and off-peak periods.

If at any time it will be necessary to close all lanes of First Street, it is recommended that local traffic be detoured around this closure by using Concord Street, Gleason Avenue and Velasco Street. Through traffic should be detoured using Indiana Street, Brooklyn Avenue and Evergreen Avenue to avoid impacts to residential neighborhoods. As mentioned earlier, decking operation on Lorena Street should be done in stages so all lanes will not be closed at any time. However, if there is a need to close the entire width of Lorena Street at First Street, through traffic should be detoured around the closure using Brooklyn Avenue, Indiana Street and Third Street.

- **Whittier/Rowan**

This is also an "on-street" station with the entire station area located below Whittier Boulevard. The cut and cover construction of this station will be accomplished by excavating Whittier Boulevard between Townsend Avenue and Gage Avenue. Figure 4-18.12 shows the segments of streets which will experience temporary or full-construction-period closures. Temporary closures which are expected to last six months, at the beginning of construction and at the end for site restoration, include: Whittier Boulevard between Townsend Avenue and Gage Avenue, and Rowan Avenue at Whittier Boulevard.

During the cut and cover construction of this station, the segment of Whittier Boulevard, which is above the station area, will be decked to maintain traffic flow and satisfy contractor's operations. This segments will, however, require temporary closures or lane reductions for deck installation procedures, and contractor operations.

Most of the decking operation is expected to occur at night. Lane closures should be limited to night time and off peak periods, and full closures should be limited to night time only. Night time traffic is minimal and lane reductions are not expected to cause any significant impacts.

The heaviest PM peak hour traffic volume on Whittier Boulevard, which has two lanes in each direction, is just under 1,000 vph, eastbound. These peak hour volumes can not be handled in only one lane of traffic, without significant delay. Therefore, adverse impacts will result on Whittier Boulevard if lane closures are not limited to night and off-peak periods. PM peak hour traffic volumes on Rowan Avenue, which has a 36-foot wide pavement and one lane in each direction, are substantially lower, at under 100 vph. Impacts of partial or full closures will be minimal on Rowan Avenue due to these lighter traffic volumes.

If at any time it will be necessary to close the entire width of Whittier Boulevard, it is recommended that through traffic be detoured around this closure by using Indiana Street, Olympic Boulevard and Eastern Avenue to avoid impacts to residential neighborhoods. Local traffic can be detoured using Ditman Avenue, Hubbard Street and Gage Avenue. Decking operation on Rowan Avenue will be done in stages so all lanes will not be closed at any time. However, if there is a need to close the entire width of Rowan Avenue at Whittier Boulevard, traffic should be detoured around the closure using Verona Street, Townsend Avenue and Percy Street.

- **Whittier/Arizona**

No temporary lane and night closures are planned for this "off-street" station area. The only street closures will be for the entire duration of the project, as discussed in the previous section and shown in Figure 4-18.13.

- **Whittier/Atlantic**

This is an "on-street" station with the entire station area located below Whittier Boulevard. The cut and cover construction of this station will be accomplished by excavating Whittier Boulevard between Vancouver Avenue and Goodrich Boulevard. Figure 4-18.14 shows the segments of streets which will experience temporary or full-construction-period closures. Temporary partial closures which are expected to last seven months, at the beginning of construction and at the end for site restoration, include: Whittier Boulevard between Vancouver Avenue and Goodrich Boulevard, Atlantic Boulevard at Whittier Boulevard, Vancouver Avenue at Whittier Boulevard, Woods Avenue at Whittier Boulevard, Amalia Avenue at Whittier Boulevard and Hill View Avenue at Whittier Boulevard.

During the cut and cover construction of this station, the segment of Whittier Boulevard, which is above the station area, will be decked to maintain traffic flow and satisfy contractor's operations. This segments will; however, require temporary closures or lane reductions for deck installation procedures, and contractor operations. Most of the decking operation is expected to occur at night. Lane closures should be limited to night time and off peak periods, and full closures should be limited to night time only. Nighttime traffic is minimal and lane reductions are not expected to cause any significant impacts. At least one lane of traffic in each direction shall be maintained at all times on Whittier Boulevard and on Atlantic Boulevard at Whittier Boulevard during business hours.

The heaviest PM peak hour traffic volume on Whittier Boulevard, which has two lanes in each direction, ranges between 1,000 and 1,100 vph, eastbound. Similarly the heaviest PM peak hour volume on Atlantic Boulevard, which also has two lanes in each direction, is about 1,000 vph, northbound. These peak hour volumes can not be handled in only one lane of traffic, without significant delay. Therefore, adverse impacts will result, on both arterials, if lane closures are not limited to night and off-peak periods.

If at any time it is necessary to close all lanes of Whittier Boulevard, it is recommended that through traffic be detoured around this closure by using Arizona Avenue, Olympic Boulevard and Goodrich Boulevard to avoid impacts to residential neighborhoods.

Decking operation on Atlantic Boulevard will be done in stages so all lanes will not be closed at any time. However, if there is a need to close the entire width of Atlantic Boulevard at Whittier Boulevard, through traffic should be detoured around the closure using Olympic Boulevard, Arizona Avenue and Third Street.

Decking operation on other minor cross streets including Vancouver, Woods, Amalia and Hill View avenues will also be done in stages so all lanes will not be closed at any time. However, if there is a need to close the entire width of these streets, it could be done during the night without significant impacts, since these streets carry light traffic volumes. It is, however, recommended that these closures be staggered as much as possible to minimize loss of north-south local street capacity in this area.

c. Trucks Removing Excavated Material

Trucks removing excavated materials from the tunneling and station construction operations have the potential to cause traffic impacts, if the number of trucks on a particular route causes congestion or if the routes utilized by the trucks are inappropriate (e.g., primarily residential in nature). As noted earlier in Tables 4-18.4 and 4-18.5, the estimated maximum number of daily truck trips for purposes of removing excavated materials could range from 150 at station construction zones during station excavation to 300 at tunnel segment earth removal sites (total of inbound plus outbound trips). The locations for the excavated material removal sites are not finalized. Sites could be located adjacent to one or more of the station excavation sites. For the purposes of evaluating the impacts of trucks removing excavated material from tunnel segments, it was assumed that the 300 truck trips per day maximum level could occur adjacent to any station. That is, tunnel segment removal sites might be located adjacent to any of the station sites. The impacts were quantified for two scenarios; (1) assuming an eight hour construction period, which could potentially concentrate as many as 38 truck trips in the peak hour, and (2) assuming a 24 hour construction period, which would lessen the concentration of truck trips to an average of 13 per hour. The impacts of these levels of truck trips on study intersection levels of service was quantified, assuming that the 20 cubic yard trucks would represent 2.5 passenger car equivalents (PCEs). That is, the impact of each individual truck was conservatively estimated to be equal to 2.5 cars to reflect their slower acceleration, longer length, and wider turning radii and other features which cause trucks to utilize more intersection capacity than a typical car.

It is not known where the disposal site(s) for the excavated material will be located. For that reason, the distribution of the trucks from each station area was based on the assumption that they would travel between the excavation site and the nearest freeway by the most direct route on the arterial street network. It was assumed that trucks would not utilize local residential streets for access to freeways. Once on the freeway system, the haul trucks would proceed to their disposal sites via freeways.

The routes assumed for the impact analysis were the following:

- Little Tokyo - Trucks would use Santa Fe Avenue and Center Street to reach the Vignes Street ramps on the Hollywood-Santa Ana Freeway (Route 101).

- First/Boyle - Trucks would use First Street to gain access to the Santa Ana Freeway (Route 101) via the First Street ramps.

- Brooklyn/Soto - Trucks would be split between Soto Street for access to the San Bernardino Freeway (I-10) and Brooklyn Avenue for access to the Golden State Freeway (I-5).

- First/Lorena - Trucks would utilize Lorena Street to gain access to the Pomona Freeway (Route 60).

- Whittier/Rowan - Two alternatives are presented for this station. Either trucks would utilize Whittier Boulevard and Lorena Street to reach Route 60, or they would utilize Whittier Boulevard and Indiana Street to reach the Santa Ana Freeway (I-5) via "frontage" roads along the freeway.

- Whittier/Arizona - Trucks would gain access to the Long Beach Freeway (I-710) via Whittier Boulevard and Eastern Avenue or via Arizona Avenue and Olympic Boulevard.

- Whittier/Atlantic - Trucks would utilize Atlantic Boulevard and be split, some to the north to reach the Pomona Freeway (Route 60) and some to the south to reach the Santa Ana Freeway (I-5).

Tunnel Excavation Truck Impacts

Analysis of tunnel excavation truck impacts required two sets of traffic model runs for each scenario. First, impacts of truck trips due to the construction of the first four stations were evaluated against future no-build conditions in 1999, which is considered the midpoint of construction for those four stations. Next, the impacts of construction at the last three stations were evaluated against 2007 no-build conditions, which is considered the midpoint of construction for those stations. Similar to the analysis of station operating impacts, a one percent per year ambient traffic growth rate has been applied. The 1999 scenario therefore has a nine percent growth rate and the 2007 scenario has a 17 percent growth rate.

The assignment of 38 peak hour truck trips (19 inbound and 19 outbound) at station areas results in the changes in V/C ratios and levels of service shown in Tables 4-18.8 and 4-18.9. Table 4-18.8 displays the impacts for the first four stations using 1999 as the base point of analysis. Table 4-18.9 displays the impacts for the last three stations using 2007 as the base year. The LOS calculations illustrate that the construction excavation trucking would not cause

TABLE 4-18.8: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 8-HOUR SCHEDULE (38 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.253	A			0.253	A		0.000
2. Boyle St. at Brooklyn Ave.			0.448	A			0.448	A		0.000
3. State St. at Brooklyn Ave.			0.684	B			0.684	B		0.000
4. State St. at I-10 WB Ramps			0.481	A			0.481	A		0.000
5. State St. at I-10 EB Ramps			0.604	B			0.604	B		0.000
6. St. Louis St. at Brooklyn Ave.			0.515	A			0.515	A		0.000
7. State St. at Marengo St.			0.860	D			0.860	D		0.000
8. I-5 NB Ramp at Brooklyn Ave.			0.479	A			0.479	A		0.000
9. I-5 SB Ramp at Brooklyn Ave.			0.371	A			0.371	A		0.000
10. Soto St. at Brooklyn Ave.			0.738	C			0.740	C		0.002
11. Mott St. at Brooklyn Ave.			0.744	C			0.744	C		0.000
12. Lorena St. at Brooklyn Ave.			0.652	B			0.652	B		0.000
13. Indiana St. at Brooklyn Ave.			0.552	A			0.552	A		0.000
14. Breed St. at Brooklyn Ave.			0.559	A			0.559	A		0.000
15. Soto St. at Marengo St.			0.950	E			0.950	E		0.000
16. Soto St. at I-10/Wabash St.			0.895	D			0.916	E		0.021
17. Soto St. at Fourth St.			0.791	C			0.791	C		0.000
18. Mott St. at Fourth St.			0.619	B			0.619	B		0.000
19. Euclid St. at Fourth St.			0.549	A			0.549	A		0.000
20. Lorena St. at Fourth St.			0.602	B			0.635	B		0.033
21. Indiana St. at 4th St./Rte 60 WB Ramp			0.746	C			0.762	C		0.016
22. Vignes St. at First St.	0.637	B	0.605	B	0.637	B	0.605		0.000	0.000
23. Mission St. at First St.	0.973	E	0.873	D	0.973	E	0.873	D	0.000	0.000
24. Second St. at Alameda St.	0.564	A	0.542	A	0.564	A	0.542	A	0.000	0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.8: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 8-HOUR SCHEDULE (38 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
25. First St. at Alameda St.	1.017	F	0.836	D	1.017	F	0.836	D	0.000	0.000
26. First St. at Central St.	0.630	B	0.649	A	0.630	B	0.649	B	0.000	0.000
27. 3rd/4th Confluence at Alameda St.	1.710	F	1.138	F	1.710	F	1.138	F	0.000	0.000
28. Merrick St. at Fourth St.	0.745	C	0.434	A	0.745	C	0.434	A	0.000	0.000
29. Molino St. at Fourth St.	0.717	C	0.485	A	0.717	C	0.485	A	0.000	0.000
30. Mateo St. at 6th St./Whittier Blvd.	0.499	A	0.527	A	0.499	A	0.527	A	0.000	0.000
31. Rte 101 NB Ramps at First St.			0.444	A			0.452	A		0.008
32. Rte 101 SB Ramps at First St.			0.473	A			0.507	A		0.034
33. Boyle St. at First St.			0.687	B			0.695	B		0.008
34. State St. at First St.			0.732	C			0.734	C		0.002
35. Rte 101 NB Ramps at Fourth St.			0.577	A			0.577	A		0.000
36. Rte 101 SB Ramps at Fourth St.			0.975	E			0.996	E		0.021
37. Boyle St. at Fourth St.			0.839	D			0.839	D		0.000
38. Soto St. at First St.			0.805	D			0.805	D		0.000
39. Mott St. at First St.			0.573	A			0.573	A		0.000
40. Lorena St. at First St.			0.590	A			0.601	B		0.011
41. Indiana St. at First St.			0.604	B			0.631	B		0.027
42. Indiana St. at Third St.			0.672	B			0.690	B		0.018
43. Soto St. at Sixth St.			0.626	B			0.626	B		0.000
44. Lorena St. at 6th St./Rte 60 WB Ramps			0.650	B			0.650	B		0.000
45. Lorena St. at Whittier Blvd.			0.891	D			0.891	D		0.000
46. Lorena St. at Seventh St.			0.413	A			0.413	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.8: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 8-HOUR SCHEDULE (38 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
47. Rte 60 EB Ramp at Whittier Blvd.			0.538	A			0.538	A		0.000
48. S. Boyle St. at Seventh St.			0.592	A			0.592	A		0.000
49. Soto St. at Seventh St.			0.791	C			0.791	C		0.000
50. S. Boyle St. at Whittier Blvd.			0.686	B			0.686	B		0.000
51. S Soto St. at Whittier Blvd.			0.897	D			0.897	D		0.000
52. S. Mott St. at Whittier Blvd.			0.739	C			0.739	C		0.000
53. Indiana St. at Whittier Blvd.			1.032	F			1.032	F		0.000
54. Rowan St. at Whittier Blvd.			0.427	A			0.427	A		0.000
55. Eastern Ave. at Brooklyn Ave.			0.639	B			0.639	B		0.000
56. Eastern Ave. at First St.			0.482	A			0.482	A		0.000
57. I-710 NB Off Ramp at Ford Blvd.			0.479	A			0.479	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.434	A			0.454	A		0.000
59. Atlantic Blvd. at 1st St./Rte 60 WB Ramp			1.166	F			1.166	F		0.000
60. Collegian Ave. at Brooklyn Ave.			0.508	A			0.508	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			0.978	E			0.978	E		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.623	B			0.623	B		0.000
63. Atlantic Blvd. at Rte 60 EB Ramps			1.197	F			1.197	F		0.000
64. Eastern Ave. at Whittier Blvd.			0.552	A			0.552	A		0.000
65. McBride Ave. at Whittier Blvd.			0.581	A			0.581	A		0.000
66. Arizona Ave. at Whittier Blvd.			0.720	C			0.720	C		0.000
67. Goodrich Ave. at Whittier Blvd.			0.696	B			0.696	B		0.000
68. Belden Ave. at Whittier Blvd.			0.485	A			0.485	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.8: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 8-HOUR SCHEDULE (38 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION		NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
69. Hoefner Ave. at Whittier Blvd.				0.623	A			0.623	B		0.000
70. Atlantic Blvd. at Verona St.				0.510	A			0.510	A		0.000
71. Atlantic Blvd. at Hubbard St.				0.631	A			0.631	A		0.000
72. Atlantic Blvd. at Whittier Blvd.				0.846	C			0.846	D		0.000
TOTALS	**E&F Intersections**		3		7		3		8		
	Significantly affected intersections										2

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, 1994.

TABLE 4-18.9: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 8-HOUR SCHEDULE (38 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.283	A			0.283	A		0.000
2. Boyle St. at Brooklyn Ave.			0.480	A			0.480	A		0.000
3. State St. at Brooklyn Ave.			0.734	C			0.734	C		0.000
4. State St. at I 10 WB Ramps			0.516	A			0.516	A		0.000
5. State St. at I-10 EB Ramps			0.649	B			0.649	B		0.000
6. St. Louis St. at Brooklyn Ave.			0.554	A			0.554	A		0.000
7. State St. at Marengo St.			0.923	E			0.923	E		0.000
8. I-5 NB Ramp at Brooklyn Ave.			0.516	A			0.516	A		0.000
9. I-5 SB Ramp at Brooklyn Ave.			0.398	A			0.398	A		0.000
10. Soto St. at Brooklyn Ave.			0.791	C			0.791	C		0.004
11. Mott St. at Brooklyn Ave.			0.799	C			0.799	C		0.000
12. Lorena St. at Brooklyn Ave.			0.702	C			0.702	C		0.000
13. Indiapa St. at Brooklyn Ave.			0.601	B			0.601	B		0.000
14. Breed St. at Brooklyn Ave.			0.600	B			0.600	B		0.000
15. Soto St. at Marengo St.			1.020	F			1.020	F		0.000
16. Soto St. at I-10/Wabash St.			0.960	E			0.960	D		0.000
17. Soto St. at Fourth St.			0.849	D			0.849	D		0.000
18. Mott St. at Fourth St.			0.663	B			0.663	B		0.000
19. Euclid St. at Fourth St.			0.589	A			0.589	A		0.000
20. Lorena St. at Fourth St.			0.646	B			0.646	B		0.000
21. Indiana St. at 4th St./Rte 60 WB Ramp			0.800	D			0.800	DC		0.000
22. Vignes St. at First St.	0.684	B	0.649	B	0.684	B	0.649	B	0.000	0.000
23. Mission St. at First St.	1.046	F	0.943	E	1.046	F	0.943	E	0.000	0.000
24. Second St. at Alameda St.	0.605	B	0.583	A	0.605	B	0.583	A	0.000	0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.9: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 8-HOUR SCHEDULE (38 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
25. First St. at Alameda St.	1.091	F	0.899	D	1.091	F	0.899	D	0.000	0.000
26. First St. at Central St.	0.678	B	0.697	B	0.678	B	0.697	B	0.000	0.000
27. 3rd/4th Confluence at Alameda St.	1.837	F	1.222	F	1.837	F	1.222	F	0.000	0.000
28. Merrick St. at Fourth St.	0.799	C	0.466	A	0.799	C	0.466	A	0.000	0.000
29. Molino St. at Fourth St.	0.769	C	0.519	A	0.769	C	0.519	A	0.000	0.000
30. Mateo St. at 6th St./Whittier Blvd.	0.535	A	0.566	A	0.535	A	0.566	A	0.000	0.000
31. Rte 101 NB Ramps at First St.			0.477	A			0.477	A		0.000
32. Rte 101 SB Ramps at First St.			0.508	A			0.508	A		0.000
33. Boyle St. at First St.			0.738	C			0.738	C		0.000
34. State St. at First St.			0.778	C			0.778	C		0.000
35. Rte 101 NB Ramps at Fourth St.			0.619	B			0.619	B		0.000
36. Rte 101 SB Ramps at Fourth St.			1.045	F			1.045	F		0.000
37. Boyle St. at Fourth St.			0.900	E			0.900	E		0.000
38. Soto St. at First St.			0.865	D			0.856	D		0.000
39. Mott St. at First St.			0.616	B			0.616	B		0.000
40. Lorena St. at First St.			0.633	B			0.633	B		0.000
41. Indiana St. at First St.			0.652	B			0.652	B		0.000
42. Indiana St. at Third St.			0.220	C			0.220	C		0.000
43. Soto St. at Sixth St.			0.668	B			0.668	B		0.000
44. Lorena St. at 6th St./Rte 60 WB Ramps			0.698	B			0.730	C		0.032
45. Lorena St. at Whittier Blvd.			0.956	E			1.005	F		0.049
46. Lorena St. at Seventh St.			0.443	A			0.443	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.9: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 8-HOUR SCHEDULE (38 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
47. Rte 60 EB Ramp at Whittier Blvd.			0.578	A			0.578	A		0.000
48. S. Boyle St. at Seventh St.			0.635	B			0.635	B		0.000
49. Soto St. at Seventh St.			0.847	D			0.847	D		0.000
50. S. Boyle St. at Whittier Blvd.			0.735	C			0.735	C		0.000
51. S. Soto St. at Whittier Blvd.			0.961	E			0.961	E		0.000
52. S. Mott St. at Whittier Blvd.			0.793	C			0.793	C		0.000
53. Indiana St. at Whittier Blvd.			1.109	F			1.136	F		0.027
54. Rowan St. at Whittier Blvd.			0.460	A			0.475	A		0.015
55. Eastern Ave. at Brooklyn Ave.			0.685	B			0.685	B		0.000
56. Eastern Ave. at First St.			0.517	A			0.517	A		0.000
57. I-710 NB Off Ramp at Ford Blvd.			0.515	A			0.515	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.467	A			0.477	A		0.010
59. Atlantic Blvd. at 1st St./Rte 60 WB Ramp			1.251	F			1.260	F		0.009
60. Collegian Ave. at Brooklyn Ave.			0.547	A			0.547	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			1.050	F			1.050	F		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.668	B			0.676	B		0.008
63. Atlantic Blvd. at Rte 60 EB Ramps			1.285	F			1.293	F		0.008
64. Eastern Ave. at Whittier Blvd.			0.592	A			0.608	B		0.016
65. McBride Ave. at Whittier Blvd.			0.624	B			0.646	B		0.022
66. Arizona Ave. at Whittier Blvd.			0.771	C			0.774	C		0.003
67. Goodrich Ave. at Whittier Blvd.			0.747	C			0.747	C		0.000
68. Belden Ave. at Whittier Blvd.			0.521	A			0.521	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.9: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 8-HOUR SCHEDULE (38 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION		NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
69. Hoefner Ave. at Whittier Blvd.				0.668	B			0.668	B		0.000
70. Atlantic Blvd. at Verona St.				0.550	A			0.550	A		0.000
71. Atlantic Blvd. at Hubbard St.				0.676	A			0.684	B		0.008
72. Atlantic Blvd. at Whittier Blvd.				0.907	E			0.918	E		0.011
TOTALS	E&F Intersections		3		14		3		14		
	Significantly affected intersections										2

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, 1994.

a significant impact under CEQA at any study intersections in the AM peak hour. In the PM peak hour, the hauling of excavated tunnel materials could result in significant impacts at the following four intersections, if the construction schedule results in the concentration of truck trips into eight hours, resulting in 38 truck trips in the PM peak hour:

- Soto St. at Wabash (#16) - Caused by truck trips to/from the Brooklyn/Soto station area
- Route 101 Southbound Ramps at Fourth Street (#36) - Caused by truck trips to/from the First/Boyle station area
- Lorena Street, at Whittier Boulevard (#45) - Caused by truck trips to/from Whittier/Rowan station area
- Indiana Street at Whittier Boulevard (#53) - Caused by truck trips to/from the Whittier/Rowan station area

In summary, tunnel segment excavation and the associated truck trips would cause significant traffic impacts under CEQA at four locations.

A second assignment of truck trips was made to quantify the conditions expected if the trucking operations were not concentrated into eight hours and therefore did not conflict as much with the peak commute hours. Assuming a 24-hour excavation schedule, with the 300 maximum daily truck trips spread over 24 hours, there would be an average of 13 truck trips per hour. Representing each truck as 2.5 PCEs, the level of service calculations were re-run. The resulting V/C ratios and levels of service are presented in Tables 4-18.10 and 4-18.11. As in the previous analysis, the impacts at the first four stations are presented relative to a 1999 base year, while the base year for the last three stations is 2007. This construction scenario results in no significant impacts in the AM or PM peak hours.

__Station Excavation Truck Impacts__

The impacts of the truck trips associated with the station excavation contracts would be less than the impacts associated with the tunnel segments described above, as the number of daily truck trips associated with station excavation contracts is not expected to exceed 150, in comparison to the 300 daily maximum for the tunnel segments. The mitigation measures identified for the tunnel segment hauling activities would therefore also mitigate any potential impacts associated with the station excavation contracts.

The potential does exist for a worst-case truck impacts scenario if a tunnel segment excavation point were located next to a station area and excavation work on the station and the tunnel occurred simultaneously. This could result in a daily maximum of 450 truck trips in the vicinity of one station. As a worst case scenario, it was assumed that 450 truck trips could occur at any individual station and that they would be concentrated into an eight hour construction period, overlapping with the peak hour of street traffic. This could result in a total of 28 trips inbound and 28 trips outbound on the haul routes described earlier. Representing these 56 truck trips as 141 PCEs and adding them to existing traffic results in the V/C ratios and levels of service shown in Tables 4-18.12 and 4-18.13.

TABLE 4-18.10: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 24-HOUR SCHEDULE (13 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.253	A			0.253	A		0.000
2. Boyle St. at Brooklyn Ave.			0.448	A			0.448	A		0.000
3. State St. at Brooklyn Ave.			0.684	B			0.684	B		0.000
4. State St. at I-10 WB Ramps			0.481	A			0.481	A		0.000
5. State St. at I-10 EB Ramps			0.604	B			0.604	B		0.000
6. St. Louis St. at Brooklyn Ave.			0.515	A			0.515	A		0.000
7. State St. at Marengo St.			0.860	D			0.860	D		0.000
8. I-5 NB Ramp at Brooklyn Ave.			0.479	A			0.479	A		0.000
9. I-5 SB Ramp at Brooklyn Ave.			0.371	A			0.371	A		0.000
10. Soto St. at Brooklyn Ave.			0.738	C			0.739	C		0.001
11. Mott St. at Brooklyn Ave.			0.744	C			0.749	C		0.000
12. Lorena St. at Brooklyn Ave.			0.652	B			0.652	B		0.000
13. Indiana St. at Brooklyn Ave.			0.552	A			0.552	A		0.000
14. Breed St. at Brooklyn Ave.			0.559	A			0.559	A		0.000
15. Soto St. at Marengo St.			0.950	E			0.950	E		0.000
16. Soto St. at I-10/Wabash St.			0.895	D			0.902	E		0.007
17. Soto St. at Fourth St.			0.791	C			0.791	B		0.000
18. Mott St. at Fourth St.			0.619	B			0.619	A		0.000
19. Euclid St. at Fourth St.			0.549	A			0.549	B		0.000
20. Lorena St. at Fourth St.			0.602	B			0.613	C		0.011
21. Indiana St. at 4th St./Rte 60 WB Ramp			0.746	C			0.752	B		0.006
22. Vignes St. at First St.	0.637	B	0.605	B	0.637	B	0.605	D	0.000	0.000
23. Mission St. at First St.	0.973	E	0.873	D	0.973	E	0.873	A	0.000	0.000
24. Second St. at Alameda St.	0.564	A	0.542	A	0.564	A	0.542	A	0.000	0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.10: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 24-HOUR SCHEDULE (13 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
25. First St. at Alameda St.	1.017	F	0.836	D	1.017	F	0.836	D	0.000	0.000
26. First St. at Central St.	0.630	B	0.649	A	0.630	B	0.699	B	0.000	0.000
27. 3rd/4th Confluence at Alameda St.	1.710	F	1.138	F	1.710	F	1.138	F	0.000	0.000
28. Merrick St. at Fourth St.	0.745	C	0.434	A	0.745	C	0.434	A	0.000	0.000
29. Molino St. at Fourth St.	0.717	C	0.485	A	0.717	C	0.485	A	0.000	0.000
30. Mateo St. at 6th St./Whittier Blvd.	0.499	A	0.527	A	0.499	A	0.527	A	0.000	0.000
31. Rte 101 NB Ramps at First St.			0.444	A			0.447	A		0.003
32. Rte 101 SB Ramps at First St.			0.473	A			0.485	A		0.012
33. Boyle St. at First St.			0.687	B			0.690	B		0.003
34. State St. at First St.			0.732	C			0.733	C		0.001
35. Rte 101 NB Ramps at Fourth St.			0.577	A			0.577	A		0.000
36. Rte 101 SB Ramps at Fourth St.			0.975	E			0.980	E		0.005
37. Boyle St. at Fourth St.			0.839	D			0.839	D		0.000
38. Soto St. at First St.			0.805	D			0.805	D		0.000
39. Mott St. at First St.			0.573	A			0.573	A		0.000
40. Lorena St. at First St.			0.590	A			0.594	A		0.004
41. Indiana St. at First St.			0.604	B			0.613	B		0.009
42. Indiana St. at Third St.			0.672	B			0.678	B		0.006
43. Soto St. at Sixth St.			0.626	B			0.626	B		0.000
44. Lorena St. at 6th St./Rte 60 WB Ramps			0.650	B			0.650	B		0.000
45. Lorena St. at Whittier Blvd.			0.891	D			0.891	D		0.000
46. Lorena St. at Seventh St.			0.413	A			0.413	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.10: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 24-HOUR SCHEDULE (13 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
47. Rte 60 EB Ramp at Whittier Blvd.			0.538	A			0.538	A		0.000
48. S. Boyle St. at Seventh St.			0.592	A			0.592	A		0.000
49. Soto St. at Seventh St.			0.791	C			0.791	C		0.000
50. S. Boyle St. at Whittier Blvd.			0.686	B			0.686	B		0.000
51. S. Soto St. at Whittier Blvd.			0.897	D			0.897	D		0.000
52. S. Mott St. at Whittier Blvd.			0.739	C			0.739	C		0.000
53. Indiana St. at Whittier Blvd.			1.032	F			1.032	F		0.000
54. Rowan St. at Whittier Blvd.			0.427	A			0.427	A		0.000
55. Eastern Ave. at Brooklyn Ave.			0.639	B			0.639	B		0.000
56. Eastern Ave. at First St.			0.482	A			0.482	A		0.000
57. I-710 NB Off Ramp at Ford Blvd.			0.479	A			0.479	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.434	A			0.434	A		0.000
59. Atlantic Blvd. at 1st St./Rte 60 WB Ramp			1.166	F			1.166	F		0.000
60. Collegian Ave. at Brooklyn Ave.			0.508	A			0.508	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			0.978	E			0.978	E		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.623	B			0.623	B		0.000
63. Atlantic Blvd. at Rte 60 EB Ramps			1.197	F			1.197	F		0.000
64. Eastern Ave. at Whittier Blvd.			0.552	A			0.552	A		0.000
65. McBride Ave. at Whittier Blvd.			0.581	A			0.581	A		0.000
66. Arizona Ave. at Whittier Blvd.			0.720	C			0.720	C		0.000
67. Goodrich Ave. at Whittier Blvd.			0.696	B			0.696	B		0.000
68. Belden Ave. at Whittier Blvd.			0.485	A			0.485	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.10: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 24-HOUR SCHEDULE (13 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION		NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
69. Hoefner Ave. at Whittier Blvd.				0.623	A			0.623	B		0.000
70. Atlantic Blvd. at Verona St.				0.510	A			0.510	A		0.000
71. Atlantic Blvd. at Hubbard St.				0.631	A			0.631	B		0.000
72. Atlantic Blvd. at Whittier Blvd.				0.846	C			0.846	D		0.000
TOTALS	E&F Intersections		3		7		3		8		
	Significantly affected intersections										0
Notes: V/C = Ratio of volume to capacity, LOS = level of service											

Source: Meyer, Mohaddes Associates, 1994.

TABLE 4-18.11: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 24-HOUR SCHEDULE (13 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.283	A			0.283	A		0.000
2. Boyle St. at Brooklyn Ave.			0.480	A			0.480	A		0.000
3. State St. at Brooklyn Ave.			0.734	C			0.734	C		0.000
4. State St. at I-10 WB Ramps			0.516	A			0.516	A		0.000
5. State St. at I-10 EB Ramps			0.649	B			0.649	B		0.000
6. St. Louis St. at Brooklyn Ave.			0.554	A			0.554	A		0.000
7. State St. at Marengo St.			0.923	E			0.923	E		0.000
8. I-5 NB Ramp at Brooklyn Ave.			0.516	A			0.516	A		0.000
9. I-5 SB Ramp at Brooklyn Ave.			0.398	A			0.398	A		0.000
10. Soto St. at Brooklyn Ave.			0.791	C			0.791	C		0.000
11. Mott St. at Brooklyn Ave.			0.799	C			0.799	C		0.000
12. Lorena St. at Brooklyn Ave.			0.702	C			0.702	C		0.000
13. Indiana St. at Brooklyn Ave.			0.601	B			0.601	B		0.000
14. Breed St. at Brooklyn Ave.			0.600	B			0.600	B		0.000
15. Soto St. at Marengo St.			1.020	F			1.020	F		0.000
16. Soto St. at I-10/Wabash St.			0.960	E			0.960	E		0.000
17. Soto St. at Fourth St.			0.849	D			0.849	D		0.000
18. Mott St. at Fourth St.			0.663	B			0.663	B		0.000
19. Euclid St. at Fourth St.			0.589	A			0.589	A		0.000
20. Lorena St. at Fourth St.			0.646	B			0.646	B		0.000
21. Indiana St. at 4th St./Rte 60 WB Ramp			0.800	D			0.800	D		0.000
22. Vignes St. at First St.	0.684	B	0.649	B	0.684	B	0.649	B	0.000	0.000
23. Mission St. at First St.	1.046	F	0.943	E	1.046	F	0.943	E	0.000	0.000
24. Second St. at Alameda St.	0.605	B	0.583	A	0.605	B	0.583	A	0.000	0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.11: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 24-HOUR SCHEDULE (13 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
25. First St. at Alameda St.	1.091	F	0.899	D	1.093	F	0.899	C	0.000	0.000
26. First St. at Central St.	0.678	B	0.697	B	0.678	B	0.697	B	0.000	0.000
27. 3rd/4th Confluence at Alameda St.	1.837	F	1.222	F	1.837	F	1.222	F	0.000	0.000
28. Merrick St. at Fourth St.	0.799	C	0.466	A	0.799	C	0.466	A	0.000	0.000
29. Molino St. at Fourth St.	0.769	C	0.519	A	0.769	C	0.519	A	0.000	0.000
30. Mateo St. at 6th St./Whittier Blvd.	0.535	A	0.566	A	0.535	A	0.566	A	0.000	0.000
31. Rte 101 NB Ramps at First St.			0.477	A			0.477	A		0.000
32. Rte 101 SB Ramps at First St.			0.508	A			0.508	A		0.000
33. Boyle St. at First St.			0.738	C			0.738	C		0.000
34. State St. at First St.			0.778	C			0.777	C		0.000
35. Rte 101 NB Ramps at Fourth St.			0.619	B			0.619	B		0.000
36. Rte 101 SB Ramps at Fourth St.			1.045	F			1.045	F		0.000
37. Boyle St. at Fourth St.			0.900	E			0.900	E		0.000
38. Soto St. at First St.			0.865	D			0.865	D		0.000
39. Mott St. at First St.			0.616	B			0.616	B		0.000
40. Lorena St. at First St.			0.633	B			0.633	B		0.000
41. Indiana St. at First St.			0.652	B			0.652	B		0.000
42. Indiana St. at Third St.			0.220	C			0.720	C		0.000
43. Soto St. at Sixth St.			0.668	B			0.660	B		0.000
44. Lorena St. at 6th St./Rte 60 WB Ramps			0.698	B			0.709	C		0.011
45. Lorena St. at Whittier Blvd.			0.956	E			0.973	E		0.017
46. Lorena St. at Seventh St.			0.443	A			0.443	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.11: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 24-HOUR SCHEDULE (13 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
47. Rte 60 EB Ramp at Whittier Blvd.			0.578	A			0.578	A		0.000
48. S. Boyle St. at Seventh St.			0.635	B			0.635	B		0.000
49. Soto St. at Seventh St.			0.847	D			0.847	D		0.000
50. S. Boyle St. at Whittier Blvd.			0.735	C			0.735	C		0.000
51. S. Soto St. at Whittier Blvd.			0.961	E			0.961	E		0.000
52. S. Mott St. at Whittier Blvd.			0.793	C			0.793	C		0.000
53. Indiana St. at Whittier Blvd.			1.109	F			1.118	F		0.017
54. Rowan St. at Whittier Blvd.			0.460	A			0.465	A		0.011
55. Eastern Ave. at Brooklyn Ave.			0.685	B			0.685	B		0.000
56. Eastern Ave. at First St.			0.517	A			0.517	A		0.000
57. I-710 NB Off Ramp at Ford Blvd.			0.515	A			0.515	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.467	A			0.477	A		0.007
59. Atlantic Blvd. at 1st St./Rte 60 WB Ramp			1.251	F			1.254	F		0.006
60. Collegian Ave. at Brooklyn Ave.			0.547	A			0.547	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			1.050	F			1.050	F		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.668	B			0.671	B		0.005
63. Atlantic Blvd. at Rte 60 EB Ramps			1.285	F			1.288	F		0.005
64. Eastern Ave. at Whittier Blvd.			0.592	A			0.597	A		0.011
65. McBride Ave. at Whittier Blvd.			0.624	B			0.631	B		0.011
66. Arizona Ave. at Whittier Blvd.			0.771	C			0.772	C		0.001
67. Goodrich Ave. at Whittier Blvd.			0.747	C			0.747	C		0.000
68. Belden Ave. at Whittier Blvd.			0.521	A			0.521	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.11: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING TUNNEL EXCAVATION; 24-HOUR SCHEDULE (13 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
69. Hoefner Ave. at Whittier Blvd.			0.668	B			0.668	B		0.000
70. Atlantic Blvd. at Verona St.			0.550	A			0.550	A		0.000
71. Atlantic Blvd. at Hubbard St.			0.676	A			0.679	B		0.003
72. Atlantic Blvd. at Whittier Blvd.			0.907	E			0.907	E		0.000
TOTALS: **E&F Intersections**		3		14		3		14		
TOTALS: Significantly affected intersections										0

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, 1994.

TABLE 4-18.12: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING SIMULTANEOUS TUNNEL AND STATION EXCAVATION; 8-HOUR SCHEDULE (56 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.253	A			0.253	A		0.000
2. Boyle St. at Brooklyn Ave.			0.448	A			0.448	A		0.000
3. State St. at Brooklyn Ave.			0.684	B			0.684	B		0.000
4. State St. at I-10 WB Ramps			0.481	A			0.481	A		0.000
5. State St. at I-10 EB Ramps			0.604	B			0.604	B		0.000
6. St. Louis St. at Brooklyn Ave.			0.515	A			0.515	A		0.000
7. State St. at Marengo St.			0.860	D			0.860	B		0.000
8. I-5 NB Ramp at Brooklyn Ave.			0.479	A			0.479	A		0.000
9. I-5 SB Ramp at Brooklyn Ave.			0.371	A			0.371	A		0.000
10. Soto St. at Brooklyn Ave.			0.738	C			0.742	C		0.004
11. Mott St. at Brooklyn Ave.			0.744	C			0.744	C		0.000
12. Lorena St. at Brooklyn Ave.			0.652	B			0.652	B		0.000
13. Indiana St. at Brooklyn Ave.			0.552	A			0.552	A		0.000
14. Breed St. at Brooklyn Ave.			0.559	A			0.559	A		0.000
15. Soto St. at Marengo St.			0.950	E			0.950	E		0.000
16. Soto St. at I-10/Wabash St.			0.895	D			0.927	E		0.032
17. Soto St. at Fourth St.			0.791	C			0.791	C		0.000
18. Mott St. at Fourth St.			0.619	B			0.619	B		0.000
19. Euclid St. at Fourth St.			0.549	A			0.549	A		0.000
20. Lorena St. at Fourth St.			0.602	B			0.651	B		0.049
21. Indiana St. at 4th St./Rte 60 WB Ramp			0.746	C			0.770	C		0.024
22. Vignes St. at First St.	0.637	B	0.605	B	0.637	B	0.605	B	0.000	0.000
23. Mission St. at First St.	0.973	E	0.873	D	0.973	E	0.873	D	0.000	0.000
24. Second St. at Alameda St.	0.564	A	0.542	A	0.564	A	0.542	A	0.000	0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.12: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING SIMULTANEOUS TUNNEL AND STATION EXCAVATION; 8-HOUR SCHEDULE (56 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
25. First St. at Alameda St.	1.017	F	0.836	D	1.017	F	0.836	D	0.000	0.000
26. First St. at Central St.	0.630	B	0.649	A	0.630	B	0.649	B	0.000	0.000
27. 3rd/4th Confluence at Alameda St.	1.710	F	1.138	F	1.710	F	1.138	F	0.000	0.000
28. Merrick St. at Fourth St.	0.745	C	0.434	A	0.745	C	0.434	A	0.000	0.000
29. Molino St. at Fourth St.	0.717	C	0.485	A	0.717	C	0.485	A	0.000	0.000
30. Mateo St. at 6th St./Whittier Blvd.	0.499	A	0.527	A	0.499	A	0.527	A	0.000	0.000
31. Rte 101 NB Ramps at First St.			0.444	A			0.456	A		0.012
32. Rte 101 SB Ramps at First St.			0.473	A			0.522	A		0.049
33. Boyle St. at First St.			0.687	B			0.699	B		0.012
34. State St. at First St.			0.732	C			0.739	C		0.007
35. Rte 101 NB Ramps at Fourth St.			0.577	A			0.577	A		0.000
36. Rte 101 SB Ramps at Fourth St.			0.975	E			1.012	F		0.037
37. Boyle St. at Fourth St.			0.839	D			0.839	D		0.000
38. Soto St. at First St.			0.805	D			0.805	D		0.000
39. Mott St. at First St.			0.573	A			0.573	A		0.000
40. Lorena St. at First St.			0.590	A			0.607	B		0.017
41. Indiana St. at First St.			0.604	B			0.644	B		0.040
42. Indiana St. at Third St.			0.672	B			0.698	B		0.026
43. Soto St. at Sixth St.			0.626	B			0.626	B		0.000
44. Lorena St. at 6th St./Rte 60 WB Ramps			0.650	B			0.650	B		0.000
45. Lorena St. at Whittier Blvd.			0.871	D			0.891	D		0.000
46. Lorena St. at Seventh St.			0.413	A			0.413	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.12: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING SIMULTANEOUS TUNNEL AND STATION EXCAVATION; 8-HOUR SCHEDULE (56 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION	NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
47. Rte 60 EB Ramp at Whittier Blvd.			0.538	A			0.538	A		0.000
48. S. Boyle St. at Seventh St.			0.592	A			0.592	A		0.000
49. Soto St. at Seventh St.			0.791	C			0.791	C		0.000
50. S. Boyle St. at Whittier Blvd.			0.686	B			0.686	B		0.000
51. S. Soto St. at Whittier Blvd.			0.897	D			0.897	D		0.000
52. S. Mott St. at Whittier Blvd.			0.739	C			0.739	C		0.000
53. Indiana St. at Whittier Blvd.			1.032	F			1.032	F		0.000
54. Rowan St. at Whittier Blvd.			0.427	A			0.427	A		0.000
55. Eastern Ave. at Brooklyn Ave.			0.639	B			0.639	B		0.000
56. Eastern Ave. at First St.			0.482	A			0.482	A		0.000
57. I-710 NB Off Ramp at Ford Blvd.			0.479	A			0.479	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.434	A			0.434	A		0.000
59. Atlantic Blvd. at 1st St./Rte 60 WB Ramp			1.166	F			1.166	F		0.000
60. Collegian Ave. at Brooklyn Ave.			0.508	A			0.508	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			0.978	E			0.978	E		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.623	B			0.623	B		0.000
63. Atlantic Blvd. at Rte 60 EB Ramps			1.197	F			1.197	F		0.000
64. Eastern Ave. at Whittier Blvd.			0.552	A			0.552	A		0.000
65. McBride Ave. at Whittier Blvd.			0.581	A			0.581	A		0.000
66. Arizona Ave. at Whittier Blvd.			0.696	B			0.720	C		0.000
67. Goodrich Ave. at Whittier Blvd.			0.485	A			0.696	B		0.000
68. Belden Ave. at Whittier Blvd.							0.485	E		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service 0.720 C

Continued

TABLE 4-18.12: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING SIMULTANEOUS TUNNEL AND STATION EXCAVATION; 8-HOUR SCHEDULE (56 TRUCK TRIPS PER HOUR) -- STATIONS 1-4

INTERSECTION		NO-BUILD (1999)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
69. Hoefner Ave. at Whittier Blvd.				0.623	A			0.623	B		0.000
70. Atlantic Blvd. at Verona St.				0.510	A			0.510	A		0.000
71. Atlantic Blvd. at Hubbard St.				0.631	A			0.631	B		0.000
72. Atlantic Blvd. at Whittier Blvd.				0.846	C			0.846	D		0.000
TOTALS	**E&F Intersections**						3		8		
	Significantly affected intersections										2

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, 1994.

TABLE 4-18.13: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING SIMULTANEOUS TUNNEL AND STATION EXCAVATION; 8-HOUR SCHEDULE (56 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.283	A			0.283	A		0.000
2. Boyle St. at Brooklyn Ave.			0.480	A			0.480	A		0.000
3. State St. at Brooklyn Ave.			0.734	C			0.734	C		0.000
4. State St. at I-10 WB Ramps			0.516	A			0.516	A		0.000
5. State St. at I-10 EB Ramps			0.649	B			0.649	B		0.000
6. St. Louis St. at Brooklyn Ave.			0.554	A			0.554	A		0.000
7. State St. at Marengo St.			0.923	E			0.923	E		0.000
8. I-5 NB Ramp at Brooklyn Ave.			0.516	A			0.516	A		0.000
9. I-5 SB Ramp at Brooklyn Ave.			0.398	A			0.398	A		0.000
10. Soto St. at Brooklyn Ave.			0.791	C			0.791	C		0.000
11. Mott St. at Brooklyn Ave.			0.799	C			0.799	C		0.000
12. Lorena St. at Brooklyn Ave.			0.702	C			0.702	C		0.000
13. Indiana St. at Brooklyn Ave.			0.601	B			0.601	B		0.000
14. Breed St. at Brooklyn Ave.			0.600	B			0.600	B		0.000
15. Soto St. at Marengo St.			1.020	F			1.020	F		0.000
16. Soto St. at I-10/Wabash St.			0.960	E			0.906	E		0.000
17. Soto St. at Fourth St.			0.849	D			0.849	D		0.000
18. Mott St. at Fourth St.			0.663	B			0.663	B		0.000
19. Euclid St. at Fourth St.			0.589	A			0.589	A		0.000
20. Lorena St. at Fourth St.			0.646	B			0.646	B		0.000
21. Indiana St. at 4th St./Rte 60 WB Ramp			0.800	D			0.800	D		0.000
22. Vignes St. at First St.	0.684	B	0.649	B	0.684	B	0.649	B	0.000	0.000
23. Mission St. at First St.	1.046	F	0.943	E	1.046	F	0.943	E	0.000	0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.13: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING SIMULTANEOUS TUNNEL AND STATION EXCAVATION; 8-HOUR SCHEDULE (56 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
24. Second St. at Alameda St.	0.605	B	0.583	A	0.605	A	0.583	A	0.000	0.000
25. First St. at Alameda St.	1.091	F	0.899	D	1.091	F	0.899	D	0.000	0.000
26. First St. at Central St.	0.678	B	0.697	B	0.678	B	0.697	B	0.000	0.000
27. 3rd/4th Confluence at Alameda St.	1.837	F	1.222	F	1.837	F	1.222	F	0.000	0.000
28. Merrick St. at Fourth St.	0.799	C	0.466	A	0.799	C	0.466	A	0.000	0.000
29. Molino St. at Fourth St.	0.769	C	0.519	A	0.769	C	0.519	A	0.000	0.000
30. Mateo St. at 6th St./Whittier Blvd.	0.535	A	0.566	A	0.535	A	0.566	A	0.000	0.000
31. Rte 101 NB Ramps at First St.			0.477	A			0.477	A		0.000
32. Rte 101 SB Ramps at First St.			0.508	A			0.508	A		0.000
33. Boyle St. at First St.			0.738	C			0.738	C		0.000
34. State St. at First St.			0.778	C			0.778	C		0.000
35. Rte 101 NB Ramps at Fourth St.			0.619	B			0.619	B		0.000
36. Rte 101 SB Ramps at Fourth St.			1.045	F			1.045	F		0.000
37. Boyle St. at Fourth St.			0.900	E			0.900	E		0.000
38. Soto St. at First St.			0.865	D			0.865	D		0.000
39. Mott St. at First St.			0.616	B			0.616	B		0.000
40. Lorena St. at First St.			0.633	B			0.633	B		0.000
41. Indiana St. at First St.			0.652	B			0.652	B		0.000
42. Indiana St. at Third St.			0.220	C			0.720	C		0.000
43. Soto St. at Sixth St.			0.668	B			0.668	B		0.000
44. Lorena St. at 6th St./Rte 60 WB Ramps			0.698	B			0.745	C		0.047

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.13: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING SIMULTANEOUS TUNNEL AND STATION EXCAVATION; 8-HOUR SCHEDULE (56 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
45. Lorena St. at Whittier Blvd.			0.956	E			1.029	F		0.073
46. Lorena St. at Seventh St.			0.443	A			0.443	A		0.000
47. Rte 60 EB Ramp at Whittier Blvd.			0.578	A			0.578	A		0.000
48. S. Boyle St. at Seventh St.			0.635	B			0.635	B		0.000
49. Soto St. at Seventh St.			0.847	D			0.847	D		0.000
50. S. Boyle St. at Whittier Blvd.			0.735	C			0.735	C		0.000
51. S. Soto St. at Whittier Blvd.			0.961	E			0.961	E		0.000
52. S. Mott St. at Whittier Blvd.			0.793	C			0.793	C		0.000
53. Indiana St. at Whittier Blvd.			1.109	F			1.148	F		0.039
54. Rowan St. at Whittier Blvd.			0.460	A			0.483	A		0.023
55. Eastern Ave. at Brooklyn Ave.			0.685	B			0.685	B		0.000
56. Eastern Ave. at First St.			0.517	A			0.517	A		0.000
57. I-710 NB Off Ramp at Ford Blvd.			0.515	A			0.515	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.467	A			0.482	A		0.015
59. Atlantic Blvd. at 1st St./Rte 60 WB Ramp			1.251	F			1.264	F		0.013
60. Collegian Ave. at Brooklyn Ave.			0.547	A			0.547	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			1.050	F			1.050	F		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.668	B			0.680	B		0.012
63. Atlantic Blvd. at Rte 60 EB Ramps			1.285	F			1.297	F		0.012
64. Eastern Ave. at Whittier Blvd.			0.592	A			0.624	B		0.032
65. McBride Ave. at Whittier Blvd.			0.624	B			0.658	B		0.034

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.13: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DURING SIMULTANEOUS TUNNEL AND STATION EXCAVATION; 8-HOUR SCHEDULE (56 TRUCK TRIPS PER HOUR) -- STATIONS 5-7

INTERSECTION		NO-BUILD (2007)				PLUS TRUCKS				CONSTRUCTION IMPACTS	
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
66. Arizona Ave. at Whittier Blvd.				0.771	C			0.775	C		0.004
67. Goodrich Ave. at Whittier Blvd.				0.747	C			0.747	C		0.000
68. Belden Ave. at Whittier Blvd.				0.521	A			0.521	A		0.000
69. Hoefner Ave. at Whittier Blvd.				0.668	B			0.668	B		0.000
70. Atlantic Blvd. at Verona St.				0.550	A			0.564	A		0.014
71. Atlantic Blvd. at Hubbard St.				0.676	A			0.688	B		0.012
72. Atlantic Blvd. at Whittier Blvd.				0.907	E			0.927	E		0.020
TOTALS	**E&F Intersections**		3		14		3		14		
	Significantly affected intersections										2

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, 1994.

Simultaneous trucking of tunnel excavation materials and station excavation materials results in the following significant impacts under CEQA:

AM Peak Hour

- No significant impacts

PM Peak Hour

- Soto Street at I-10/Wabash Street (#16) - Caused by truck trips to/from Brooklyn/Soto station area.
- Route 101 SB ramps at Fourth Street (#36) - Caused by truck trips to/from First/Boyle station area.
- Whittier Boulevard at Lorena Street (#45) - Caused by truck trips to/from the Whittier/Rowan station area.
- Atlantic Boulevard at Whittier Boulevard (#72) - Caused by truck trips to/from the Whittier/Atlantic station area.

The simultaneous excavation of a tunnel segment and a station at the same excavation point with trucks utilizing the same haul routes would cause, under CEQA, significant traffic impacts requiring mitigation.

d. Construction Equipment and Worker Trips

In addition to construction traffic associated with the trucks hauling excavated materials, there is the potential for traffic impacts associated with the daily traffic generated by workers and equipment or delivery vehicles. Table 4-18.6, presented earlier, listed the number of daily construction equipment vehicles and workers automobiles at each station. The types of vehicles that likely would be driving on public streets, travelling to and from the construction sites daily, and the general number of such vehicles per shift, are the following:

During Excavation (per shift)

- 20 dump trucks
- 10 delivery trucks
- 50 worker automobiles

During Station Construction (per shift)

- 22 concrete trucks
- 12 delivery trucks
- 50 worker automobiles

To analyze the worst case, it was assumed that there could be a shift change during the peak hour of adjacent street traffic, resulting in 50 inbound workers and 50 outbound workers. This is not likely to occur, since construction schedules usually begin earlier than the peak hour. It was also assumed that approximately 20 percent of the truck trips for the eight-hour shift could occur during the peak hour of adjacent street traffic. Applying passenger car equivalency (PCE) factors of 2.5 to the dump and delivery trucks and 2.0 to the smaller concrete trucks, it was estimated that there could be the equivalent of 15 peak hour PCE (truck) trips during excavation and 16 peak hour PCE (truck) trips during station construction. The impacts of up to 66 trips into and out of the construction zone at each station area were quantified, assuming a distributed pattern of worker/equipment trips on arterial streets surrounding each station (not necessarily concentrated on the shortest route to the closest freeway). The resulting V/C ratios and levels of service are shown in Tables 4-18.14 and 4-18.15. These display construction worker impacts relative to the 1999 and 2007 construction midpoint years.

Based on the intersection critical movement analysis, the addition of daily worker and equipment trips to existing traffic will not result in any significant traffic impacts under CEQA at any study intersections in either the AM or PM peak hours.

e. Other Impacts

A minor on-going impact will be associated with traffic on the decking installed atop the station construction areas. Once fully installed, the decking can be striped to resemble a city street with the same number of lanes as previously in place on the street. In theory, the street will then possess the same traffic carrying capacity as it did prior to installation of the decking. In actuality, however, the effect of the decking on drivers' behavior will likely be to slow traffic to less than its pre-construction speed. This is only a marginal impact and the effect is not significant, but it could result in the perception of more congestion through the construction zone, as traffic drives at slower speeds across the decking, or it could cause a small percentage of drivers to seek alternate routes. This would not be considered a significant impact.

Drop holes will be used for purposes of adding concrete to tunnel sections. These holes will occur between station/tunnel excavation sites due to the limitation in distance that concrete can be feasibly pumped. Although the exact locations of the holes is not known at this time, some may occur on local residential or collector streets. In general, it is recommended that complete street closures do not occur. If complete closures are required, they should be limited to off-peak traffic hours (i.e., avoid morning and evening peaks) and should never block cul-de-sac streets or driveways. It is not expected that limited lane or street closures on local or collector streets will have a significant impact on traffic. Detour routes, signing, turnarounds and other work site traffic control elements should be coordinated with the City and County of Los Angeles for all drop hole locations.

4-18.2.3 <u>Cumulative Impacts</u>

There are two types of cumulative construction impacts that could occur if the LPA construction contracts are not well coordinated with one another or with other major construction projects in the vicinity of the LPA.

TABLE 4-18.14: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DUE TO CONSTRUCTION WORKER AND EQUIPMENT/DELIVERY TRIPS -- STATIONS 1-4

INTERSECTION	NO-BUILD				EXISTING PLUS WORKERS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.253	A			0.253	A		0.000
2. Boyle St. at Brooklyn Ave.			0.448	A			0.450	A		0.002
3. State St. at Brooklyn Ave.			0.684	B			0.686	B		0.002
4. State St. at I-10 WB Ramps			0.481	A			0.482	A		0.001
5. State St. at I-10 EB Ramps			0.604	B			0.605	B		0.001
6. St. Louis St. at Brooklyn Ave.			0.515	A			0.517	A		0.002
7. State St. at Marengo St.			0.860	D			0.861	D		0.001
8. I-5 NB Ramp at Brooklyn Ave.			0.479	A			0.481	A		0.002
9. I-5 SB Ramp at Brooklyn Ave.			0.371	A			0.373	A		0.002
10. Soto St. at Brooklyn Ave.			0.738	C			0.743	C		0.005
11. Mott St. at Brooklyn Ave.			0.744	C			0.749	C		0.005
12. Lorena St. at Brooklyn Ave.			0.652	B			0.655	B		0.003
13. Indiana St. at Brooklyn Ave.			0.552	A			0.572	A		0.020
14. Breed St. at Brooklyn Ave.			0.559	A			0.562	A		0.003
15. Soto St. at Marengo St.			0.950	E			0.950	E		0.000
16. Soto St. at I-10/Wabash St.			0.895	D			0.897	D		0.002
17. Soto St. at Fourth St.			0.791	C			0.742	C		0.001
18. Mott St. at Fourth St.			0.619	B			0.621	B		0.002
19. Euclid St. at Fourth St.			0.549	A			0.549	A		0.000
20. Lorena St. at Fourth St.			0.602	B			0.615	B		0.013
21. Indiana St. at 4th St./Rte 60 WB Ramp			0.746	C			0.747	C		0.001
22. Vignes St. at First St.	0.637	B	0.605	B	0.639	B	0.606	B	0.002	0.001
23. Mission St. at First St.	0.973	E	0.873	D	0.973	E	0.873	D	0.000	0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.14: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DUE TO CONSTRUCTION WORKER AND EQUIPMENT/DELIVERY TRIPS -- STATIONS 1-4

INTERSECTION	NO-BUILD				EXISTING PLUS WORKERS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
24. Second St. at Alameda St.	0.564	A	0.542	A	0.566	A	0.546	A	0.002	0.004
25. First St. at Alameda St.	1.017	F	0.836	D	1.018	F	0.837	D	0.001	0.001
26. First St. at Central St.	0.630	B	0.649	A	0.631	B	0.650	B	0.001	0.001
27. 3rd/4th Confluence at Alameda St.	1.710	F	1.138	F	1.710	F	1.140	F	0.000	0.002
28. Merrick St. at Fourth St.	0.745	C	0.434	A	0.745	C	0.435	A	0.000	0.001
29. Molino St. at Fourth St.	0.717	C	0.485	A	0.717	C	0.486	A	0.000	0.001
30. Mateo St. at 6th St./Whittier Blvd.	0.499	A	0.527	A	0.501	A	0.528	A	0.002	0.001
31. Rte 101 NB Ramps at First St.			0.444	A			0.447	A		0.003
32. Rte 101 SB Ramps at First St.			0.473	A			0.479	A		0.006
33. Boyle St. at First St.			0.687	B			0.694	B		0.007
34. State St. at First St.			0.732	C			0.734	C		0.002
35. Rte 101 NB Ramps at Fourth St.			0.577	A			0.579	A		0.002
36. Rte 101 SB Ramps at Fourth St.			0.975	E			0.975	E		0.000
37. Boyle St. at Fourth St.			0.839	D			0.841	D		0.002
38. Soto St. at First St.			0.805	D			0.806	D		0.001
39. Mott St. at First St.			0.573	A			0.580	A		0.007
40. Lorena St. at First St.			0.590	A			0.600	B		0.010
41. Indiana St. at First St.			0.604	B			0.615	B		0.011
42. Indiana St. at Third St.			0.672	B			0.673	B		0.001
43. Soto St. at Sixth St.			0.626	B			0.628	B		0.002
44. Lorena St. at 6th St./Rte 60 WB Ramps			0.650	B			0.652	B		0.002

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.14: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DUE TO CONSTRUCTION WORKER AND EQUIPMENT/DELIVERY TRIPS -- STATIONS 1-4

INTERSECTION	NO-BUILD				EXISTING PLUS WORKERS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
45. Lorena St. at Whittier Blvd.			0.891	D			0.894	D		0.003
46. Lorena St. at Seventh St.			0.413	A			0.417	A		0.004
47. Rte 60 EB Ramp at Whittier Blvd.			0.538	A			0.538	A		0.000
48. S. Boyle St. at Seventh St.			0.592	A			0.592	A		0.000
49. Soto St. at Seventh St.			0.791	C			0.792	C		0.001
50. S. Boyle St. at Whittier Blvd.			0.686	B			0.686	B		0.000
51. S. Soto St. at Whittier Blvd.			0.897	D			0.899	D		0.002
52. S. Mott St. at Whittier Blvd.			0.739	C			0.739	C		0.000
53. Indiana St. at Whittier Blvd.			1.032	F			1.034	F		0.002
54. Rowan St. at Whittier Blvd.			0.427	A			0.427	A		0.000
55. Eastern Ave. at Brooklyn Ave.			0.639	B			0.639	B		0.000
56. Eastern Ave. at First St.			0.482	A			0.482	A		0.000
57. I-710 NB Off Ramp at Ford Blvd.			0.479	A			0.479	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.434	A			0.434	A		0.000
59. Atlantic Blvd. at 1st St./Rte 60 WB Ramp			1.166	F			1.166	F		0.000
60. Collegian Ave. at Brooklyn Ave.			0.508	A			0.508	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			0.978	E			0.978	E		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.623	B			0.623	B		0.000
63. Atlantic Blvd. at Rte 60 EB Ramps			1.197	F			1.197	F		0.000
64. Eastern Ave. at Whittier Blvd.			0.552	A			0.552	A		0.000
65. McBride Ave. at Whittier Blvd.			0.581	A			0.581	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.14: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DUE TO CONSTRUCTION WORKER AND EQUIPMENT/DELIVERY TRIPS -- STATIONS 1-4

INTERSECTION		NO-BUILD AM PEAK HOUR V/C	NO-BUILD AM PEAK HOUR LOS	NO-BUILD PM PEAK HOUR V/C	NO-BUILD PM PEAK HOUR LOS	EXISTING PLUS WORKERS AM PEAK HOUR V/C	EXISTING PLUS WORKERS AM PEAK HOUR LOS	EXISTING PLUS WORKERS PM PEAK HOUR V/C	EXISTING PLUS WORKERS PM PEAK HOUR LOS	CONSTRUCTION IMPACTS AM	CONSTRUCTION IMPACTS PM
66. Arizona Ave. at Whittier Blvd.				0.720	C			0.720	C		0.000
67. Goodrich Ave. at Whittier Blvd.				0.696	B			0.696	B		0.000
68. Belden Ave. at Whittier Blvd.				0.485	A			0.485	A		0.000
69. Hoefner Ave. at Whittier Blvd.				0.623	A			0.623	B		0.000
70. Atlantic Blvd. at Verona St.				0.510	A			0.510	A		0.000
71. Atlantic Blvd. at Hubbard St.				0.631	A			0.631	B		0.000
72. Atlantic Blvd. at Whittier Blvd.				0.846	C			0.846	D		0.000
TOTALS	E&F Intersections						3		7		
	Significantly affected intersections										0

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, 1994.

TABLE 4-18.15: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DUE TO CONSTRUCTION WORKER AND EQUIPMENT/DELIVERY TRIPS -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				EXISTING PLUS WORKERS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1. Echandia St. at Brooklyn Ave.			0.253	A			0.283	A		0.000
2. Boyle St. at Brooklyn Ave.			0.448	A			0.480	A		0.000
3. State St. at Brooklyn Ave.			0.684	B			0.734	C		0.000
4. State St. at I-10 WB Ramps			0.481	A			0.516	A		0.000
5. State St. at I-10 EB Ramps			0.604	B			0.649	B		0.000
6. St. Louis St. at Brooklyn Ave.			0.515	A			0.554	A		0.000
7. State St. at Marengo St.			0.860	D			0.923	E		0.000
8. I-5 NB Ramp at Brooklyn Ave.			0.479	A			0.516	A		0.000
9. I-5 SB Ramp at Brooklyn Ave.			0.371	A			0.398	A		0.000
10. Soto St. at Brooklyn Ave.			0.738	C			0.791	C		0.000
11. Mott St. at Brooklyn Ave.			0.744	C			0.799	C		0.000
12. Lorena St. at Brooklyn Ave.			0.652	B			0.702	C		0.000
13. Indiana St. at Brooklyn Ave.			0.552	A			0.601	B		0.000
14. Breed St. at Brooklyn Ave.			0.559	A			0.600	B		0.000
15. Soto St. at Marengo St.			0.950	E			1.020	F		0.000
16. Soto St. at I-10/Wabash St.			0.895	D			0.960	E		0.000
17. Soto St. at Fourth St.			0.791	C			0.849	D		0.000
18. Mott St. at Fourth St.			0.619	B			0.663	B		0.000
19. Euclid St. at Fourth St.			0.549	A			0.589	A		0.000
20. Lorena St. at Fourth St.			0.602	B			0.646	B		0.000
21. Indiana St. at 4th St./Rte 60 WB Ramp			0.746	C			0.800	D		0.000
22. Vignes St. at First St.	0.637	B	0.605	B	0.684	B	0.649	B	0.000	0.000
23. Mission St. at First St.	0.973	E	0.873	D	1.046	F	0.943	E	0.000	0.000
24. Second St. at Alameda St.	0.564	A	0.542	A	0.605	B	0.583	A	0.000	0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.15: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DUE TO CONSTRUCTION WORKER AND EQUIPMENT/DELIVERY TRIPS -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				EXISTING PLUS WORKERS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
25. First St. at Alameda St.	1.017	F	0.836	D	1.091	F	0.899	D	0.000	0.000
26. First St. at Central St.	0.630	B	0.649	A	0.678	B	0.697	B	0.000	0.000
27. 3rd/4th Confluence at Alameda St.	1.710	F	1.138	F	1.837	F	1.222	F	0.000	0.000
28. Merrick St. at Fourth St.	0.745	C	0.434	A	0.799	C	0.466	A	0.000	0.000
29. Molino St. at Fourth St.	0.717	C	0.485	A	0.769	C	0.519	A	0.000	0.000
30. Mateo St. at 6th St./Whittier Blvd.	0.499	A	0.527	A	0.535	A	0.566	A	0.000	0.000
31. Rte 101 NB Ramps at First St.			0.444	A			0.477	A		0.000
32. Rte 101 SB Ramps at First St.			0.473	A			0.508	A		0.000
33. Boyle St. at First St.			0.687	B			0.738	C		0.000
34. State St. at First St.			0.732	C			0.778	C		0.000
35. Rte 101 NB Ramps at Fourth St.			0.577	A			0.619	B		0.000
36. Rte 101 SB Ramps at Fourth St.			0.975	E			1.045	F		0.000
37. Boyle St. at Fourth St.			0.839	D			0.900	E		0.000
38. Soto St. at First St.			0.805	D			0.865	D		0.000
39. Mott St. at First St.			0.573	A			0.616	B		0.000
40. Lorena St. at First St.			0.590	A			0.633	B		0.000
41. Indiana St. at First St.			0.604	B			0.652	B		0.000
42. Indiana St. at Third St.			0.672	B			0.720	C		0.000
43. Soto St. at Sixth St.			0.626	B			0.668	B		0.000
44. Lorena St. at 6th St./Rte 60 WB Ramps			0.650	B			0.698	B		0.000
45. Lorena St. at Whittier Blvd.			0.891	D			0.956	E		0.000
46. Lorena St. at Seventh St.			0.413	A			0.443	A		0.000

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.15: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DUE TO CONSTRUCTION WORKER AND EQUIPMENT/DELIVERY TRIPS -- STATIONS 5-7

INTERSECTION	NO-BUILD (2007)				EXISTING PLUS WORKERS				CONSTRUCTION IMPACTS	
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
47. Rte 60 EB Ramp at Whittier Blvd.			0.538	A			0.578	A		0.000
48. S. Boyle St. at Seventh St.			0.592	A			0.635	B		0.000
49. Soto St. at Seventh St.			0.791	C			0.847	D		0.000
50. S. Boyle St. at Whittier Blvd.			0.686	B			0.735	C		0.000
51. S. Soto St. at Whittier Blvd.			0.897	D			0.961	E		0.000
52. S. Mott St. at Whittier Blvd.			0.739	C			0.793	C		0.000
53. Indiana St. at Whittier Blvd.			1.032	F			1.111	F		0.002
54. Rowan St. at Whittier Blvd.			0.427	A			0.473	A		0.013
55. Eastern Ave. at Brooklyn Ave.			0.639	B			0.687	B		0.002
56. Eastern Ave. at First St.			0.482	A			0.519	A		0.002
57. I-710 NB Off Ramp at Ford Blvd.			0.479	A			0.515	A		0.000
58. I-710 NB Ramps at Ford Blvd.			0.434	A			0.470	A		0.003
59. Atlantic Blvd. at 1st St./Rte 60 WB Ramp			1.166	F			1.252	F		0.001
60. Collegian Ave. at Brooklyn Ave.			0.508	A			0.547	A		0.000
61. Atlantic Blvd. at Brooklyn Ave.			0.978	E			1.050	F		0.000
62. Atlantic Blvd. at Rte 60 WB On Ramp			0.623	B			0.669	B		0.001
63. Atlantic Blvd. at Rte 60 EB Ramps			1.197	F			1.286	F		0.001
64. Eastern Ave. at Whittier Blvd.			0.552	A			0.600	B		0.008
65. McBride Ave. at Whittier Blvd.			0.581	A			0.632	B		0.008
66. Arizona Ave. at Whittier Blvd.			0.720	C			0.795	C		0.024
67. Goodrich Ave. at Whittier Blvd.			0.696	B			0.751	C		0.004
68. Belden Ave. at Whittier Blvd.			0.485	A			0.524	A		0.003

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Continued

TABLE 4-18.15: SUMMARY OF PEAK INTERSECTION CAPACITY ANALYSES -- CONSTRUCTION IMPACTS DUE TO CONSTRUCTION WORKER AND EQUIPMENT/DELIVERY TRIPS -- STATIONS 5-7

INTERSECTION		NO-BUILD (2007)				EXISTING PLUS WORKERS				CONSTRUCTION IMPACTS	
		AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR			
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
69. Hoefner Ave. at Whittier Blvd.				0.623	A			0.664	B		0.004
70. Atlantic Blvd. at Verona St.				0.510	A			0.553	A		0.003
71. Atlantic Blvd. at Hubbard St.				0.631	A			0.679	B		0.003
72. Atlantic Blvd. at Whittier Blvd.				0.846	C			0.918	E		0.011
TOTALS	**E&F Intersections**		3		7		3		14		
	Significantly affected intersections										0

Notes: V/C = Ratio of volume to capacity, LOS = level of service

Source: Meyer, Mohaddes Associates, 1994.

The construction schedule and the packaging of contracts for the LPA will be defined during final design. The analysis of trucks removing excavated material presented in Section 4-18.2.2. above, quantified the impact of simultaneous excavation at all stations, assuming that trucks would use the most direct arterial street connection to reach the freeway system from each excavation site. Under that scenario, there were no cumulative impacts at any intersections or along any roadways because the trucks from each excavation site could use different haul routes to reach the freeways. The LPA area is traversed by six freeways making it relatively easy to design haul routes from each station to a freeway via different arterial streets, thus minimizing the potential for cumulative impacts on any arterial street.

Since the precise construction scheduling of the LPA and its construction packages is not known at this time, it is not possible to comprehensively identify other specific development projects or public infrastructure improvement projects that might be under construction at the same time as the LPA. Section 2-7, Related Projects, lists projects that are currently known. MTA/RCC will continue to work with other jurisdictions and entities (e.g., utility companies) to identify other major construction projects in the vicinity of LPA contracts and coordinate construction activities, particularly haul routes, during the period of the construction contracts.

4-18.2.4 Mitigation

The following mitigation measures will be implemented to reduce the traffic impacts of construction of the LPA:

- In order to avoid cumulative construction impacts, the RCC will seek to package the construction contracts so that multiple excavation efforts are not happening in close proximity to one another with trucks from more than one excavation project attempting to use the same haul route at the same time.

- The MTA/RCC will work with the Los Angeles Department of Transportation (LADOT) and the Los Angeles County Department of Public Works (LACDPW) to prepare work site Traffic Control Plans in the final design documents which identify detour routes, signing and barricade locations, turnarounds at street closures and other work site traffic control elements.

- The RCC will develop preferred haul route plans for each construction package which entails removal of excavated material. The haul route plans shall prohibit the use of local residential streets. The haul route plans shall also avoid utilizing streets on which schools are located. In the case of a potential haul route past a school, such as Atlantic Boulevard north of the Atlantic/Whittier station, where there are no nearby alternative arterial streets which provide access to east-west freeways, trucks shall be prohibited from hauling past the schools during normal school hours.

- If tunnel segment excavation sites are located at either the First/Boyle station or the Whittier/Rowan station, the following mitigation measures should be implemented to reduce the impacts of haul truck trips:

  1. Avoid concentrating the truck hauling activities into an eight hour period.

  2. Minimize trucking hauling activities in the PM peak traffic hour.

  3. Develop a truck haul route plan that distributes the trucks over more than one arterial street route to/from the freeways, but avoids use of any local residential streets. Trucks should also avoid the Fourth Street ramps to access the Santa Ana Freeway (Route 101).

- To the extent possible, hauling operations should be spread over more than one shift (not concentrated in an eight-hour period) and should not allow hauling during peak hours of adjacent street traffic.

- The RCC will coordinate with other major construction projects within a one-mile radius of the construction site to avoid, to the maximum extent possible, overlapping haul routes between LPA construction contracts and with other public or private construction projects.

4-18.3 CONSTRUCTION AIR QUALITY

4-18.3.1 Construction Impacts Related to Air Quality

This section reviews construction-related air emissions associated with the Locally Preferred Alternative (LPA). In response to the comment letter on the Draft AA/DEIS/DEIR from the South Coast Air Quality Managment District (Letter #20), this sections reviews in more detail the impacts that would occur from simultaneos construction activities. For example, as a worst case, it is assumed that four stations and their associated tunnel segments would be constructed at the same time. These segments would extend from Union Station to First and Lorena, a distance of approximately 3.5 miles. As shown in Figure 4-18.15, it is anticipated that the construction period for this work would extend for approximately 60 months. The construction work phases that are evaluated for air quality impacts are:

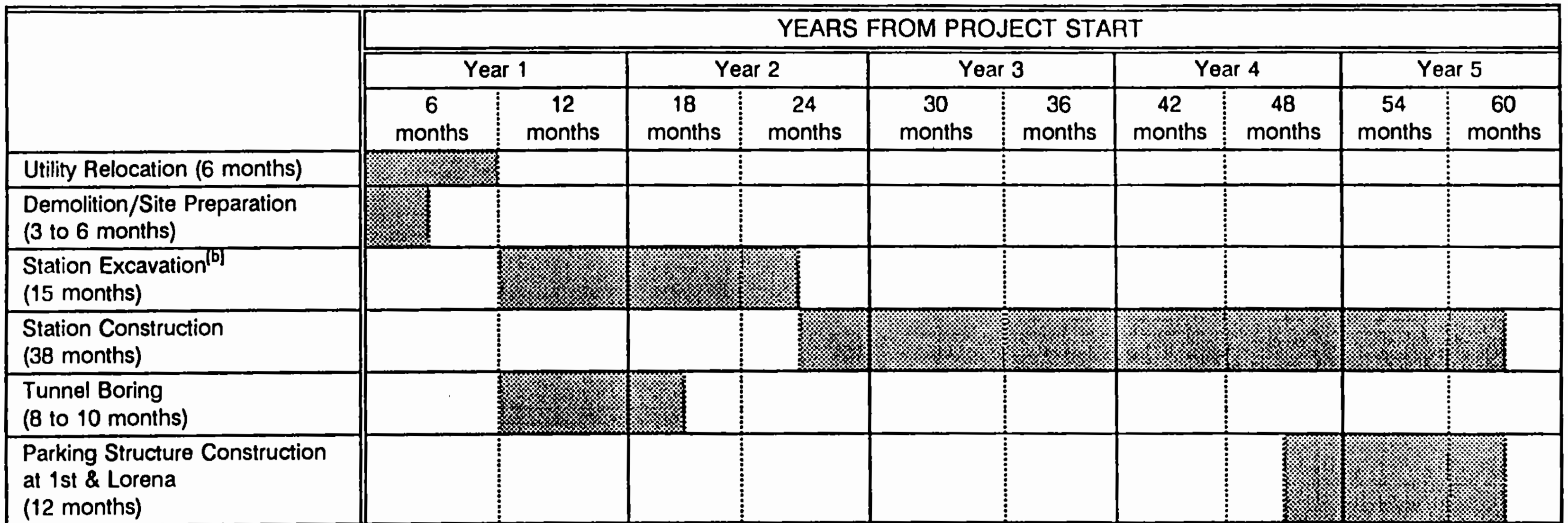
- Utility relocation
- Site preparation and demolition
- Station excavation
- Tunnel boring
- Station construction
- Parking structure excavation/construction (First and Lorena)

The source of air emissions from these activities includes emissions from the operation of heavy equipment, emissions from debris and earth moving and handling and tail pipe emissions from vehicles (automobiles and trucks) travelling to and from the construction sites. As can be seen from the sequence of anticipated construction activities in Figure 4-18.15, there are likely to be periods when emissions from various construction work phases would overlap and contribute to a cumulative effect. These overlapping periods are anticipated to be:

- Utility relocation and site preparation and demolition
- Station excavation and tunnel boring
- Station construction and parking structure excavation and construction

A brief description of each construction work phase and anticipated daily and quarterly emissions is provided in the following sections. Because construction equipment is a primary source of these emissions, the daily use of construction equipment by construction phase and type of equipment is estimated in Table 4-18.16 and is referenced in the tables that follow for each of the individual work phases. Cumulative emissions from overlapping phases is also discussed. For purposes of assessment, these emissions are compared with emissions thresholds identified in the South Coast Air Quality Management District's CEQA Air Quality Handbook (November 1993). These thresholds are used by the SCAQMD as broad indicators of potential significant impacts as required by the California Environmental Quality Act (CEQA), but have no regulatory or enforcement status other than to provide decision makers and the local public with a threshold to determine when mitigation measures may be necessary.

FIGURE 4-18.15: WORST-CASE CONSTRUCTION SCHEDULE [a]



Notes: [a] Assumes four stations constructed simultaneously
[b] Includes pile installation and deck placement

Source: Rail Construction Corporation, Engineering Management Consultant, Myra L. Frank & Associates, 1994.

TABLE 4-18.16: DAILY USE OF CONSTRUCTION EQUIPMENT BY PHASE/TYPE OF EQUIPMENT (PER STATION)[a]

EQUIPMENT/PHASE	UNDERGROUND STATION		BORED TUNNELS	
	NUMBER USED PER SHIFT	TIME HOURS/DAY[b]	NUMBER USED PER SHIFT	TIME HOURS/DAY
Relocation of Buried Utility Lines (per station)[c]				
Excavator/backhoe	2	8	0	0
Trencher	2	8	0	0
Truck	3	8	0	0
Worker auto	10	N/A	0	0
Generator/Compressor	1	8	0	0
Cement truck	2	8	0	0
Paver	1	8	0	0
Roller	1	8	0	0
Power compactor	1	8	0	0
Demolition (per station)[c]				
Crawler dozer/loader	1	8	0	0
Pavement breaker	1	8	0	0
Rubber-tired loader/bob cat	2	8	0	0
Truck	10	8	0	0
Worker auto	16	N/A	0	0
Excavator/backhoe	1	8	0	0
Generator/compressor	1	8	0	0
Excavation (per station)				
Crawler dozer/loader	1	24	1	24
Pile drilling rig	2	24	2	24
Water pump	4	24	4	24
Rubber-tired loader/bob cat	2	24	1	24
Pavement breaker	1	16	N/A	N/A
Excavator/backhoe	2	24	2	24
Conveyer system	1	24	1	24
Tunnel Mining Machine	N/A	N/A	1	24
Dump truck	20	24	35	24
Truck (delivery)	10	24	10	24
Worker auto	50	N/A	60	N/A
Crane	2	24	2	24
Generator/compressor	2	24	2	24
Shotkrete machine	1	24	N/A	N/A
Fork lift	1	24	N/A	N/A
Construction (per station)				
Concrete pump truck	2	16	2	16
Cement truck	22	16	22	16
Pavement breaker	1	16	N/A	N/A
Crawler crane	1	24	2	24

Continued

TABLE 4-18.16: DAILY USE OF CONSTRUCTION EQUIPMENT BY PHASE/TYPE OF EQUIPMENT (PER STATION)[a]

EQUIPMENT/PHASE	UNDERGROUND STATION		BORED TUNNELS	
	NUMBER USED PER SHIFT	TIME HOURS/DAY[b]	NUMBER USED PER SHIFT	TIME HOURS/DAY
Construction (per station) continued				
Compactor (street restoration)	1	8	N/A	N/A
Roller (street restoration)	1	8	N/A	N/A
Welder	4	24	2	24
Truck (delivery)	12	24	10	16
Worker auto	50	N/A	60	N/A
Generator/compressor	2	24	2	24
Excavator/backhoe	1	8	N/A	N/A
Crawler dozer/loader	1	8	1	24
Paver (street restoration)	1	8	N/A	N/A
Parking Structure Excavation/Construction (First and Lorena)				
Concrete Pump Truck	1	8	0	0
Cement Truck	18	8	0	0
Crawler Crane	1	8	0	0
Welder	2	8	0	0
Truck (delivery)	3	8	0	0
Worker automobile	30	N/A	0	0
Generator/Compressor	2	8	0	0
Excavator/backhoe	1	8	0	0
Crawler dozer/loader	1	8	0	0
Dump Truck	50	8	0	0

Notes: [a] This table provides an estimate of the equipment that may be used on any given day during construction of the Eastern Extension. The amount or type of equipment used may be different than that shown, and typically less equipment would be used for shorter periods of time. In addition, rarely would all equipment types be used at the same point in time. Estimates are provided, however, to evaluate the possible worst-case impacts that may be present over the course of the construction period.

[b] 24-hour or 16-hour use of equipment may not be possible due to the location of the station in relation to adjoining land uses. Should the use of equipment be limited (e.g. not used at night, used only for one shift, not used during peak traffic hours), the overall construction period would need to be extended.

[c] Although expected to occur only rarely, street closures or double shifts (16 hrs.) may be necessary for demolition activities.

N/A = Not Applicable

Source: Rail Construction Corporation, Engineering Management Consultant, Myra L. Frank & Associates, 1984; Terry A. Hayes Associates, 1994.

a. Relocation of Buried Utility Lines

Subject to other restraints, the Locally Preferred Alternative (LPA) stations have been located to avoid to the extent possible conflicts with the space occupied by utilities. In certain instances, however, the positioning of the station or the location of station entrances and vent shafts would require that conflicting utilities be relocated to clear the way for the station structures. This relocation is performed prior to the construction of the subway station. As shown in Table 4-18.17, none of the criteria pollutants was estimated to have a significant impact except nitrogen oxides, which exceed the AQMD threshold by a substantial margin.

TABLE 4-18.17: UTILITY RELOCATION DAILY EMISSIONS

EMISSIONS SOURCE	POLLUTANT (POUNDS/DAY)				
	CARBON MONOXIDE	NITROGEN OXIDES	SULFUR DIOXIDE	REACTIVE ORGANIC GAS	PARTICULATES
Area Sources					
Construction Equipment[a]	99.14	177.56	16.31	15.99	10.13
Material Handling[b]	N/A	N/A	N/A	N/A	8.5
Grading	N/A	N/A	N/A	N/A	N/A
Stockpiling	N/A	N/A	N/A	N/A	N/A
Vehicles on Unpaved Surfaces	N/A	N/A	N/A	N/A	N/A
Mobile Sources[c]					
Worker Auto	11.60	0.80	0[d]	0.80	0.03
Trucks	94.40	110.40	0[d]	22.40	16.00
DAILY TOTAL	205.14	288.76	16.31	39.19	34.66
QUARTERLY TOTAL (TONS)[e]	6.46	9.10	0.51	1.23	1.09
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75

Notes: [a] Equipment quantities for four stations. See Table 4-18.16 for itemization.
[b] Quantity of material: 48,848 cubic yards.
[c] Number of daily truck trips: 40; number of daily auto trips: 80.
[d] EMFAC7F does not estimate SOx emissions.
[e] Based on 63 days/quarter

Source: Terry A. Hayes Associates, 1994.

b. Site Preparation/Demolition of Existing Structures

The construction phase involving site preparation and demolition of existing structures entails removal of existing structures on land acquired for the excavation and construction of the station areas. Two of the five criteria pollutants, nitrogen oxides and particulates, were estimated to exceed the SCAQMD thresholds by significant proportions, as shown in Table 4-18.14.

