4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter of the Final SEIS/SEIR analyzes the environmental consequences associated with the implementation of the LRT Build Alternative and its two Options A and B and compares it to that anticipated with the implementation of the No-Build Alternative. Detailed technical information may be found in the supporting environmental technical reports and addendums available at MTA's offices, One Gateway Plaza, Los Angeles, California. Those documents are hereby incorporated by reference into this Final SEIS/SEIR. In cases where those reports differ from this document, this document supercedes, as it was prepared subsequent to the technical reports and contains the most up-to-date information.

Analysis of each environmental topic consists of using a defined method for analyzing impacts, describing the impacts resulting from implementation of the LRT Build Alternative, and identifying mitigation measures that are needed to reduce or avoid adverse significant impacts. Discussion of each environmental category is generally organized as follows:

- **Affected Environment.** The regulatory framework and physical environment are described. The affected environment serves as the baseline against which project impacts are evaluated.
- **Methodology for Impact Evaluation.** A description of the amount or type of impact that constitutes a significant impact on the environment for California Environmental Quality Act (CEQA) purposes or an adverse impact under the National Environmental Policy Act (NEPA). Based on these criteria, project impacts can be classified as: no effect, adverse but not significant, potentially significant, significant, or beneficial.
- **Impacts.** A discussion of the impacts of the alternatives in qualitative and/or quantitative terms, and a conclusion of no effect, adverse but not significant impact, potentially significant impact, significant impact, or beneficial effect.
- **Mitigation.** Where impacts are identified as adverse or significant, mitigation to reduce or avoid the impacts is identified.

While CEQA requires that only effects that have a "significant impact" be identified in an Environmental Impact Report, the National Environmental Policy Act (NEPA) requires that all adverse impacts of a proposed project be analyzed. Accordingly, in this joint federal and state environmental document, reference to "significant impacts" is made to fulfill this requirement under CEQA, pursuant to standards of California law. However, regardless of level of significance, all potentially adverse environmental impacts have been analyzed and mitigation proposed where feasible to reduce identified adverse effects.

4.1 LAND USE AND DEVELOPMENT

4.1.1 Affected Environment

4.1.1.1 Regional Setting

Southern California Association of Governments (SCAG)

The Southern California Association of Governments (SCAG) serves as the Metropolitan Planning Organization (MPO) for the region. The policies and goals of the SCAG Regional Comprehensive Plan and Guide (RCPG) focus on the need to coordinate land use and transportation decisions to manage travel demand within the region. They include:

- Promote Transportation Demand Management (TDM) programs along with transit and ridesharing facilities as a viable and desirable part of the overall mobility program while recognizing the particular needs of individual subregions;
- Support the coordination of land use and transportation decisions with land use and transportation capacity, taking into account the potential for demand management strategies to mitigate travel demand if provided for as a part of the entire package;
- Urban form, land use, and site-design policies should include requirements for safe and convenient non-motorized transportation, including the development of bicycle and pedestrian-friendly environments near transit;
- Encourage patterns of urban development and land use that reduce costs on infrastructure construction and make better use of existing facilities;
- Encourage local jurisdictions' plans that maximize the use of existing urbanized areas accessible to transit through infill and redevelopment;
- Support local plans to increase density of future development located at strategic points along the regional commuter rail, transit systems, and activity centers;
- Support local jurisdictions' strategies to establish mixed-use clusters and other transit oriented developments around transit stations and along transit corridors;
- Encourage developments in and around activity centers, transportation corridors, underutilized systems, and areas needing recycling and redevelopment.
- Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater discharges; and
- With respect to housing, SCAG supports the following objectives: Decent and affordable housing choices for all; Adequate supply and availability of housing; Housing stock maintenance and preservation; and Promoting a mix of housing opportunities regionwide.

Los Angeles Community Development Department Consolidated Plan

The City of Los Angeles Community Development Department prepared the 2000-2003 Consolidated Plan as required by the U.S. Department of Housing and Urban Development (HUD). The Plan is a comprehensive, integrated approach to planning and implementing the city's housing, community development, and economic development needs and priorities in the form of a strategic plan. Applicable priorities and strategies include:

- Basic infrastructure is important. Neighborhoods and businesses cannot flourish in an environment of decay. Clean and re-paved streets, closed nuisance alleys, and improved streetscapes and landscaping are all important to uplifting communities and their residents.

- The City must increase the availability of clean, safe, and decent affordable housing. The City must focus on preserving and revitalizing the city's existing housing stock, address problems of substandard housing, and support programs that promote home ownership. The City must utilize measures that are sensible and cost-effective.

4.1.1.2 Study Area

Existing Land Uses

The study area encompasses the Central City, including the Little Tokyo and Arts District communities, Central City North and Boyle Heights communities within the City of Los Angeles, and the unincorporated East Los Angeles community of the County of Los Angeles, and a small southerly portion of the City of Monterey Park. Figure 4.1-1 indicates the communities in the study area and the respective Community Plan boundaries. Figures 4.1-2A and 4.1-2B present generalized land uses in the study area, and Figure 4.1-2C provides a legend for the graphic.

Central City and Central City North

The existing land uses of the Central City and Central City North area are primarily defined by the subdistricts that comprise these areas. North of the Hollywood Freeway is El Pueblo State Historic Park. West of Alameda Street and south of the Hollywood area is the eastern portion of the Los Angeles Civic Center, which contains governmental buildings. From 1st Street south to 3rd Street is the historic and contemporary Little Tokyo community. The land uses include a variety of retail uses, hotels, museums, residential complexes, and community oriented uses. South of 3rd Street, the area consists primarily of light industrial uses and the expanding retail toy industry, which has reused older structures and created some new infill industrial structures.

The area east and west of Alameda Street and north of the Hollywood Freeway is part of the Central City North area. The subdistrict north of Hollywood Freeway includes Union Station and the Gateway Center. South of the Hollywood Freeway, the land uses are primarily light industrial uses, facilities for the Los Angeles Department of Water and Power, and several large vacant parcels. The area along 1st Street and south to 3rd Street also contains several Little Tokyo oriented retail uses. South of 1st Street are the expanding artist loft district and studios intermixed with light industrial uses and scattered vacant parcels. There are also 600 arts and residential units in the area. At Alameda and First Streets are the approved Mangrove Estates and First Street South Plaza projects, which will both replace currently vacant parcels with large, mixed-use projects (office, commercial, residential uses) once constructed.

Boyle Heights Community

Boyle Heights has a mixture of residential, commercial, and public uses. Between Boyle Avenue and Lorena Street, residential land uses include Aliso Village and Pico Gardens public housing projects and a variety of residential densities ranging from two to four units per lot to over five units per lot with small scattered areas of single-family units. Smaller parcels, coupled with the mix and variety of housing types and larger than county average household sizes all contribute to higher population densities in Boyle Heights. East from the proposed 1st/Lorena Station, the land uses are primarily single-family residential uses.

FIGURE 4.1-1
LOS ANGELES EASTSIDE CORRIDOR JURISDICTIONAL BOUNDARY
GENERAL PLAN AREAS

FIGURE 4.1-2A
GENERAL PLAN LAND USE DESIGNATIONS, CENTRAL CITY &
CENTRAL CITY NORTH COMMUNITIES

FIGURE 4.1-2B
GENERAL PLAN LAND USE DESIGNATIONS, BOYLE HEIGHTS, AND EAST LOS ANGELES COMMUNITIES

FIGURE 4.1-2C
GENERAL PLAN LAND USE LEGEND

Neighborhood oriented commercial uses exist along the frontage of 1st Street from Boyle Avenue on the west to Evergreen Avenue on the east. This commercial frontage is also intermixed with residential uses, public and community facilities. The small commercial hub, known as "El Mercado" is also located on 1st Street, just east of Lorena Street.

East Los Angeles Community

From Indiana Street to Mednik Avenue on the east, the neighborhoods are developed primarily with one and two-family residential dwellings per lot. A cluster of residential apartments is located along Mednik Avenue, south of Cesar Chavez Avenue. The Nueva Maravilla Housing Project, which was demolished and rebuilt in the early 1970's, is located north of Cesar Chavez Avenue.

Neighborhood serving commercial uses are located along Cesar Chavez Avenue with commercial nodes just east of Indiana Street and at Ford Boulevard and along 1st Street primarily concentrated east of Indiana Street. 3rd Street from Indiana Street to La Verne Avenue contains very scattered commercial uses intermixed with residential uses, public and community facilities. The frontages near the intersection of Beverly and Pomona Boulevards with Atlantic Boulevard contain a concentration of commercial related uses.

General Plan Summaries

Central City/City of Los Angeles

The *Central City Community Plan* was adopted by the Los Angeles City Council in 1974 and has been amended through 1998. The Central City planning area abuts the study area on the west, west of Alameda Street. Major land use and transportation policies of the plan are:

- Support additions to the housing stock in Little Tokyo;
- Retain the existing retail base in Central City;
- Make Downtown a tourist destination by combining its cultural and commercial offerings with those of the ethnic communities surrounding it;
- Encourage traditional and non-traditional sources of open space by capitalizing on linkages with transit, parking, historic resources, cultural facilities, and social services programs;
- Encourage rail connections and high occupancy vehicle lanes that will serve the Downtown traveler; and
- Reinforce the integration and accessibility of the neighborhoods surrounding Downtown with the Downtown core through enhanced levels of service.

Central City North/City of Los Angeles

The *Central City North Community Plan* was amended in December 2000, and includes the following applicable policies:

- To conserve and strengthen viable commercial development in the community and to provide additional opportunities for new commercial development and services (by requiring that projects be designed and developed to achieve a high level of quality, distinctive character and compatibility with existing uses and development);
- To attract uses which strengthen the economic base and expand market opportunities for existing and new businesses (by A. preserving existing pedestrian oriented areas; and B. adding and enhancing the existing pedestrian street activity);

- To retain industrial plan designations to maintain the industrial employment base for community residents and to increase it whenever possible (by protecting the numerous large rail yards and other industrially planned parcels located in predominantly industrial areas from development by other uses which do not support the industrial base of the city and the community);
- Develop a public transit system that improves mobility with convenient alternatives to automobile travel (by encouraging the expansion, wherever feasible, of programs aimed at enhancing the mobility of senior citizens, disabled persons, and the transit dependent population);
- To provide parking in appropriate locations in accord with citywide standards and community needs;
- Installing on-site lighting along all pedestrian walkways and vehicular access ways, as well as shielding and directing of on-site lighting onto driveways and walkways, directed away from adjacent residential uses; and
- New lighting systems will be designed to minimize glare and "light trespass," (in compliance with currently adopted city standards, and approved by the Bureau of Street Lighting).

Boyle Heights/City of Los Angeles

The *Boyle Heights Community Plan* was amended in 1998 and includes the following updated policies:

- That the existing Low-Medium I and II density housing be preserved where such housing is in relatively good condition or can be made so with moderate improvements;
- That the pedestrian-oriented commercial centers of Avenida Cesar Chavez and Soto Street and the Mercado area on East First Street be preserved and continue to serve as focal points for shopping, social and entertainment activities;
- That the neighborhood commercial areas at Whittier Boulevard and Lorena Street, Evergreen and Wabash Avenues, Fourth and Soto Streets, and First and Bailey Streets continue to serve the everyday and weekly shopping needs of residents, providing supermarkets, drugstores, retail shops and other neighborhood-oriented services;
- That the unique character of community streets should be maintained and enhanced by improved design characteristics such as street trees, landscaped median strips, traffic islands and special paving;
- That Indiana Street remains designated as a Secondary Highway. Any widening and improvements shall be coordinated with the County of Los Angeles;
- That Medium density housing be located near commercial corridors where access to public transportation and shopping services is convenient and where a buffer from, or a transition between, low-density housing can be achieved to the extent feasible;
- That, in general, housing for the elderly has convenient access to public transportation, commercial services, recreation and health facilities;
- That the city continue to encourage and assist MTA in analyzing the community's transit needs in order to increase bus service and improve its efficiency and comfort; and
- That public transportation, including rapid transit accessible to transit-dependent residents, be provided.

Framework Element of the City of Los Angeles General Plan

The Los Angeles General Plan Framework Element is a strategy for long-term growth that sets a citywide context to guide the subsequent amendments of the city's community plans, zoning ordinances, and other pertinent programs. The Framework Element contains an objective and three land use policies that support housing in the city:

- Objective 4.2: Encourage the location of new multi-family housing development to occur in proximity to transit stations, along some transit corridors, and within some high activity areas with

adequate transitions and buffers between higher-density developments and surrounding lower-density residential neighborhoods;

- Policy 3.2.1: Provide a pattern of development consisting of distinct districts, centers, boulevards, and neighborhoods that are differentiated by their functional role, scale, and character. This shall be accomplished by considering factors such as the existing concentrations of use, community-oriented activity centers that currently or potentially service adjacent neighborhoods, and existing or potential public transit corridors and stations;
- Policy 3.2.4: Provide for the siting and design of new development that maintains the prevailing scale and character of the city's stable residential neighborhoods and enhances the character of commercial and industrial districts;
- Policy 3.4.1: Conserve existing stable residential neighborhoods and lower-intensity commercial districts and encourage the majority of new commercial and mixed-use (integrated commercial and residential) development to be located (a) in a network of neighborhood districts, community, regional and downtown centers, (b) in proximity to rail and bus transit stations and corridors, and (c) along the city's major boulevards, referred to as districts, centers, and mixed-use boulevards, in accordance with the Framework Long-Range Land Use Diagram; and
- Policy 3.4.3: Establish incentives for the attraction of growth and development in the districts, centers, and mixed-use boulevards targeted for growth that may include: (a) Densities greater than surrounding areas, (b) prioritization of capital investment strategies for infrastructure, services, and amenities to support development, (c) economic incentives (e.g., redevelopment, Enterprise Zones, Neighborhood Recovery, and other), (d) streamline development review processes, (e) "by-right" entitlements for development projects consistent with the community plans and zoning, (f) Modified parking requirements in areas in proximity to transit or other standards that reduce the cost of development, and (g) pro-active solicitation of development.

Rent Stabilization Ordinance/City of Los Angeles

The City of Los Angeles Municipal Code contains a Rent Stabilization Ordinance that stipulates what the owner or renting agency of a residential property can or cannot do in regards to charging their tenants, removing their tenants, and notifying their tenants of other information. This includes implementation of a rent-control policy that limits the owner or renting agency of frequent or dramatic changes in rent price over a certain period of time.

East Los Angeles/County of Los Angeles

The *East Los Angeles Community Plan* was adopted in 1988. The planning area is located in an unincorporated area of the County bounded by Indiana Street on the west, the San Bernardino Freeway, Floral Drive, Pomona Freeway, and Repetto Street on the north, Concourse Avenue on the east, and Telegraph Road and Union Pacific Avenue on the south. Major land use and transportation policies of the plan are:

- Maintain and enhance the quality of healthy and stable residential neighborhoods;
- Allow the intensification of land uses only if it does not adversely impact existing uses, neighborhoods, and the existing character and density of the East Los Angeles community;
- Encourage rehabilitation of existing commercial uses and development of new commercial in-fill along the major corridors (Whittier, Olympic, and Atlantic Boulevards) and where transportation and other municipal services can support development;
- Improve the local public transit to more closely serve the needs of the people; and
- Improve the image of the major corridors by use of landscaping, lighting, graphics, and/or other streetscape treatments.

Redevelopment Areas

The Corridor contains several redevelopment and specialized zone areas. They are delineated in Figures 4.1-3 and Figure 4.1-4.

Central City and Central City North/City of Los Angeles

The Central City planning area contains two redevelopment project areas.

- The Little Tokyo Redevelopment Project is generally bounded by 1st Street on the north, Los Angeles Street on the west, 3rd Street on the south, and Alameda Street on the east. The Little Tokyo Redevelopment Project was adopted in 1970 and served as the catalyst for major changes in the community, including the restoration and reuse of historic structures, the Japanese American National Museum, and the Japanese American Cultural and Community Center. The community's revitalization has also included expansion of the residential base through housing developments for senior citizens and affordable housing unit complexes and commercial development to serve the residents. Some of these developments include Japanese Village Plaza and Yaohan Plaza. These projects have come about, in part, as a result of one of the plan's objectives to create new sites for residential development and the provision of housing units for families with low to moderate incomes and senior citizens.
- The Central City Redevelopment Project, which borders the Little Tokyo Redevelopment Project, and extends north to the Hollywood Freeway, east to Alameda Street, and west to the Harbor Freeway with the exception of the Bunker Hill area. The Central Business District Redevelopment Plan, for the Central City Redevelopment Project, provides two objectives that support housing in the redevelopment area: 1) to create a modern, efficient and balanced urban environment for people, including a full range of around-the-clock activities and uses, such as recreation and housing; and 2) to provide high- and medium-density housing close to employment and available to all ethnic and social groups, and to make an appropriate share of the city's low and moderate income housing available to residents of the area.

Boyle Heights Community/City of Los Angeles

The Boyle Heights Community has a primarily commercial and industrial redevelopment project known as the Adelante Eastside Redevelopment Project, which was adopted in 1999 and includes all of the commercial corridors and industrial sectors of the Boyle Heights community. The redevelopment project area includes the street frontages along Cesar E. Chavez Avenue, 1st Street, 4th Street, Whittier Boulevard as well as the industrial sector that lies immediately east of the Los Angeles River, south of Olympic Boulevard, and the greater LAC+USC Medical Center Complex, which is located north of I-10. The following objective of the plan supports housing: Promote the development of sound residential neighborhoods through mechanisms such as: land use, density and design standards; public improvements; property rehabilitation; sensitive mixed-use and in-fill housing rehabilitation and development; traffic and circulation programming; and development of open spaces and other services necessary to enable residents to live and work in or adjacent to the Redevelopment Area.

East Los Angeles Community/County of Los Angeles

The East Los Angeles Community includes the Maravilla Redevelopment Project, which was adopted in 1973. The redevelopment area is bounded by 3rd Street on the south, Mednik Avenue on the east, Floral Drive on the north, and Ford Boulevard on the west. Some new affordable housing and senior citizen housing has been developed within the Project area located north of 3rd Street and west of Mednik Avenue.

FIGURE 4.1-3
REDEVELOPMENT PROJECT AREAS

FIGURE 4.1-4
SPECIALIZED ZONES, EMPOWERMENT, ENTERPRISE AND REVITALIZATION ZONES

Specialized Zones/City of Los Angeles

Eastside Enterprise Zone

The Eastside Enterprise Zone was designated by the State of California in 1988. This zone area has been targeted for economic revitalization and investment. The zone area includes all of the Boyle Heights Community and almost all of the Central City North community plan area. The enterprise designation allows for State incentives such as: 1) hiring tax credit; 2) sales and tax credits; 3) business expense deduction; 4) net interest deduction for lenders; and 5) net operating loss carryover.

Los Angeles Revitalization Zone

The Los Angeles Revitalization Zone was created by the City of Los Angeles in 1993 for areas affected by the 1992 civil unrest. In relation to the study area, the Revitalization Zone covers all of the Boyle Heights Community, Central City North, and Central City of the City of Los Angeles. The Revitalization Zone entitles the area to the following tax incentives: 1) employee hiring credit; 2) construction hiring credit; 3) sales and use tax credits; 4) business expense deduction; 5) net interest deduction for lenders; and 6) net operating loss carryover.

Empowerment Zone

The Empowerment Zone is a federal program that seeks to create reinvestment and job creation within the nation's poorest urban communities. The Empowerment Zone includes most of the Central City North area, the western and southern portion of the Boyle Heights Community, and the eastern portion of the Central City area of the City of Los Angeles. Some of the opportunities provided in the Empowerment Zone include micro-loans, business loans, commercial real estate and venture capital financing, special tax-exempt bonds, “brownfields” deduction, and city business tax reduction.

Land Use/Transportation Policy – City of Los Angeles

In 1993 and 1994, the Los Angeles City Council and the Los Angeles County Metropolitan Transportation Authority respectively adopted the *Land Use/Transportation Policy* to address land use, transportation, and air quality issues related to the regional transportation system. The Policy provides general objectives and principles to guide future development around transit station areas and addresses transit/land use coordination within the City of Los Angeles to promote transit-supportive land uses adjacent to the station areas.

Recent and Future Development Activity

A number of development projects are currently under construction, in the planning stages or proposed within the vicinity or adjacent to the LRT Build Alternative alignment. These projects, listed in Table 4.1-1, are considered in determining cumulative impacts that may arise if the LRT Build Alternative were implemented.

4.1.2 Methodology for Impact Evaluation

The evaluation of each of the alternatives' compatibility with local plans and policies as well as the types of redevelopment/revitalization areas that are serviced involved a pragmatic methodology. The community plans or general plans of each affected jurisdiction were reviewed to determine adopted land use designations and to identify appropriate land use and transportation /transit related policies. General plan land use designations were identified within an approximate 0.5-mile distance of the LRT alignment.

Information about existing redevelopment project areas and existing revitalization or special zones was reviewed from each affected jurisdiction.

TABLE 4.1-1
RECENT AND FUTURE DEVELOPMENT ACTIVITY

Project	Location	Development	Land Use	Status
New Pico Gardens	Clarence Street/South of 4th Street	280 units	Residential	Under Construction
Day Care Center/ Management Facility/ Youth Facility	4th Street & Clarence Street	10,000 sq. ft.	Community Facility	Under Construction
Multipurpose Facility	4th Street & Clarence Street	4,500 sq. ft.	Community Facility	Under Construction
Las Casitas	3rd Street & Clarence Street	42 units	Residential	Completed
Las Casitas	3rd Street & Clarence Street	39 units	Residential	Planned
Senior Housing	1st Street & Clarence Street	75 units	Residential	Under Construction
Nuevo Aliso Village	Mission Road/North of 1st Street	469 units	Residential	Proposed
Child Care Center	Utah Street/North of 1st Street	---	Community Facility	Proposed
Commercial Development	1st Street & Mission Road	3 acres	Commercial	Proposed
Community Service/ Computer Learning Center	1st Street & Clarence Street	3 acres	Community Facility	Proposed
White Memorial Medical Center	Avenida Cesar Chavez & Boyle Avenue	Seismic Upgrades & Replacement Facilities	Hospital Facility	Planned
Salesian Youth Center	4th Street & Breed Street	17,000 sq. ft.	Community Facility	Completed
Commercial Development	3rd Street & Mednik Avenue	34,000 sq. ft.	Commercial	Planned
ELA Civic Center	3rd Street & Mednik Avenue	Site Enhancement	Public	Planned
Parking Structure Addition	Fetterly Avenue/North of 3rd Street	180 additional parking spaces	Public	Planned
New Library	ELA Civic Center/North of 3rd Street	26,000 sq. ft	Public	Planned
Existing Library Building Reuse	3rd Street & Fetterly Avenue	15,000 sq. ft.	Public	Planned
Child Care Center	ELA Civic Center	5,500 sq. ft.	Community Facility	Planned
Soledad Enrichment Action Facility	Fetterly & Gleason Avenues	6,000 sq. ft.	Community Facility	Planned
Kaiser Medical Clinic	Pomona Boulevard & Woods Avenue	50,000 sq. ft.	Medical Facility	Under Construction
Mangrove Estates Project	East of northeast corner of 1st & Alameda Streets	2.7 million sq. ft.	Hotel, Multi-family, and Retail	Approved
SCI-ARC Architectural College and student apartments	Southwest of 3rd Street and Santa Fe Avenue	---	College and Multi-family Residential	Under Construction
Los Angeles Children's Museum	Southwest corner of Alameda and Temple Streets	---	Community Facility	Proposed
First Street South Plaza	Southeast corner of Alameda and 1st Streets	616,000 sq. ft.	Office, Retail, Health Club, and Multi-family Residential	Approved

Under CEQA, significant land use and planning impacts would occur if an alternative would:

- **Divide Community:** Physically divide an established community;
- **Conflict with Land Use Plans/Policies/Regulations:** Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the

general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; and

- **Conflict with Conservation Plans:** Conflict with any applicable habitat conservation plan or natural community conservation plan.

4.1.3 Impacts

4.1.3.1 No-Build Alternative

There would be no impacts on land use or development because this alternative only includes improvements to the transportation network that have already been approved and funded. Since no capital improvements are included under this alternative, no land use changes would occur in the study area. This alternative would maintain the status quo and, therefore, would not address the stated goals and objectives for the communities within the study area as well as the LRT Build Alternative.

4.1.3.2 LRT Build Alternative

Option A

Compatibility with Local Plans and Policies

The general plan of both the County of Los Angeles and the City of Los Angeles contain transit-supportive concepts. The existence of these policies combine with the project area characteristics that form a strong transit orientation that would match well with the LRT Build Alternative Option A and strengthen efforts to improve the quality of life for area residents and businesses.

Option A would be compatible with policies in the Central City Plan. The proposed project would provide improved accessibility to the Central City area; support the redevelopment of Union Station as a transportation center; accommodate the expansion of the Little Tokyo Community east of Alameda Street; and continue the development of government facilities.

Option A of the LRT Build Alternative would generally be compatible with the policies of the Central City North Community Plan. It would attract uses that strengthen the economic base in the primarily industrial and commercial land uses with transit-oriented development. It would not result in displacing any industrial plan designations nor would it remove a significant amount of industrial uses that support the industrial base of the city and community. It would result in the development of a public transit system that would improve mobility with alternatives to automobile travel, especially for the transit-dependent population. Two multi-use developments are planned in the Central City near 1st/Alameda: Mangrove Estate and First Street South Plaza (FSSP). Option A would result in limiting planned access to the Mangrove Estate project by closing both Turner and Banning Streets and resulting in the prohibition of the northbound right-turn movement from Alameda Street onto eastbound Temple Street. Access to the property would be located at Hewitt Street, with installation of a new signal. An access point would be re-created as part of Option A, thus the reduction of planned access to the multi-use project is considered a less than significant land use impact, as it would not significantly detract from the proposed commercial development. With coordination between MTA, the City of Los Angeles, and the Mangrove Estate developer, access issues would be offset further.