TABLE 4-18.18: SITE PREPARATION DEMOLITION DAILY EMISSIONS					
EMISSIONS SOURCE	POLLUTANT (POUNDS/DAY)				
	CARBON MONOXIDE	NITROGEN OXIDES	SULFUR DIOXIDE	REACTIVE ORGANIC GAS	PARTICULATES
Area Sources					
Construction Equipment[a]	66.31	113.70	10.12	10.97	6.53
Demolition	N/A	N/A	N/A	N/A	84.70
Material Handling[b]	N/A	N/A	N/A	N/A	84.70
Grading	N/A	N/A	N/A	N/A	351.60
Stockpiling	N/A	N/A	N/A	N/A	N/A
Vehicles on Unpaved Surfaces	N/A	N/A	N/A	N/A	147.20
Mobile Sources[c]					
Worker Auto	18.56	1.28	0[d]	1.28	0.04
Trucks	188.80	220.80	0[d]	44.80	32.00
DAILY TOTAL	273.67	335.78	10.12	57.05	622.07
QUARTERLY TOTAL (TONS)[e]	8.62	10.58	0.32	1.80	19.60
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75

Notes: [a] Equipment quantities for four stations. See Table 4-18.16 for itemization.
[b] Quantity of material: 654,000 cubic yards.
[c] Number of daily truck trips: 80; number of daily auto trips: 128.
[d] EMFAC7F does not estimate SOx emissions.
[e] Based on 63 days/quarter.

Source: Terry A. Hayes Associates, 1994.

c. Excavation of Station Areas

Excavation of station areas involves the support of foundations of buildings adjacent to the station excavation and support for the excavation itself. Soldier piles are installed in pre-drilled holes around the area to be excavated, after which deck beams and a deck are installed under which excavation may proceed. At this time, more utility lines may be relocated. The cut-and-cover method of station construction is a straight-forward operation and would not require sophisticated construction equipment. However, it would temporarily interfere with the normal flow of traffic, causing some traffic lanes to be closed to vehicles for short durations.

During the excavation phase, as shown in Table 4-18.19, all the criteria pollutants except sulfur oxides are estimated to exceed the SCAQMD threshold of significance.

TABLE 4-18.19: STATION EXCAVATION DAILY EMISSIONS					
EMISSIONS SOURCE	POLLUTANT (POUNDS/DAY)				
	CARBON MONOXIDE	NITROGEN OXIDES	SULFUR DIOXIDE	REACTIVE ORGANIC GAS	PARTICULATES
Area Sources					
Construction Equipment[a]	1,577.00	2,470.01	212.40	275.11	148.50
Material Handling[b]	N/A	N/A	N/A	N/A	83.70
Grading	N/A	N/A	N/A	N/A	N/A
Stockpiling	N/A	N/A	N/A	N/A	N/A
Vehicles on Unpaved Surfaces	N/A	N/A	N/A	N/A	1,324.80
Mobile Sources[c]					
Worker Auto	58.00	4.00	0/d/	4.00	0.13
Trucks	1,699.20	1,987.20	0/d/	403.20	288.00
DAILY TOTAL	3,334.20	4,461.21	212.40	682.31	1,845.13
QUARTERLY TOTAL (TONS)[e]	105.03	140.53	6.69	21.49	58.12
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75

Notes: [a] Equipment quantities for four stations. See Table 4-18.16 for itemization.
[b] Quantity of material: 638,045 cubic yards.
[c] Number of daily truck trips: 720; number of daily auto trips: 400.
[d] EMFAC7F does not estimate SOx emissions.
[e] Based on 63 days/quarter.

Source: Terry A. Hayes Associates, 1994.

d. Construction of Station Areas

During station construction, the station floor known as the invert or base slab, would be installed first. Invert slabs are generally poured in alternate sections so that the placement of reinforcing steel and the pouring of concrete do not interfere with each other. After a reasonable length of continuous base slab has been completed, the installation of exterior walls and any interior column elements can proceed up to the underside of slab level that is to be supported by the walls and/or columns. Thus, the wall and the column pour lifts might be to an upper track level, a mezzanine level or a roof level. The suspended slabs are then poured. Slabs are poured as the columns and intermediate floor and roof wall pours progress.

After the station structure has been completed, the area is backfilled and site restoration can proceed. This involves rebuilding sidewalks, reconstructing the road surface and restoring utilities to their original locations. When the surface area is completed, equipment installations can continue beneath the surface with minimal disruption to street use by vehicles and pedestrians.

During the station construction phase, as shown in Table 4-18.20, all criteria pollutants except sulfur dioxide are estimated to exceed the SCAQMD threshold of significance.

TABLE 4-18.20: STATION CONSTRUCTION DAILY EMISSIONS					
EMISSIONS SOURCE	POLLUTANT (POUNDS/DAY)				
	CARBON MONOXIDE	NITROGEN OXIDES	SULFUR DIOXID E	REACTIVE ORGANIC GAS	PARTICULATE S
Area Sources					
Construction Equipment[a]	359.32	650.48	60.88	72.47	45.90
Material Handling	N/A	N/A	N/A	N/A	N/A
Grading	N/A	N/A	N/A	N/A	N/A
Stockpiling	N/A	N/A	N/A	N/A	N/A
Vehicles on Unpaved Surfaces	N/A	N/A	N/A	N/A	N/A
Mobile Sources[b]					
Worker Auto	58.00	4.00	0[c]	4.00	0.13
Trucks	1,585.92	1,854.72	0[c]	376.32	268.80
DAILY TOTAL	2,003.24	2,509.20	60.88	452.79	314.83
QUARTERLY TOTAL (TONS)[d]	63.10	79.04	1.92	14.26	9.92
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75

Notes: [a] Equipment quantities for four stations. See Table 4-18.16 for itemization.
[b] Number of daily truck trips: 672; number of daily auto trips: 400.
[c] EMFAC7F does not estimate SOx emissions.
[d] Based on 63 days/quarter.

Source: Terry A. Hayes Associates, 1994.

e. Tunnel Boring

After the initial boring of the tunnel sections, the tunnel shield machine used for the boring erects precast concrete segments that form a temporary tunnel lining to provide support during the removal of materials from the tunnel. The permanent tunnel lining is then poured. Other construction work includes the installation of walkways alongside the track, cross-passages between the twin tunnels, tunnel openings to ventilation shafts and low-point drainage sumps. Following these activities, the track bed construction and other finishing work would be completed.

Bored tunnel construction activities would mostly affect areas in the vicinity of the tunnel construction shafts. The tunnel shafts are typically located adjacent to a cut-and-cover station site. Haul trucks and heavy equipment used to excavate the tunnel would be major sources of criteria pollutants.

During the tunnel boring phase, as shown in Table 4-18.21, all of the criteria pollutants except sulfur dioxide are estimated to exceed the SCAQMD threshold of significance.

TABLE 4-18.21: TUNNEL BORING DAILY EMISSIONS

EMISSIONS SOURCE	POLLUTANT (POUNDS/DAY)				
	CARBON MONOXIDE	NITROGEN OXIDES	SULFUR DIOXIDE	REACTIVE ORGANIC GAS	PARTICULATES
Area Sources					
Construction Equipment[a]	1,392.64	2,387.73	213.39	271.94	166.42
Material Handling[b]	N/A	N/A	N/A	N/A	95.40
Grading	N/A	N/A	N/A	N/A	N/A
Stockpiling	N/A	N/A	N/A	N/A	N/A
Vehicles on Unpaved Surfaces	N/A	N/A	N/A	N/A	N/A
Mobile Sources[c]					
Worker Auto	139.20	9.6	0[d]	9.6	0.32
Trucks	3,832.64	4,482.24	0[d]	909.44	649.60
DAILY TOTAL	5,364.64	6,879.57	213.39	1,190.98	911.74
QUARTERLY TOTAL (TONS)[e]	168.99	216.71	6.72	37.52	28.72
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75

Notes: [a] Equipment quantities for four stations. See Table 4-18.16 for itemization.
[b] Quantity of material: 681,304 cubic yards.
[c] Number of daily truck trips: 1,344; number of daily auto trips: 880.
[d] EMFAC7F does not estimate SOx emissions.
[e] Based on 63 days/quarter.

Source: Terry A. Hayes Associates, 1994.

f. Parking Structure

The parking structure would be located at the First/Lorena station. Piles are drilled around the area to be excavated for the foundation, which is then poured. Each successive floor together with support pillars is subsequently poured.

Emissions for the parking structure excavation and construction are shown in Table 4-18.22. Three out of the five criteria pollutants (nitrogen oxides, reactive organic gas and particulates) are expected to exceed AQMD thresholds of significance.

g. Cumulative Emissions from Overlapping Phases

As can be seen from the sequence of anticipated construction activities in Figure 4-18.5, there are likely to be periods when emissions from various construction work phases would overlap and contribute to a cumulative effect. These overlapping periods are anticipated to be:

- Utility Relocation and Site Preparation and Demolition
- Station Excavation and Tunnel Boring
- Station Construction and Parking Structure Excavation and Construction

TABLE 4-18.22: PARKING STRUCTURE EXCAVATION AND CONSTRUCTION DAILY EMISSIONS

EMISSIONS SOURCE	POLLUTANT (POUNDS/DAY)				
	CARBON MONOXIDE	NITROGEN OXIDES	SULFUR DIOXIDE	REACTIVE ORGANIC GAS	PARTICULATES
Area Sources					
Construction Equipment[a]	19.68	40.56	3.92	4.32	4.48
Material Handling[b]	N/A	N/A	N/A	N/A	57.10
Grading	N/A	N/A	N/A	N/A	N/A
Stockpiling	N/A	N/A	N/A	N/A	N/A
Vehicles on Unpaved Surfaces	N/A	N/A	N/A	N/A	529.92
Mobile Sources[c]					
Worker Auto	69.60	4.80	0/d/	4.80	0.16
Trucks	339.84	397.44	0/d/	80.64	57.60
DAILY TOTAL	429.12	442.80	3.92	89.76	649.26
QUARTERLY TOTAL (TONS)[e]	13.52	13.95	0.12	2.83	20.45
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75

Notes: [a] Equipment quantities for four stations. See Table 4-18.16 for itemization.
[b] Quantity of material: 54,363 cubic yards.
[c] Number of daily truck trips: 144; number of daily auto trips: 60.
[d] EMFAC7F does not estimate SOx emissions.
[e] Based on 63 days/quarter.

Source: Terry A. Hayes Associates, 1994.

Table 4-18.23 shows cumulative emissions for the overlapping phases. During the phases of utility relocation and site preparation/demolition, three out of the five criteria pollutants, nitrogen oxides, reactive organic gases and particulates, are expected to exceed AQMD thresholds of significance.

During the phases of station excavation and tunnel boring, all five criteria pollutants would exceed AQMD thresholds of significance.

During the phases of station construction and parking structure excavation/construction, four out of the five criteria pollutants (sulfur dioxide excluded) would exceed AQMD thresholds of significance.

TABLE 4-18.23: AIR EMISSIONS ASSOCIATED WITH SIMULTANEOUS CONSTRUCTION ACTIVITY

EMISSIONS SOURCE	POLLUTANT (POUNDS/DAY)				
	CARBON MONOXIDE	NITROGEN OXIDES	SULFUR DIOXIDE	REACTIVE ORGANIC GAS	PARTICULATES
Utility Relocation	205.14	288.76	16.31	39.19	34.66
Site Preparation/ Demolition	273.67	335.78	10.12	57.05	622.07
DAILY TOTAL	478.81	624.54	26.43	96.24	656.73
QUARTERLY TOTAL (TONS)[a]	15.08	19.67	0.83	3.03	20.69
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75
Station Excavation	3,334.70	4,461.21	212.40	682.31	1,845.13
Tunnel boring	5,364.64	6,879.57	213.39	1,190.98	911.74
DAILY TOTAL	8,699.34	11,340.78	425.79	1,873.29	2,756.87
QUARTERLY TOTAL (TONS)[a]	274.03	357.23	13.41	59.01	86.84
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75
Station Construction	2,003.24	2,509.20	60.88	452.79	314.83
Parking structure excavation/construction	429.12	442.80	3.92	89.76	649.26
DAILY TOTAL	2,432.36	2,952.00	64.80	542.55	964.09
QUARTERLY TOTAL (TONS)[a]	76.62	92.99	2.04	17.09	30.37
THRESHOLD (tons per quarter)	24.75	2.50	6.75	2.50	6.75

Note: [a] Based on 63 days/quarter.

Source: Terry A. Hayes Associates, 1994.

h. Impacts on Adjacent Land Uses

All station areas are adjacent to or in the immediate vicinity of residential areas. No schools are within 700 feet of a station site: Second Street Elementary school is approximately 800 feet south-east of the First/Boyle station; Sheridan Street Elementary school is approximately 700 feet north-west of the Brooklyn/Soto station; and Ramona High school is approximately 900 feet south-east of the First/Lorena station.

The degree to which any one property will be affected by wind dispersed pollutants is affected by wind direction, wind speed and proximity to the source. The predominant wind direction in the area is from the west and none of the stations lies due west of any school within 1,000 feet of a station. Theoretically, schools would be most affected by pollutants when the wind blows directly across a station site and toward a school. However, given the distance separating schools and station sites and the presence of intervening structures, the likelihood of adverse impacts from construction-generated pollutants, particularly dust, is considered minimal. The areas in which many of the stations are located are heavily residential; therefore wind from any direction would result in air quality impacts at nearby residences.

i. Fugitive Dust (PM_{10} Emissions)

Fugitive dust is airborne particulate matter, generally a relatively large particle size (greater than 100 micron in diameter). One constituent of fugitive dust, PM_{10} (particles less than 10 microns in size), is of particular concern in the South Coast Air Basin. PM_{10} is a criteria pollutant. Construction-related PM_{10} emissions would be generated by excavation and hauling activities at the construction sites. In addition to emissions from construction equipment, materials handling during the excavation of station areas and tunnels is likely to result in an increase of PM_{10} emissions during this phase. Vehicle movements around the construction sites would also generate emissions. Table 4-18.16 shows the impact of material handling and construction equipment for each construction phase. Dust impacts would be most severe at station sites and at tunnel access shafts. Another likely source of PM_{10} emissions is demolition of buildings. Emissions from building demolition would vary significantly from building to building, as a function of size and original construction materials. Demolition of buildings is assumed to occur at several station sites. The only exceedance of the SCAQMD PM_{10} threshold is estimated to occur in the excavation phase.

4-18.3.2 Mitigation Measures

Short term impacts of construction could be reduced by the measures indicated below. These measures should be considered as conditions of project approval and could be contained in applicable contracts between the project sponsor and contractors.

a. Mitigation Measures to Reduce Fugitive Dust Emissions

Mitigation measures that will reduce fugitive dust emissions include maintaining a fugitive dust control program consistent with the provisions of SCAQMD Rule 403 for any grading or earthwork activity. Other measures that will be applied to reduce emissions include:

- Pave or chemically treat all unpaved road surfaces.
- Pave or chemically treat unpaved parking lots and vehicle staging areas.
- Pave construction access roads as soon as access roads are created. Paving must extend from the paved roadway into the construction area at least 120 feet in length, and must be cleaned at the end of each work day.
- Establish dirt-removal programs to remove visible dirt accumulations from paved road surfaces.
- Phase grading to prevent the susceptibility of large areas to erosion over extended periods of time.
- Schedule activities to minimize the amount of exposed excavated soil during and after the end of work periods.

- Cover the road surface with material of lower silt content or soil stabilizers, whenever possible.
- Suspend grading operations during first and second stage smog alerts, and during high winds, i.e. winds greater than 25 miles per hour.
- Comply with SCAQMD's Rule 1403, which pertains to asbestos emissions from renovation or demolition.
- Water or chemically treat all active projects with multiple daily applications to assure proper dust control.
- Prohibit parking on unpaved or untreated parking lots.
- Require enclosures or chemical stabilization of open storage piles of sand, dirt or other aggregate materials.
- Require all trucks hauling dirt, sand, soil, backfill and other loose substances or building materials to be covered with tarpaulin from point of origin to point of destination.

b. Mitigation Measures to Reduce Other Construction-Related Emissions

Mitigation measures to reduce other construction-related emissions will include the following:

- Maintain construction equipment engines by keeping them tuned.
- Use clean and low-sulfur fuel for equipment when available.
- Utilize existing power sources (e.g. power poles) or clean-fuel generators rather than temporary power generators as feasible and practical.
- Use low emission on-site stationary equipment (e.g., methanol powered internal combustion engines) as feasible and practical.
- Require a phased schedule for construction activities to minimize daily emissions as much as possible.

c. Mitigation Measures to Reduce Emissions Through Traffic Flow Improvements

Mitigation measures that will reduce emissions through traffic flow improvements during construction include the following:

- Configure parking to minimize traffic interference.
- Minimize obstruction of through-traffic lanes.
- Provide a flag-person to guide traffic and ensure safety at construction sites.

- Schedule operations affecting traffic for off-peak hours.

- Develop a traffic plan to minimize traffic flow interference from construction activities. Plan may include advance public notice of routing, use of public transportation and satellite parking areas with a shuttle service.

- Schedule goods movements for off-peak hours as feasible and practical.

- Provide dedicated turn lanes as appropriate.

d. Mitigation Measures to reduce Volatile Organic Compound (VOC) Emissions

Mitigation measures that will reduce volatile organic compounds (VOC) emissions from the finishing phase include the following:

- Utilize precoated and natural materials (natural stones and wood surfaces) for finished surfaces as feasible and practical.

- Utilize water-based or low-VOC materials to coat architectural surfaces.

- Utilize low-emitting spray equipment or applicators when applying architectural coatings.

4-18.4 CONSTRUCTION NOISE

4-18.4.1 Setting

The existing ambient noise environment in the LPA noise study area is presented in Section 4-7.3.

4-18.4.2 Impacts

Construction of the proposed LPA alignment would involve short-term, localized noise impacts due to operation of construction equipment and machinery and ghe generation of truck and automobile trips. Construction noise where equipment is in use will be temporary, but will contribute to the existing noise levels predominantly generated by motor vehicle traffic. The time frame for the highest construction noise levels would be during the excavation of the station areas and construction of the station structures. Stations would be constructed in a cut-and-cover operation. Covering over (decking) the station hole with planking after excavation would contain some of the noise while constructing the station shell and lessen the time of higher noise emission. At this point decking is not proposed for the off-street stations.

Construction of the subway tunnels would be accomplished by a tunnel shield machine. Under normal circumstances, this activity results in little or no noise impact, except where excavation materials are removed and along the haul routes for dump trucks removing the spoils material. As discussed in Section 4-18.2, Construction Traffic, spoils trucks on haul routes are assumed to travel between the excavation site and the nearest freeway by the most direct route on the arterial street network and not utilize local residential streets.

The assumed haul routes in general avoid local residential streets, but may have an impact on residences along arterials such as Lorena Street (south of First Street) and Soto Street (north of Brooklyn Avenue). This would not be a significant impact under CEQA, because the ambient noise on these streets would not be substantially changed, unless haul trucks were to operate at night. Nighttime hauling along Lorena Street and Soto Street would have a significant impact under CEQA for residences along these streets. Nighttime hauling should occur only along major arterials.

The use of Whittier Avenue and Lorena Street as a haul route from the Whittier/Rowan station site would have less of an impact than the alternative route using the frontage roads along I-5 which are through residential neighborhoods with a soundwall shielding noise from the freeway. Hauling along Eastern Avenue south of Whittier Avenue may have an impact on burial ceremonies at Home of Peace Cemetery, although this route is adjacent to I-710 freeway. The noise of trucks hauling spoils along Eastern Avenue would not be inconsistent with the noise from I-710 freeway. The use of Whittier Avenue and Eastern Avenue as a haul route for the Whittier/Arizona station construction would have less of an impact than the alternative route along Arizona Avenue and Olympic Boulevard, because of the residences along Arizona Avenue. The haul route along Olympic Boulevard would also pass by the Ford Boulevard elementary school, although the existing ambient noise environment at this receptor is dominated by noise from I-710 freeway traffic and the on-ramp to northbound I-710 would be approximately 300 feet away from the school. It is not expected that the Whittier/Rowan station haul route along Whittier and Eastern avenues would have a significant impact under CEQA.

Away from station areas, there would be a much lower potential for noise impacts during construction. For the immediate station vicinity, the potential for noise impacts would be dependent on the presence and proximity of sensitive receptors.

The planned construction easement which has been adopted by MTA for its Metro Rail projects is a minimum of 15 feet around the construction site. This will result in construction equipment that may be close to residences and, under CEQA, could cause significant impacts from noise at these sites. To avoid these impacts, a minimum of 50 feet from residential structures should be maintained where possible to provide a greater buffer zone. Where a buffer zone of 50 feet from residential buildings can not be achieved and/or noisy equipment that cannot be muffled further is being used, special noise abatement may be necessary. Such special noise abatement would consist of temporary sound walls or sound curtains where wall heights would be too excessive to mitigate noise for multi-story buildings. Temporary wood walls of 10 to 12 feet in height can be erected where residences are close to noisy equipment and/or additional noise abatement is necessary. Such noise abatement has been used effectively for other Metro Red Line construction sites. In many instances, field office trailers can be used to separate noise sensitive buildings from equipment. Field office trailers also will provide some noise shielding for residences on the ground floor.

If it is necessary to acquire additional residences surrounding the construction site as a result of significant construction impacts (e.g., noise and dust) under CEQA, relocation assistance would be provided to the affected property owners and/or tenants, as discussed in Section 4-3. To a lesser extent, the same potential for impacts and need for noise and vibration control measures would apply to commercial areas.

The stations having the greatest potential for noise impact during construction are: First/Boyle, Brooklyn/Soto, First/Lorena and Whittier/Arizona. The construction of the station at Whittier/Atlantic would have a lesser potential for impact, because residences are farther away. Construction of a parking structure and bus facility at the Whittier/Atlantic station would have an impact on residences on Louis Place and South Woods Avenue, but mitigation of equipment noise, as indicated in Section 4-18.5.4, should result in a less than significant impact under CEQA. During construction of stations, truck traffic access to station sites should be restricted, where possible, to major arterials to minimize impact to local residences. Except for a professional office near the proposed Little Tokyo station site, there are no noise sensitive receptors in that area.

The greatest potential for impacts due to construction noise would occur if construction were to take place at night. These impacts would be most pronounced in residential areas (i.e., during construction of off-street stations). In Section 4-18.1.1 (Station Construction Methods), Table 4-18.4 indicates that hauling of excavation spoils material could possibly occur 24 hours per day and Table 4-18.6 indicates that excavation could possibly occur 24 hours per day, but that time restrictions may be necessary because of adjoining land use. Table 4-18.6 also indicates that some construction could occur 16 or 24 hours per day, but with possible similar time restrictions, because of adjoining land use. It is unlikely that nighttime construction can be conducted at any of the station sites except Little Tokyo without causing noise impacts, because of the close proximity of residences and the sensitivity of these receptors.

Appropriate nighttime noise levels in residential areas are quite restrictive and would be exceeded by most equipment and machinery without additional mitigation beyond the normal noise abatement provided on typical equipment. It is expected that significant noise impacts under CEQA would occur in residential areas adjacent to all station construction sites, except Little Tokyo, if construction were to occur during nighttime hours of 8:00 p.m. and 7:00 a.m. (including Sundays and legal holidays). To reduce these nighttime noise impacts to levels that are less than significant under CEQA would require compliance with the RCC construction noise criteria. Achieving these noise levels would require a combination of mitigation measures, including additional noise control applied to equipment, noise barriers around equipment and/or at the property line and possibly additional insulation of affected residential buildings (e.g., replacement of windows facing construction sites).

Concrete for constructing tunnel sections between stations is delivered by concrete trucks and pumped to the tunnel through "drop holes." Drop holes will be spaced approximately every 800 feet. Actual locations for drop holes will be determined by the tunnel contractor. Construction of each concrete tunnel segment will be done in three stages. Each stage will last approximately one week with a period of 2 to 4 months between the first and second stages and a period of 6 to 9 months between the second and third stages. Where drop holes are located in residential neighborhoods, noise impacts may occur, however these impacts will last for only one week at a time. In general, quieter residential areas should be avoided to minimize noise impacts from concreting. No significant impacts under CEQA are expected from noise associated with concreting from drop holes, unless concreting were to occur at night. No nighttime concreting should be permitted in residential areas, unless special noise abatement measures are adopted to satisfy the appropriate residential noise criterion.

Demolition of existing buildings and site preparation to make way for construction of stations will result in noise. Pavement breakers will be used to break concrete and asphalt on the surface of each site. Where pavement breakers are to be used near residences, temporary sound walls may need to be erected to reduce noise to appropriate levels at these receptors. Demolition of buildings has the potential for generating high levels of noise that would cause short term impacts in residential areas. If possible, jackhammers in building demolition in residential areas should not be used, because of the high levels of noise associated with the impacting hammer and the difficulty of erecting noise barriers that would shield multi-story buildings. Instead, equipment that breaks a buildings walls and floors (especially those made of concrete) should be used. Noise curtains, similar to those erected at other Metro Red Line station sites in residential neighborhoods, may be necessary to minimize impact during demolition and site preparation.

Table 4-18.24 indicates the receptors that would be potentially affected by construction noise. Also shown are the number and type of dominant land uses surrounding each site, which determine the appropriate construction noise criterion for noise sensitive areas.

TABLE 4-18.24: SENSITIVE RECEPTORS POTENTIALLY AFFECTED BY CONSTRUCTION NOISE

STATION	AFFECTED RECEPTORS	PREDOMINANT LAND USE	DISTANCE (FT) OF CLOSEST AFFECTED BUILDINGS TO GENERAL CONSTRUCTION*	DISTANCE (FT) OF CLOSEST AFFECTED BUILDINGS FROM CUT-AND-COVER CONSTRUCTION
Little Tokyo	• None	Industrial	N/A	N/A
First/Boyle	• 20 Residences	Commercial/ Multi-Family	15	30
Brooklyn/Soto	• 12 Residences	Commercial/ Multi-Family	15	40
First/Lorena	• 35 Residences • Evergreen Cemetery	Single-Family/ Commercial	25	25
Whittier/Rowan	• 16 Residences • 3 Churches • 1 Community Health Center • East Los Angeles Doctor's Hospital	Single-Family/ Commercial	15	80
Whittier/Arizona	• 23 Residences	Commercial/ Multi-Family	15	100
Whittier/Atlantic	• 8 Residences	Commercial/ Multi-Family	80	160

Note: *A minimum 15 foot construction easement will be maintained.

Source: Wilson, Ihrig & Associates, Inc., 1994.

Of the potentially affected receptors indicated in Table 4-18.20, most are located in multi-family residential areas, semi-residential/commercial areas or along arterials; and the appropriate construction noise criteria would be those indicated for these types of structures and areas. There are quieter single-family residential areas in the vicinity of First/Boyle (away form First Street), Brooklyn/Soto, Whittier/Rowan, Whittier/Arizona and Whittier/Atlantic (away from Whittier Boulevard) stations construction sites. Except for First/Boyle and Whittier/Atlantic sites, these single-family areas would be less affected that the multi-family residences, because they are farther away. However, at the First/Boyle and Whittier/Atlantic station sites, single-family residences would be within 75 to 80 feet of the construction sites along Bailey Street and South Woods Avenue respectively. The appropriate construction noise criteria for these receptors would be those indicated for single-family areas.

4-18.4.3 Cumulative Impacts

There are no foreseeable projects anticipated for the corridor study area that would be constructed by the project horizon year of 2010 that would substantially increase the airborne noise during construction. Consequently, there would be no cumulative noise impacts associated with construction of the proposed LPA alignment.

4-18.4.4 Mitigation

The primary means of minimizing noise and vibration impacts during construction is meeting the criteria contained in the RCC System Design Criteria. These criteria will be included in the construction documents as they are developed in the engineering phase of the project. These criteria set specific noise and vibration limits which are not to be exceeded by the contractor. Adherence to these noise and vibration limits would be enforced by the construction management team and audited by an environmental compliance consultant.

For the eastern extension of the Metro Red Line, the construction contracts will include a section on permissible noise limits. The limits are based on the type of nearby land use, type of construction activity and time of day. The contractor will conduct construction activities in such a manner that the noise levels measured, as specified in the RCC System Design Criteria, at noise sensitive buildings (e.g., residences, hospitals, schools) affected acoustically by the contractor's operations conform to the following:

- Stationary/Continuous Noise. Prevent noise intrusion from stationary sources and/or parked mobile sources which produce repetitive or long-term noise lasting more than two hours from exceeding the limits shown on Table 4-18.25.

TABLE 4-18.25: LIMITS FOR CONTINUOUS CONSTRUCTION NOISE

AFFECTED STRUCTURE OR AREA		MAXIMUM ALLOWABLE CONTINUOUS NOISE LEVEL, dBA L_{max}	
		DAYTIME	NIGHTTIME
Residential	Single-family residence	60	50
	Along an arterial or in multi-family residential areas, including hospitals	65	55
	In semi-residential/commercial areas, including hotels	70	60
		AT ALL TIMES	
Commercial	In semi-residential/commercial areas, including schools	70	
	In commercial areas with no nighttime residency	75	
Industrial	All locations	80	

Source: RCC Metro Red Line System Design Criteria & Standards, July 1990

- Mobile/Intermittent Noise. Prevent noise from non-stationary mobile equipment operated by a driver, or from a source of intermittent, non-reoccurring on a long-term basis, non-scheduled, non-repetitive, short-term noises not lasting more than two hours from exceeding the limits shown on Table 4-18.26.

- Conduct periodic measurements of sound levels at the nearest receptors as mentioned above, and maintain records of the measurements for inspection by the MTA or its designee.

TABLE 4-18.26: LIMITS FOR INTERMITTENT CONSTRUCTION NOISE

AFFECTED STRUCTURE OR AREA		MAXIMUM ALLOWABLE INTERMITTENT NOISE LEVEL, dBA L_{max} DAYTIME	NIGHTTIME
Residential	Single-family residence	75	60
	Along an arterial or in multi-family residential areas, including hospitals	80	65
	In semi-residential/commercial areas, including hotels	85	70
		AT ALL TIMES	
Commercial	In semi-residential/commercial areas, including schools	85	
	In commercial areas with no nighttime residency	85	
Industrial	All locations	90	

Source: RCC Metro Red Line System Design Criteria & Standards, July 1990

Special Zone or Special Construction Sites may be designated as follows:

- In areas outside of construction limits, which have been determined to be outside of noise sensitive areas but for which the contractor has obtained designation as a special zone or special construction site from the agency having jurisdiction, the noise limitations for buildings in industrial areas shall apply.

- In zones designated by the local agency having jurisdiction as a special zone or special premise or special facilities, such as hospital zones or areas with libraries, schools, etc., the noise level and working time restrictions imposed by the agency shall apply. These zones and work hour restrictions shall be obtained by the contractor from the local agency.

The contractor should only use construction equipment meeting noise emission limits listed on Table 4-18.27, as measured according to the RCC System Design Criteria and shall:

- Conform to SAE J88 and J366.

- Maintain a file of certificates that equipment meets the criteria. These certificates will be inspected by MTA or its designee.

In no cases shall the contractor expose the public to construction noise levels exceeding 90 dBA (slow), or to impulsive noise levels with a peak sound pressure level exceeding 140 dB as measured on an impulsive sound level meter or 125 dBC maximum transient level as measured on a general purpose sound level meter on "fast" meter response.

Where more than one noise limit is applicable, the more restrictive requirement for determining compliance shall be used.

TABLE 4-18.27: NOISE EMISSION LIMITS ON CONSTRUCTION NOISE

TYPE OF EQUIPMENT	MAXIMUM NOISE LIMIT (dBA) L_{max}	
	EQUIPMENT MANUFACTURED BEFORE JAN. 1, 1983	EQUIPMENT MANUFACTURED ON OR AFTER JAN. 1, 1983
Equipment other than highway trucks; including hand tools and heavy equipment	90	85
Highway trucks in any operating mode or location	83	80

Note: California Motor Vehicle Law has been relaxed. Highway trucks manufactured on or after January 1, 1988 must meet 80 dBA maximum noise level. For vehicles of less than 10,000 pounds gross vehicle weight manufactured before January 1, 1983, refer to the Califomia Vehicle Code for allowed noise levels.

Source: RCC System Design Criteria, July 1990

The contractor should use drilled piles instead of using impact pile drivers. Past experience with Metro construction indicates that piles can be placed using drilled holes without the need for impact pile drivers. Therefore, pile drivers will not be used and the method of installing piles will be to use augured holes.

Other site-specific mitigation measures within construction limits could include, but are not limited to:

- Limiting the hours of construction activity to less noise sensitive hours.
- Limiting removal of spoils material from station excavation to less noise-sensitive hours.
- Requiring a careful maintenance and lubrication program for heavy equipment.
- Erecting temporary noise barriers where specification noise limits cannot be met with available construction equipment. Wood walls can be erected where wall heights are 12 feet or less. Noise curtains or sound batting can be used where wall heights would be excessive.
- Use of welding instead of riveting.
- Mixing concrete off-site instead of on-site.
- Employing prefabricated structures instead of assembling them on-site.
- Using of construction equipment modified to lessen noise emissions, such as:
    - electric-powered equipment instead of diesel equipment,
    - hydraulic tools instead of pneumatic tools,
    - electric instead of air- or gasoline-driven saws,

- effective intake and exhaust mufflers on internal combustion engines and compressors, and
- hoppers, storage bins and chutes lined or covered with sound-deadening material.

- Maximizing the physical separation, as far as practicable, between noise generators and noise receptors. Such separation includes but is not limited to the following measures:
  - Providing enclosures for stationary items of equipment and barriers around particularly noisy areas on the site or around the entire site,
  - using shields, impervious fences or other physical sound barriers to inhibit transmission of noise, and
  - locating stationary equipment to minimize noise impact on the community, subject to approval of the MTA or its designee.
- Turning off idling equipment.
- Minimizing noise-intrusive impacts during the most noise-sensitive hours by:
  - planning noisier operations during times of highest ambient noise levels, and
  - keeping noise levels relatively uniform; avoiding peaks and impulsive noises.

Other measures for outside construction limits could include, but are not limited to:

- The RCC, in coordination with the applicable City (Los Angeles Department of Transporation) or County (Los Angeles County Deparmtne of Public Works) transporation agency will develop preferred haul route plans for each construction package which entails removal of excavated material. The haul route plans shall prohibit the use of local residential streets. The haul route plans shall also avoid utilizing streets on which schools are located. In the case of a potential haul route past a school, such as Atlantic Boulevard north of the Atlantic/Whittier station, where there are no nearby alternative arterial streets which provide access to east-west freeways, trucks shall be prohibited from hauling past the schools during normal school hours.
- Conduct truck loading, unloading and hauling operations so that noise is kept to a minimum.
- Routing construction equipment and vehicles carrying soil, concrete or other materials over streets and routes that will cause the least disturbance to residents and other sensitive receptors in the vicinity of the construction work.

- Insulation of residences close to construction site. Windows facing the construction site could be replaced with new windows that provide more sound attenuation. Supplementary ventilation may need to be provided, because windows would need to be kept closed to achieve interior noise levels appropriate for sleeping rooms. Additional insulation in walls might also be required.

4-18.5 CONSTRUCTION VIBRATION

4-18.5.1 Setting

The existing ambient vibration environment in the LPA study area is presented in Section 4-8.3.

4-18.5.2 Impacts

There would be a very short-term groundborne vibration and/or noise impact lasting one or two days while the tunneling machine passed nearby residential buildings or other vibration sensitive receptors. The potential affected receptors are indicated in Table 4-18.24. There are fewer potentially affected receptors due to construction vibration than due to construction noise, because vibration effects are attenuated in a shorter distance. Where residences and other sensitive receptors are close to the open-cut and cut-and-cover construction for the station, special precautions may be necessary to limit the vibration to appropriate levels.

TABLE 4-18.28: SENSITIVE RECEPTORS POTENTIALLY AFFECTED BY CONSTRUCTION VIBRATION

STATION	AFFECTED RECEPTORS	PREDOMINANT LAND USE	DISTANCE (FT) OF CLOSEST AFFECTED BUILDINGS TO GENERAL CONSTRUCTION	DISTANCE (FT) OF CLOSEST BUILDINGS FROM CUT-AND-COVER CONSTRUCTION
Little Tokyo	• None	Industrial	N/A	N/A
First/Boyle	• 2 Residences	Commercial/ Multi-Family	15	30
Brooklyn/Soto	• 1 Residence	Commercial/ Multi-Family	15	40
First/Lorena	• 10 Residences	Single-Family Commercial	25	25
Whittier/Rowan	• 1 Community Health Center • 2 Churches • East Los Angeles Doctor's Hospital	Single-Family Commercial	15	80
Whittier/Arizona	• None	Commercial/ Multi-Family	15	100
Whittier/Atlantic	• None	Commercial/ Multi-Family	80	160
Note: A minimum 15-foot construction easement will be maintained.				

Source: Wilson, Ihrig & Associates, Inc., 1994.

At First/Boyle, Brooklyn/Soto and First/Lorena station, residences are close enough (i.e., less than 50 feet away) from the excavation and construction of the station to possibly require other than typical construction procedures to achieve appropriate vibration levels. At the Whittier/Rowan station site, the East Los Angeles Doctor's Hospital would be approximately 150 feet from the cut and cover construction site. It is not anticipated that typical activities would result in significant vibration impacts under CEQA for a typical hospital at this distance, but prior to construction, the Hospital's equipment and procedures should be surveyed to ensure that construction vibration at the site would not affect the Hospital's operation.

Under CEQA, the tunneling operation would not result in significant groundborne noise or vibration impact, because of its short duration. However, there have been situations where operation of subsurface trains removing excavated materials have resulted in longer-term groundborne noise and vibration impacts in residential areas, lasting the duration of the tunneling operation. This situation is unusual. If it did occur, mitigation measures could be implemented on a case-by-case basis, e.g., resilient mats or floating slab trackbeds could be used underneath track supports to lessen vibration. When the shield tunneling machine is in the vicinity of White Memorial Hospital and East Los Angeles Doctor's Hospital, precautions should be taken to ensure tunneling vibration does not adversely affect the operation of either facility.

4-18.5.3 Cumulative Impacts

There are no foreseeable projects anticipated for the corridor study area that would be constructed by the project horizon year of 2010 that would create perceptible groundborne noise and/or vibration. Consequently, there would be no cumulative impacts associated with the proposed LPA alignment.

4-18.5.4 Mitigation

The measures applied to limit noise levels, as indicated above, will also limit vibration levels. In addition, the contractor shall conduct construction activities so that vibration levels at a distance of 200 feet from the construction limits or at the nearest affected building (whichever is closer) do not exceed root-mean-square (rms) unweighted vibration velocity levels in any direction over the frequency range of 1 to 100 Hz, as shown in Table 4-18.29.

TABLE 4-18.29: VIBRATION LIMITS

VIBRATION TYPE AND PERMISSIBLE AGGREGATE DURATION	LIMIT
Sustained (1 hour/day)	0.01 inches/second (80 dB re 10 inches/second)
Transient (1 hour/day)	0.03 inches/second (90 dB re 10 inches/second)
Transient (10 minutes/day)	0.10 inches/second (100 dB re 10 inches/second)

Source: RCC System Design Criteria, July 1990

In zones designated by the local agency having jurisdiction as special zone or special premise or special facilities, the vibration level and working time restrictions imposed by the agency shall apply. These zones and work hour restrictions shall be obtained by the contractor from the local agency.

4-18.6 UTILITIES

4-18.6.1 Setting

Existing underground utilities along the Locally Preferred Alternative (LPA) are expected to be in conflict with the LPA alignment at various locations. While gravity lines such as sanitary sewers and storm drains will quite often control the elevation of the top of station and tunnel structures, other utilities such as telephone duct banks, underground electrical cables, gas lines and water lines close to the surface can be relocated or left in place by temporary support during construction. Planning and continued coordination with utility providers during the final design stage would be necessary to minimize interruption in utility service to customers. Among other things, this would include submitting of a set of detailed plans to utility providers for review and comment.

4-18.6.2 Impacts

Cut and cover construction at all station sites would require temporarily supporting and/or rerouting of the smaller utility lines. Utilities being supported during construction would be hung from a deck beam constructed prior to the construction of the station. Larger (36-inch or larger) gravity flow lines such as sanitary sewer and storm sewer are problematic and may have to be supported by an auxiliary set of beams spanning between the sheeting system. Utilities that can be supported by the deck beam or relocated would be done in a space (8-foot minimum) between the top of structure and the ground surface.

Utilities present at the proposed open-cut station sites may or may not be problematic and will have to be addressed during final design and construction. These stations are as follows.

a. Little Tokyo

A 12-foot storm drain that traverses in a easterly direction through the Metro Rail Yard to the Los Angeles River has been avoided by shifting the station to the south. Other utilities that will be relocated or supported during construction and traverse through the proposed station area parallel to Santa Fe Avenue are 8, 12 and 30-inch gas lines; a 4-inch underground oil line; overhead electrical and telephone lines; and a 6-inch VCP sanitary sewer line.

b. First/Boyle

The shafts of the First/Boyle station were shifted in order to avoid a large telephone duct bank south and parallel to First Street. Other utilities that will be relocated or supported during construction are a 14-inch storm drain, 2-inch to 6-inch gas lines, 4-inch to 10-inch water lines, an 8-inch and 10-inch sanitary sewer lines and several telephone duct banks.

c. Brooklyn/Soto

There are several utilities that would traverse the proposed Brooklyn/Soto station location at Soto Street and Mathews Street. These utilities can be relocated or supported during construction. Utilities include 4-inch water lines, 8-inch sanitary sewer lines, a storm drain line, a 2-inch gas line and telephone duct banks.

d. First/Lorena

With its long length (950 feet) centered in First Street, the First/Lorena station has several utility lines that cross and traverse parallel to its location. The problematic utilities include a crossing 72-inch R.C.P. storm drain and a 10-inch VCP sanitary sewer. These utilities will be avoided by constructing a notch in the top slab of the station. Several other utilities to be relocated or supported during construction include 6-inch to 12-inch water lines, 2-inch to 3-inch gas lines, several sanitary sewer service lines, telephone duct banks and electrical conduit.

e. Whittier/Rowan

The Whittier/Rowan station area consists of several utilities that will have to be relocated or supported during construction. The largest lines in the vicinity are a 42-inch RCP storm drain oriented parallel to the proposed station and an 18-inch RCP storm drain that crosses the station location at Eastman Avenue. Both gravity flow lines have invert elevations above the top of the station slab. Other utilities that will be relocated or supported during construction are 6-inch and 12-inch water lines, 8-inch sanitary sewer lines, 2-inch to 10-inch gas lines, telephone duct banks and electrical conduit.

f. Whittier/Arizona

The Whittier/Arizona station is located off-street (north of Whittier Boulevard) and parallel to an alley containing several utilities that will need to be relocated or supported during construction. The largest utilities are a 66-inch RCP storm drain under Arizona Avenue. However, the invert of this storm drain is above the tunnel line rather than the station. Utilities that will be relocated or supported during construction are 2-inch to 6-inch gas lines, 6-inch and 8-inch water lines, 8-inch and 15-inch sanitary sewer lines, 18-inch and 27-inch storm drain lines, telephone duct banks and electrical conduit.

g. Whittier/Atlantic

The Whittier/Atlantic station site extends from Vancouver Avenue to Amalia Avenue and is located in the center of Whittier Boulevard. The larger utilities in this area are a 60-inch RCP storm drain under Woods Avenue that traverses the station site and a 24-inch storm drain located under Whittier Boulevard. Both of these storm drain lines have inverts above the top of the station slab and can be supported during construction activities. Other utilities to be relocated or supported during construction are 6-inch and 12-inch gas lines; 6-inch and 8-inch water lines; 8-, 15- and 18-inch sanitary sewer lines, a smaller 18-inch storm drain line, telephone duct banks and electrical conduit.

4-18.6.3 Cumulative Utility Impacts

The City of Los Angeles Wastewater Program staff and management are studying alternatives to the East Central Interceptor sewer that are not expected to be in conflict with the LPA alignment. However, continued coordination with the City of Los Angeles Wastewater Program Management Division will be necessary in order to prevent and resolve conflicts between the East Central Interceptor Sewer (ECIS) and the LPA.

4-18.6.4 Mitigation

Careful and periodic coordination with all utility providers will continue during the final design and construction stages to identify any potential conflicts and to formulate strategies to overcome potential problems. Disruptions to utility service will be restricted to short-term localized disruptions. Careful scheduling of these disruptions and prior notification of adjacent properties that will be affected by temporary service disruptions will mitigate the construction impact.

4-18.7 BUSINESS DISRUPTION

The purpose of this section is to review the possible impacts that construction of the Locally Preferred Alternative (LPA) would have on commercial (i.e., retail and office) establishments, particularly those near or adjacent to construction sites. Construction impacts on businesses would not occur under the No-Build Alternative.

4-18.7.1 Setting

Commercial activity within the East Los Angeles area is generally comprised of commercial strips along major east-west streets. The types of commercial activities range from small local stores to small clusters of neighborhood retail stores and community-oriented commercial centers.

4-18.7.2 Impacts

During adoption of the LPA, station location and design were selected in an effort to minimize potential impacts to residential properties and local businesses. A mix of on- and off-street stations was therefore adopted for the LPA to best meet these objectives. Criteria used to identify station locations and entrances are discussed in Section 2-3.2, Station Descriptions.

Construction of station boxes and crossovers for the LPA would be performed using a cut-and-cover or open-cut technique, as discussed at the beginning of Section 4-18. As reviewed in other portions of this section, construction activities for the LPA would produce physical impacts within the immediate station areas. As reviewed in the preceding sections, potential impacts include: increased noise, vibration and dust; modified vehicular and pedestrian traffic patterns; accidental utility disruptions; and building settlement. Typically, a minimum width of 60 feet is required for station box construction, and many of the streets in East Los Angeles are narrow. For under street stations (i.e., Little Tokyo, First/Boyle, First/Lorena, Whittier/Rowan and Whittier/Atlantic), adjacent sidewalk space would need to be taken temporarily for station construction, thereby reducing access to adjacent businesses. Business impacts in these station construction areas would include reduced visibility of commercial and retail signs and of businesses themselves. Other construction impacts are discussed in Sections: 4-18.1 Construction Methods; 4-18.2 Traffic; 4-18.3 Air Quality; 4-18.4 Noise; 4-18.5 Vibration; and 4-18.6 Utilities.

These construction impacts may in turn produce economic impacts to commercial establishments. Businesses most likely to be affected include those dependent on pedestrian traffic and impulse buying (e.g., fast food restaurants, clothing stores, record stores, thrift shops, etc.). Establishments which serve other businesses, provide unusual services or sell unique or expensive items (e.g., offices, jewelry stores, antique shops, travel agencies, etc.) are less likely to be affected. Businesses that are sensitive to noise/vibration (e.g., motels, hotels, theaters, etc.) may also be affected by construction activities.

Although it is difficult to fully and precisely define the economic impacts on commercial establishments as a result of construction of the LPA, such impacts would be related to station locations and whether or not the station would be located on- or off-street. Potential adverse impacts to businesses resulting from construction of the LPA are described below.

a. Little Tokyo

The Little Tokyo station would be constructed within Santa Fe Avenue, extending from Second Street to a point approximately 240 feet south of Third Street. Commercial activity within the immediate station area is primarily comprised of warehouses and professional services and currently includes the Los Angeles County Metropolitan Transportation Authority (MTA) Rail Yard to the east. An architectural firm, professional services, artists lofts and vacant warehouse space are currently located adjacent and to the west of the station construction site.

Construction of the Little Tokyo station would be performed using an open-cut configuration. A construction staging area would be located immediately to the southwest of the station within a large vacant parcel of land. There are currently two proposed station entrance sites under consideration. Site one is proposed for the southwest corner of Third Street and Santa Fe Avenue; Site two is within the Metro Rail yard parking area adjacent to the main yard entrance and the maintenance-of-way building.

During the construction period (expected to last from three to five years), access along Santa Fe Avenue in the vicinity of the station site would be closed. Proposed street closures would include: an estimated 4-year closure of Santa Fe Avenue between the south side of Second Street and approximately 75 feet south of the station. A temporary detour would be provided. Third Street/Santa Fe Avenue would also be closed during this period with a turnaround provided. See Section 4-18.2 for a discussion of construction traffic impacts.

Under CEQA, businesses located within the immediate station area would not be significantly affected during the construction period. However, seven off-street parking spaces fronting an architectural firm would be eliminated for three to five years as would access to a gated alley located to the south of the building. Parking access to the gated alley could be reached by Second Street. (See Section 3-3 for a discussion of construction parking impacts.) Noise generated by construction may periodically inconvenience offices located within the architectural firm's building. In addition, access to loading docks fronting Santa Fe Avenue at the vacant toy building located on the northwest corner of Santa Fe Avenue and Third Street would be impaired; however, two loading docks are located within a gated alley on the west side of the building and are accessible from Third Street.

b. First/Boyle

The First/Boyle station area currently contains a mix of residential and neighborhood-oriented commercial uses which include: restaurants, laundry facilities, dental offices, beauty salons, meat markets, professional services, a sporting goods store and hardware store. (White Memorial Medical Center is also located in this station area. For a discussion of impacts to this facility, please refer to Section 4-16). The proposed station would span the First/Boyle intersection diagonally, terminating at Pennsylvania Avenue. The station entrance would be located on the northwest corner of Pleasant Avenue and Bailey Street. In order to minimize traffic disruptions, the station box would be decked where it crosses First and Boyle streets . Construction activities would require acquisition of a number of commercial and residential properties in order to provide a staging area for equipment and materials storage. Acquisitions are discussed in detail in Section 4-3.

Commercial establishments located within the immediate station area may be affected by reduced access and visibility resulting from construction activities. The western entrance to a laundry facility located on Boyle Avenue would be temporarily eliminated during decking of the station box, anticipated to last three months. Alternate access to the establishment is, however, available to the east through an adjacent alley leading to First Street. In addition, approximately four off-street parking spaces from the laundry would be temporarily eliminated during decking of the street and street restoration, estimated at three months each. Construction activities would also require closure of Pleasant Avenue from Boyle Avenue to First Street for three to five years, effectively eliminating direct vehicular access to a restaurant (vacant), clothing boutique and meat market (vacant); however, pedestrian access would be maintained at all times. Construction activities may reduce visibility to these businesses. Commercial establishments located to the southeast of the station construction site along First Street may also be temporarily affected by elimination of a portion of the on-street parking within the station area. (See Section 3-3, Parking.)

The City of Los Angeles Cultural Affairs Department is currently considering plans for construction of a Mariachi Plaza located between Boyle Avenue, First Street and Pleasant Avenue in the vicinity of the proposed First/Boyle station. Preliminary designs call for the closing of Pleasant Avenue at Boyle Avenue and the placement of off-street parking at the east end of Pleasant Avenue near First Street. Funding for the project has been earmarked, and construction is scheduled to begin in 1995. Should the project be implemented at a later date, construction of the First/Boyle station would require temporary elimination of vehicular access and on-street parking along Pleasant Avenue from Boyle Avenue to First Street.

c. Brooklyn/Soto

The Brooklyn/Soto area is a community shopping area characterized by high pedestrian and auto volumes. Commercial activity within the immediate station area is comprised of clothing stores, restaurants, neighborhood markets and professional services. Because of the relatively high number of retail businesses fronting Brooklyn Avenue and the narrow street right-of-way, the Brooklyn/Soto station was designed off-street in order to minimize impacts to businesses. Construction of the proposed station would be located approximately 200 feet south of and parallel to Brooklyn Avenue and extend from Soto Street to the alley west of Fickett Street. An open-cut configuration is proposed. A construction staging area would be located immediately south of the station, extending from Soto Street on the west to the alley east of Mathews Street.

Since the proposed station would be located off-street, away from the commercial activities along Brooklyn Avenue, many of the potential construction related impacts upon businesses would be reduced. A primary benefit of off-street station construction would be reduced impacts to vehicular and pedestrian traffic, since construction activities would be out of the street right-of-way. Businesses located along Brooklyn Avenue are not expected to be significantly affected during the construction period. However, a tailor shop located south of Brooklyn Avenue along Mathews Street may be temporarily inconvenienced by construction activities. Equipment employed during station construction would typically include heavy duty/high volume machinery. Because station construction would be performed approximately 20 feet from the tailor shop, construction activities/equipment may produce low-level vibration and increased noise and dust (see Sections 4-18.4, Air Quality and 4-18.5, Noise). In addition, elimination of vehicular access along Mathews Street from Brooklyn Avenue to 250 feet south of Brooklyn Avenue for the duration of the construction period (three to five years) may adversely affect the tailor shop, although pedestrian access would be maintained at all times.

d. First/Lorena

Commercial activity within the First/Lorena station area is primarily located to the northeast in a two-story shopping complex and to the south along First Street from Lorena Street to Indiana Street. Businesses are primarily community-oriented and include: professional services, neighborhood markets, restaurants, a lumberyard, auto sales, a meat market (vacant) and a shopping complex.

The First/Lorena station would be constructed within First Street utilizing a cut-and-cover construction method, extending from Concord Street to Cheesebroughs Lane. The station entrance would be located on the northeast corner of First Street and Lorena Street. A construction staging area would be located on land to be used for the station entrance, involving the acquisition of a lumberyard and restaurant. Construction activities would also require closure of the alley located between Lorena Street and Cheesebroughs Lane, adjacent to the shopping complex for the duration of the construction period (three to five years). Temporary lane closure along Cheesebroughs Lane would also be necessary.

Under CEQA, significant impacts to businesses are not anticipated during the construction period, although decking of the station area (anticipated to last three months) may produce temporary adverse access and visibility impacts to the auto sales and adjacent neighborhood market located on the south side of First Street (between Lorena Street and Indiana Street). Station decking would also affect access to a restaurant along the south side of First Street; however, access along Lorena Street would be maintained. Temporary elimination of on-street parking along First Street and increased noise in the vicinity of the station area may also affect an office that provides professional services; these impacts however, are not expected to be significant under CEQA. The office is set back from the street and currently has no off-street parking. Patrons therefore must either park along First Street or in the adjacent neighborhood along Concord Street (approximately 200 feet to the west). On-street parking along First Street would be temporarily eliminated for three to five months while decking of the station area is performed. The shopping complex would not be adversely affected during station construction. The establishment contains off-street parking, and access from Lorena Street and from Cheesebroughs Lane from First Street would be maintained throughout the construction period.

e. Whittier/Rowan

Auto-related service shops and neighborhood-oriented commercial comprise the majority of businesses located within the Whittier/Rowan immediate station area. Construction of the Whittier/Rowan station would be performed within Whittier Boulevard employing a cut-and-cover construction method. The station would extend from Townsend Avenue to Gage Avenue with the station entrance located on the southeast corner of Whittier Boulevard and Rowan Avenue. A construction staging area and materials storage yard would be located on the south side of Whittier Boulevard extending approximately 150 feet south of the boulevard for the entire station length (approximately 940 feet) and would require the acquisition of a number of commercial establishments fronting Whittier Boulevard. For a more detailed discussion of acquisitions, please refer to Section 4-3. (The East Los Angeles Doctors Hospital is also located within this station area. For a discussion of impacts to this facility, please refer to Section 4-16.)

During station construction, businesses located along Whittier Boulevard within the immediate station area may be temporarily affected by increased noise, dust and elimination of on-street parking. Construction activities may also reduce visibility to an auto body shop, auto service shop, fast food restaurant, auto parts store, gas station, tire shop, ironworks, plumbing services and neighborhood market. Both pedestrian and vehicular access along Whittier Boulevard would be maintained throughout the construction period. However, vehicular access south of Eastman Avenue/Whittier Boulevard would be eliminated for the duration of the construction period (three to five years). Elimination of auto access at Eastman Avenue/Whittier Boulevard is not anticipated to affect the tire store located on the northeast corner; the facility currently has access only from Eastman Avenue.

The fast food restaurant located on the northeast corner of Rowan Avenue and Whittier Boulevard may be adversely affected by increased noise and dust, which may cause patrons to seek other establishments in the area. Conversely, given the large number of workers that would be employed during station construction, these impacts may be reduced as workers frequent the site.

f. Whittier/Arizona

The Whittier/Arizona station is located within the heart of the Whittier Boulevard commercial strip and is a major shopping destination for residents of the East Los Angeles area. Professional services as well as retail shops comprise the majority of commercial activity within the area. In order to lessen impacts to businesses along Whittier Boulevard, the station would be located off-street approximately 200 feet north of Whittier Boulevard and would extend from McBride Avenue to Arizona Boulevard. An open-cut excavation method would be employed during the construction period, which is expected to last three to five years. The station entrance would be located between McDonnell Avenue and Arizona Boulevard. Construction staging and materials storage would occur directly north of the station and would require acquisition of a furniture warehouse. Acquisition of the warehouse may affect the operation of the associated furniture store if adequate alternate locations within the area are unavailable. Relocation assistance would be provided by MTA and is discussed in detail in Section 4-3.

Since the proposed station would be located off-street, away from commercial frontage along Whittier Boulevard, many of the construction-related impacts on businesses would be reduced. A primary benefit of off-street construction would be reduced impacts to vehicular and pedestrian traffic, since construction activities would be out of the street right-of-way. Potential impacts to businesses within the immediate station area would largely be limited to elimination of on-street parking along McBride Avenue and McDonnell Avenue for four years. However, station construction would require closure of the alley located north of Whittier Boulevard between McBride Avenue and Arizona Boulevard used by two furniture stores for deliveries, thus eliminating access to loading/unloading facilities for these businesses.

g. Whittier/Atlantic

The Whittier/Atlantic station marks the eastern terminus of both the LPA and Whittier Boulevard commercial strip. Of the seven LPA stations, this station exhibits the largest modular station design and contains the largest concentration of businesses fronting on an LPA station and crossover. Businesses located within the immediate station area include retail, professional services and medical related offices. Of these establishments, small retail shops comprise the largest group of businesses, many of which depend upon foot traffic and visibility from the street; therefore the likelihood for adverse impacts during construction to businesses is greater.

Construction of the Whittier/Atlantic station would be performed within Whittier Boulevard using a cut-and-cover construction technique extending from Vancouver Avenue to Amalia Avenue and would last approximately three to five years. In order to accommodate construction activities and proposed terminal station facilities, two construction staging and property acquisition locations are proposed: site one would require acquisition of properties located along Whittier Boulevard from Woods Avenue to Atlantic Boulevard and approximately 350 feet south; site two would require acquisition of a mini-mall located on the northeast corner of Whittier Boulevard and Atlantic Boulevard as well as an adjacent bank parking structure and building. In addition, acquisition of a bank located on Oxford Drive and Whittier Boulevard (northwest corner) is proposed. Acquisitions are discussed in detail in Section 4-3. Closure of Oakford Drive between Whittier Boulevard and the alley north of Whittier Boulevard would be required for the duration of the construction period.

Businesses potentially affected by the Whittier/Atlantic station construction would be primarily located to the north along Whittier Boulevard from Vancouver Avenue to Atlantic Boulevard and to the south between Vancouver Avenue and Woods Avenue and between Atlantic Boulevard and Amalia Avenue.

From Vancouver Avenue to Woods Avenue, commercial activity is currently comprised of a travel agency, two neighborhood markets and a music store. the travel agency is not expected to be substantially affected by construction activities. Professional services such as travel agencies often conduct business over the phone and generally rely less on foot traffic for sales, therefore reducing the likelihood of significant impacts. However, retail shops such as music stores and neighborhood markets often rely on impulse buying for sales; therefore, reduced visibility and/or accessibility may affect sales at these establishments.

Between Woods Avenue and Atlantic Boulevard businesses are primarily concentrated within a mini-mall and to the east. Current businesses include: a bakery, beauty salon, dental office, restaurant, barbershop, optometrist office, cocktail bar, clothing boutique and bank. A mix of both professional services and retail shops is located within the mini-mall, which is not expected to be significantly affected during construction. The mini-mall is set back from Whittier Boulevard, with about half of the businesses facing west towards Woods Avenue, away from construction activities. Businesses oriented towards Whittier Boulevard would be located some 80 feet away from station construction. The mini-mall also contains off-street parking and is accessible from both Whittier Boulevard and Woods Avenue. A large sign displaying business names marks the site and is clearly visible from Whittier Boulevard.

Adjacent to the mini-mall are a cocktail bar, clothing boutique and bank. Reduced visibility and impaired pedestrian access may affect both the cocktail bar and clothing boutique during station construction. In addition, dust generated by construction equipment may also inconvenience the clothing boutique. Construction is not expected to substantially affect the bank. The bank is set back from the station site with pedestrian and vehicular access available from both Whittier and Atlantic Boulevards. Construction of the station would temporarily interfere with the normal flow of traffic along Whittier Boulevard. During soldier pile installation (estimated at less than a week in front of the bank) and station decking (estimated at 3 months), access to the bank's Whittier Boulevard entrance would be impaired.

The south side of Whittier Boulevard from Vancouver Avenue to Woods Avenue is currently comprised of a pawn shop, dry cleaners, restaurant, pool hall, palm reader and retail stores. Typically, businesses of this nature depend on foot traffic and visibility from the street. Construction of the Whittier/Atlantic station would occur directly adjacent to these establishments and would reduce both visibility from the street and pedestrian access, which may affect sales. Without mitigation, impacts to these businesses are considered potentially significant under CEQA. However, businesses with rear entrances (e.g., the pool hall and restaurant) should be less affected by reduced pedestrian access resulting from construction. In addition, the dry cleaners is not expected to be significantly affected by construction of the station. A fire zone (red curb) currently fronts the establishment; patrons therefore must either park east or west of the site along Whittier Boulevard or seek parking within the adjacent neighborhood along Vancouver Avenue.

From Atlantic Boulevard to Amalia Avenue along the south side of Whittier Boulevard a gas station and legal offices currently comprise the commercial activity adjacent to the station site. Construction activities are not expected to substantially affect the gas station. However, during construction of the station, access to the gas station along Whittier Boulevard may be temporarily impaired during installation of soldier piles and station decking; alternate access along Atlantic Boulevard would be available. The legal offices are not expected to be substantially affected by construction of the station, although noise generated by construction activities may periodically inconvenience the establishment. Legal firms often conduct business either by appointment or phone and depend less on walk-ins from off the street. Accordingly, the potential for significant impacts would be low. Pedestrian access to the offices would be maintained at all times for the duration of the construction period.

4-18.7.3 Cumulative Impacts

The cumulative effects on businesses located adjacent to construction areas would depend largely upon site-specific conditions and the strength of the business at the outset of construction. Construction activity, while temporary, could permanently affect businesses that currently are experiencing only a marginal level of business. For those marginal businesses, especially small retail operations which rely upon pedestrian traffic and impulse shoppers, prolonged construction could significantly affect their operation and viability.

Two road-widening projects currently are scheduled in the vicinity of the LPA and station construction areas: Caltrans' road-widening projects on First Street, between Indiana Street and Rowan Avenue and on Whittier Boulevard, between Atlantic Boulevard and Garfield Avenue. However, there would be no cumulative impact upon businesses in these areas because construction of the LPA is not expected to begin until after these projects are completed.

The Mariachi Plaza and First/Boyle station are both pending construction. Coordination will need to occur with regard to the timing, design and construction of these two project.

4-18.7.4 <u>Mitigation</u>

Prior to and during construction of LPA stations, the Rail Construction Corporation (RCC) staff will contact and interview individual businesses potentially affected by construction activities. Interviews with commercial establishments will provide knowledge and understanding of how these businesses carry out their work, and will identify business usage, delivery and shipping patterns and critical times of the day and year for business activities. Data gathered from these interviews will also assist the RCC as it works with the Los Angeles Department of Transportation and the Los Angeles Department of Public Works to develop the Worksite Site Traffic Control plans. Among other elements, these plans will identify alternate access routes to maintain critical business activities.

Taking into consideration the potentially adverse impacts on businesses that construction activities may have, both standard and site specific mitigation measures will be implemented/ developed to deal with these impacts and are discussed below. Additional mitigation measures that would reduce impacts on the local businesses are provided in both Chapters 3 and 4 of this Final EIS/EIR.

- **Community Input**

The MTA/RCC will work with community residents, elected officials, local businesses and community organizations to tailor the mitigation program to best meet community needs. The MTA/RCC will continue to work with the Eastern Extension Review Advisory Committee (RAC) through all project phases. This work includes reporting on project status and facilitation of communication between the RAC and the MTA/RCC.

a. Standard Mitigation

As part of the construction mitigation process, MTA/RCC will provide the below listed standard and site-specific measures to reduce construction impacts. Where needed, these measures will be tailored to meet these specific construction site needs. These measures will be implemented by a combination of construction contract drawings, specifications and public affairs programs.

MTA will inform the public of its progress in implementing the measures selected through a quarterly program of auditing, monitoring and reporting. A quarterly status report will be made available to the public.

MTA/RCC staff will be assigned to work directly with the public to provide project information and to resolve construction-related problems.

- **Construction Site and Field Offices**

During construction of the LPA, MTA/RCC staff will establish a Metro information field office(s) located along the LPA. The field office(s) in conjunction with other MTA/RCC staff will serve multiple purposes:

- provide the community and businesses with a physical location where information pertaining to construction can be exchanged,
- enable MTA/RCC to better understand community/business needs during the construction period,
- allow MTA/RCC to participate in local events in an effort to promote public awareness of the project,
- manage construction related matters pertaining to the public,
- notify property owners, residences and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks),
- provide literature to the public and press,
- promote and provide presentations on the project via MTA's Speaker Bureau,
- respond to phone inquires,
- coordinate business outreach programs,
- schedule promotional displays,
- participate in community committees.

The Metro information offices will be open various days of the work week for the duration of the construction period. A schedule will be developed before construction begins.

- **Information Line**

An information telephone line will be available to provide community members and businesses the opportunity to express their views regarding construction. Calls received will be reviewed by MTA/RCC staff and will, as appropriate, be forwarded to the necessary party for action (e.g., utility company, fire department, Resident Engineer in charge of construction operations). Information available from the telephone line will include current project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints and general information. During construction of the project, phone service will be provided in both English and Spanish and will be operated on a 24-hour basis.

- **Advertisements**

The MTA/RCC will provide bilingual English/Spanish advertisements for local print and radio for affected businesses. In addition, a bilingual English/Spanish construction update is proposed that would be available regularly throughout the community.

- **Business Support Programs**

The MTA/RCC will provide affected businesses the support to implement promotions for their businesses.

- **Signage**

The MTA/RCC will work with establishments affected by LPA construction activities. Appropriate signage will be developed and displayed by the MTA/RCC to direct both pedestrian and vehicular traffic to businesses via alternate routes.

- **Traffic Management Plans**

Traffic management plans to maintain access to all businesses will be prepared for all LPA station sites. In addition, daily cleaning of work areas will be performed by contractors for the duration of the construction period. Provisions will be contained in construction contracts to require the maintenance of driveway access to businesses to the extent feasible.

- **Deck Level**

Prior segments of the Metro Rail project have used decks that are raised (3-4 feet) above the street level. For the LPA, decking at the under-street cut-and-cover stations will be installed flush with the existing street or sidewalk levels.

- **Sidewalk Design and Maintenance During Construction**

Wherever feasible, sidewalks will be maintained at a 10-foot width during construction. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), it will be restored to a 10-foot width during the majority of construction period. In some places this may require placing the temporary sidewalk actually on the deck. Each sidewalk design shall be of a good quality and be approved by the RCC Resident Engineer prior to construction. Handicapped access shall be maintained during construction where feasible.

- **Construction Site Fencing During Construction**

Construction site fencing shall be of good quality, capable of supporting the accidental application of the weight of an adult without collapse or major deformation. Fence designs or examples shall be submitted to the RCC Resident Engineer for approval prior to installation. Where major boulevards must be fenced, business owners shall be offered the opportunity to request covered walkways in lieu of chain link type fencing. Where covered walkways or other solid surface fencing is installed, a program will be implemented to allow for art work (e.g., by local students) on the surface(s). Where feasible and approved by local neighbors and businesses, chain link fences shall be planted with vines to minimize visual impact during construction period of up to five years.

- **Construction Site Maintenance**

The construction site shall be maintained in a neat manner, with all trash collected daily, all wood and pipes stacked neatly and all small parts stored in closed containers.

- **Bridge Loan Program**

The current MTA/RCC bridge loan program will be reviewed by the MTA/RCC to determine its possible application and effectiveness for the local businesses that would be affected by LPA construction. Revisions may be made to the program to allow for a broader application than currently exists; however, such revisions will, of necessity, continue to take into account not only the needs of the local businesses but also the risk levels for the MTA/RCC associated with this program.

b. Site-Specific Mitigation

The measures provided above are for the full LPA. Station-area-specific mitigation measures are discussed below. It should be noted that these measures are for business and land use patterns that exist today (1994). In the event that different business and/or land use patterns exist at the time of construction, the following mitigation measures will need to be re-evaluated for the new circumstances and adjusted accordingly. In addition, additional measures beyond those identified below may be required as construction progresses.

- **Little Tokyo**

Alternate parking or compensation may be necessary for the temporary loss of seven off-street parking spaces fronting an architectural firm and for the possible temporary impairment of access to loading docks at a vacant toy building during construction of the Little Tokyo station.

- **First/Boyle**

Signage will be provided to businesses affected by construction activities as part of mitigation of the First/Boyle station. MTA/RCC should coordinate the with the schedule and design for the Mariachi Plaza.

- **Brooklyn/Soto**

The MTA will afford the tailor shop located south of Brooklyn Avenue along Mathews Street the opportunity to relocate during construction of the Brooklyn/Soto station. (For a discussion of relocation assistance, please refer to Section 4-3.) However, should the tailor shop choose not to relocate, signage will be provided and pedestrian access will be maintained.

- **First/Lorena**

During construction of the First/Lorena station, the contractor will be required to coordinate with the auto sales retailer and adjacent neighborhood market to maintain access to these establishments to the extent feasible. In addition, adequate signage will be provided to ensure visibility from the street.

- **Whittier/Rowan**

The MTA will provide adequate signage to businesses located adjacent to the Whittier/Rowan station during construction.

- **Whittier/Arizona**

During final design of the Whittier/Arizona station the station box may be moved north out of the alley to provide access to the businesses fronting on Whittier Boulevard. Relocation assistance will be provided to the furniture store as a result of acquisition of the associated furniture warehouse.

- **Whittier/Atlantic**

Signage will be provided to businesses affected by construction activities associated with the Whittier/Atlantic station. During decking of the station box, contractors will be required to coordinate with the bank and gas station in order to maintain access to these establishments to the extent feasible.

4-19 SUMMARY OF IMPACTS

4-19.1 UNAVOIDABLE SIGNIFICANT ADVERSE IMPACTS UNDER CEQA

No significant unavoidable adverse impacts under CEQA are expected to occur for the No-Build alternative. The following adverse environmental impacts may remain significant after mitigation for the Locally Preferred Alternative (LPA) and initial operable segments (IOSs):

- Land Acquisition/ Displacement & Relocation

  The LPA, IOS-1 and IOS-2 would involve acquisition and demolition of a portion of the housing stock in the Corridor. This is considered potentially significant after mitigation.

- Traffic.

  For the LPA and IOS-2, it is not feasible to mitigate impacts at the Whittier/Lorena intersection because it would be necessary to acquire structures to accomplish the required road widening.

- Noise/Vibration

  The LPA, IOS-1 and IOS-2 could result in increased traffic volumes during peak hour periods in residential areas adjacent to stations. These increased volumes could raise community noise levels by more than 3 dBA in some areas, if after implementation of mitigation measures. At such locations, the residualt impacts are considered to be potentially significant.

- Geotechnical

  Subsurface hydrogen sulfide and methane gas are likely to be present in the project area. In the case of hydrogen sulfide, the expected concentrations in some locations may be above standards established for health risk. While it is probable that applying appropriate mitigation measures would reduce the impact to below a level of significance, there may be isolated locations where the impact should still be considered potentially significant.

- Paleontological Resources

  Tunnelling associated with the LPA and IOSs may result in the destruction of fossils.

- Construction Impacts - Noise/Vibration

  Construction of the LPA and IOSs would result in short-term, localized impacts from equipment and construction processes, with the greatest potential for adverse effects occurring at the First/Boyle, Brooklyn/Soto, First/Lorena and Whittier/Arizona stations.

- Construction Impacts - Business Disruption

  Construction of the LPA and IOSs would affect access to commercial businesses adjacent to cut-and-cover construction areas.

4-19.2 IMPACTS FOUND NOT TO BE SIGNIFICANT UNDER CEQA

The proposed project would result in impacts in the following areas that are beneficial, that are adverse but not significant under CEQA or that can be mitigated to a level of insignificance: (1) transit, (2) traffic, (3) parking, (4) land use, (5) economic impacts, (6) communities/neighborhoods, (7) visual & aesthetics, (8) air quality, (9) preexisting hazardous waste, (10) seismicity, (11) water resources, (12) floodplains, (13) groundwater, (14) natural features/ecosystems, (15) energy, (16) safety and security, (17) community facilities/parklands and (18) construction impacts - traffic, parking and utilities.

4-19.3 GROWTH INDUCING IMPACTS

Overall, the possible introduction of rail transit to the Eastside Corridor is not expected to change economic growth levels within the region but may influence the location of such growth and economic activity. The No-Build alternative would not be expected to affect the location of economic activity. The experience of major rapid transit systems in other urban areas confirms that the strength of the underlying real estate market and the public sector would play vital roles in determining the ultimate influence of rail in shaping development patterns within the Eastside Corridor. The introduction of the LPA would constitute one of several elements that may accelerate future growth within affected station influence areas. The Southern California Association of Governments (SCAG) forecasts that by the year 2010, an additional 7,246 housing units and 16,047 employees would be contained within all of the Eastside Corridor station influence areas (See Section 4-1).

4-19.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The No-Build alternative would not directly involve a use of resources that would be irreversible and irretrievable. However, in comparison with the LPA, the No-Build alternative would result in a greater level of vehicular fossil fuel consumption.

Construction of the LPA would involve irreversible and irretrievable commitments of resources. Fossil fuels would be used to power construction vehicles and equipment and in the manufacturing process for project components. Construction materials such as asphalt, cement, steel lumber and fabricated metals would be irreversibly committed to the rail lines. Operation of the LPA would require the use of electricity for power but would also reduce vehicular energy consumption.

4-19.5 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The No-Build Alternative would not involve a short-term use of the environment but would allow long-term conditions to worsen, such as poor transit access, particularly for transit dependent portions of the population, increased traffic congestion and associated air quality problems.

The LPA would involve a short-term uses of the environment during the project's construction period, such as the use of fuel and construction materials (as described above in section 4-18.1) and adverse environmental impacts (listed in Section 4-18, above). However, these short-term adverse environmental effects and uses of resources would be outweighed by the project's long-term benefits, which include the following:

- Improved transit access to employment, commercial and recreational centers served by the project;
- Better achievement of certain development objectives in most station areas;
- Decreased traffic congestion;
- Improved air quality; and
- Reduced energy consumption.

4-19.6 JUSTIFICATION FOR A PROJECT NOW

Rather than deferring the project, there are several reasons why transit improvements in the Eastside Corridor are justified at this time, including:

- The LPA would contribute to the achievement of air quality goals in a region that is currently a severe non-attainment area for two criteria pollutants.
- Eastside rail transit improvements are part of the adopted regional transportation plan and contribute to the effectiveness of the overall transportation program.
- Rail transit investments will accelerate the improvement of transit services to a highly transit-dependent area.
- Improved transit service will afford transit-dependent job seekers much greater access to regional job opportunities.
- A more efficient transit system will save its users time and money.

CHAPTER 5: COORDINATION AND CONSULTATION

5-1 INTRODUCTION

A comprehensive three year outreach program was designed and conducted to coordinate with and obtain input from public agencies, private interests, community organizations and the public at large during the Eastside Corridor's AA/DEIS/DEIR and FEIS/FEIR processes. Community outreach efforts were held throughout the development of the AA/DEIS/DEIR and FEIS/FEIR. This chapter summarizes the coordination and consultation activities and approaches, organized as follows: (1) public participation, meetings and communication, (2) Public Education and Information and (3) Public Response.

The objectives of the MTA's FEIS/FEIR Coordination and Consultation Program are to:

- Obtain full and continuous public participation and involvement throughout the project.
- Assure that the process is open and fair.
- Assure that community concerns are incorporated into project planning.
- Obtain full and continuous public involvement throughout the entire project process.
- Respond to local desires and comply with FTA requirements for public participation.
- Develop and continue a program for public participation and community involvement that is acceptable to the public and FTA.
- Achieve consensus, to the maximum extent possible, on ongoing project development.

5-2 PUBLIC PARTICIPATION, MEETINGS AND COMMUNICATION

Since commencement of the AA/DEIS/DEIR process in 1991, MTA has conducted a series of public meetings and other communication efforts in support of the Metro East Side Extension. The following is a list of activities conducted in order to receive public response.

5-2.1 SCOPING MEETINGS — September and October, 1991

As part of the formal AA/DEIS/DEIR development process, MTA conducted scoping meetings designed to obtain public participation and feedback on the Metro East Side Extension. These were formal meetings to review the AA/DEIS/DEIR process and alternatives proposed for the project.

The MTA conducted four scoping meetings: three located in the Eastside community held in the evening and one at the MTA offices in downtown Los Angeles held during working hours for interested public agencies. For each meeting, an open house and formal scoping meeting was held. A total of approximately 100 individuals attended the Eastside Corridor AA/DEIS/DEIR scoping meeting series. A total of 19 persons presented public statements at the meetings, which were received and recorded by MTA.

After the scoping meetings, written input was reviewed and additional community meetings were held to present and receive input on the refined alternatives. Following these meetings, the MTA Board selected the final list of AA/DEIS/DEIR alternatives to be evaluated.

Table 5-2.1 summarizes the range of issues discussed at the respective scoping meetings held in September and October, 1991.

TABLE 5-2.1: EASTSIDE CORRIDOR AA/DEIS/DEIR
SCOPING MEETINGS ISSUES SUMMARY

ISSUE	BOYLE HEIGHTS SR. CITIZENS CENTER SEPT. 24, 1991	BELVEDERE PARK SEPT. 26, 1991	MTA SEPT. 27, 1991	RESURRECTION CHURCH OCTOBER 9, 1991
Route Alignments	X	X	X	X
Station Locations	X			X
Future Extensions	X	X	X	X
Preferred Technology	X	X	X	X
Safety/Security/ Crime		X		
Environmental/ Traffic Impacts	X	X		X
Private Property	X	X		
Economic Development			X	X
Geological Considerations	X			
Construction Impacts		X		X
Project Cost/ Financing		X	X	
Community-Related Concerns	X	X	X	X
Technical Operating System		X		X

Source: Cordoba Corporation, 1992.

5-2.2 COMMUNITY MEETINGS AND WORKSHOPS

Following the formal scoping meetings, another set of community meetings, workshops and outreach efforts were held by MTA to assist in the selection of a Locally Preferred Alternative (LPA) for the Eastside Corridor. Issues of concern and results of studies were presented to the community, interested groups, government agencies, and the public at large before decisions were made. This public involvement strategy contributed to the development of the final set of alternatives for the Eastside Corridor AA/DEIS/DEIS and helped to ensure that a LPA was selected with community support.

Three series of community workshops were held: January, 1992 (four workshops), May, 1992 (four workshops) and October, 1992 (two workshops). These workshops were held in locations within the study area, and various methods of community outreach efforts were made to assure that they were accessible to as many local residents and affected parties as possible. The purposes of these workshops were to continue the ongoing dialogue with the community regarding the project, to present updated project information regarding the AA/DEIS/DEIR, and to enhance public awareness, involvement, and increased understanding of the project.

During this time period, MTA additionally held focus group meetings with employees, advisory groups, PTA's and representatives from each of the following: 39 schools (elementary, junior and high schools), 21 churches, 6 hospitals, 4 business/merchant associations, 18 senior club and centers. The purpose of these meetings was to further develop a direct understanding between the MTA and the community in relation to the direct impacts and issues associated with proposed transit alternatives.

5-2.3 PUBLIC HEARINGS

Upon distribution of the Notice of Availability, the draft AA/DEIR/DEIS was made available to the public for comment. Four public hearings were conducted by MTA to obtain formal public comment. The public hearings, which were again held in locations within the Eastside study area, were attended by 265 participants, attracted 117 commentors who articulated a total of 570 public comments. Chapter 6, Response to Comments, contains all public comments presented during the public comment period. All public hearings were recorded and written testimony was also received. Each public hearing was preceded by a two-hour open house period during which MTA staff and consultants discussed the project informally with the community. The public hearings were held as follows:

Thursday, June 10, 1993
Open House: 5:00 to 7:00 pm
Public Hearing: 7:00 to 9:00 pm

Brightwood School Cafetorium
1701 Brightwood Avenue
Monterey Park

Tuesday, June 15, 1993
Open House: 4:00 to 6:00 pm
Public Hearing: 6:00 to 8:00 pm

St. Alphonsus Church School
532 S. Atlantic Blvd.
Los Angeles

Thursday, June 17, 1993
Open House: 4:00 to 6:00 pm
Public Hearing: 6:00 to 8;00 pm

International Institute
435 S. Boyle Ave.
Los Angeles

Tuesday, June 22, 1993
Open House: 4:00 to 6:00 pm
Public Hearing: 6:00 to 8:00 pm

Resurrection Church Parish Hall
3324 E. Opal Street
Los Angeles

5-2.4 REVIEW ADVISORY COMMITTEE

Following the selection of the Locally Preferred Alternative in June, 1993, MTA continued its public participation program by establishing a formalized working relationship with the Metro East Extension Review Advisory Committee (RAC), a community-based committee organized specifically to review and comment upon the status and direction of the Metro Eastern Extension project. This was completed in consultation with the study area's local elected officials. The committee's stated objective is to ensure that all elements of project development are presented to the community with specific opportunities for comments and review. Issues discussed at RAC meetings have included: environmental/construction impacts and mitigation, economic development goals and community linkages.

As recommended by local elected officials, the RAC is composed of individuals from the community appointed by local public officials. The majority of these individuals participated during the AA/DEIS/DEIR public involvement program. The following is a list of Review Advisory Committee members:

- Barba, Steve. Boyle Heights Chamber of Commerce
- Castillo, Aurora. Mothers of East Los Angeles
- Coria, Joe. White Memorial Medical Center
- Dichirico, Jimmy. Asian Pacific Planning Council
- Escudero, Laura. Comision Feminil de Los Angeles
- Figueras, Teresa. Centro De Ninos Child Care Center
- Foster, Shirley. White Memorial Medical Center
- Gonzalez. Dina. Aliso Village Resident
- Gutierrez, Juan Jose. One Stop Immigration
- Hartshom, Dorthy. Boyle Heights Music Center
- Hashimoto, Frances. Little Tokyo Chamber of Commerce
- Hernandez, Hector. Boyle Heights Chamber of Commerce
- Herrera, Art. Member, C.R.A. Revitalization Study Community Committee
- Jugan, Bruce. Local Business Owner
- Lechtenberg, Sister Jenny. Puente Learning Center
- Madrigal, Gloria. Sheridan Street Elementary School Parents Association
- Martinez, Maria Elena. East Los Angeles Community College
- Martinez, Louis. El Comite Asociacion
- Maruyama, Kiyoshi. Japanese Retirement Home
- Ortega, Carlos. Business Owner
- Perez, Alfredo. Los Angeles Neighborhood Housing Service
- Riveros, Sonia. Boyle Heights Senior Citizens Center
- Santiago, Rene. Community Health Foundation
- Salazar, Alex. International Institute of Los Angeles
- Spolidoro, Andrea. Older Adults Task Force
- Sugino, Lisa. Little Tokyo Service Center Housing Program
- Taira, Albert. Los Angeles River Artist and Business Association
- Yang, William. Asian Business Association

RAC meetings commenced in December, 1993 and public meetings are held monthly at a local community site. For each meeting, MTA staff presentations and supporting written material are provided to committee members regarding the Eastside Extension. For issues discussed at the RAC meetings, please refer to Table 5-2.2 RAC Meetings Issues Summary.

5-2.5 STATION AREA ADVISORY COMMITTEES

Similar to the RAC, Station Area Advisory Committees (SAAC) have been formed in consultation with the local elected officials to ensure local public participation in the Eastside Extension. MTA has established a formal working relationship with the SAACs as sub-committees of the RAC, which will begin meeting in June, 1994. The goal of each SAAC is to continue the public participation process by addressing specific station area concerns, such as economic development opportunities, transit connections and physical station plans. All components of station area planning are presented to the community with opportunities for comment and review. Station areas have been divided into three corridors for the LPA: Little Tokyo (one station), Boyle Heights (three stations) and East Los Angeles (three stations). Between 12 and 28 committee members representing residents, business owners, community organizations and public agencies participate in each SAAC, and reports directly to the RAC.

TABLE 5-2.2: EASTSIDE CORRIDOR RAC MEETINGS -- ISSUES SUMMARY

ISSUE	DEC. 1, 1993	JAN.13, 1994	FEB.10, 1994	MAR. 10, 1994	MAR. 30, 1994
Logistics	X				
Review or RAC Process	X				
Expectation and Intent	X				
Route Alignment		X			
Station Location		X		X	
Future Extensions					
FEIS/FEIR		X		X	X
Mitigation Measures		X		X	X
Mitigation Monitoring			X		X
Private Property					X
Economic Development		X			
Geological Consideration			X		X
Construction Impacts			X	X	X
Project Cost/Finance				X	
Community Related Concerns		X	X	X	X
Business Related Concerns		X	X	X	X
Construction Process			X		X
Environmental Process				X	

Source: Cordoba Corporation, 1994.