Option A would not significantly conflict on a land use/planning basis with the approved FSSP. Although there may be temporary land use impacts to the high-rise development buildings during construction, which may temporarily restrict access and/or parking for these land uses, Option A's transit and station operation would not restrict access to nor displace or hinder land use-associated elements of

the FSSP and, therefore, would have no operational impacts. Option A would not divide the FSSP's sense of community, nor would it conflict with land use policies associated with the FSSP. The transit facilities would be compatible with the adjacent "C2-2" zoning that was established for the FSSP. Although Option A would result in displacing street parking along the north and south sides of 1st Street between Alameda and Vignes Streets, it is not anticipated that this would be a significant land use impact because the nearby land uses are presently vacant. In the future, if the proposed multi-use projects were constructed, the developers would provide on-site parking. Implementation of Option A would add a mode of mass transit and provide additional access for residents and workers at the FSSP and Mangrove Estate for travel to the Union Station area and along the Eastside Transit Corridor, a beneficial impact. The Central City North Community Plan discourages "light trespass" on residential areas. Option A would not add major new light sources in areas that are currently dark. Generally, the areas through which this option would pass currently have street lights that are sufficient for visibility and safety. There would be new lighting in the vicinity of stations and station entrances, but these areas are not currently dark and the additional lighting would not change the overall lighting levels in the vicinity of the stations.

Option A under the LRT Build Alternative would be generally compatible with policies in the Boyle Heights Community Plan, which encourages alternative modes of travel, particularly to meet the needs of transit-dependent residents, to preserve commercial services in neighborhoods, and to conserve and strengthen viable commercial and pedestrian corridors. Aside from a few commercial relocations associated with the traction power substation facilities and new station locations, this option would be compatible with the Community Plan policies. Displacements on lands categorized as Medium-Density Residential would occur south of 1st Street and west of Boyle Avenue. Residential displacements on Neighborhood-Commercial designated land would also occur at the southwest corner of 1st and Soto Streets. In areas where Low-Medium I or II density housing would be displaced, such displacements are considered potentially significant impacts as they would disrupt existing housing land uses and thus conflict with the Boyle Heights Community Plan policy that states that: "…existing Low-Medium I or II density housing be preserved where such housing is in relatively good condition or can be made so with moderate improvements."

Option A would be compatible with the housing-related objective and policies of the Framework Element of the Los Angeles General Plan. It would create new transit in proximity to multi-family housing development; it would assist in providing a pattern of development consisting of distinct districts differentiated by their function role, scale, and character; it would maintain the prevailing scale and character of the City's stable residential neighborhoods; it would be located in proximity to stable residential neighborhoods and conserve these neighborhoods; and it would assist in attracting growth and development in the districts.

Option A would not adversely affect the Los Angeles rent-control policies or stipulations of the Rent Control Ordinance because, although the project has the potential to influence the increase in property values along the Corridor, the Ordinance would still be in effect and govern the rate of increase at a moderate rate. Although real estate values along the Corridor and areas it serves may increase, local sales taxes and commercial taxes are also anticipated to increase along with incomes, benefiting the community as a whole. In some cases, review by the City of Los Angeles Rent Adjustment Commission is required and would help to keep high increases in rent in check and affordable to the general community.

Option A would be consistent with the Los Angeles Community Development Department Consolidated Plan priorities and strategies, because it would improve the basic infrastructure for local neighborhoods and businesses by providing additional mass transit. Although it may result in increasing some property values along the Corridor, there would still be a sufficient supply of affordable housing stock in the area, and it would not result in degrading such affordable housing. Furthermore, MTA has established a fund

that will be used for housing replenishment by specifically assisting developers, community-based or otherwise, in the construction and rehabilitation of affordable housing in East Los Angeles.

Option A would be generally compatible with County of Los Angeles policies in the East Los Angeles Community. This option would maintain the quality of residential neighborhoods, assist in encouraging rehabilitation of existing commercial uses and promote in-fill where transportation can support development, improve public transit, and not significantly degrade the image of major corridors. Parking mitigation off of Indiana Street would result in displacing two multi-family buildings and two businesses. These are considered less than significant impacts, however, because the eastern side of Indiana Street is comprised of several types of land uses. Therefore, these displacements would not result in a significant land use impact. Although this option would result in commercial and industrial displacements associated with the other traction power substations and park-and-ride lot, no significant impacts related to compatibility with County of Los Angeles policies are anticipated.

Option A would be compatible with policies in SCAG's Regional Comprehensive Plan and Guide (RCPG) in several ways. The project would be influential in supporting transportation demand management in that it would decrease overall demand for vehicle ridership in the project Corridor. By reducing vehicle demand and providing another mode of transportation, a more balanced demand for several modes of transportation would be supported. Land use patterns that are consistent with transportation and transit characteristics, such as transit-oriented development, would also be supported by Option A, as discussed in further detail in this section. The project would support safe and convenient means of non-motorized transportation, including bicycle and pedestrian-friendly environments near the project. Option A would also be located along an ideal Corridor for its use, which would maximize the use of existing urbanized areas, support redevelopment, and increase density of land uses in many locations along the Corridor. Although Option A may result in increasing property values, it would nevertheless support the housing objectives of the RCPG as it would not displace a significant amount of housing nor dramatically raise rental rates because of Los Angeles' rental control policies. As part of the MTA's project commitments, where water would be needed for irrigation of landscaping, bathroom facilities, and wherever else feasible, reclaimed water would be used to reduce reliance on imported water and wastewater discharges.

Compatibility with Redevelopment Areas/Specialized Zones

Option A under the LRT Build Alternative would support many of the policies of redevelopment areas and specialized zones in the project area, including housing policies. Although it may increase property values in redevelopment areas, which would be inconsistent with the Little Tokyo Redevelopment Plan objective to "provide housing units for families with low to moderate incomes and senior citizens," it is anticipated that many other places in these redevelopment areas would be available at affordable costs. It would not interfere with providing high- and medium-density housing close to employment in the Central Business District Redevelopment area, nor significantly hinder the promotion of sound residential development in the Adelante Eastside Redevelopment area. Furthermore, it would have an overall beneficial impact of supporting the activities of an efficient and balanced urban environment, as well as it would provide a new transportation mode to enable residents to live and work in or adjacent to the redevelopment areas.

Impacts of Stations and Ancillary Facilities

With the exception of the Alameda/1st and 1st/Soto Stations, stations would be accommodated within the existing right-of-way, and would include a raised platform with a canopied sign and lighting. The station at 1st/Alameda would require a partial taking of a strip of land along the planned Mangrove Estates multi-use project, resulting in less than significant impacts. The station/substation/construction staging at

1st/Soto would result in displacing several businesses and residences, which would be a less than significant land use impact. Parking removed for these stations would not result in significant impacts, because adequate replacement parking is part of the Option A design. The stations would be designed to blend with their surroundings and would not affect local neighborhoods at a land use level. As mentioned above, parking mitigation on Indiana Street would result in displacing two businesses and two multi-family buildings. Traction power substations throughout the Corridor would result in displacing commercial uses. Individually and cumulatively, these would result in less than significant land use impacts, especially considering the potential transit-oriented development that would be spurred from the project.

At the eastern terminus, parcels containing several businesses would be acquired for development of a park-and-ride facility. Also, a Pep Boys parking lot will be utilized under a shared-use agreement for the park-and-ride facility. These land use displacements are not anticipated to be potentially significant as their absence would not disrupt the community nor be incompatible with land use policies for the area. (See Section 4.3 for further information about displacement impacts).

Potential for Transit Supportive Land Uses

FTA criteria for evaluating transit supportive land uses include: 1) promoting a variety of residential and commercial uses; 2) potential to assist in containment of sprawl; 3) encouraging greater population density, and 4) enhancing pedestrian facilities. Existing local and regional land use and transportation planning policies are compatible with these criteria and actively promote the implementation of transit supportive land uses and development. In addition, local plans and policies encourage high-traffic uses that are compatible with new transit facilities, such as schools, health care clinics, community centers, and libraries to be located along the proposed LRT alignment.

It is anticipated that transit oriented districts would be spurred by the project due to three major factors – the objectives of the *MTA Joint Development Policy*, the MTA's successful history of transit oriented districts, and the project area's long history of transit oriented development. MTA's objectives are established to encourage public-private joint partnerships in spurring transit oriented districts by: Encouraging transit compatible land use plans; providing comprehensive urban design, planning and development activities to ensure the most appropriate mix of land uses and densities; establishing procedures for the selection of private sector joint development participants through a competitive proposal process; and negotiating joint development transactions that create a long-term source of revenue to the MTA for the development, operation, and maintenance of the transit system. These objectives express MTA's commitment to nurturing and maintaining transit oriented development.

MTA projects have helped to spur and support transit oriented districts in several areas in the Los Angeles area. Districts adopted by the Los Angeles Planning Commission are located at the Broadway/Manchester (major MTA Bus lines), Avenue 57 (station on the future Pasadena Blue Line), and Vermont/Western (three stations on the red line). Fully implemented transit oriented districts include the Pine Street Project (in response to the MTA urban rail network) and the Holly Street Village (built partly on the space above the future Pasadena Blue Line). These examples show MTA's success in spurring transit-oriented districts.

The long history of the Corridor's transit oriented development indicates that the dynamics for additional transit-oriented development may once again become present with the development of the LRT Build Alternative, Option A. Originally, the land uses were established in response to the streetcar system from the 1890s until 1963. The alignment passes through neighborhoods which have small lots and retail establishments under apartments, which are features sought by contemporary visions of transit oriented districts. These physical features of the Corridor may act to spur new transit oriented development, and

the demographics of high transit dependency on the part of the residents of these largely Latino neighborhoods near the City Center may help to maintain such transit-oriented development. This would be a beneficial impact to the community.

Significance of Impacts

With regard to dividing, disrupting, or isolating the community, Option A would have a less than significant impact. The LRT alignment will extend mainly along existing roadways or within tunnel sections and would therefore not require a new exclusive right-of-way that could divide the community. Pedestrian access will be maintained to maximum extent possible along the alignment through the use of existing or improved crosswalks. Although some sidewalks would be removed, it is anticipated that adequate access throughout the Corridor will be maintained. Option A would not be compatible with all local land use plans and policies resulting in a potentially significant impact. Option A would not be compatible with the policy of the Boyle Heights Community Plan to conserve and improve existing sound housing, because housing displacements at 1st Street/Boyle Avenue and 1st Street/Soto Street would result in disruption of the intended land use. There would also be beneficial impacts because the City and County of Los Angeles have developed a number of transit-supportive land use plans and programs that Option A would further in the Los Angeles Eastside Corridor.

Option B

Compatibility with Local Plans and Policies

The compatibility with Local Plans and Policies are the same as described for Option A with the exception of compatibility with the East Los Angeles Community Plans and Policies. Option B would displace all of the residential and commercial uses on the east side of Indiana Street, as well as Ramona High School. This is considered a potentially significant land use impact because it would disrupt a community. The displacement or reconstruction of Ramona High School on Indiana Street would contribute to this impact because the school serves as a community asset. This impact would be less if the school is reconstructed on the same site, but the removal of all other uses on the east side of Indiana Street would still be a significant impact. (Potential environmental impacts at the alternative site if the school would be relocated would be addressed in a separate document to be prepared by the Los Angeles Unified School District.)

Compatibility with Redevelopment Areas/Specialized Zones and Potential for Transit-Supportive Land Uses

Same as Option A.

Impacts of Stations and Ancillary Facilities

The impacts of stations and ancillary facilities are the same as described for Option A with the following exceptions. Under Option B, the station location at 3rd and Indiana Streets would result in either the relocation or reconstruction of Ramona High School, as discussed above. Land use impacts in this area relate to the removal of land uses, not the construction of the station. If the school is reconstructed, the location of the station on Indiana Street would provide an alternative means of access to the school, which would be a beneficial impact. For Option B, the 3rd/Ford and Pomona/Atlantic Stations would not result in right-of-way acquisitions, and thus no land use impacts would occur. The stations would be designed to blend with their surroundings and would not affect local neighborhoods at a land use level. The acquisitions associated with the eastern terminus of the Option B alignment would be the same as for Option A, however the Pep Boys parking lot would not be used.

Significance of Impacts

With regard to dividing, disrupting, or isolating the community, Option B would have a potentially significant impact. Although much of the LRT alignment will extend mainly along existing roadways or within tunnel sections and would not require a new exclusive right-of-way, Option B would result in displacing all land uses along the eastern side of Indiana Street. If Option B results in displacing Ramona High School, potentially significant impacts associated with disrupting and dividing the community would be greater. Pedestrian access will be maintained to the maximum extent possible along the alignment through the use of existing or improved crosswalks. Although some sidewalks would be removed, adequate access throughout the Corridor will be maintained. Option B would have the same potentially significant impact as Option A with regard to compatibility with some of the local land use plans and policies and the same beneficial impact as Option A with regard to furthering transit-supportive land use plans and programs.

4.1.4 Mitigation

4.1.4.1 Option A

The community generally supports transportation improvements as an important link to future revitalization. To assure compatibility with local land use objectives, to the extent possible, the provision of Option A will be closely coordinated by MTA with future local, state, and federal redevelopment and revitalization plans and programs. Coordination between MTA, the City of Los Angeles, and the developer of the Mangrove Estates project would further offset less than significant access impacts to the Mangrove Estates project. Option A would improve transit service in the Eastside Corridor and is in general agreement with future plans and policies. Option A would not be compatible with one policy of the Boyle Heights Community Plan, and this impact would be mitigated as described below.

Compatibility with Local Plans and Policies

For residential displacements at the 1st/Boyle and 1st/Soto stations associated with Option A, the remaining space on residential parcels acquired by MTA for the alignment will be reconfigured and made available for neighborhood commercial to medium-density residential uses, similar to designations in the Boyle Heights Community Plan. Reconfiguration of this land will be coordinated by the City of Los Angeles and will include input by MTA, so as not to restrict MTA's proposed uses. It is expected that the incorporation of this mitigation will reduce potentially significant impacts to land use policies to a less than significant level.

Significance of Impacts Remaining After Mitigation

The mitigation measures would reduce impacts on land use policies to a less than significant level.

4.1.4.2 Option B

The community generally supports transportation improvements as an important link to future revitalization. To assure compatibility with local land use objectives, to the extent possible, the provision of Option B will be closely coordinated with future local, state, and federal redevelopment and revitalization plans and programs. Coordination between MTA, the City of Los Angeles, and the developer of the Mangrove Estates project would further offset less than significant access impacts to the Mangrove Estates project. Option B would improve transit service in the Eastside Corridor in general

agreement with future plans and policies. Option B would not be compatible with one policy of the Boyle Heights Community Plan, as described below.

Division of Community

For residential displacements at the 1st/Boyle and 1st/Soto stations associated with Option B, the same mitigation as described for Option A will be implemented. For residential and commercial displacements along the eastern side of Indiana Street, MTA will acquire the remaining parcels for the 3rd/Indiana Station and LRT track. The remaining properties will be reconfigured and made available for re-use in conformity with Los Angeles County Regional Planning Department requirements. Reconfiguration of this land will be coordinated by the City of Los Angeles and will include input by MTA, so as not to restrict MTA's proposed uses. MTA will work closely with the City and County of Los Angeles Planning Departments to ensure that an adequate replacement land use (e.g., community facility, replacement housing, etc.) is chosen that works well along the county/city boundary and with MTA's proposed transit facilities.

If displacement of Ramona High School to another site is selected, MTA will provide the resources needed to acquire parcel(s) and construct a new facility. If reconstruction of Ramona High School is selected, MTA will design the alignment and station to allow access and safety for students and staff that attend Ramona High School. MTA will work closely with the school district, Los Angeles County Planning Department, and the City of Los Angeles Planning Department to ensure that adequate access and safety are implemented in their design. See Sections 4.14 and 4.16 for further information about safety issues and mitigation at Ramona High School.

Compatibility with Local Plans and Policies

The same mitigation measures will be implemented as for Option A.

Significance of Impacts Remaining After Mitigation

The mitigation measures would reduce impacts on land use policies to a less than significant level.

4.2 ECONOMIC AND FISCAL IMPACTS

4.2.1 Affected Environment

4.2.1.1 Employment

As presented in Table 4.2-1, the 1994 employment within the Corridor was 170,328 and is projected to grow to 221,403 in 2020, about a 30 percent increase. This is at a lower rate than Los Angeles County, where employment is expected to increase by 40.7 percent. Employment in the entire Southern California Association of Governments (SCAG) region is expected to grow 60.1 percent during this same period, or twice the rate of the Corridor. The Los Angeles County labor force was approximately 4.7 million in September 1999. As indicated in Table 4.2-2, the unemployment rate for the Corridor was 9.2 percent, substantially greater than the City and County unemployment rates.

TABLE 4.2-1
POPULATION/EMPLOYMENT DATA

Jurisdiction	1994	2020	Growth (%)
SCAG Region			
Total Population	15,610,700	22,352,000	43.2%
Total Employment	6,604,000	10,574,000	60.1%
Total Area (square miles)	38,000		
Los Angeles County			
Total Population	9,231,600	12,249,100	32.7%
Total Employment	4,134,000	5,817,600	40.7%
Total Area (square miles)	4,083		
Central Business District – Downtown LA			
Total Population	45,464	69,686	53.3%
Total Employment	250,037	278,873	11.5%
Employment – Percent of SCAG Region	3.8%	2.6%	
Employment – Percent of LA County	6.1%	4.8%	
CBD Area (square miles)	6.31		
Employment Density (employees/square mile)	39,625	44,195	
Eastside Corridor Study Area			
Total Population	284,669	340,065	19.5%
Total Employment	170,328	221,403	30.0%
Population – Percent of SCAG Region	1.8%	1.5%	
Population – Percent of LA County	3.1%	2.8%	
Employment – Percent of SCAG Region	2.6%	2.1%	
Employment – Percent of LA County	4.1%	3.8%	
Corridor Area (square miles)	27.65		
Population Density (population/square mile)	10,295	12,299	
Employment Density (employees/square mile)	6,160	8,007	

Source: SCAG 1999 TAZ Data (Employment and Population Projections).

TABLE 4.2-2
EMPLOYMENT/UNEMPLOYMENT – SEPTEMBER 1999

Area	Labor Force	Employment	Unemployment	Rate
East Los Angeles	52,840	47,960	4,880	9.2%
Los Angeles	1,897,590	1,771,650	125,940	6.6%
Los Angeles County	**4,734,900**	**4,458,400**	**276,500**	**5.8%**

Source: California Employment Development Department, 1999.

4.2.1.2 Disadvantaged Business Enterprise Participation

As part of its existing practices and procedures, MTA has established Disadvantaged Business Enterprise (DBE) Programs to encourage broad-based business participation in its mass transit procurement programs. A DBE is a firm that is owned by socially and economically disadvantaged individuals. The DBE Program was designed by MTA to comply with both state and federal laws to ensure that businesses are not discriminated against in procurement practices on the basis of gender, race, color, national origin, age, or disability. 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.

4.2.1.3 Fiscal Environment

Total tax receipts for the City of Los Angeles in Fiscal Year 1999/2000 were $2.85 billion, of which property taxes accounted for an estimated $528 million; licenses, permits, fees, and fines accounted for an estimated $420 million and business tax fees accounted for an estimated $317 million. Sales tax revenue for the City of Los Angeles for Fiscal Year 1999/2000 was $332 million. Los Angeles County receipts in Fiscal Year 1996/97 were $36.5 billion, with property taxes accounting for $1.2 billion and sales tax accounting for $32 million.

The City of Los Angeles portion of the study area contains three specialized zones where economic revitalization and investment are targeted: Eastside Enterprise Zone, Los Angeles Revitalization Zone, and Empowerment Zone (refer to Section 4.1, Land Use).

4.2.2 Methodology for Impact Evaluation

4.2.2.1 Long-term Employment

Operation of the LRT Build Alternative would generate jobs and increase customer patronage for local businesses especially those located near light rail stations. These jobs are considered permanent. The completion of a project can be expected to improve business conditions and employment opportunities. Employment is generated by new business activity that occurs as a result of project completion and transit operating expenditures.

The 2000 conceptual operating cost estimates (Fiscal Years 2007/20) developed for the LRT Build Alternative and the factors identified below were used to estimate the total number of long-term jobs created. Based on the Regional Industrial Modeling System (RIMS) developed by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA), transit operating expenses create substantially more employment per $100 million than do capital projects. Most of the direct impacts from operation are created in the transit industry, usually on-site. Others are created in other sectors, such as local businesses, that indirectly benefit from the new transit service. Based on the RIMS model and the indirect multiplier of 1.365, $100 million spent on transit operations would support a total of 9,610 direct and indirect full-time equivalent (FTE) positions.

4.2.2.2 Short-term Employment

Construction of the LRT Build Alternative would generate employment opportunities at the local and regional level. Direct impacts account for construction workers, professional services, motor vehicle manufacturing, steel works, and others. Indirect impacts account for added employment in other sectors that is generated by LRT construction (the trickle down effect).

The 2000 conceptual construction cost estimates developed for the LRT Build Alternative and the direct and indirect factors identified above were used to estimate the total number of temporary jobs created. Based on the RIMS II model, transit capital investments have been shown to result in a direct regional employment benefit. Using the RIMS II model, the American Public Transit Association has determined that for each $100 million[1] invested in new rail projects, it is estimated to directly increase employment by 3,380 FTE jobs. Of the total number of short-term jobs generated by new rail starts, over half are typically construction-related or business and professional services. Employment impacts of new start projects are attributable to the labor-intensity of new transit construction work and related professional services (APTA, 1983).

Indirect impacts are estimated through an employment multiplier of 1.365 drawn from a 1981 U.S. Department of Transportation study (USDOT, 1981). This estimate is based on Bureau of Labor Statistics studies, which have been used in a number of FTA projects. A new rail transit investment of $100 million is estimated to indirectly increase short-term employment by 4,610 FTE jobs. The combination of direct and indirect short-term jobs would total 7,990 FTE positions.

4.2.2.3 Fiscal

Providing governmental services such as fire and police require additional funds supplied by the jurisdictions they are to serve. Information related to fire and police services in the study area was obtained from the Internet. Information regarding property and sales tax revenues was obtained from the City of Los Angeles for Fiscal Year 1999/2000 and from the County of Los Angeles for Fiscal Year 1996/97. Impacts were identified utilizing displacement data contained in Section 4.3, Land Acquisition/Displacement and Relocation.

4.2.3 Impacts

4.2.3.1 No-Build Alternative

There would be no impacts on employment because the No-Build Alternative only includes improvements to the transportation network that have already been approved and funded. By maintaining the status quo, this alternative would not stimulate employment within the study area, generate fiscal impacts or create the need for additional government services, such as fire and police. In addition, the No-Build Alternative would not require property acquisitions that would diminish local tax revenues.

4.2.3.2 LRT Build Alternative

Option A

Long-term Employment Impacts

Table 4.2-3 presents the conceptual operating costs for fiscal years beginning in 2006/07 and the potential long-term or permanent jobs created by the LRT Build Alternative over a 14-year period. The long-term employment estimate for direct and indirect jobs is based on operating costs. Within the first 14 years of operation, the LRT Build Alternative would support 1,078 long-term jobs, including indirect employment opportunities coming from potential business development and redevelopment along the alignment and near stations. Thus, operation of the LRT Build Alternative would result in indirectly fostering economic

[1] Does not include right-of-way.

and population growth that has been considered in the goals and policies of local plans, and the additional employment would ultimately be a beneficial impact.

TABLE 4.2-3
ESTIMATED LONG-TERM EMPLOYMENT – LRT BUILD ALTERNATIVE

Fiscal Year	Conceptual Operating Costs (1999 $ in millions)[1]	Estimated Direct Employment Generated[2]	Estimated Indirect Employment Generated[2]	Estimated New Employment-Per-Year Generated[3]	Estimated Total Employment Generated[2]
2006/2007	$4.5	184	251	**435**	**435**
2008	$6.8	275	376	**216**	**651**
2009	$7.1	290	396	**35**	**686**
2010	$7.5	305	417	**36**	**722**
2011	$7.9	320	438	**36**	**758**
2012	$8.3	335	458	**35**	**793**
2013	$8.6	350	479	**36**	**829**
2014	$9.0	365	499	**35**	**864**
2015	$9.4	380	520	**36**	**900**
2016	$9.7	395	540	**35**	**935**
2017	$10.1	410	561	**36**	**971**
2018	$10.5	425	582	**36**	**1,007**
2019	$10.9	441	602	**36**	**1,043**
2020	$11.2	456	623	**35**	**1,078**
TOTAL	**N/A**	**N/A**	**N/A**	**1,078**	**N/A**

Sources:
[1] Conceptual operations costs (PBQD, 2000).
[2] For each $100 million operating expenses - 4,060 direct and 5,550 indirect jobs would be generated (APTA, 1983).
[3] New employment-per-year generated is based on the difference between employment from immediate previous years only.

Fire/Police Services

Local fire and police staff and services would be minimally affected by the direct and indirect employment created by operation of the LRT Build Alternative. No significant impacts to fire/police services are anticipated to occur because, according to discussions with the City and County police and fire departments' personnel, the existing fire and police would be sufficiently staffed to service the LRT facility. In addition, the LRT Build Alternative 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 rail operations and would be the responsibility of MTA. 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 LRT Build Alternative, therefore, is not expected to have a significant effect on the cost of providing these services.

Property Tax

Possible property acquisitions for the LRT Build Alternative have an estimated real estate value totaling approximately $10.73 million. The estimated real estate value for partial acquisitions and easements total approximately $6.07 million.[2] Properties that would be fully acquired for Option A of the LRT Build Alternative would reduce the tax bases of the City and County of Los Angeles. Property taxes are levied on the assessed value of all privately owned property and are collected by the County. Based on tax

[2] Accessed at www.dataquick.com on November 16, 2000.

amounts per current property values, the property tax loss to all property acquisitions would total approximately $141,870 annually.