5-2.6 AGENCY COORDINATION

Upon commencement of the AA/DEIS/DEIR process in 1991, MTA established the Interagency Management Committee (IMC) to provide advice and comments regarding the Eastside Extension project. The IMC met about once a month for an 18-month period to discuss issues and impacts relative to the AA/DEIS/DEIR alternatives. The IMC provided guidance regarding the alignments evaluated for the AA/DEIS/DEIR. For the FEIS/FEIR, the IMC has continued to meet to remain informed on the project. The IMC is comprised of local public agencies with which MTA must coordinate for the development and operation of the Metro Rail Public Works Projects. Participating agencies include (partial list):

- City of Los Angeles Community Redevelopment Agency
- City of Los Angeles Housing Authority
- City of Los Angeles Planning Department
- City of Los Angeles Department of Public Works
- City of Los Angeles Department of Transportation
- City of Los Angeles Bureau of Engineering
- County of Los Angeles Department of Public Works
- Los Angeles Unified School District
- Montebello Municipal Bus Lines

5-3 PUBLIC INFORMATION

The Eastside Corridor's AA/DEIS/DEIR and FEIS/FEIR public information program includes a variety of activities and the use of various media methods to communicate and distribute information. All community meetings held for the Eastside Corridor project have Spanish-speaking individuals and use simultaneous translation services. An English and Spanish language Hot Line was also established (213/244-6834) and staffed Monday through Friday between 8:30 a.m. and 5:00 p.m. Calls placed to the hot line after working hours were recorded on an answering machine and returned within one business day.

Input received from community meetings, through the Hot Line, letters or other means are logged, distributed to the MTA staff and made available to MTA Commissioners. A record of all MTA responses received through meetings, letters, and hot line are kept and distributed to the technical staff for review and response. An Input and Response Log was used to monitor comments during the AA/DEIS/DEIR process. A series of five newsletters were also produced by MTA to promote public education and awareness of the project. The "Metro Eastern Extension News" newsletter was distributed before each community workshop series and the public hearings. All community meeting times, locations and subject matters were announced in the local media, including the Los Angeles Times, La Opinion and the local newspapers of Eastern Group Publications and Northeast Newspapers. Input received was taken into account when assessing impacts, evaluating alternatives and making other decisions affecting the AA/DEIS/DEIR.

In addition to the above efforts, announcements were mailed to individuals on the Metro East Side Extension mailing list, including neighborhood and school groups, elected officials, churches, medias and other interested organizations. Informational flyers were distributed to churches and businesses in the community. Copies of all AA/DEIS/DEIR reports were made available for public review in local libraries and at MTA offices and were mailed to more than 350 community based organizations, interested parties and public agencies. Individuals interested in being on the Metro East Side Extension mailing list call the Hot Line (213/244-6834) or sign up at a community meeting. Everyone on the mailing list receive ongoing project public information, including newsletters, bulletins and notices regarding upcoming meetings for the Eastern Extension project.

5-4 PERSONS AND ORGANIZATIONS CONSULTED

Persons and organizations consulted during the preparation of this AA/FEIS/FEIR include:

- Bravo, Carlo. United States Department of the Army, Corps of Engineers.
- Breskin, Keith. City of Monterey Park Economic Development Department.
- Evans, Linda. City of Los Angeles Planning Department.
- Fitzgerald, Ellen. Los Angeles Regional Planning.
- Flannery, Lowell. United States Department of the Army, Corps of Engineers.
- Helsley, Jeff. Central and West Basin Water Replenishment District.
- Hogan, Ronald. Caltrans Microfilm Services.
- Le, Rudy. Los Angeles County Department of Public Works.
- Lee, Louis. City of Los Angeles Tax Assessor's Office.
- Lenaburger, Ray. United States Federal Emergency Management Agency.
- Loera, Jose. Los Angeles County Department of Public Works, Waste Management Division, Water Quality Section.
- Lewis, Jim. Montebello Municipal Bus Lines.
- Luvender, Patricia. United States Department of the Army, Corps of Engineers.
- Morales, Max. Los Angeles County Community Planning Commission, Maravilla Redevelopment Area.
- Nagao, Mike. Los Angeles County Department of Public Works, Planning Division.
- Naimo, John. Los Angeles County Department of the Auditor/Controller.
- Nguyen, Peter. City of Los Angeles Department of Transportation.
- Niglar, Chris. State of California Department of Water Resources.
- Okazaki, James. City of Los Angeles Department of Transportation.
- Ossman, Farouk. City of Los Angeles Department of Public Works, Bureau of Engineering.
- Page, R. Scott. Southern California Rapid Transit District Planning Department.
- Phifer, Susan. Southern California Rapid Transit Department Electric Trolleybus Program.
- Ramstead, Chris. Los Angeles County Department of Public Works.
- Santillanes, Al. City of Los Angeles, Community Redevelopment Agency, Boyle Heights Project Office.
- Salas, Michael. County of Los Angeles Department Of Public Works.
- Schwartz, Jerry. City of Monterey Park Redevelopment Agency.
- Schalini, George. Southern California Air Quality Management District.
- Till, W.R. United States Coast Guard.
- Turner, Debbie. Los Angeles County Department of the Auditor/Controller.
- Ujor, Willie O. City of Monterey Park Planning Department.
- Young, Annie. City of Monterey Park, Department of Finance.
- Zarrilli, Bob. City of Commerce Community Development Department.

5-5 PUBLIC RESPONSE

5-5.1 NOTICE OF INTENT

Consistent with the requirements of the National Environmental Protection Act (NEPA), a Notice of Intent (NOI) was published in the Federal Register in September 1991 to and was provided to public agencies upon commencement of the AA/DEIS/DEIR.

5-5.2 NOTICE OF PREPARATION

Consistent with the requirements of the California Environmental Quality Act (CEQA), a Notice of Preparation (NOP) was distributed in September 1991 to public agencies upon commencement of the AA/DEIS/DEIR. A copy of the NOP is contained in Appendix 8. Table 5-5.1 summarizes the comments received regarding the NOP and provides responses to these comments, including references to sections in the FEIS/FEIR that concern the subject matter identified in the agency response.

5-5.3 COMMENTS AND RESPONSES FOR AA/DEIS/DEIR

As required by law, copies of the AA/DEIS/DEIR were made available to the public for comment. Chapter 6 contains all comments received during the AA/DEIS/DEIR public comment period along with written responses to those comments. In accordance with requirements for preparing an FEIS/FEIR, MTA has responded to all comments received and these responses are contained in Chapter 6 of this FEIS/FEIR.

TABLE 5-5.1: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL	DATE	SIGNATURE	COMMENTS	RESPONSE/ LOCATION IN FEIS/FEIR
Department of Fish and Game	9-20-91	R.E. Mall for Fred Worthy, Regional Manager Region 5	• Complete assessment of flora and fauna with particular emphasis on endangered, threatened and locally unique species and sensitive and critical habitats.	• See Section 4-11 (Natural Features and Ecosystems)
			• Discussion of direct and indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts.	• See Section 4-11 (Natural Features and Ecosystems)
			• Discussion of potential adverse impacts from any increased runoff, sedimentation, soil erosion, and/or urban pollutants on streams and watercourses on or near the project site, with mitigation measures proposed to alleviate such impacts.	• See Section 4-10 (Water Resources)
			• Discussion of alternatives that not only minimize adverse impacts to wildlife, but benefit wildlife and wildlife habitat.	• See Section 4-11 (Natural Features and Ecosystems)
			• Diversion, obstruction of the natural flow or change in the bed, channel, or bank of any river, stream, lake will require notification to the department, after project approval.	• See Section 4-10 (Water Resources)
California Regional Water Quality Board - Los Angeles Region	9-16-91	John L. Lewis, Unit Chief Technical Support Unit	• Request discussion regarding the generation of sewage and/or waste water for the project, reporting quantities and methods of disposal, or affirming the lack of any.	• See Section 4-10 (Rivers)
Department of Transportation (Caltrans)	10-18-91	Wilford Melton, IGR\CEQA Coordinator Advance Planning Branch	• The document should address park-and-ride needs to prevent parking overflow into surrounding neighborhoods and to encourage patronage at all stations.	• See Section 3-3 (Parking)
			• Need for discussion of how the proposed project will interface with the feeder system to enhance ridership and how service would avoid duplication of service with bus lines.	• See Sections 3-1 (Transit).
			• We recommend the preparation of cost-benefit analysis and include the highway network as part of the study.	• See Chapter 2 for an evaluation of alternatives

TABLE 5-5.1: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL	DATE	SIGNATURE	COMMENTS	RESPONSE/ LOCATION IN FEIS/FEIR
Caltrans (Continued)			• Discussion of how proposed project would interface with overall rail system plans in Los Angeles and Orange Counties. We are especially concerned about the Orange Line in relation to the I-5 rail corridor. The document needs to address Orange County's plans for the corridor and any potential linkage or interface.	• See Sections 1-3.1 (Public Transportation) and Section 3-1 (Transit)
City of Los Angeles Department of City Planning	10-29-91	Melanie S. Fallon, Director of Planning	• The proposed project may result in an increase in trip generation above the current level. This could increase the surface parking that may result in the development of a new circulation system in the area. Our concern is what type of circulation will be in place during and after construction, and how this will affect pedestrian flow?	• See Sections 3-1 (Transit), Section 3-2 (Traffic) and Section 3-3 (Parking)
			• Request that other non-motorized transportation facilities such as bicycle pathways and racks be considered in the analysis.	• See Chapter 2 (Alternatives Considered)
			• Will the stations be easily accessible to the disabled and local residents or only commuters?	• See Section 3-1 (Transit). System will comply with ADA.
			• Recommends mitigation measures for dust, noise, and vibration due to construction, and adverse traffic impacts due to construction related congestion.	• See Section 4-18.2 (Traffic Construction Impacts), Section 4-18.3 (Air Quality Construction Impacts); Section 4-18.4/5 (Construction Impacts - Noise/Vibration).
			• Determine whether physical development that occurs in conjunction with station development would be consistent with adopted land use plans: a) consistency of developments along each alternative alignment with existing land use and policies and; b) the amount of projected development which may be accommodated at the proposed stations without adverse effects.	• See Section 4-1 (Land Use)
			• Determine the amount of land acquired and resulting displacement; type and nature of land use displaced and probable relocation costs; total employment and population that would be affected.	• See Section 4-3 (Land Acquisition and Displacement).

TABLE 5-5.1: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL	DATE	SIGNATURE	COMMENTS	RESPONSE/ LOCATION IN FEIS/FEIR
City of Los Angeles Department of Transportation	10-29-91	James M. Okazaki, Chief of Transit Programs	• The distribution of arriving and departing modes used by riders at each station site should include a realistic mix of bus, pedestrian and passenger vehicle modes from both the region and local eastside areas. The potential for riders arriving in passenger vehicles should not be underestimated.	• See Section 3-1 (Transit) and 3-2 (Traffic) for mode of access tables.
			• Need to accurately assess the adverse impacts on roadway capacity, neighborhood intrusion, and spillover parking. Alignments that cross the freeway system should consider locating station sites in areas easily accessible to local as well as regional passengers. Consideration should be made to interface rail stations with High Occupancy Vehicle (HOV) facilities and provide direct rail access for bus transit and other HOV modes. Alignments and station locations are located at substantial distances from freeway ramps and interchanges and may unnecessarily draw regional users into or through residential and business neighborhoods causing congestion and depletion of both residential and business parking spaces.	• See Sections 3-2 (Traffic), Section 3-3 (Parking) and Section 4-4.2 (Neighborhoods). • Regarding station sites located near freeway ramps and interchanges: the First/ Boyle station is located near on/off-ramps to the I-5. Express bus service and automobiles would also come from the freeways to the First/Lorena and Whittier/Atlantic proposed parking facilities.
			• Alternatives which include a station integrated with the rail maintenance yard west of the Los Angeles River can also potentially provide a site for the Central Business District intercept parking. This feature should be carefully evaluated for the environmental impacts in the DEIR.	• Given the limited accessibility of Metro Rail yard from current surface streets, providing access to the site as intercept parking would be difficult.
			• In assessing impacts to the arterial highway system in the DEIR, please note that the Department of Transportation has proposed that both First Street and Fourth Street bridges over the Los Angeles River be connected to reversible-flow operations.	• Comment noted.

TABLE 5-5.1: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL	DATE	SIGNATURE	COMMENTS	RESPONSE/ LOCATION IN FEIS/FEIR
Los Angeles County Department of Regional Planning	10-23-91	James E. Hartl, AICP Director of Planning	• Development of rail transit service in East Los Angeles should avoid the errors made in freeway development whereby freeway corridors created barriers within the community. In order to minimize creation of barriers, rail transit service should utilize subway lines or existing freeway right-of-way.	• The LPA is an all-subway alignment. See Section 4-4.2 (Neighborhoods).
			• Major commercial land uses are located along arterial highways which are east-west oriented. The East Los Angeles Community Plan and Countywide General Plan show an activity center on Whittier Boulevard east of the Long Beach Freeway. Three of the alternatives outlined would serve this center.	• The LPA would serve this corridor and activity center.
			• The Countywide General Plan shows a regional center at the intersection of Atlantic Boulevard and Brooklyn Avenue in the City of Monterey Park. This center includes both commercial activities and East Los Angeles Junior College. You should consider inclusion of an alternative transit corridor (perhaps an eastward extension of Alternative 3 to serve this activity center.	• Due to opposition from the City of Monterey Park, this station alternative has not been selected as the LPA. This alternative was added as part of the AA/DEIS/DEIR review. Alternatives 4 and 10 in the AA/DEIS/DEIR included a Brooklyn/Atlantic/ SR60 station, which would have served the East Los Angeles Junior College.
			• Alternatives serving the east Whittier Boulevard Activity Center could be eventually extended to Orange County possibly along the Santa Ana Freeway Corridor. An alternative serving the Atlantic Boulevard-Brooklyn Avenue Center could possibly be extended eastward in the future to serve communities along the Pomona Freeway Corridor.	• Comment noted.

TABLE 5-5.1: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL	DATE	SIGNATURE	COMMENTS	RESPONSE/ LOCATION IN FEIS/FEIR
County of Los Angeles Department of Public Works	10-29-91	T.A. Tidemanson, Director of Public Works Prepared by Carl L. Blum, Assistant Deputy Director of Planning Director	• Project could significantly affect the roadways and intersections in the proposed Corridor area. A traffic study should be prepared to identify impacts of each alternative and ensure that appropriate mitigation measures are proposed. It should include anticipated delays to motorists, the rerouting of traffic and the traffic impact during construction, as well as level of service analysis for intersection and freeway interchanges. Impact on traffic circulation in the vicinity of the stations needs to be addressed. A number of major and secondary highways are located within the proposed project corridor. We recommend any impacts to these highways be addressed in the DEIR with appropriate mitigation measures.	• See Sections 3-2 (Traffic) and 4-18.2 (Construction-Traffic).
County of Los Angeles Department of Public Works (Continued)			• We are particularly concerned about any possible consideration of surface rail alternatives that may arise during the scoping process as these can create a substantial barrier and cause significant delays to auto traffic on roads crossing such surface lines. • All rail proposals affect planned highways on the Los Angeles County Highway Plan in both East Los Angeles and the City of Los Angeles. Each alternative begins at the intersection of Atlantic Boulevard with Whittier boulevard and follows either Whittier Boulevard, Eastern Avenue, 1st Street or Brooklyn Avenue into downtown. Each of these are classified as Secondary Highways. In addition, there are other major and secondary highways running north-south across the proposed routes. We recommend any impacts to these highways be addressed.	• The LPA is an all-subway alignment. Surface rail alternatives were not included in the AA/DEIS/DEIR with the exception of the stations in the Metro Rail yard, which would not have affected any roadways. • See Section 3-2 (Traffic).

TABLE 5-5.1: RESPONSES TO NOTICE OF PREPARATION

AGENCY OR INDIVIDUAL	DATE	SIGNATURE	COMMENTS	RESPONSE/ LOCATION IN FEIS/FEIR
Southern California Rapid Transit District	10-31-91	Albert H. Perdon, Director Transit Systems Development	• The main area of concern is with the Metro Rail Yard. The District's position is that the alignment chosen should retain the option of having a station in the vicinity of the yard. This would maintain the joint development potential of the yard and the adjacent Santa Fe yard should the Commission decide to purchase that as part of the Orange Line property. This will also insure Metro Rail service for emerging redevelopment of the industrial area adjacent to the yard. Our strong support is therefore with either the First Street or Whittier Boulevard alignment.	• The LPA includes a Little Tokyo Station (formerly called the Station in the yard) under Santa Fe Avenue. Alternatives 6,8 and 9 in the AA/DEIS/DEIR included stations in the Metro Rail yard.
			• In considering any alignment through or adjacent to the yard, the operation and maintenance of the yard should be considered. Some of the specific points would be the effect on the automatic to manual operation transfer zone at the north end of the yard and the mitigation of any lost storage capacity in the body of the yard. We think that these issues can be readily resolved with proper forethought.	• Continued operation of the maintenance facilities at the Metro Rail yard is of paramount importance.
California Office of Historic Preservation	10-10-91	Kathryn Gualtieri, State Preservation Officer	• Scoping information identified historic preservation responsibilities. Request submission of project for review under section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR Part 800.	• See Section 4.14 (Historic Resources).

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APPENDIX 2: LIST OF PREPARERS

NAME	RESPONSIBILITY/SUBJECT
METROPOLITAN TRANSPORTATION AUTHORITY	
Central Area Team	
Jim De La Loza	Director, Central Area Team
Diego Cardoso	Project Manager
Steve Brye	Environmental Planning
Lawrence N. Garcia	Community Outreach/Government Relations
Yvette Pierre	Planning/Linkages
Robin Blair	Economic Development
Walt Davis	Inter-Agency Coordination
Linda Tam	Administrative Assistant
John Given	Joint Development
Maya Emsden	Art for Rail Program
John Hilmer	Operations
Martha Butler	Operations
Mike Sieckert	Operations
Scott Page	Operations
Naiomi Nightingale	Job Training & Development
Keith Killough	Patronage Modeling
Jimmy Chen	Patronage Modeling
Linda Bohlinger	Capital Planning
Frank Flores	Capital Planning
Velma Marshall	Real Estate
Cecilia Melanson	Real Estate
Donald Holman	Real Estate
RAIL CONSTRUCTION CORPORATION	
Charles Stark	Segment 3 Project Director
Alan Dale	Deputy Project Manager, Engineering
Samantha Pierce	Preliminary Engineering Project Unit Manager
Dennis Mori	Supervising Facilities Engineering Manager
Enrique Valenzuela	Public Affairs
Jim Sowell	Environmental Compliance
John Higgins	Construction Coordinator

APPENDIX 2: LIST OF PREPARERS

NAME	RESPONSIBILITY/SUBJECT
MYRA L. FRANK & ASSOCIATES, INC.	
Frank, Myra L.	Principle-in-Charge - EIR
Mansen, David	FEIS/FEIR Project Director
Petersen, Gary	Executive Summary, Air Quality, Visual, Summary of Impacts
Lisecki, Lee	Summary
Starzak, Richard	Historic/Archaeological/Paleontological Resources and Section 106 Complaiance
Ballin, Lisa	Responses to Comments
Francesca Smith	Historic/Archaeological/Paleontological Resources and Section 106 Complaiance
Miyasato, Mona	Land Use and Development, Economic and Fiscal Impacts, Land Acquisition/Displacment and Relocation, Section 106 Compliance
Lora Zier	Visual and Aesthetics
Lott, Michael	Geolotechnical/Subsurface/Seismicity, Water Resources, Natural Resources
Kollmeyer, Ben	Related Projects, Energy, Response to Comments
Ruiz, Gilberto	Communities/Neighborhoods, Safety and Security, Business Disruption, Community Facilities and Parklands
Harris, Bradley	Technical Assistance
Williams, Greg	Energy
Weston, Linda	Technical Editor/Document Management
CORDOBA CORPORATION	
Genoveva Arelanno	Employment, Minority Business Participation, Job Training and Development, Coordination and Consultation, Appendix 3
Swylana Campos	Employment, Minority Business Participation, Job Training and Development, Coordination and Consultation, Appendix 3
Robert Vasquez	Employment, Appendix 3
David Light	Appendix 3
MEYER, MOHADDES ASSOCIATES, INC.	
Michael Meyer	Principal-in-Charge, Transportation Setting, Impacts & Mitigation
Gary Hamrick	Project Manager
Ravi Goli	Project Engineer
Noel Casil	Project Engineer
Viggen Davidian	Project Engineer
John Kim	Project Engineer
Veronica Montgomery	Word Processor
Anne Koperski	Graphics Subconsultant

APPENDIX 2: LIST OF PREPARERS

NAME	RESPONSIBILITY/SUBJECT
TERRY A. HAYES ASSOCIATES, INC.	
Terry A. Hayes	Parking Lot Emissions
Andrew Pimm	Construction Emissions
Cynthia van Empel	Mobile Emissions
WILSON, IHRIG ASSOCICATES, INC.	
Richard A. Carman, Ph.D., P.E.	Noise and Vibration
Dereck Watry	Noise and Vibration
ICF KAISER ENGINEERS, INC.	
Dyer, John	Alternatives Considered, Transportation Impacts and Mitigation
Chaushie Chu	Travel Demand Forecasting and Transit Analysis
Anthony Catalina	Travel Demand Forecasting and Transit Analysis
Ron Rypinski	Operations Plan
Robert Woolery	Hazardous Waste, Utilities, Water Resources
Terri Solis	Utilities and Water Resources
Jerry Joy	Geology and Subsurface Gases
Bill Houppermans	Water Rresources
Heinz Mueller	Tunneling
George Dockter	Word Processing and Graphics
BRAND FERRAR CZIUBLA FREILICH & KOLSTAD	
Amy Freilich	Legal Review

APPENDIX 3: LIST OF FEIS/FEIR RECIPIENTS

3-1 FEDERAL AGENCIES

Advisory Council on Historic Preservation, Executive Office (Washington, D.C.)
Advisory Council on Historic Preservation, Western Office of Project Review, (Washington, D.C.)
Office of Management and Budget (Washington, D.C.)
U.A. Army Corps of Engineers (Los Angeles)
U.S. Army Corps of Engineers, (Washington, D.C.)
U.S. Department of Agriculture (Los Angeles)
U.S. Department of Commerce

- Office of the Secretary (Washington, D.C.)
- Office of the Secretary (Los Angeles)
- National Oceanic and Atmospheric Administration (Washington, D.C.)
- National Oceanic and Atmospheric Administration (Los Angeles)

U.S. Department of Energy (Los Angeles)
U.S. Department of Health and Human Services (Washington, D.C.)
U.S. Department of Health and Human Services (Santa Ana)
U.S. Department of Housing and Urban Development (Washington, D.C.)
U.S. Department of Housing and Urban Development (Los Angeles)
U.S. Department of Interior

- Office of the Secretary (Washington, D.C.)
- Director of Environmental Project Review (Washington, D.C.)
- U.S. Fish and Wildlife Service (Gardena)
- National Parks Service (Agoura Hills)
- Office of Deputy Asst. Secretary for Environmental Affairs (Washington, D.C.)

U.S. Department of Transportation

- Office of the Secretary (Washington, D.C.)
- Office of the Secretary (Los Angeles)
- Office of Transportation and Regulatory Affairs, Chief Environmental Division
- Federal Aviation Administration (Washington, D.C.)
- Federal Highway Administration (Los Angeles)
- Federal Railroad Administration (Los Angeles)
- U.S. Coast Guard (Long Beach)

U.S. Environmental Protection Agency (Washington, D.C.)
U.S. Environmental Protection Agency (San Francisco)
U.S. Federal Emergency Management Agency (Washington, D.C.)
U.S. Federal Emergency Management Agency (Los Angeles)

3-2 STATE AGENCIES

Air Resources Board (El Monte)
California Highway Patrol
California Transportation Commission
State Department of Transportation (Caltrans)
State Energy Commission
State Food and Agriculture Department
State Parks and Recreation Department
State Fish and Game Department (Long Beach)

3-3 COUNTY AGENCIES

County Administrative Offices
County Board of Supervisors
County Community Development Commission
County Agricultural Commissioner
County Health Services Department
County Sheriffs Department
County Public Works Department, Flood Maintenance Division
County Regional Planning Department
South Coast Air Quality Management District

3-4 LOCAL AGENCIES

3-4.1 CITY OF LOS ANGELES

Department of Airports
City Administrative Office
City Attorney
City Clerk
Community Development Department
Community Redevelopment Agency
Construction Services Center
Cultural Affairs Department
Environmental Affairs Department
General Services Department
Housing and Preservation Department
Planning Department
Police Department
Public Works Department
Recreation and Parks Department
Social Services Department
Transportation Department
Department of Water and Power

3-4.2 CITY OF COMMERCE

Administration
City Attorney
City Clerk
Community Development
Human Resources
Library Services
Parks and Recreation
Public Information Office
Public Works
Transportation

3-4.3 CITY OF ALHAMBRA

City Attorney
City Clerk
City Manager
Community Development
Public Services
Redevelopment

3-4.4 CITY OF MONTEBELLO

Human Resources
Parks and Recreation
Planning
Public Works
Redevelopment Agency
Transportation

3-4.5 CITY OF MONTEREY PARK

Building
City Clerk
City Manager
Community Redevelopment/Economic Development Services
Engineering
Fire Department
Library
Planning
Police
Public Works
Recreation and Parks
Support Services

3-5 GOVERNOR, U.S. SENATORS AND U.S. CONGRESSMEN

Governor State of California - Honorable Pete Wilson
U.S. Senator - Honorable Barbara Boxer
U.S. Senator - Honorable Dianne Feinstein
U.S. Congresswoman - Honorable Lucille Roybal-Allard (District #33)
U.S. Congressman - Honorable Xavier Becerra (District #30)
U.S. Congressman - Honorable Matthew Martinez (District #31)
U.S. Congressman - Honorable Esteban Torres (District #34)

3-6 STATE LEGISLATORS

State Senator - Honorable Art Torres (District #24)
State Senator - Honorable Charles Calderon (District #26)
State Assemblyman - Honorable Richard Polanco (District #45)

State Assemblyman - Honorable Louis Caldera (District #46)
State Assemblywoman - Honorable Diane Martinez (District #49)
State Assemblywoman - Honorable Martha Escutia (District #50)
State Assemblywoman - Honorable Grace M. Napolitano (District #58)

3-7 COUNTY BOARD OF SUPERVISORS

Honorable Gloria Molina (District #1)
Honorable Yvonne Braithwaite Burke (District #2)
Honorable Edmund D. Edelman (District #3)
Honorable Deane Dana (District #4)
Honorable Michael D. Antonovich (District #5)

3-8 LOCAL OFFICIALS

3-8.1 LOS ANGELES

Mayor - Honorable Richard Riordan
Councilman - Honorable Mike Hernandez (District #1)
Councilman - Honorable Joel Wachs (District #2)
Councilwoman - Honorable Laura Chick (District #3)
Councilman - Honorable John Ferraro (District #4)
Councilman - Honorable Zev Yaroslavsky (District #5)
Councilwoman - Honorable Ruth Galanter (District #6)
Councilman - Honorable Richard Alarcon (District #7)
Councilman - Honorable Mark Ridley-Thomas (District #8)
Councilwoman - Honorable Rita Walters (District #9)
Councilman - Honorable Nathan Holden (District #10)
Councilman - Honorable Marvin Braude (District #11)
Councilman - Honorable Hal Bernson (District #12)
Councilman - Honorable Jackie Goldberg (District #13)
Councilman - Honorable Richard Alatorre (District #14)
Councilwoman - Honorable Rudy Svorivich (District #15)

3-8.2 CITY OF COMMERCE

Mayor - HonorableRuth R. Aldaco
Mayor Pro-Tem - Honorable Ruben Batres
Councilman - Honorable Robert Cornejo
Councilwoman - Honorable Artemio E. Navarro
Councilman - Honorable James Dimas

3-8.3 CITY OF ALHAMBRA

Mayor - Honorable Barbara Messina
Vice Mayor - Honorable Boyd G. Condie
Councilman - HonorableTalmage V. Burke
Councilwoman - Honorable Mary Louise Bunker
Councilman - Honorable Michael Blanco

3-8.4 CITY OF MONTEBELLO

Mayor - Honorable Ed C. Pizzorno
Mayor Pro Tem - Honorable Art Payan
Councilman - Honorable Arnold Alvarez-Glassman
Councilman - HonorableWilliam Molinari
Councilman - Honorable Jess Ramirez

3-8.5 CITY OF MONTEREY PARK

Mayor - Honorable Marie T. Purvis
Mayor Pro Tem - Honorable Judy Chu
Councilman - Honorable Fred Balderrama
Councilman - Honorable Samuel Kiang
Councilwoman - Honorable Rita Valenzuela

3-9 PUBLIC LIBRARIES

Los Angeles Central Library
Anthony Quinn Public Library
City Terrace Public Library
East Los Angeles Public Library
El Camino Real Public Library

3-10 LOCAL MEDIA

Los Angeles Times
La Opinion
Downtown News
Eastern Group Publications
Northeast Newspapers
KNXT - Channel 2
KNBC - Channel 4
KTLA - Channel 5
KABC - Channel 7
KHJ - Channel 9
KTTV - Channel 11
KCOP - Channel 13
KMEX - Channel 34
KVEA - Channel 52
KNX-AM Radio
KFWB-AM Radio
KTNQ/KLVE-AM/FM Radio
KWKW-AM Radio

3-11 AA/DEIS/DEIR COMMENTORS

3-11.1 ELECTED OFFICIALS

Atatorre, Richard - Councilmember, City of Los Angeles
Caldera, Charles - Senator, California
Caldera, Louis - Assemblymember, California
Escuitia, Martha - Assemblymember, California
Kiang, Samuel - Councilmember of City of Monterey Park
Martinez, Diane - Assemblymember, California
Napolitano, Grace - Assemblymember, California
Polanco, Richard - Assemblymember, California
Roybal-Allard, Lucille - Congressmember, United States
Torres, Richard - City Administrator, City of Montebello

3-11.2 FEDERAL AGENCIES

Broun, Richard - U.S. Department of Housing and Urban Development
Leisch, Gordon - U.S. Department of the Interior
Rodenhurst, G.W. - U.S. Coastguard
Wieman, Deanna - U.S. Environmental Protection Agency

3-11.3 STATE AND REGIONAL AGENCIES

Greenwald, Cindy - South Coast Air Quality Management District
Kinne, Christine - Governor's Office of Planning and Research
Melton, Wilford - California Department of Transportation
Pumford, Mark - California Regional Water Quality Control Board
Therkelsen, Robert - California Energy Commision

3-11.4 COUNTY AGENCIES

Frederick, Hungerford - County of Los Angeles Department of Public Works
Pagenkopp, Marie - County Sanitation Districts of Los Angeles County
Sasaki, Brian - County of Los Angeles Department of Public Works

3-11.5 CITY AGENCIES

Friedman, Joan - Los Angeles Unitied School District
Howard, Dal - City of Los Angeles Department of Fire
Jeffers, Chris - City Manager, City of Monterey Park
Okazaki, James - City of Los Angeles Department of Transportation
Suarex, Omero - East Los Angeles College
Zarifi, Sina - Community Redevelopment Agency of the City of Los Angeles

3-11.6 COMMUNITY ORGANIZATIONS

Barba, Steve - Boyle Heights Chamber of Commerce
McNott, Marshall - Los Angeles Mission Foundation
Salazar, Alex - Eastside Neighborhood Revitalization Study Citizens Advisory Committee
Tokeshi, Jimmy - Japanese American Citizens League

3-11.7 Individuals and Businesses

Alba, Rodolfo - Jack in the Box
Alba, Rudy - Jack in the Box
Allah, Antonio
Castillo Long, Esther
Coria, Joseph
Coria, Felicitas
de Alba, Rosario
Flores, Amparo
Garcia, A.L.
Hayashi, Leo
Hernandez, M.
Heyer, Amy
Inadomi, Minoru
Kiya, Davis
Martinex, Margarita
Medrano, Heather
Montellano, Ernestina
Nelson, Tom
Palmer, Roger
Robles, Victor
Shibata, Kazuo
Singer, Oscar
Snyder, Arthur
Sugata, Shigzku
Torre, Estela
Trujillo, Gloria
Utah Elementary School students
White Memorial Medical Center
Zellman, Dean

3-12 RAC MEMBERS

Castillo, Aurora - Mothers of East Los Angeles
Coria, Joe - White Memorial Medical Center
Dichirico, Jimmy - Asian Pacific Planning Council
Escudero, Laura - Comision Feminil de Los Angeles
Figueras, Teresa - Centro De Ninos
Foster, Shirley - White Memorial Medical Center
Gonzalez, Dina - Aliso Village

Gutierrez, Juan Jose - One Stop Immigration
Hartshom, Dorthy - Resident
Hashimoto, Frances - Business Owner
Herrera, Art - C.R.A.
Jugan, Bruce - Business Owner
Madrigal, Gloria - Sheridan Street Elementary School
Martinez, Luis - El Comite
Martinez, Maria Elena - East Los Angeles Community College
Maruyama, Kiyoshi - Business Owner
Ortega, Carlos - Business Owner
Perez, Alfredo - L.A. Neighborhood Housing Service
Santiago, Rene - Community Health Foundation
Sugino, Lisa - Little Tokyo Service Center Housing Program
Spolidoro, Andrea - Older Adults Task Force
Taira, Albert - Taira Services Corporation
Yang, Wi

3-13 INTERESTED ORGANIZATIONS

Archdiocese of Los Angeles
Belvedere Merchants Association
Boyle Heights Chamber of Commerce
Community and Human Resources
City Terrace Coordinating Council
Comision Femenil de Los Angeles
Community Health Foundation
Community Rehabilitation Service
Domingos Alegres
East Los Angeles Alcoholism Council
East Los Angeles Chamber of Commerce
East Los Angeles Community College
East Los Angeles Occupational Center
East Los Angeles Skills Center
East Los Angeles YMCA
Estrada Courts
Garfield High School
Hispanic Women's Council
Hollenbeck Youth Center
International Institute of Los Angeles
Latin Business Association
Lincoln Heights Chamber of Commerce
Los Angeles Community Hospital
Los Angeles County Chicano Employees Association
Maravilla Foundation
Mexican American Grocers Association
Mexican American Opportunity Foundation
Miracle on Broadway
Montebello High School

Mothers of East Los Angeles
Multicultural Health Center
Ramona High School
Resurrection Church
Roosevelt High School
St. Alphonsus Catholic Church
St. Lucy's Catholic Church
Salesian Boys and Girls Club
Santa Marta Hospital
Schurr High School
Self Help Graphics
Society of Hispanic Professional Engineers
Southwest Voter Registration and Education Project
The East Los Angeles Community Union (TELACU)
The Industrial Council
United Neighborhood Organization (UNO)
White Memorial Medical Center
Whittier Merchants Association
Our Lady of Solitude (La Soledad)
Santa Isabel
Our Lady Queen of Martyrs
St. Alphonsus
Our Lady of the Rosary of Talpa
Resurrection
Our Lady of Lourdes
Our Lady of Guadalupe
Sacred Heart

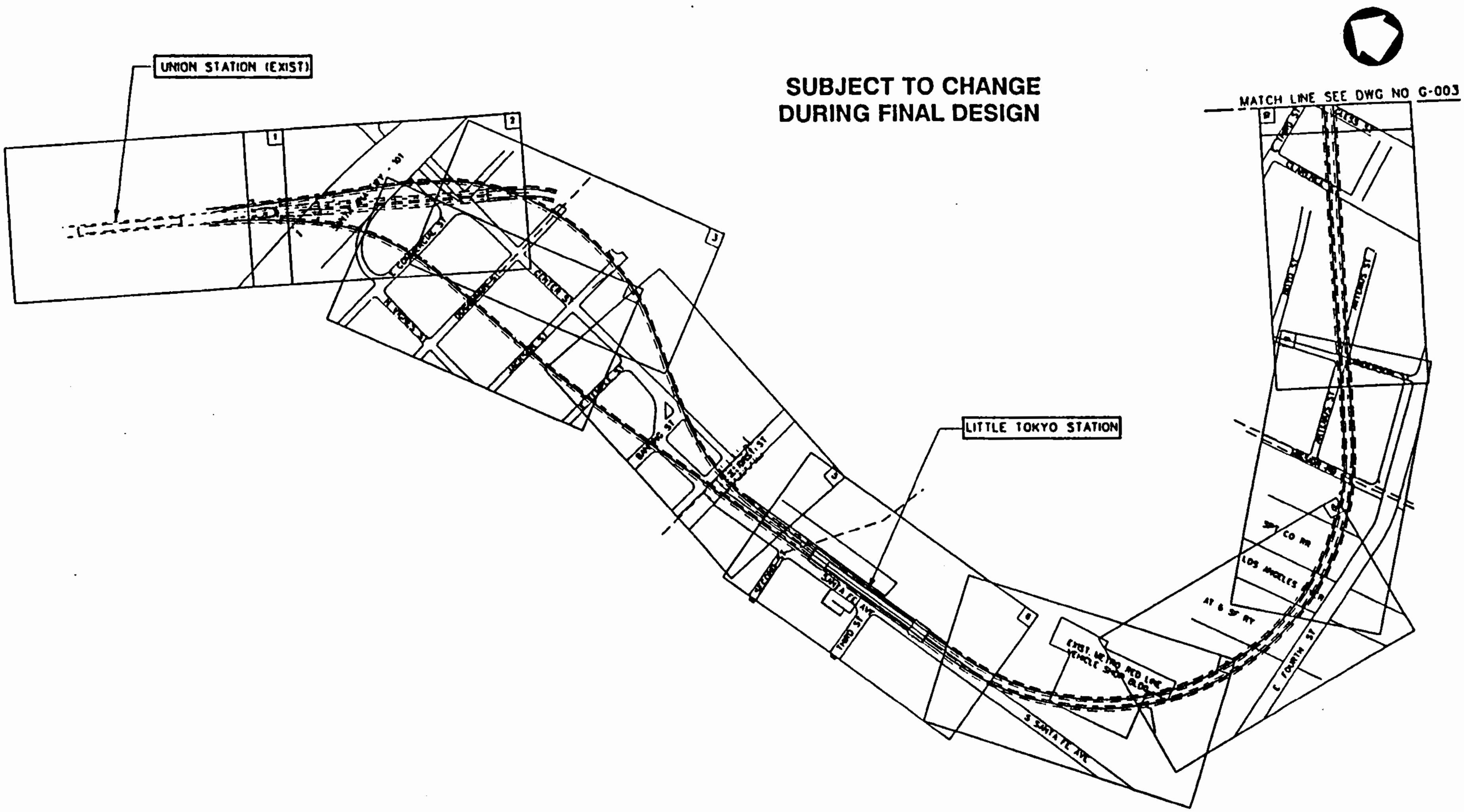
3-14 CITIZENS (Parties who commented on the AA/DEIS/DEIR for which the MTA has an address)

Mr.& Mrs. Vicky & Agustine
Ms. Veronica R.
Mr. Refugio Agundez
Mr. Jose Alfaro
Mr. Brian Allen
Mr. Tony Alloca
Ms. Sandra Almanza
Mr. Sal Altamirano
Ms. Ana Alvarez
Ms. Norma Alvarez
Mr. Antonio Andrade
Ms. Marie Andrade
Mr. Jose Andrade
Mr. Fransico Andrez
Ms. Beverly Angustain
Ms. Mary Aranda
Mr. Hose Arevalo
Mr. Salvador Arevalo
Ms. Aida Asuncion
Mr. Rudy Baca
Mr. John Beenthald
Mr. Gustavo Blancht
Mr. Nick Brkiett
Mr. Al Bubion
Ms. Maria Burkiel
Ms. Olivia Cara
Ms. Carlota Carpio
Mr. Brian Carter
Mr. Diego Castillo
Ms. Celia Castro
Ms. Juanita Centeno
Mr. Jose Cervantes
Ms. Lilian Cetina
Ms. Solis Chacon
Mr. Chen
Mr. Sam Chew
Ms. Irene Cisinero
Ms. Esther Colorado
Mr. Manuel Cordova Jr.
Ms. Martha Cordova
Mr. Octaviano Corona
Mr. Bill Cruz
Ms. Lidia Davalos
Ms. Socorro Davalos
Mr. Mario De La Torre
Mr. Tony De La Torre
Ms. Guadalupe De Leon
Mr. John De Soto
Mr. Ernest De La Pena
Ms. Arcelia Delgadillo
Mr. Ramon Delgadillo

Mr. David Diaz
Ms. Polly Dominguez
Mr. Gerald J. Donohue
Ms. Hilda Dunn
Ms. Maurice Epps
Ms. Bernice Escobedo
Mr. Gabino Espinoza
Mr. Roberto Espinoza
Ms. Catalina Estrada
Mr. Felipe
Ms. Trish Fernandez
Mr. George Fernandez
Mr. Ron Flechter
Mr. Arturo Fletes
Mr. Fredis Flores
Mr. Tony Forkush
Ms. Maria Foursto
Mr. Miguel Fuentes
Mr. Carlos Galvan
Ms. Maria Galvez
Ms. Maria Gamboa
Ms. E Garay
Ms. Herlinda Garcia
Ms. Marina Garcia
Mr. Jose Luis Garcia
Ms. Juanita Garcia
Mr. Pedro Gardillo
Mr. George Georeopoulos
Ms. Margrita Gomez
Mr. Jose Gomez
Ms. Maria Gomez
Ms. Rimmie Gonzales
Ms. Gloria Gonzales
Ms. Elvira Gonzalez
Mr. Eric Gordillo
Ms. Elena Green
Ms. Rose Griffieth
Ms. Teri Griffin
Ms. Angelica Grojeda
Mr. Pat Guajardo
Mr. Vince Guilliano
Mr. R. J. Gutierrez
Ms. Maria Henriquez
Mr. Ricardo Hernandez
Ms. Hortencia Hernandez
Ms. Gloria Hernandez
Mr./Ms. P Hernandez
Ms. Teresa Herrera
Mr. Gonzalo Huerta
Mr. Taz Inadomi
Mr. Chuck K. Tang
Ms. Jessie Kelly
Ms. Bernadette Kennedy
Ms. Ana Koh
Ms. Cathy Landnem
Mr. David Lara
Mr. Ron Lechter
Mr. Armando Licon
Mr. Jorge Licon
Mr. Israel J. Lojas
Mr. Jess Lopez
Mr. Jessy Lopez
Ms. Grace Lopez
Ms. Maria Macias
Ms. Laura Madrid
Mr. Larry Maldonado
Ms. Yvonne Malone
Ms. Sara Manza
Ms. Bibiana Marteli
Mr. Juan Martinez
Mr. Eulalio Martinez
Mr. Louis Martinez
Ms. Deanna Matsumoto
Mr./Ms. M. Murillo
Ms. Patti Mauricio
Mr. Ernesto McFarlane
Mr. Felipe Media
Ms. Margarita Medina
Mr. Gonzalo Mendez
Mr. & Mrs. A. Meraz
Ms. Alicia Mercado
Ms. Emilia Mesa
Mr. Sam Mevorach
Ms. Patricia Monroe
Mr. Arthur Montoya
Ms. Consuelo Mora
Mr. Pat Moser
Ms. Cecilia Mucado
Ms. Maria Munoz
Mr. David Munoz
Mr. Norman Murdock
Mr. Sam Nassimian
Mr. Jose Navarro
Mr. Brian Navis
Mr. Tom Nelson
Ms. Dora Nelson
Mr./Ms. Noriega
Ms. Gladys Nunez
Mr. Jesus Ochoa
Ms. Lily Olivas
Mr. Isidro Olmos
Ms. Norma Olvera
Ms. Celia Orozco
Ms. Carmen Ortega
Mr. Steven Ortega
Ms. Lisa Ortiz
Ms. Socoro Ortiz
Ms. Leticia Padilla
Ms. Carmen Padilla
Ms. Maria Pena
Mr. Robert Perez
Mr. Eligio Perez
Mr. Jesse Ponce
Ms. Maria Porfillo
Ms. Yolanda Portillo
Mr. John Quesada
Father Roberto Quinones
Mr. E. Ralin
Ms. Trinidad Ramos
Mr. Gabriel Ramos
Mr. Stephan Reed
Ms. Crystal Rengifo
Ms. Marcela Rentenia
Mr. Raul Reyes
Ms. Reina Reyes
Mr. Roberto Reyes
Ms. Mercedes Reyes
Ms. Erlinda Reyna
Ms. Consuelo Rico
Mr. Ralph Robinson
Mr. Angel Rodriguez
Mr. David Roeback
Mr. Julio C. Romero
Ms. Teresa Ruiz
Ms. Rebecca Saldivar
Ms. Maria Sanchez
Ms. Susie Sanchez
Ms. Isabel Sanchez
Ms. Audrea Sanchez
Ms. Amelia Sanchez
Ms. Sara Sanchez
Mr. Bob Sanders
Mrs. Socorro Sandoval
Ms. Victoria Sandoval

Mr. Nick Santangelo
Mr. Lou Santillan
Mr. Al Santillanes
Mr. Daniel Santos
Mr. Aurora Serrato
Mr. Pat Soto
Ms. Esperanza Soto
Mr. Frank Tena
Ms. Celia Torres
Ms. Ofelia Torres
Ms. Beverly Tresp
Ms. Mary Lou Trevis
Ms. Carmen Urenda
Mr. Mark Valdivia
Ms. Paulin Van Harrevelt
Mr. Salvador Varges
Mr./Ms. T. Vasquez
Ms. Virginia Vasquez
Ms. Lupe Vela
Ms. Luz Vezcaya
Mr. Juan Vidrio
Ms. Lilia Villa
Ms. Juana Villegas
Ms. Lily Villegas
Mr. Vorge Vizcaya
Ms. Vivian Voccarri
Mr. Craig Weingarten
Mr. David Wolf
Ms. Amelia Wong
Ms. Cristina Zanbrom
Mr. John Zeigler

APPENDIX 4: TUNNEL PLAN AND PROFILES



DESIGNED BY	J. AL-MASHAT
DRAWN BY	C. SHORE
CHECKED BY	J. IVYNIAN
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION

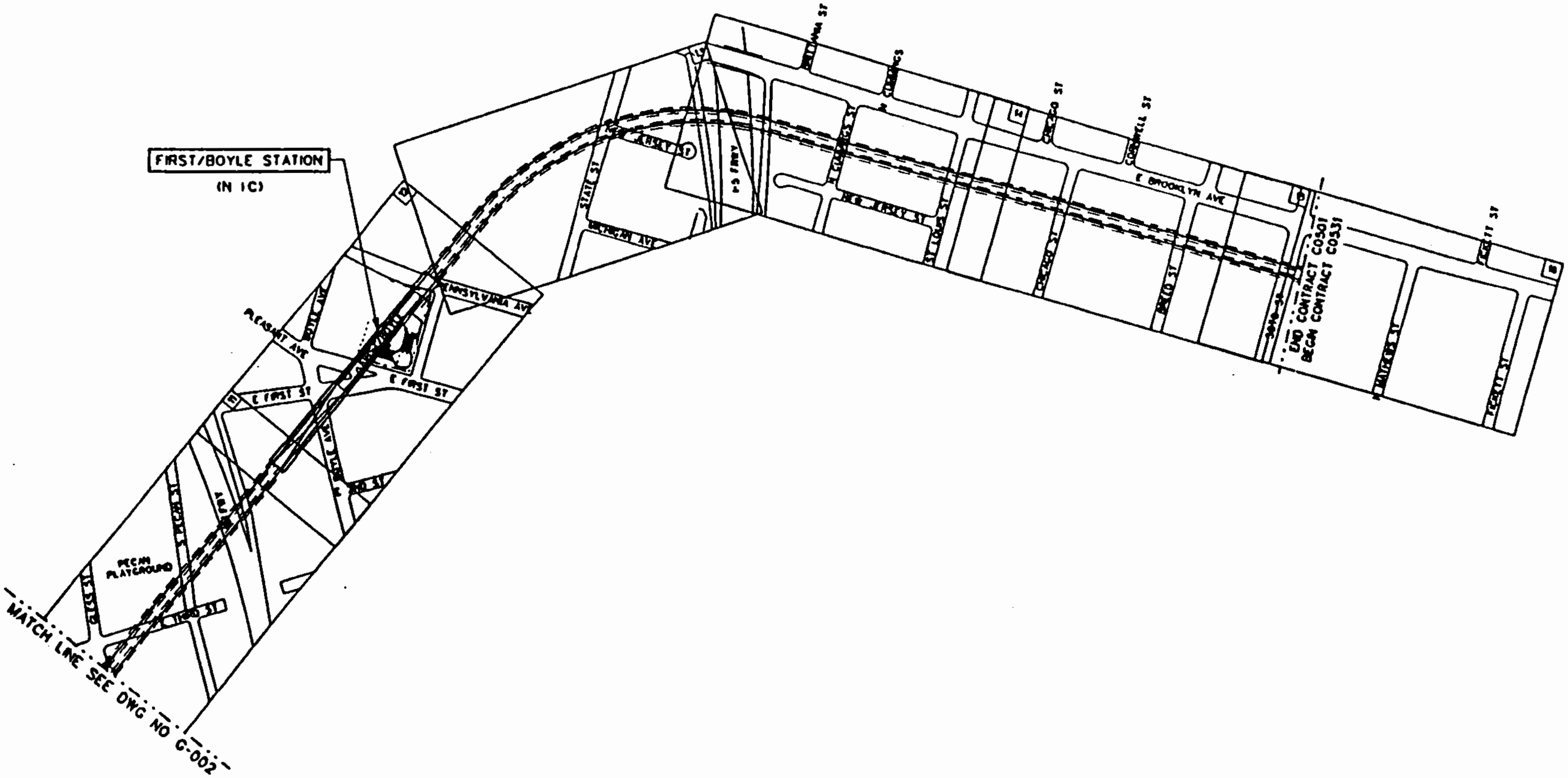
LAYOUT INDEX-SHEET 1 OF 2

CONTRACT NO	C0501
DRAWING NO	G-002
SCALE	1"-200'
SHEET NO	2

A-4.2

A-4.3

SUBJECT TO CHANGE
DURING FINAL DESIGN



DESIGNED BY	J. AL-MASHAT
DRAWN BY	C. SHORE
CHECKED BY	J. IVYNIAN
IN CHARGE	J. IVYNIAN

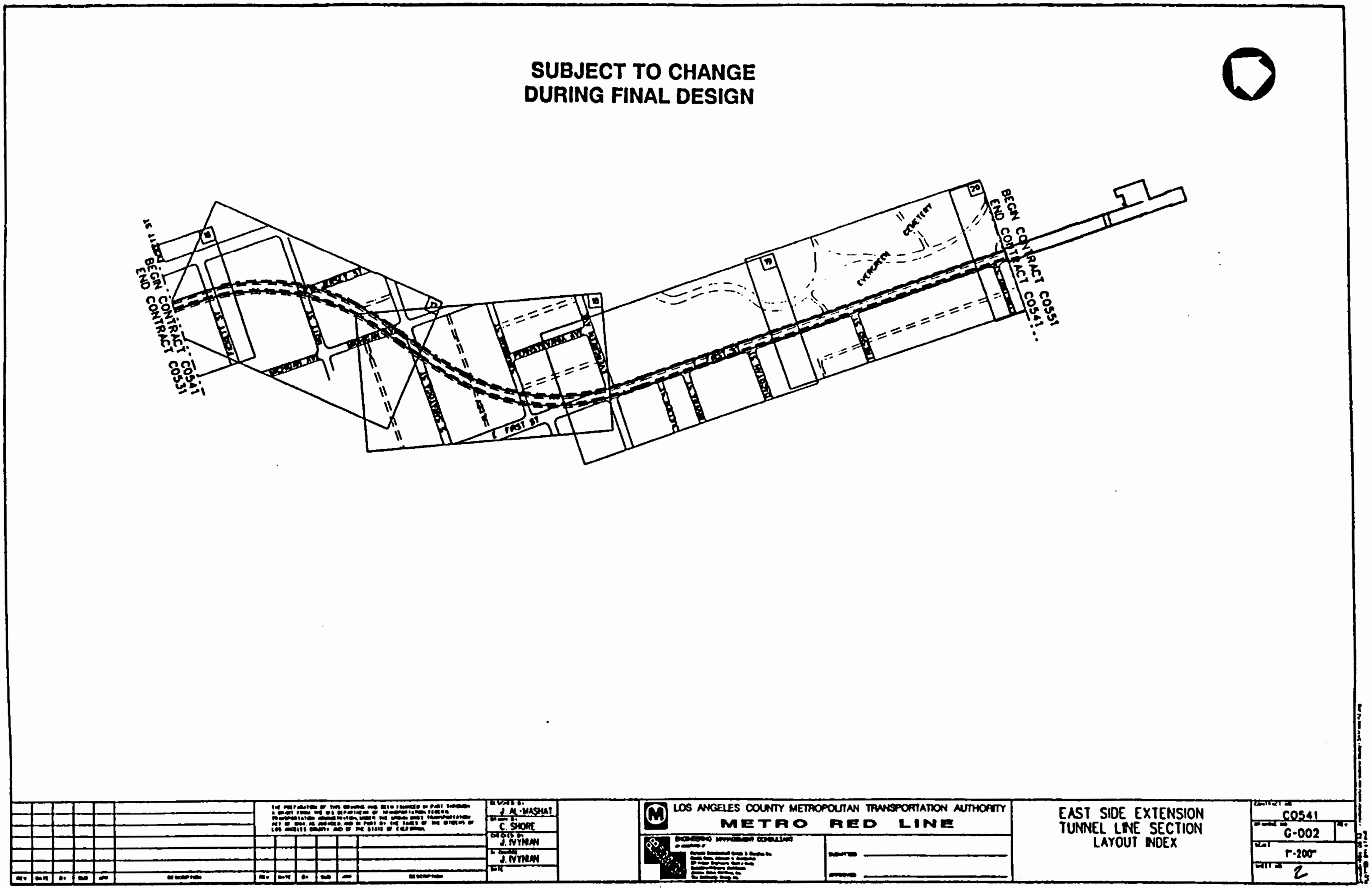
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

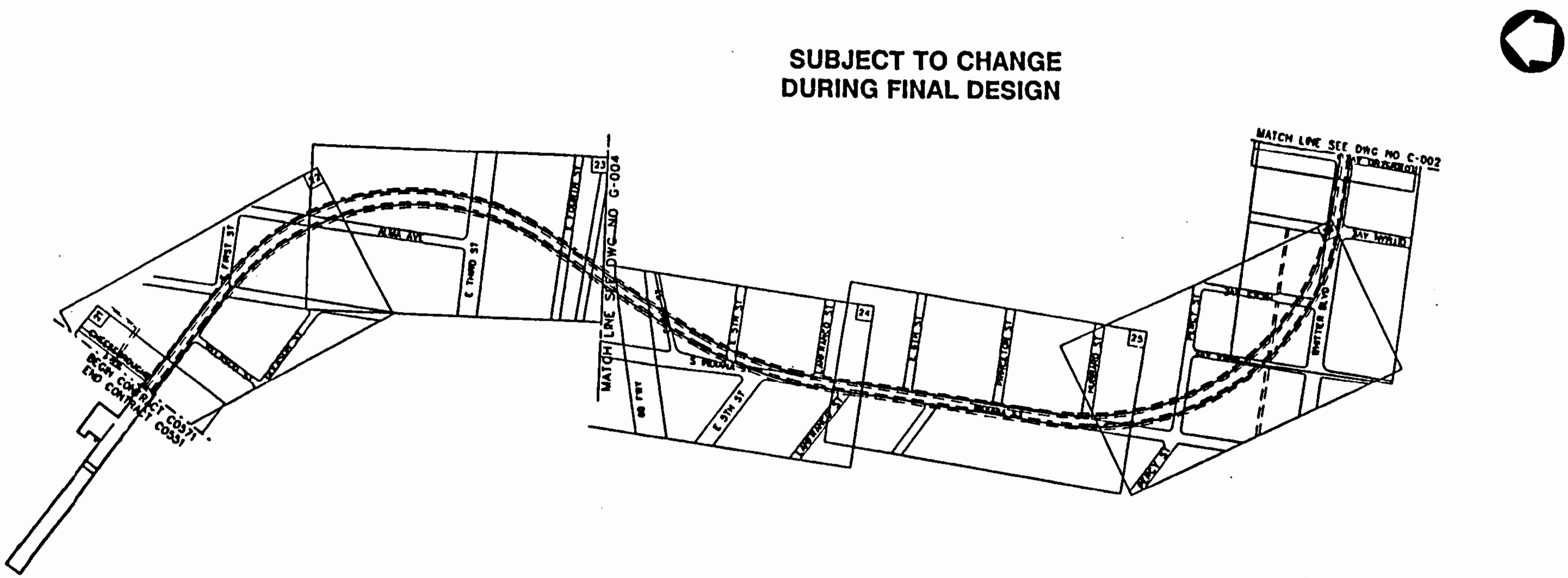
ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
LAYOUT INDEX-SHEET 2 OF 2

CONTRACT NO	C0501
DRAWING NO	G-003
SCALE	1"-200'
SHEET NO	3

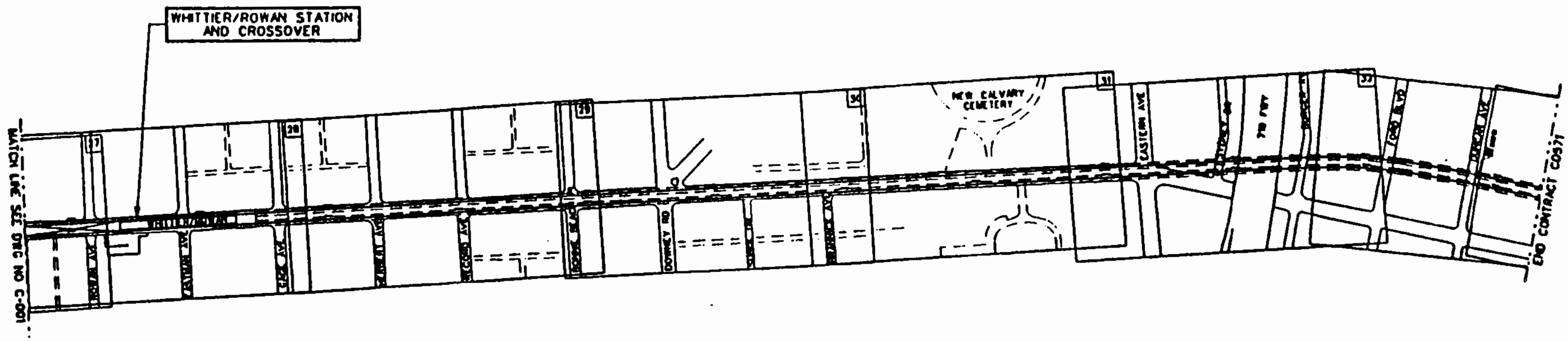

SUBJECT TO CHANGE
DURING FINAL DESIGN
BEGIN CONTRACT C0551
END CONTRACT C0541
BEGIN CONTRACT C0541
END CONTRACT C0531
EVERGREEN
CEMETERY
FIRST ST
J. AL-MASHAT
C. SHORE
J. IVYNIAN
J. IVYNIAN
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
LAYOUT INDEX
C0541
G-002
1"-200'
2

**SUBJECT TO CHANGE
DURING FINAL DESIGN**



J. AL-MASHAT	LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY METRO RED LINE	EAST SIDE EXTENSION TUNNEL LINE SECTION LAYOUT INDEX-SHEET 1 OF 2
C. SHORE		C0571
J. IVYNIAN		G-002 / 0
J. IVYNIAN		1"=200'
		2

A-4.5



SUBJECT TO CHANGE
DURING FINAL DESIGN

DESIGNED BY: J. AL-MASHAT
DRAWN BY: C. SHORE
CHECKED BY: J. IVYNIAN
J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

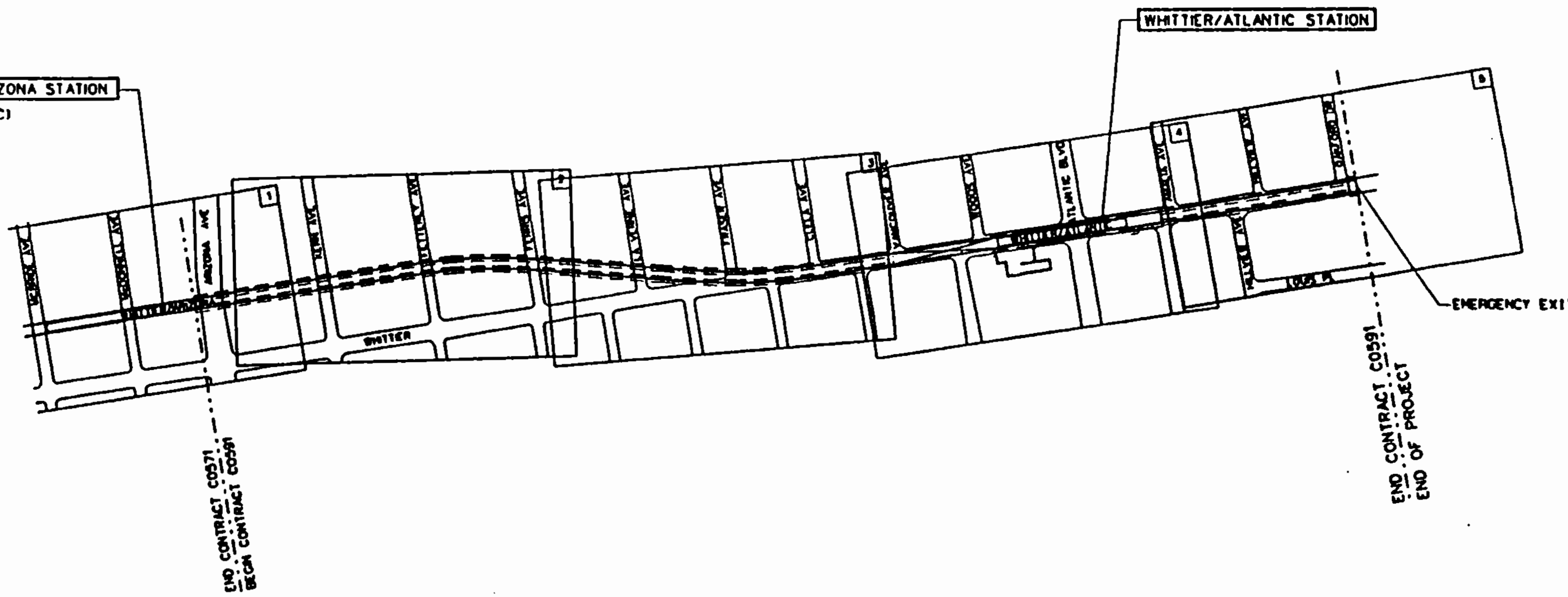
ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED
APPROVED

EAST SIDE EXTENSION
TUNNEL LINE SECTION
LAYOUT INDEX-SHEET 2 OF 2

CONTRACT NO. C0571
DRAWING NO. G-003
REV 0
SCALE 1"=200'
SHEET NO. 3

SUBJECT TO CHANGE DURING FINAL DESIGN

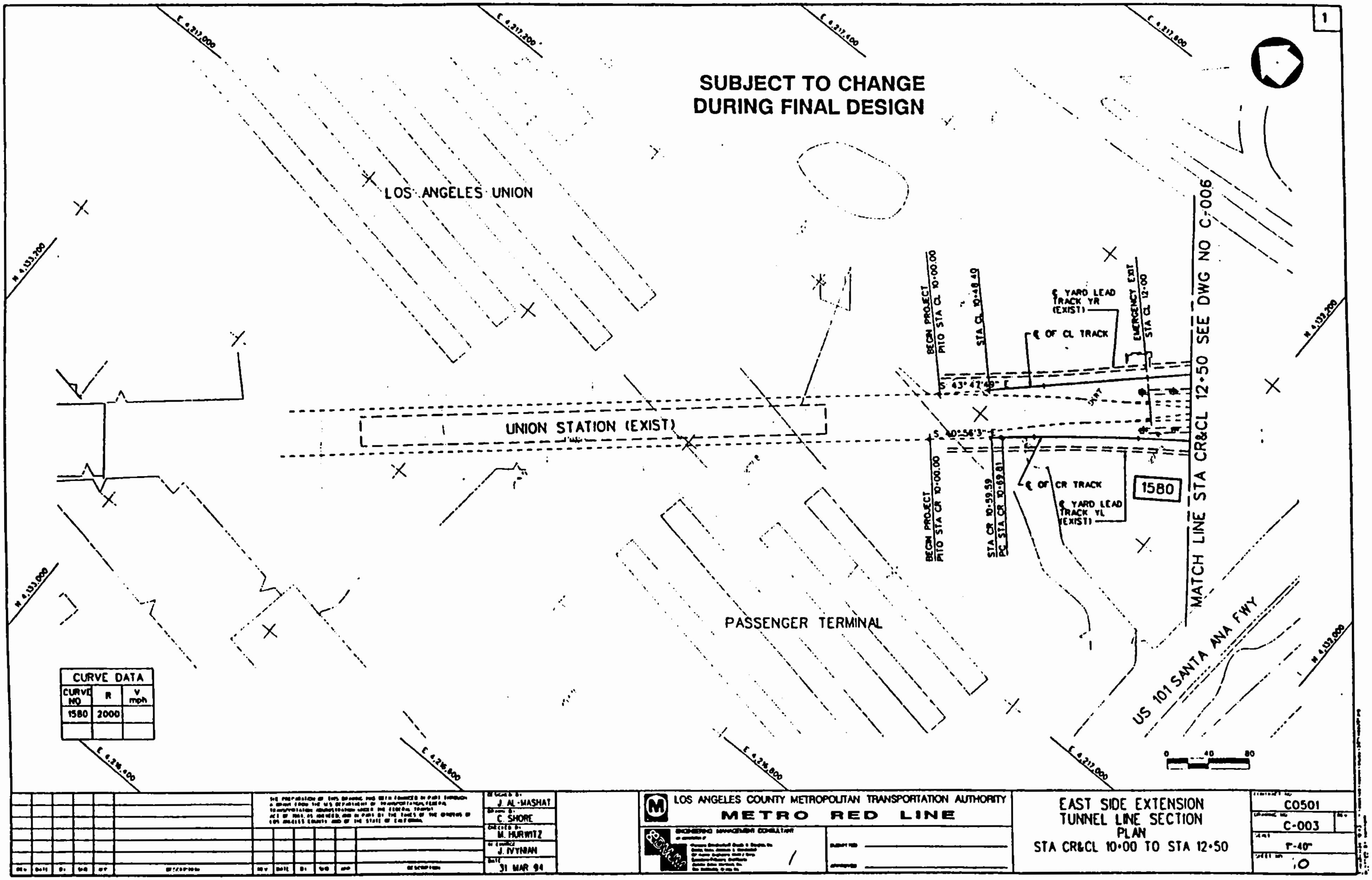


LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
LAYOUT INDEX

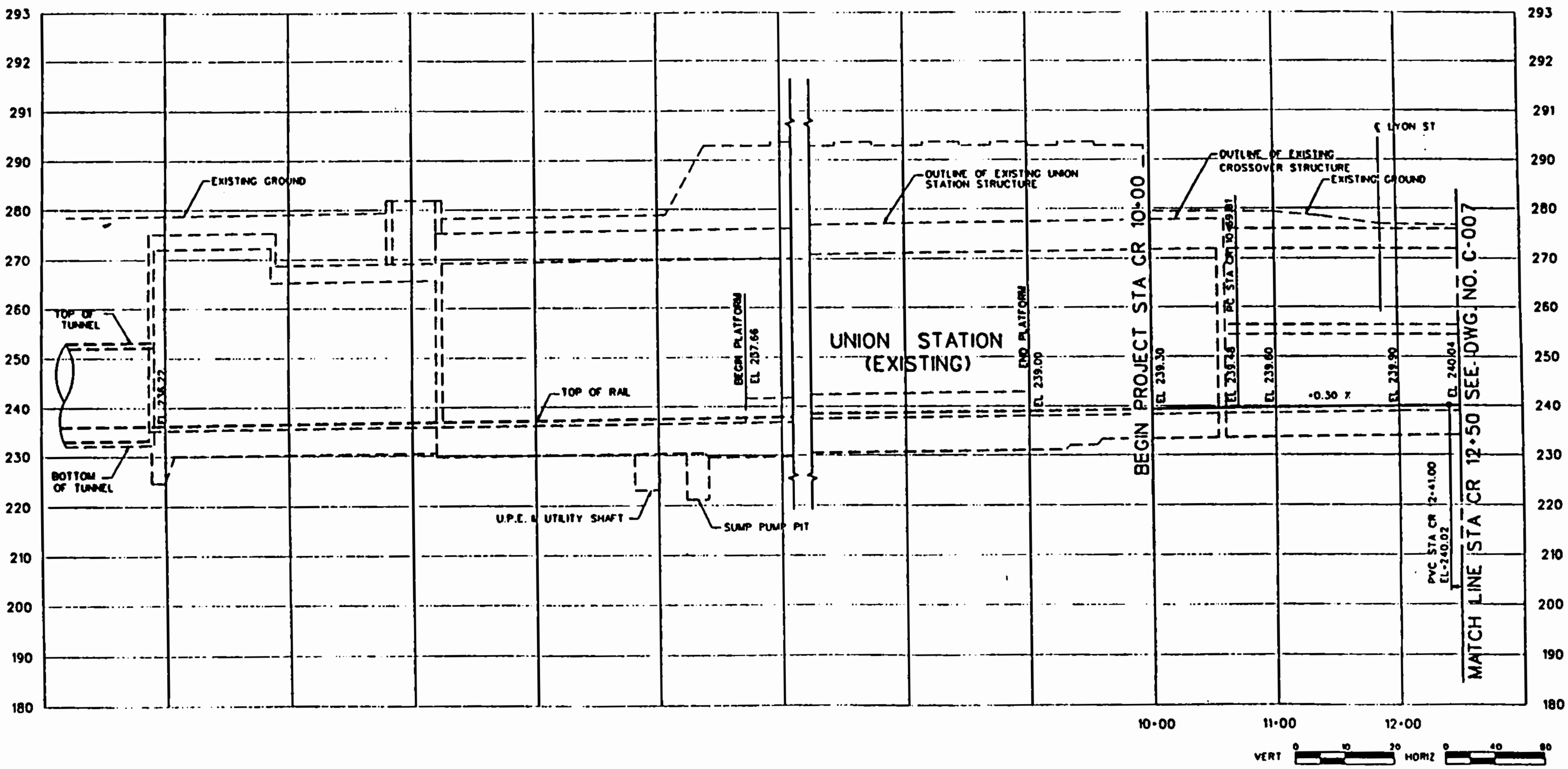
Designed by	J. AL-MASHAT
Drawn by	C. SHORE
Checked by	J. IVYNIAN
In charge	J. IVYNIAN
Contract No.	C0591
Drawing No.	G-002
Scale	1"=200'
Sheet No.	2



SUBJECT TO CHANGE
DURING FINAL DESIGN
LOS ANGELES UNION
UNION STATION (EXIST)
PASSENGER TERMINAL
US 101 SANTA ANA FWY
MATCH LINE STA CR&CL 12+50 SEE DWG NO C-006
BEGIN PROJECT PITO STA CL 10+00.00
STA CL 10+48.49
℄ YARD LEAD TRACK YR (EXIST)
℄ OF CL TRACK
EMERGENCY EXIT STA CL 12+00
BEGIN PROJECT PITO STA CR 10+00.00
STA CR 10+59.59
PC STA CR 10+69.81
℄ OF CR TRACK
℄ YARD LEAD TRACK YL (EXIST)
1580
CURVE DATA
CURVE NO
R
V mph
1580
2000
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 10+00 TO STA 12+50
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYNIAN
31 MAR 94
C0501
C-003
1"=40'
10

A-4.8

SUBJECT TO CHANGE DURING FINAL DESIGN



Designed by	M. HURWITZ
Drawn by	S. IBRAHIM
Checked by	Y. MAGNER
In charge	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

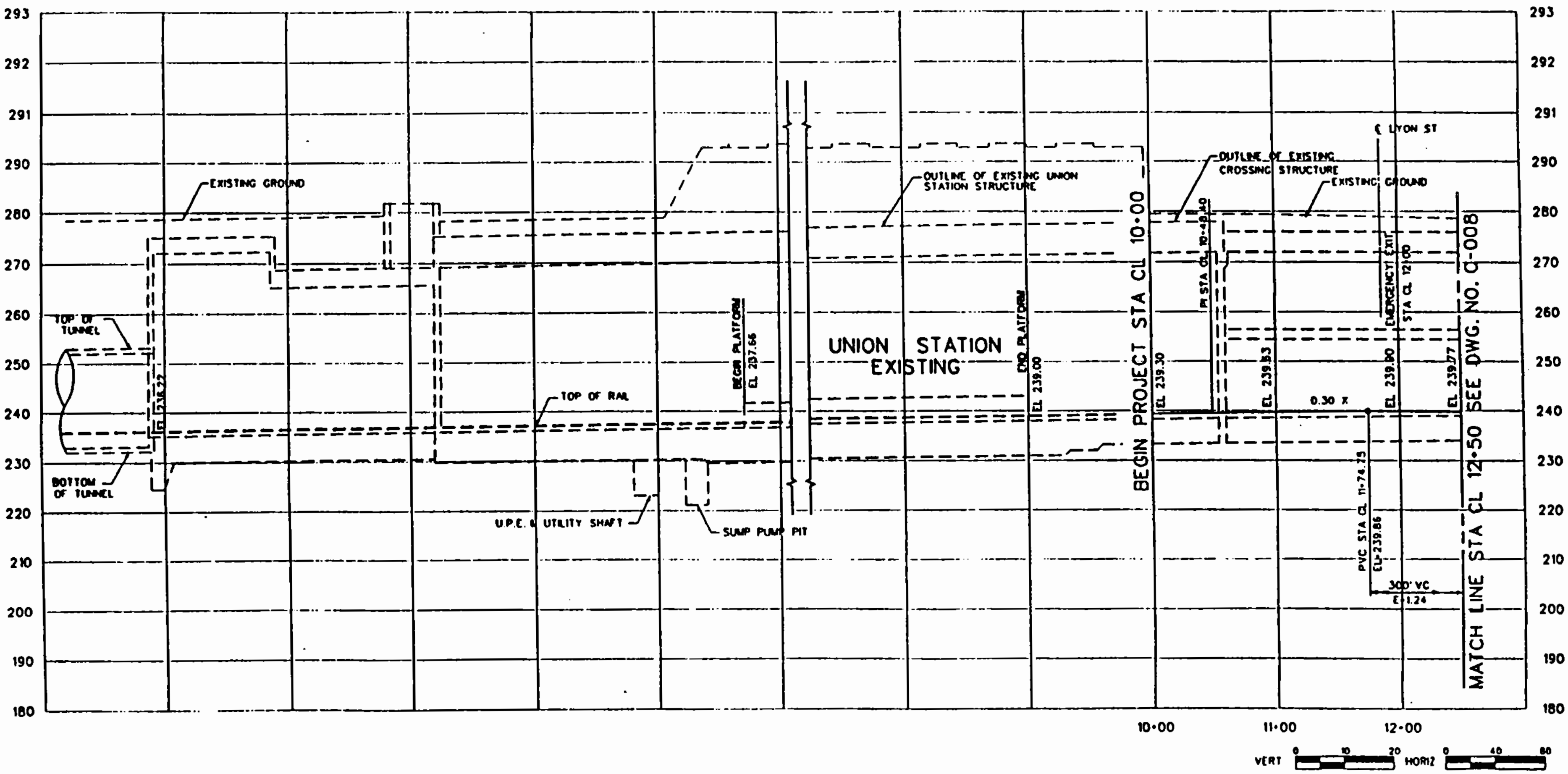
METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 10+00 TO STA CR 12+50

Contract No. C0501
Drawing No. C-004
Scale HORIZ. 1"=40' VERT. 1"=10'
Sheet No. 11

SUBJECT TO CHANGE DURING FINAL DESIGN



A-4.10

DESIGNED BY	M. HURWITZ
DRAWN BY	S. IBRAHIM
CHECKED BY	Y. MAGNER
IN CHARGE	J. IVYMAN

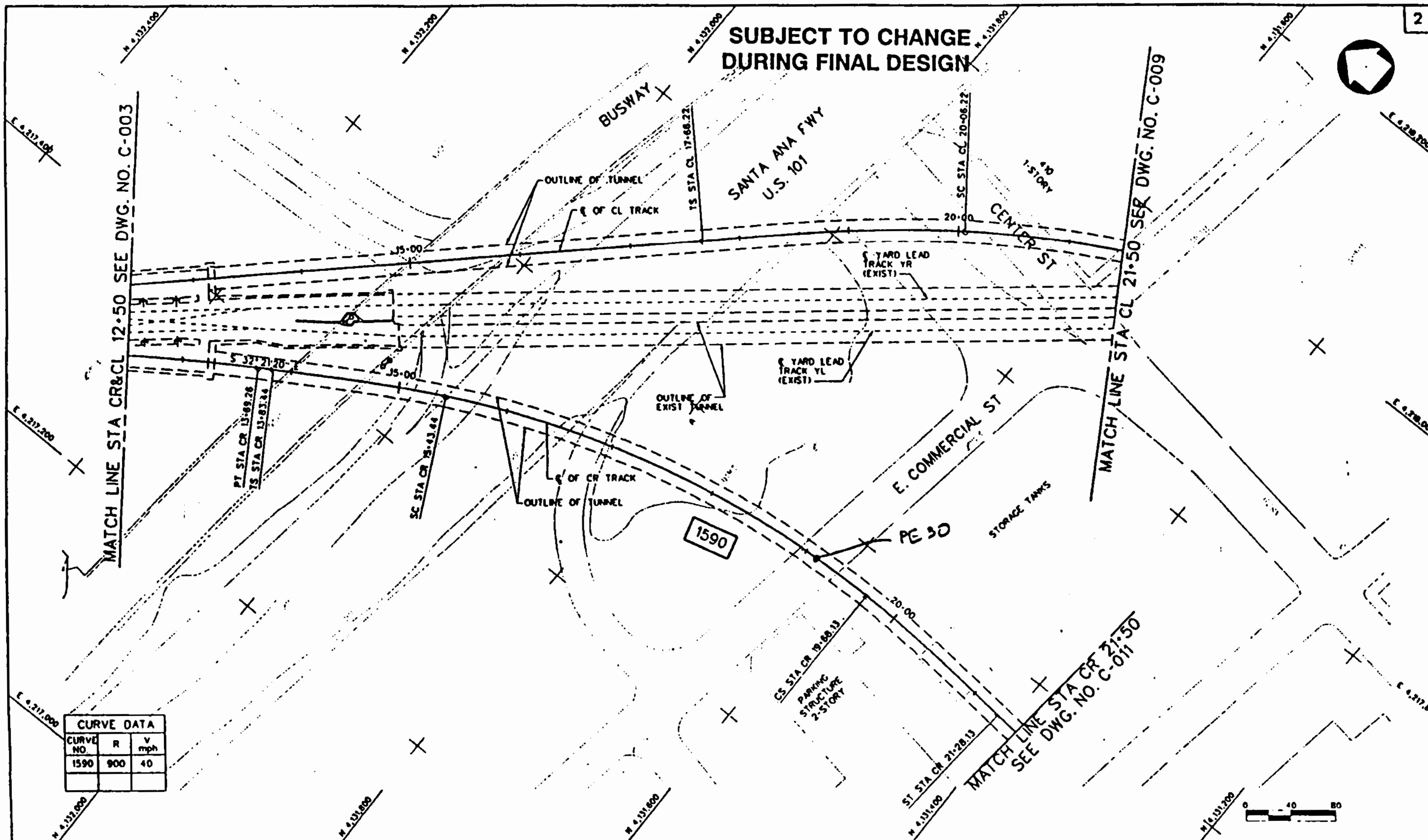
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CL 10+00 TO STA CL 12+50

CONTRACT NO.	C0501
DRAWING NO.	C-005
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	12



CURVE DATA

CURVE NO.	R	V mph
1590	900	40

A-4.11

J. AL-MASHAT
C. SHORE
M. HURWITZ
J. NYMAN
31 MAR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

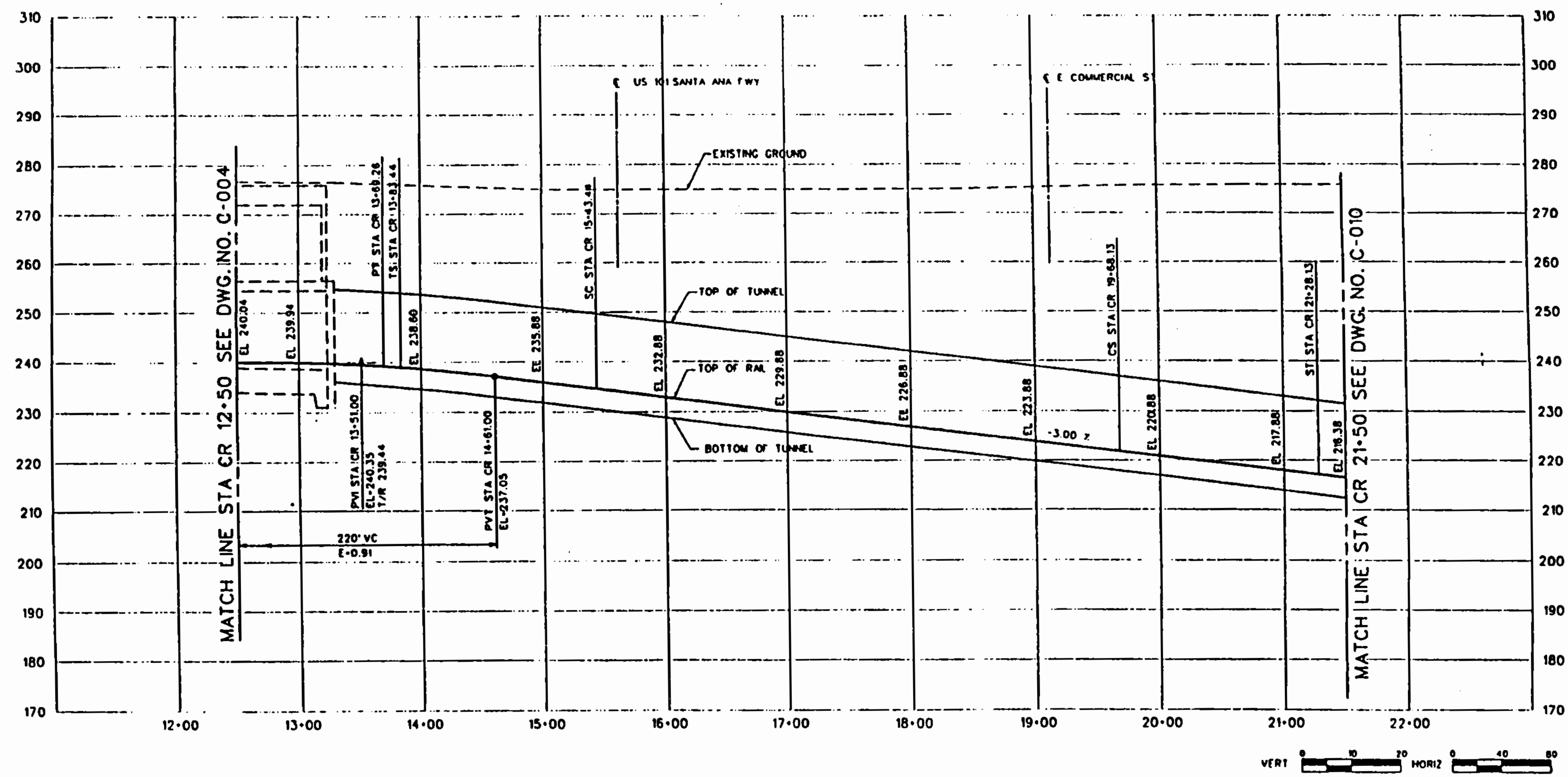
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 12+50 TO STA 21+50