The anticipated annual property tax loss to the City and the County would be minimal compared to their respective total property tax revenues. The resulting tax revenues would be sufficient to continue the current level of social spending and governmental services. The reduction of property tax revenue due to the LRT Build Alternative would, therefore, be less than significant. Indirect tax revenue benefits may be realized with infusion of development around stations and revitalization and development within the surrounding areas.

Sales Tax

If Option A of the LRT Build Alternative were implemented, the City of Los Angeles and East Los Angeles communities would lose 20 businesses. The business acquisitions would lower the level of sales tax revenues if the businesses could not relocate within the local jurisdiction. By relocating within their current jurisdictions, sales tax revenue losses would be temporary or offset in nature.

The loss of sales tax revenue would not be sufficient to adversely affect the tax base for the City or the County given the relatively small number of commercial/retail acquisitions compared to the total businesses operating within these jurisdictions. The existing tax revenue amounts would be sufficient to continue the current level of social spending and governmental services. No significant impact is expected.

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, the loss is not expected to generate a significant impact, since these business license fees represent only a small portion of the City's or the County's revenues, and existing revenue amounts would be sufficient to continue the current level of governmental services.

Lighting Improvements and Proposition 218

In general, any street or pedestrian lighting improvements within the City of Los Angeles that create new assessments or increase existing assessments to property owners require the Proposition 218 process. This process not only requires community participation, but also public approval through a ballot process. Not all lighting improvements require the process. Lighting improvements associated with Option A will be reviewed for eligibility by the City of Los Angeles prior to installation. The lighting assessment is paid by property owners through the county property tax.

Significance of Impacts

There would be no impacts on staffing of fire or police services or reduction of tax revenues.

Option B

The economic and fiscal impacts and the significance of the impacts of Option B are the same as Option A.

4.2.4 Mitigation

4.2.4.1 No-Build Alternative

No operational impacts were identified for the No-Build Alternative; therefore no mitigation measures are required.

4.2.4.2 LRT Build Alternative

From an employment and fiscal impact perspective, both Options A and B of the LRT Build Alternative are essentially are the same. Therefore, the mitigation measures to reduce already less than significant impacts for each option are the same as described below.

Operation of the LRT Build Alternative would indirectly increase employment in the Los Angeles Eastside Corridor by improving mass transit along the Corridor, and would not result in impacts requiring mitigation. In addition, MTA will be formulating a local employment policy for both construction-related and long-term job opportunities for the Corridor that will be reviewed by the Eastside Corridor Review Advisory Committee. Such a program will include resources for job development and training.

The City and County of Los Angeles would have minimal short-term tax revenue losses, but it is anticipated that long-term development and revitalization would increase overall tax revenues. There is no mitigation for the loss of tax revenue. Operation of the LRT Build Alternative would not have a significant impact on the staffing of fire or police services, therefore, no mitigation measures are required.

MTA is currently conducting station area meetings that provide local residents, businesses, and organizations the opportunity to provide input into planning for specific station areas. The goal is to address specific station area concerns, such as impacts and mitigation measures during construction, as well as economic development opportunities, transit connections, and station plans. Implementation of these mitigation measures is anticipated to help offset less than significant economic impacts.

4.3 LAND ACQUISITION/DISPLACEMENT AND RELOCATION

4.3.1 Affected Environment

Properties required for construction and operation of the LRT Build Alternative are indicated in the property identification plan drawings in Appendices E and F. The two alignment Options A and B, which have differing acquisition requirements, are displayed on separate drawings. During final design, the amount of property required at each acquisition site may increase or decrease. Property acquisition may be phased over time, depending on project funding and schedule.

The subway portion of the light rail alignment would be primarily under the public street rights-of-way. In those locations where the subway passed under individual parcels (either publicly or privately owned), MTA would need to obtain easements instead of acquiring or displacing the uses on those parcels. Table 4.3-1 provides a demographic summary of housing characteristics for the project study area and for one-half mile radius around the planned light rail stations. A description of land use characteristics along the alignment is presented in Section 4.1, Land Use and Development. Demographic characteristics are provided in Section 4.4, Communities/Neighborhoods.

4.3.2 Methodology for Impact Evaluation

Engineering plans indicate the location of the alignment, tunnel portals, station locations, and park-and-ride facilities. The right-of-way required for these facilities was plotted on maps in July 2000. Aerial photographs of the study area, city and county land use and parcel maps, encoded real estate data for the County, as well as windshield surveys, were used to determine the characteristics of the properties needed for construction and operation of the LRT Build Alternative. Properties potentially affected were identified according to existing zoning and land use, square footage, and, in the case of residential properties, number of units and average household size. Affected properties were grouped by station location or, if they were located further than one-half mile from a proposed station site, by alignment segment.

The analysis assumed a worst-case scenario for property requirements. Full property acquisitions were assumed if the project physically intruded on existing buildings, removed a substantial portion of the available parking such that a business could not operate, or used the majority of vacant land leaving the remainder too small to develop. This assumption was also applied to properties that were needed for construction purposes only. However, in the case of parking lots, only the portion of the lot needed for the public right-of-way was included. Reference is made to properties originally acquired by MTA for the suspended Red Line Extension and needed for the construction or operation of the LRT Build Alternative. Since acquisition and displacement proceedings for these properties were finalized as part of the suspended project, they are not included in this analysis.

To determine the effect of the property acquisitions and displacements, an estimate of the number of displaced residents and employees was calculated. For residential properties, the number of persons affected was determined by multiplying the number of displaced units by 4.0, the average household size in the Corridor. For non-residential displacements, the number of employees affected was determined by applying per-square-foot factors to the total building area of properties subject to full takes. The factors were taken from the Fiscal Impact Handbook (Burchell and Listokin, 1978) as follows:

- Office – 1 employee displaced for every 250 square feet of space
- Retail – 1 employee displaced for every 500 square feet of space
- Industrial – 1 employee displaced for every 525 square feet of space

If one property contained two different businesses, it was counted as two displacements, and the number of employees displaced was counted for each business. The calculations reflect full-time employees and may underestimate the number of part-time employees affected.

TABLE 4.3-1
DEMOGRAPHIC SUMMARY OF HOUSING CHARACTERISTICS FOR THE PROJECT STUDY AREA AND FOR A 1/2 MILE RADIUS AROUND PROPOSED LIGHT RAIL STATIONS

Demographic Area/ Station	Housing Units		Average Size Households	Vacancy Rate	Percent Owner-Occupied	Median Value of Owner-Occupied Units	Median Rent
	1990[1]	2020[2]/ % Increase	1990[1]	1990[1]	1990[1]	1990[1]	1990[1]
Los Angeles County	2,989,552	4,239,050 (41.8%)	3.0	1.9	48.2	226,400	570
Project Study Area[3,4]	25,028	40,896 (63.3%)	4.0	3.6	26.1	123,756	404
Union Station	872	5,729 (557.0%)	2.8	3.7	1.0	59,615	376
1st/Alameda	1,328	7,676 (78.0%)	2.6	9.2	8.8	57,673	349
1st/Utah	3,069	3,133 (2.1%)	3.8	3.6	7.2	103,700	470
1st/Boyle	4,273	4,545 (6.4%)	3.9	4.1	11.0	120,782	369
1st/Soto	5,435	7,674 (41.2%)	4.1	3.8	16.4	140,383	398
1st/Lorena (Option A only)	3,714	4,833 (30.1%)	4.2	3.7	34.1	137,419	416
3rd/Indiana (Option B only)	3,696	4,513 (22.1%)	4.3	3.3	32.2	139,165	421
3rd/Rowan (Option A only)	3,692	4,635 (25.5%)	4.3	2.7	32.2	141,661	427
3rd/Ford (Option B only)	2,255	2,894 (28.3%)	4.1	3.4	35.3	127,056	379
3rd/Mednik	2,544	3,134 (23.2%)	4.1	2.6	40.3	141,588	403
Beverly/Atlantic (Option A only)	2,374	3,228 (36.0%)	3.5	2.2	45.3	171,679	472
Pomona/Atlantic (Option B only)	2,154	3,013 (39.9%)	3.5	2.2	43.4	173,640	477

Notes:
1. U. S. Census of Population and Housing, 1990. Data based upon blocks, which are the smallest tabulated area measurement.
2. SCAG TAZ Population and Employment Projection Data, 2020. Data based upon U. S. Census full or partial tracts that are based upon aggregated blocks.
3. The Project Study Area extends east from Union Station to Beverly Blvd just east of Atlantic (Option A) and to Pomona Blvd just west of Atlantic Blvd (Option B) and is confined to the area one-half mile on either side of the alignment.
4. The Project Study Area and its associated nine stations excluded 1990 U. S. Census block groups 207400-1, 206000-2, and 207100-5 from demographic analysis due to the presence of jail facilities.

According to CEQA guidelines, acquisition and displacement impacts are considered "generally significant" if:

- Acquisition of privately-owned land is required, and would result in relocation of ten or more residences or businesses;
- Adequate replacement facilities for displaced households and businesses are not available;
- Housing sites and/or funds to construct replacement facilities are not available;
- Replacement facilities are available but are located in neighborhoods unfamiliar to the residents of the displaced households;
- Replacement facilities exceed the financial capability of displaced households;
- Relocation of businesses and/or industries would result in loss of jobs or decreased accessibility between residences and places of employment, resulting in loss of sales or incomes;
- Location of replacement facilities for businesses or industries decreases accessibility to established market areas; or
- A comparatively large or disproportionate number of minority, elderly, or low-income displacements would occur.

Acquisition and displacement impacts would be considered "potentially significant" if:

- Acquisition of privately owned land is required, and would result in relocation of one to ten residences and/or businesses: or
- Replacement facilities matching the needs of the displaced households and businesses are not available in the same or nearby neighborhoods.

The severity of acquisition and displacement impacts must be evaluated in terms of changes in land use, loss of housing stock, effects upon special needs populations, fiscal impact, and business loss and disruption. See Sections 4.1 and 4.2 for more information regarding land use and economic impacts.

4.3.3 Impacts

4.3.3.1 No-Build Alternative

The No-Build Alternative would not require the acquisition or displacement of any property in the study area.

4.3.3.2 LRT Build Alternative

The LRT Build Alternative would require the acquisition and displacement of residential, commercial, and public utility property for the construction and operation of the light rail line. In the absence of mitigation, residential and non-residential displacements resulting from implementing the LRT Build Alternative are considered generally significant under CEQA. A summary of potential acquisitions and displacements is presented in Table 4.3-2 for Option A and Table 4.3-3 for Option B.

Option A

Residential Displacement

As indicated in Table 4.3-1, residential displacements under Option A would require displacing a total of 18 residential units containing an estimated 72 persons. The displacements would occur at:

TABLE 4.3-2
RESIDENTIAL AND NON-RESIDENTIAL ACQUISITIONS AND POPULATION DISPLACEMENT BY LRT FACILITES AND ALIGNMENT FOR OPTION A

Residential Uses					Non-Residential Uses						
Station/ Alignment Location	**Purpose of Property Acquisition**	**Multiple Family Units**	**Single Family Units**	**Estimated Persons Displaced[1]**	**Commercial Business**	**Public Facility**	**Vacant Lot**	**Parking Lot[2]**	**Estimated Parking Spaces**	**Estimated Building Sq. Ft. for Displaced Businesses[3]**	**Estimated Total Employ-ment[3]**
Alameda between Commercial and 1st	Right-of-Way/Train Control				2 businesses-gas station/repair shop and car wash	DWP Street Frontage		1 1 1	13 spaces 9 spaces 11spaces	Gas/mart – 2,250 Repair shop – 1,350	4 persons – gas/mart 3 persons – repair shop
1st / Alameda	Right-of-Way/Station							1 1	None 19 spaces		
Alameda to 1st/Boyle	Right–of-Way						1	1	7 private spaces		
1st / Boyle	Construction Staging/ Station Entrance	4 units		16			1				
1st / Soto	Construction Staging/ Station/ Substation		8 units	32	8 businesses-retail, medical office, and auto sales					18,300	42 persons
Indiana/Gleason	Offstreet Parking	6 units		24	2 businesses-plumbing supply and commercial					6,500	13 persons
3rd/Sunol	Substation				1 vacant business, 2 outdoor signs					No active businesses	0 persons
3rd/Arizona	Substation				1 business, auto sales					380	2 persons
Beverly/ Atlantic	Substation				1 business, auto repair					1,730	3 persons
Pomona/Atlantic	Park-and-Ride				5 businesses -	1 medical				9,810 for the 5	18 persons[4]

TABLE 4.3-2
RESIDENTIAL AND NON-RESIDENTIAL ACQUISITIONS AND POPULATION DISPLACEMENT BY LRT FACILITES AND ALIGNMENT FOR OPTION A

Residential Uses					Non-Residential Uses						
Station/ Alignment Location	**Purpose of Property Acquisition**	**Multiple Family Units**	**Single Family Units**	**Estimated Persons Displaced[1]**	**Commercial Business**	**Public Facility**	**Vacant Lot**	**Parking Lot[2]**	**Estimated Parking Spaces**	**Estimated Building Sq. Ft. for Displaced Businesses[3]**	**Estimated Total Employ-ment[3]**
					medical lab, used car lot, auto repair, furniture store and warehouse	clinic (to be vacated by Kaiser Hospital[4])				businesses	
Ducommun/Garey/ Center	Yard Lead/Replace-ment Parking				2 businesses – storage and impound lot (part take/not displaced)		1-part take			13,800 for storage business	26 persons
Total Displacements for Option A		**10 units**	**8 units**	**72 displaced persons**	**20 active businesses/1 vacant business/ 1 impound lot (part take)/ 2 outdoor signs**	**DWP frontage/ 1 hospital clinic[4]**	**2 vacant lots/ 1 part take of vacant lot**	**6 parking lots**	**59 spaces**	**54,120 square feet**	**111 persons**

[1]Estimated total population displacement is calculated by multiplying the number of displaced units by 4.0, the average number of persons per household.
[2]Only portions of the lots (See "Estimated Parking Spaces" column) would be acquired.
[3]Estimated employment displacement is calculated using square foot per use factors identified in the Fiscal Impact Handbook (Burchell and Listokin, 1978)
[4]Since the hospital clinic is being replaced by Kaiser Permanente prior to LRT project construction, the LRT project would not be responsible for displacing the clinic employees.