C0501
C-006
1"=40'
13

A-4.12

SUBJECT TO CHANGE
DURING FINAL DESIGN



DESIGNED BY	M. HURWITZ
DRAWN BY	S. IBRAHIM
CHECKED BY	Y. WAGNER
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

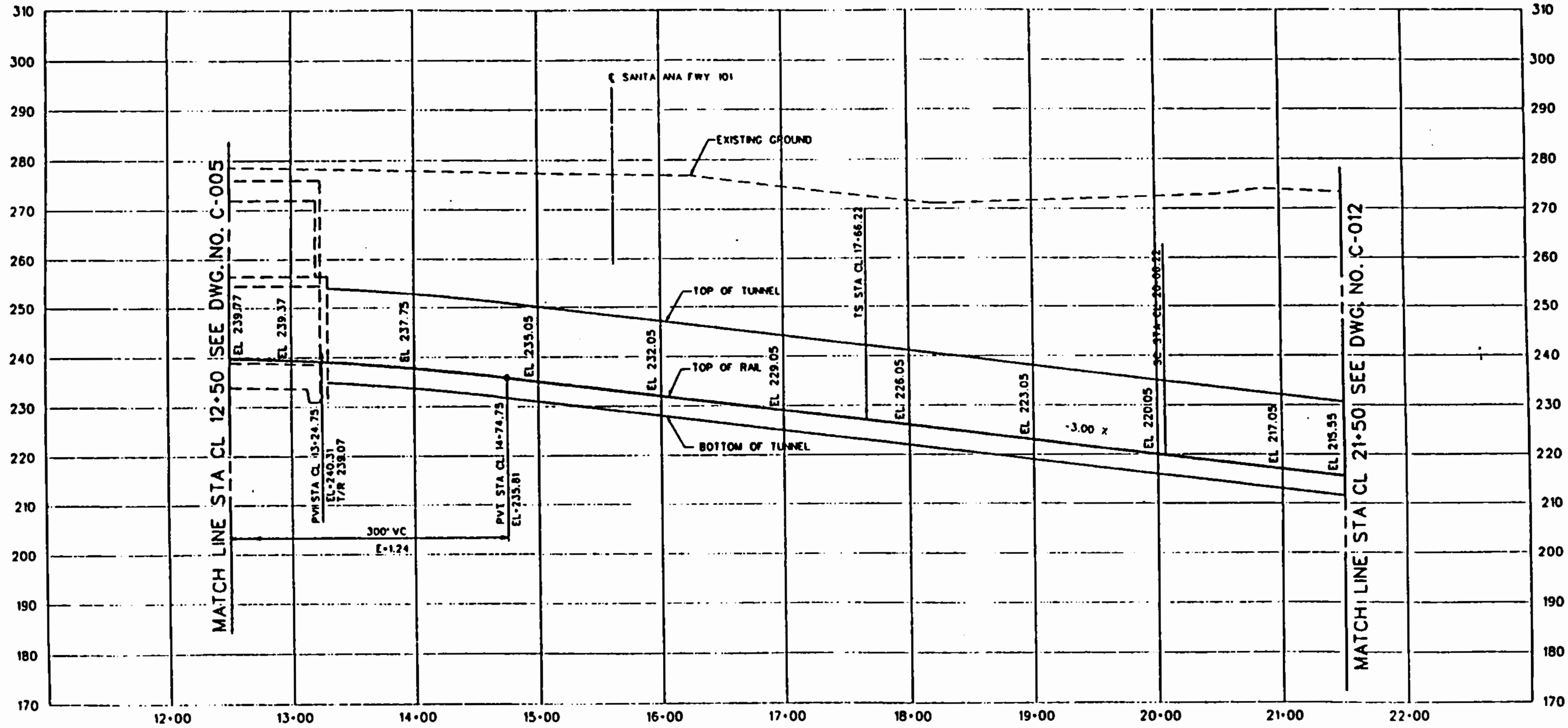
ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 12+50 TO STA 21+50

CONTRACT NO.	C0501
DRAWING NO.	C-007
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	14

A-4.13

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY	M. HURWITZ
DRAWN BY	J. TODOROV
CHECKED BY	S. IBRAHIM
IN CHARGE	J. IVYMAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

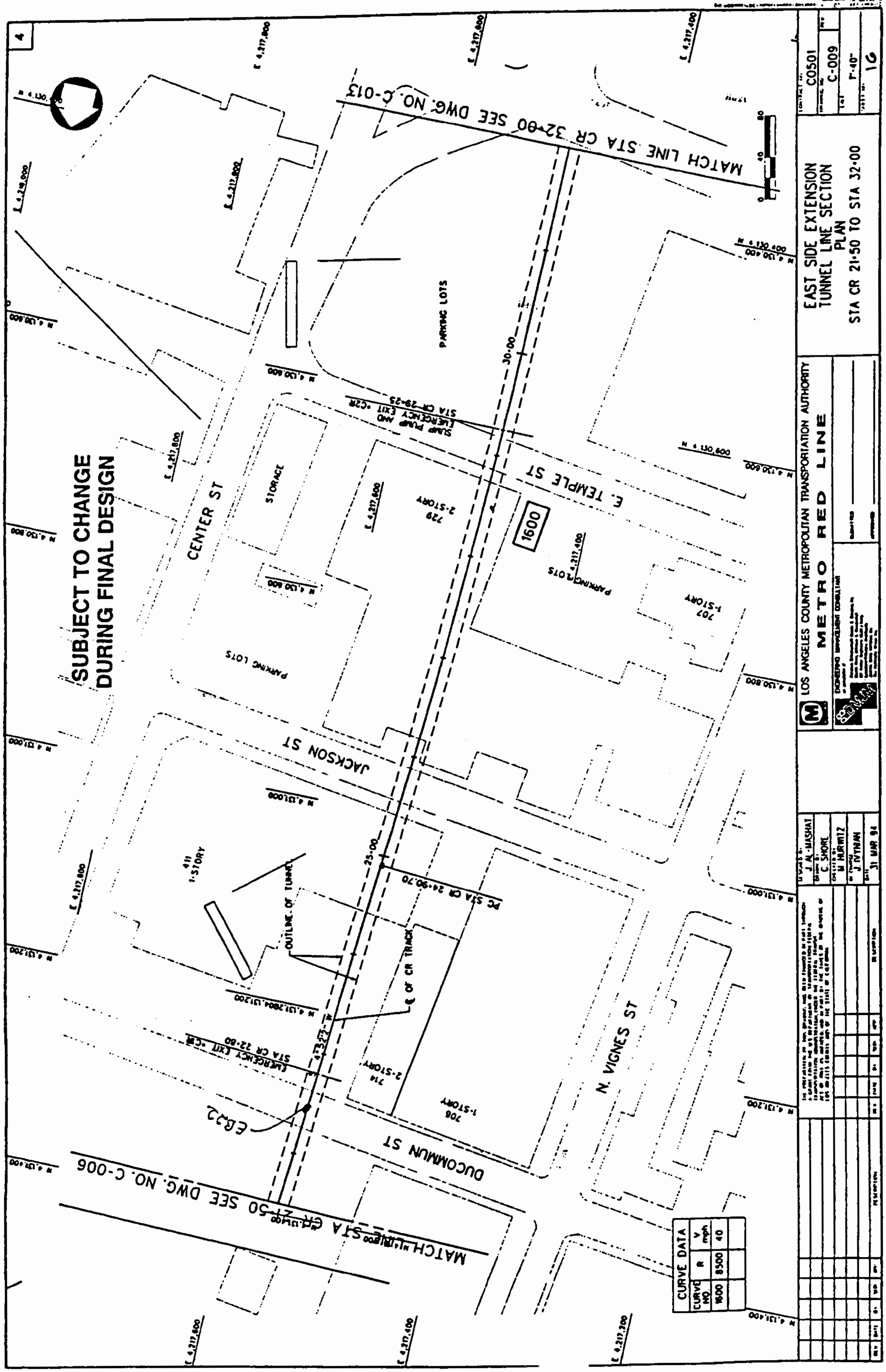
ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED

APPROVED

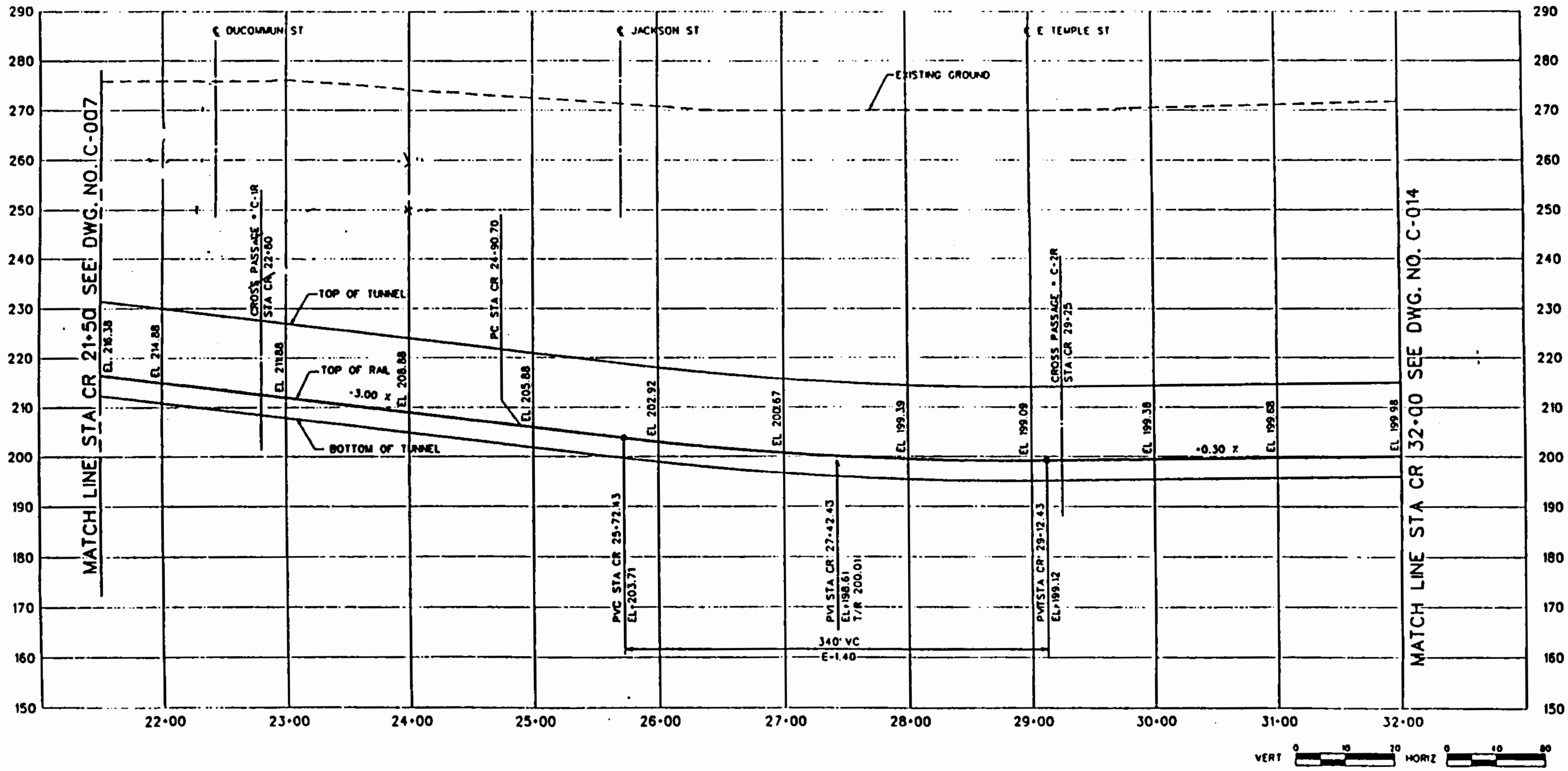
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CL 12+50 TO STA 21+50

CONTRACT NO.	C0501
DRAWING NO.	C-008
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	15


SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE STA CR 32+00 SEE DWG. NO. C-013
MATCH LINE STA CR 21+50 SEE DWG. NO. C-006
CENTER ST
E. TEMPLE ST
JACKSON ST
N. VIGNES ST
DUCOMMUN ST
PARKING LOTS
STORAGE
OUTLINE OF TUNNEL
℄ OF CR TRACK
1600
CURVE DATA
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR 21+50 TO STA 32+00
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
C0501
C-009
31 MAR 94

A-4.15

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY	F. FAZELI
DRAWN BY	S. IBRAHIM
CHECKED BY	M. HURWITZ
IN CHARGE	J. IVYNIAN

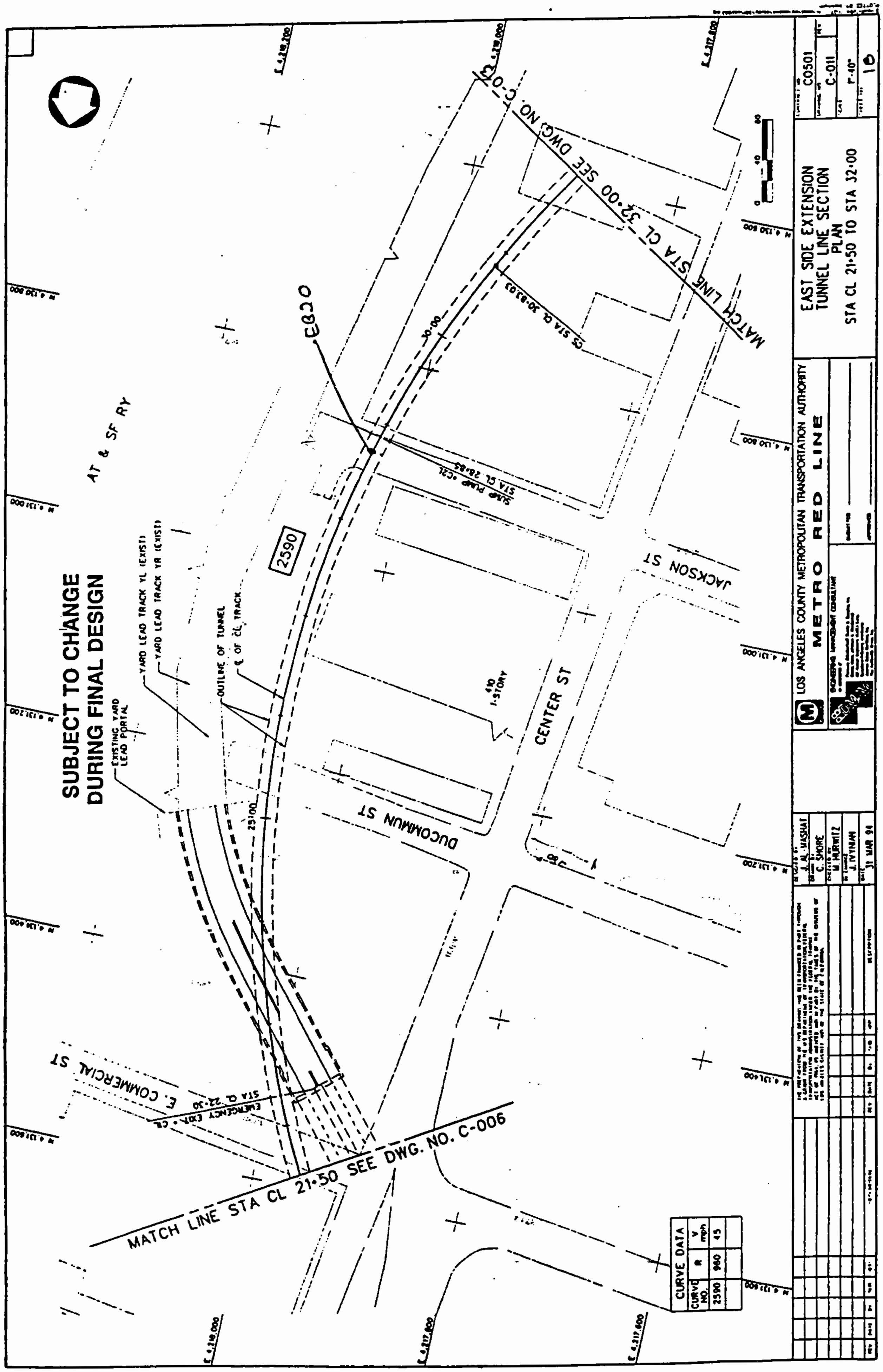
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

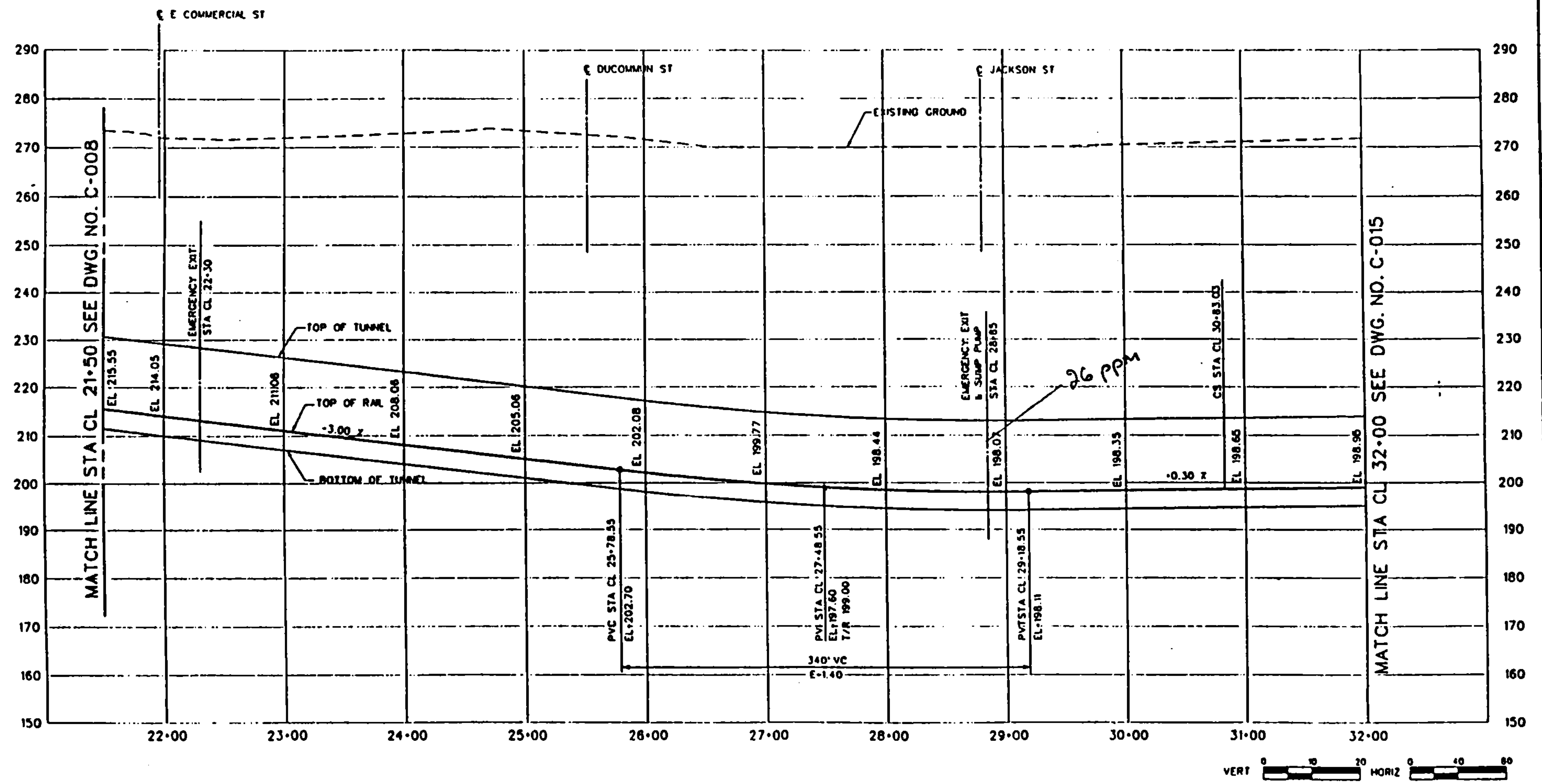
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 21+50 TO STA CR 32+00

CONTRACT NO.	C0501
DRAWING NO.	C-010
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	17


SUBJECT TO CHANGE
DURING FINAL DESIGN
AT & SF RY
EXISTING YARD LEAD PORTAL
YARD LEAD TRACK YL (EXIST)
YARD LEAD TRACK YR (EXIST)
OUTLINE OF TUNNEL
℄ OF CL TRACK
2590
SUMP PUMP •CZL
STA CL 28+85
STA CL 30+83.03
EB20
MATCH LINE STA CL 32+00 SEE DWG. NO. C-011
MATCH LINE STA CL 21+50 SEE DWG. NO. C-006
STA CL 22+30
EMERGENCY EXIT • CL
E. COMMERCIAL ST
DUCOMMUN ST
CENTER ST
JACKSON ST
410
1-STORY
25+00
30+00
CURVE DATA
CURVE NO. | R | V mph
2590 | 960 | 45
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CL 21+50 TO STA 32+00
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
C0501
C-011
1"=40'
16
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. LYNHAM
31 MAR 94

A-4.17

SUBJECT TO CHANGE DURING FINAL DESIGN



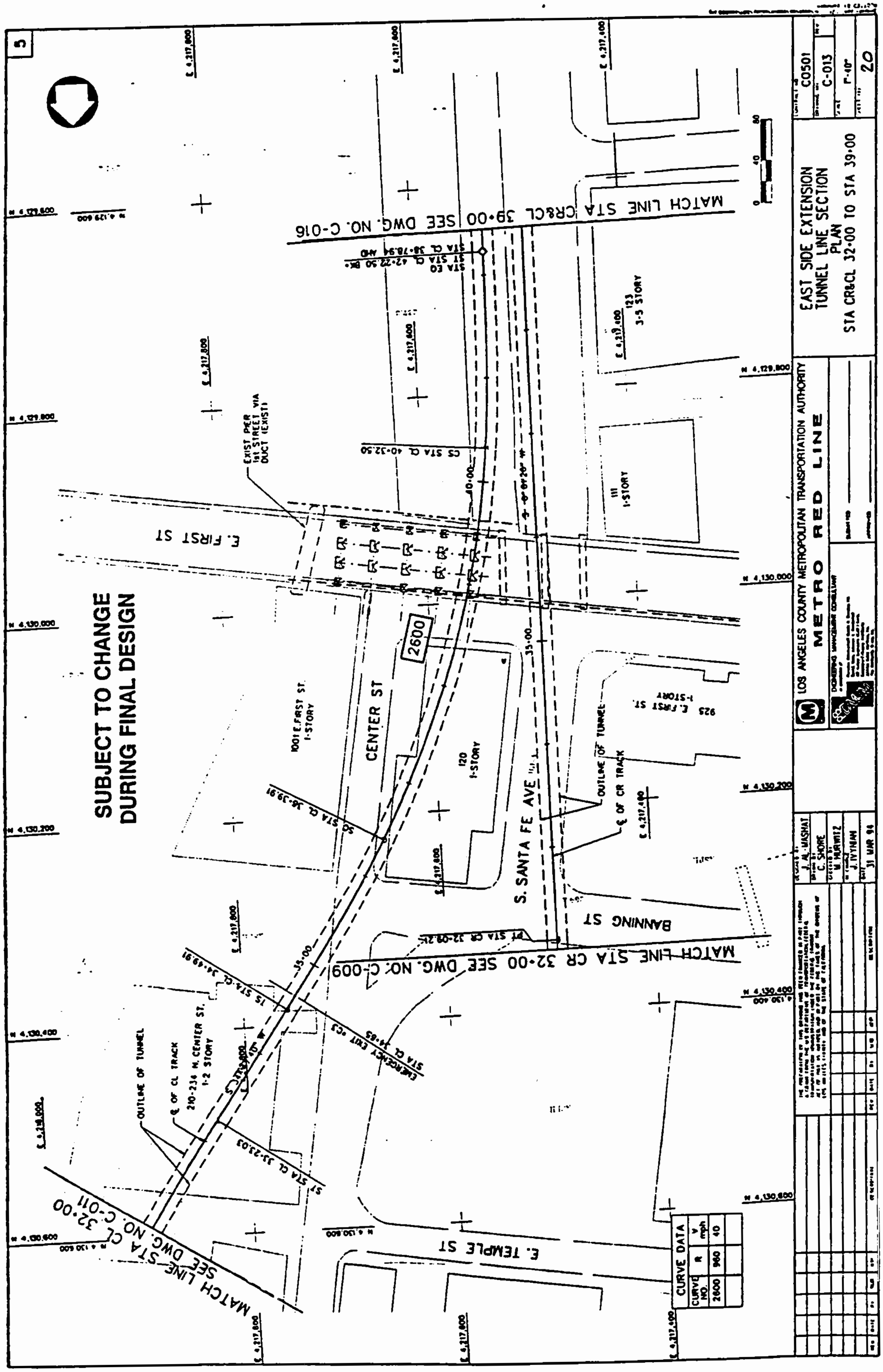
DESIGNED BY: M. HURWITZ
DRAWN BY: S. IBRAHIM
CHECKED BY: S. IBRAHIM
IN CHARGE: J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

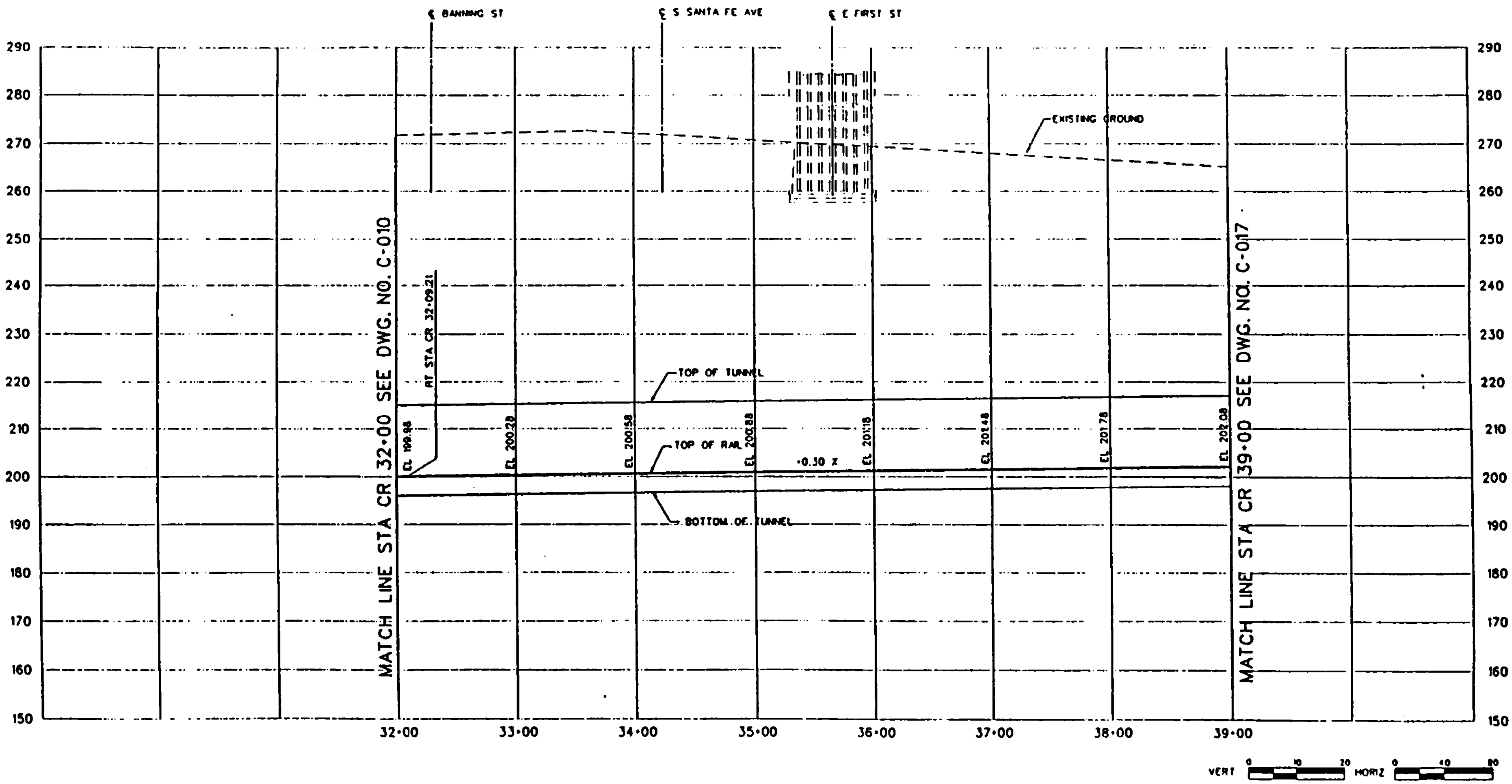
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CL 21+50 TO STA CL 32+00

CONTRACT NO. C0501
DRAWING NO. C-012
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 19


SUBJECT TO CHANGE DURING FINAL DESIGN
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 32+00 TO STA 39+00
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
C0501
C-013
20
MATCH LINE STA CR&CL 39+00 SEE DWG. NO. C-016
MATCH LINE STA CR 32+00 SEE DWG. NO. C-009
MATCH LINE STA CL 32+00 SEE DWG. NO. C-011
E. FIRST ST
CENTER ST
S. SANTA FE AVE
BANNING ST
E. TEMPLE ST
2600
EXIST PIER 1st STREET VIA DUCT (EXIST)
OUTLINE OF TUNNEL
℄ OF CR TRACK
℄ OF CL TRACK
EMERGENCY EXIT #C3
1001 E. FIRST ST. 1-STORY
120 1-STORY
111 1-STORY
123 3-5 STORY
925 E. FIRST ST. 1-STORY
210-234 N. CENTER ST. 1-2 STORY
CURVE DATA
CURVE NO. | R | V mph
2600 | 960 | 40
J. AL-HASHAT
C. SHORE
M. HURWITZ
31 MAR 94

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY F. FAZELI
DRAWN BY S. EBRAHIM
CHECKED BY M. HURWITZ
IN CHARGE J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

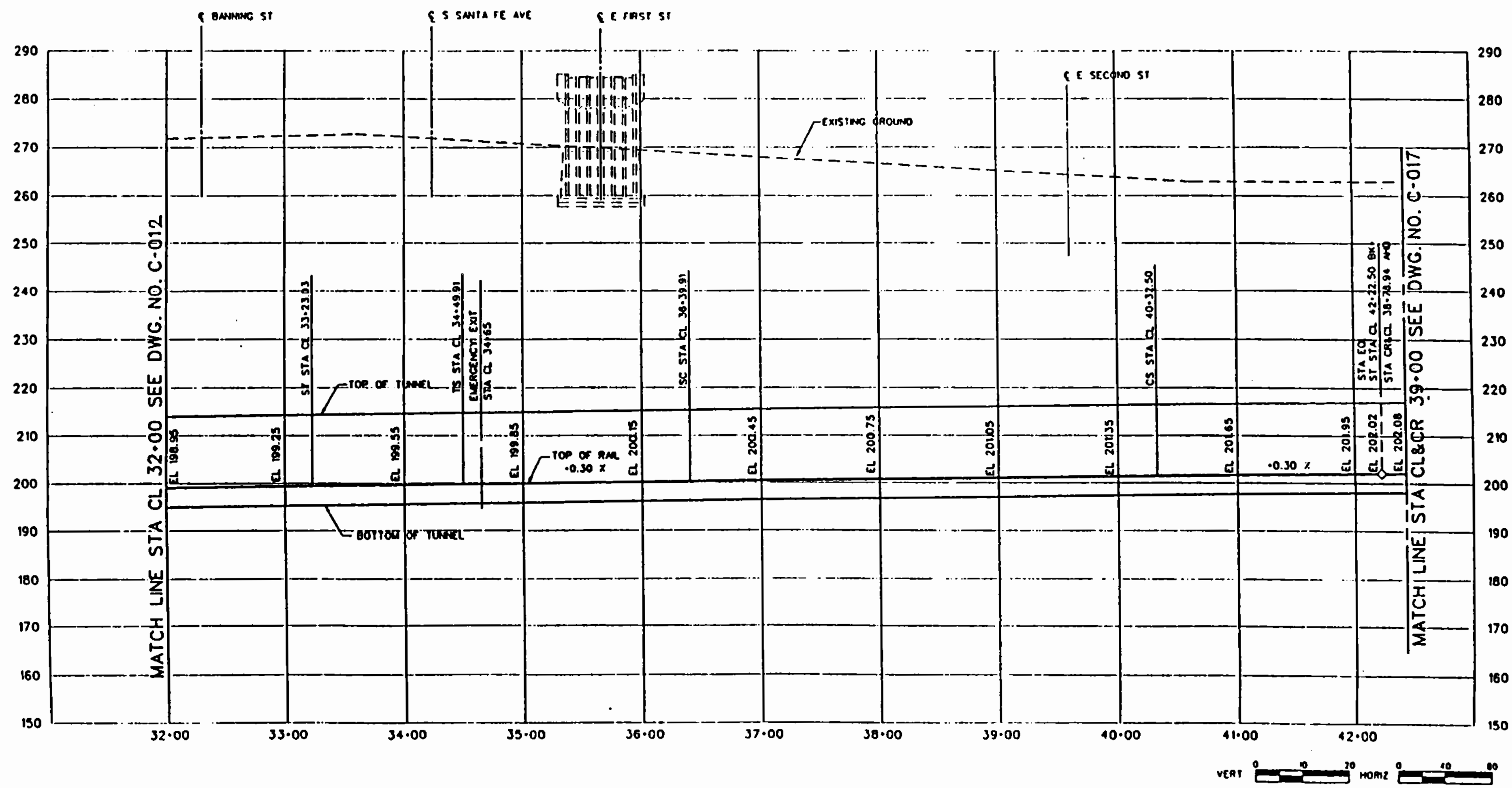
ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 32+00 TO STA CR 39+00

CONTRACT NO. C0501
DRAWING NO. C-014
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 21

A-4.20

SUBJECT TO CHANGE DURING FINAL DESIGN



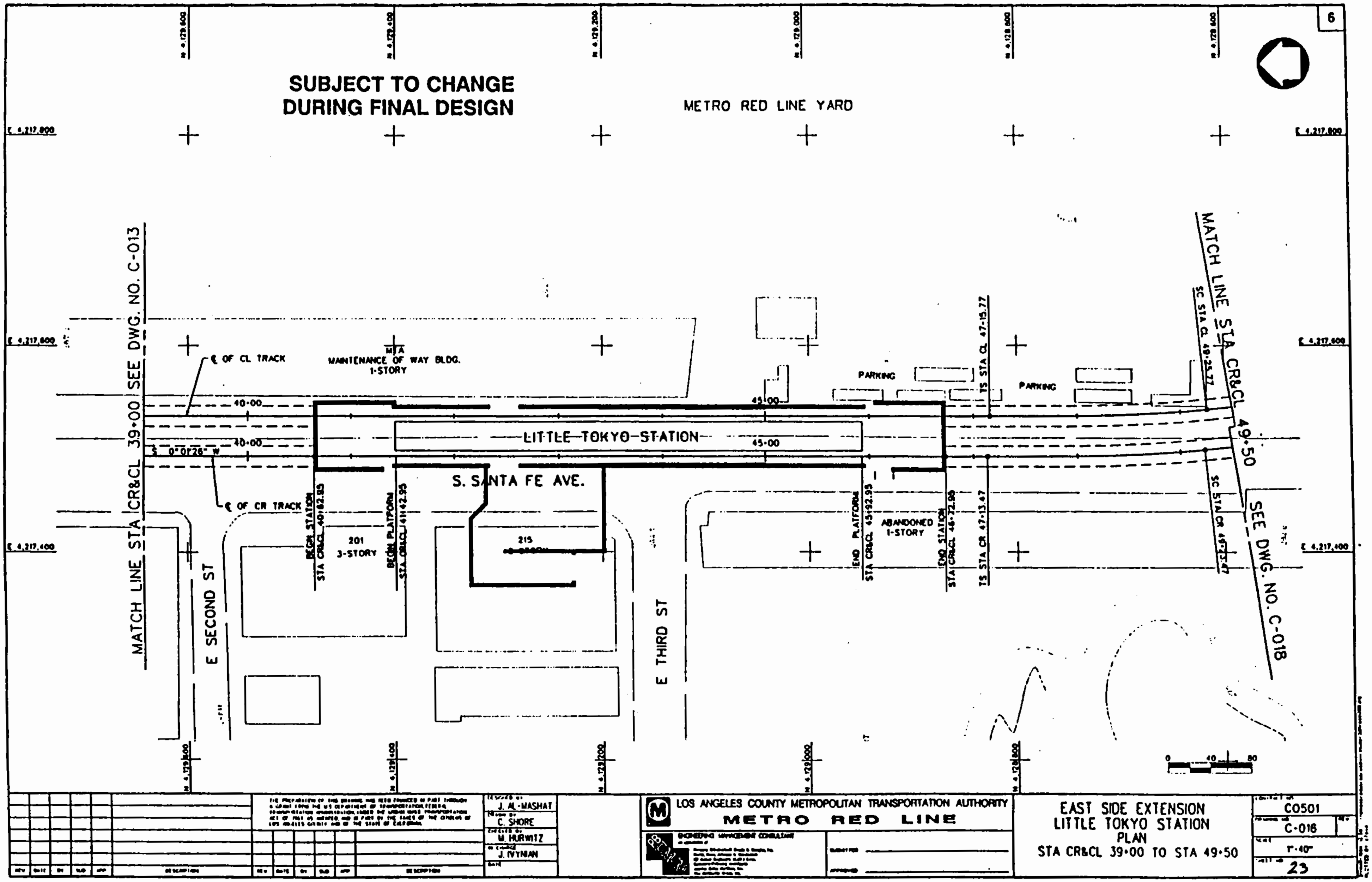
DESIGNED BY	M. HURWITZ
DRAWN BY	S. IBRAHIM
CHECKED BY	Y. MAGNER
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CL 32+00 TO STA CR 39+00

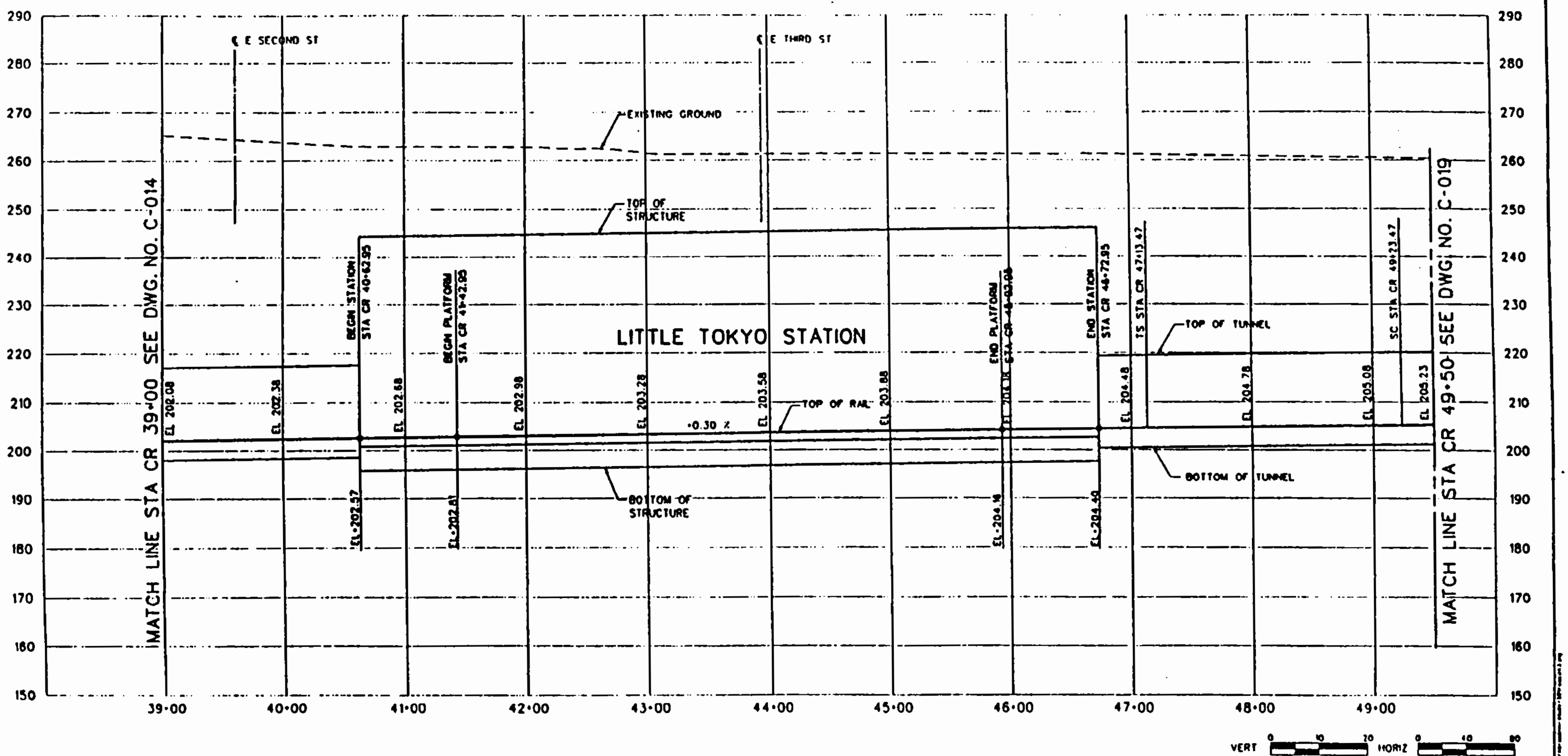
CONTRACT NO.	C0501
DRAWING NO.	C-015
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	22



SUBJECT TO CHANGE
DURING FINAL DESIGN
METRO RED LINE YARD
MATCH LINE STA CR&CL 39+00 SEE DWG. NO. C-013
MATCH LINE STA CR&CL 49+50 SEE DWG. NO. C-018
℄ OF CL TRACK
℄ OF CR TRACK
MTA
MAINTENANCE OF WAY BLDG.
1-STORY
LITTLE TOKYO STATION
S. SANTA FE AVE.
E SECOND ST
E THIRD ST
201
3-STORY
215
PARKING
ABANDONED
1-STORY
BEGIN STATION
BEGIN PLATFORM
END PLATFORM
END STATION
40+00
45+00
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
ENGINEERING MANAGEMENT CONSULTANT
EAST SIDE EXTENSION
LITTLE TOKYO STATION
PLAN
STA CR&CL 39+00 TO STA 49+50
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYNAN
C0501
C-016
1"=40'
23
6

A-4.21

SUBJECT TO CHANGE
DURING FINAL DESIGN



DESIGNED BY	M. HURWITZ
DRAWN BY	S. EBRAHIM
CHECKED BY	S. EBRAHIM
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 39+00 TO STA CR 49+50

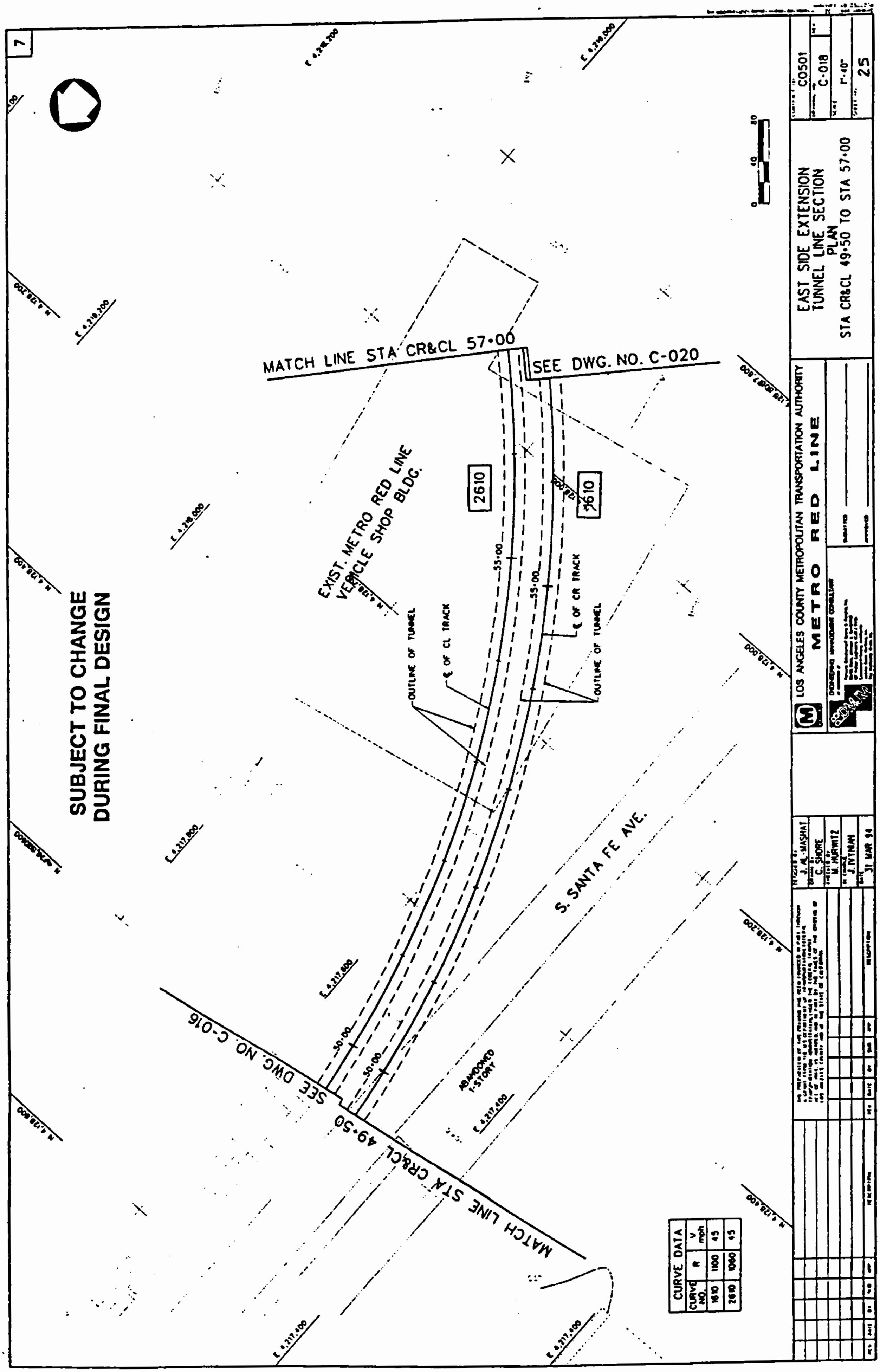
CONTRACT NO. C0501

DRAWING NO. C-017

SCALE HORIZ. 1"=40' VERT. 1"=10'

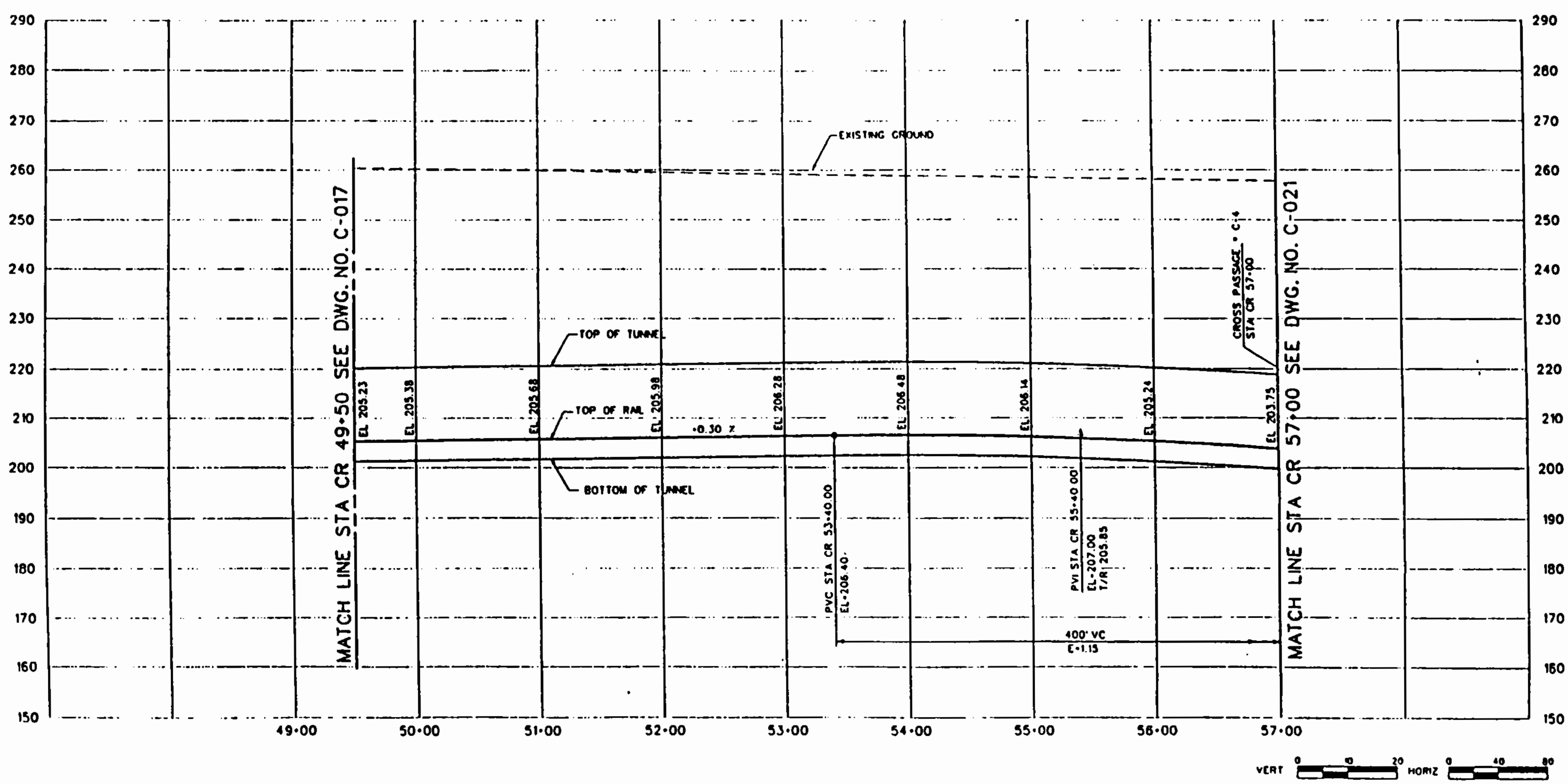
SHEET NO. 24

A-4.22



SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE STA CR&CL 57+00
SEE DWG. NO. C-020
MATCH LINE STA CR&CL 49+50
SEE DWG. NO. C-016
EXIST. METRO RED LINE
VEHICLE SHOP BLDG.
S. SANTA FE AVE.
2610
1610
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
ABANDONED
1-STORY
CURVE DATA
CURVE NO.
R
V mph
1610
1100
45
2610
1060
45
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 49+50 TO STA 57+00
C0501
C-018
1"=40'
25
J. AL-WASHAT
C. SHORE
M. HURWITZ
J. NYINAN
31 MAR 94

SUBJECT TO CHANGE
DURING FINAL DESIGN

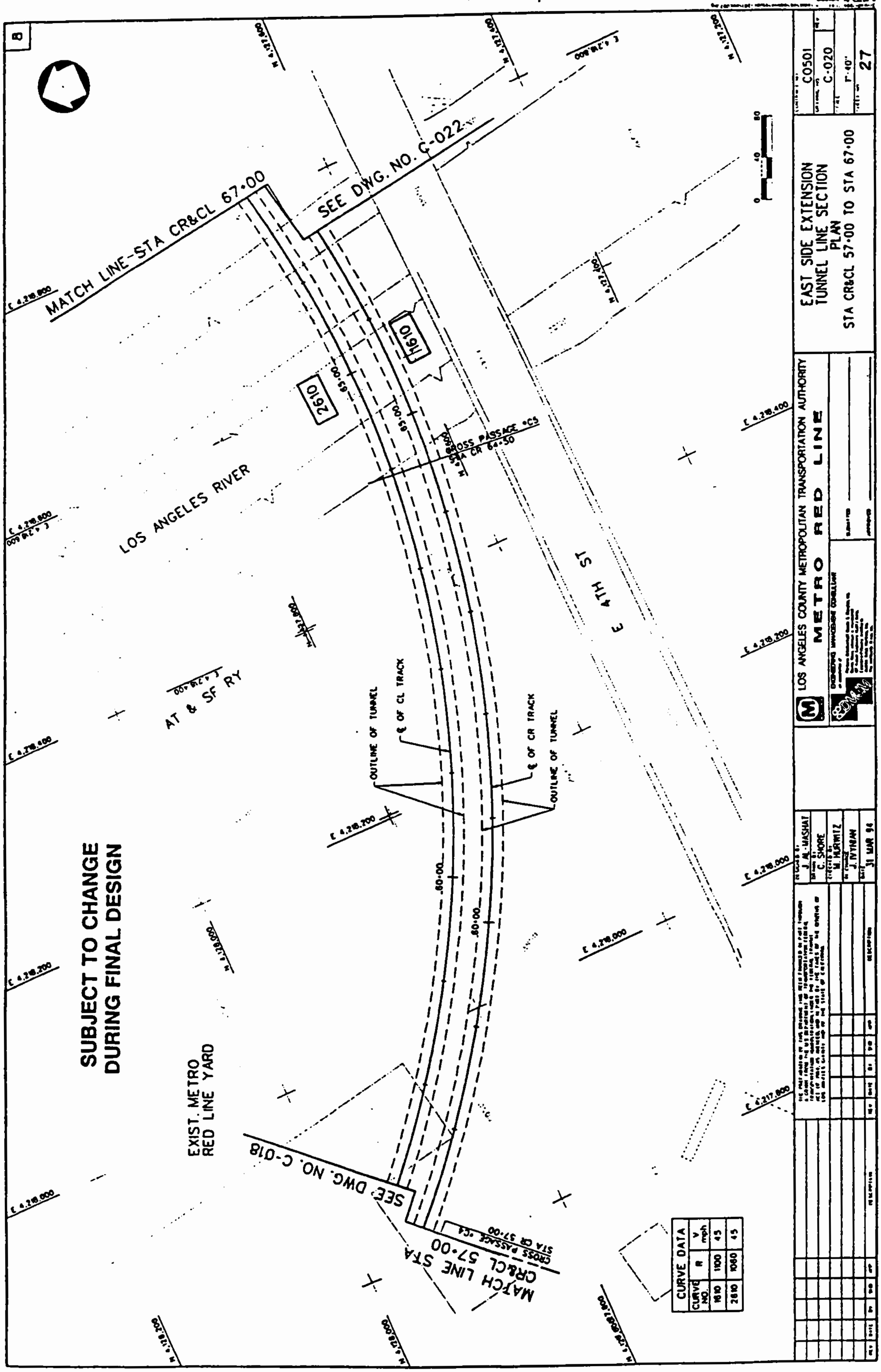


DESIGNED BY	Y. MACNER
DRAWN BY	J. TODOROV
CHECKED BY	S. IBRAHIM
IN CHARGE	J. IVYMAN

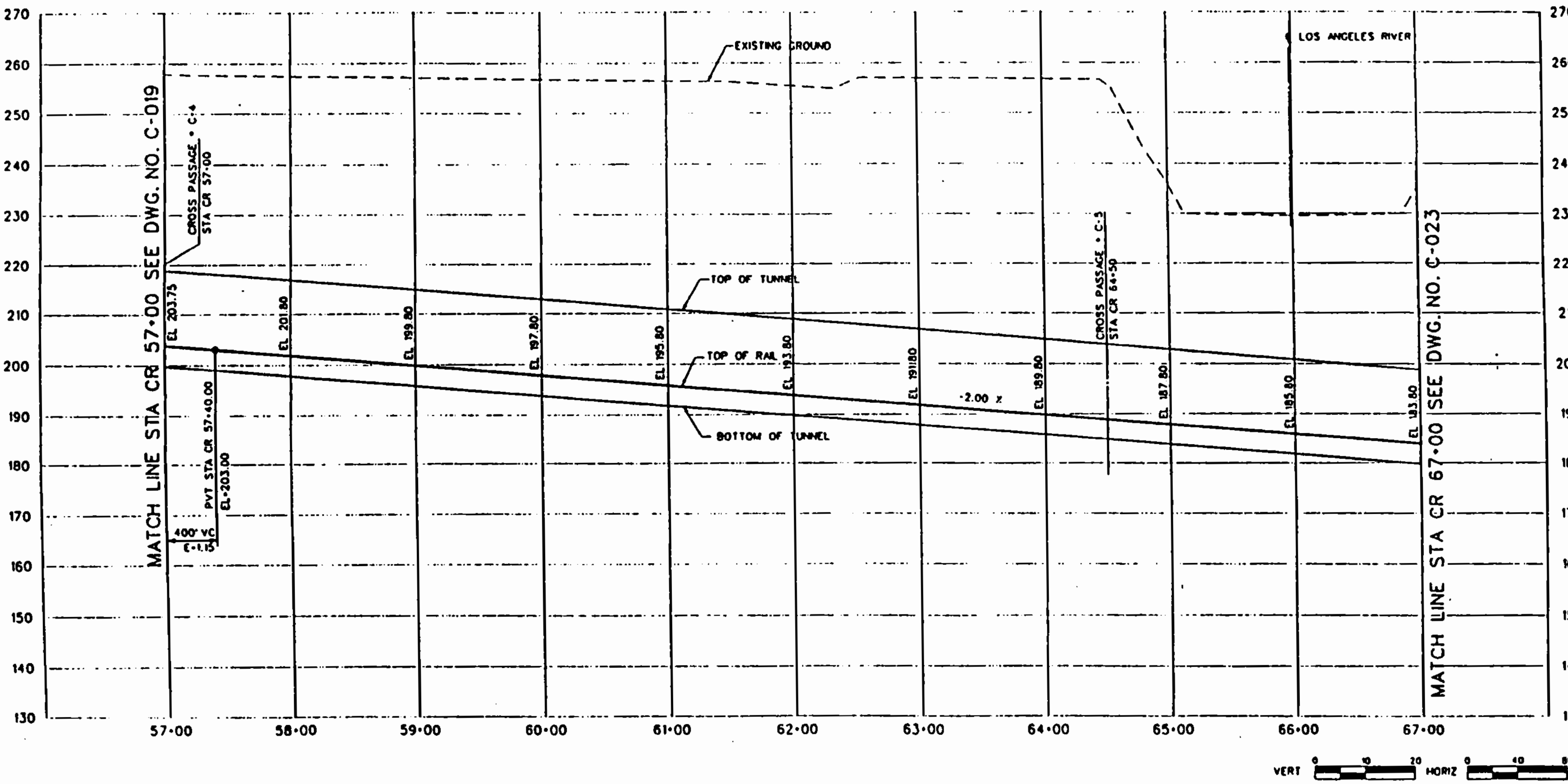
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 49+50 TO STA CR 57+00

C0501
C-019
HORIZ. 1"=40'
VERT. 1"=10'
26


SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE-STA CR&CL 67+00
SEE DWG. NO. C-022
SEE DWG. NO. C-018
MATCH LINE STA CR&CL 57+00
CROSS PASSAGE #C4
STA CR 57+00
CROSS PASSAGE #C5
STA CR 64+50
LOS ANGELES RIVER
AT & SF RY
E 4TH ST
EXIST. METRO
RED LINE YARD
2610
1610
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
OUTLINE OF TUNNEL
CURVE DATA
CURVE NO. | R | V mph
1610 | 1100 | 45
2610 | 1060 | 45
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 57+00 TO STA 67+00
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. TYTHAN
31 MAR 94
C0501
C-020
1"=40'
27

SUBJECT TO CHANGE
DURING FINAL DESIGN



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

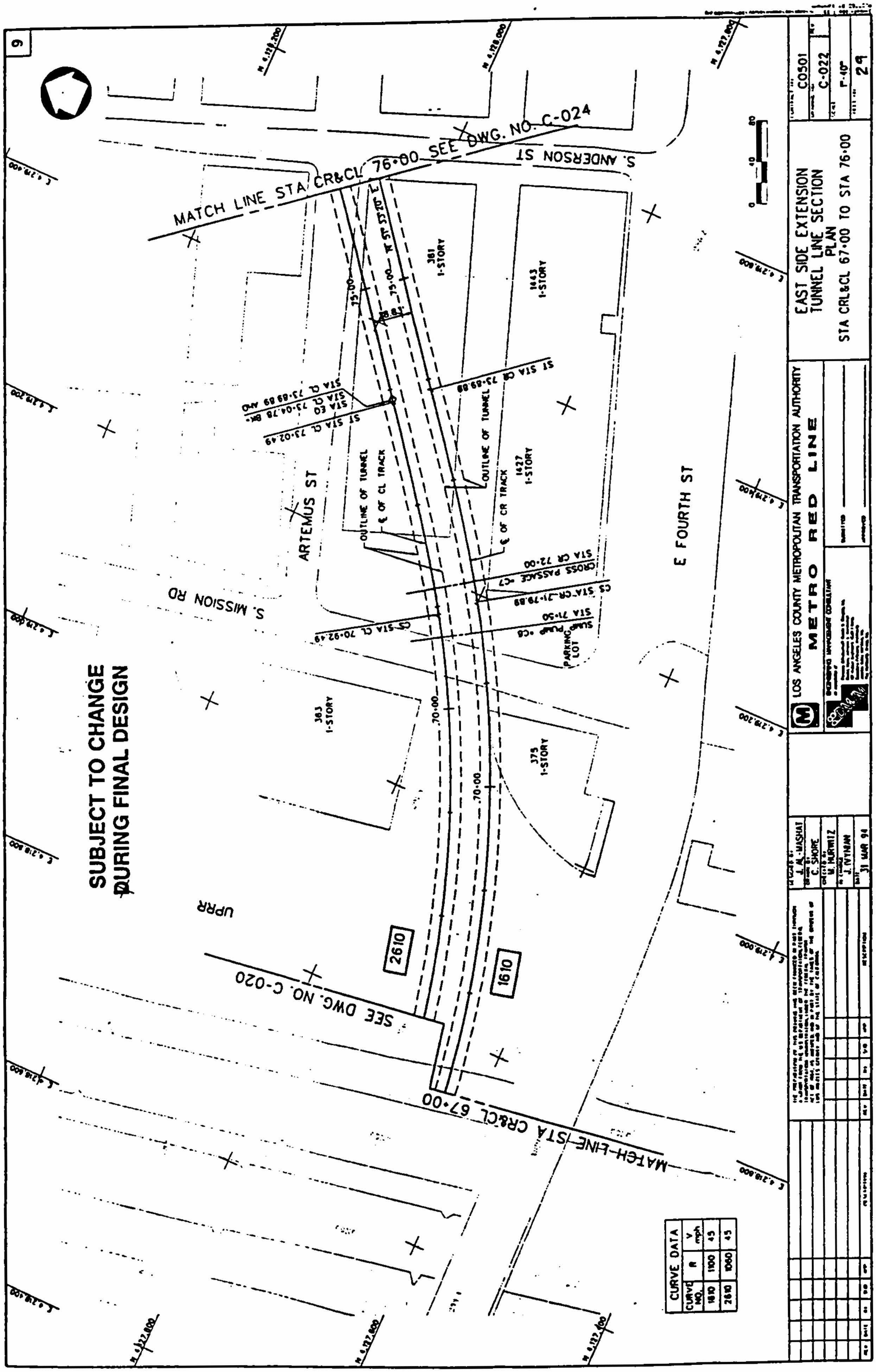
METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

DESIGNED BY S. IBRAHIM
DRAWN BY S. IBRAHIM
CHECKED BY Y. MAGNER
IN CHARGE J. IVYNIAN

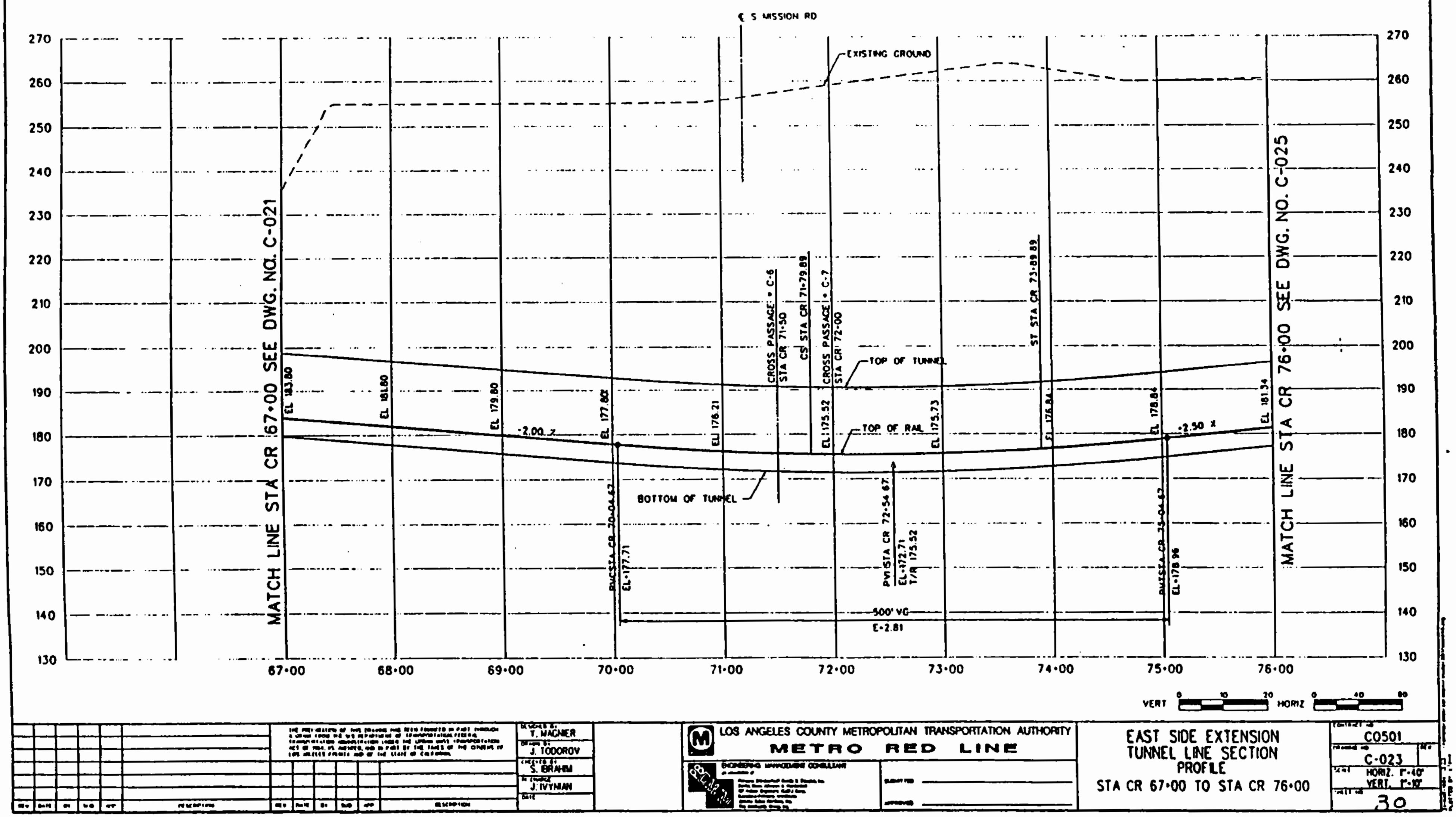
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 57+00 TO STA CR 67+00

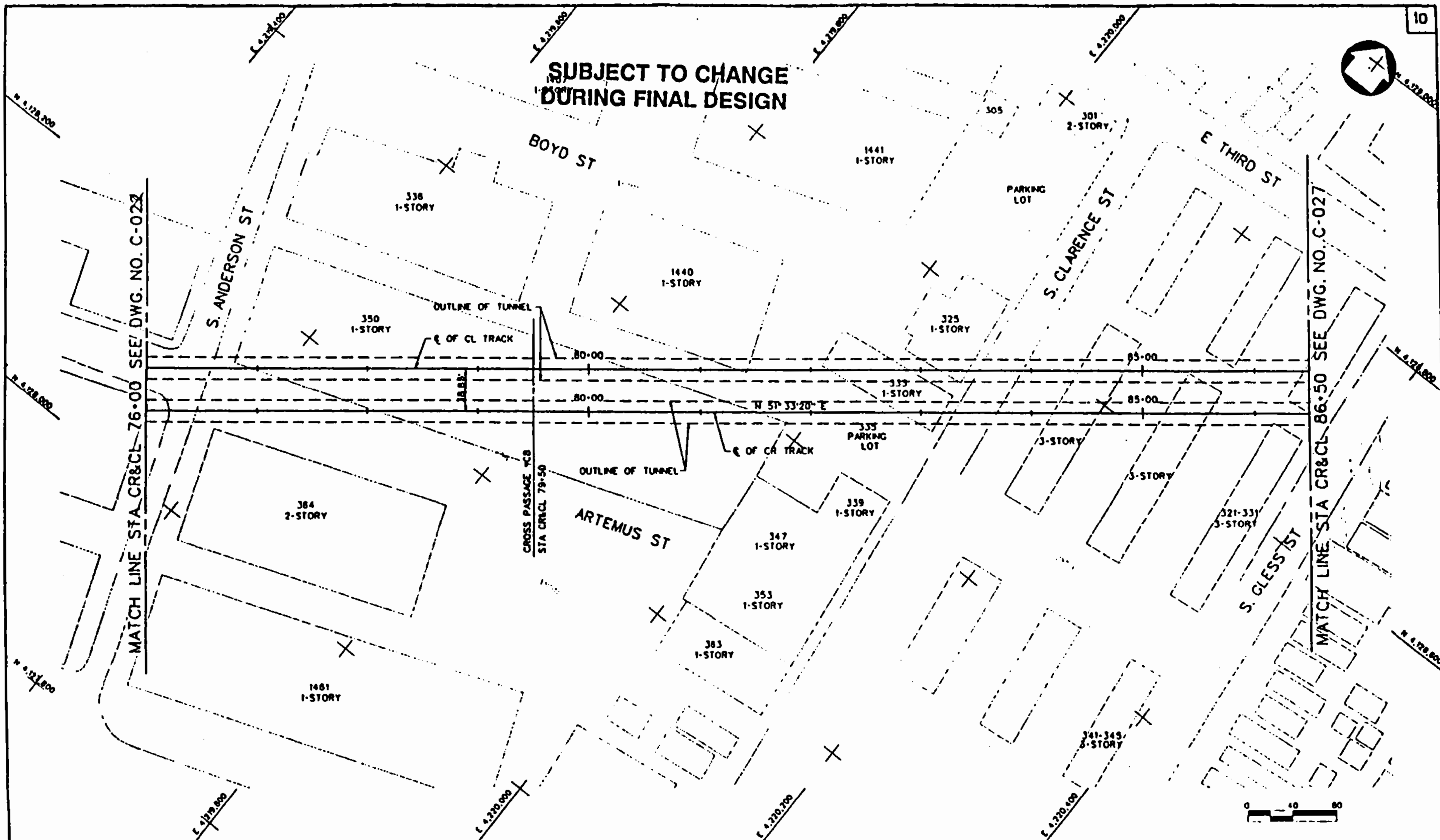
CONTRACT NO. C0501
DRAWING NO. C-021
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 28


SUBJECT TO CHANGE DURING FINAL DESIGN
MATCH LINE STA CR&CL 76+00 SEE DWG. NO. C-024
MATCH LINE STA CR&CL 67+00
SEE DWG. NO. C-020
S. ANDERSON ST
ARTEMUS ST
S. MISSION RD
E FOURTH ST
UPRR
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
CROSS PASSAGE +C7
SUMP PUMP +C8
PARKING LOT
STA CR 72+00
STA 71+50
2610
1610
CURVE DATA
CURVE NO.
R
V mph
1610
1100
45
2610
1060
45
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CRL&CL 67+00 TO STA 76+00
C0501
C-022
1"=40'
29
31 MAR 94

A-4.28

**SUBJECT TO CHANGE
DURING FINAL DESIGN**

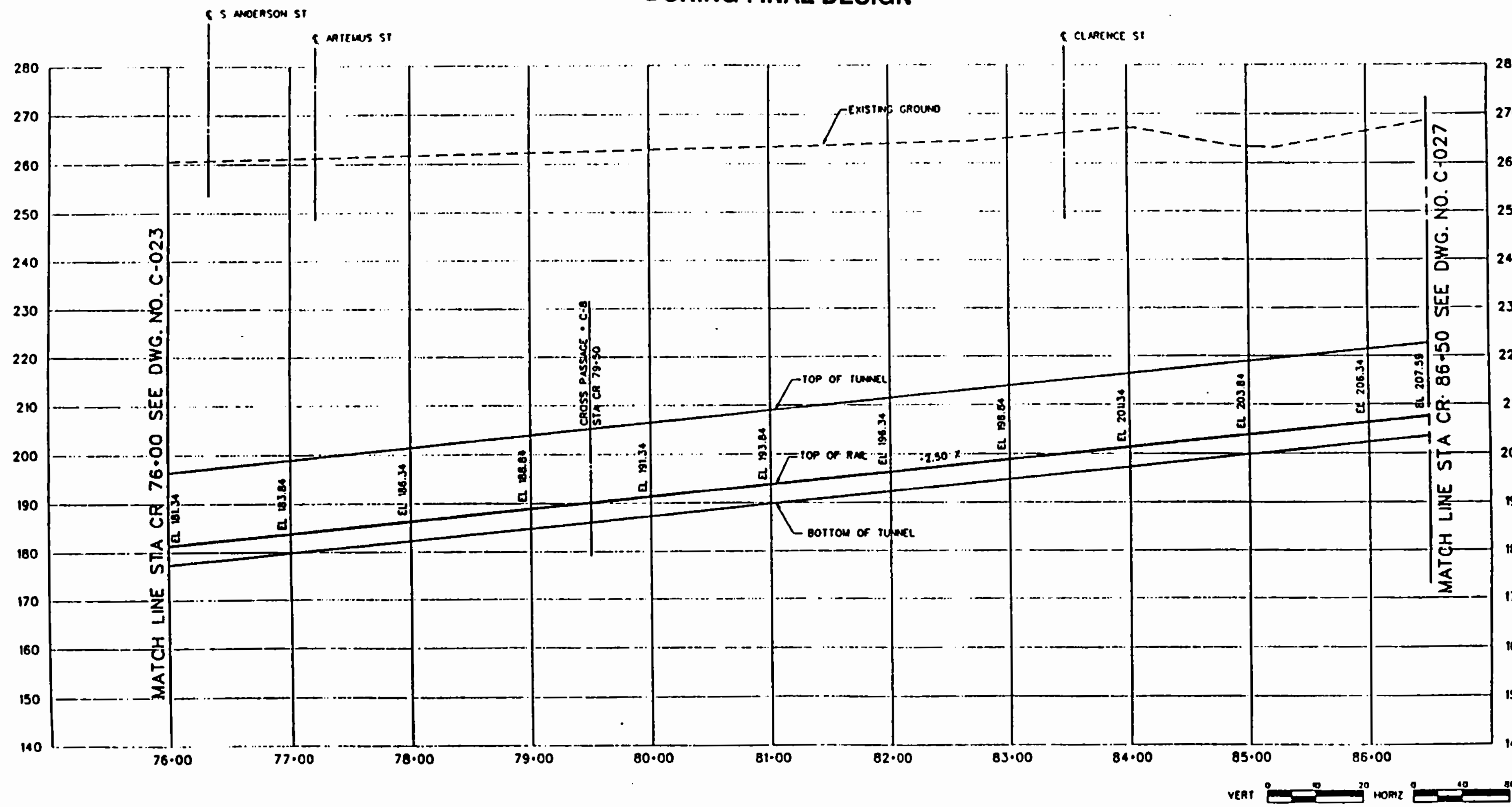




DESIGNED BY J. AL-MASHAT DRAWN BY C. SHORE CHECKED BY M. HURWITZ IN CHARGE J. IVYNIAN DATE 31 MAR 94	LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY METRO RED LINE ENGINEERING MANAGEMENT CONSULTANT	EAST SIDE EXTENSION TUNNEL LINE SECTION PLAN STA CR&CL 76+00 TO STA 86+50	C0501 C-024 1"=40' 31

A-4.30

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY	S. IBRAHIM
DRAWN BY	J. TODOROV
CHECKED BY	Y. MAGNER
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

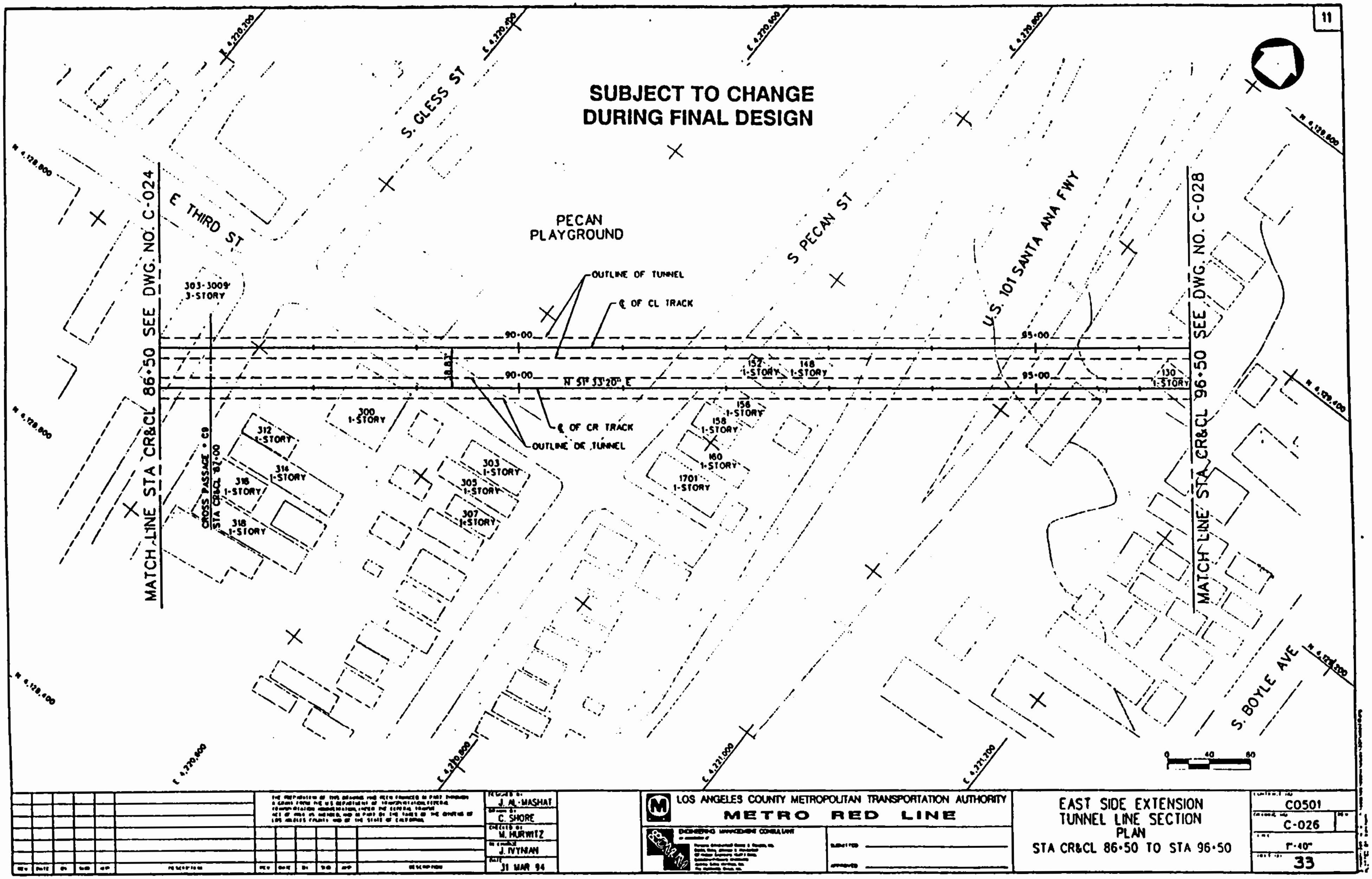
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 76+00 TO STA CR 86+50

CONTRACT NO. C0501

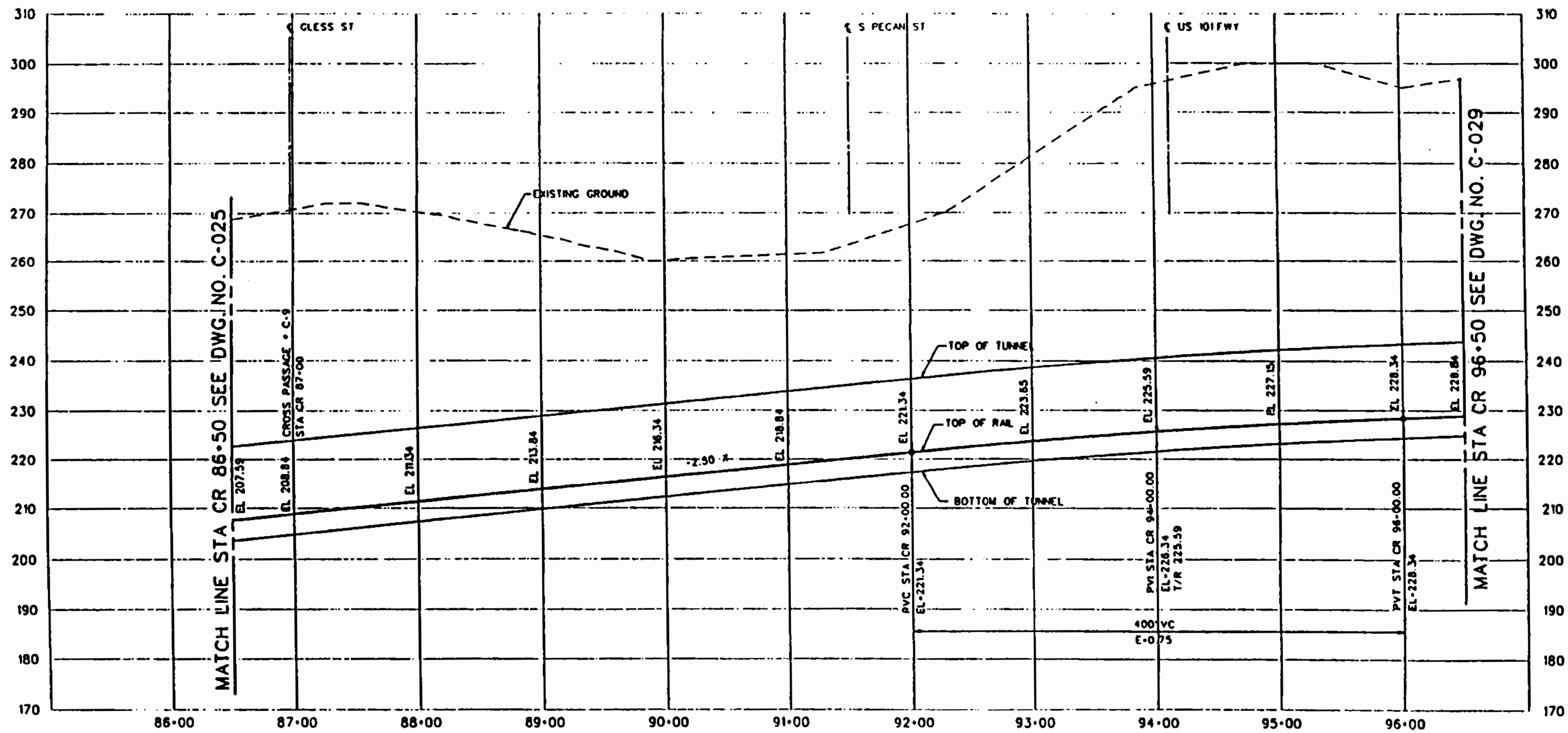
DRAWING NO. C-025

SCALE HORIZ. 1"=40' VERT. 1"=10'

SHEET NO. 32


SUBJECT TO CHANGE
DURING FINAL DESIGN
S. GLESS ST
E THIRD ST
PECAN
PLAYGROUND
S PECAN ST
U.S. 101 SANTA ANA FWY
S. BOYLE AVE
MATCH LINE STA CR&CL 86+50 SEE DWG. NO. C-024
MATCH LINE STA CR&CL 96+50 SEE DWG. NO. C-028
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
OUTLINE OF TUNNEL
90+00
95+00
N 51° 53' 20" E
CROSS PASSAGE • C9
STA CR&CL 87+00
303-3009
3-STORY
300
1-STORY
312
1-STORY
314
1-STORY
316
1-STORY
318
1-STORY
303
1-STORY
305
1-STORY
307
1-STORY
152
1-STORY
148
1-STORY
156
1-STORY
158
1-STORY
160
1-STORY
1701
1-STORY
130
1-STORY
11
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYNAN
31 MAR 94
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 86+50 TO STA 96+50
C0501
C-026
1"=40'
33

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY	Y. MAGNER
DRAWN BY	J. TODOROV
CHECKED BY	S. IBRAHIM
IN CHARGE	J. IVYNIAN

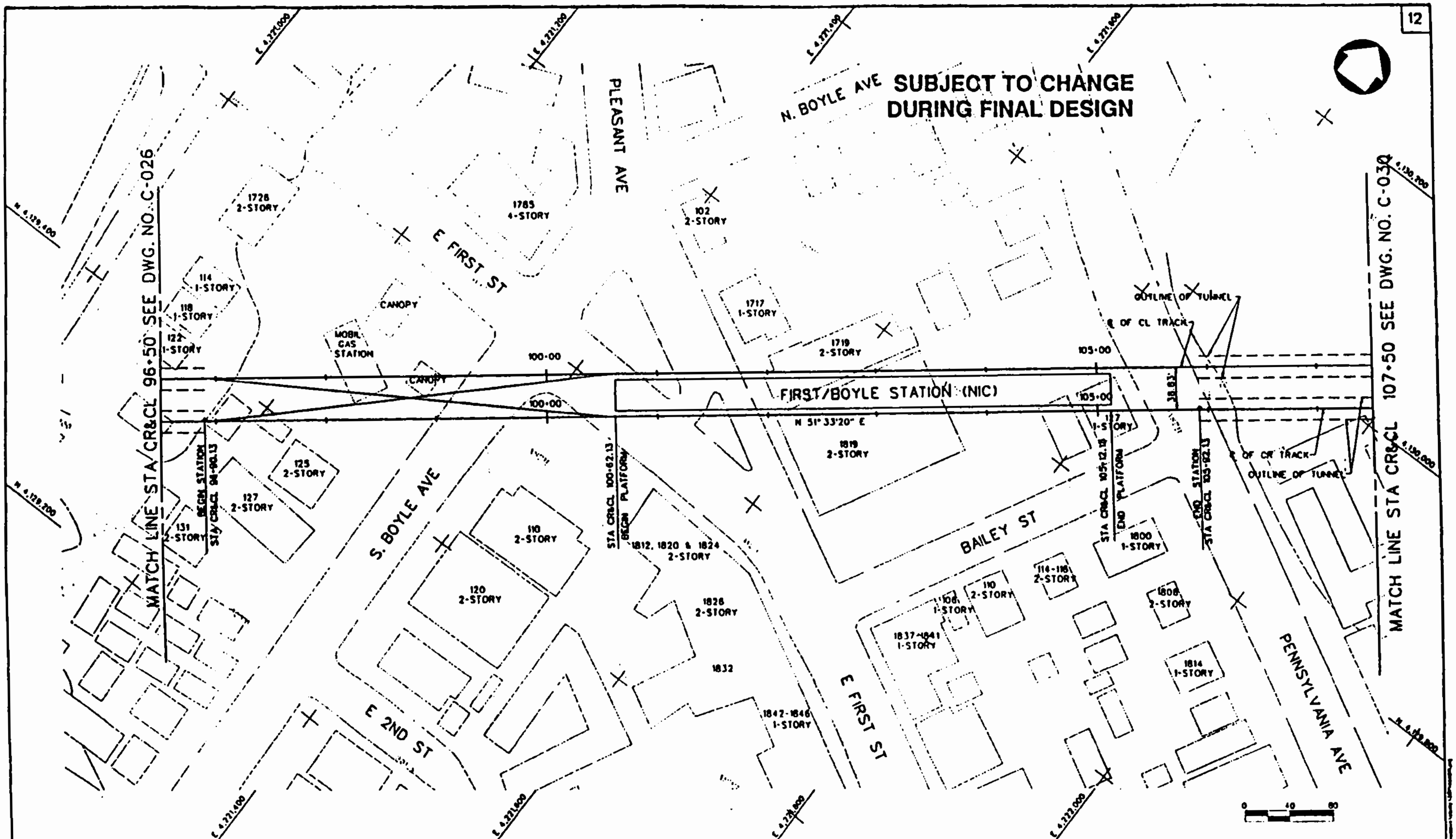
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 86+50 TO STA CR 96+50

CONTRACT NO.	C0501
DRAWING NO.	C-027
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	34



DESIGNED BY	J. M. MASHAT
DRAWN BY	C. SHORE
CHECKED BY	M. HURWITZ
IN CHARGE	J. NYNAN
DATE	31 MAR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

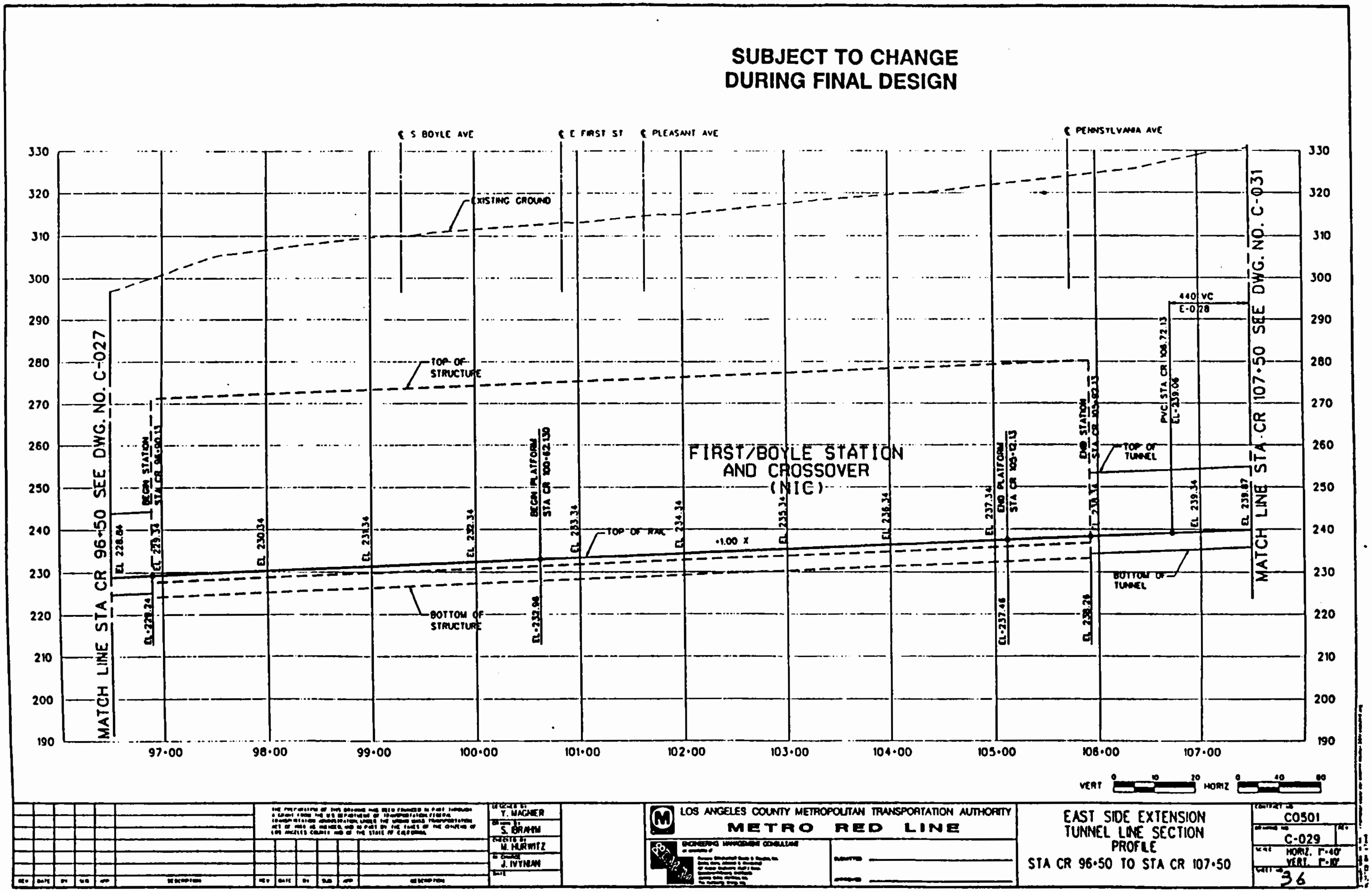
METRO RED LINE

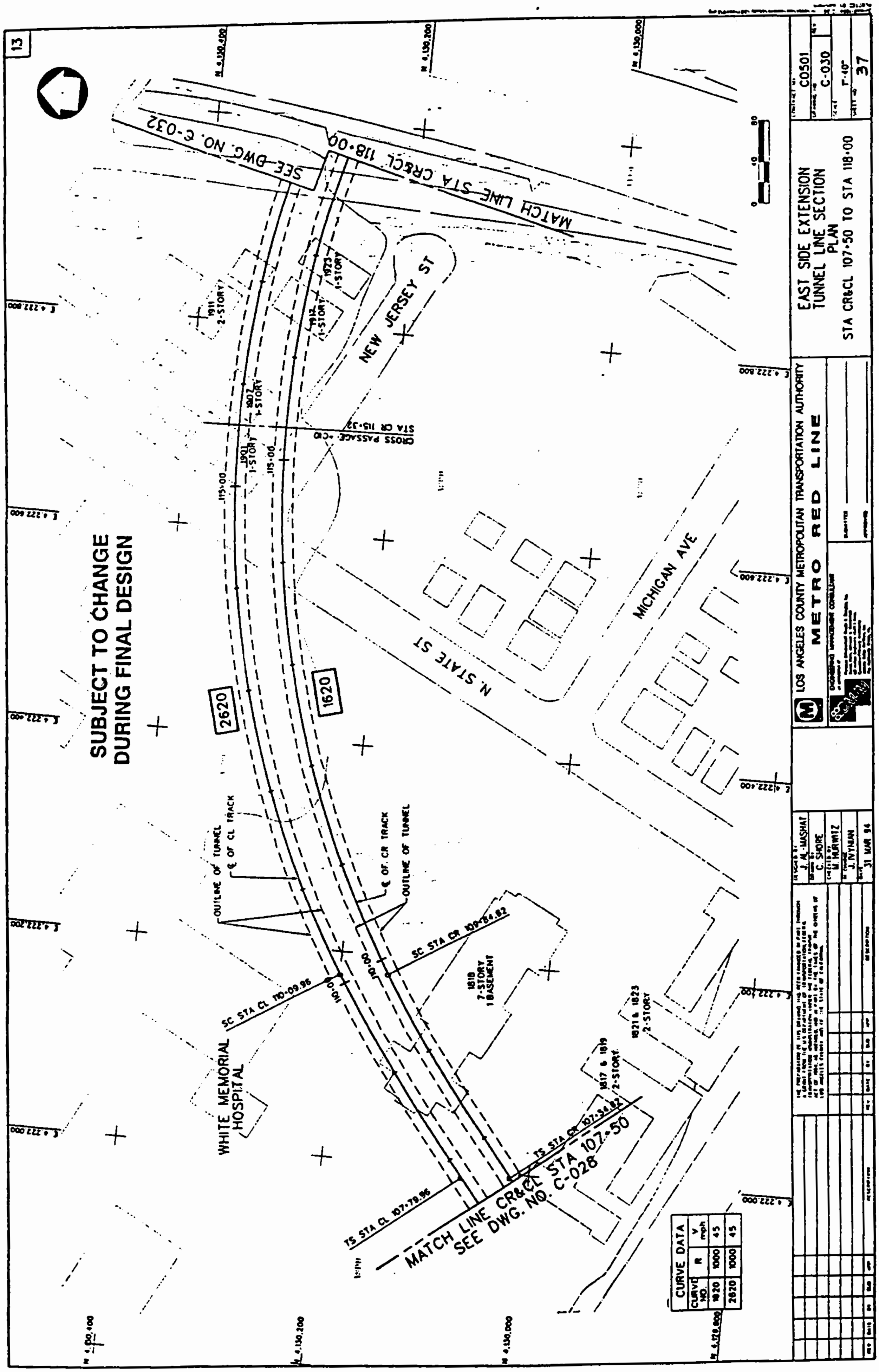
ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 96+50 TO STA 107+50

CONTRACT NO	C0501
DRAWING NO	C-028
SCALE	1"=40'
SHEET NO	35

A-4.34

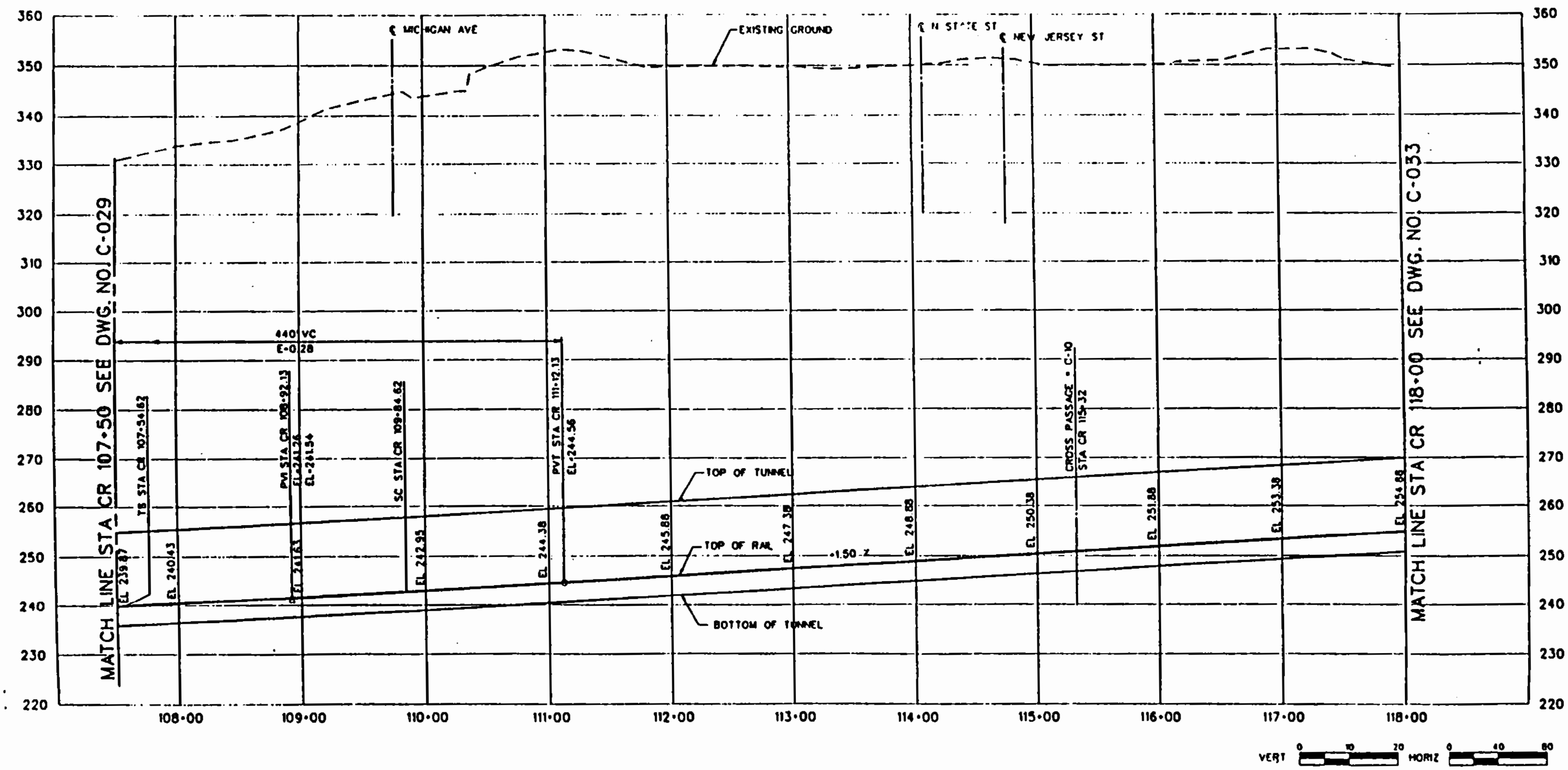

SUBJECT TO CHANGE
DURING FINAL DESIGN
℄ S BOYLE AVE
℄ E FIRST ST
℄ PLEASANT AVE
℄ PENNSYLVANIA AVE
EXISTING GROUND
TOP OF STRUCTURE
BOTTOM OF STRUCTURE
TOP OF RAIL
TOP OF TUNNEL
BOTTOM OF TUNNEL
+1.00 X
440 VC
E-0.28
FIRST/BOYLE STATION
AND CROSSOVER
(NIC)
MATCH LINE STA CR 96+50 SEE DWG. NO. C-027
MATCH LINE STA CR 107+50 SEE DWG. NO. C-031
BEGIN STATION STA CR 96+90.13
BEGIN PLATFORM STA CR 100+62.130
END PLATFORM STA CR 105+12.13
END STATION STA CR 105+62.13
PVC STA CR 106+72.13
EL 239.06
EL 228.84
EL 229.37
EL 230.34
EL 231.34
EL 232.34
EL 233.34
EL 234.34
EL 235.34
EL 236.34
EL 237.34
EL 238.34
EL 239.34
EL 239.87
EL 229.24
EL 232.96
EL 237.46
EL 238.26
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
97+00
98+00
99+00
100+00
101+00
102+00
103+00
104+00
105+00
106+00
107+00
VERT 0 10 20
HORIZ 0 40 80
Y. WAGNER
S. BRAHM
M. HURWITZ
J. IVYNIAN
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
ENGINEERING MANAGEMENT CONSULTANT
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 96+50 TO STA CR 107+50
C0501
C-029
HORIZ. 1"=40'
VERT. 1"=10'
36



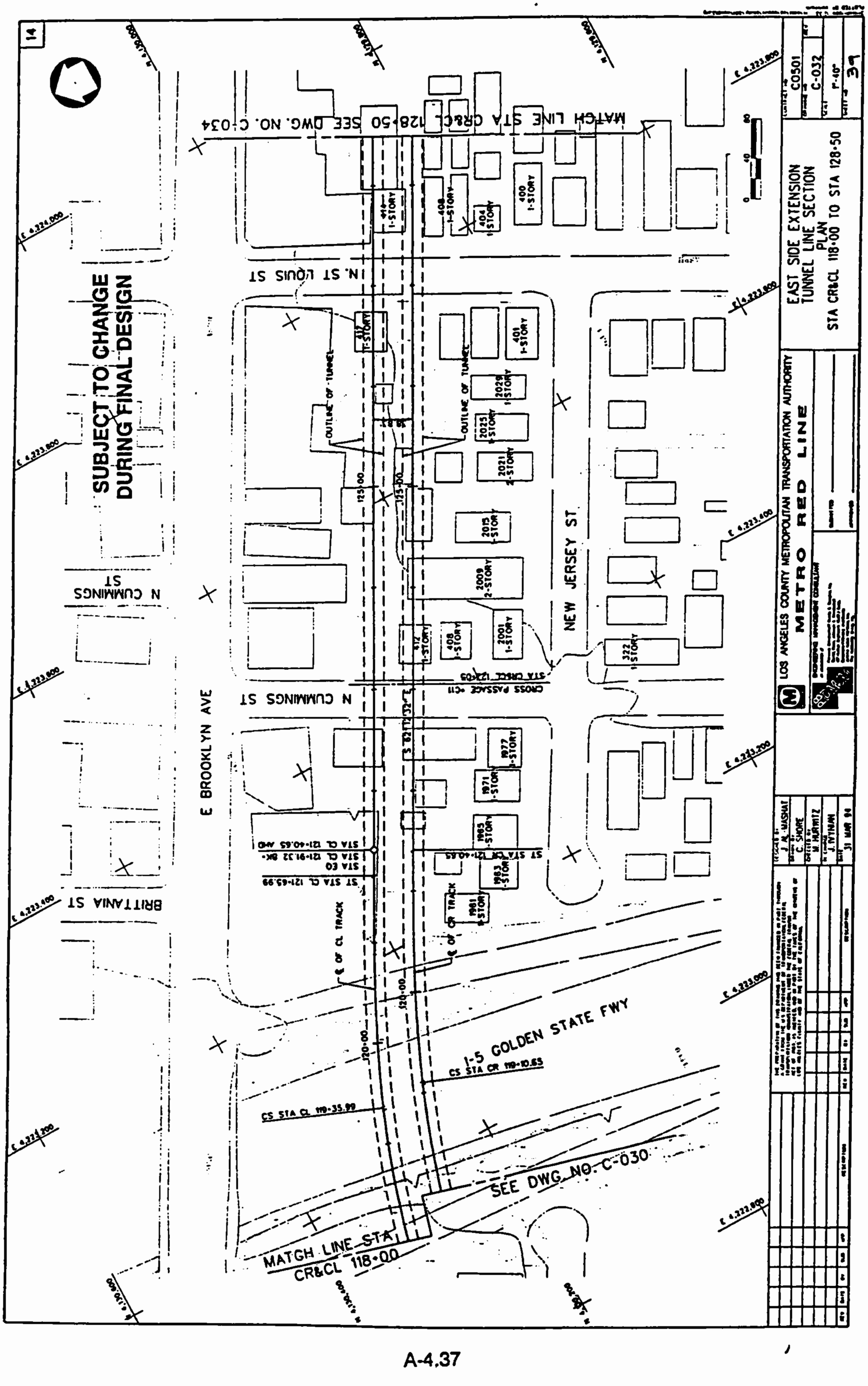
SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE STA CR&CL 118+00
SEE DWG. NO. C-032
MATCH LINE CR&CL STA 107+50
SEE DWG. NO. C-028
NEW JERSEY ST
MICHIGAN AVE
N. STATE ST
WHITE MEMORIAL HOSPITAL
2620
1620
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
OUTLINE OF TUNNEL
SC STA CL 110+09.96
SC STA CR 109+84.82
TS STA CL 107+79.96
TS STA CR 107+36.82
CROSS PASSAGE -C10
STA CR 115+32
1818
7-STORY
1 BASEMENT
1821 & 1823
2-STORY
1817 & 1819
2-STORY
CURVE DATA
CURVE NO. | R | V mph
1620 | 1000 | 45
2620 | 1000 | 45
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 107+50 TO STA 118+00
C0501
C-030
1"=40'
37
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. NYHAN
31 MAR 94

A-4.36

**SUBJECT TO CHANGE
DURING FINAL DESIGN**



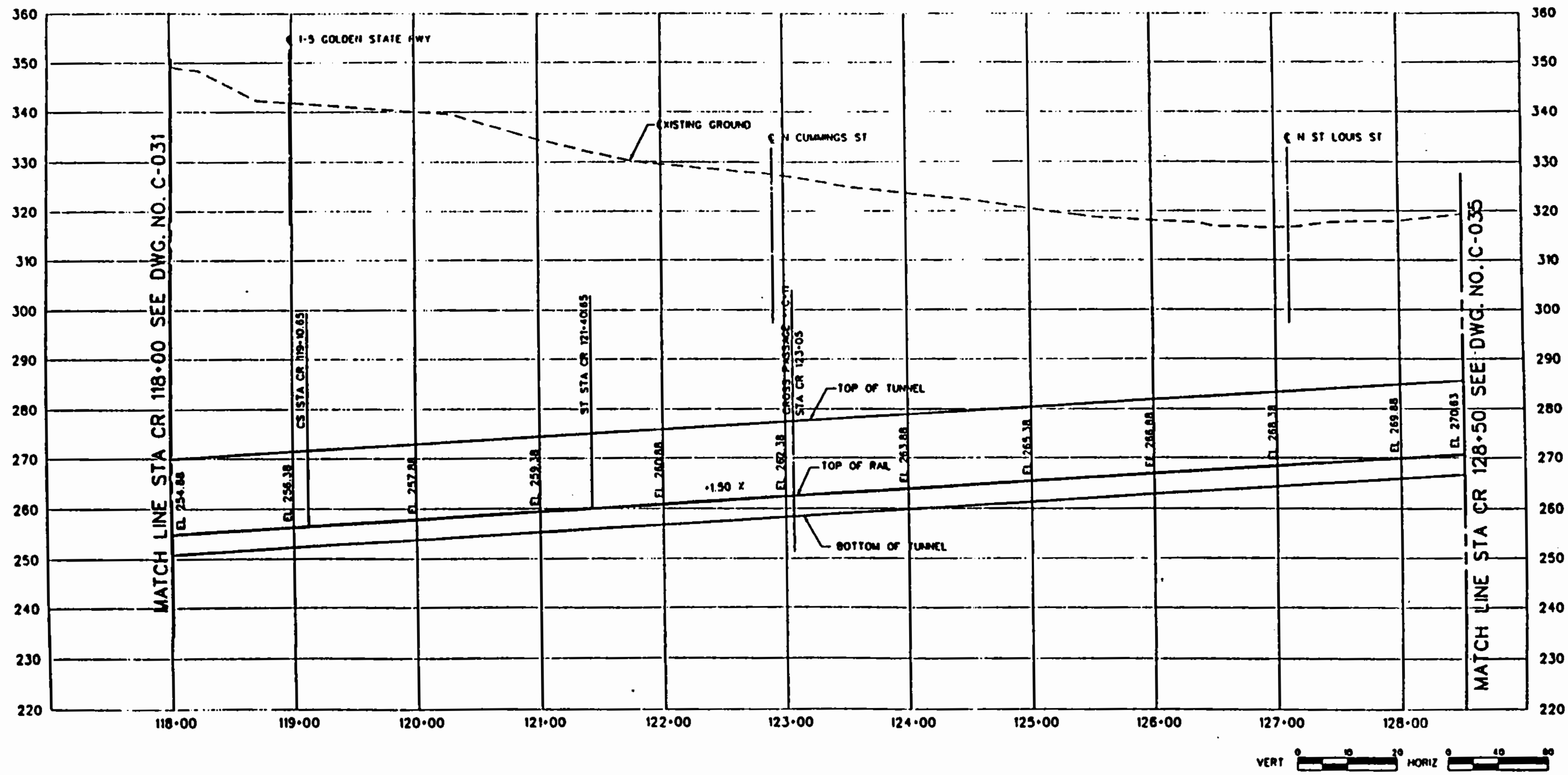
DESIGNED BY Y. MAGNER DRAWN BY J. TODOROV CHECKED BY S. IBRAHIM IN CHARGE J. IVYNIAN	LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY METRO RED LINE	EAST SIDE EXTENSION TUNNEL LINE SECTION PROFILE STA CR 107+50 TO STA CR 118+00	CONTRACT NO. C0501 DRAWING NO. C-031 SCALE HORIZ. 1"=40' VERT. 1"=10' SHEET NO. 38



SUBJECT TO CHANGE DURING FINAL DESIGN
MATCH LINE STA CR&CL 128+50 SEE DWG. NO. C-034
MATCH LINE STA CR&CL 118+00
SEE DWG. NO. C-030
N. ST LOUIS ST
N CUMMINGS ST
NEW JERSEY ST
E BROOKLYN AVE
BRITTANIA ST
I-5 GOLDEN STATE FWY
OUTLINE OF TUNNEL
CROSS PASSAGE #C11
STA CR&CL 123+03
CS STA CR 119+10.63
CS STA CL 119+35.99
℄ OF CL TRACK
℄ OF CR TRACK
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 118+00 TO STA 128+50
C0501
C-032
1"=40'
31 MAR 94

A-4.38

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY S. IBRAHIM
DRAWN BY J. TODOROV
CHECKED BY Y. MAGNER
IN CHARGE J. IVYMAN

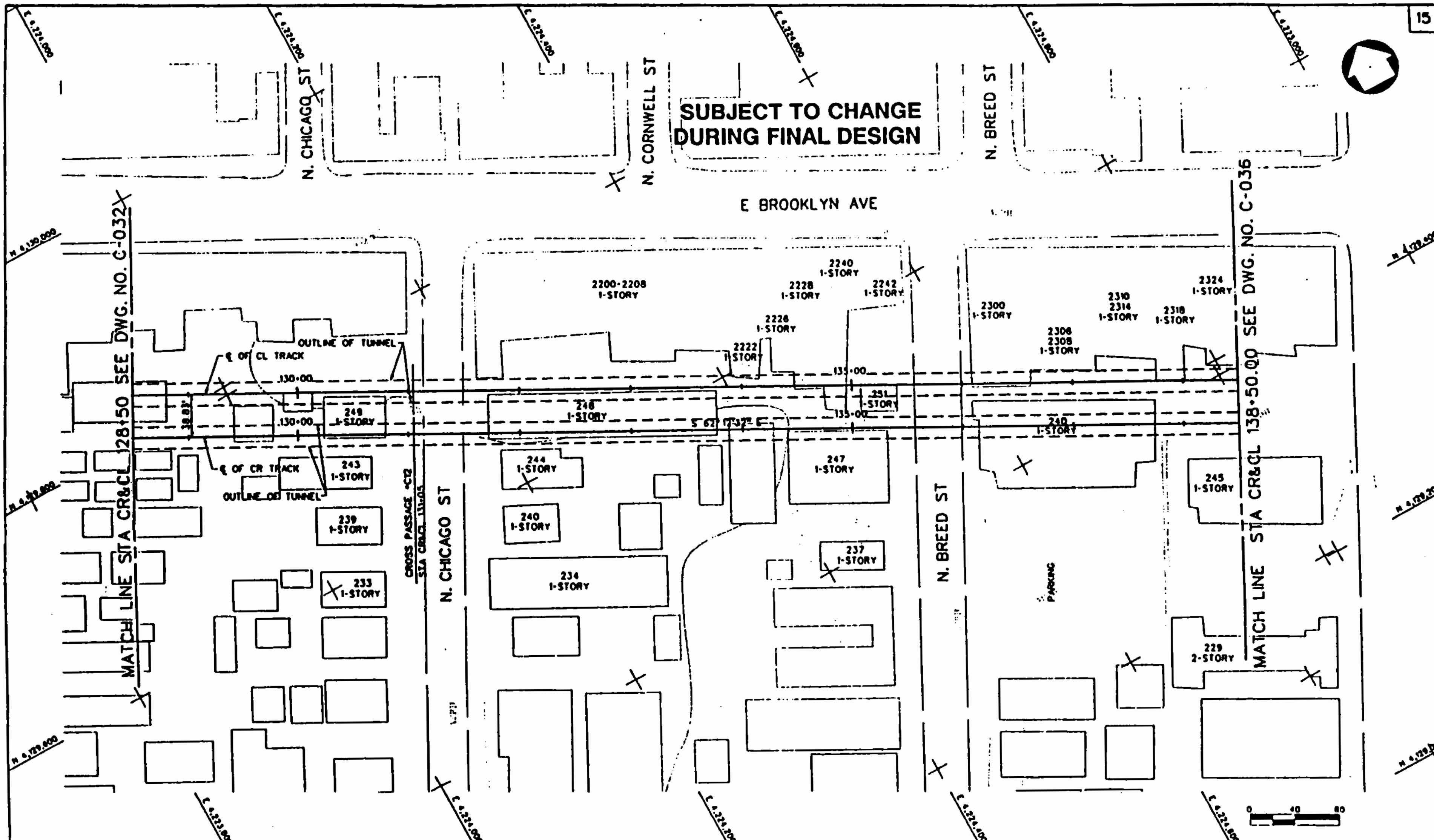
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 118+00 TO STA CR 128+50

CONTRACT NO. C0501
DRAWING NO. C-033
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 40



DESIGNED BY J. AL-MASHAT	DRAWN BY C. SHORE	CHECKED BY M. HURWITZ
IN CHARGE J. NYNAN	DATE 31 MAR 94	

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

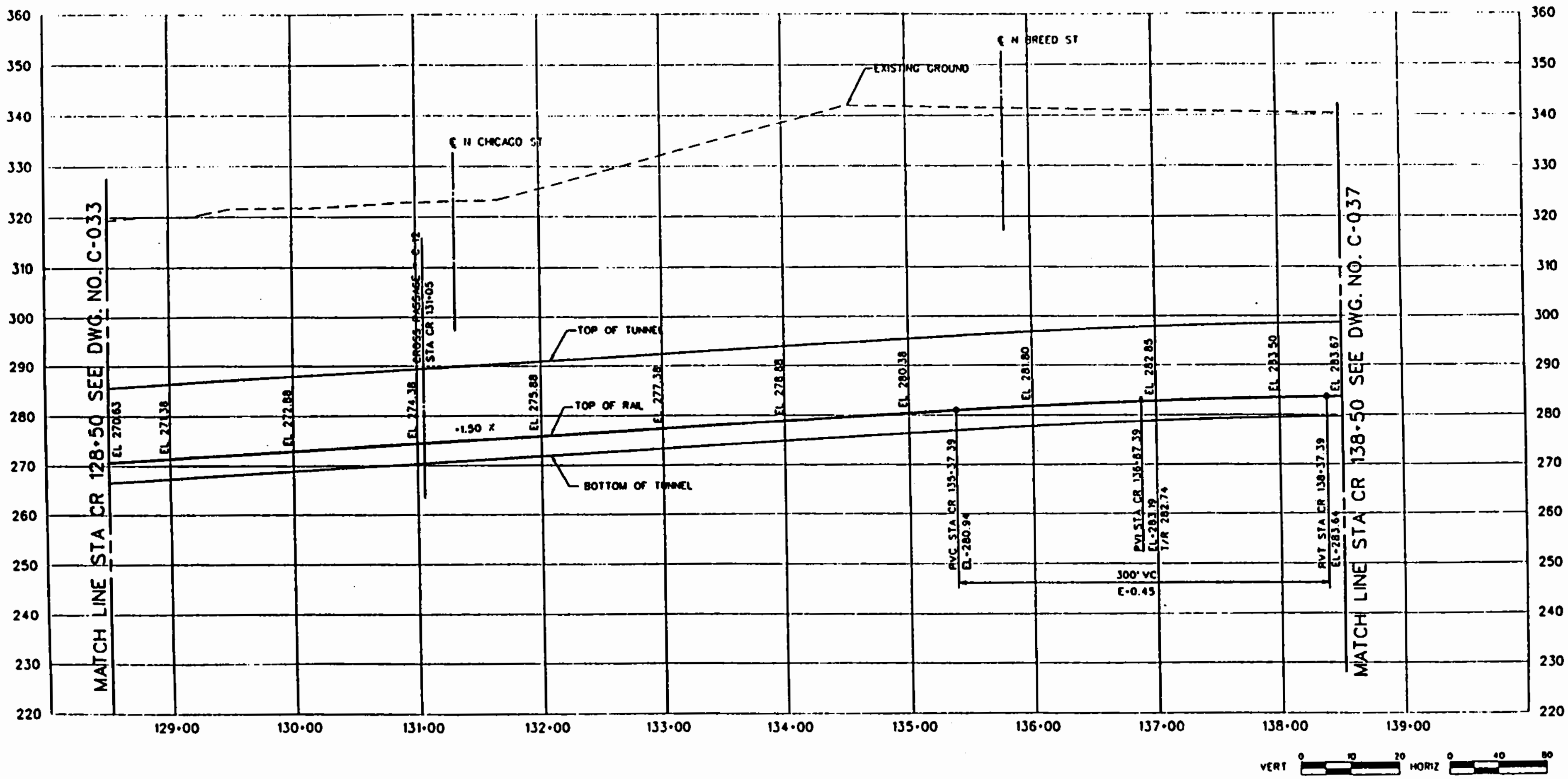
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 128+50 TO STA 139+50

CONTRACT NO. C0501
DRAWING NO. C-034
SCALE 1"=40'
SHEET NO. 41

A-4.40

SUBJECT TO CHANGE
DURING FINAL DESIGN



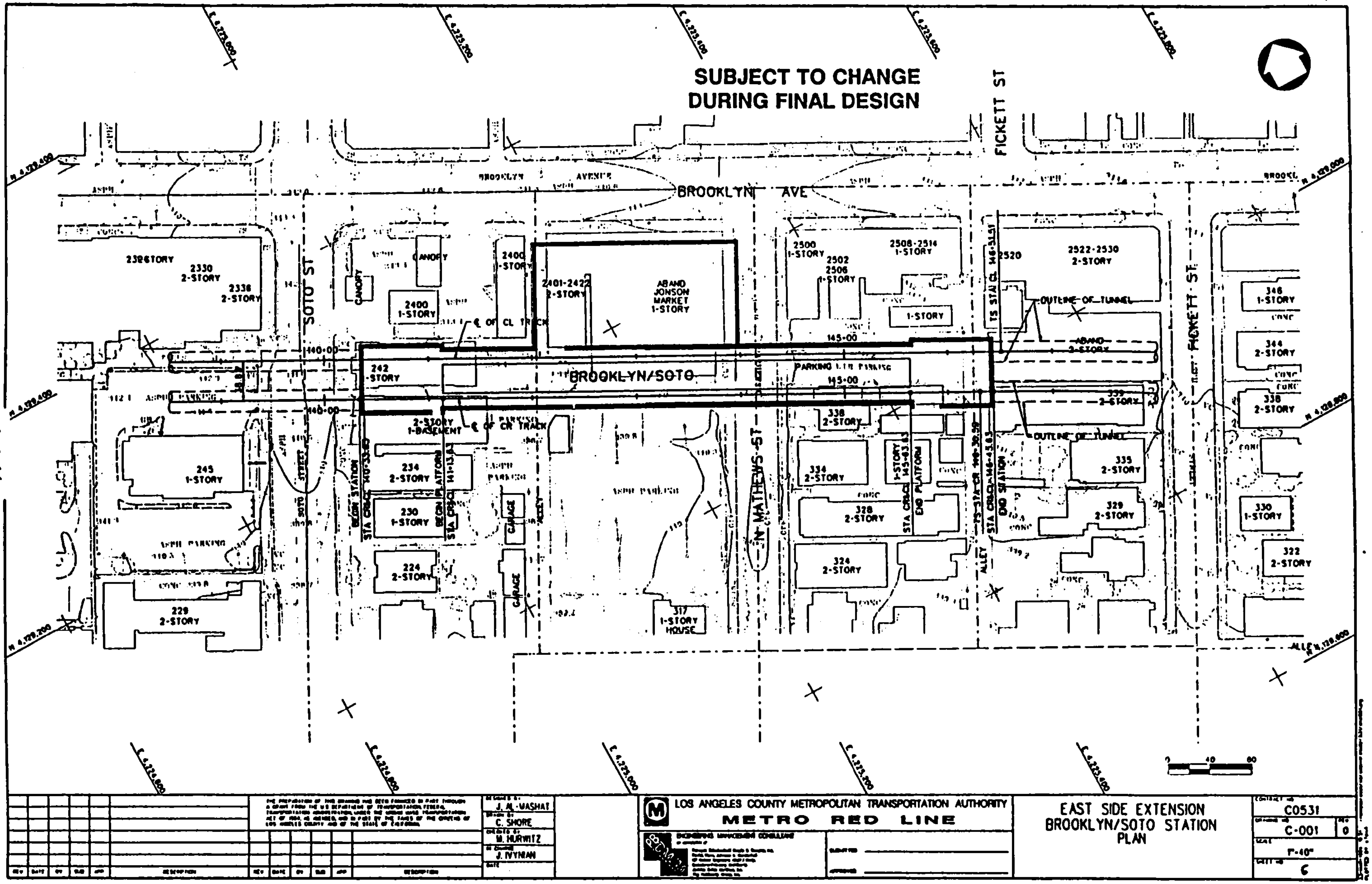
REVIEWED BY S. IBRAHIM
DRAWN BY S. IBRAHIM
CHECKED BY Y. MAGNIER
IN CHARGE J. IVYMAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

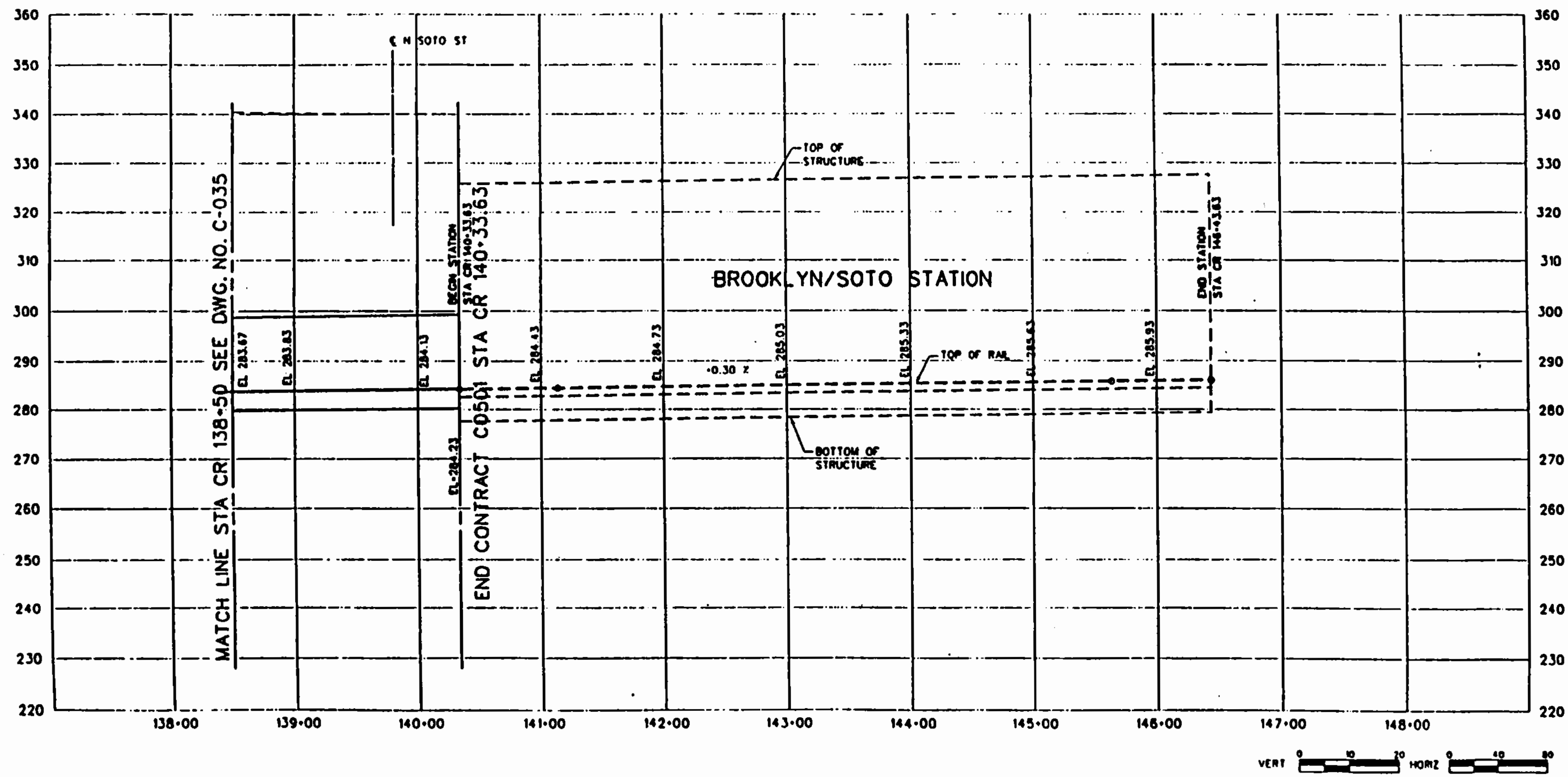
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 128+50 TO STA CR 138+50

C0501
C-035
HORIZ. 1"=40'
VERT. 1"=10'
42



SUBJECT TO CHANGE DURING FINAL DESIGN
BROOKLYN AVE
SOTO ST
N MATHEWS ST
FICKETT ST
BROOKLYN/SOTO
ABAND JONSON MARKET 1-STORY
OUTLINE OF TUNNEL
BEGIN STATION
END STATION
BEGIN PLATFORM
END PLATFORM
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
BROOKLYN/SOTO STATION
PLAN
J. AL-WASHAT
C. SHORE
M. HURWITZ
J. IVYNIAN
C0531
C-001
1"=40'

SUBJECT TO CHANGE
DURING FINAL DESIGN



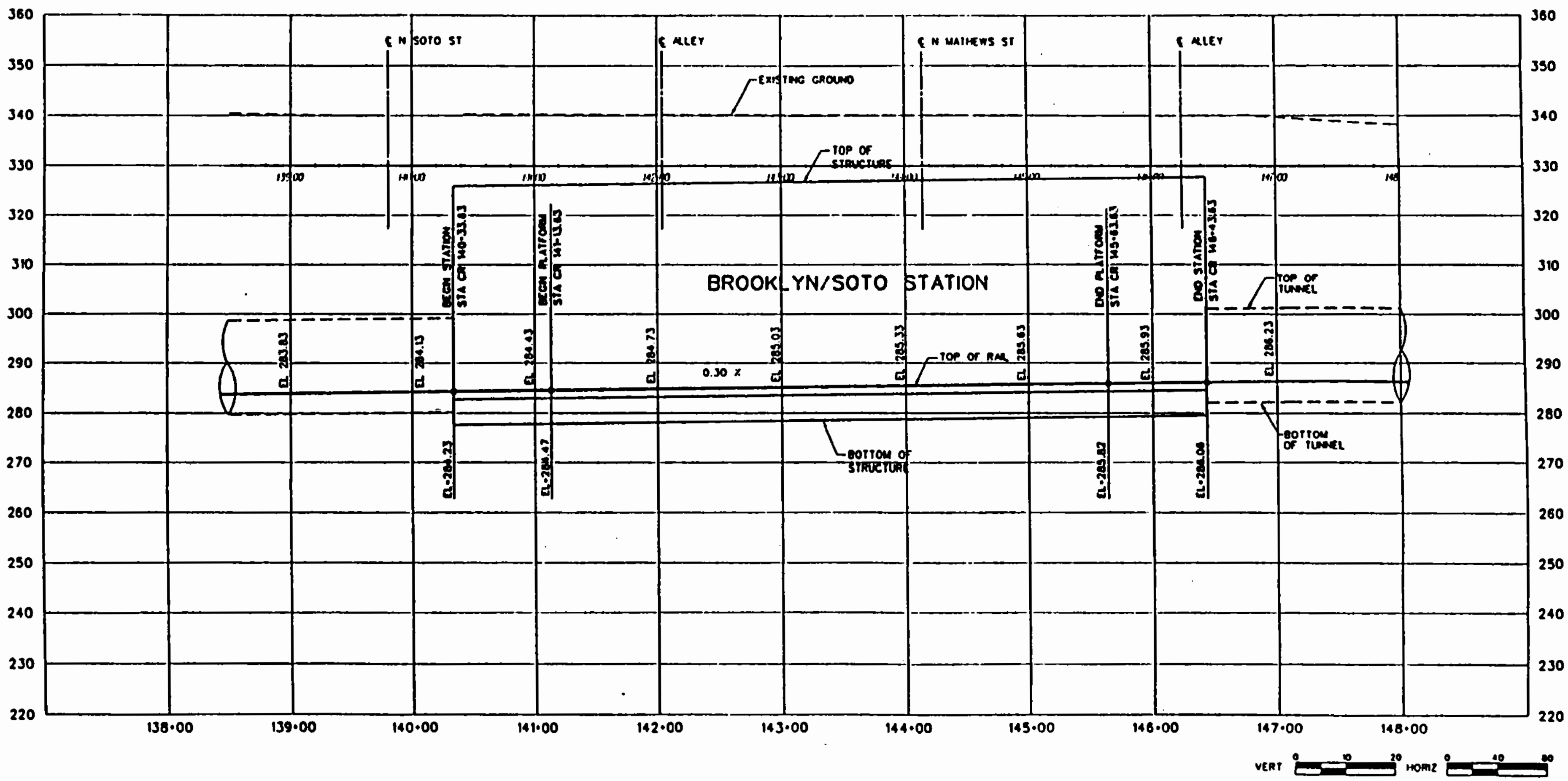
DESIGNED BY	Y. MAGNER
DRAWN BY	S. BRAHIM
CHECKED BY	S. BRAHIM
IN CHARGE	J. IVYNAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 138+50 TO STA CR 140+33.63

CONTRACT NO.	C0501
DRAWING NO.	C-037
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	44

SUBJECT TO CHANGE
DURING FINAL DESIGN

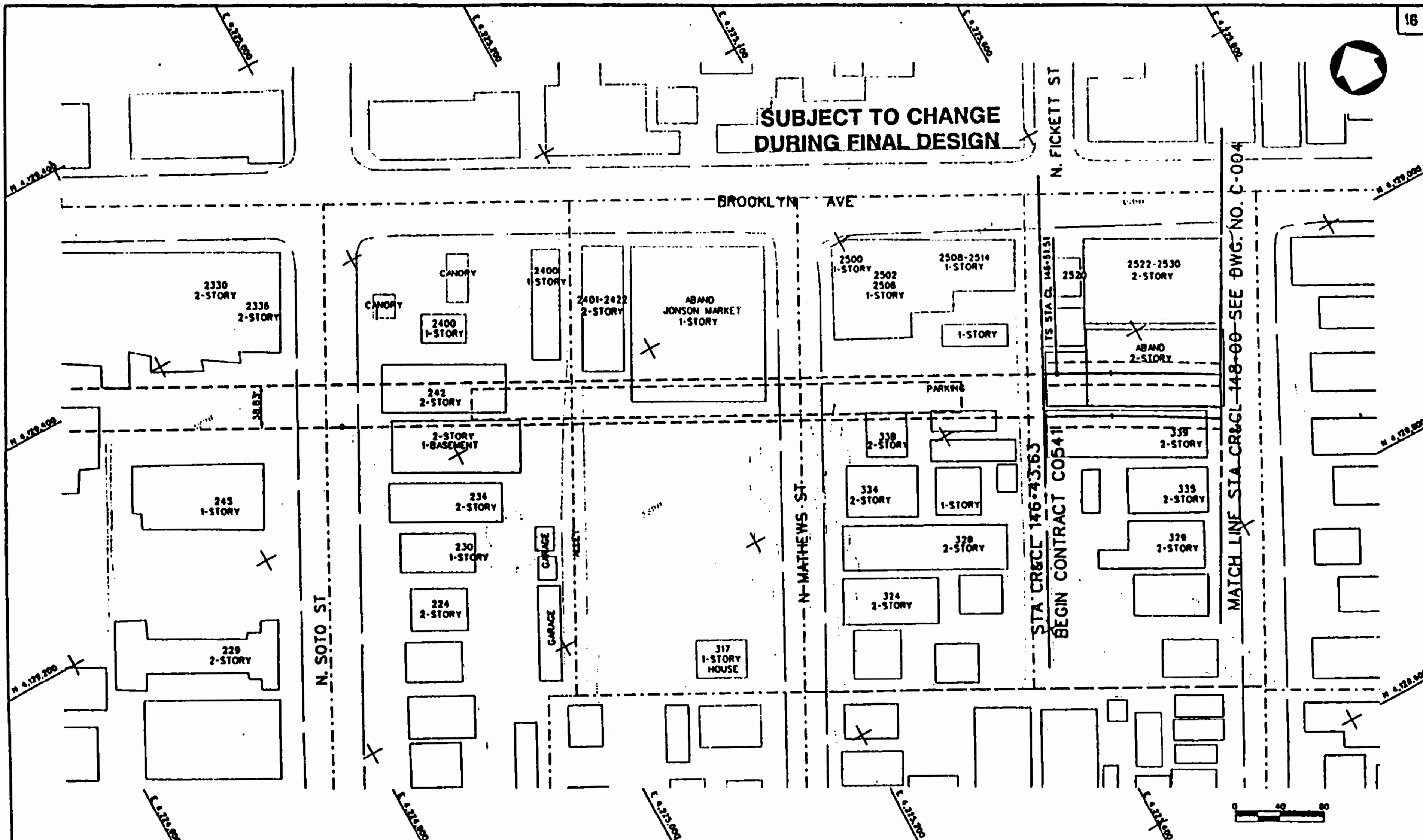


DESIGNED BY Y. WAGNER
DRAWN BY S. IBRAHIM
CHECKED BY S. IBRAHIM
IN CHARGE J. IVYNAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
BROOKLYN/SOTO STATION
PROFILE

CONTRACT NO. C0531
DRAWING NO. C002
REV 0
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 7



REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION				

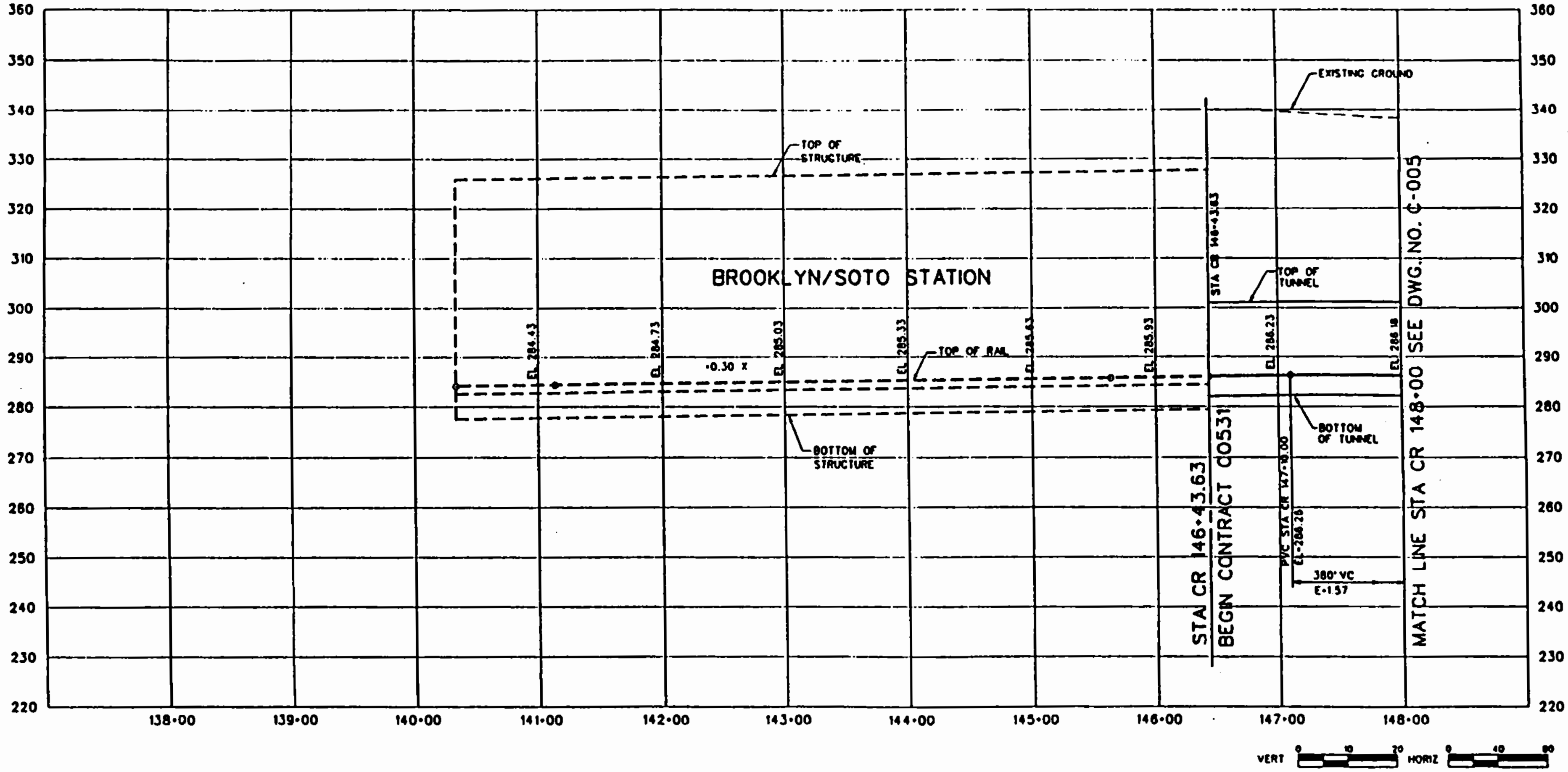
DESIGNED BY J. AL-MASHAT
DRAWN BY C. SHORE
CHECKED BY M. HURWITZ
IN CHARGE J. IVYNAN
DATE

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED
APPROVED

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 146+43.63TO STA148+00.00

CONTRACT NO. C0541
DRAWING NO. C-002
SCALE 1"=40'
SHEET NO. 8

SUBJECT TO CHANGE
DURING FINAL DESIGN

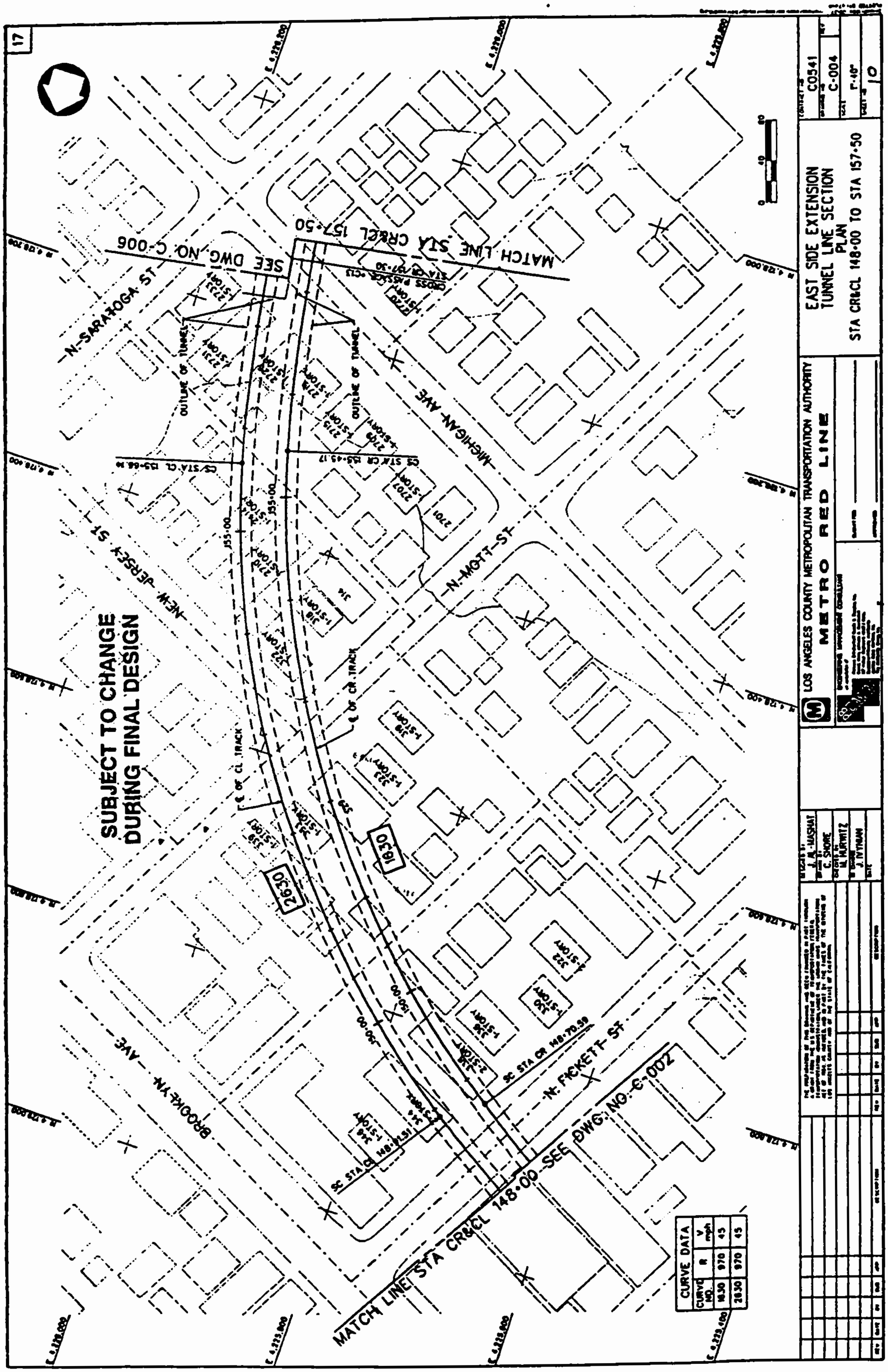


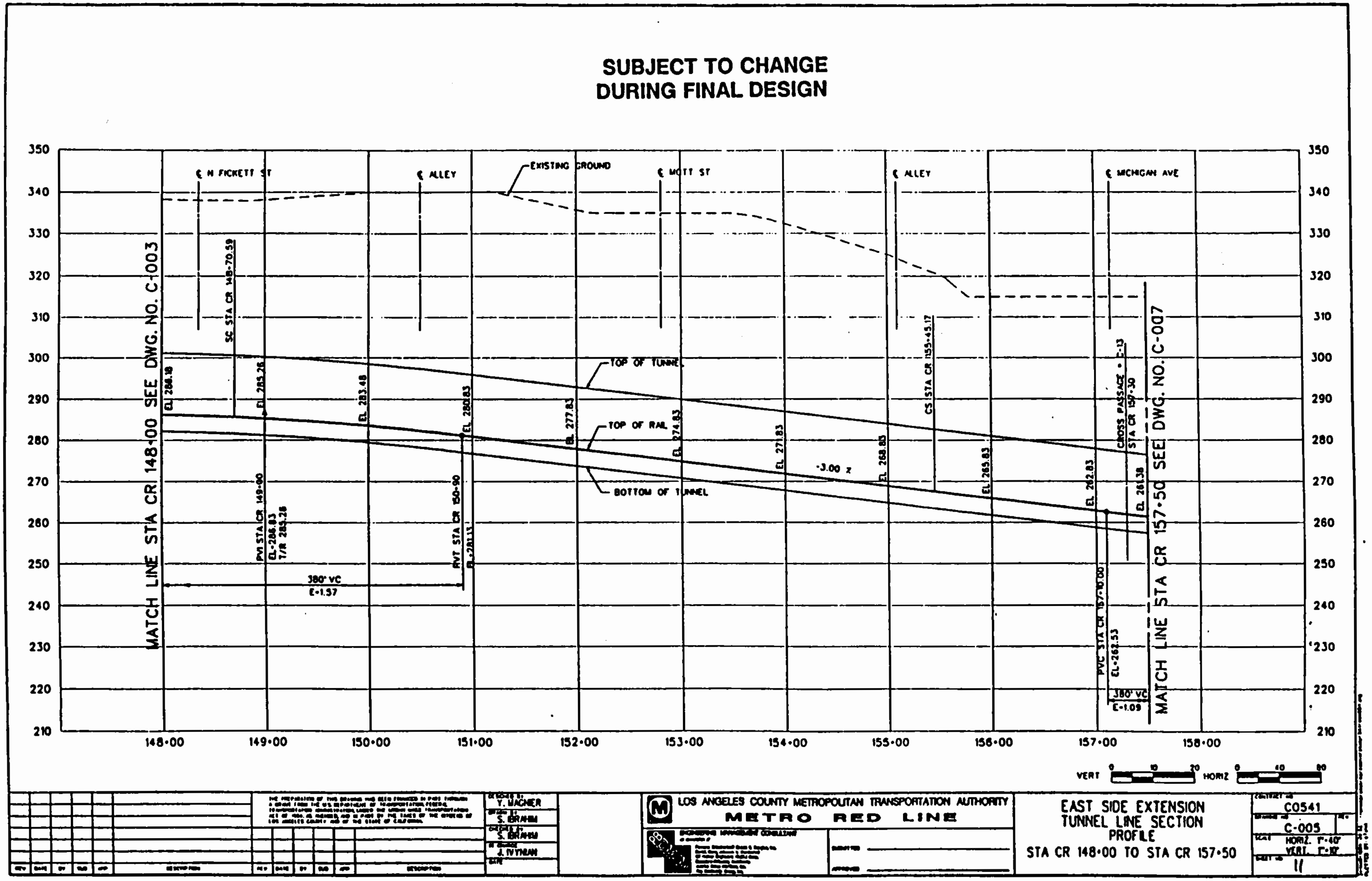
Y. MAGNER
S. EBRAHIM
S. EBRAHIM
J. IVYMAN

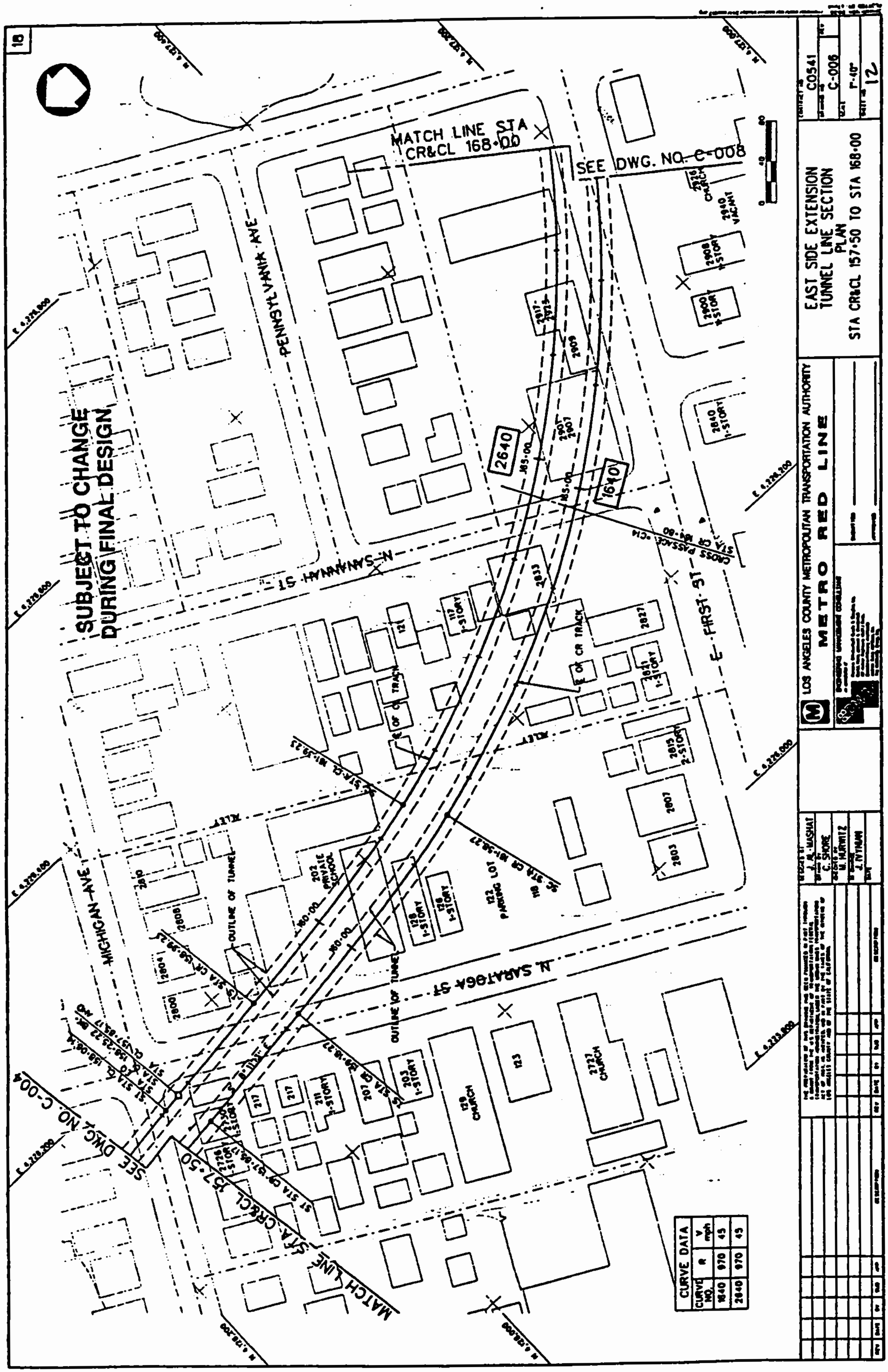
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR146+43.63TO STA CR 148+00.00

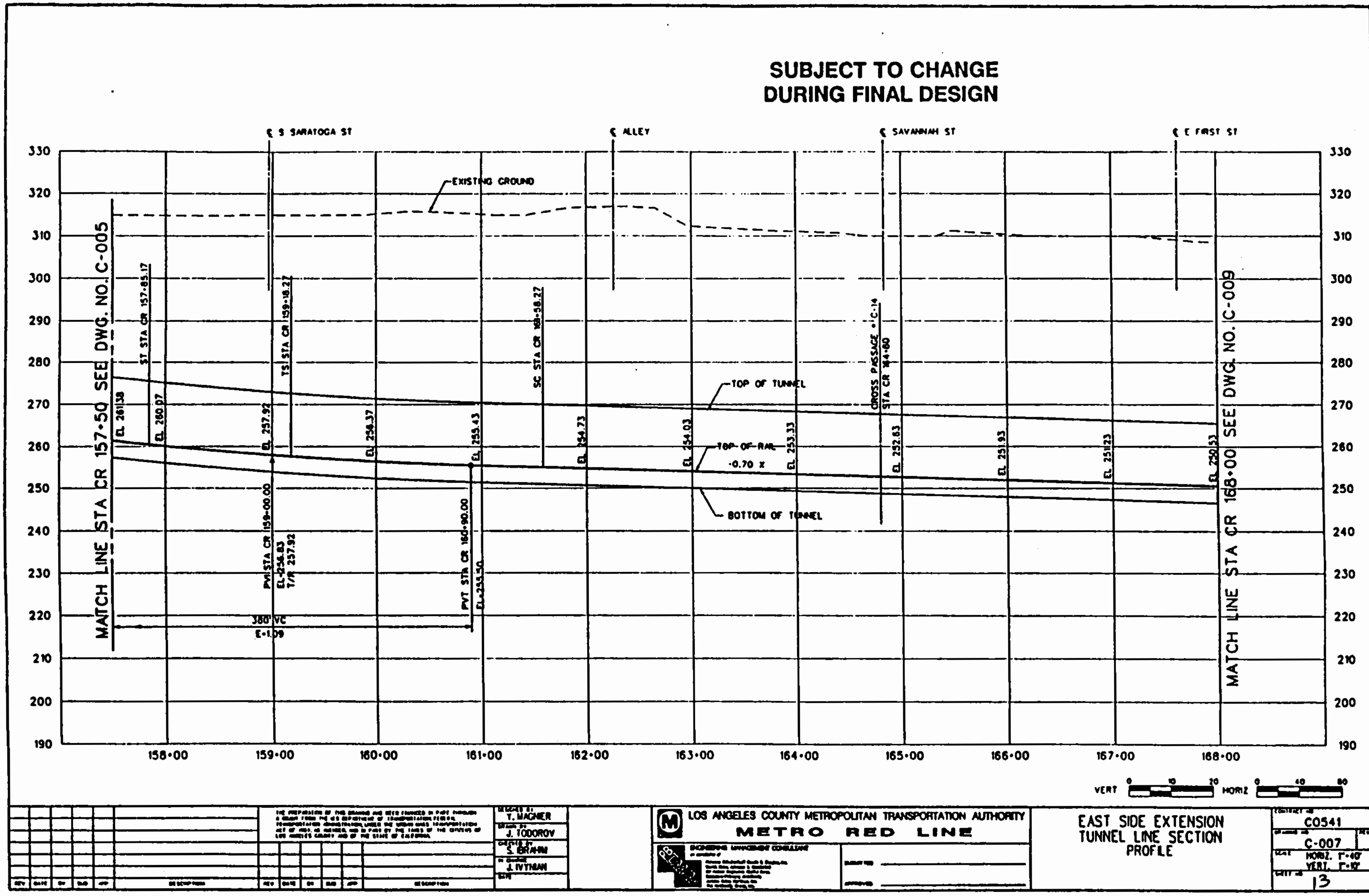
C0541
C-003
HORIZ. 1"=40'
VERT. 1"=10'
9


SUBJECT TO CHANGE DURING FINAL DESIGN
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 148+00 TO STA 157+50
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
C0541
C-004
MATCH LINE STA CR&CL 157+50 SEE DWG NO. C-006
MATCH LINE STA CR&CL 148+00 SEE DWG NO. C-002
N. SARATOGA ST
MICHIGAN AVE
N. MOTT ST
NEW JERSEY ST
BROOKLYN AVE
N. FICKETT ST
OUTLINE OF TUNNEL
℄ OF CR TRACK
℄ OF CL TRACK
2630
1830
CURVE DATA
CURVE NO. R V mph
1830 970 45
2630 970 45
17

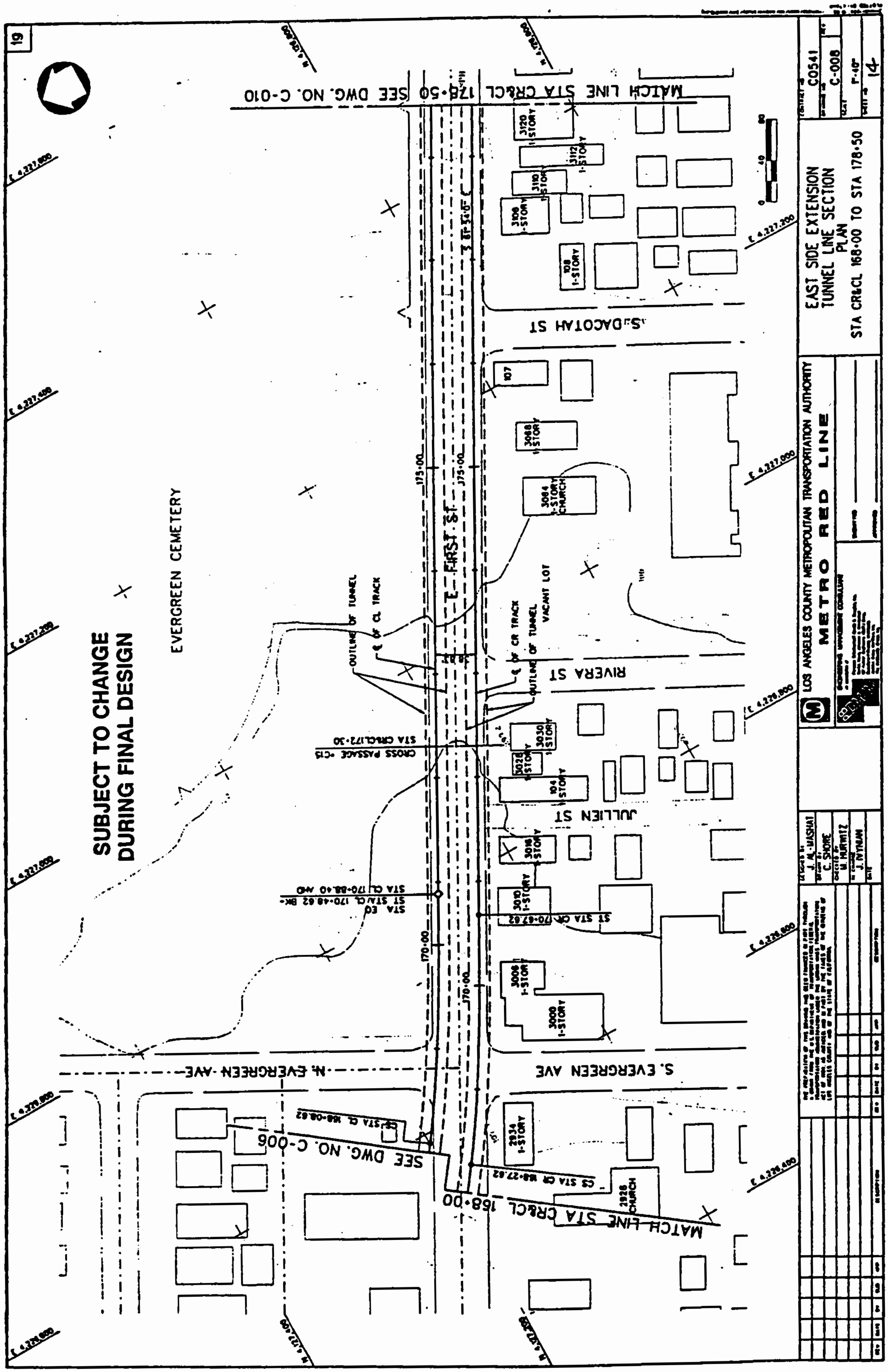

SUBJECT TO CHANGE
DURING FINAL DESIGN
N FICKETT ST
ALLEY
EXISTING GROUND
MOTT ST
ALLEY
MICHIGAN AVE
MATCH LINE STA CR 148+00 SEE DWG. NO. C-003
MATCH LINE STA CR 157+50 SEE DWG. NO. C-007
SC STA CR 148+70.59
PVI STA CR 149+00
EL-286.83
T/R 285.26
PVT STA CR 150+90
380' VC
E-1.57
380' VC
E-1.09
TOP OF TUNNEL
TOP OF RAIL
BOTTOM OF TUNNEL
-3.00 %
CS STA CR 155+45.17
CROSS PASSAGE
STA CR 157+50
PVC STA CR 157+00.00
EL-262.53
EL 286.18
EL 285.26
EL 283.48
EL 280.83
EL 277.83
EL 274.83
EL 271.83
EL 268.83
EL 265.83
EL 262.83
EL 261.38
148+00
149+00
150+00
151+00
152+00
153+00
154+00
155+00
156+00
157+00
158+00
VERT
HORIZ
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
Y. WAGNER
S. IBRAHIM
J. IVYMAN
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 148+00 TO STA CR 157+50
C0541
C-005
HORIZ. 1"=40'
VERT. 1"=10'
11



SUBJECT TO CHANGE DURING FINAL DESIGN
MATCH LINE STA CR&CL 168+00
SEE DWG. NO. C-008
SEE DWG. NO. C-004
MATCH LINE STA CR&CL 157+50
PENNSYLVANIA AVE
N. SAVANNAH ST
E. FIRST ST
MICHIGAN AVE
N. SARATOGA ST
ALLEY
OUTLINE OF TUNNEL
CROSS PASSAGE
202 PRIVATE SCHOOL
122 PARKING LOT
128 CHURCH
2727 CHURCH
2726 CHURCH
2940 VACANT
CURVE DATA
CURVE NO. | R | V mph
1640 | 970 | 45
2640 | 970 | 45
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 157+50 TO STA 168+00
C0541
C-006
1"=40'
12

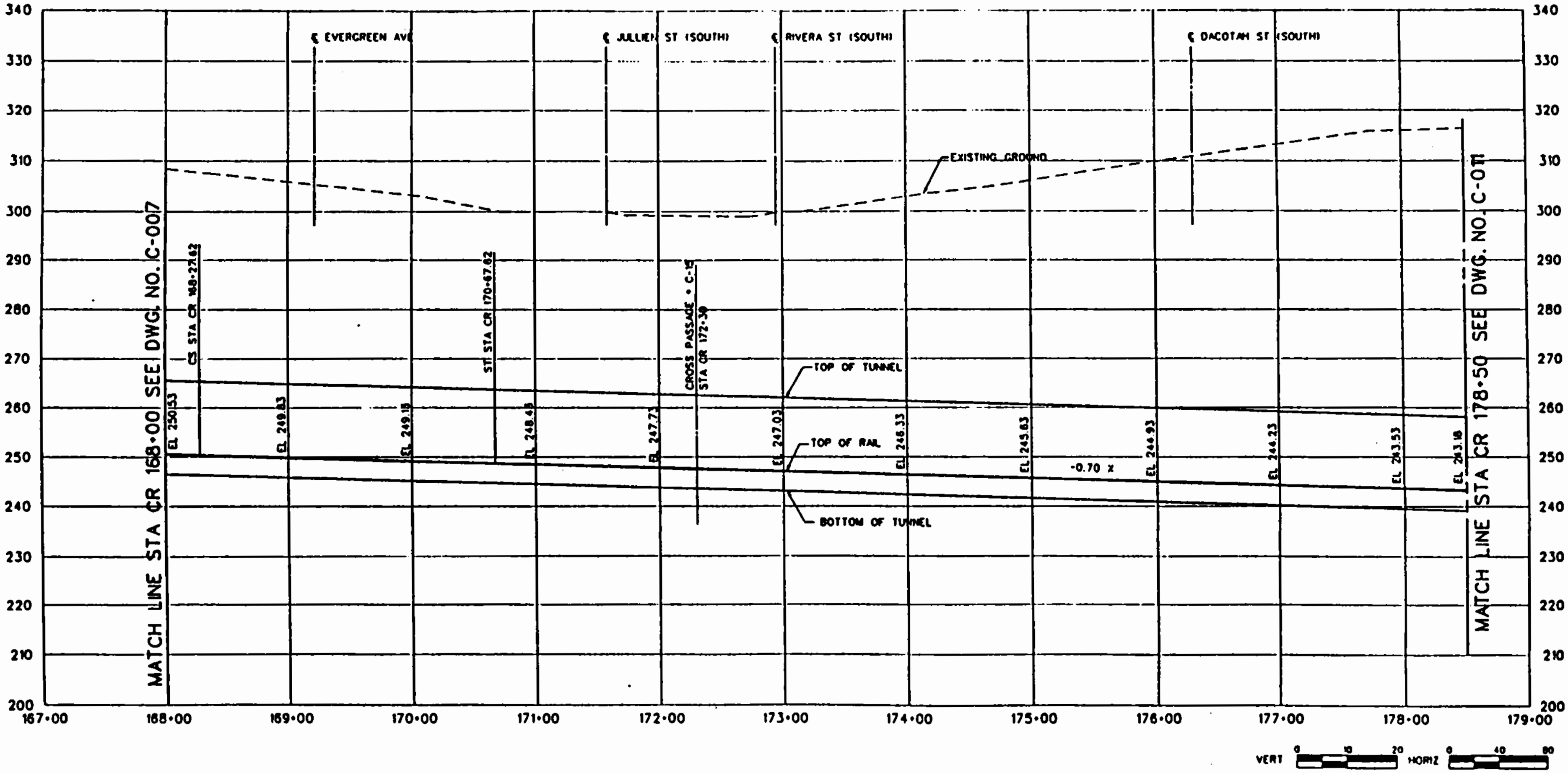


SUBJECT TO CHANGE DURING FINAL DESIGN
℄ S SARATOGA ST
℄ ALLEY
℄ SAVANNAH ST
℄ E FIRST ST
EXISTING GROUND
TOP OF TUNNEL
TOP OF RAIL -0.70 %
BOTTOM OF TUNNEL
MATCH LINE STA CR 157+50 SEE DWG. NO. C-005
MATCH LINE STA CR 168+00 SEE DWG. NO. C-009
ST STA CR 157+85.17
TS STA CR 159+18.27
SC STA CR 160+58.27
CROSS PASSAGE #C-14 STA CR 164+80
PVI STA CR 159+00.00 EL 256.83 T/R 257.92
PVT STA CR 160+90.00 EL 255.50
380' VC E=1.09
EL 261.58
EL 260.07
EL 257.92
EL 256.37
EL 255.43
EL 254.73
EL 254.03
EL 253.33
EL 252.63
EL 251.93
EL 251.23
EL 250.53
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
158+00
159+00
160+00
161+00
162+00
163+00
164+00
165+00
166+00
167+00
168+00
VERT 0 10 20
HORIZ 0 40 80
T. WAGNER
J. TODOROV
S. IBRAHIM
J. IVTHAN
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
ENGINEERING MANAGEMENT CONSULTANT
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
C0541
C-007
HORIZ. 1"=40'
VERT. 1"=10'
13


SUBJECT TO CHANGE
DURING FINAL DESIGN
EVERGREEN CEMETERY
E. FIRST ST
S. DACOTAH ST
RIVERA ST
JULLIEN ST
S. EVERGREEN AVE
N. EVERGREEN AVE
VACANT LOT
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
CROSS PASSAGE
MATCH LINE STA CR&CL 178+50 SEE DWG. NO. C-010
MATCH LINE STA CR&CL 168+00
SEE DWG. NO. C-006
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 168+00 TO STA 178+50
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
C0541
C-008
1"=40'
14

A-4.51

SUBJECT TO CHANGE DURING FINAL DESIGN



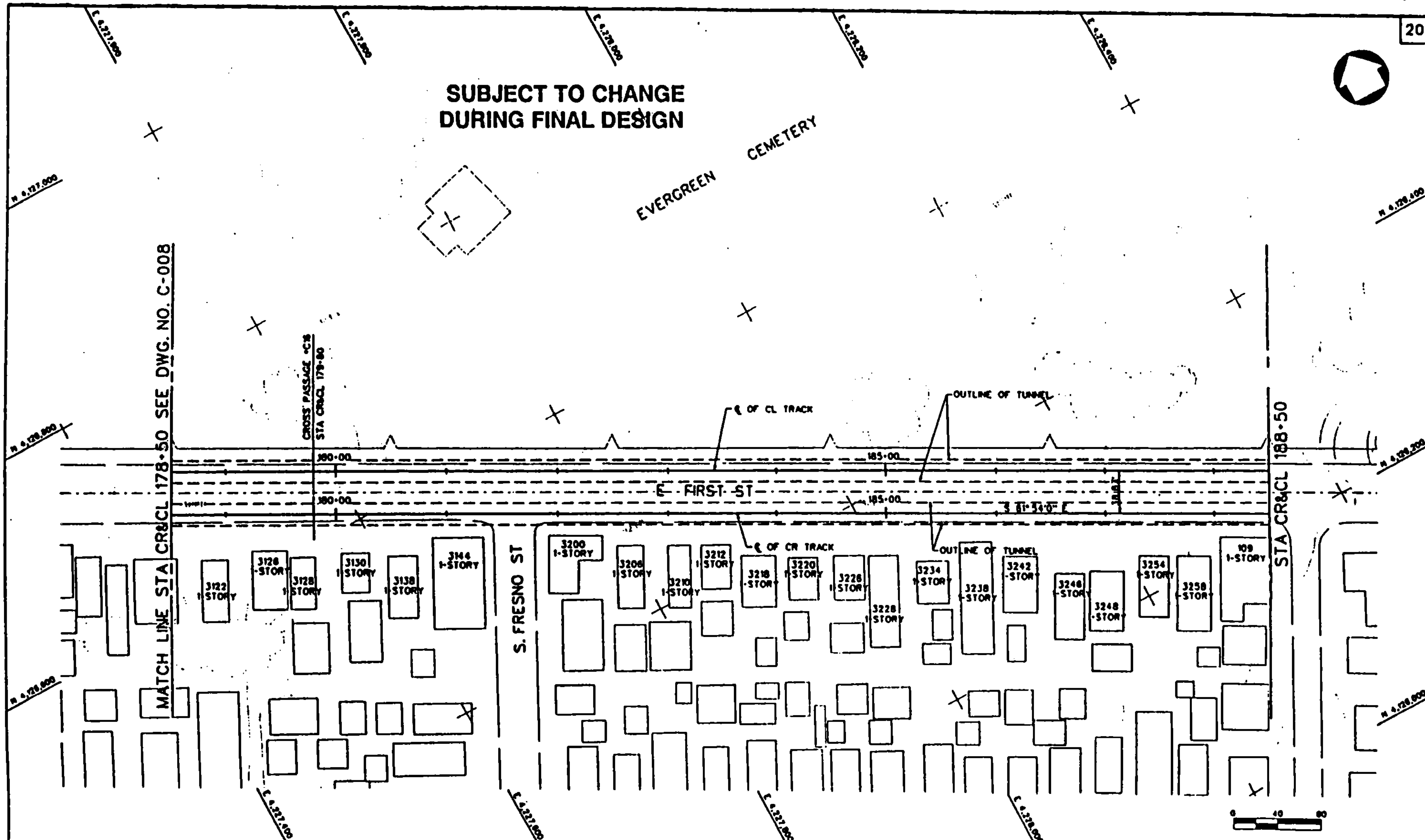
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 168+00 TO STA CR 178+50