TABLE 4.3-3
RESIDENTIAL AND NON-RESIDENTIAL ACQUISITIONS AND POPULATION DISPLACEMENT BY LRT FACILITES AND ALIGNMENT FOR OPTION B

Residential Uses					Non-Residential Uses						
Station/ Alignment Location	**Purpose of Property Acquisition**	**Multiple Family Units**	**Single Family Units**	**Estimated Persons Displaced[1]**	**Commercial Business**	**Public Facility**	**Vacant Lot**	**Parking Lot[2]**	**Estimated Parking Spaces**	**Estimated Building Sq. Ft.[3]**	**Estimated Total Employ-ment[3]**
Alameda between Commercial and 1st	Right-of-Way/Train Control				2 businesses-gas station/repair shop and car wash	DWP street frontage		1 1 1	13 spaces 9 spaces 11spaces	Gas/mart – 2,250 Repair shop – 1,350	4 persons – gas mart 3 persons-repair shop
1st / Alameda	Right of Way/Station							1 1	None 19 spaces		
Alameda to 1st/Boyle	Right-of-Way						1	1	7 private spaces		
1st / Boyle	Construction Staging/ Station Entrance	4 units		16			1				
1st / Soto	Construction Staging/ Station/ Substation		8 units	32	8 businesses-retail, medical office, and auto sales					18,300	42 persons
Indiana/1st to 3rd	Alignment and Station	6 units		24	3 businesses-plumbing supply, medical office, and commercial	1 public high school (relocated or reconstructed)	5			10,500	29 persons
3rd/Sunol	Substation				1vacant business, 2 outdoor signs					No active businesses	0
3rd/Arizona	Substation				1 business, auto sales					380	2 persons
Pomona/ Atlantic	Park-and-Ride Lot/Substation				5 businesses- auto repair, medical lab, used car lot, furniture store, warehouse	1 medical clinic (to be vacated by Kaiser Hospital[4])				9,810 for the 5 businesses	18 persons[4]

TABLE 4.3-3
RESIDENTIAL AND NON-RESIDENTIAL ACQUISITIONS AND POPULATION DISPLACEMENT BY LRT FACILITES AND ALIGNMENT FOR OPTION B

Residential Uses					Non-Residential Uses						
Station/ Alignment Location	**Purpose of Property Acquisition**	**Multiple Family Units**	**Single Family Units**	**Estimated Persons Displaced[1]**	**Commercial Business**	**Public Facility**	**Vacant Lot**	**Parking Lot[2]**	**Estimated Parking Spaces**	**Estimated Building Sq. Ft.[3]**	**Estimated Total Employ-ment[3]**
Ducommun/Garey/ Center	Yard Lead/Replace-ment Parking				2 businesses-storage and impound lot (part take/not displaced)		1-part take			13,800 for storage business	26 persons
Total Displacements for Option B		**10 units**	**8 units**	**72 displaced persons**	**20 active businesses/1 vacant business/ 1 impound lot (part take)/ 2 outdoor signs**	**DWP frontage/1 hospital clinic[4]/1 public high school**	**7 vacant lots/1 part take of vacant lot**	**6 parking lots**	**59 spaces**	**56,390 square feet**	**124 persons**

[1]Estimated total population displacement is calculated by multiplying the number of displaced units by 4.0, the average number of persons per household.
[2]Only portions of the lots (See "Estimated Parking Spaces" column) would be acquired.
[3]Estimated employment displacement is calculated using square foot per use factors identified in the Fiscal Impact Handbook (Burchell and Listokin, 1978)
[4]Since the hospital clinic is being replaced by Kaiser Permanente prior to LRT project construction, the LRT project would not be responsible for displacing the clinic employees.

- 1st/Boyle – A construction staging area on the south side of 1st Street just west of Boyle Avenue would require a four-unit apartment building. The residential units, which are affordable housing, house approximately 16 persons.
- 1st/Soto – Acquisition of one parcel on the southeast and six parcels on southwest corners at 1st/Soto, for construction of the 1st/Soto light rail station, a substation, and a construction staging area would require eight residences housing 32 persons. The units are affordable housing.
- Indiana Street between 1st and 3rd Streets – Acquisition of three parcels on the east side of Indiana Street opposite Gleason Street for replacement parking would require six units of housing, potentially displacing 24 residents. All of the units are affordable housing.

Under CEQA, the displacement of 18 dwelling units containing an estimated 72 residents would be a significant impact.

Impacts on Housing Stock

Option A would displace 18 low and moderate-income residences. This number represents one-tenth of one percent of the study area's housing stock and, with the projected increase in housing units in the study area, would not substantially diminish the total number of units. More detailed information is presented for the affected station areas below.

- 1st/Boyle – Of the 4,273 residential units located within a half-mile of this proposed station, four apartment units would be acquired (refer to Table 4.3-1). The loss of four affordable units would not substantially affect the quantity of homes or the low vacancy rate in the area, particularly since a six percent increase in housing units is anticipated in the 1st/Boyle area over the planning period. However, the rents for the newer units may not be comparable to those for the displaced units.
- 1st/Soto – Of the 5,435 residential units within one-half mile of the station, the acquisition of eight affordable units would not substantially affect the quantity of homes or the low vacancy rate in the area, particularly since a 41 percent increase in housing units is anticipated in the 1st/Soto area over the planning period. However, housing demand and the Corridor's low vacancy rate may limit the availability of comparable replacement homes in the study area.
- Indiana Street – The loss of six units along Indiana Street would not substantially reduce the number of housing units in the area between 1st and 3rd Streets, particularly since the number of housing units in the area is expected to increase by 23 percent over the planning period. However, housing demand and the Corridor's low vacancy rate may limit the availability of comparable (affordable) replacement homes in the study area.

Non-residential Displacement

Option A would displace six parking lots containing 59 spaces, Department of Water & Power (DWP) landscaped frontage, two vacant lots, one vacant commercial space, and two outdoor advertising signs. Option A would also displace 20 businesses. One additional business and one additional vacant lot would involve partial takes. As indicated in Table 4.3-2, non-residential displacements would occur at:

- Alameda between Commercial and 1st – Portions of three parking lots containing 33 spaces, DWP landscaped frontage, and a gas station, including a mini-mart, car wash, and a repair shop, would be acquired. The acquisitions include the perimeter of parcels bordering the sidewalks along Alameda and 1st Streets that are proposed to be part of the Mangrove Estates development, which has an approved preliminary development plan. The LRT track alignment is not expected to reduce the development potential for the site as the development plans are finalized and move forward through the City's approval process.

- 1st/Alameda – Portions of two parking lots containing 19 spaces would be acquired to accommodate the turning of the track from 1st Street onto Alameda and the installation of a station.
- Alameda to Boyle – Seven private parking spaces from the Los Angeles Hompa Hongwanji Buddhist Temple would be required.
- 1st/Boyle -- A vacant lot would be acquired east of the apartment building that will also be acquired as part of this project (see preceding residential displacement discussion). One business (a market) was previously purchased by MTA for the suspended Metro Red Line project (and is therefore not included in Table 4.3-2). The market continues to operate at this location and leases the property from the MTA. MTA has previously paid the market's costs to relocate the business whenever the lease is terminated. The property is needed to provide construction staging for the current project. The 1st/Boyle Station would be located underground beneath Mariachi Plaza, also owned by MTA.
- 1st/Soto – The proposed station, substation, and construction staging area would require the displacement of eight businesses employing approximately 42 people. The businesses, which serve neighborhood clientele, may be difficult to relocate in the neighborhood.
- 1st/Lorena -- No new acquisitions are required. However, property on the northeast corner was previously acquired by MTA for the suspended Metro Red Line project and is, therefore, not shown in Table 4.3-2. This vacant property will be used for construction staging and installation of a traction power substation.
- Indiana Street – Three parcels would be required for replacement parking on the east side of Indiana opposite Gleason Street. Two of the parcels contain businesses, a plumbing supply with a parking lot and a commercial space.
- 3rd/Sunol – Locating a traction power substation along 3rd Street immediately west of Sunol Drive and south of the Pomona Freeway would require acquisition of a parcel containing a vacant business and two outdoor advertising signs.
- 3rd/Arizona – Locating a substation on the southeast corner of 3rd/Arizona would require acquisition of a parcel containing an auto sales business.
- Beverly/Atlantic – A parcel of land would be acquired for a traction power substation on Beverly at Atlantic near the proposed eastern terminal of the light rail line under Option A. The site is currently occupied by an auto repair shop, which would be displaced. Station area parking would be co-located at the Pepboys parking lot (east side of Atlantic Boulevard north of Beverly Boulevard). MTA intends to negotiate a joint use agreement for use of the Pepboys lot.
- Pomona/Atlantic – A park-and-ride lot would be constructed on parcels along Atlantic Boulevard immediately north of Pomona Boulevard. The site is currently the location for a Kaiser Permanente hospital clinic and parking lot as well as five other businesses, including a medical laboratory, a used car lot, an auto repair shop, a furniture store, and a warehouse. Kaiser intends to dispose of their existing facility once the new clinic (now under construction) is completed, and MTA would purchase the facilities.

In addition, the lead track from the light rail line to the existing Red Line maintenance and storage facility would require two businesses (one full take and one part take) and a part take of a vacant lot as follows:

- Ducommun/Garey – A warehouse would be acquired at the northeast corner of Ducommun and Garey to accommodate the lead track from the LRT alignment to the maintenance and storage facility at the existing Red Line Yard and would also be used to provide replacement parking for parking losses along Ducommun Street. The building has been recently sold. A partial take of a vacant lot at the northwest corner of the intersection is required to also accommodate replacement parking along Ducommun Street.
- Ducommun/near Center. A partial take of an impound lot would require the owner to reconfigure the lot.

Easements

MTA would obtain an encroachment permit from Caltrans to construct the aerial structure and at-grade tracks on their property south of Union Station. Also subsurface easements will be obtained for properties located above the tunnel segment between 1st/Gless and 1st/Lorena.

Significance of Impacts

Since more than ten residences and businesses would be acquired under Option A, the displacements would be a significant impact without mitigation. Similarly, if replacement housing or business facilities are not available in the same or nearby neighborhoods, and the residences and businesses would need to relocate outside the study area, this impact would be potentially significant.

Option B

Residential Displacements and Impacts on Housing Stock

As indicated in Table 4.3-3, residential displacements for Option B would be the same as Option A (18 single-family and multi-family household units containing an estimated 72 persons). Therefore, impacts on housing stock would also be the same as Option A.

Non-residential Displacements

Option B would require the same parking and other non-residential displacements as in Option A with the following exceptions:

- Indiana Street – Three parcels required for Option A for replacement parking on the east side of Indiana Street opposite Gleason Street would also be acquired to accommodate the light rail alignment and station along Indiana Street at Gleason Street in Option B. Two of the parcels contain businesses, a plumbing supply with parking lot and a commercial space. In addition, Option B would require a medical office building at 1st/Indiana with parking, a separate parking lot for the medical office building, and a lot providing access to the El Enganto furniture store from Indiana Street. Access to the furniture store will be provided at this or an alternate location. A portion or all of Ramona High School property will be acquired to accommodate the LRT track and 3rd/Indiana Station. The school will either be reconstructed at the existing site or relocated.
- Pomona/Atlantic – Instead of locating the eastern terminal station and substation at Beverly/Atlantic, under Option B the station, park-and-ride lot, and substation would be located west of Atlantic Boulevard immediately north and on Pomona Boulevard, using the site identified for a park-and-ride lot for Option A. The same non-residential displacements identified for this site under Option A would be required for Option B.
- Beverly/Atlantic – The property required for Option A for a traction power substation is not needed under Option B. Instead the substation will be provided at Pomona/Atlantic as discussed above.

Easements

Same as Option A.

Significance of Impacts

Same as Option A.