DESIGNED BY S. IBRAHIM
DRAWN BY J. TODOROV
CHECKED BY Y. WAGNER
IN CHARGE J. IVYNIAN

CONTRACT NO. C0541
DRAWING NO. C-009
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 15



DESIGNED BY	M. HURWITZ
DRAWN BY	C. SHORE
CHECKED BY	J. AL-MASHAT
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

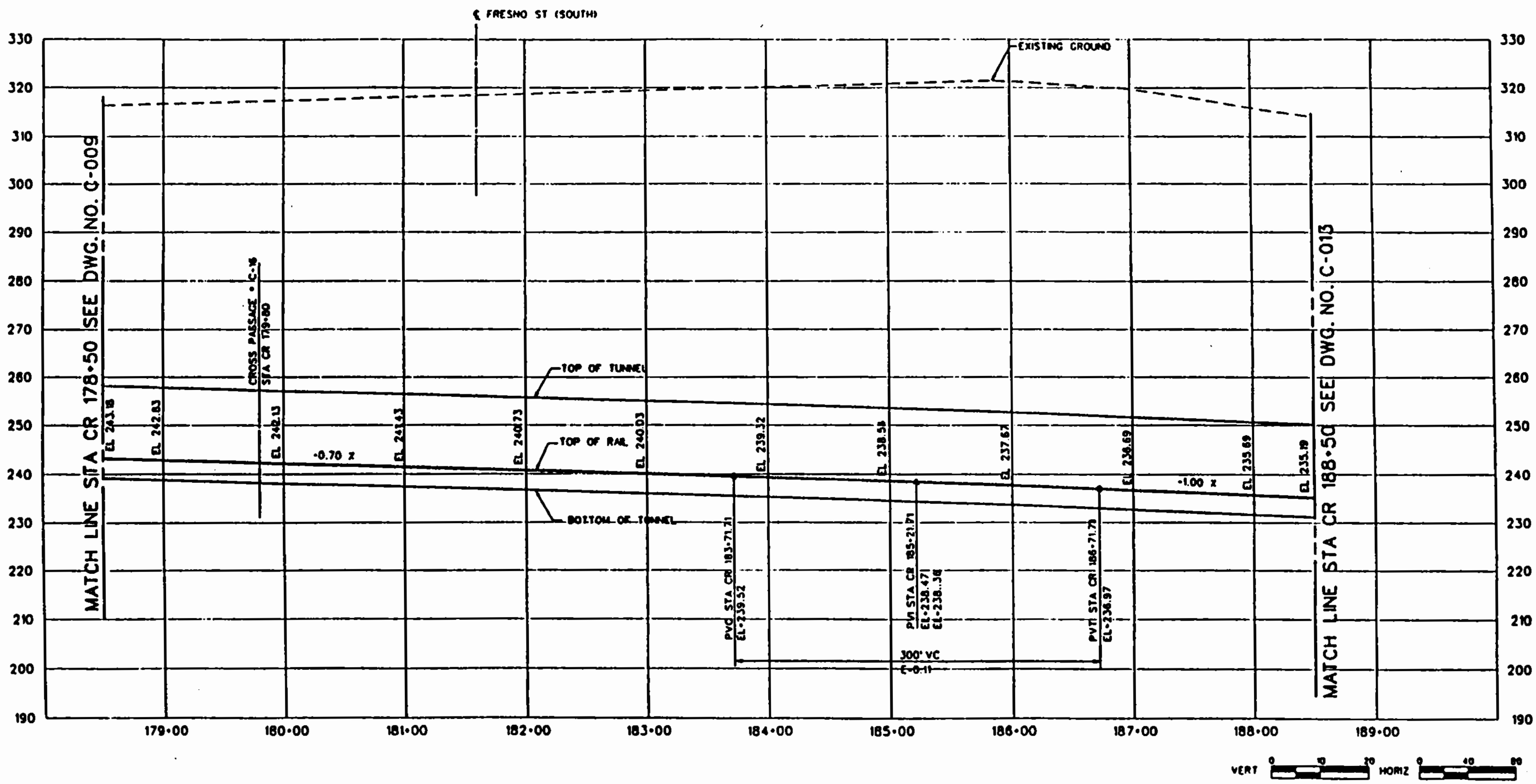
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 178+50 TO STA 189+49.19

CONTRACT NO.	C0541
DRAWING NO.	C-010
SCALE	1"=40'
SHEET NO.	16

A-4.53

SUBJECT TO CHANGE
DURING FINAL DESIGN



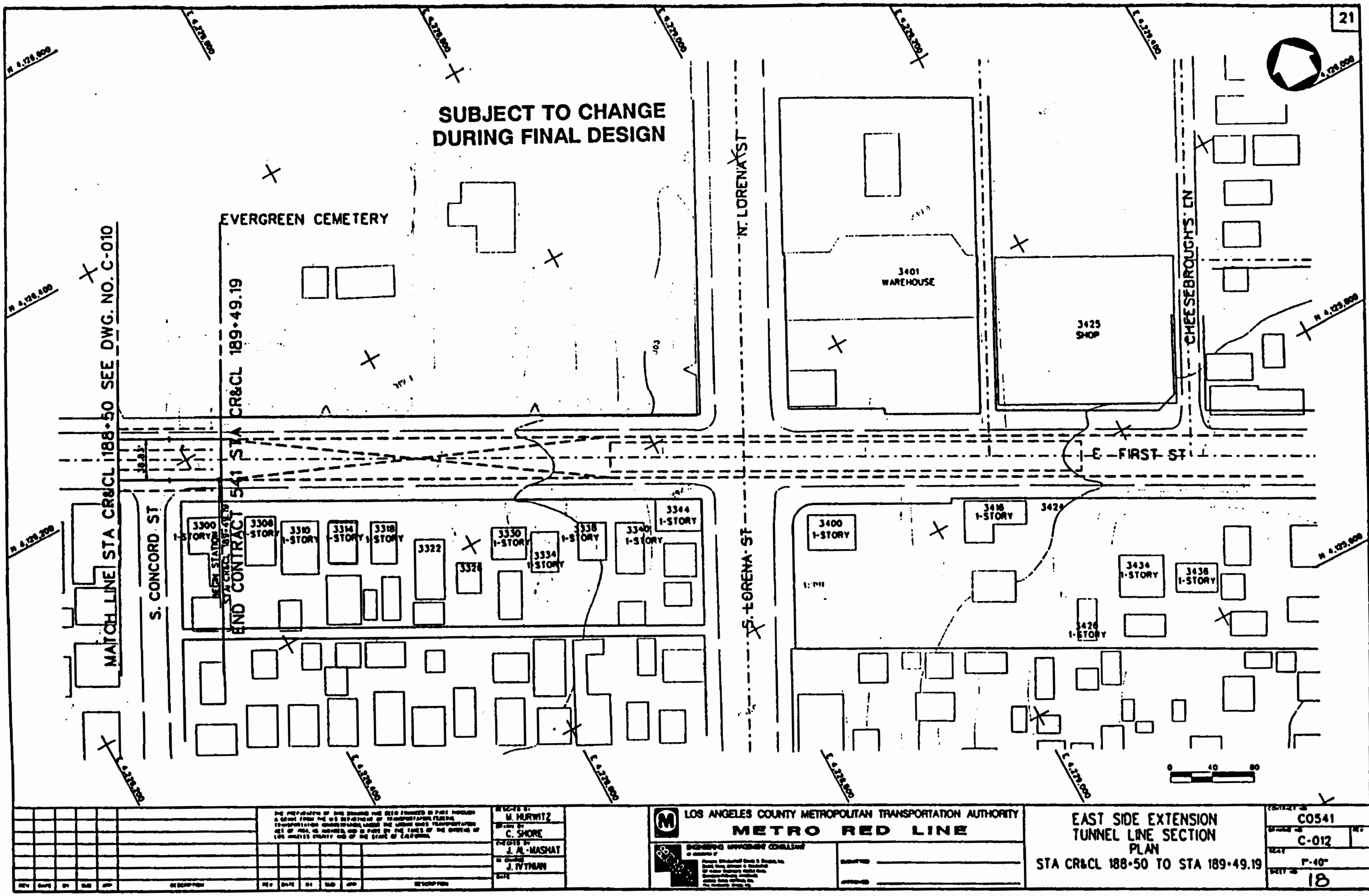
Y. MAGNER
J. TODOROV
S. IBRAHIM
J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 178+50 TO STA CR 188+50

C0541
C-011
HORIZ. 1"=40'
VERT. 1"=10'
17

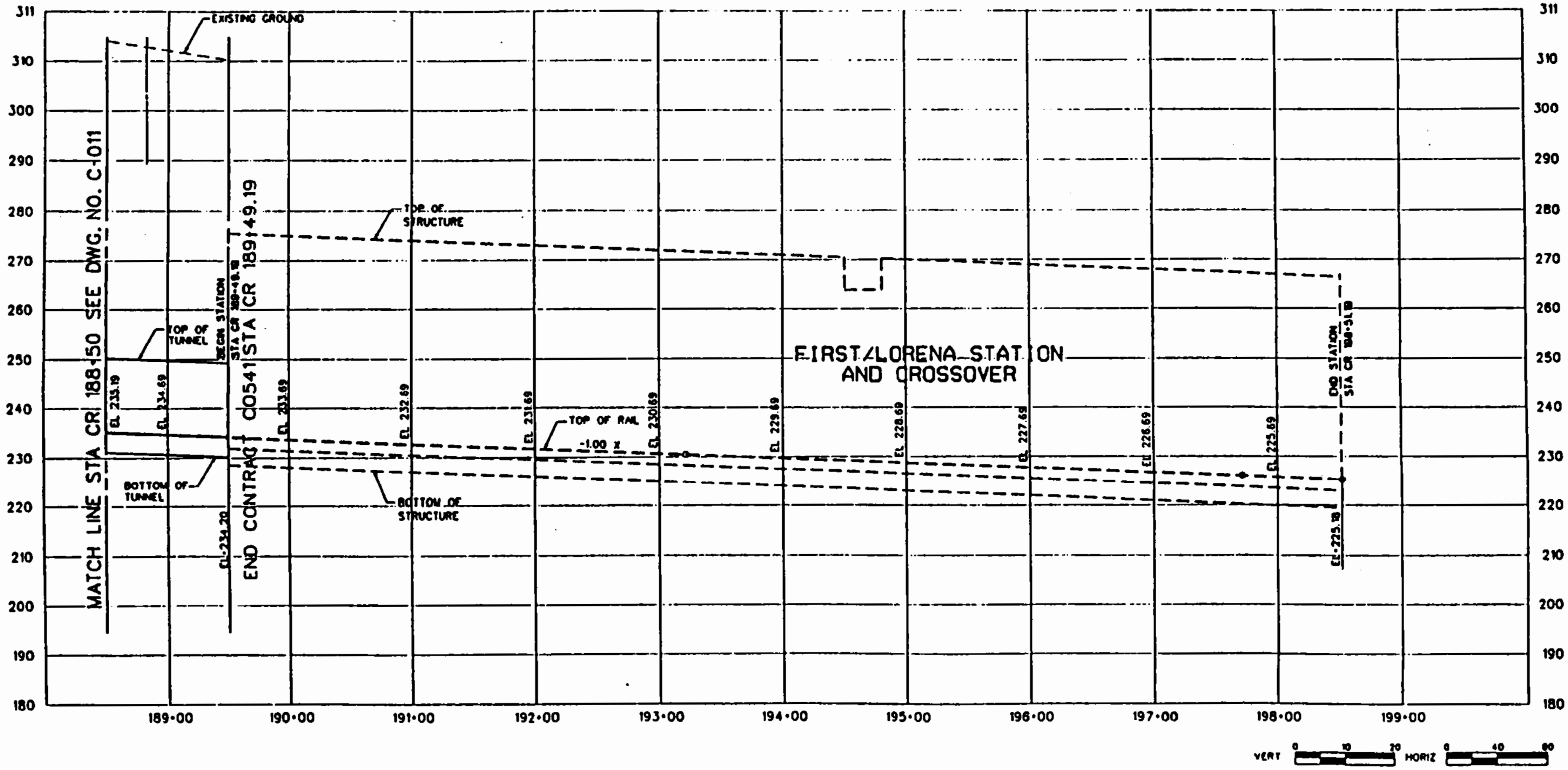
A-4.54



21
SUBJECT TO CHANGE
DURING FINAL DESIGN
EVERGREEN CEMETERY
MATCH LINE STA CR&CL 188+50 SEE DWG. NO. C-010
END CONTRACT 541 STA CR&CL 189+49.19
S. CONCORD ST
N. LORENA ST
S. LORENA ST
CHEESEBROUGH'S LN
E FIRST ST
3401
WAREHOUSE
3425
SHOP
3300
1-STORY
3306
1-STORY
3310
1-STORY
3314
1-STORY
3318
1-STORY
3322
3326
3330
1-STORY
3334
1-STORY
3338
1-STORY
3340
1-STORY
3344
1-STORY
3400
1-STORY
3418
1-STORY
3424
3426
1-STORY
3434
1-STORY
3436
1-STORY
0
40
80
M. HURWITZ
C. SHORE
J. AL-MASHAT
J. IVYNIAN
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 188+50 TO STA 189+49.19
C0541
C-012
1"=40'
18

A-4.55

**SUBJECT TO CHANGE
DURING FINAL DESIGN**



DESIGNED BY	M. HURWITZ
DRAWN BY	S. BRAHM
CHECKED BY	Y. MAGNER
IN CHARGE	J. IVYNIAN

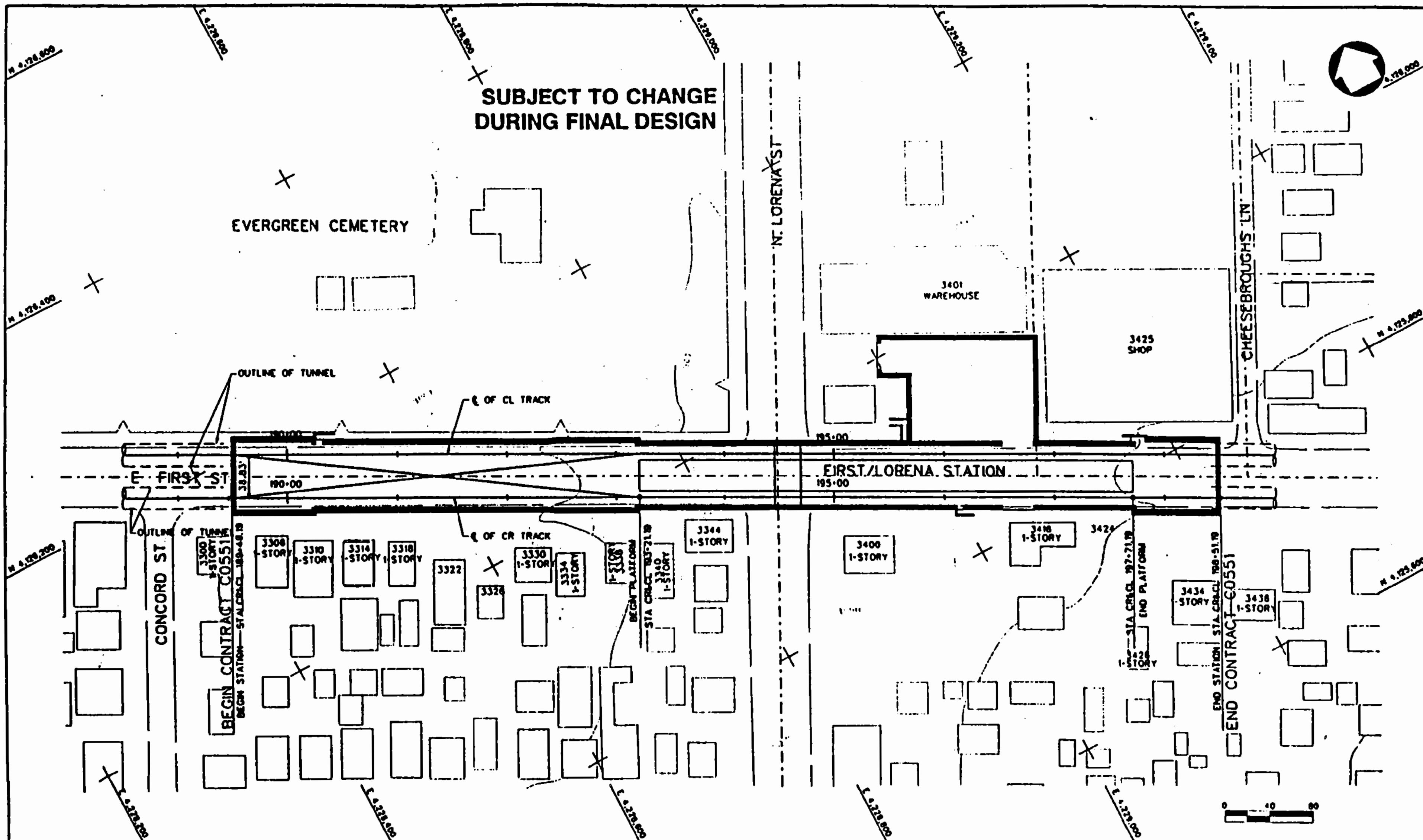
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 188+50 TO STA CR 189+49.19

CONTRACT NO. C0541
DRAWING NO. C-013
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 19

A-4.56



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

DESIGNED BY	M. HURWITZ
DRAWN BY	C. SHORE
CHECKED BY	J. AL-MASHAT
IN CHARGE	J. IVYNIAN
DATE	

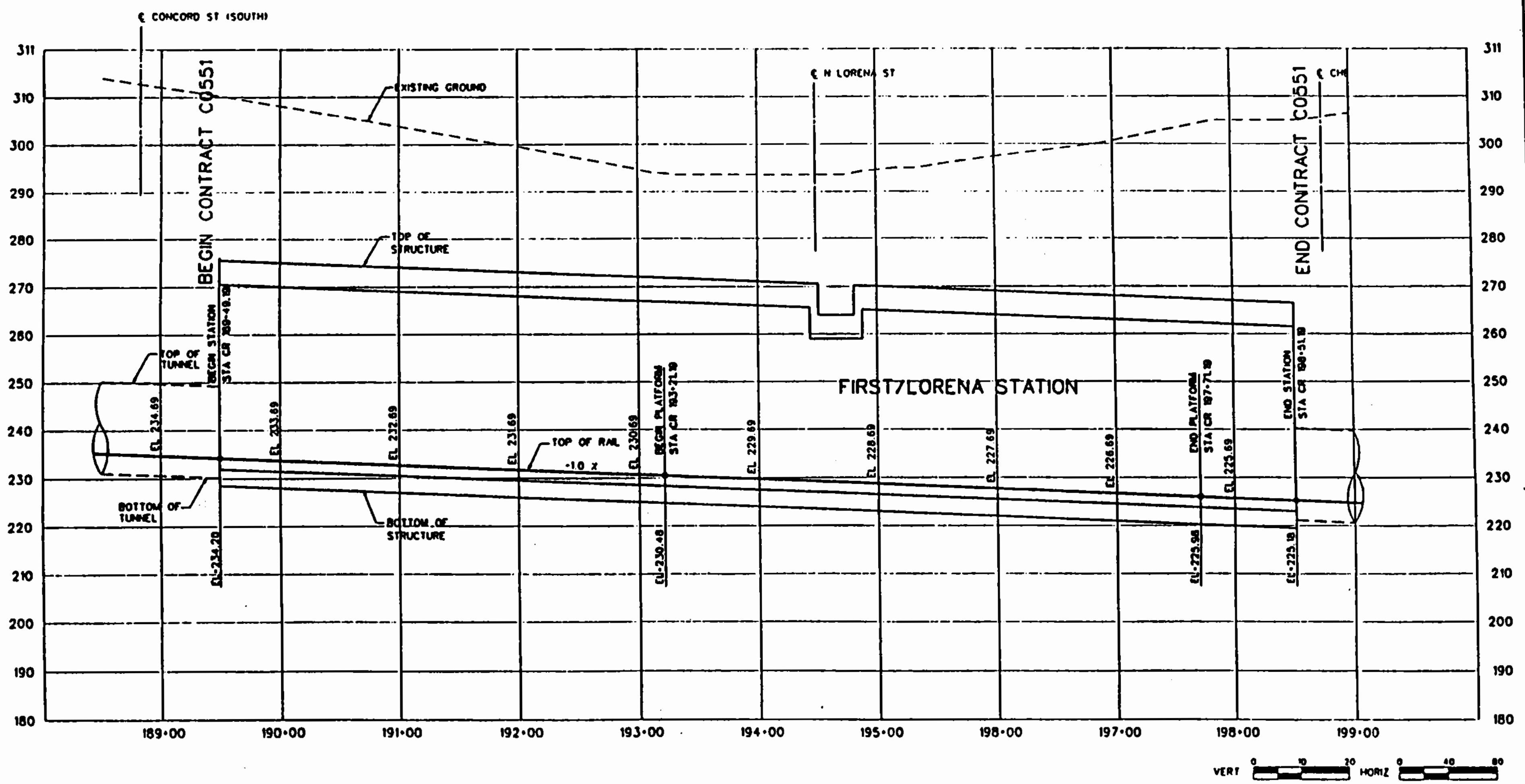
EAST SIDE EXTENSION
FIRST/LORENA STATION
PLAN

CONTRACT NO.	C0551
DRAWING NO.	C-001
REV	0
SCALE	1"-40'
SHEET NO.	175 7

SUBMITTED ____________

APPROVED ____________

SUBJECT TO CHANGE
DURING FINAL DESIGN



DESIGNED BY	M. HURWITZ
DRAWN BY	S. IBRAHIM
CHECKED BY	Y. MAGNER
IN CHARGE	J. IVYMAN

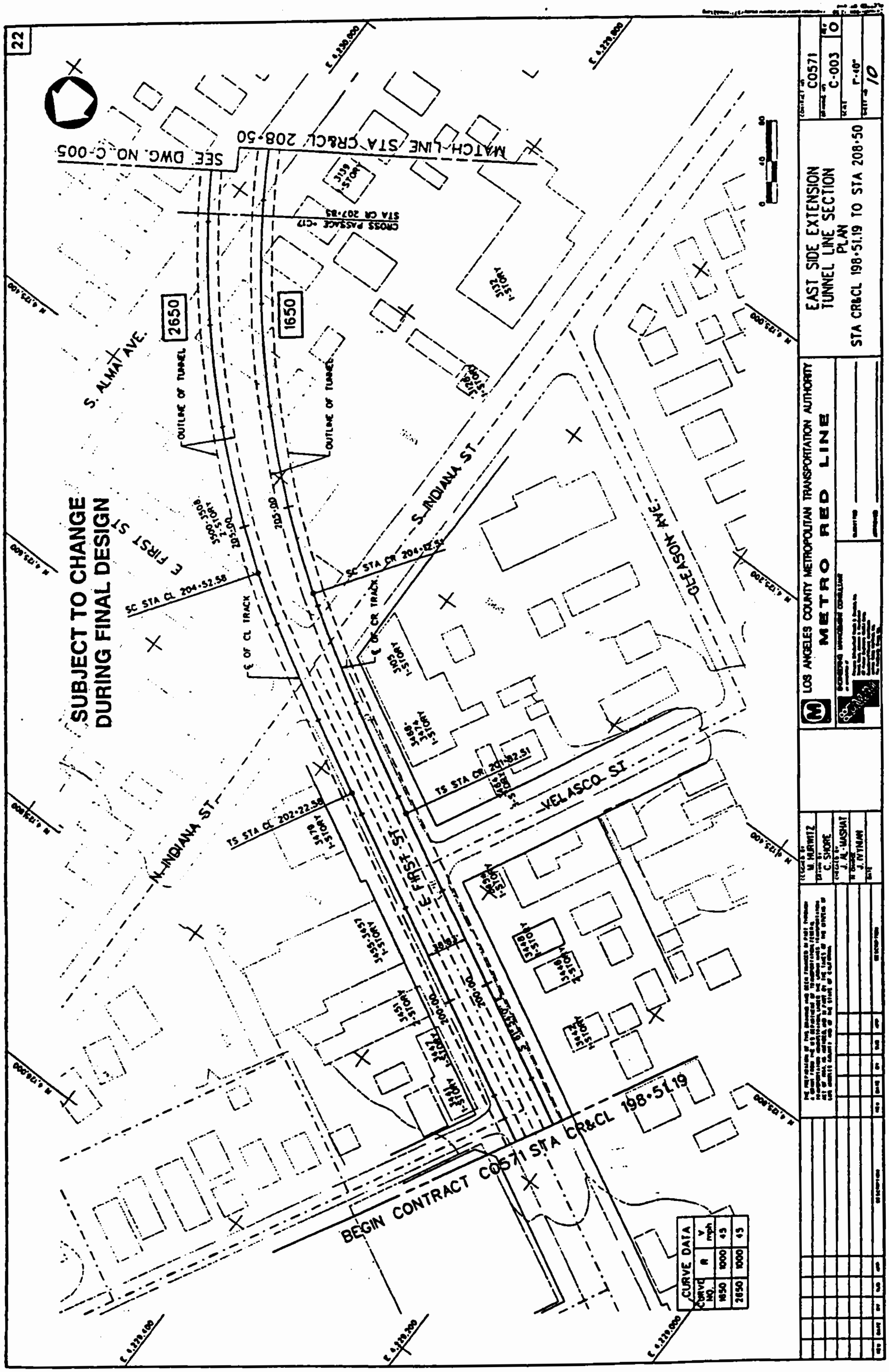
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

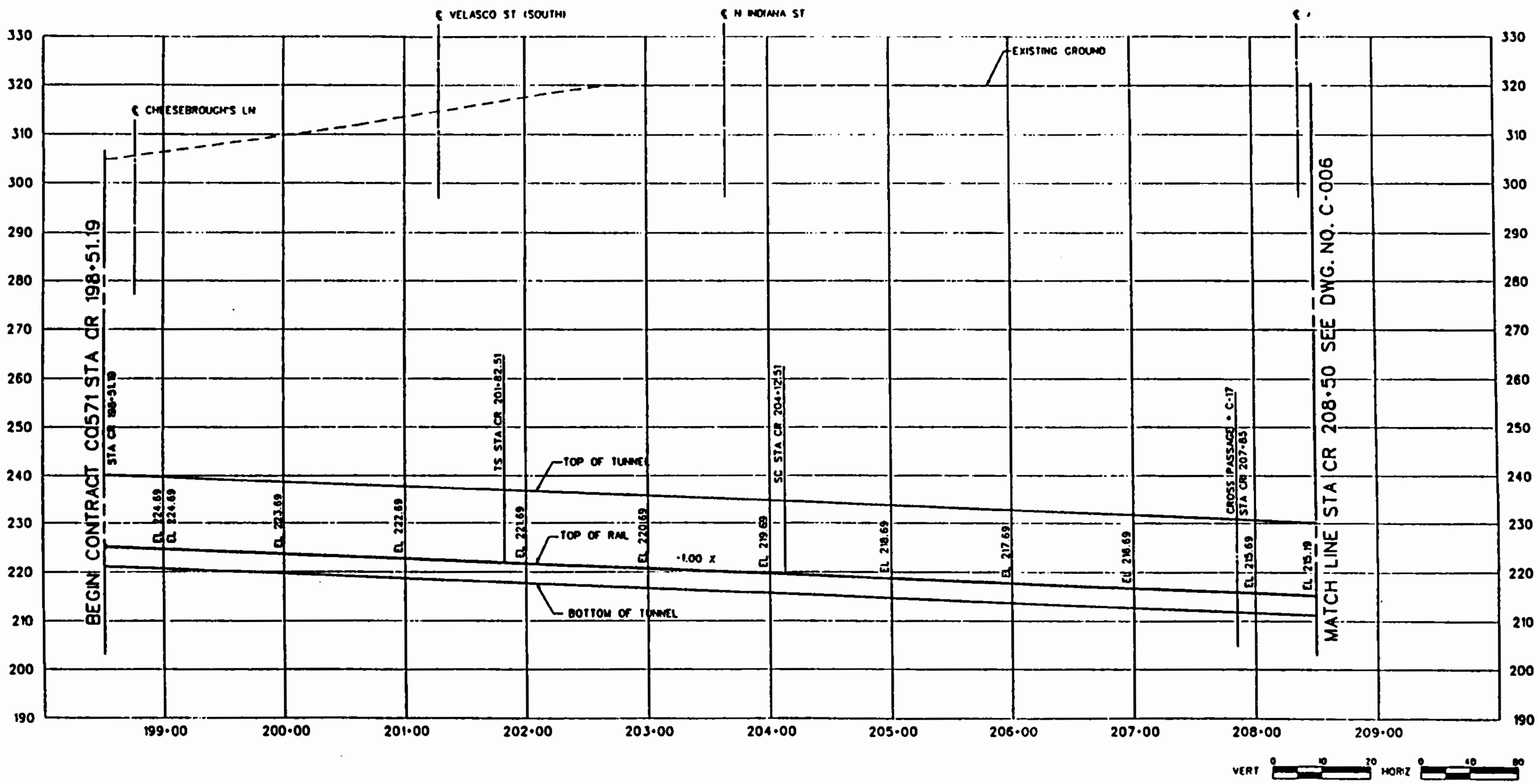
EAST SIDE EXTENSION
FIRST/LORENA STATION
PROFILE
STA CR 188+50 TO STA CR 199+00

CONTRACT NO	C0551
DRAWING NO	C002
REV	0
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO	174-B



22
SUBJECT TO CHANGE
DURING FINAL DESIGN
SEE DWG. NO. C-005
MATCH LINE STA CR&CL 208+50
CROSS PASSAGE #C17
STA CR 207+83
S. ALMA AVE.
2650
1650
OUTLINE OF TUNNEL
E FIRST ST
S. INDIANA ST
N. INDIANA ST
GLEASON AVE.
VELASCO ST
E. FIRST ST
SC STA CL 204+52.58
SC STA CR 204+12.51
TS STA CR 201+82.51
TS STA CL 202+22.58
℄ OF CL TRACK
℄ OF CR TRACK
BEGIN CONTRACT C0571 STA CR&CL 198+51.19
CURVE DATA
CURVE NO. | R | V mph
1650 | 1000 | 45
2650 | 1000 | 45
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 198+51.19 TO STA 208+50
C0571
C-003
0
1"=40'
10
M. HURWITZ
C. SHORE
J. AL-HASHAT
J. IVYNAN

SUBJECT TO CHANGE DURING FINAL DESIGN



A-4.59

DESIGNED BY	S. IBRAHIM
DRAWN BY	S. IBRAHIM
CHECKED BY	Y. MAGNER
IN CHARGE	J. IVYMAN

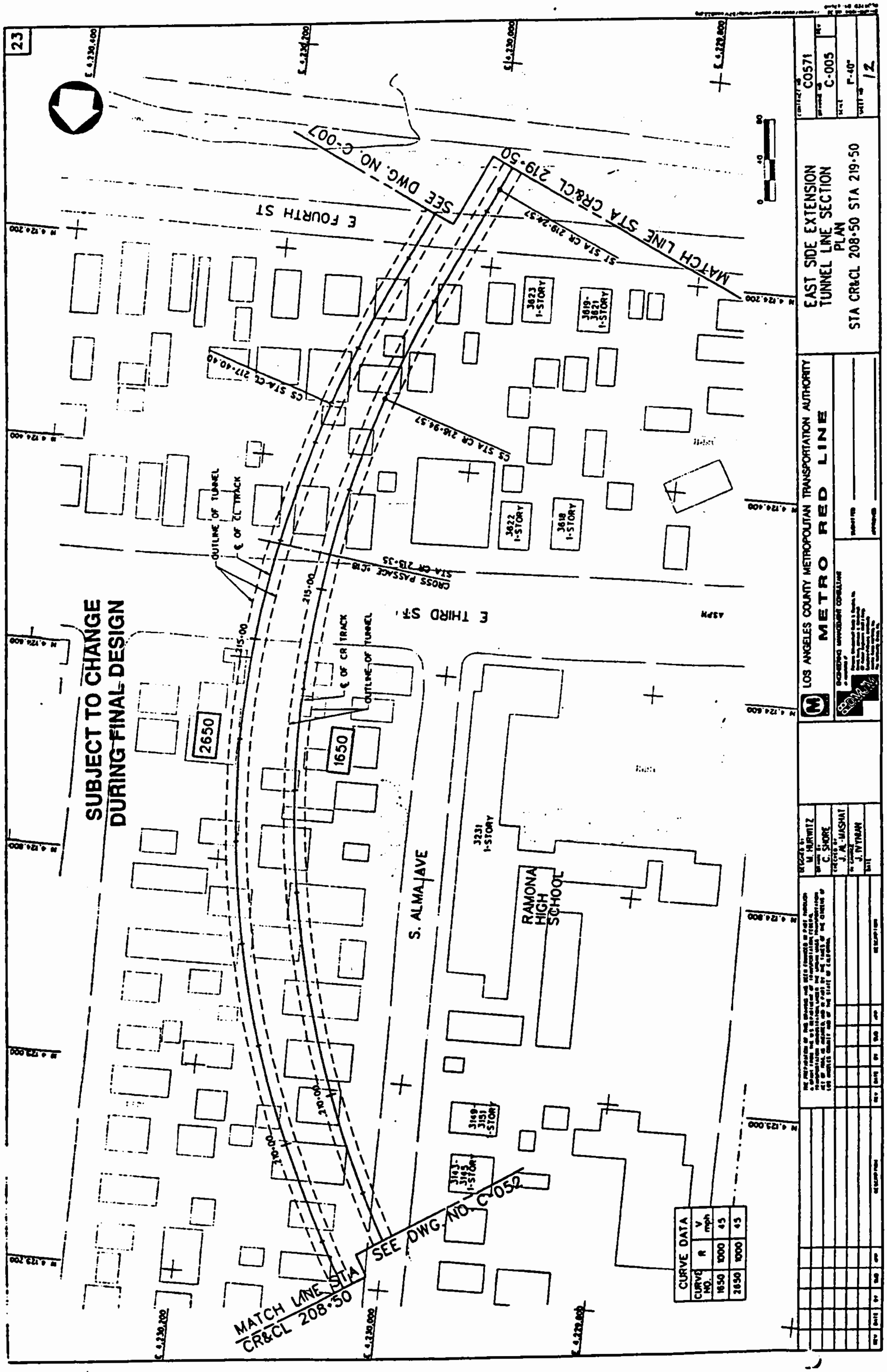
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

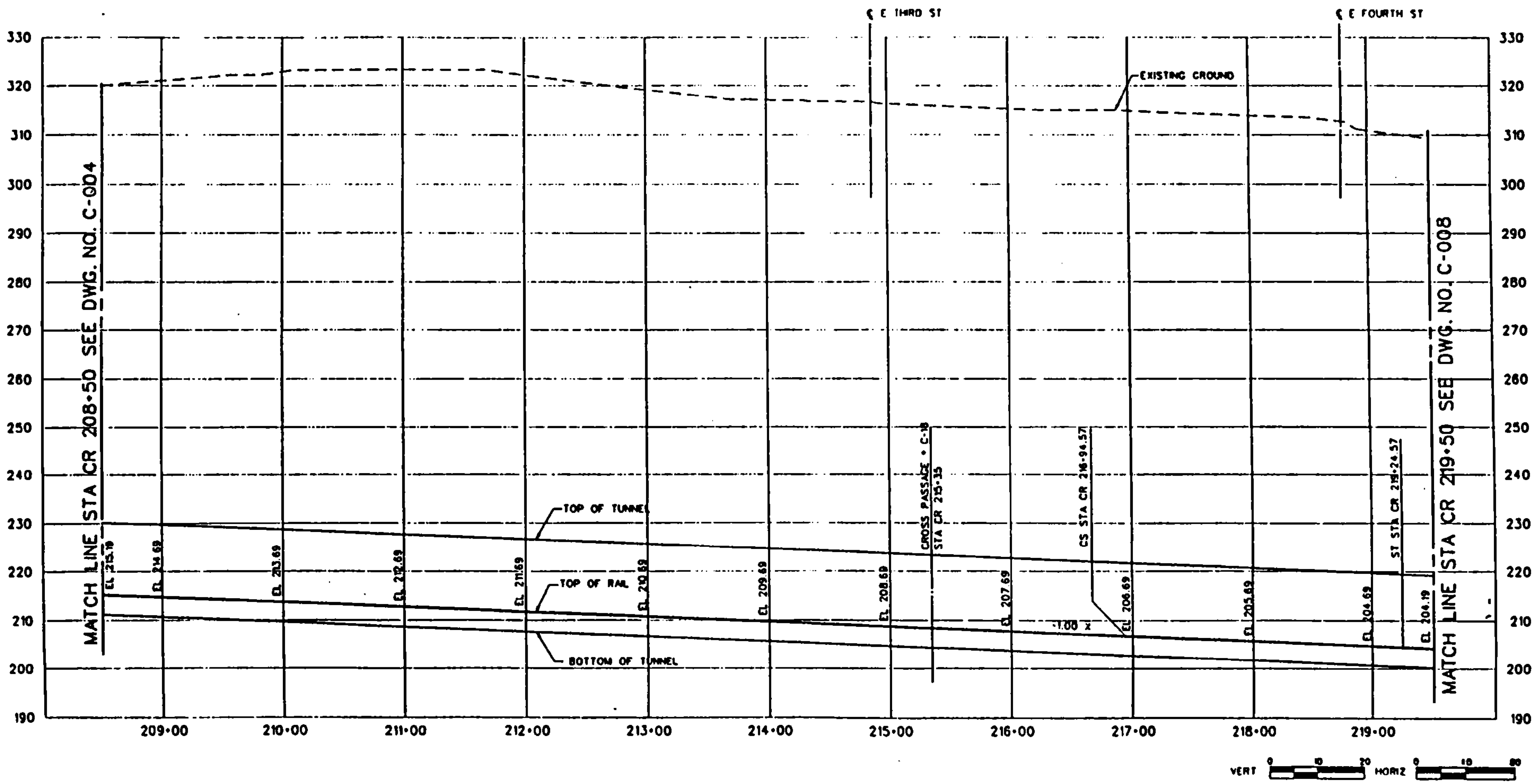
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 198+51.19 TO STA CR 208+50

CONTRACT NO.	C0571
DRAWING NO.	C-004
REV	0
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	11



23
SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE STA CR&CL 219+50
SEE DWG. NO. C-007
MATCH LINE STA CR&CL 208+50
SEE DWG. NO. C-052
E FOURTH ST
E THIRD ST
S. ALMA AVE
RAMONA HIGH SCHOOL
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
CROSS PASSAGE #18
2650
1650
CURVE DATA
CURVE NO.
R
V mph
1650
1000
45
2650
1000
45
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 208+50 STA 219+50
C0571
C-005
1"-40'
12

SUBJECT TO CHANGE DURING FINAL DESIGN



S. BRAHM
J. TODOROV
Y. MAGNIER
J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

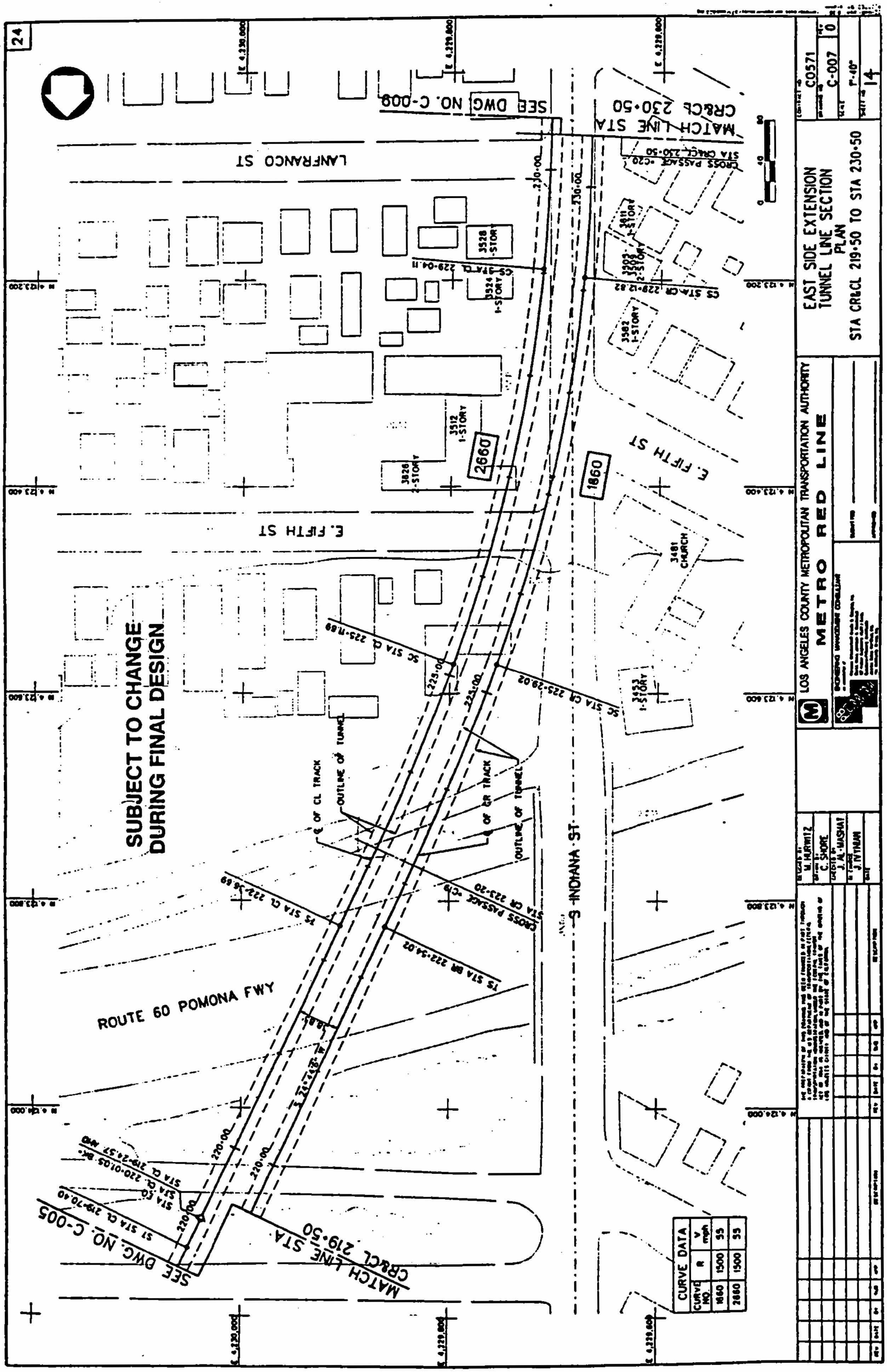
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 208+50 TO STA CR 219+50

C0571

C-006 | 0

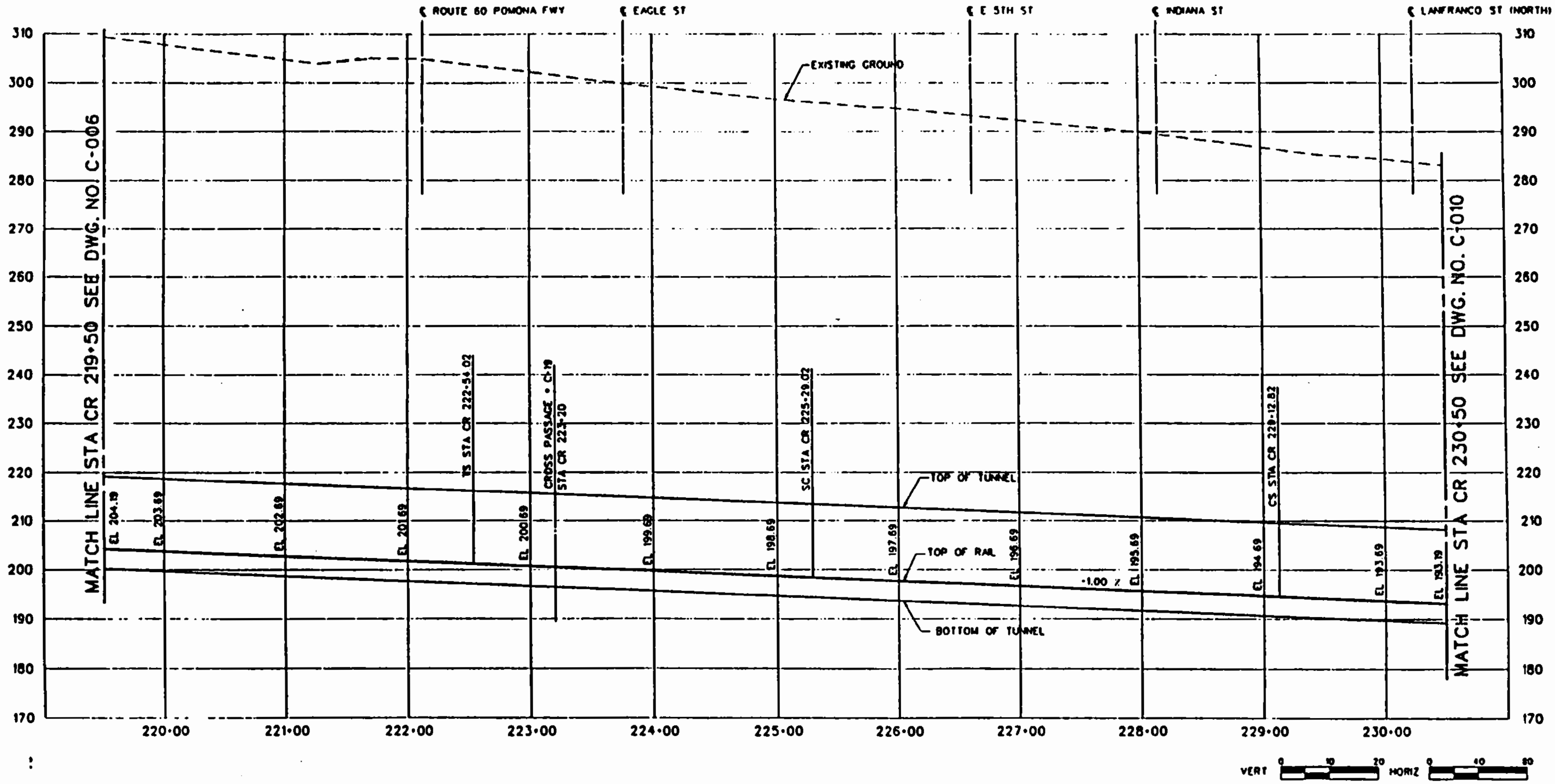
HORIZ. 1"=40'
VERT. 1"=10'

13



24
SEE DWG NO. C-009
MATCH LINE STA CR&CL 230+50
LANFRANCO ST
E. FIFTH ST
S INDIANA ST
ROUTE 60 POMONA FWY
SUBJECT TO CHANGE DURING FINAL DESIGN
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
3481 CHURCH
3512 1-STORY
3528 1-STORY
3524 1-STORY
3502 1-STORY
3453 1-STORY
2660
1860
SEE DWG. NO. C-005
MATCH LINE STA CR&CL 219+50
CURVE DATA
CURVE NO.
R
V mph
1860
1500
55
2660
1500
55
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 219+50 TO STA 230+50
C0571
C-007
M. HURWITZ
C. SHORE
J. AL-MASHAT
J. TYNAN

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY S. IBRAHIM
DRAWN BY J. TODOROV
CHECKED BY Y. MAGHIER
IN CHARGE J. IVYNIAN

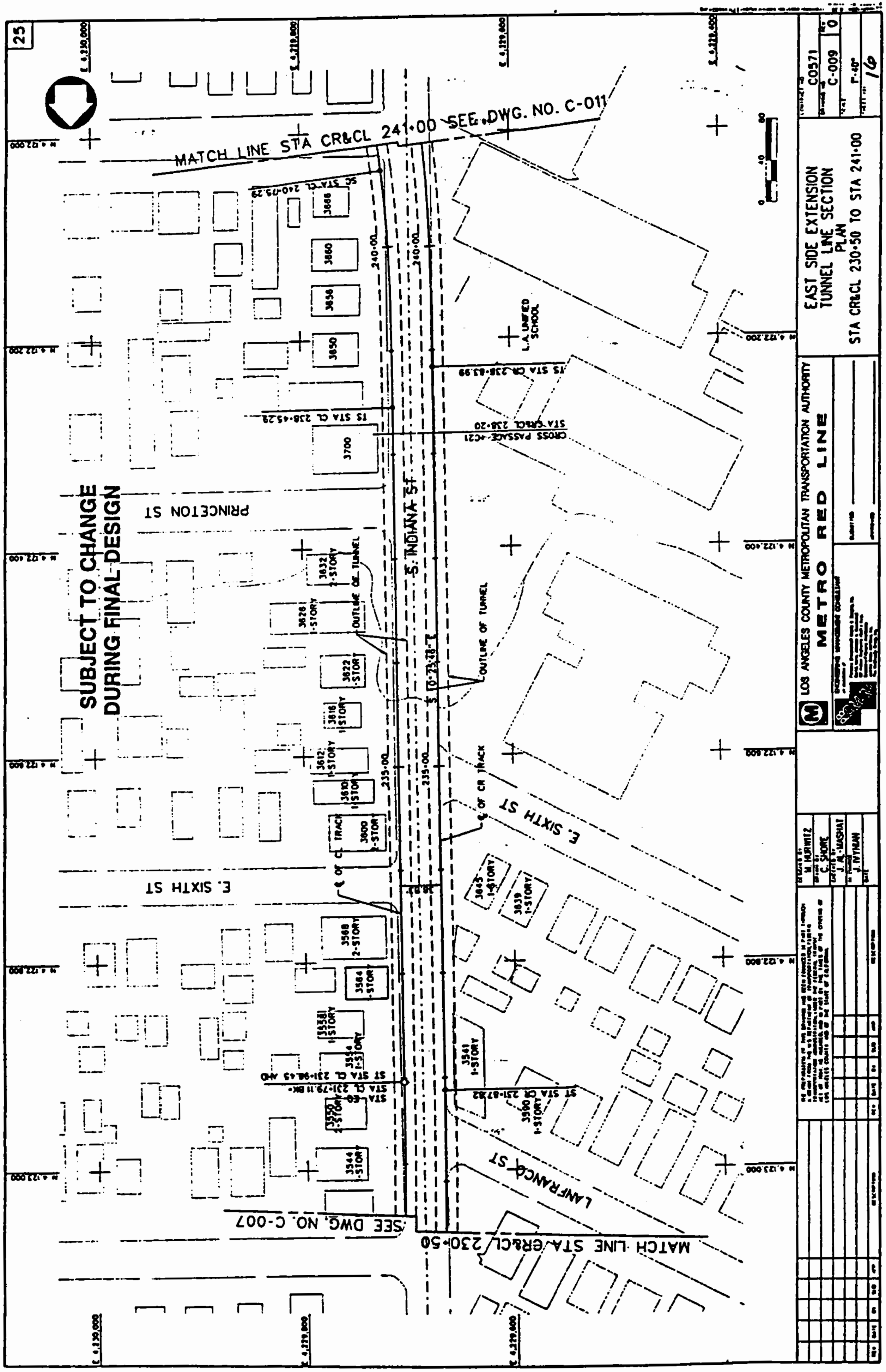
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

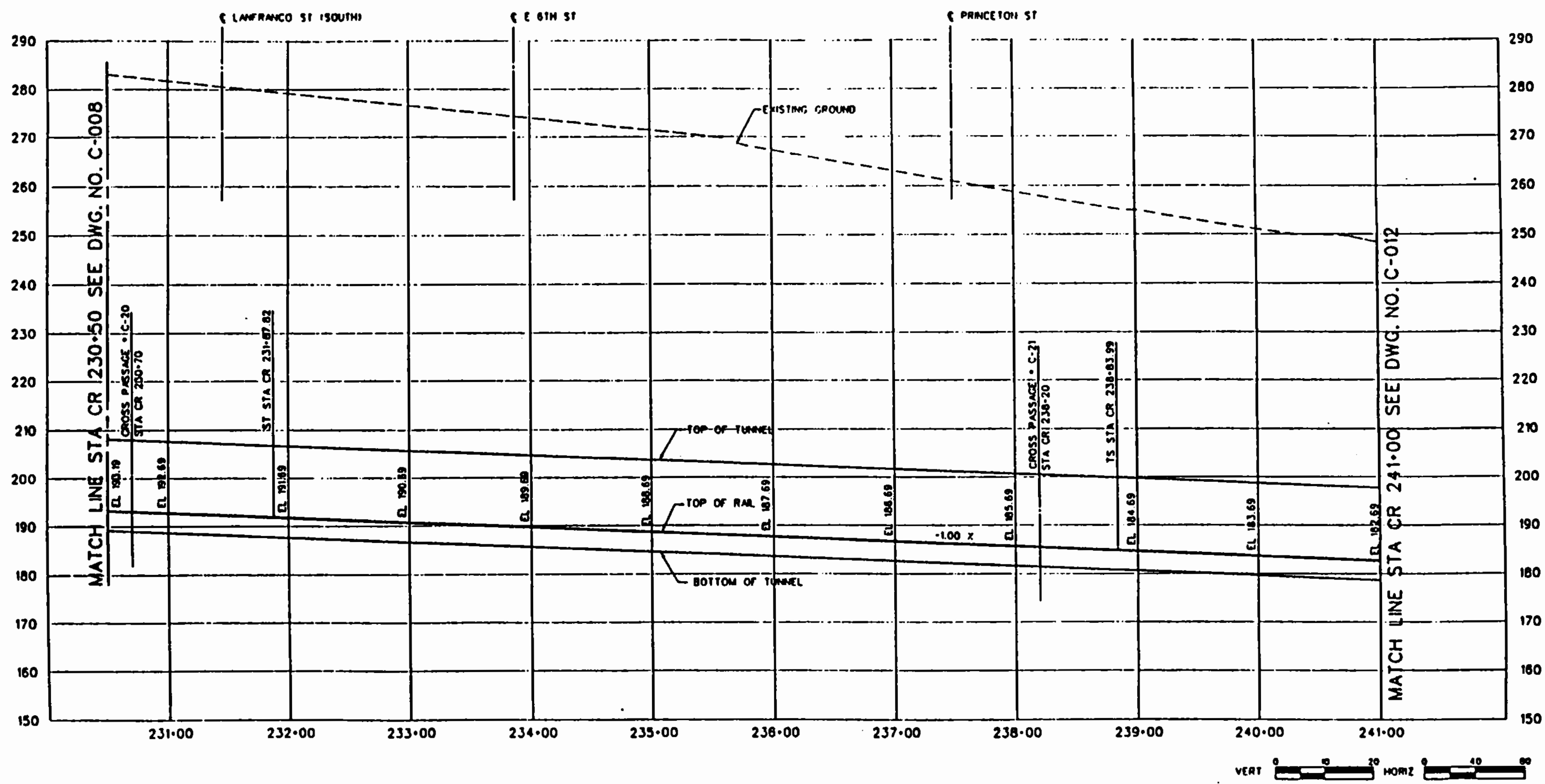
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 219+50 TO STA CR 230+50

CONTRACT NO. C0571
DRAWING NO. C-008
REV. 0
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 15



25
MATCH LINE STA CR&CL 241+00 SEE DWG. NO. C-011
SUBJECT TO CHANGE DURING FINAL DESIGN
PRINCETON ST
E. SIXTH ST
S. INDIANA ST
LANFRANCO ST
L.A. UNIFIED SCHOOL
OUTLINE OF TUNNEL
MATCH LINE STA CR&CL 230+50
SEE DWG. NO. C-007
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 230+50 TO STA 241+00
C0571
C-009

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY	Y. MAGNER
DRAWN BY	S. BRAHM
CHECKED BY	S. BRAHM
IN CHARGE	J. IVYMAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

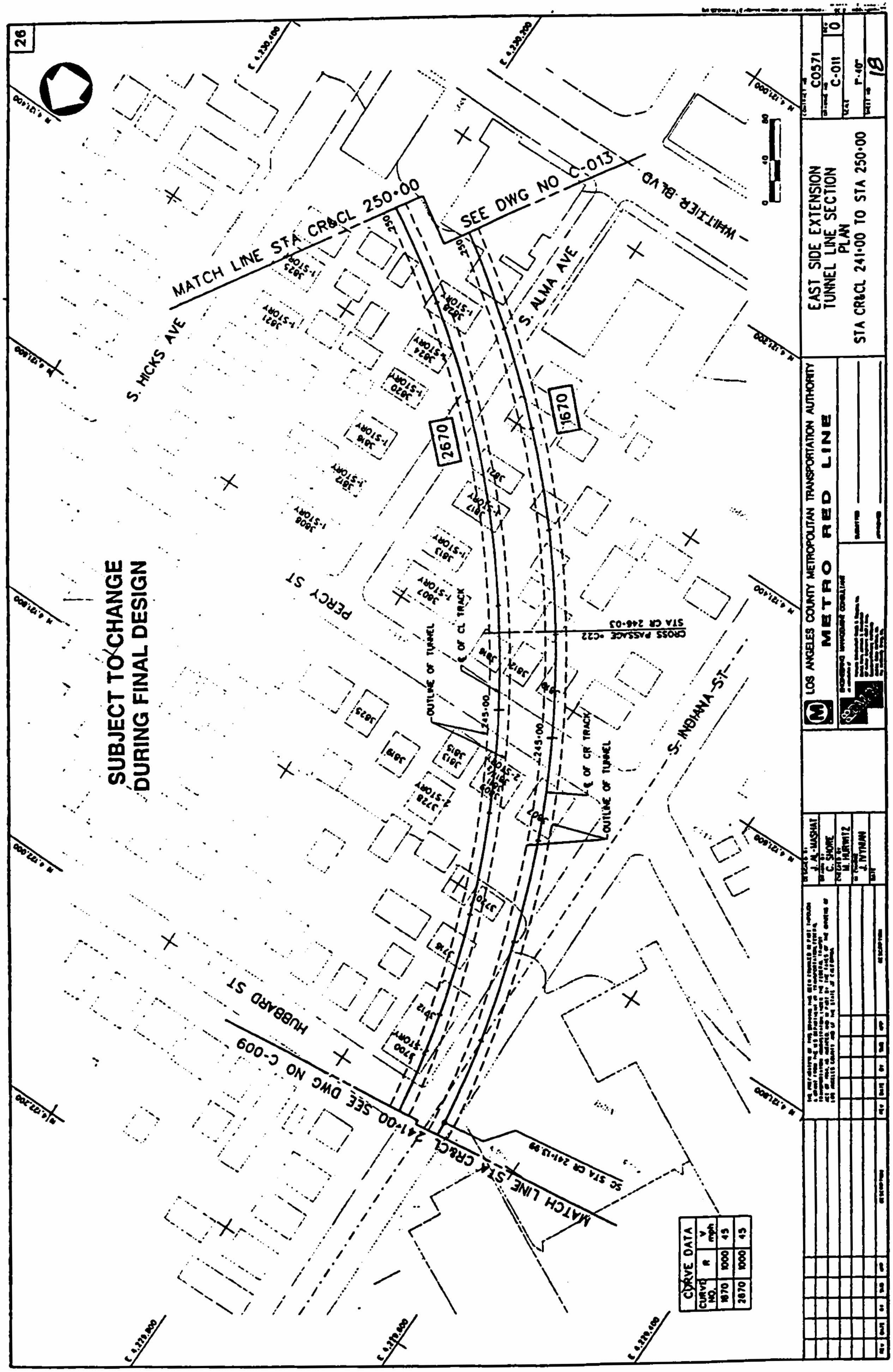
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 230+50 TO STA CR 241+00

CONTRACT NO. C0571

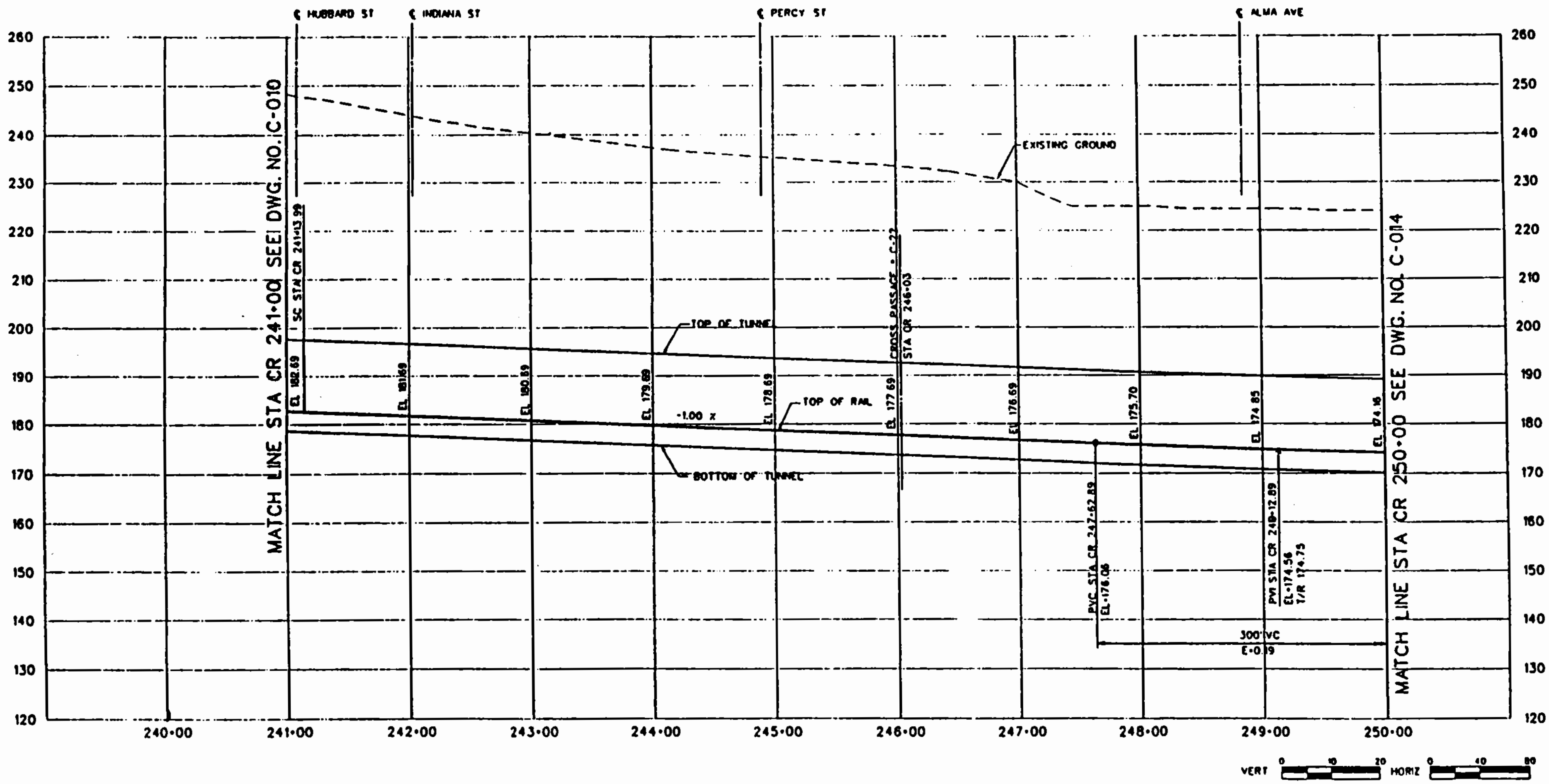
DRAWING NO. C-010 REV 0

SCALE HORIZ. 1"=40' VERT. 1"=10'

SHEET NO. 17


SUBJECT TO CHANGE DURING FINAL DESIGN
MATCH LINE STA CR&CL 250+00 SEE DWG NO C-013
MATCH LINE STA CR&CL 241+00 SEE DWG NO C-009
S. HICKS AVE
S. ALMA AVE
WHITTIER BLVD
PERCY ST
HUBBARD ST
S. INDIANA ST
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
CROSS PASSAGE #C22
STA CR 246+03
2670
1670
CURVE DATA
CURVE NO. | R | V mph
1670 | 1000 | 45
2670 | 1000 | 45
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 241+00 TO STA 250+00
C0571
C-011
1"=40'

SUBJECT TO CHANGE DURING FINAL DESIGN

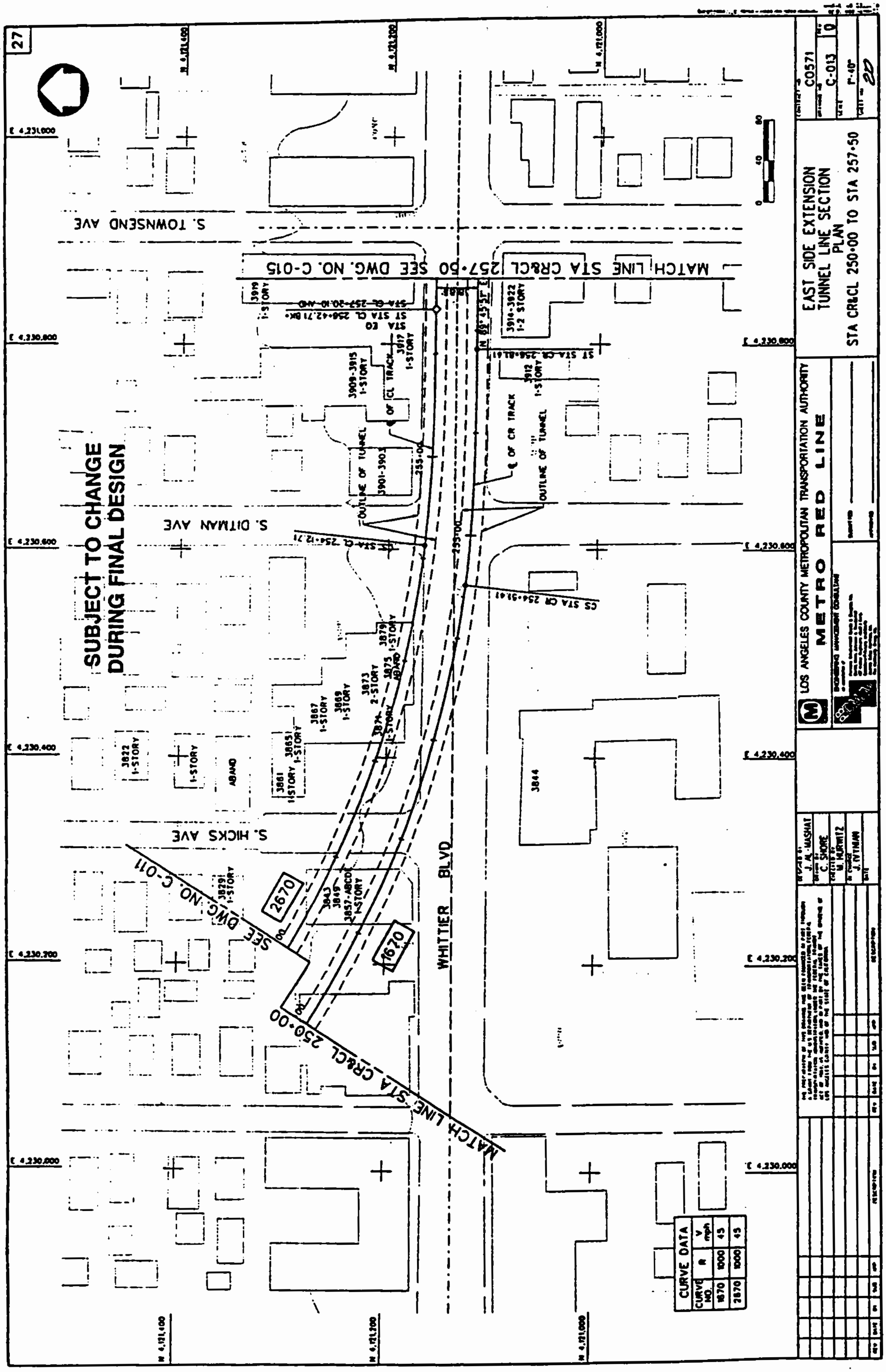


DESIGNED BY T. WAGNER
DRAWN BY S. EBRAHIM
CHECKED BY M. HURWITZ
IN CHARGE J. IVYMAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 241+00 TO STA CR 250+00

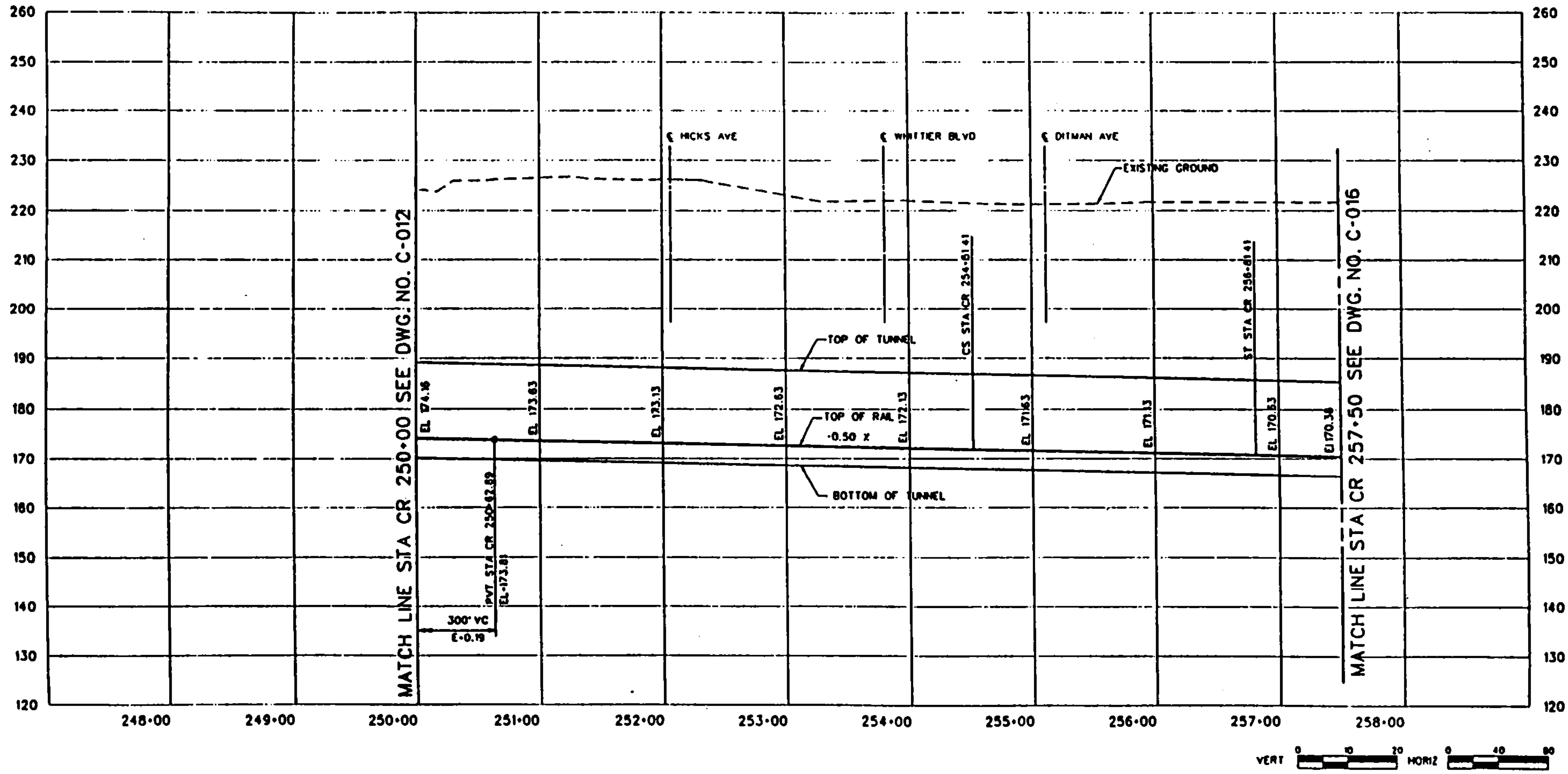
CONTRACT NO. C0571
DRAWING NO. C-012 REV 0
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 19



27
SUBJECT TO CHANGE DURING FINAL DESIGN
S. TOWNSEND AVE
S. DITMAN AVE
S. HICKS AVE
WHITTIER BLVD
MATCH LINE STA CR&CL 257+50 SEE DWG. NO. C-015
MATCH LINE STA CR&CL 250+00 SEE DWG. NO. C-011
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
2670
1670
3844
CURVE DATA
CURVE NO. | R | V mph
1670 | 1000 | 45
2670 | 1000 | 45
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 250+00 TO STA 257+50
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
C0571
C-013
0

A-4.69

SUBJECT TO CHANGE DURING FINAL DESIGN



Y. MAGNER
S. IBRAHIM
S. IBRAHIM
J. IVYNIAN

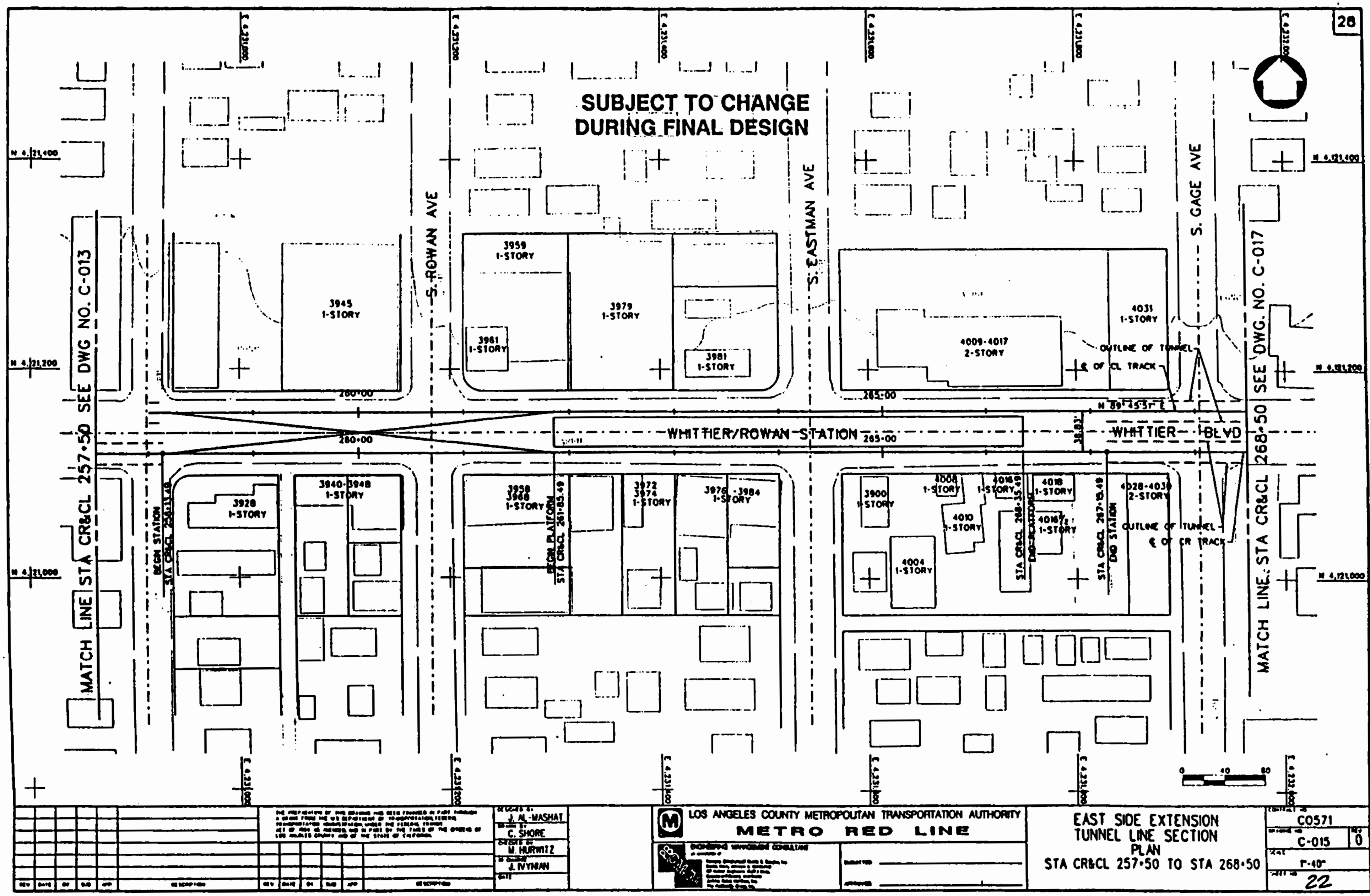
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 250+00 TO STA CR 257+50

CONTRACT NO.	C0571
DRAWING NO.	C-014
REV	0
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	21

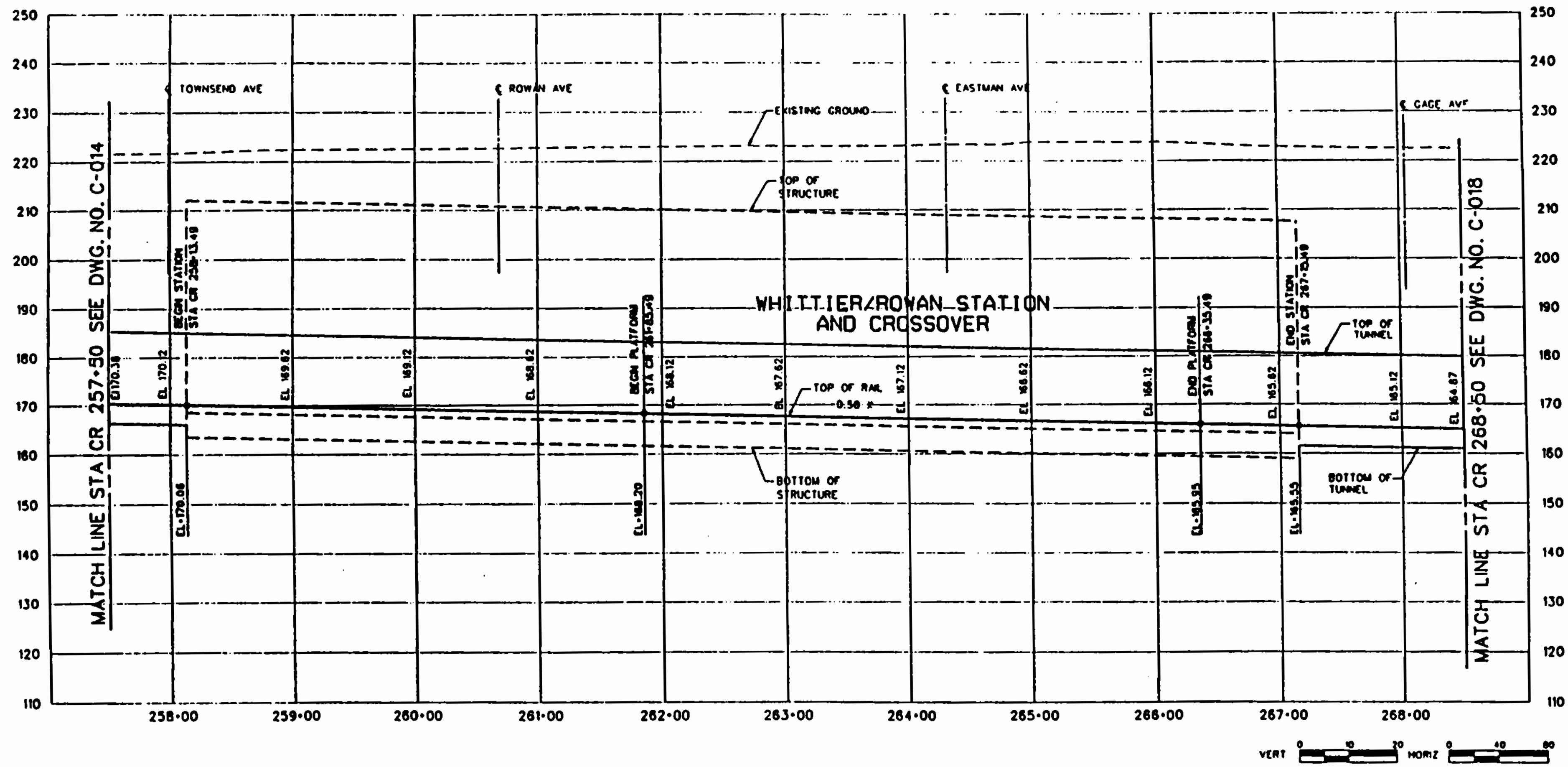
A-4.70



28
SUBJECT TO CHANGE
DURING FINAL DESIGN
S. ROWAN AVE
S. EASTMAN AVE
S. GAGE AVE
MATCH LINE STA CR&CL 257+50 SEE DWG NO. C-013
MATCH LINE STA CR&CL 268+50 SEE DWG. NO. C-017
WHITTIER/ROWAN STATION
WHITTIER BLVD
3945 1-STORY
3959 1-STORY
3961 1-STORY
3979 1-STORY
3981 1-STORY
4009-4017 2-STORY
4031 1-STORY
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
3928 1-STORY
3940-3948 1-STORY
3958 3968 1-STORY
3972 3974 1-STORY
3976-3984 1-STORY
3900 1-STORY
4008 1-STORY
4010 1-STORY
4016 1-STORY
4018 1-STORY
4016½ 1-STORY
4004 1-STORY
4028-4030 2-STORY
BEGIN STATION
BEGIN PLATFORM
END STATION
260+00
265+00
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYNIAN
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 257+50 TO STA 268+50
C0571
C-015
0
1"=40'
22

A-4.71

SUBJECT TO CHANGE
DURING FINAL DESIGN



DESIGNED BY Y. MAGNER
DRAWN BY S. EBRAHIM
CHECKED BY M. HURWITZ
IN CHARGE J. IVYNIAN

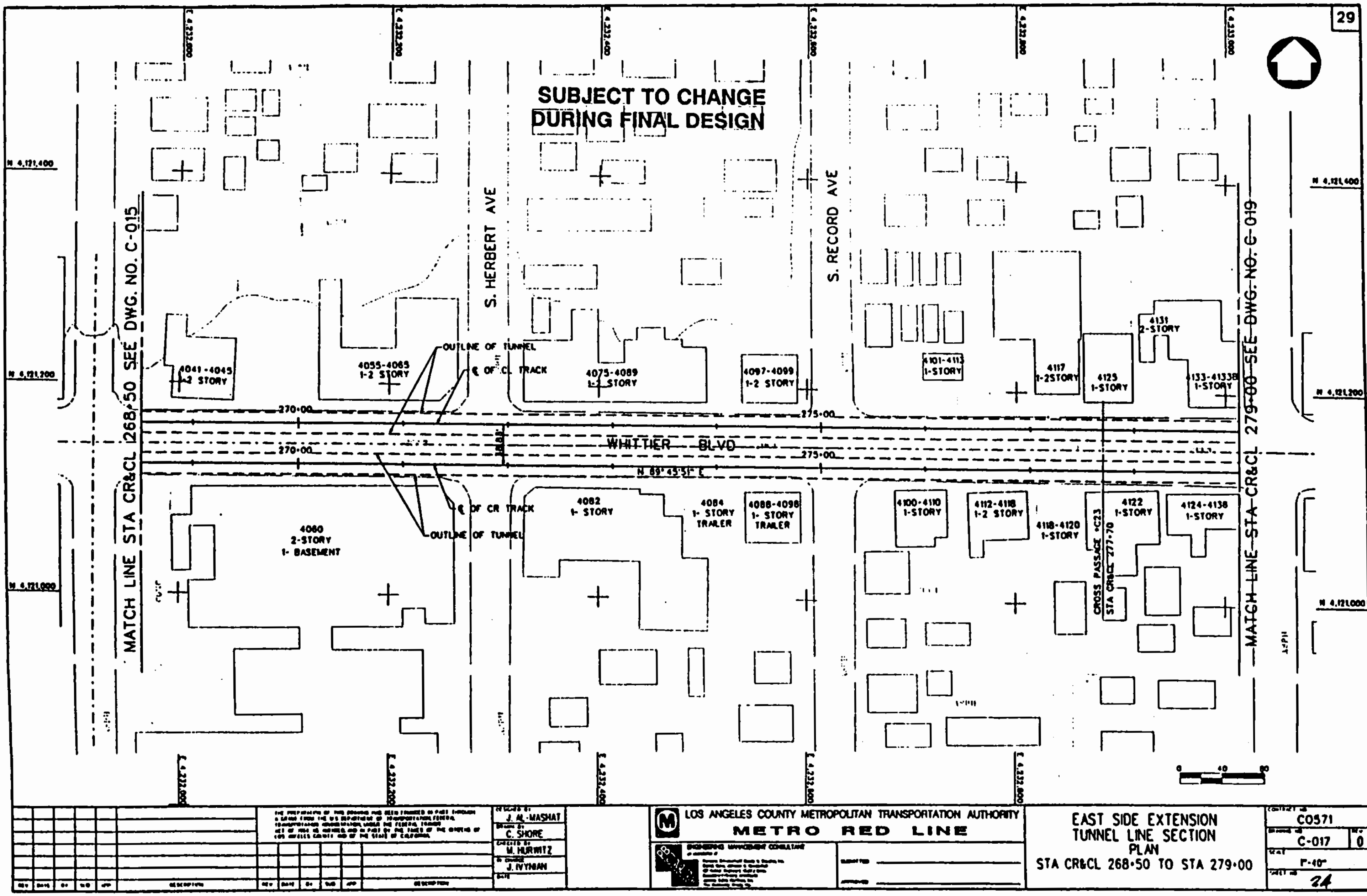
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

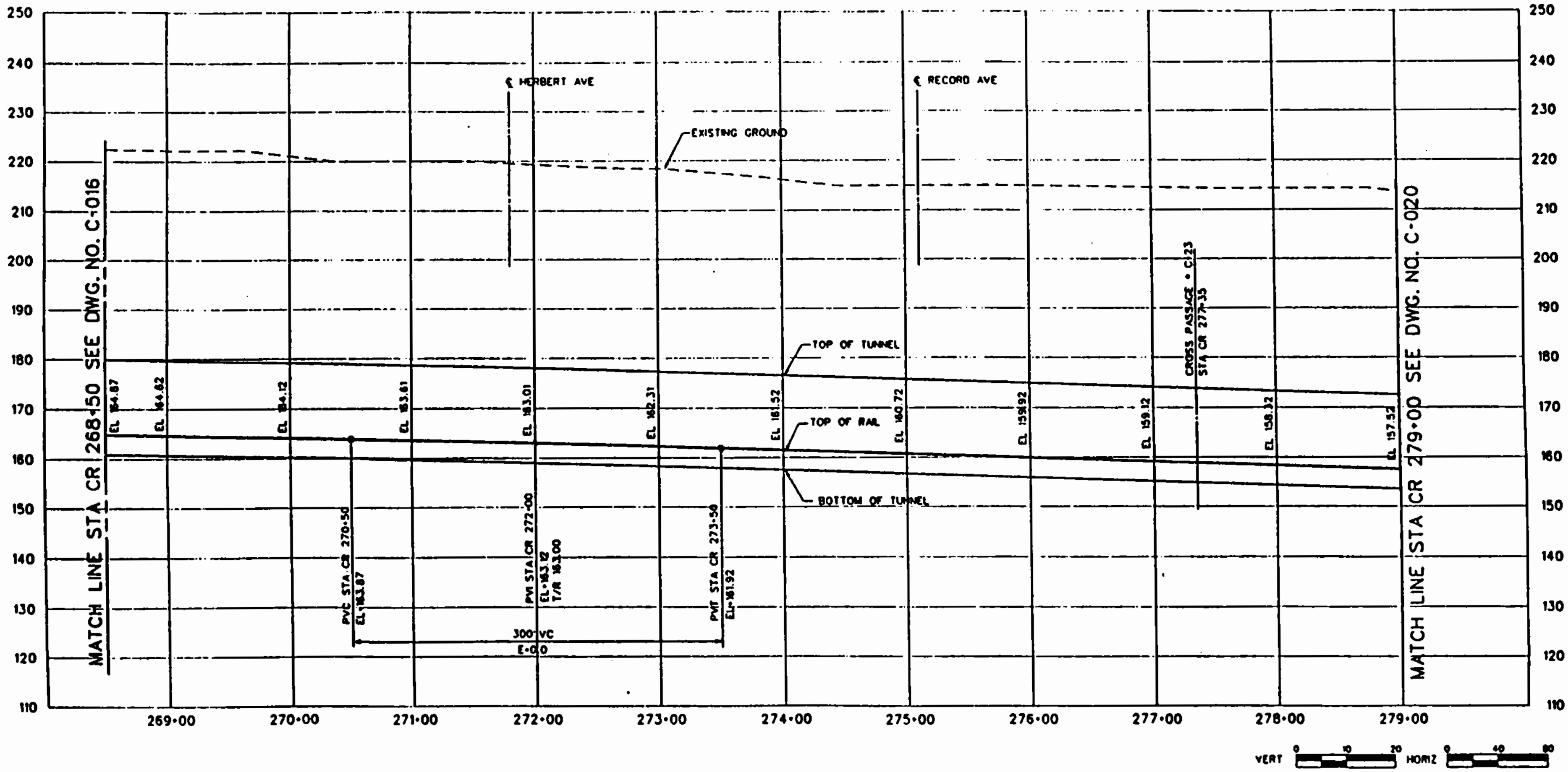
ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 257+50 TO STA CR 268+50

CONTRACT NO. C0571
DRAWING NO. C-016
REV 0
SCALE HORIZ. 1"=40' VERT. 1"=10'
SHEET NO. 23


29
SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE STA CR&CL 268+50 SEE DWG. NO. C-015
MATCH LINE STA CR&CL 279+00 SEE DWG. NO. C-019
S. HERBERT AVE
S. RECORD AVE
WHITTIER BLVD
N 89° 45' 51" E
270+00
275+00
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
4041-4045 1-2 STORY
4055-4065 1-2 STORY
4075-4089 1-2 STORY
4097-4099 1-2 STORY
4101-4113 1-STORY
4117 1-2STORY
4125 1-STORY
4131 2-STORY
4133-4133B 1-STORY
4060 2-STORY 1- BASEMENT
4082 1- STORY
4084 1- STORY TRAILER
4088-4098 1- STORY TRAILER
4100-4110 1-STORY
4112-4118 1-2 STORY
4118-4120 1-STORY
CROSS PASSAGE #C23 STA CR&CL 277+70
4122 1-STORY
4124-4138 1-STORY
N 4,121,400
N 4,121,200
N 4,121,000
0 40 80
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYNIAN
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 268+50 TO STA 279+00
C0571
C-017
0
1"=40'
24

SUBJECT TO CHANGE
DURING FINAL DESIGN



A-4.73

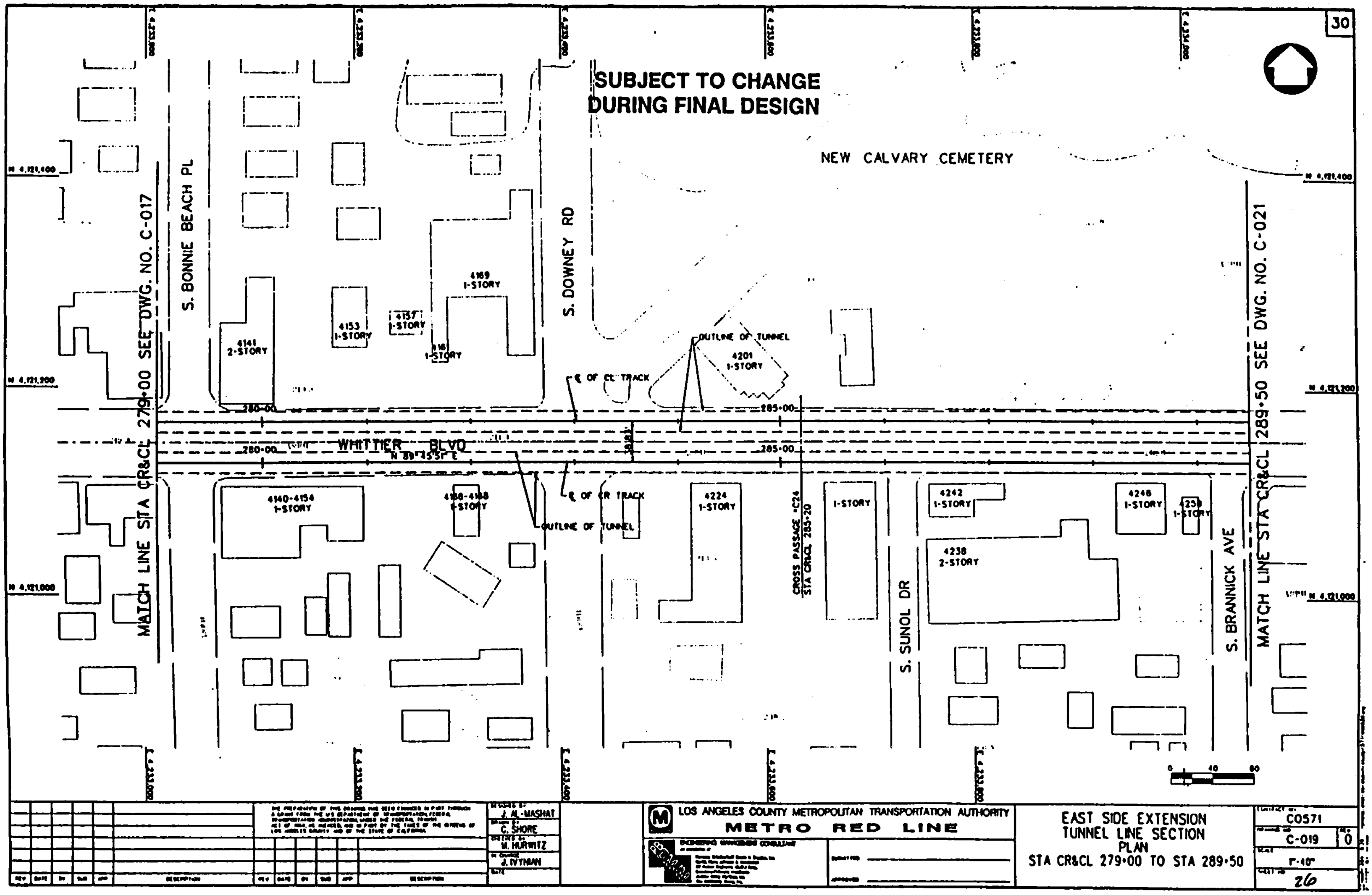
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 268+50 TO STA CR 279+00

T. WAGNER
S. IBRAHIM
S. IBRAHIM
J. IVYMAN

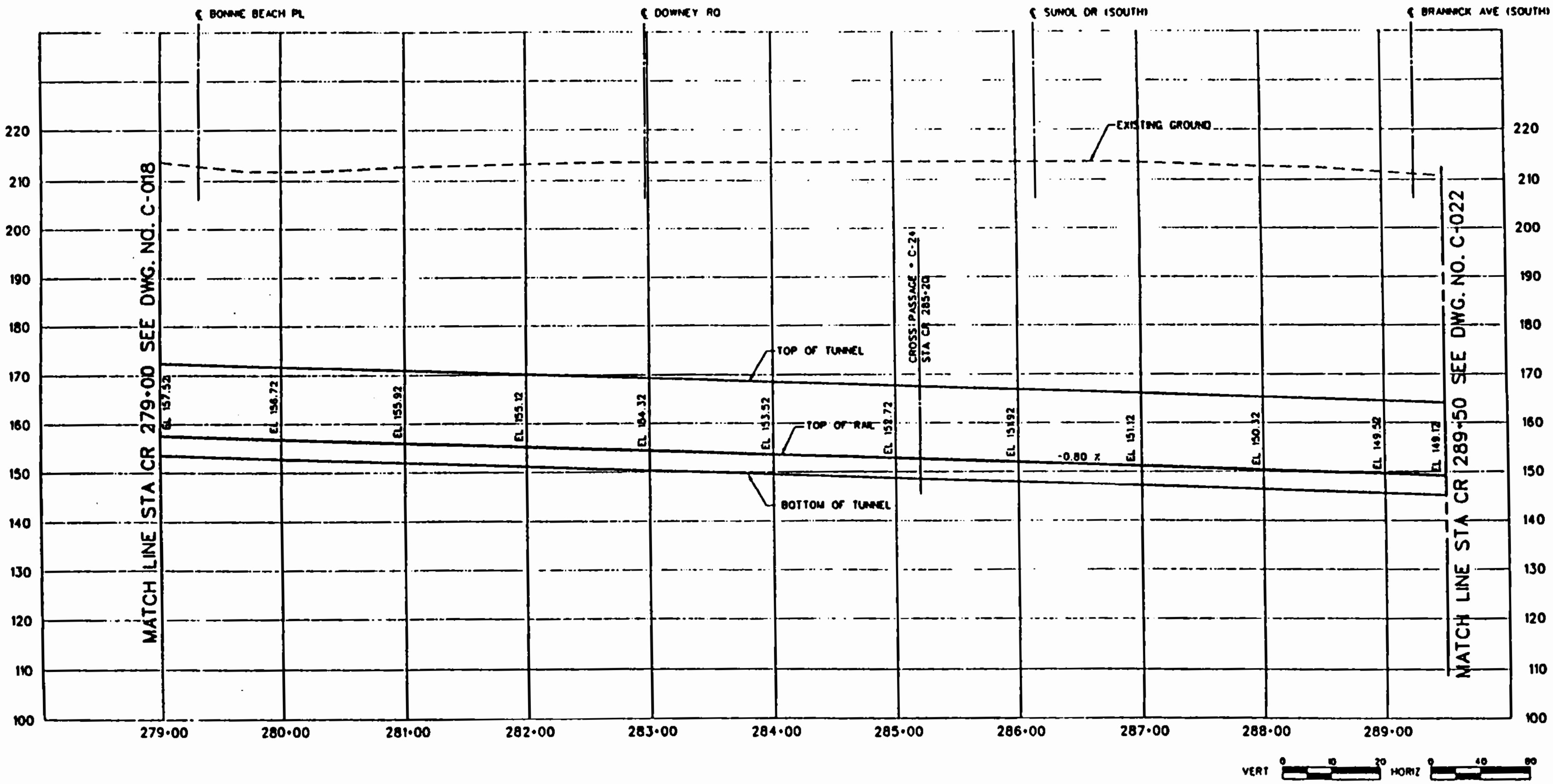
C0571
C-018
0
HORIZ. 1"=40'
VERT. 1"=10'
25

A-4.74


30
SUBJECT TO CHANGE DURING FINAL DESIGN
NEW CALVARY CEMETERY
S. BONNIE BEACH PL
S. DOWNEY RD
S. SUNOL DR
S. BRANNICK AVE
WHITTIER BLVD
MATCH LINE STA CR&CL 279+00 SEE DWG. NO. C-017
MATCH LINE STA CR&CL 289+50 SEE DWG. NO. C-021
4141 2-STORY
4153 1-STORY
4157 1-STORY
4161 1-STORY
4169 1-STORY
4201 1-STORY
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
280+00
285+00
4140-4154 1-STORY
4158-4168 1-STORY
4224 1-STORY
CROSS PASSAGE #C24 STA CR&CL 285+20
1-STORY
4242 1-STORY
4238 2-STORY
4246 1-STORY
4250 1-STORY
N 4,121,400
N 4,121,200
N 4,121,000
0 40 80
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYMAN
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 279+00 TO STA 289+50
C0571
C-019
0
1"=40'
26

A-4.75

SUBJECT TO CHANGE DURING FINAL DESIGN



Designed by	S. IBRAHIM
Drawn by	J. TODOROV
Checked by	Y. MACNER
In charge	J. IVYNIAN

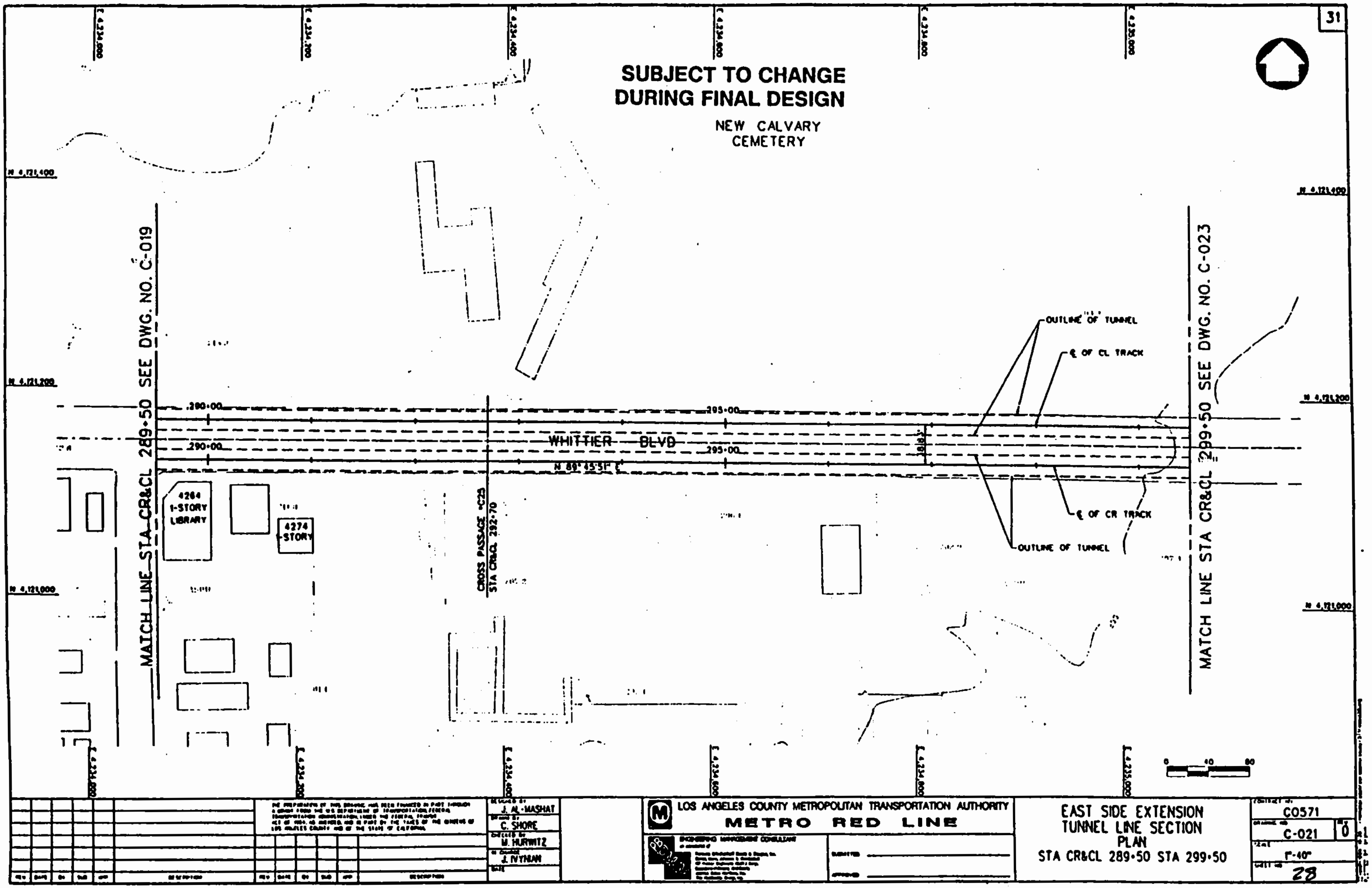
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

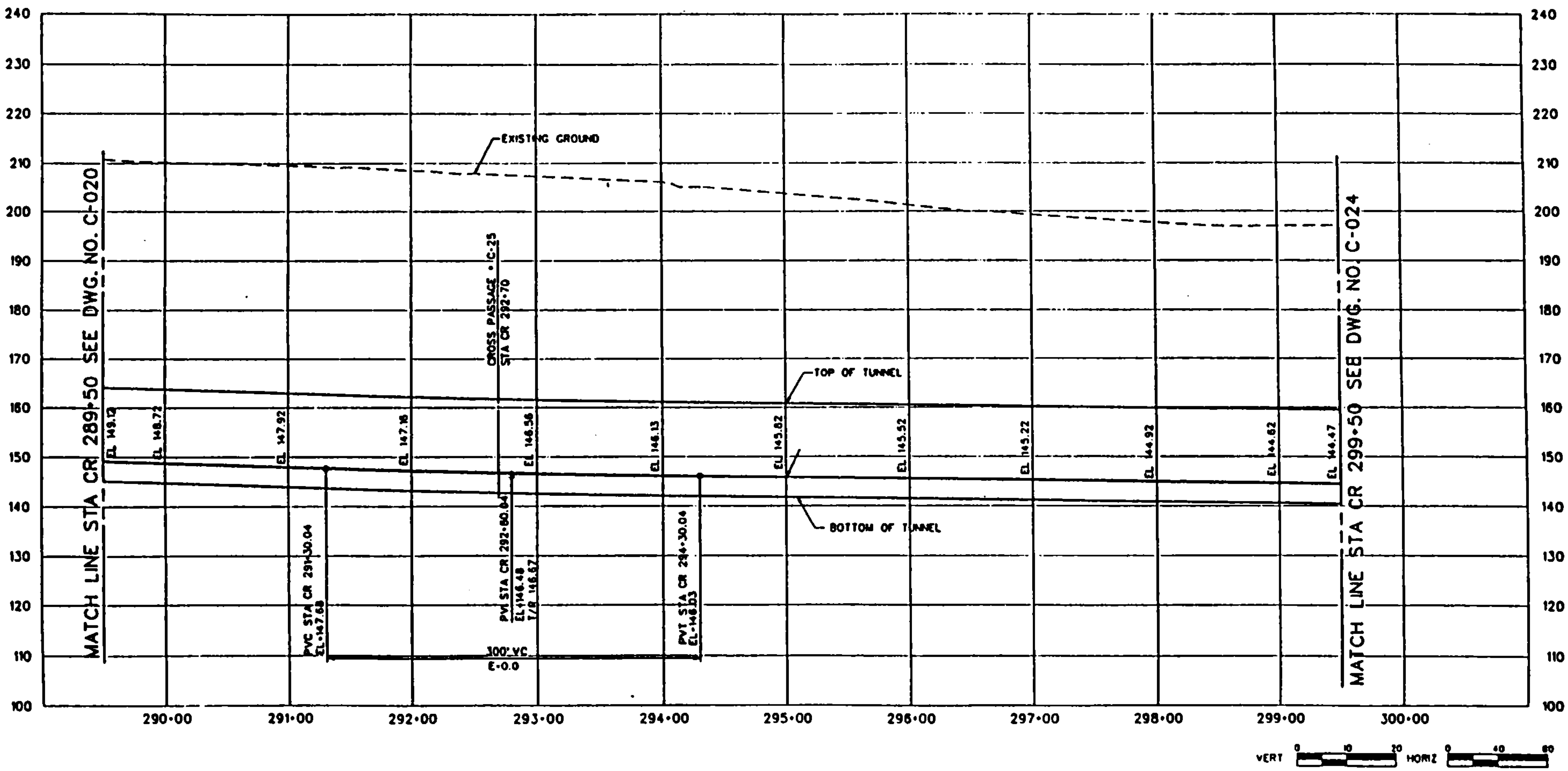
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 279+00 TO STA CR 289+50

Contract No.	C0571
Drawing No.	C-020
Rev.	0
Scale	HORIZ. 1"=40' VERT. 1"=10'
Sheet No.	27


SUBJECT TO CHANGE
DURING FINAL DESIGN
NEW CALVARY
CEMETERY
31
MATCH LINE STA CR&CL 289+50 SEE DWG. NO. C-019
MATCH LINE STA CR&CL 299+50 SEE DWG. NO. C-023
WHITTIER BLVD
290+00
295+00
N 89°45'51" E
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
OUTLINE OF TUNNEL
4264
1-STORY
LIBRARY
4274
1-STORY
CROSS PASSAGE #C25
STA CR&CL 292+70
0
40
80
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. NYHAN
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
ENGINEERING MANAGEMENT CONSULTANT
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 289+50 STA 299+50
C0571
C-021
0
1"=40'
28

A-4.77

SUBJECT TO CHANGE
DURING FINAL DESIGN

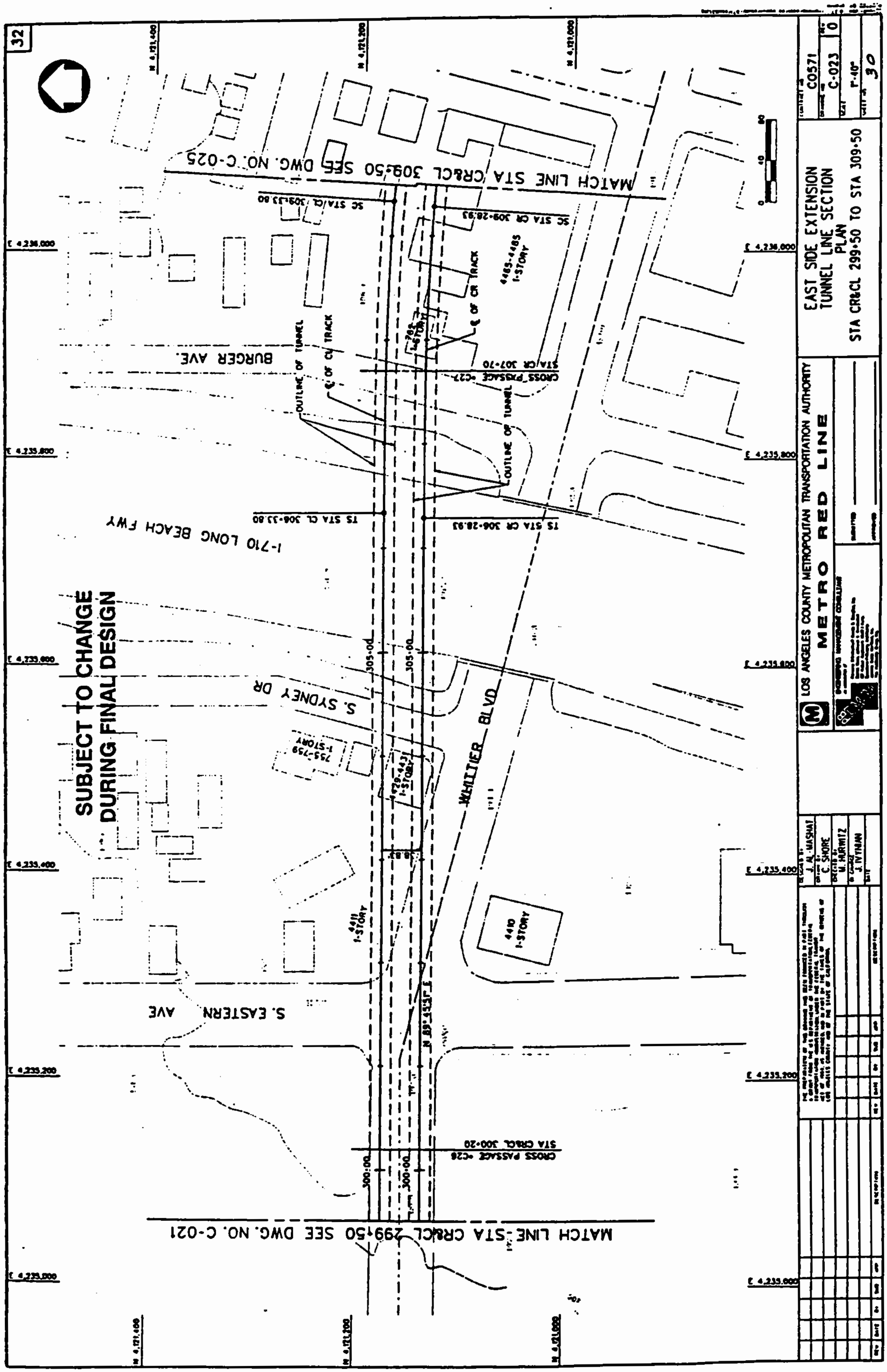


LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

DESIGNED BY: Y. MAGNER
DRAWN BY: J. TODOROV
CHECKED BY: S. IBRAHIM
IN CHARGE: J. IVYNIAN

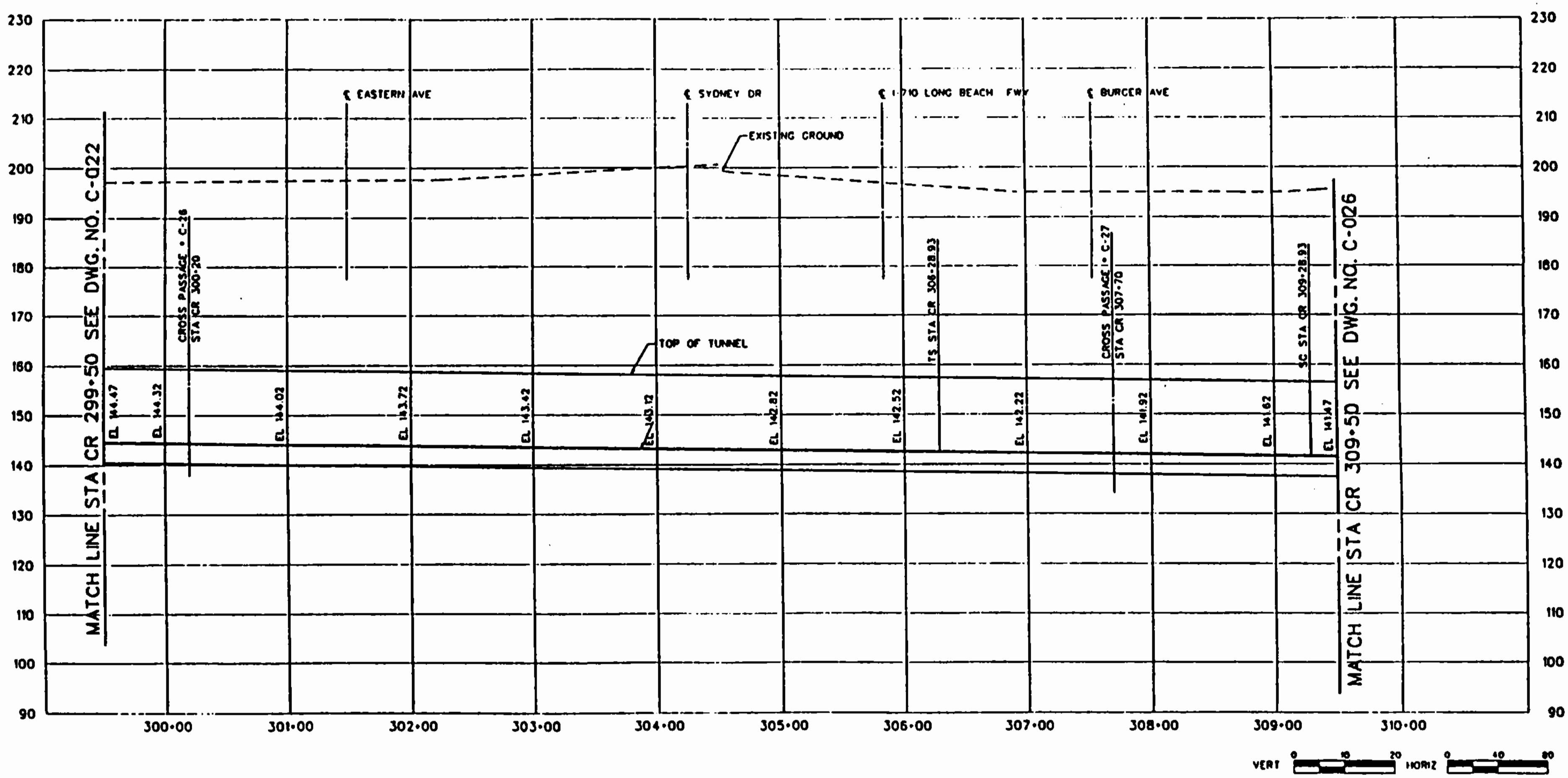
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 289+50 TO STA CR 299+50

CONTRACT NO.	C0571
DRAWING NO.	C-022
REV	0
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	29



32
SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE STA CR&CL 309+50 SEE DWG. NO. C-025
MATCH LINE STA CR&CL 299+50 SEE DWG. NO. C-021
BURGER AVE.
I-710 LONG BEACH FWY
S. SYDNEY DR
WHITTIER BLVD
S. EASTERN AVE
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
CROSS PASSAGE •C27
STA CR 307+70
CROSS PASSAGE •C28
STA CR&CL 300+20
SC STA CL 309+33.80
SC STA CR 309+28.93
TS STA CL 306+33.80
TS STA CR 306+28.93
4411 1-STORY
4410 1-STORY
755-759 1-STORY
4485-4485 1-STORY
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 299+50 TO STA 309+50
C0571
C-023
1"=40'
30
J. AL-MASHAT
C. SHORE
M. HORWITZ
J. NYHAN

SUBJECT TO CHANGE DURING FINAL DESIGN



A-4.79

DESIGNED BY	S. IBRAHIM
DRAWN BY	J. TODOROV
CHECKED BY	Y. WAGNER
IN CHARGE	J. WYNAN

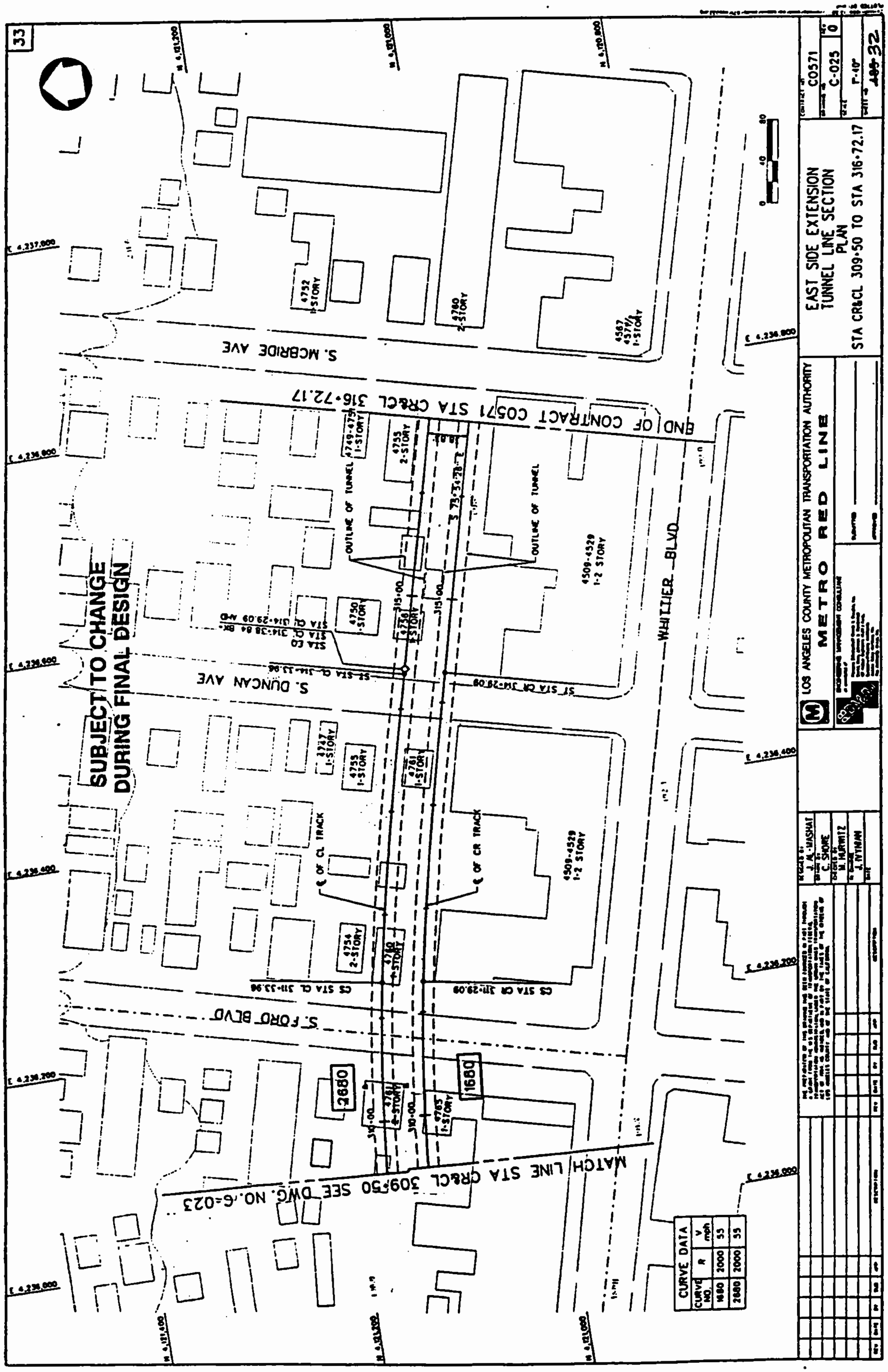
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

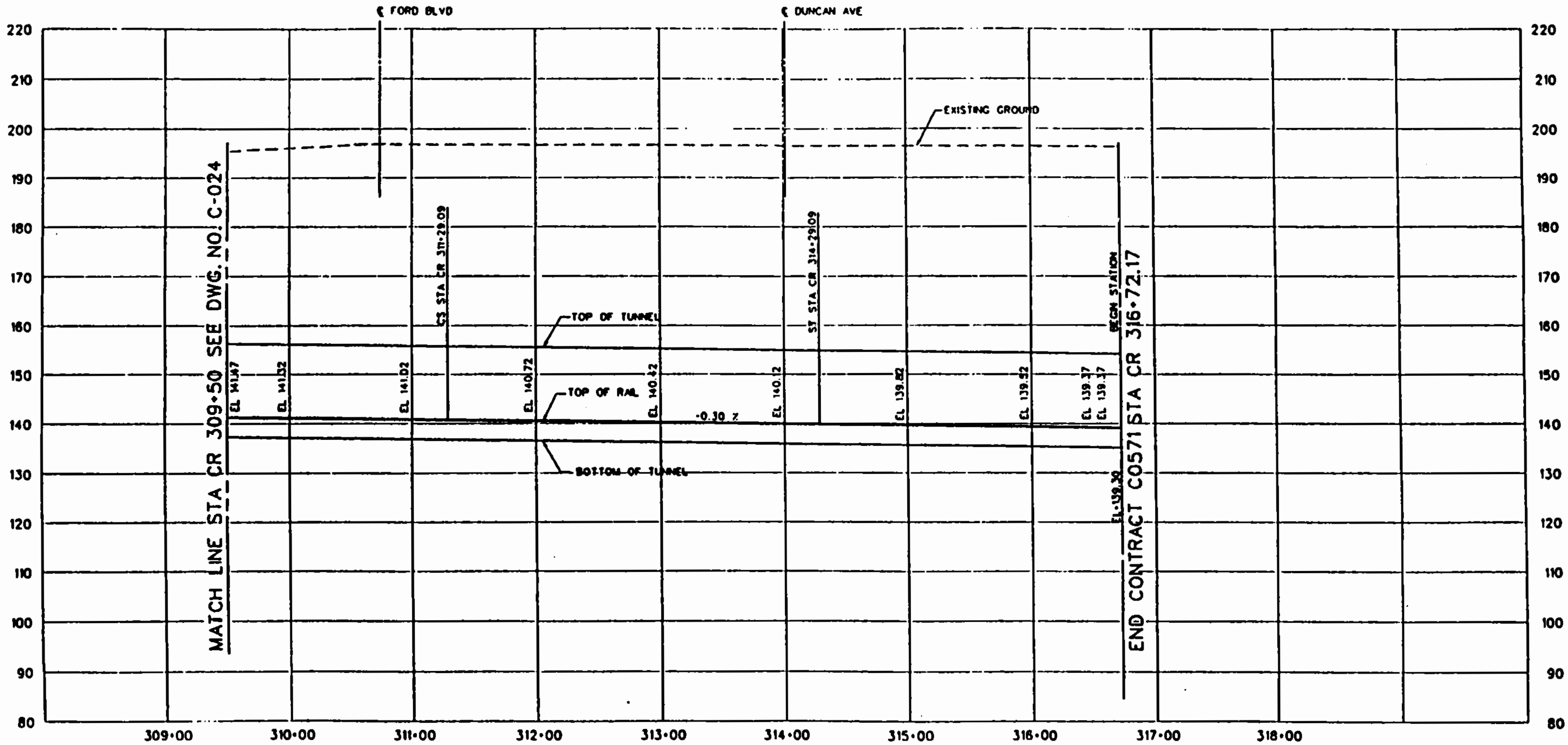
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 299+50 TO STA CR 309+50

CONTRACT NO	C0571
DRAWING NO	C-024
REV	0
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO	31



33
SUBJECT TO CHANGE
DURING FINAL DESIGN
S. MCBRIDE AVE
S. DUNCAN AVE
S. FORD BLVD
WHITTIER BLVD
END OF CONTRACT C0571 STA CR&CL 316+72.17
MATCH LINE STA CR&CL 309+50 SEE DWG. NO. C-023
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
CS STA CL 311+53.96
CS STA CR 311+29.09
ST STA CR 314+29.09
CURVE DATA
CURVE NO. | R | V mph
1680 | 2000 | 55
2680 | 2000 | 55
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 309+50 TO STA 316+72.17
C0571
C-025
0
1"=40'

SUBJECT TO CHANGE DURING FINAL DESIGN



CHECKED BY	Y. WAGNER
DRAWN BY	J. TODOROV
CHECKED BY	S. IBRAHIM
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

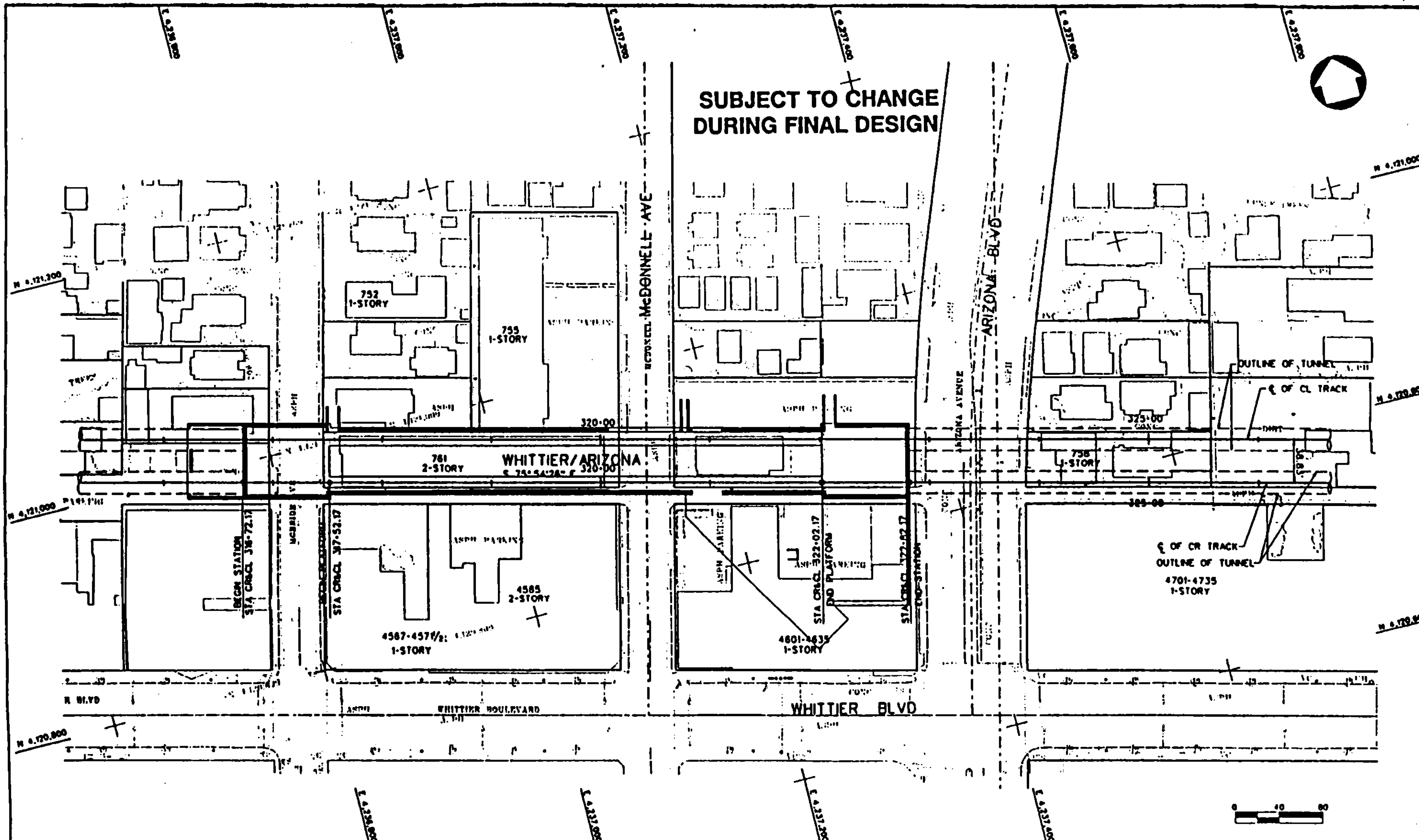
METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 309+50 TO STA CR 316+72.17

CONTRACT NO.	C0571
DRAWING NO.	C-026
REV	0
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	33

A-4.82



DESIGNED BY	M. HURWITZ
DRAWN BY	C. SHORE
CHECKED BY	J. AL-MASHAT
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

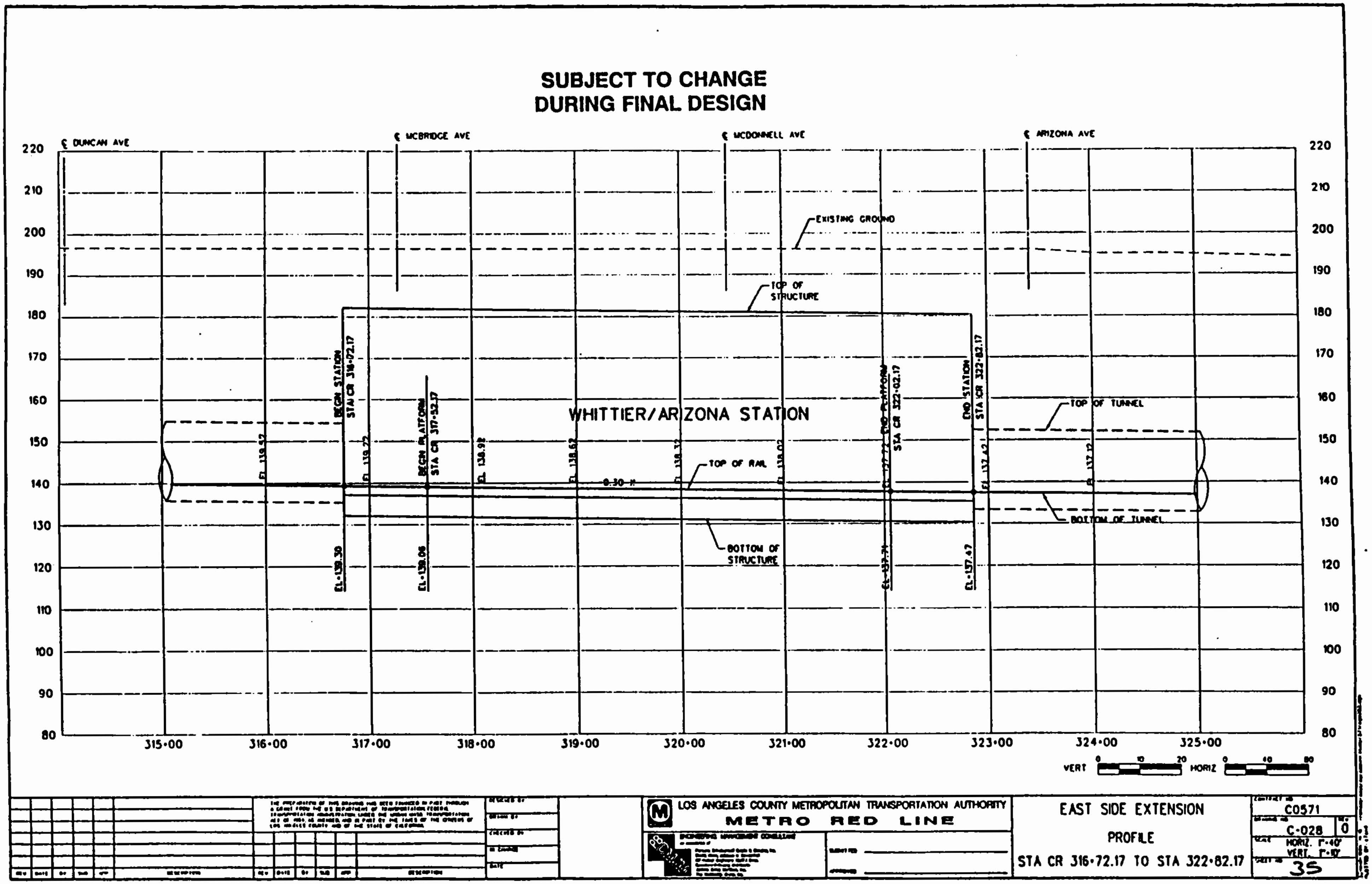
EAST SIDE EXTENSION

PLAN

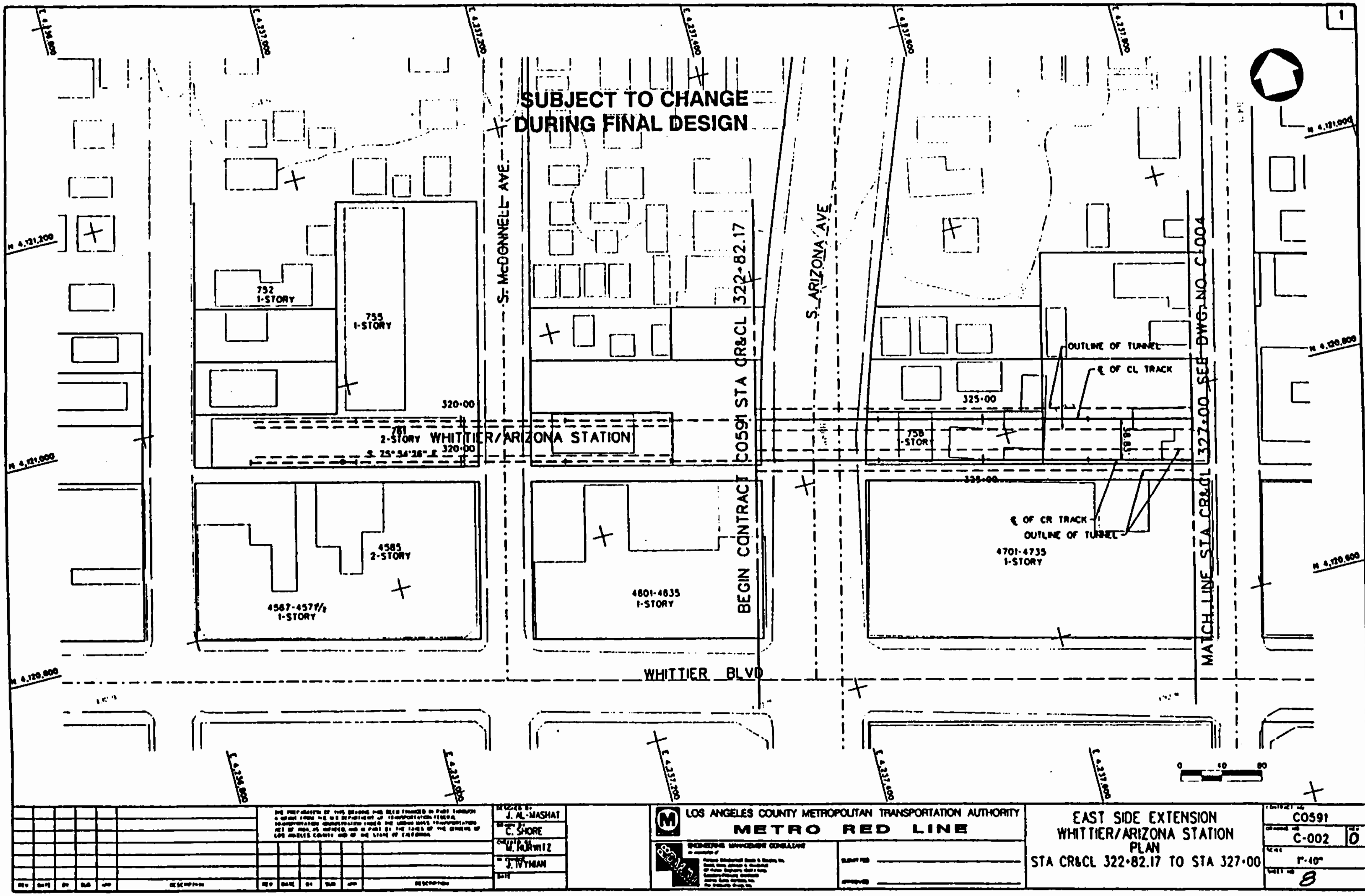
STA CR&CL 316+72.17 TO 322+82.17

CONTRACT NO.	C0571
DRAWING NO.	C-027
REV	0
SCALE	1"=40'
SHEET NO.	34

A-4.83



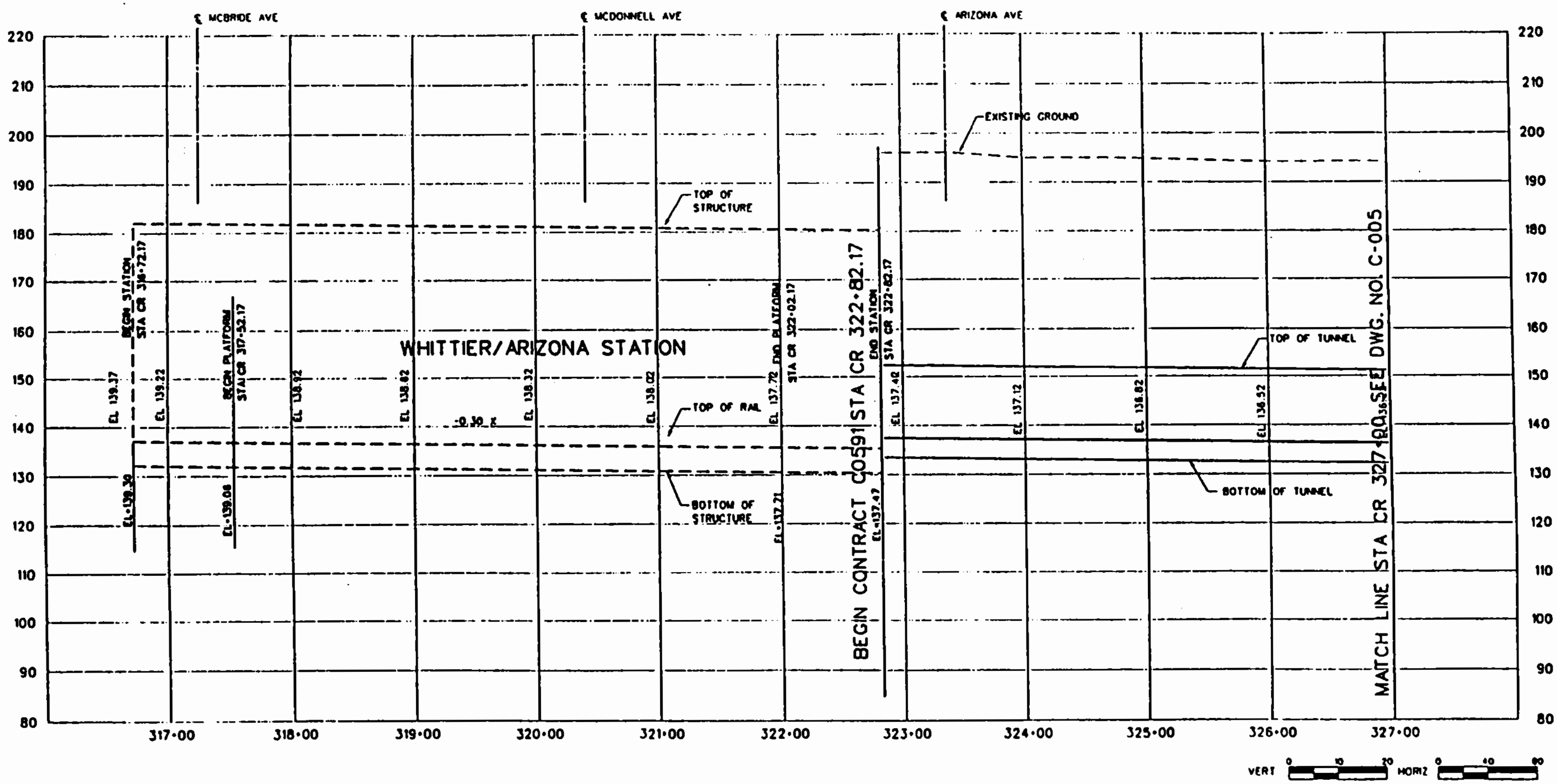
SUBJECT TO CHANGE
DURING FINAL DESIGN
℄ DUNCAN AVE
℄ MCBRIDGE AVE
℄ MCDONNELL AVE
℄ ARIZONA AVE
EXISTING GROUND
TOP OF STRUCTURE
WHITTIER/ARIZONA STATION
BEGIN STATION STA CR 316+72.17
BEGIN PLATFORM STA CR 317+52.17
END PLATFORM STA CR 322+02.17
END STATION STA CR 322+82.17
TOP OF TUNNEL
TOP OF RAIL
BOTTOM OF STRUCTURE
BOTTOM OF TUNNEL
0.30 %
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
315+00
316+00
317+00
318+00
319+00
320+00
321+00
322+00
323+00
324+00
325+00
VERT
HORIZ
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
PROFILE
STA CR 316+72.17 TO STA 322+82.17
C0571
C-028
0
HORIZ. 1"=40'
VERT. 1"=10'
35


SUBJECT TO CHANGE DURING FINAL DESIGN
S. McDONNELL AVE.
S. ARIZONA AVE
WHITTIER BLVD
WHITTIER/ARIZONA STATION
BEGIN CONTRACT C0591 STA CR&CL 322+82.17
MATCH LINE STA CR&CL 327+00 SEE DWG. NO. C-004
752 1-STORY
755 1-STORY
781 2-STORY
758 1-STORY
4585 2-STORY
4567-4571½ 1-STORY
4601-4635 1-STORY
4701-4735 1-STORY
320+00
325+00
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
WHITTIER/ARIZONA STATION
PLAN
STA CR&CL 322+82.17 TO STA 327+00
C0591
C-002
1"=40'
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYNIAN

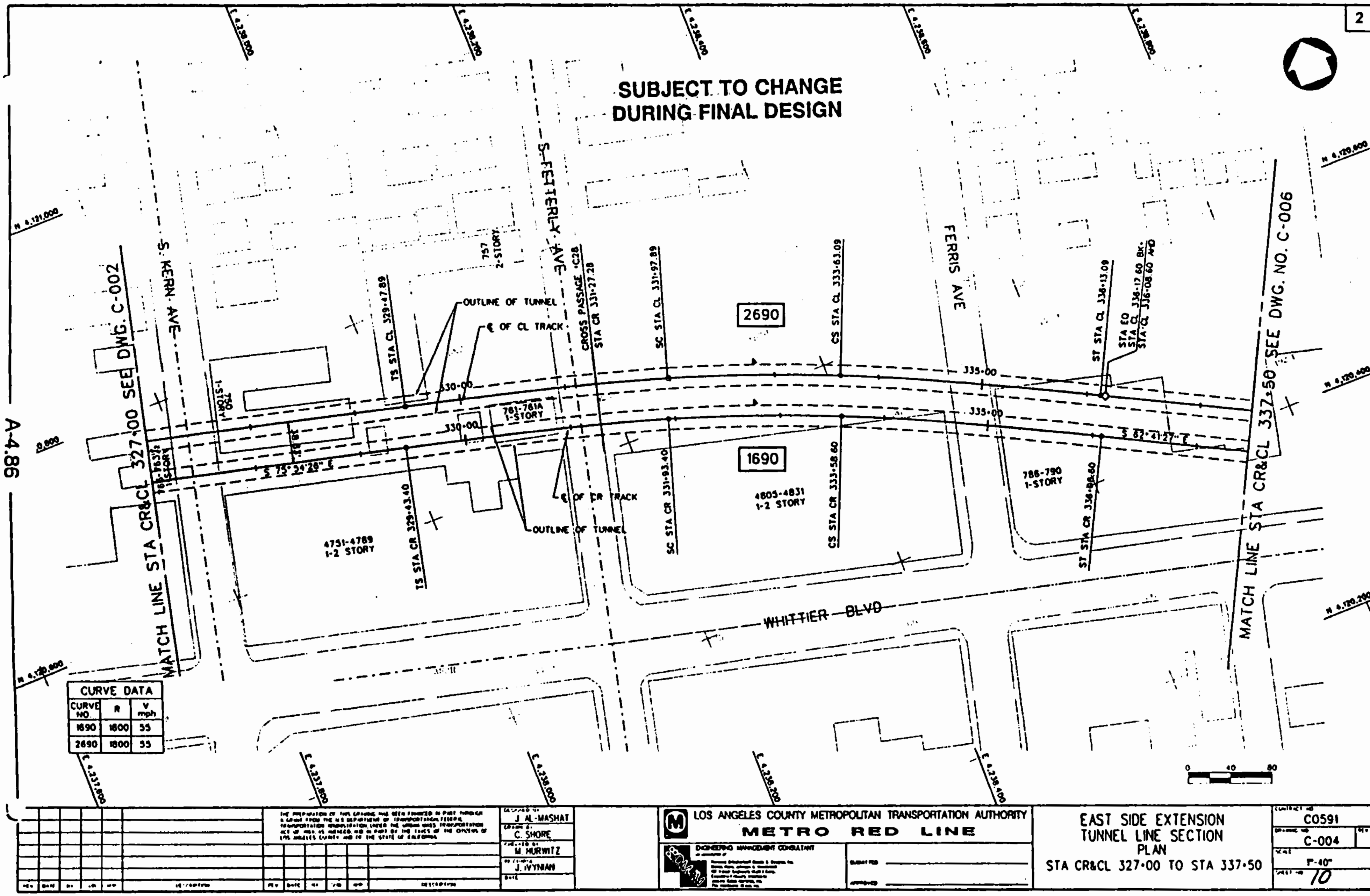
A-4.84

A-4.85

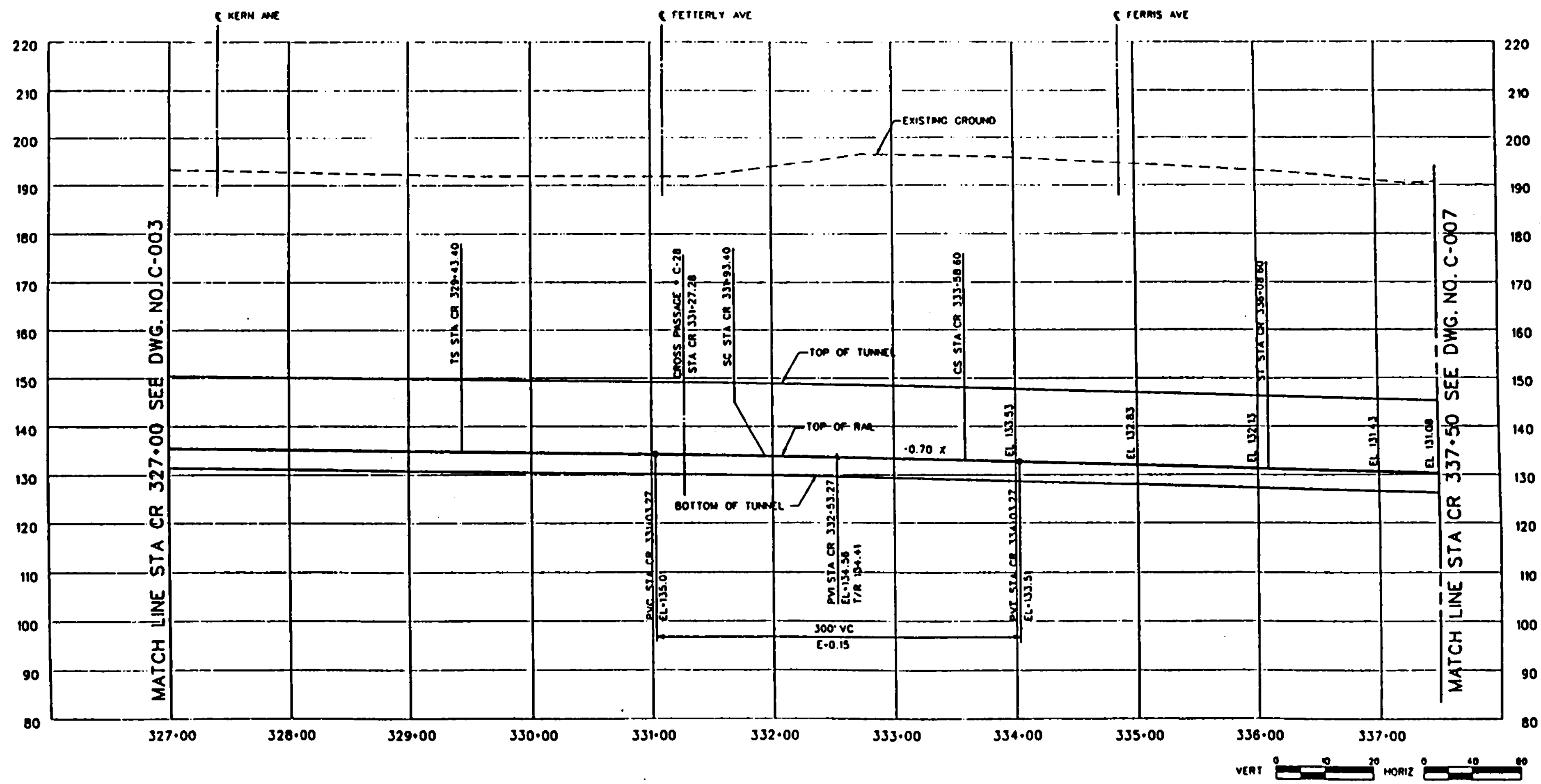
SUBJECT TO CHANGE DURING FINAL DESIGN



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY	METRO RED LINE
EAST SIDE EXTENSION TUNNEL LINE SECTION PROFILE	STA CR 322+82.17 TO STA CR 327+00
CONTRACT NO.	C0591
DRAWING NO.	C-003
REV	0
SCALE	HORIZ. 1"=40' VERT. 1"=10'
SHEET NO.	9

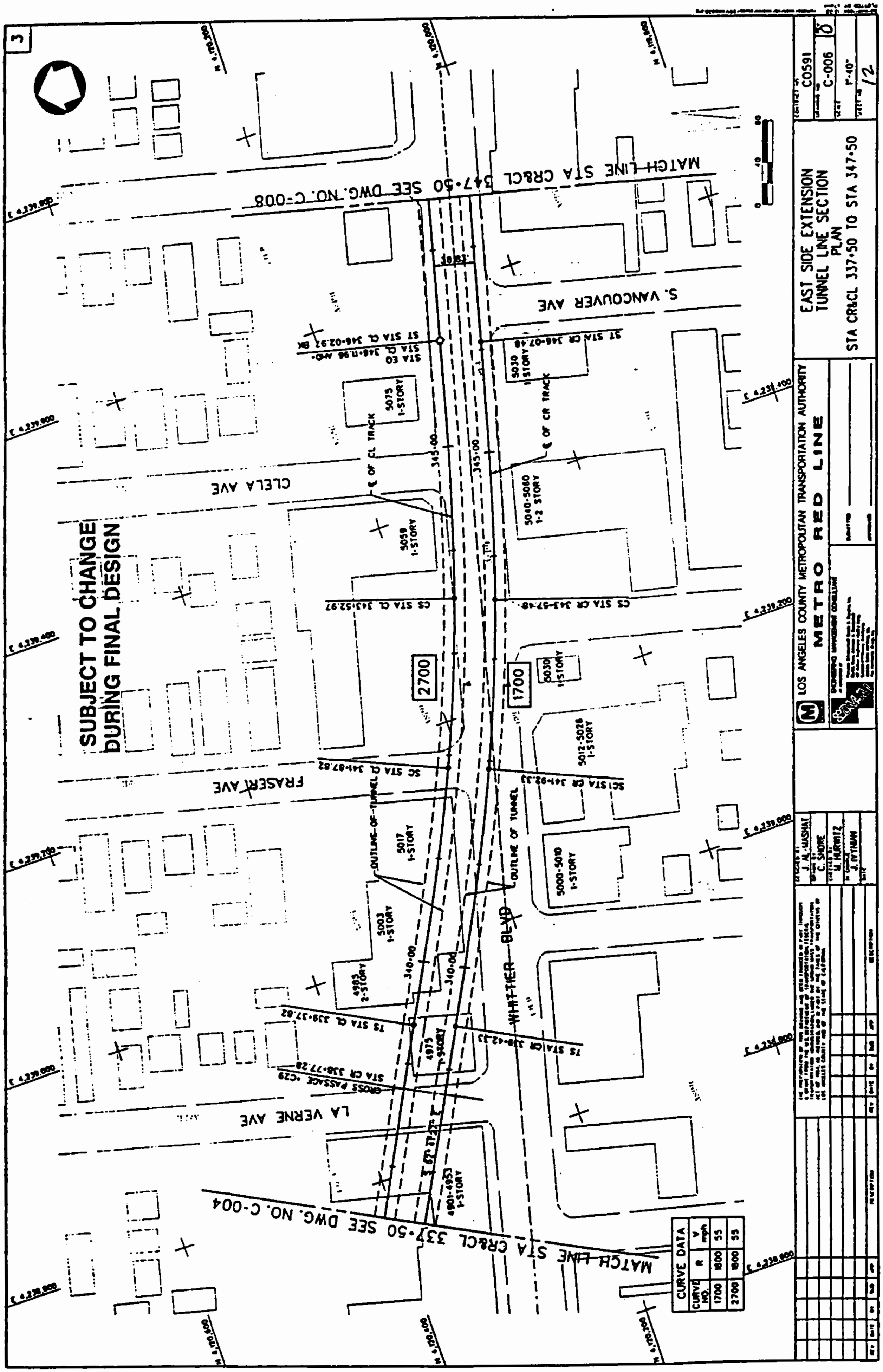

SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE STA CR&CL 327+00 SEE DWG. C-002
MATCH LINE STA CR&CL 337+50 SEE DWG. NO. C-006
S. KERN AVE
S. FETTERLY AVE
FERRIS AVE
WHITTIER BLVD
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
CROSS PASSAGE #C28
STA CR 331+27.28
TS STA CL 329+47.89
TS STA CR 329+43.40
SC STA CL 331+97.89
SC STA CR 331+93.40
CS STA CL 333+63.09
CS STA CR 333+58.60
ST STA CL 336+13.09
ST STA CR 336+08.60
STA EQ
STA CL 336+17.60 BK.
STA CL 336+08.60 AHD
330+00
335+00
S 75°34'20" E
S 82°41'27" E
2690
1690
757
2-STORY
750
1-STORY
761-761A
1-STORY
4751-4789
1-2 STORY
4805-4831
1-2 STORY
786-790
1-STORY
CURVE DATA
CURVE NO. | R | V mph
1690 | 1800 | 55
2690 | 1800 | 55
0 40 80
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
ENGINEERING MANAGEMENT CONSULTANT
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 327+00 TO STA 337+50
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYNIAN
C0591
C-004
1"=40'
10
2

SUBJECT TO CHANGE
DURING FINAL DESIGN



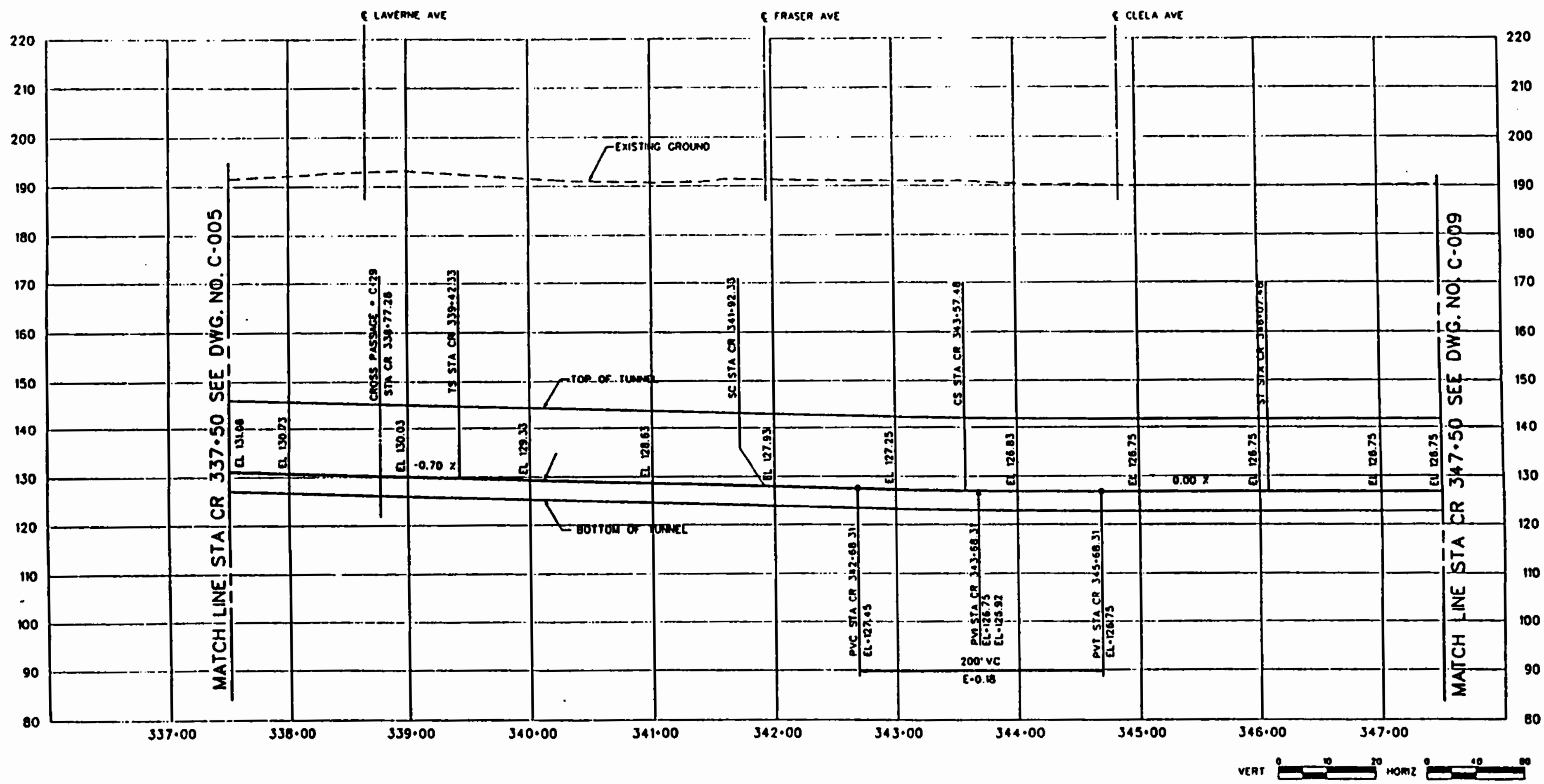
DESIGNED BY: S. IBRAHIM	LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY	CONTRACT NO. C0591
DRAWN BY: J. TODOROV	METRO RED LINE	DRAWING NO. C-005 REV 0
CHECKED BY: T. MAGNER	EAST SIDE EXTENSION TUNNEL LINE SECTION PROFILE	SCALE HORIZ. 1"=40' VERT. 1"=10'
IN CHARGE: J. IVYNIAN	STA CR 327+00 TO STA CR 337+50	SHEET NO. 11

A-4.87


SUBJECT TO CHANGE
DURING FINAL DESIGN
MATCH LINE STA CR&CL 347+50 SEE DWG. NO. C-008
MATCH LINE STA CR&CL 337+50 SEE DWG. NO. C-004
S. VANCOUVER AVE
CLELA AVE
FRASER AVE
LA VERNE AVE
WHITTIER BLVD
OUTLINE OF TUNNEL
℄ OF CL TRACK
℄ OF CR TRACK
CURVE DATA
CURVE NO.
R
V mph
1700
1800
55
2700
1800
55
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 337+50 TO STA 347+50
C0591
C-006
1"=40'
12

A-4.89

SUBJECT TO CHANGE DURING FINAL DESIGN



DESIGNED BY	M. HURWITZ
DRAWN BY	S. IBRAHIM
CHECKED BY	Y. WAGNER
IN CHARGE	J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 337+50 TO STA CR 347+50

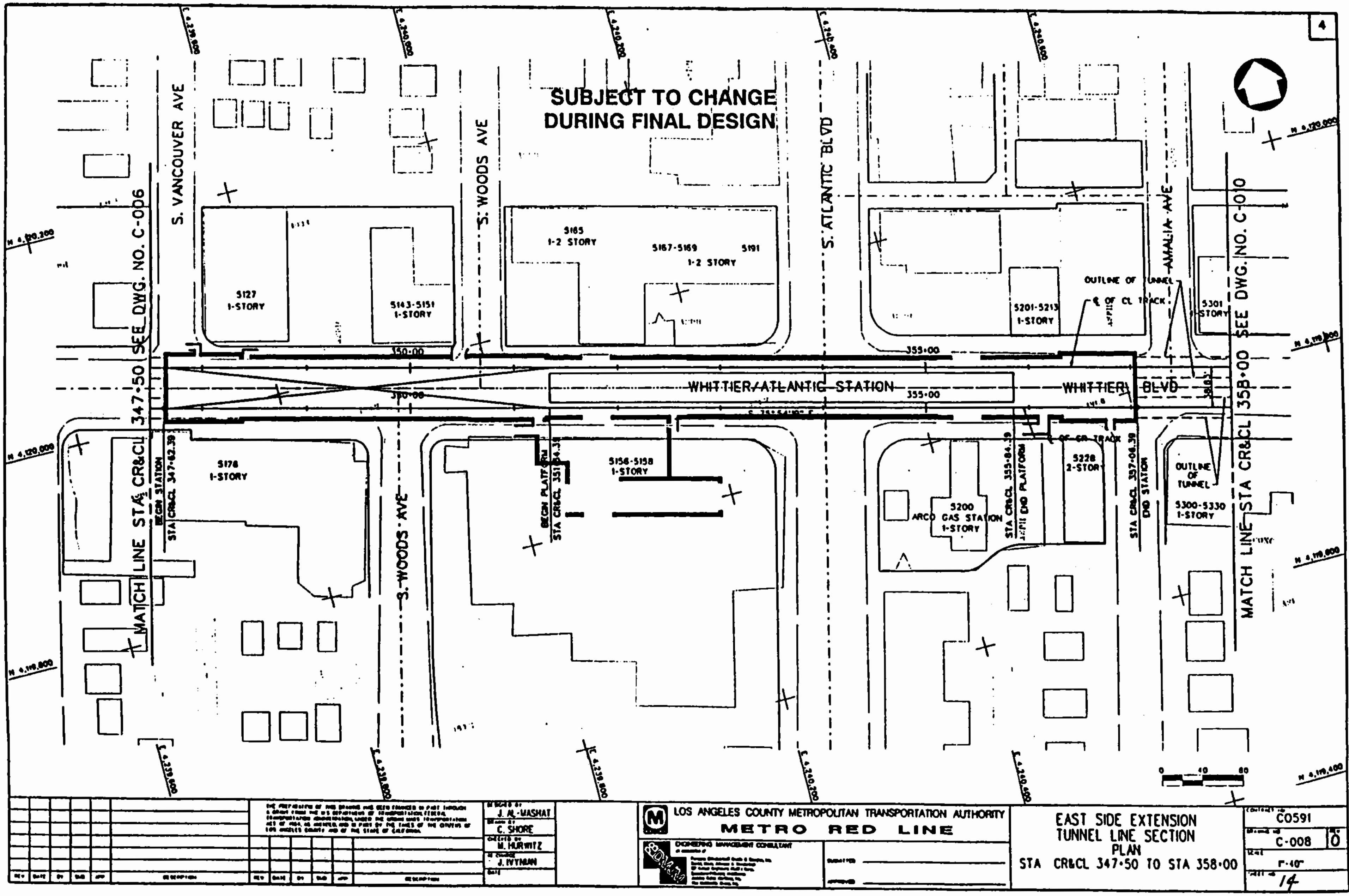
CONTRACT NO. C0591

DRAWING NO. C-007 REV. 0

SCALE HORIZ. 1"=40' VERT. 1"=10'

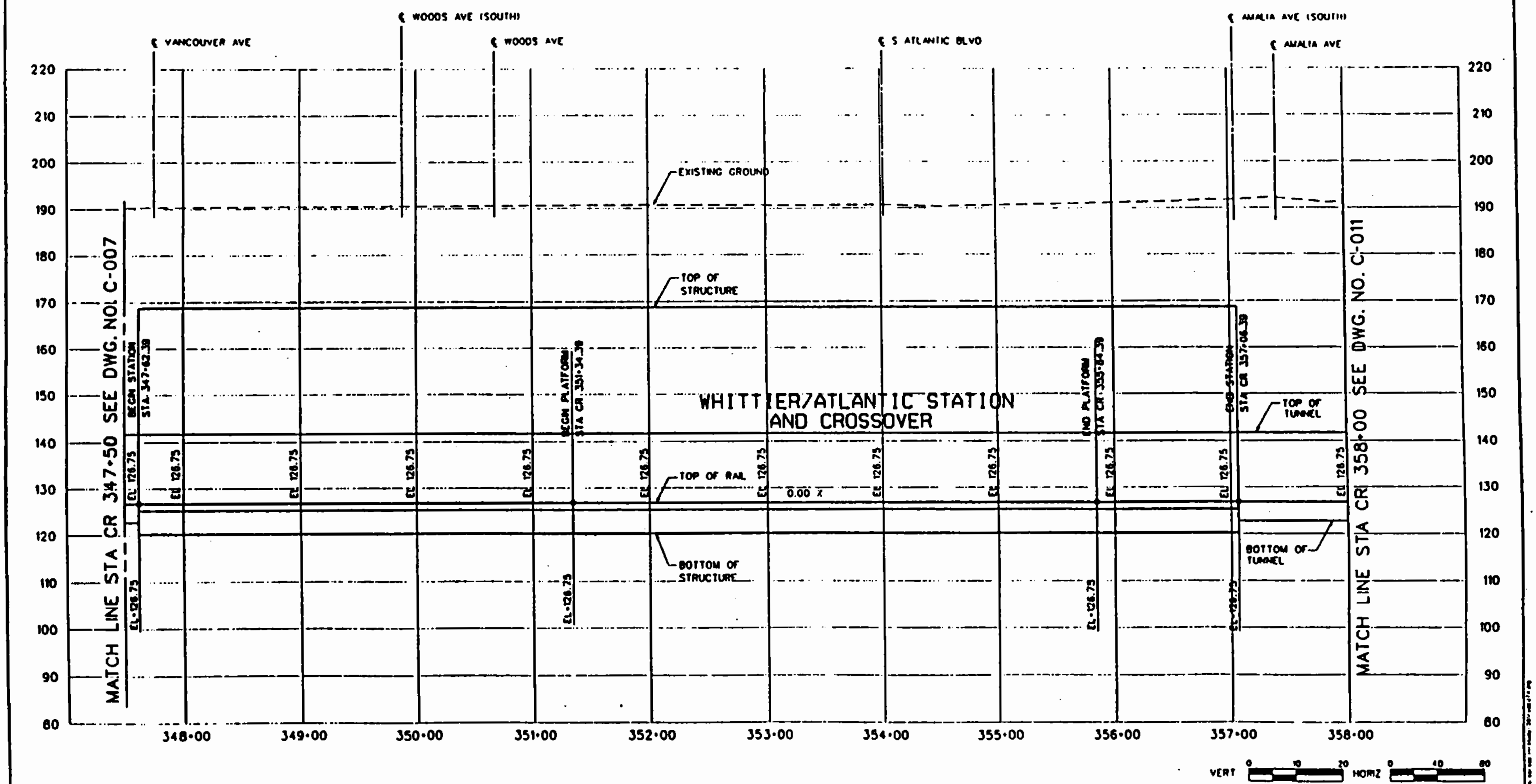
SHEET NO. 13

A-4.90



SUBJECT TO CHANGE
DURING FINAL DESIGN
S. VANCOUVER AVE
S. WOODS AVE
S. ATLANTIC BLVD
AMALIA AVE
WHITTIER/ATLANTIC STATION
WHITTIER BLVD
MATCH LINE STA CR&CL 347+50 SEE DWG. NO. C-006
MATCH LINE STA CR&CL 358+00 SEE DWG. NO. C-010
5127
1-STORY
5143-5151
1-STORY
5165
1-2 STORY
5167-5169
1-2 STORY
5191
5201-5213
1-STORY
5301
1-STORY
5178
1-STORY
5156-5158
1-STORY
5200
ARCO GAS STATION
1-STORY
5228
2-STORY
5300-5330
1-STORY
OUTLINE OF TUNNEL
OUTLINE OF TUNNEL
BEGIN STATION
BEGIN PLATFORM
END PLATFORM
END STATION
350+00
355+00
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
TUNNEL LINE SECTION
PLAN
STA CR&CL 347+50 TO STA 358+00
J. AL-MASHAT
C. SHORE
M. HURWITZ
J. IVYMAN
C0591
C-008
0
1"=40'
14