4.3.4 Mitigation

4.3.4.1 Option A

Residential and Commercial Displacement

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 VI 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 MTA be made available to eligible residents, businesses and non-profit 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, and 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 will 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 will apply acquisition and relocation policies to assure compliance with the Uniform Act and Amendments. All real property acquired by MTA will be appraised to determine its fair market value. An offer of just compensation, which shall not be less than the approved appraisal, will be made to each property owner. Each homeowner, renter, business or nonprofit organization displaced as a result of the project will 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 LRT Build Alternative 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; or
- 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 and businesses located above the light rail tunnel will not be acquired in fee simple for the LRT Build Alternative, MTA will acquire subsurface easements from those properties.

MTA will be formulating a local employment policy for construction and operations-related job opportunities in the Corridor. Such a program will include resources for job development and training and will be made available to persons unable to find a new job as a result of the business relocations.

Following application of these policies and regulations by the MTA, relocation/displacement impacts would not be significant under CEQA.

Loss of Housing Stock

As a mitigation measure for loss of housing stock resulting from the suspended Metro Red Line East Side Extension project, MTA established the revolving loan fund program, which included the following components[3]:

- MTA committed to making available sites for joint development projects, including housing;
- MTA established a $5.2 million revolving loan fund (which was later reduced to $2.6 million when the Red Line Extension was truncated at 1st/Lorena) targeted to replace units taken for the suspended project. The intent of the loan fund was 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; and assist with affordable housing rehabilitation in Boyle Heights; and
- MTA committed to offer existing residential and other structures required for station construction to community-based housing and social service providers as well as other public agencies prior to their demolition.

Loan repayment was to be from construction and permanent loan proceeds. Criteria for eligibility, funding prerequisites, program administration, underwriting and repayment was to be formulated through

[3] Metro Red Line East Side Extension, Final Environmental Impact Statement, Los Angeles County Metropolitan Transportation Authority, Los Angeles, California, September 1994, pages 4-3.17 and 4-3.18.

the program, based on affordable housing guidelines set forth by the city, state, and federal governments. The program was designed to allow for flexibility in the type of projects MTA can fund.

To provide mitigation for the potential loss of housing stock if either Option A or Option B of the LRT Build Alternative were implemented, MTA would incorporate elements of the revolving loan fund program into a new Housing Replenishment Program. A new revolving loan fund will be set up that sets aside $26,000 per acquired unit for affordable housing development and rehabilitation. Whereas, the suspended project's revolving loan fund only applied to residences within Boyle Heights, this fund would apply to all residences that are acquired as a result of the Eastside Corridor LRT Build Alternative. This fund would be used for housing replenishment as a result of the loss of housing stock. MTA will set aside the funding for the new revolving loan fund program, which will be implemented through a Memorandum of Understanding (MOU) with the City of Los Angeles Housing Department (LAHD), which will administer the program. MTA will work with LAHD, experts in the field of affordable housing finance and development, who will provide the expertise necessary to implement this program.

The loss of housing stock is a potentially significant impact if the displaced residents are unable to find replacement housing in the area. The revolving loan fund may not fully mitigate this impact but will provide funds to assist community-based developers in constructing and rehabilitating affordable housing in East Los Angeles.

Significance of Impacts Remaining After Mitigation

Following application of these policies and regulations by the MTA, relocation/displacement impacts would not be significant under CEQA. However, impacts would be potentially significant if the displaced residences and businesses are unable to find replacement homes or businesses in the area.

4.3.4.2 Option B

Measures to mitigate acquisition and displacement impacts for Option B will be the same as for Option A, with the exception of mitigation for Ramona High School under Option B. MTA will provide funding to LAUSD to either purchase a new school site (whether with a new or existing building) acceptable to LAUSD or to reconstruct the school at its present location. It is not feasible for MTA to analyze the impacts of this proposed school replacement at this time because LAUSD has not undertaken any programmatic planning for the new school and the timing, location, and extent of work required to undertake this replacement are unknown. MTA staff has conferred with LAUSD staff, and LAUSD has agreed that, upon its completion of programmatic planning and identification of potential new sites, LAUSD will conduct all required environmental studies as a condition to its determination of whether to relocate or reconstruct the school. Because of the indeterminate nature of the school project, it is beyond the scope of the analysis for the Eastside Corridor Project. However, MTA will monitor LAUSD progress with regard to Ramona High School decision-making and will work with LAUSD to address any conflicts which may arise between LAUSD's Ramona High School and MTA's Eastside Corridor project.

Significance of Impacts Remaining After Mitigation

Following application of these policies and regulations by the MTA, relocation/displacement impacts would not be significant under CEQA. However, impacts would be potentially significant if the displaced residences and businesses are unable to find replacement homes or businesses in the area.

4.4 COMMUNITIES/NEIGHBORHOODS

4.4.1 Affected Environment

4.4.1.1 Regional Population and Demographics (1990 and 2020 Projections)

Los Angeles County, with a 1990 population of over 8.8 million, is the most populous county in California (Table 4.4-1). It contains 30 percent of the state's population, and the majority of residents in the six-county region included in the Southern California Association of Governments. By 2020, the County and the region are expected to grow by about 38 percent and 43 percent, respectively. During the same period, the number of housing units in the County will increase from approximately 3.0 million to 4.2 million, thereby augmenting population density.

TABLE 4.4-1
DEMOGRAPHIC SUMMARY FOR THE LOS ANGELES REGION AND THE CORRIDOR STUDY AREA

Demographic Area	Total Population		Population Density		Populations 6 – 18 years		Populations 65 years +	
	1990[1]	2020[2]/ % Increase	1990[1]	2020[2]	1990[1]	2020[2]	1990[1]	2020[2]
SCAG Region	14,531,529	20,768,041 (42.9%)	1,521	2,174	2,509,030	NA	1,584,540	NA
Los Angeles County	8,863,164	12,237,247 (38.1%)	2,240	3,093	1,586,022	NA	860,587	NA
Project Study Area[3, 4]	103,289	128,585 (24.5%)	15,791	19,483	21,716	NA	8,499	NA

Notes:
1. U. S. Census of Population and Housing, 1990. Data based upon blocks, which are the smallest tabulated area measurement.
2. SCAG TAZ Population and Employment Projection Data, 2020. Data based upon U. S. Census full or partial tracts that are based upon aggregated blocks.
3. The Project Study Area for Option A extends east from Union Station to Beverly Blvd. just east of Atlantic and for Option B extends from Union Station to Pomona Blvd just west of Atlantic and is confined to the area one-half mile on either side of the alignment.
4. The Project Study Area and its associated nine stations excluded 1990 U. S. Census block groups 207400-1, 206000-2, and 207100-5 from demographic analysis due to the presence of jail facilities.

4.4.1.2 Corridor Population and Demographics (1990 and 2020 Projections)

For this SEIS/SEIR, the Eastside Corridor extends from Union Station to the eastern terminal at Beverly/Atlantic under Option A or to Pomona/Atlantic under Option B and is confined to a half-mile strip on either side of the alignment. In 1990 the Corridor (study area) had 103,289 residents living in an area with a population density over seven times that of the County. Twenty-one percent of Corridor residents are between six and 18 years compared with 17.8 percent for the county as a whole. The senior population in the study area is similar to the County percentage of approximately nine percent. By 2020, the population of the study area is expected to increase to 128,585, a gain of 25 percent. This increase is less than the growth rate anticipated for Los Angeles County and is expected to occur with or without the implementation of the light rail line. Similarly, population densities in the Corridor will increase from 15,791 to 19,483 residents per square mile (Figure 4.4-1).

FIGURE 4.4-1
COMPARATIVE 1990 AND 2020 POPULATION DENSITY
FOR THE CORRIDOR, LOS ANGELES COUNTY, AND THE SCAG REGION

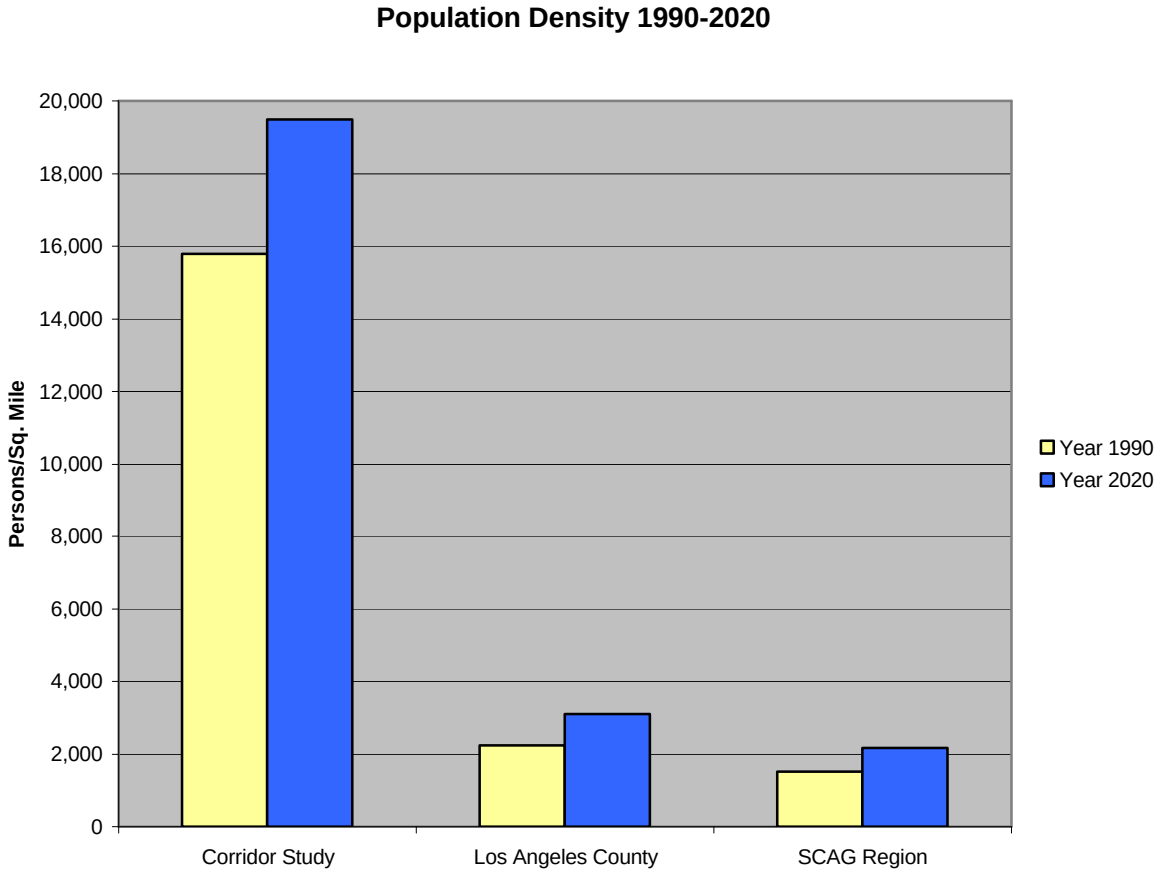

Table 4.4-2 presents 1990 and 2020 data for the area within a half-mile of each proposed light rail station location. The table indicates that the greatest concentration of area residents is located in the middle portion of the Corridor between 1st/Boyle and 3rd/Rowan under Option A. In this segment, over 15,000 people reside within one-half mile of each proposed station location. The population concentration drops off between the 3rd/Rowan and 3rd/Ford Stations as shown in Option B, where 9,653 people reside near the 3rd/Ford Station. The area surrounding the 1st/Soto Station has the largest and densest population of all station locations. By 2020, the number of residents in this area will have increased from 21,426 (1990 data) to 28,981, a 35 percent gain. This rate of increase appears to be typical for most station areas along the alignment except for Union Station and 1st/Alameda, which, due to redevelopment plans, are expected to grow by 41 percent and 230 percent, respectively, and 1st/Utah and 1st/Boyle, which will decrease in population.

4.4.1.3 Corridor Socio-Economic Characteristics

As indicated in Table 4.4-3, the study area is nearly 97 percent minority, principally of Hispanic descent. The distribution of minority populations occurs fairly evenly throughout the Corridor (Figure 4.4-2). Although the concentration of minority populations is not unusual in Los Angeles County, the percentage

of the total population that is minority is substantially higher in the Corridor than in the county as a whole (97 percent compared with 59 percent).