SUBJECT TO CHANGE
DURING FINAL DESIGN



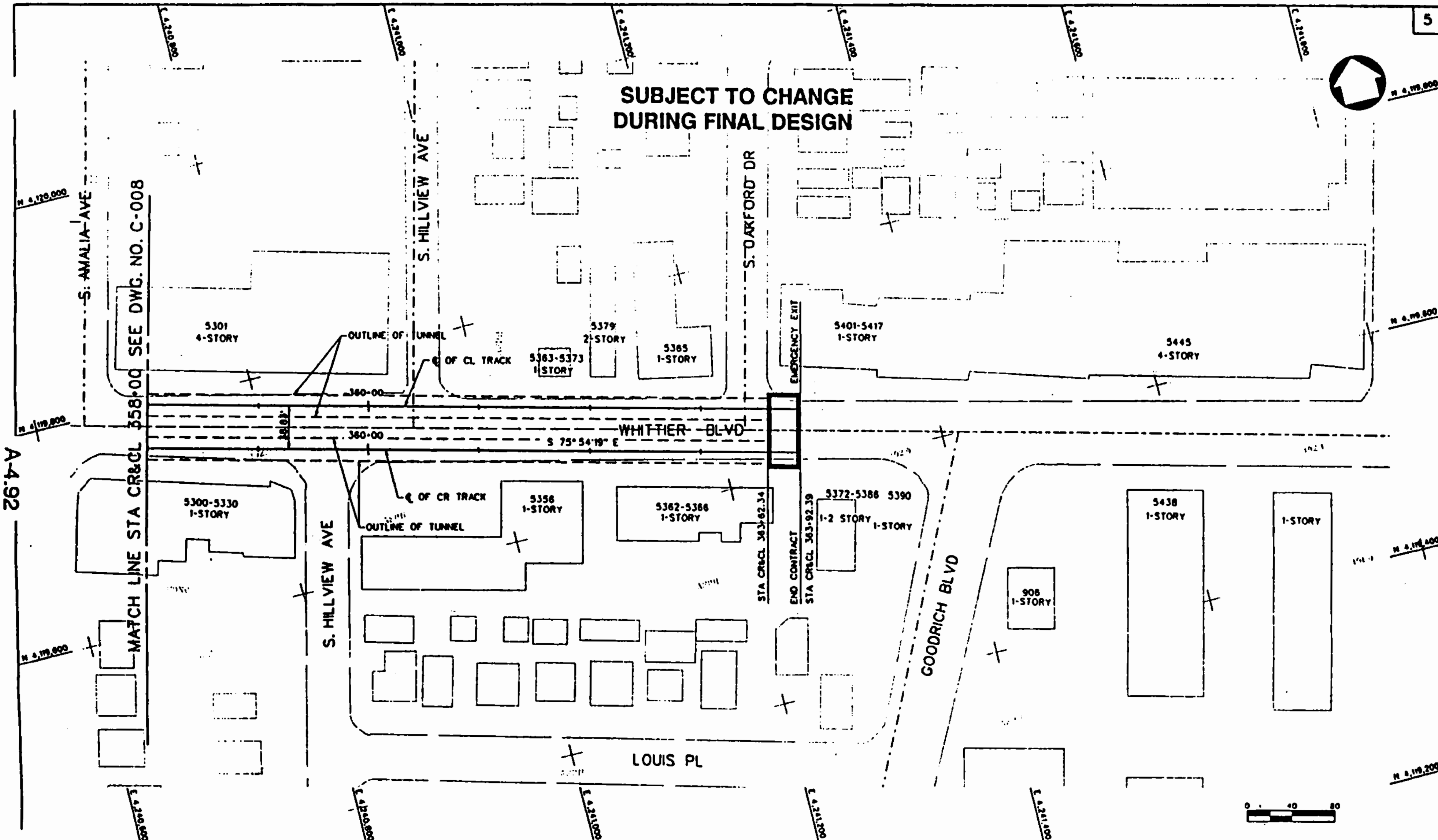
DESIGNED BY M. HURWITZ
DRAWN BY S. EBRAHIM
CHECKED BY Y. WAGNER
IN CHARGE J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE

C0591
C-009 | 0
HORIZ. 1"=40'
VERT. 1"=10'
15

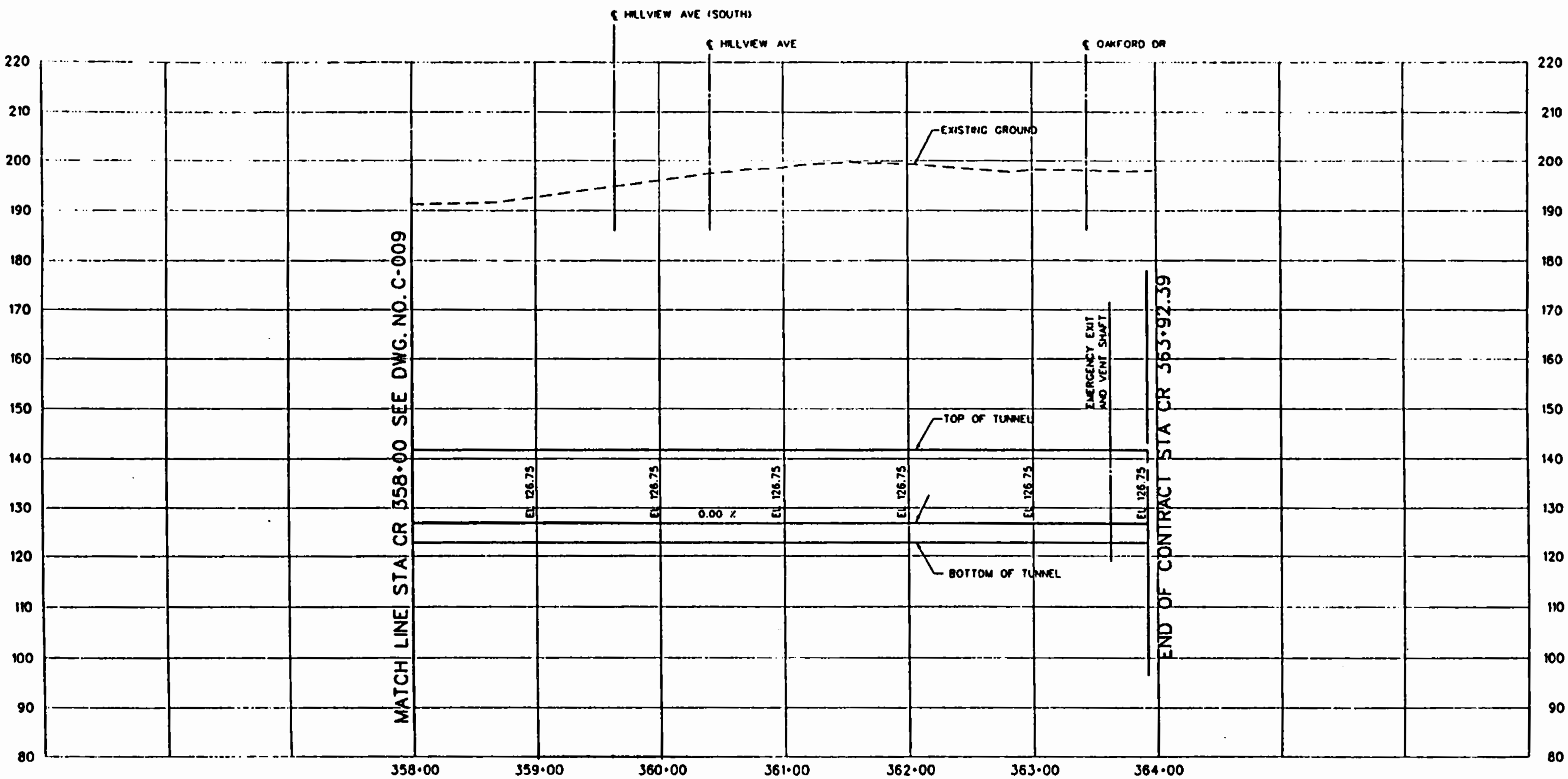
A-4.91



DESIGNED BY J. AL-MASHAT	LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY	CONTRACT NO. C0591
DRAWN BY C. SHORE	METRO RED LINE	DRAWING NO. C-010
CHECKED BY M. HURWITZ	EAST SIDE EXTENSION TUNNEL LINE SECTION PLAN	SCALE 1"=40'
IN CHARGE J. IVYNIAN	STA CR&CL 358+00 TO STA 363+92.39	SHEET NO. 76

ENGINEERING MANAGEMENT CONSULTANT

SUBJECT TO CHANGE DURING FINAL DESIGN



S. IBRAHIM
J. TODOROV
Y. WAGNER
J. IVYNIAN

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
TUNNEL LINE SECTION
PROFILE
STA CR 358+00 TO STA CR 363+92.39

C0591

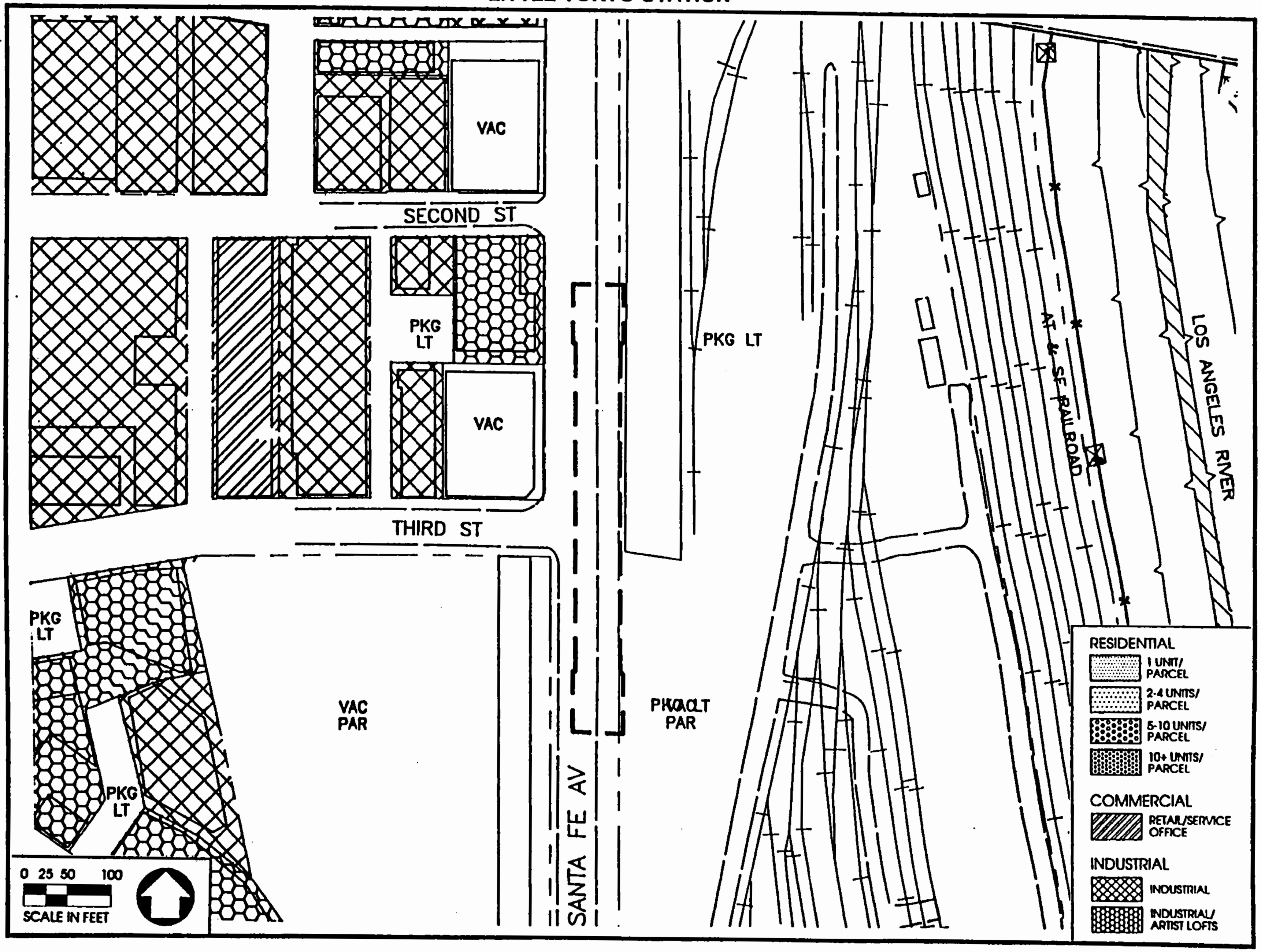
C-011

HORIZ. 1"=40'
VERT. 1"=10'

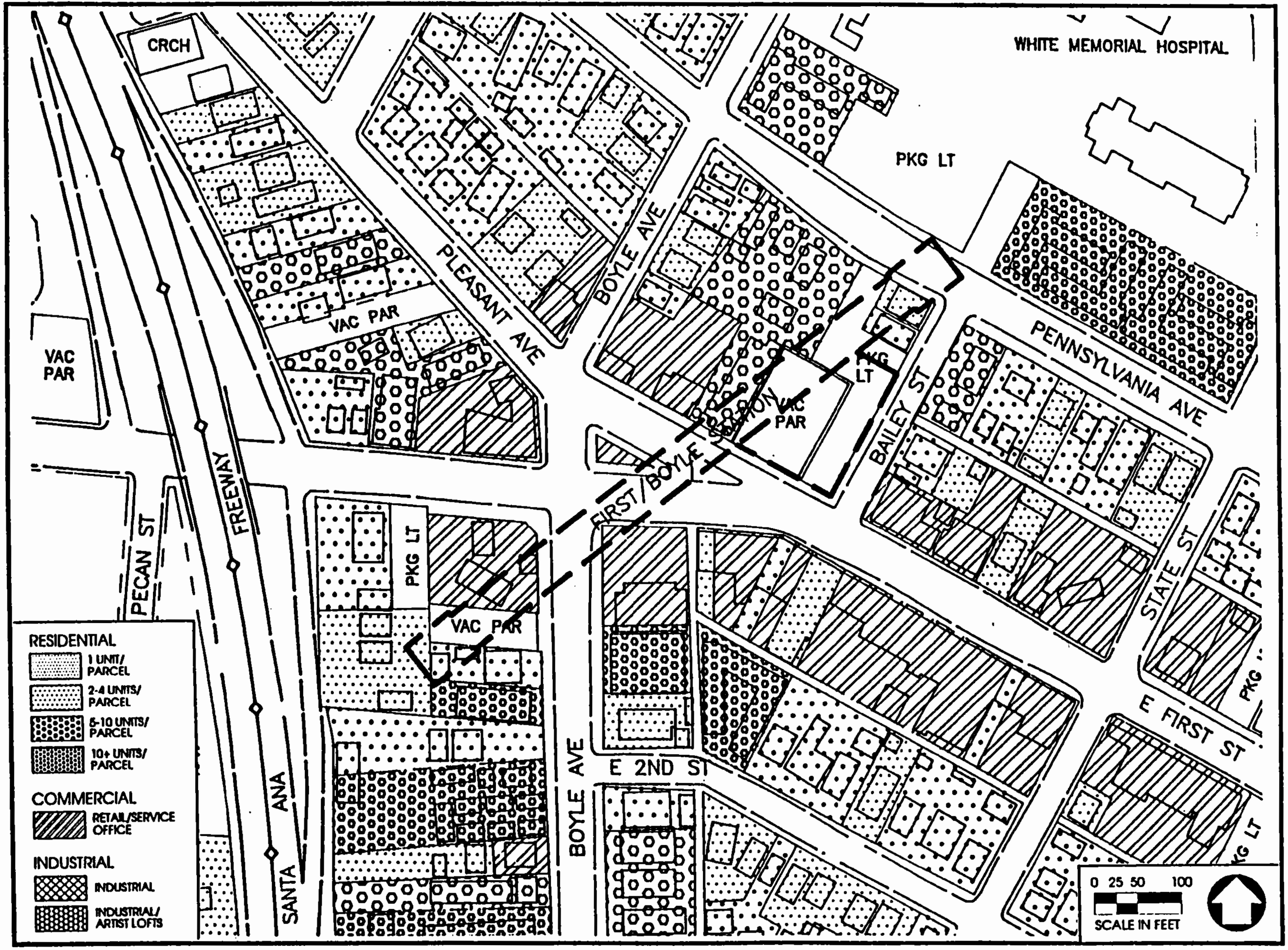
17

APPENDIX 5: LOCAL LAND USE MAPS

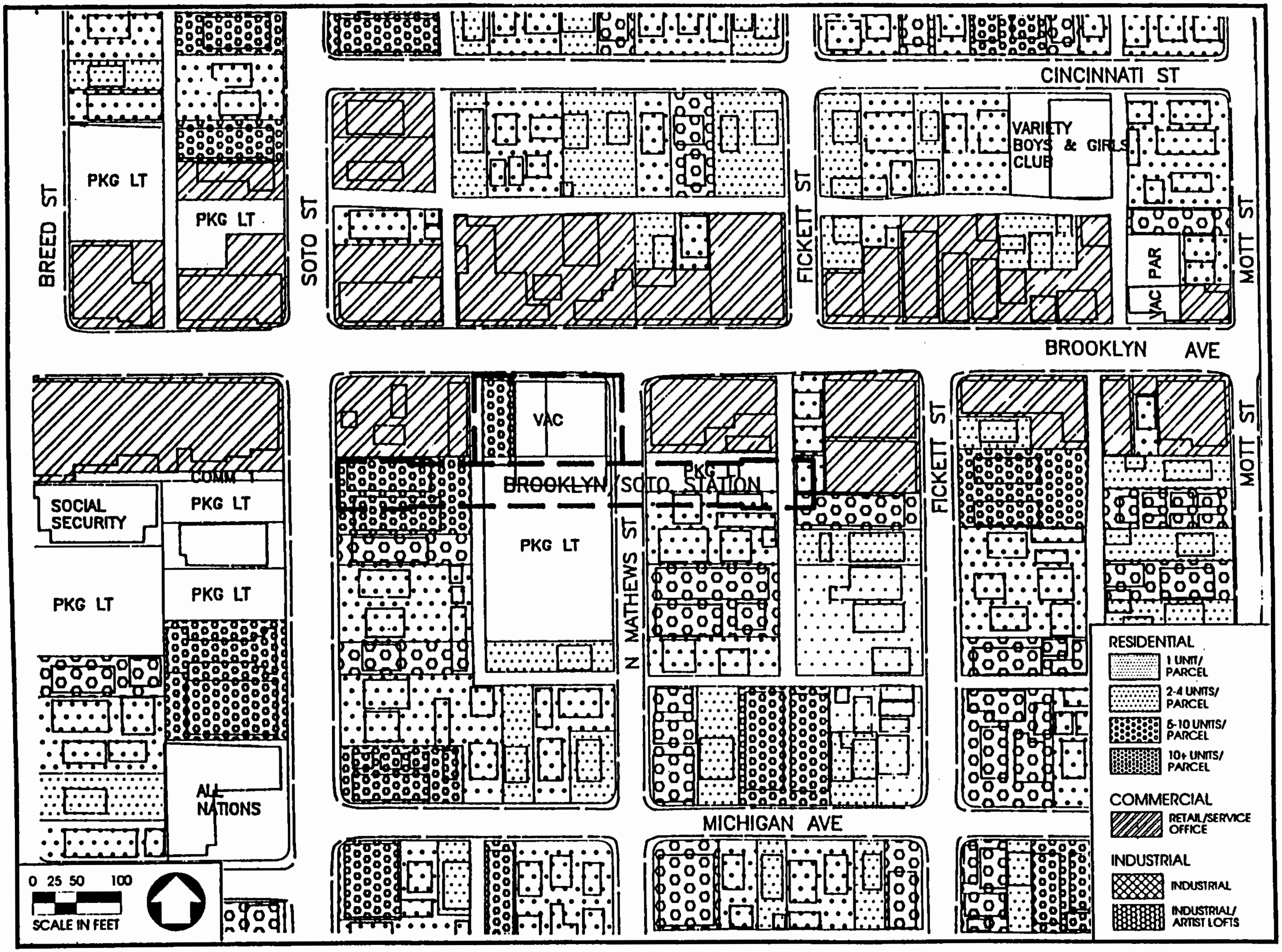
LITTLE TOKYO STATION



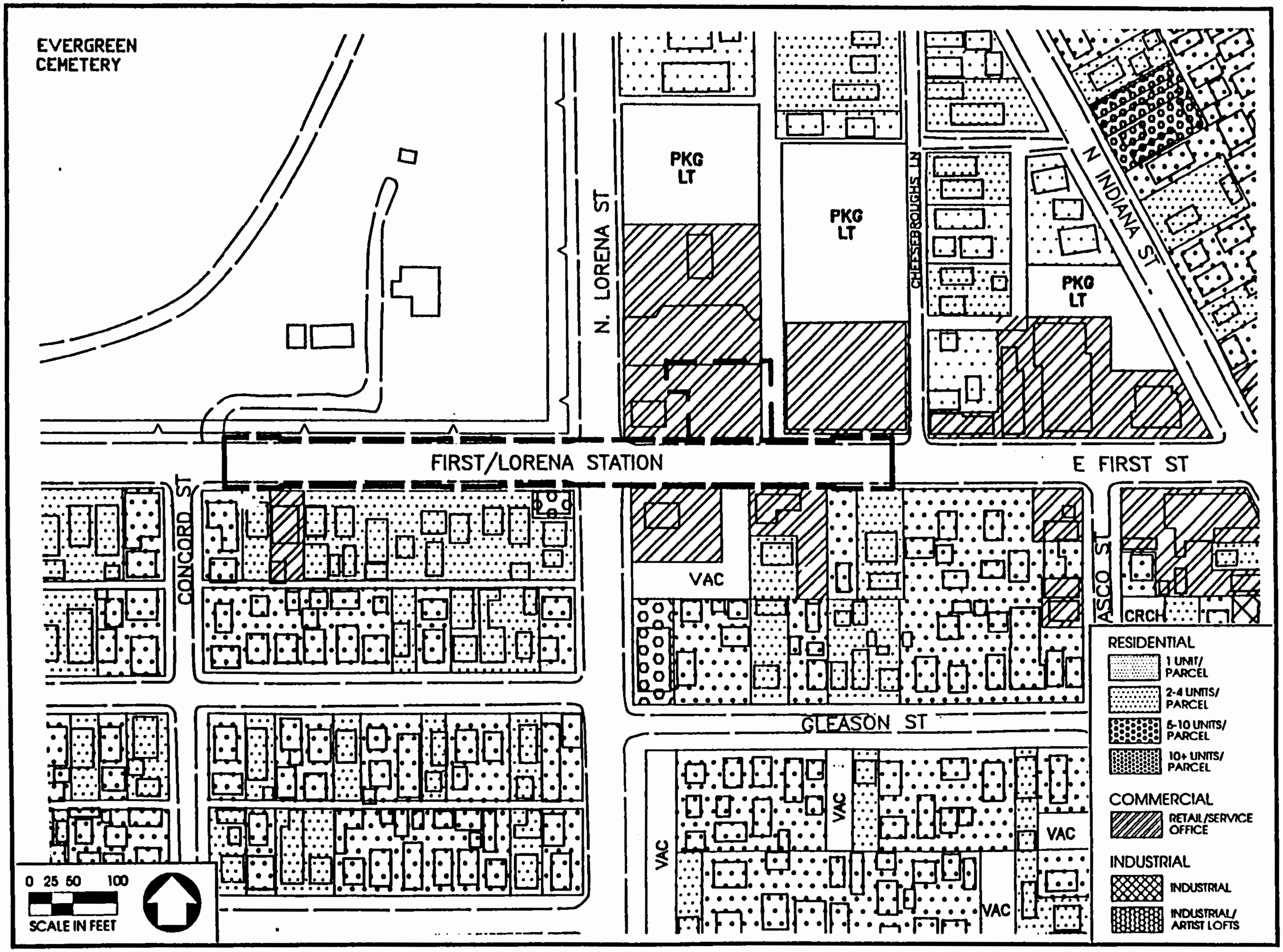
FIRST/BOYLE STATION



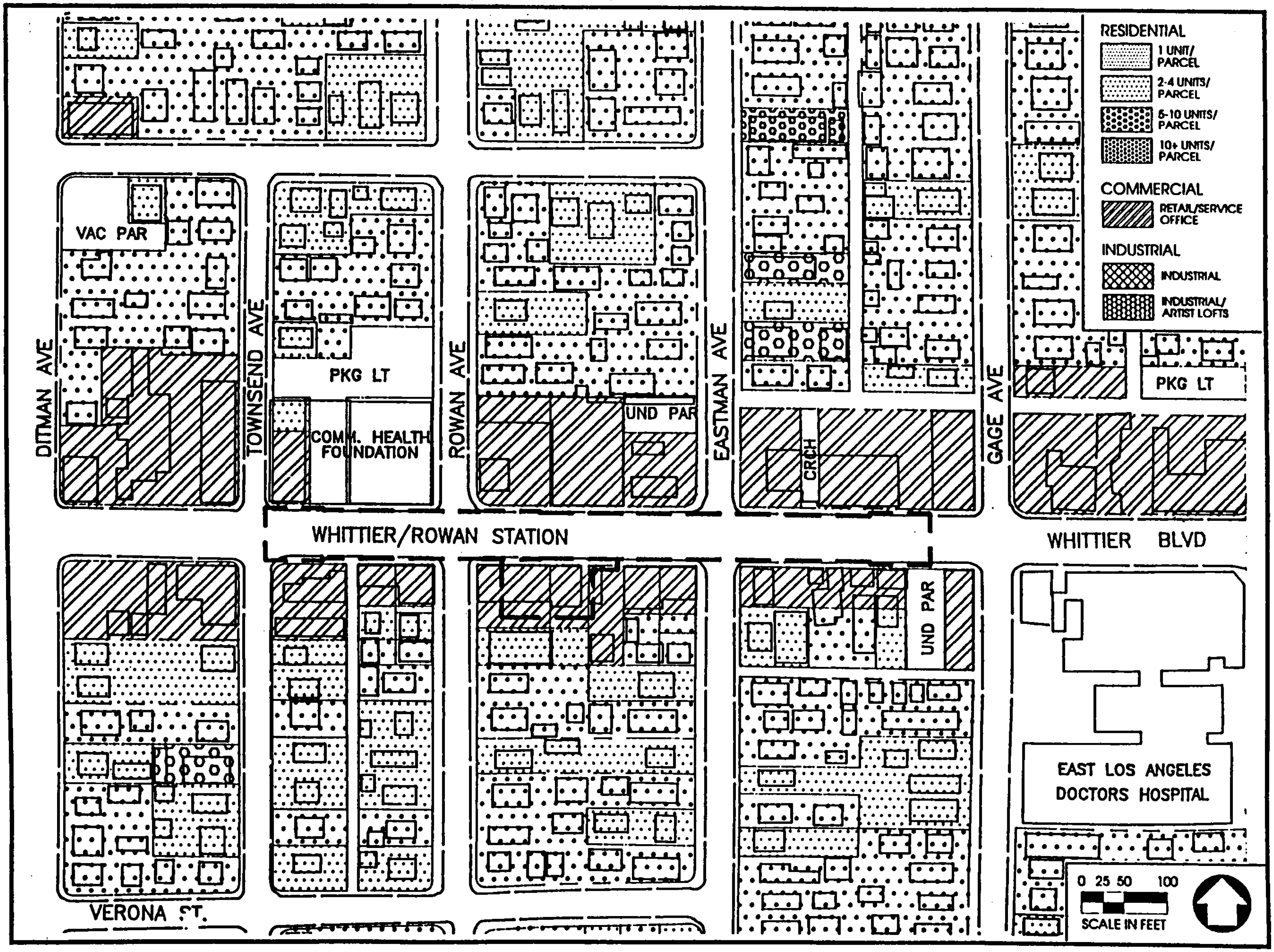
BROOKLYN/SOTO STATION



FIRST/LORENA STATION

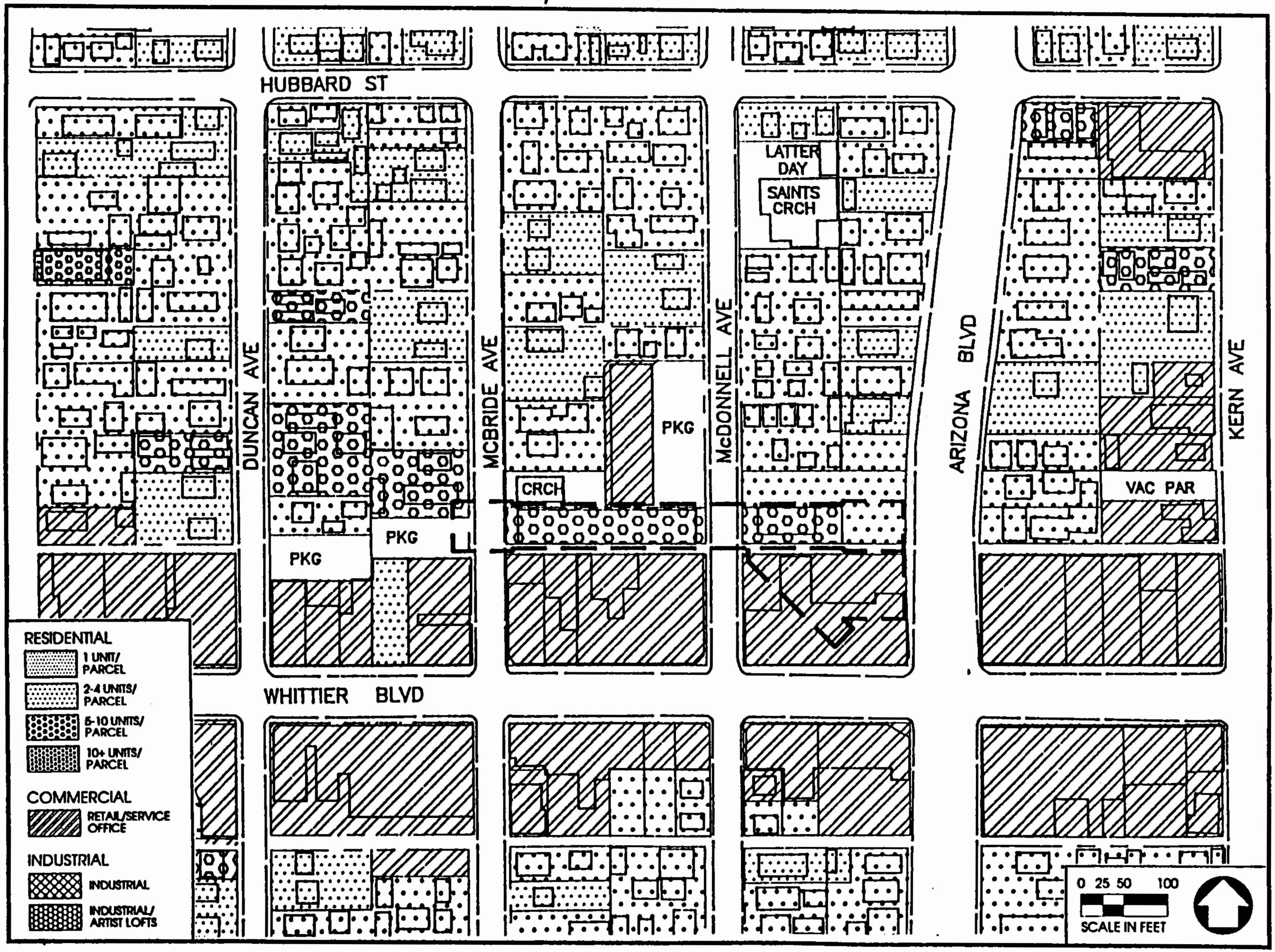


WHITTIER/ROWAN STATION

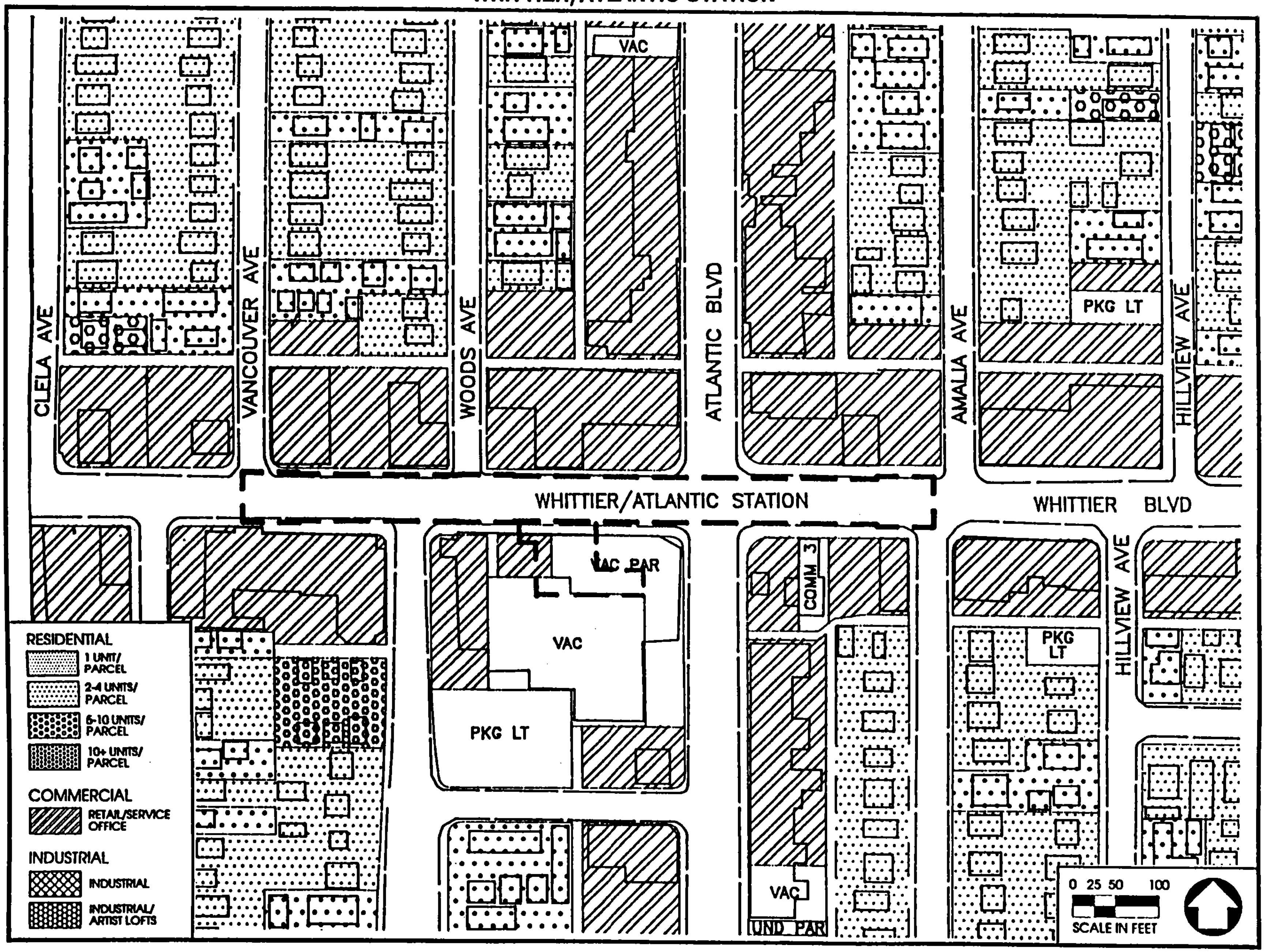


A-5.6

WHITTIER/ARIZONA STATION

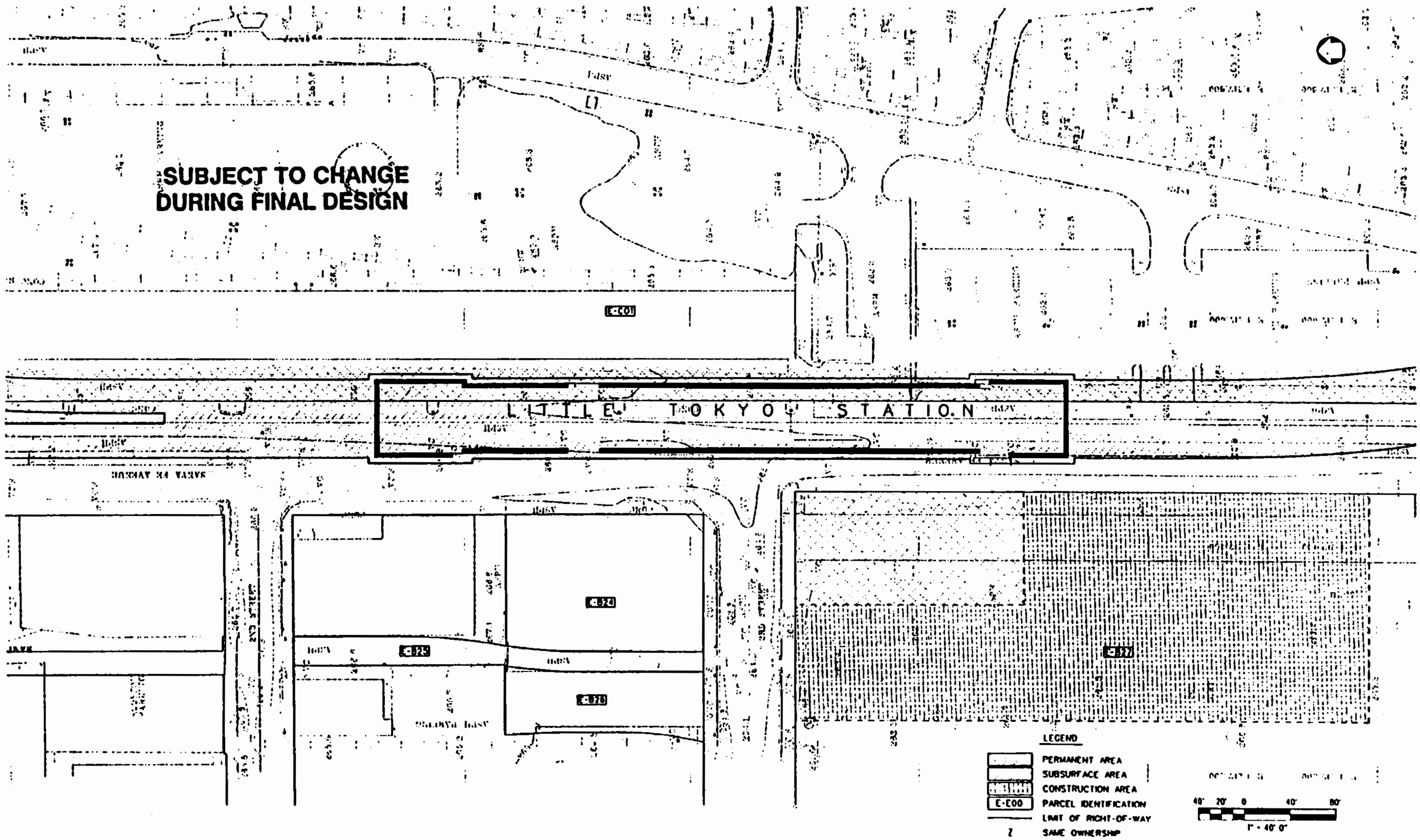


WHITTIER/ATLANTIC STATION



APPENDIX 6: PROPOSED PROPERTY ACQUISITIONS

(Please See Section 4-3 of the FEIS/FEIR)



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

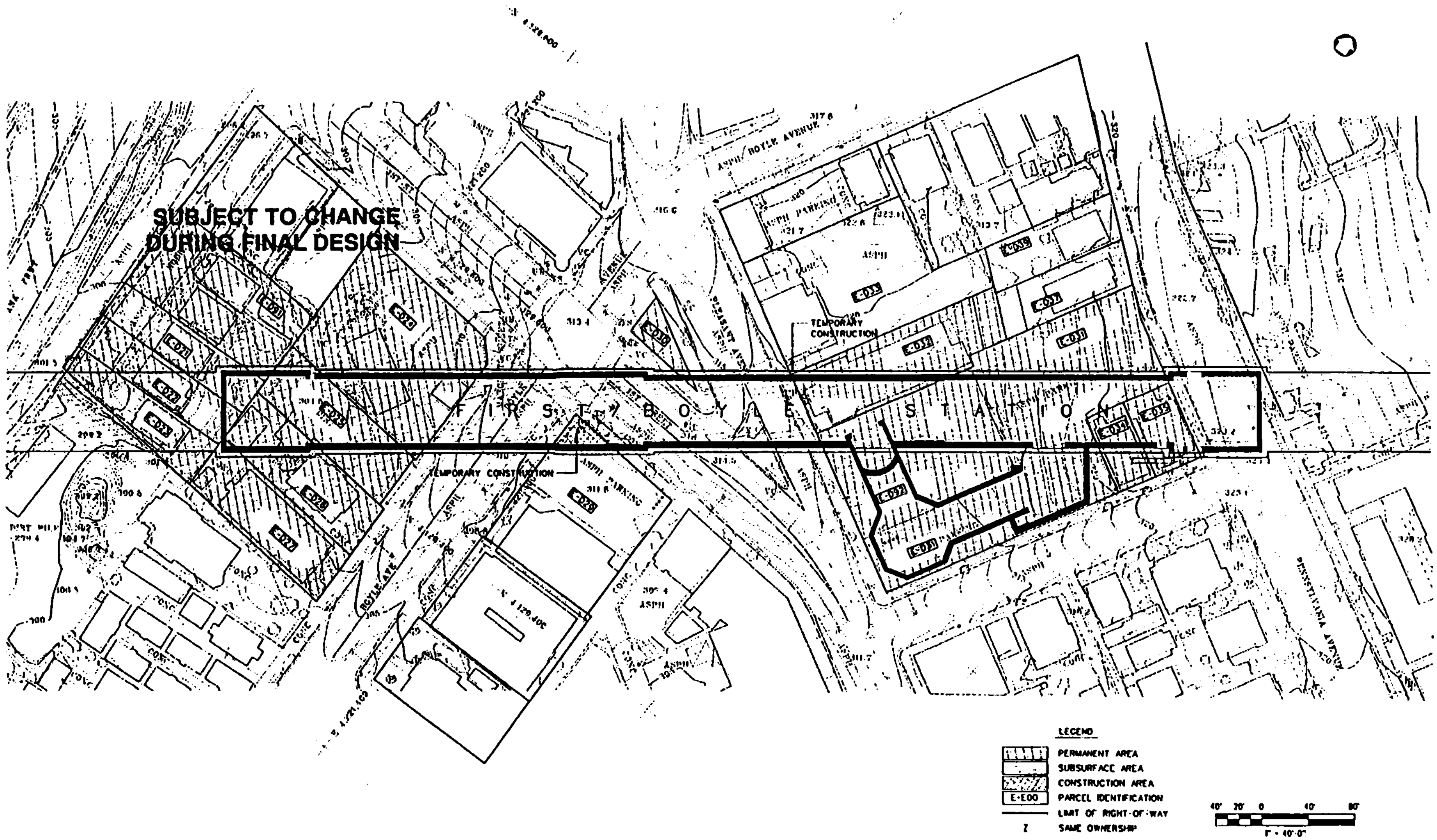
METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

Designed by L E RUSH
Drawn by S SIBILIA
Checked by L E RUSH
In charge J C CHAVEZ
Date 31 MAR 94

EAST SIDE EXTENSION
LITTLE TOKYO STATION

Scale 1"=40'-0"



DESIGNED BY	L E RUSH
DRAWN BY	S SIBILIA
CHECKED BY	L E RUSH
IN CHARGE	J C CHAVEZ
DATE	31 MAR 94

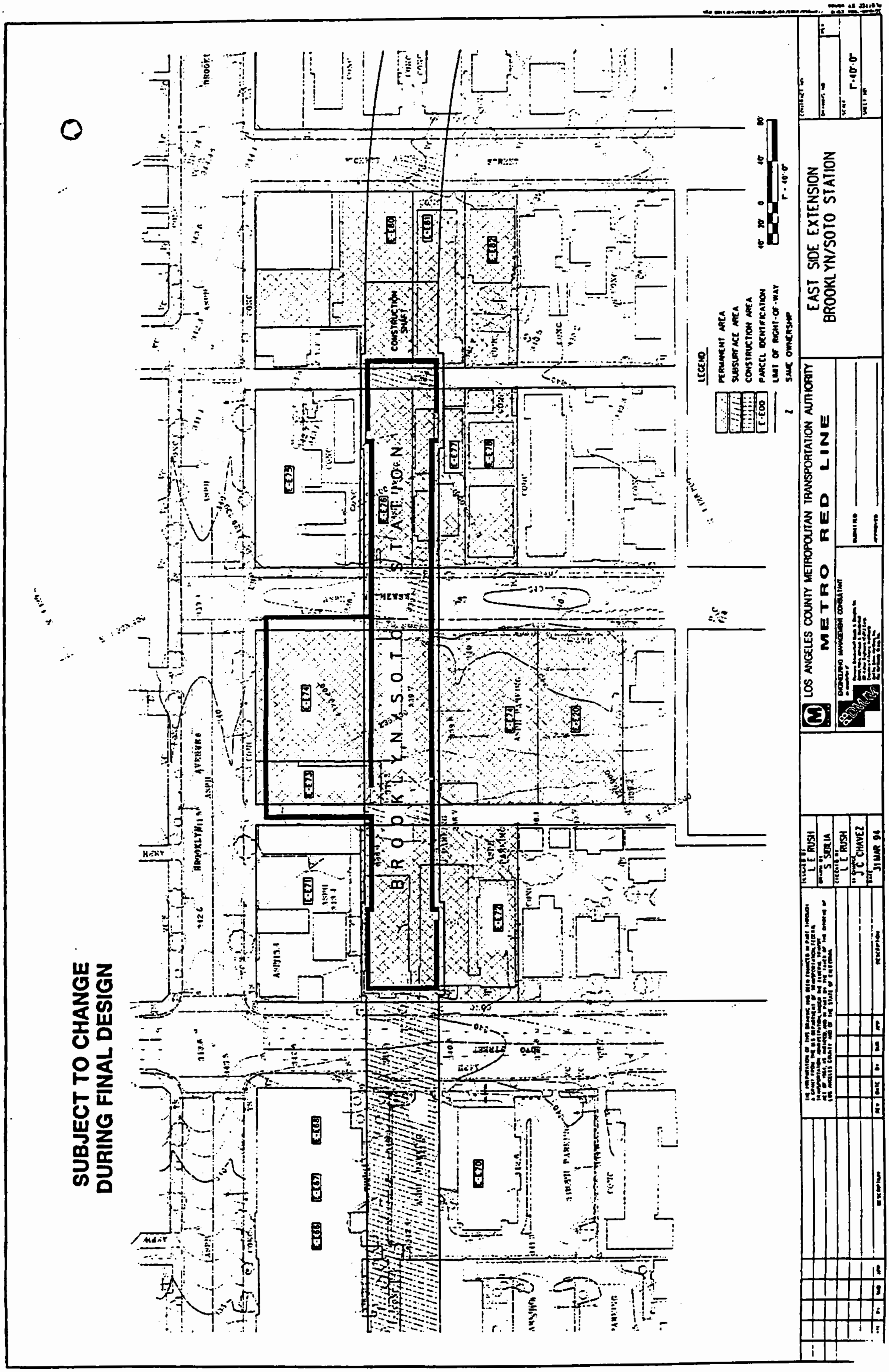
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

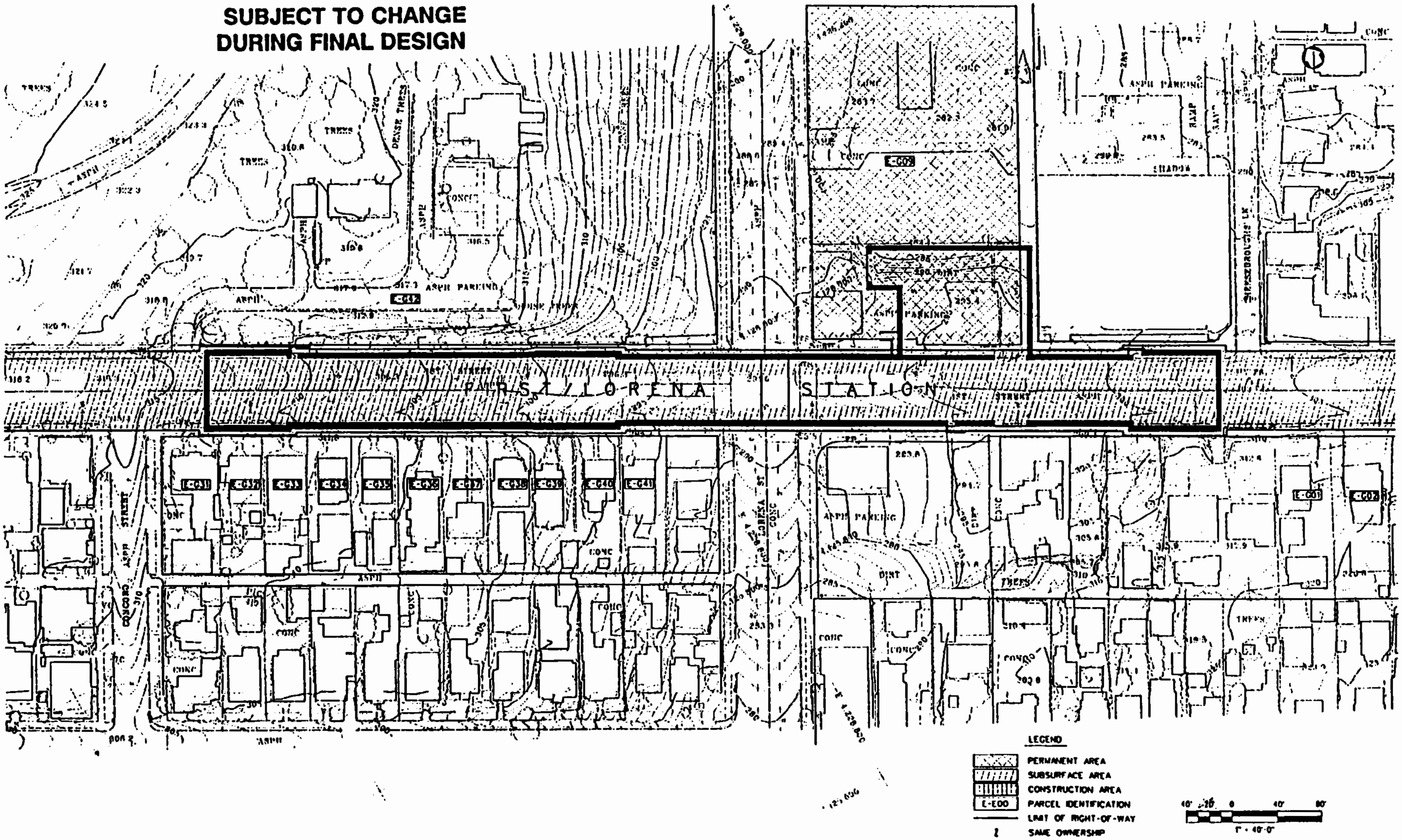
METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
FIRST/BOYLE STATION

SCALE 1"=40'-0"


SUBJECT TO CHANGE
DURING FINAL DESIGN
BROOKLYN STATION
SOTO STATION
LEGEND
PERMANENT AREA
SUBSURFACE AREA
CONSTRUCTION AREA
PARCEL IDENTIFICATION
LIMIT OF RIGHT-OF-WAY
SAME OWNERSHIP
CONSTRUCTION SHAFT
1" = 40'-0"
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
BROOKLYN/SOTO STATION
L E RUSH
S SERLIA
J C CHAVEZ
31 MAR 94



Designed by L E RUSH
Drawn by S SIBILIA
Checked by L E RUSH
In charge J C CHAVEZ
Date 31 MAR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

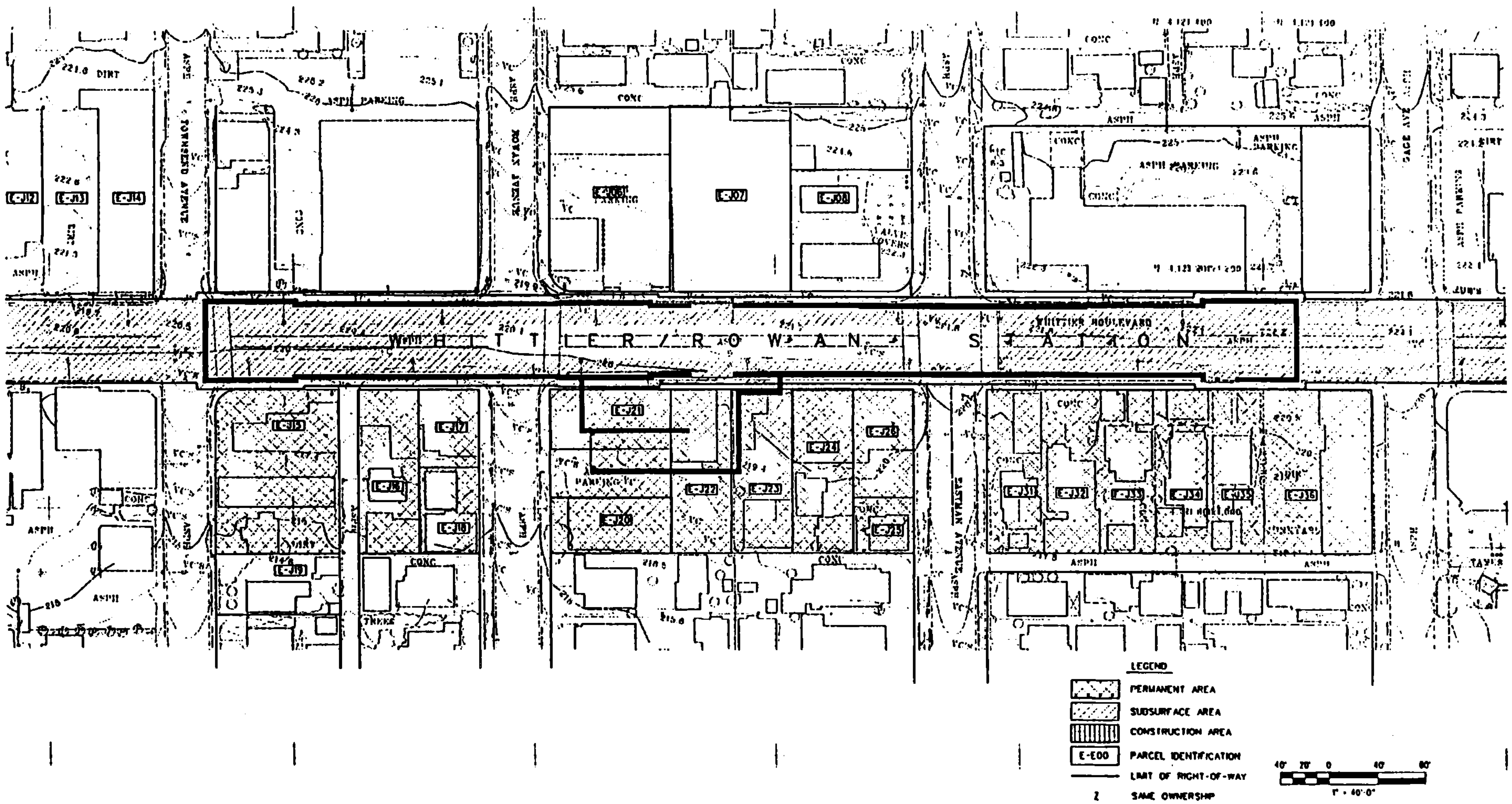
METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
FIRST/LORENA STATION

Scale 1"=40'-0"

SUBJECT TO CHANGE
DURING FINAL DESIGN



DESIGNED BY	L E RUSH
DRAWN BY	S SIBILIA
CHECKED BY	L E RUSH
IN CHARGE	J C CHAVEZ
DATE	31 MAR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

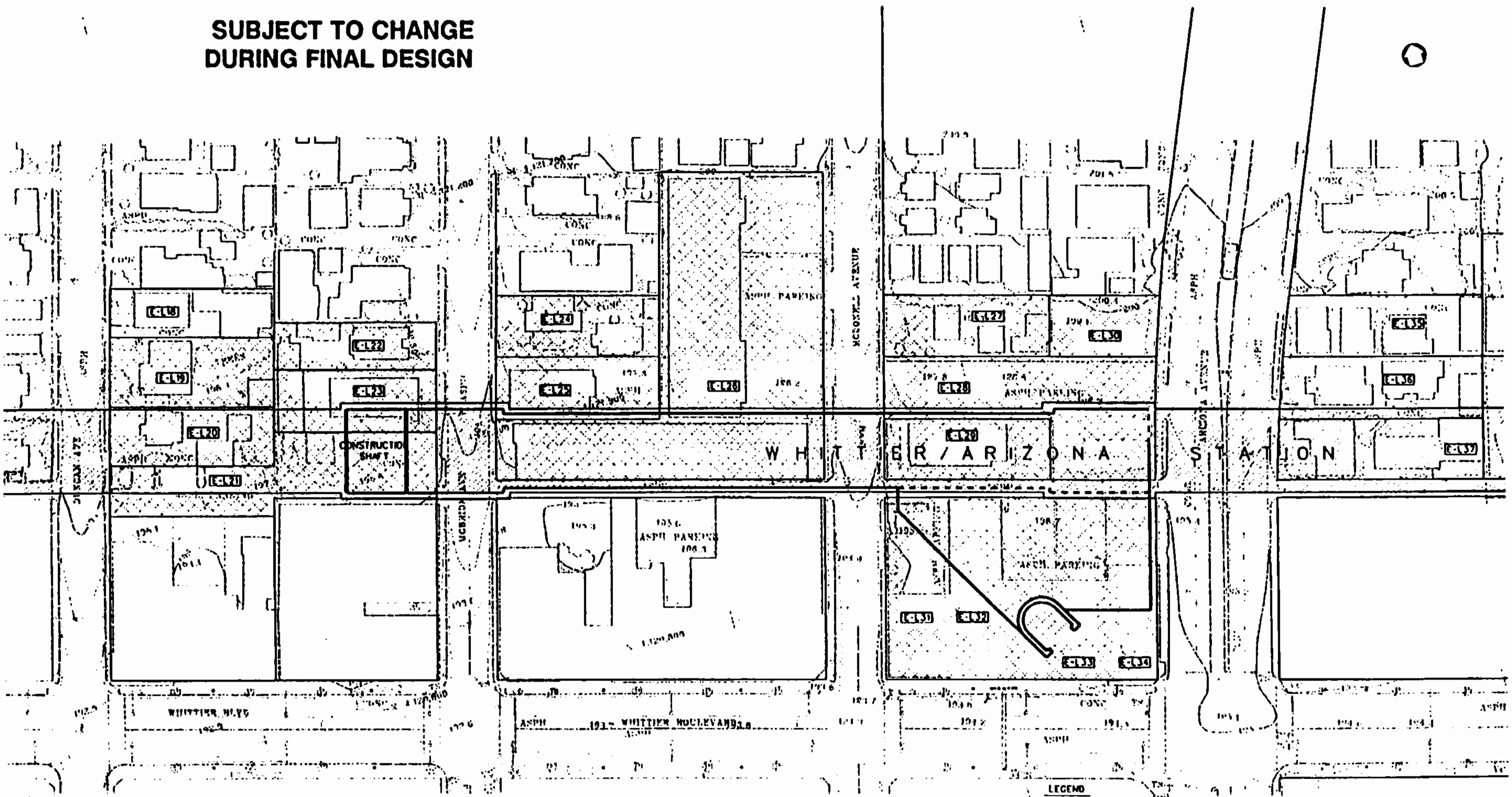
SUBMITTED

APPROVED

EAST SIDE EXTENSION
WHITTIER/ROWAN STATION

SCALE 1"=40'-0

SUBJECT TO CHANGE DURING FINAL DESIGN



LEGEND

- PERMANENT AREA
- SUBSURFACE AREA
- CONSTRUCTION AREA
- E-E00 PARCEL IDENTIFICATION
- LIMIT OF RIGHT-OF-WAY
- SAME OWNERSHIP

1" = 40'-0"

A-6.7

DESIGNED BY	L E RUSH
DRAWN BY	S SIBILIA
CHECKED BY	L E RUSH
IN CHARGE	J C CHAVEZ
DATE	31 MAR 94

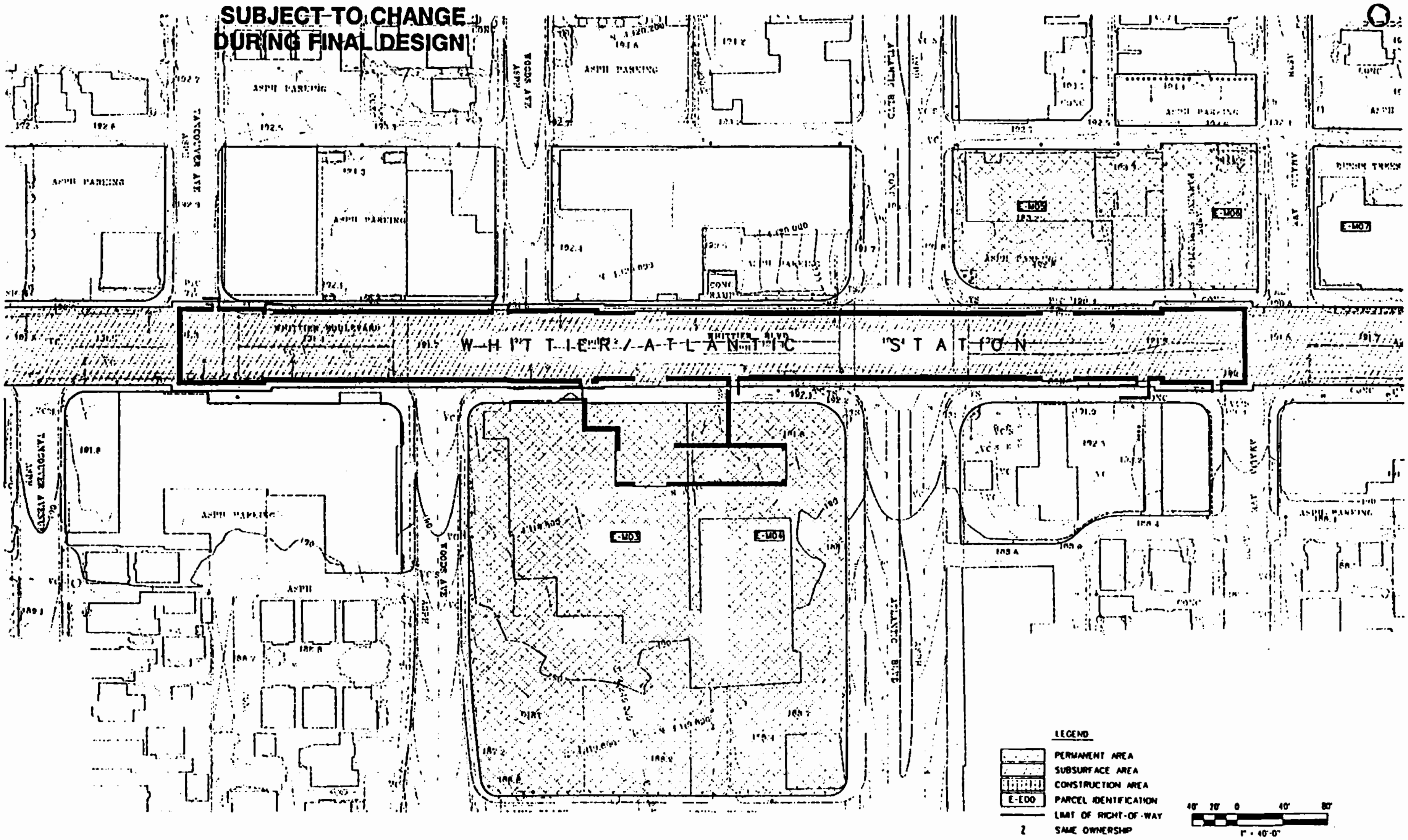
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

EAST SIDE EXTENSION
WHITTIER/ARIZONA STATION

SCALE 1"=40'-0"



DESIGNED BY L E RUSH
DRAWN BY S SIBILIA
CHECKED BY L E RUSH
IN CHARGE J C CHAVEZ
DATE 31 MAR 94

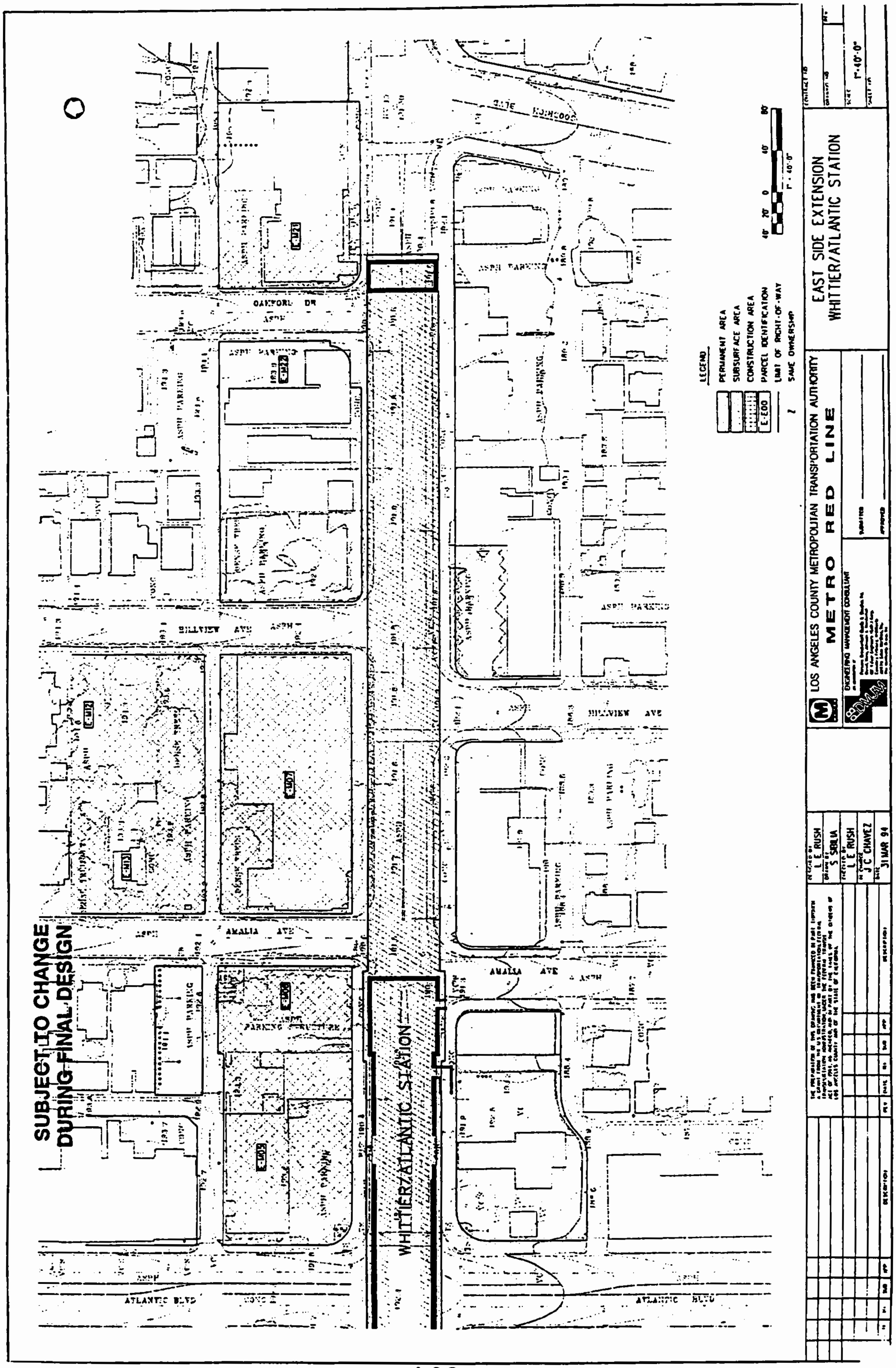
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED
APPROVED

EAST SIDE EXTENSION
WHITTIER/ATLANTIC STATION

SCALE 1"=40'-0"


SUBJECT TO CHANGE
DURING FINAL DESIGN
WHITTIER/ATLANTIC STATION
OAKFORD DR
HILLVIEW AVE
AMALIA AVE
ATLANTIC BLVD
ASPH PARKING
PARKING STRUCTURE
LEGEND
PERMANENT AREA
SUBSURFACE AREA
CONSTRUCTION AREA
PARCEL IDENTIFICATION
LIMIT OF RIGHT-OF-WAY
SAME OWNERSHIP
1" = 40'-0"
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
EAST SIDE EXTENSION
WHITTIER/ATLANTIC STATION
ENGINEERING MANAGEMENT CONSULTANT
L E RUSH
L E RUSH
J C CHAVEZ
31 MAR 94

APPENDIX 7: STIPULATION

Preservation Stipulations
AT&SF Outbound Freight House, 970 East 3rd Street, Los Angeles

The Los Angeles County Metropolitan Transportation Authority (MTA), in order to facilitate the construction of the Metro Red Line Eastside Extension, proposes to acquire the *AT&SF Outbound Freight House* property in the City of Los Angeles, County of Los Angeles. MTA proposes the following mitigation measures to ensure preservation of this property's historic features during construction of the undertaking:

> Under Option 1 of the Little Tokyo Station, the *AT&SF Outbound Freight House* would be acquired, and the station entrance would be located adjacent to the rear of the historic building. To provide passenger access to the station, a tunnel would be dug under the historic building. Construction of the passenger access tunnel will be undertaken in such a way that it would not damage or cause the alteration of the *AT&SF Outbound Freight House*. The contractor would be required to confine all construction traffic to a safe distance from the *AT&SF Outbound Freight House* to avoid accidental damage. The design of the new station entrance will conform to the guidelines specified in Part IV.A. of the November 1983 Memorandum of Agreement.
>
> Option 2 of the Little Tokyo Station would also acquire the *AT&SF Outbound Freight House* property, and use the vacant portion of the parcel to the rear of the building as a temporary construction lay-down area, but in this option the station entrance would be located across (east of) Santa Fe Avenue in the Metro Rail yard. No demolition or alteration of any portion of the historic building would be undertaken. The contractor would be required to confine all construction traffic to a safe distance from the *AT&SF Outbound Freight House* to avoid accidental damage.

In order to ensure preservation of this property's historic features after construction of the undertaking is completed, the following covenant will accompany any property transfer, lease or sale agreements between MTA and any other party, and will be recorded in the real estate records of Los Angeles County, State of California.

This covenant will only be necessary if MTA is unable to obtain a construction easement from the current owner:

Preservation Covenant

In consideration of the conveyance of certain improved real property, hereinafter referred to as the *AT&SF Outbound Freight House*, located in the City of Los Angeles, County of Los Angeles, State of California, which is more fully described as:

Santa Fe Freight Station Grounds (M.B. 12-18)

[Name of property recipient or lessee] hereby covenants on behalf of [himself/herself/itself], [his/her/its] heirs, successors, and assigns to maintain and preserve all those exterior and interior features that qualify the *AT&SF Outbound Freight House* for inclusion in the National Register of Historic Places and California Register of Historical Resources as follows:

1. [Name of recipient] shall preserve and maintain the *AT&SF Outbound Freight House* in accordance with the recommended approaches in the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service, 1983) in order to preserve and enhance those qualities that make the *AT&SF Outbound Freight House* eligible for inclusion in the National Register of Historic Places.

2. No significant alteration or any other thing shall be undertaken or permitted to be undertaken on the *AT&SF Outbound Freight House* which would affect the structural integrity or the appearance of the property without the express prior written permission of the California Historic Preservation Officer and signed by a fully authorized representative thereof.

3. Any development on the property requiring discretionary action on the part of a public agency, would be subject to full compliance with the California Environmental Quality Act [as amended California Public Resources Code 21084.1] and all its provisions regarding public disclosure of proposed actions and mitigation measures for substantial adverse changes to the significance of the *AT&SF Outbound Freight House*.

The covenant shall be a binding servitude upon the *AT&SF Outbound Freight House* and shall be deemed to run with the land. Execution of this covenant shall constitute conclusive evidence that [name of recipient] agrees to be bound by the foregoing conditions and restrictions and to perform to the obligations herein set forth.

Preservation Stipulations
Jewish Home for Wayfarers, 127 South Boyle Avenue, Los Angeles

The Los Angeles County Metropolitan Transportation Authority (MTA), in order to facilitate the construction of the Metro Red Line Eastside Extension, proposes to acquire the *Jewish Home for Wayfarers* property in the City of Los Angeles, County of Los Angeles. MTA proposes the following mitigation measures to ensure preservation of this property's historic features during construction of the undertaking:

> The cut-and-cover construction of the First and Boyle Station would require acquisition of this property, a temporary move of the *Jewish Home for Wayfarers* off the lot during construction activities, and a return to its original setting after construction of the station is completed. Construction may require grading of part of the property; however, the site topography will be returned to its original condition before the building is returned.

The MTA, acting on behalf of the FTA, shall ensure that the property is moved in accordance with the approaches recommended in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History), in consultation with the State Office of Historic Preservation, by a professional mover who has the capability to move historic structures properly. The MTA shall ensure that the *Jewish Home for Wayfarers* is properly secured and protected from vandalism and weather damage during the period it is unoccupied.

The site of the *Jewish Home for Wayfarers* has been near documented sources of human activity for over 100 years. Because of the proposed extensive grading which would occur at this site and its archaeological and historic archaeological sensitivity, the MTA shall adopt an Identification Study and Treatment Plan for significant archaeological and historic archaeological data consistent with that adopted in Part II of the November 1983 Memorandum of Agreement for *Union Station* and *Campo de Cahuenga*.

In order to ensure preservation of this property's historic features after construction of the undertaking is completed, the following covenant will accompany any property transfer, lease or sale agreements between MTA and any other party, and will be recorded in the real estate records of Los Angeles County, State of California:

Preservation Covenant

In consideration of the conveyance of certain improved real property, hereinafter referred to as the *Jewish Home for Wayfarers*, located in the City of Los Angeles, County of Los Angeles, State of California, which is more fully described as:

Tract No. 1545/City Lands of Los Angeles, Lot commencing 230 ft south of SW corner of 1st Street and Boyle Avenue, then south 50 ft, then west 150 feet, then north 50 feet, then east 150 feet.

[Name of property recipient or lessee] hereby covenants on behalf of [himself/herself/itself], [his/her/its] heirs, successors, and assigns at all times to MTA to maintain and preserve all those exterior and interior features that qualify the *Jewish Home for Wayfarers* for inclusion in the National Register as follows:

1. [Name of recipient] shall preserve and maintain the *Jewish Home for Wayfarers* in accordance with the recommended approaches in the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service, 1983) in order to preserve and enhance those qualities that make the *Jewish Home for Wayfarers* eligible for inclusion in the National Register of Historic Places.

2. No significant alteration or any other thing shall be undertaken or permitted to be undertaken on the *Jewish Home for Wayfarers* which would affect the structural integrity or the appearance of the property without the express prior written permission of the California Historic Preservation Officer and signed by a fully authorized representative thereof.

3. Any development on the property requiring discretionary action on the part of a public agency, would be subject to full compliance with the California Environmental Quality Act [as amended California Public Resources Code 21084.1] and all its provisions regarding public disclosure of proposed actions and mitigation measures for substantial adverse changes to the significance of the *Jewish Home for Wayfarers*.

The covenant shall be a binding servitude upon the *Jewish Home for Wayfarers* and shall be deemed to run with the land. Execution of this covenant shall constitute conclusive evidence that [name of recipient] agrees to be bound by the foregoing conditions and restrictions and to perform to the obligations herein set forth.

Preservation Stipulations
Walter & Lillie Webb Residence, 125 South Boyle Avenue, Los Angeles

The Los Angeles County Metropolitan Transportation Authority (MTA), in order to facilitate the construction of the Metro Red Line Eastside Extension, proposes to acquire the *Walter & Lillie Webb Residence* property in the City of Los Angeles, County of Los Angeles. MTA proposes the following mitigation measures to ensure preservation of this property's historic features during construction of the undertaking:

The cut-and-cover construction of the First and Boyle Station would require acquisition of this property, a temporary move of the building off the lot during construction activities, and a return to its original setting after construction of the station is completed. A ventilation shaft would be permanently located in the front of the *Walter & Lillie Webb Residence* property. A ventilation shaft consists of a grating set flush to the ground and has no above-ground vertical elements. It will be placed in an unobtrusive location, probably the sidewalk, and will not alter the characteristics of the property which qualify it for inclusion in the National Register of Historic Places. If the ventilation shaft must be located on the property, it will be designed in accordance with Part IV. B. of the November 1983 Memorandum of Agreement.

The MTA, acting on behalf of the FTA, shall ensure that the property is moved in accordance with the approaches recommended in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History), in consultation with your office, by a professional mover who has the capability to move historic structures properly. The MTA shall ensure that the *Walter & Lillie Webb Residence* is properly secured and protected from vandalism and weather damage during the period it is unoccupied.

The site of the *Walter & Lillie Webb Residence* has been near documented sources of human activity for over 100 years. Because of the proposed extensive grading which would occur at this site and its archaeological and historic archaeological sensitivity, the MTA shall adopt an Identification Study and Treatment Plan for significant archaeological and historic archaeological data consistent with that adopted in Part II of the November 1983 Memorandum of Agreement for *Union Station* and *Campo de Cahuenga*.

In order to ensure preservation of this property's historic features after construction of the undertaking is completed, the following covenant will accompany any property transfer, lease or sale agreements between MTA and any other party, and will be recorded in the real estate records of Los Angeles County, State of California:

Preservation Covenant

In consideration of the conveyance of certain improved real property, hereinafter referred to as the *Walter & Lillie Webb Residence*, located in the City of Los Angeles, County of Los Angeles, State of California, which is more fully described as:

> *Tract No. 1545/City Lands of Los Angeles, Lot commencing 180 ft south of SW corner of 1st Street and Boyle Avenue, then south 50 ft, then west 150 feet, then north 50 feet, then east 150 feet.*

[Name of property recipient or lessee] hereby covenants on behalf of [himself/herself/itself], [his/her/its] heirs, successors, and assigns at all times to MTA to maintain and preserve all those exterior and interior features that qualify the *Walter & Lillie Webb Residence* for inclusion in the National Register as follows:

1. [Name of recipient] shall preserve and maintain the *Walter & Lillie Webb Residence* in accordance with the recommended approaches in the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service, 1983) in order to preserve and enhance those qualities that make the *Walter & Lillie Webb Residence* eligible for inclusion in the National Register of Historic Places.

2. No significant alteration or any other thing shall be undertaken or permitted to be undertaken on the *Walter & Lillie Webb Residence* which would affect the structural integrity or the appearance of the property without the express prior written permission of the California Historic Preservation Officer and signed by a fully authorized representative thereof.

3. Any development on the property requiring discretionary action on the part of a public agency, would be subject to full compliance with the California Environmental Quality Act [as amended California Public Resources Code 21084.1] and all its provisions regarding public disclosure of proposed actions and mitigation measures for substantial adverse changes to the significance of the *Walter & Lillie Webb Residence*.

The covenant shall be a binding servitude upon the *Walter & Lillie Webb Residence* and shall be deemed to run with the land. Execution of this covenant shall constitute conclusive evidence that [name of recipient] agrees to be bound by the foregoing conditions and restrictions and to perform to the obligations herein set forth.

Preservation Stipulations
Brooklyn Theatre, 2524 East Brooklyn Avenue, Los Angeles

The Los Angeles County Metropolitan Transportation Authority (MTA), in order to facilitate the construction of the Metro Red Line Eastside Extension, proposes to acquire the *Brooklyn Theatre* property in the City of Los Angeles, County of Los Angeles. MTA proposes the following mitigation measures to ensure preservation of this property's historic features during construction of the undertaking:

> The construction of the Brooklyn/Soto Station would require acquisition of this property for a construction shaft on the rear 44 feet of this 150 foot parcel. The depth of the *Brooklyn Theatre* building is only 70 feet, so that the construction shaft would be 20 feet from its rear wall, and would not result in its alteration. A non-historic building located on the same parcel to the rear of the *Brooklyn Theatre* would, however, be demolished. The contractor would be required to confine all subsequent construction traffic to a safe distance from the *Brooklyn Theatre* to avoid accidental damage.

In order to ensure preservation of this property's historic features after construction of the undertaking is completed, the following covenant will accompany any property transfer, lease or sale agreements between MTA and any other party, and will be recorded in the real estate records of Los Angeles County, State of California.

This covenant will only be necessary if MTA is unable to obtain a construction easement from the current owner:

Preservation Covenant

In consideration of the conveyance of certain improved real property, hereinafter referred to as the *Brooklyn Theatre*, located in the City of Los Angeles, County of Los Angeles, State of California, which is more fully described as:

> *Portions of Lots 21 and 19 and all of Lot 17 of Dennis & Cook's Subdivision of Lot 3 of the Mathews and Ficket Tract (M.R. 36-85)*

[Name of property recipient or lessee] hereby covenants on behalf of [himself/herself/itself], [his/her/its] heirs, successors, and assigns at all times to MTA to maintain and preserve all those exterior and interior features that qualify the *Brooklyn Theatre* for inclusion in the National Register as follows:

1. [Name of recipient] shall preserve and maintain the *Brooklyn Theatre* in accordance with the recommended approaches in the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service, 1983) in order to preserve and enhance those qualities that make the *Brooklyn Theatre* eligible for inclusion in the National Register of Historic Places.

2. No significant alteration or any other thing shall be undertaken or permitted to be undertaken on the *Brooklyn Theatre* which would affect the structural integrity or the appearance of the property without the express prior written permission of the California Historic Preservation Officer and signed by a fully authorized representative thereof.

3. Any development on the property requiring discretionary action on the part of a public agency, would be subject to full compliance with the California Environmental Quality Act [as amended California Public Resources Code 21084.1] and all its provisions regarding public disclosure of proposed actions and mitigation measures for substantial adverse changes to the significance of the *Brooklyn Theatre*.

The covenant shall be a binding servitude upon the *Brooklyn Theatre* and shall be deemed to run with the land. Execution of this covenant shall constitute conclusive evidence that [name of recipient] agrees to be bound by the foregoing conditions and restrictions and to perform to the obligations herein set forth.

Preservation Stipulations

Golden Gate Theatre, 5170-5188 East Whittier Boulevard, East Los Angeles (Unincorporated)

The Los Angeles County Metropolitan Transportation Authority (MTA), in order to facilitate the construction of the Metro Red Line Eastside Extension, proposes to acquire the *Golden Gate Theatre* property in an unincorporated portion of the County of Los Angeles. MTA proposes the following mitigation measures to ensure preservation of this property's historic features during construction of the undertaking:

> The construction of the Whittier/Atlantic Station would require permanent acquisition of the entire block located between Whittier Boulevard, Atlantic Boulevard, Woods Avenue, and Louis Place, which includes the *Golden Gate Theatre* parcel. No demolition or alteration of the *Golden Gate Theatre* is required for the construction of the station. Although plans are not finalized, a four- to six-story parking garage may be built adjacent to the theater at some time in the future, as well as potential joint development commercial facilities. Any facilities built adjacent to the theater will meet the design compatibility provisions in Part IV. A. and B. of the November 1983 Memorandum of Agreement.

In order to ensure preservation of this property's historic features after construction of the undertaking is completed, the following covenant will accompany any property transfer, lease or sale agreements between MTA and any other party, and will be recorded in the real estate records of Los Angeles County, State of California:

This covenant will only be necessary if MTA is unable to obtain a construction easement from the current owner:

Preservation Covenant

In consideration of the conveyance of certain improved real property, hereinafter referred to as the *Golden Gate Theatre*, located in the City of Los Angeles, County of Los Angeles, State of California, which is more fully described as:

Tract No. 9814 (M.B. 128-51-52)

[Name of property recipient or lessee] hereby covenants on behalf of [himself/herself/itself], [his/her/its] heirs, successors, and assigns at all times to MTA to maintain and preserve all those exterior and interior features that qualify the *Golden Gate Theatre* for inclusion in the National Register as follows:

1. [Name of recipient] shall preserve and maintain the *Golden Gate Theatre* in accordance with the recommended approaches in the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service, 1983) in order to preserve and enhance those qualities that make the *Golden Gate Theatre* eligible for inclusion in the National Register of Historic Places.

2. No significant alteration or any other thing shall be undertaken or permitted to be undertaken on the *Golden Gate Theatre* which would affect the structural integrity or the appearance of the property without the express prior written permission of the California Historic Preservation Officer and signed by a fully authorized representative thereof.

3. Any development on the property requiring discretionary action on the part of a public agency, would be subject to full compliance with the California Environmental Quality Act [as amended California Public Resources Code 21084.1] and all its provisions regarding public disclosure of proposed actions and mitigation measures for substantial adverse changes to the significance of the *Golden Gate Theatre*.

The covenant shall be a binding servitude upon the *Golden Gate Theatre* and shall be deemed to run with the land. Execution of this covenant shall constitute conclusive evidence that [name of recipient] agrees to be bound by the foregoing conditions and restrictions and to perform to the obligations herein set forth.

APPENDIX 8: NOTICE OF PREPARATION

METRO

NOTICE OF PREPARATION

TO: Mr. Thomas Tidemanson
Director
L.A. County Dept. of Public Works
P.O. Box 4089
Los Angeles, CA 90051

FROM: Los Angeles County Transportation Commission
818 West Seventh Street, Suite 1100
Los Angeles, CA 90017

SUBJECT: **Notice of Preparation of a Draft Environmental Impact Report for Transportation Improvements in the Eastside Corridor in Los Angeles County**

The Los Angeles County Transportation Commission will be the Lead in Agency and will prepare an environmental impact report for the corridor. A federal environmental impact statement will also be prepared for the subject corridor with the USDOT Urban Mass Transportation Administration.

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 corridor. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for any project which results from this study.

The proposed transportation alternatives and the environmental issues to be studied are contained in the attached Scoping Information document and the Federal Notice of Intent to Prepare an Environmental Impact Statement. An Initial Study for the subject project was not prepared. The Los Angeles County Transportation Commission determined that the scope of the proposed alternatives and actions would require the preparation of an EIR.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Ms, Nancy Michali, Project Manager, Central Area, at the address shown above. We will also need the name for a contact person in your agency.

Project Title: Eastside Corridor Transportation Improvements in Los Angeles, California

Project Applicant: Los Angeles County Transportation Commission

Date: September 9, 1991 **Signature:** ______________

Name: Ms. Nancy Michali

Title: Project Manager, Central Area

Telephone: (213) 244-6736