TABLE 4.4-2
DEMOGRAPHIC SUMMARY FOR A ½ MILE RADIUS AROUND LRT STATIONS

Proposed Station[1, 2]	Total Population		Population Density		Populations 6 – 18 years		Populations 65 years +	
	1990[3]	2020[4] (% Increase)	1990[3]	2020[4]	1990[3]	2020[4]	1990	2020
Option A								
Union Station	8,147	11,467 (40.8%)	4,274	14,515	821	N/A	426	N/A
1st/Alameda	3,154	10,395 (229.6%)	5,257	13,327	78	N/A	634	N/A
1st/Utah	11,358	8,946 (-21.2%)	14,945	11,469	2,906	N/A	928	N/A
1st/Boyle	16,214	15,598 (-3.9%)	21,057	19,744	3,903	N/A	1,295	N/A
1st/Soto	21,426	28,981 (35.3%)	27,826	37,155	4,807	N/A	1,590	N/A
1st/Lorena	15,098	20,256 (34.2%)	19,356	25,969	3,466	N/A	1,275	N/A
3rd/Rowan	15,479	18,473 (19.3%)	19,594	23,384	3,724	N/A	1,199	N/A
3rd/Mednik	10,129	11,416 (12.7%)	12,986	14,636	2,419	N/A	959	N/A
Beverly/Atlantic	8,133	10,556 (29.8%)	10,295	13,533	1,667	N/A	955	N/A
Option B								
Union Station	8,147	11,467 (40.8%)	4,274	14,515	821	N/A	426	N/A
1st/Alameda	3,154	10,395 (229.6%)	5,257	13,327	78	N/A	634	N/A
1st/Utah	11,358	8,946 (-21.2%)	14,945	11,469	2,906	N/A	928	N/A
1st/Boyle	16,214	15,598 (-3.9%)	21,057	19,744	3,903	N/A	1,295	N/A
1st/Soto	21,426	28,981 (35.3%)	27,826	37,155	4,807	N/A	1,590	N/A
3rd/Indiana	15,242	18,535 (21.8%)	19,541	23,762	3,582	N/A	1,221	N/A
3rd/Ford	9,653	11,679 (21.0%)	12,376	14,973	2,369	N/A	682	N/A
3rd/Mednik	10,129	11,416 (12.7%)	12,986	14,636	2,419	N/A	959	N/A
Pomona/Atlantic	7,146	9,718 (36.0%)	9,161	12,459	1,440	N/A	915	N/A

Notes:
1. The project study area and its associated nine stations excluded 1990 U. S. Census block groups 207400-1, 206000-2, and 207100-5 from demographic analysis due to the presence of jail facilities.
2. Information for stations is confined to a one-half mile radius surrounding the proposed station locations.
3. U. S. Census of Population and Housing, 1990. Data based upon blocks, which are the smallest tabulated area measurement.
4. SCAG TAZ Population and Employment Projection Data, 2020. Data based upon U. S. Census full or partial tracts that are based upon aggregated blocks.

TABLE 4.4-3
DEMOGRAPHIC SUMMARY OF SOCIO-ECONOMIC CHARACTERISTICS FOR THE PROJECT STUDY AREA AND FOR A 1/2 MILE RADIUS AROUND LRT STATIONS

Demographic Area	Minority Population[1]		Low-Income Households[1]		Workers 16 and Older Using Public Transportation[1]		Zero-Car Households[1]	
	No.	% of Total Pop.	No.	% of Total House-holds	No.	% of Workers 16 and Older	No.	% of Total Residen-tial Units
Los Angeles County	5,228,442	59.0	355,295	11.9	267,210	6.5	333,562	11.2
Project Study Area[2,3]	99,971	96.7	6,350	25.8	6,890	19.9	7,365	30.1
Option A								
Union Station	7,356	86.5	309	37.1	270	32.2	570	60.5
1st/Alameda	4,204	80.6	328	26.0	300	26.0	942	70.6
1st/Utah	11,270	97.0	1,131	38.1	1,011	28.2	1,167	38.8
1st/Boyle	16,921	97.6	1,343	32.9	1,672	27.6	1,591	36.3
1st/Soto	21,100	98.7	1,410	27.1	2,208	27.0	1,818	34.8
1st/Lorena	14,541	99.1	828	23.4	937	18.5	744	22.7
3rd/Rowan	15,199	99.2	932	26.0	982	19.2	892	26.2
3rd/Mednik	10,049	98.5	572	23.0	332	9.4	546	21.5
Beverly/Atlantic	7,723	95.8	397	17.1	254	8.2	376	16.4
Option B								
Union Station	7,356	86.5	309	37.1	270	32.2	570	60.5
1st/Alameda	4,204	80.6	328	26.0	300	26.0	942	70.6
1st/Utah	11,270	97.0	1,131	38.1	1,011	28.2	1,167	38.8
1st/Boyle	16,921	97.6	1,343	32.9	1,672	27.6	1,591	36.3
1st/Soto	21,100	98.7	1,410	27.1	2,208	27.0	1,818	34.8
3rd/Indiana	15,013	98.8	884	24.6	1,081	19.7	849	23.6
3rd/Ford	9,572	99.2	514	23.6	426	12.9	420	19.2
3rd/Mednik	10,049	98.5	572	23.0	332	9.4	546	21.5
Pomona/Atlantic	6,903	95.4	370	17.1	230	8.2	363	17.1

Notes:
1. U. S. Census of Population and Housing, 1990. Data based upon blocks, which are the smallest tabulated area measurement.
2. The Project Study Area for Option A extends east from Union Station to Beverly Blvd just east of Atlantic and is confined to the area one-half mile on either side of the alignment. The Project Study Area for Option B is the same except that the eastern terminus extends to Pomona Blvd just west of Atlantic.
3. The Project Study Area and its associated nine stations excluded 1990 U. S. Census block groups 207400-1, 206000-2, and 207100-5 from demographic analysis due to the presence of jail facilities.

Similarly, the percentage of low-income households (refer to Section 4.4.2, Methodology for Impact Evaluation for definition of low income) in the Corridor is over twice the percentage for the County (26.0 percent compared with 11.9 percent). The greatest concentration of low-income households is in the western portion of the Corridor around Union Station, 1st/Utah, and 1st/Boyle. In these locations, low-income households comprise over 30 percent of total households, reaching 50 to 70 percent in certain census tracts. This percentage declines to 17 percent in the area surrounding Beverly/Atlantic and Pomona/Atlantic, the eastern terminals for the light rail alignment under Options A and B, respectively. (Figure 4.4-3).

FIGURE 4.4-2
MINORITY POPULATION

FIGURE 4.4-3
LOW INCOME POPULATION

Compared with the county's high percentage of car ownership (only 11 percent of households are without a car), 30 percent of Corridor households do not own automobiles. The percentage of zero-auto households increases to over 70 percent surrounding the proposed 1st/Alameda Station (Figure 4.4-4). Further east, the percentage of zero-auto households drops dramatically. For example, in the area surrounding the proposed Beverly/Atlantic Station under Option A and Pomona/Atlantic under Option B, only 16 or 17 percent of total households are without cars. In spite of the relatively low rate of car ownership in the Corridor, only 20 percent of the working population use public transportation to get to work, which may be an indication of unmet transit demand. The highest percentage of transit use is by residents who live in the western portion of the Corridor, between Union Station and 1st/Soto.

The census data indicates that the Corridor is characterized primarily as low income, minority, and transit dependent, containing one of the most densely populated sections of Los Angeles County. These demographic characteristics may be particularly favorable, in terms of ridership potential, to the success of proposed fixed guideway investments.

4.4.1.4 Corridor Housing Characteristics

In 1990, over 25,000 households existed in the study area (refer to Table 4.3-1 in the Land Acquisition/Displacement section). This number is expected to increase to over 40,000 units in 2020, or a 63 percent rate of growth from 1990 to 2020. This rate of new housing construction is more than 20 percent greater than Los Angeles County as a whole. Yet the growth is not expected to occur uniformly throughout the Corridor. Although the highest number of households are within a half-mile of proposed station locations at 1st/Boyle and 1st/Soto, the largest rates of housing development are expected to occur in less-populated areas close to the Central Business District, around Union Station and 1st/Alameda. By 2020, the area surrounding the 1st/Alameda Station is projected to surpass 1st/Soto as the area along the light rail alignment containing the greatest number of housing units.

Currently, the demand for housing in the study area exceeds the supply. Less than four percent of total units are vacant. As in many low-income communities, average household size is greater than the countywide average. Nearly 75 percent of housing units in the Corridor are rentals, compared with 52 percent for the County as a whole. Home ownership is particularly rare in the segment between Union Station and 1st/Boyle. Less than 12 percent of households own their home. The median value of houses in the study area is approximately half the value of those countywide (refer to Table 4.3-1 in the Land Acquisition/Displacement section). Although housing values increase in the eastern portion of the Corridor, they still do not approach the median value of housing in the County. Rental prices are also less expensive in the Corridor than in the County and do not vary substantially throughout the Corridor.

4.4.1.5 Neighborhoods

The study area traverses or is adjacent to several districts or communities as defined by the City and County of Los Angeles in their adopted community plan areas. The identified communities included Central City and Central City North located west of the Los Angeles River; the Boyle Heights community located east of the Los Angeles River to the Los Angeles City and County boundary at Indiana Street; and the East Los Angeles community located east of Indiana Street to about one-quarter mile east of Beverly and Atlantic Boulevards under Option A or to just west of Pomona and Atlantic Boulevards under Option B (refer to Figure 4.1-1).

FIGURE 4.4-4
ZERO CAR HOUSEHOLDS

Central City

Central City is the generic term used to identify the greater downtown community planning area composed of several distinct sub-districts of which the Civic Center, Little Tokyo community, and Central City East sub-districts abut the proposed LRT alignment on the west side of Alameda Street. The Civic Center sub-district includes the El Pueblo State Historic Park, the birthplace of the City of Los Angeles, located just north of the Hollywood Freeway and west of Alameda Street and Union Station. Olvera Street, which was enhanced as a Mexican marketplace in 1932, contains 13 historic structures dating from 1818 to 1926. Over the past ten years, the El Pueblo area has undergone considerable improvements including seismic retrofit, building restoration, and public improvements. South of the Hollywood Freeway to First Street is the concentration of City, County, and Federal buildings that comprise the downtown Civic Center.

The Little Tokyo community, which lies west of Alameda Street between 1st and 3rd Streets, was the primary location for Japanese immigrants at the beginning of the 21st century. The population that resides in the Little Tokyo community is primarily minority (80%) with approximately one-half considered low income. Most residents (70%) do not own automobiles and are heavily dependent on public transportation. The Little Tokyo Redevelopment Project served as a catalyst for community revitalization (refer to Section 4.1, *Land Use and Development*).

Central City North

Central City North, which extends from Alameda Street east to the Los Angeles River, is one of the City's oldest industrial areas. This area has remained largely industrial with some large vacant parcels, public support facilities for the Department of Water and Power and the Los Angeles Unified School District, and some Little Tokyo related facilities such as temples, mortuary, and the Maryknoll School.

Boyle Heights

Boyle Heights, encompassing approximately six square miles between the Los Angeles River and Indiana Street, served as a primary port of entry for Molokan Russians, Jews, Armenians, Chinese, Japanese, and Mexican peoples around 1900. Today the ethnic composition of the community is primarily Hispanic. A range of 23% to 42% of existing families are considered low income; about 27% are transit dependent; and a range of 22% to 38% do not own an automobile.

The 1940's and 1950's saw the introduction and construction of four public housing projects in Boyle Heights. In total they represented 1,800 apartment units and over 11,000 residents. Over the past 20 years, a variety of revitalization programs have been implemented to address the physical deterioration of existing structures. Some of these are on-going such as the housing rehabilitation program administered through the Community Redevelopment Agency; the former Commercial Area Revitalization Program along Cesar Chavez Avenue; the Los Angeles Neighborhood Initiative Program along 1st Street; and the current Urban Revitalization Demonstration Program of the greater Pico-Aliso public housing project. More recently, in 1999, the City of Los Angeles adopted the Adelante Eastside Redevelopment Project (refer to Section 4.1, Land Use and Development).

East Los Angeles

The unincorporated East Los Angeles community is approximately eight square miles in size located between Indiana Street on the west and the incorporated cities of Monterey Park and Montebello on the east. Although East Los Angeles abuts the Boyle Heights community and presently shares similar social and demographic characteristics, its historical context is very different. The housing boom of the 1920's

generated the development of East Los Angeles, which was largely settled by persons of European background, particularly in the area between 3rd Street on the north and Whittier Boulevard on the south.

Current demographics indicate that approximately 95% of the population is minority and predominantly of Mexican descent in the East Los Angeles community. About one-quarter of the families are considered low income. Over the past 20 years, very few efforts have been attempted to address the need of rehabilitating the existing housing stock in East Los Angeles, although some new affordable housing and senior citizen housing has been developed, as have public improvements, including streetscape enhancements, including the famous Whittier Archway and Latino Walk of Fame along the commercial Corridor of Whittier Boulevard. In the near future, a major revitalization effort is also scheduled for the East Los Angeles Civic Center complex at 3rd Street and Mednik Avenue.

4.4.2 Methodology for Impact Evaluation

The assessment of potential community/neighborhood impacts focuses on the following issues:

- The effect of the alternatives on the relationship of neighborhoods within the study area and the region;
- The effect of the alternatives within the neighborhoods; and
- The effect of the alternatives on the immediate vicinity of the station locations.

An impact would be considered significant under CEQA if an alternative induced substantial growth, if it would displace a large number of residents or businesses, or if it would substantially alter the location, distribution, density, or growth rate of population of an area in a manner inconsistent with public policy. Disruption of neighborhood access or isolation of a portion of a neighborhood from the remainder of the neighborhood would also constitute a significant impact. Impacts could be temporary (produced during construction) or long-term (produced by light rail operation).

The demographic information utilized in this analysis is based on the 1990 Census data since this is the most recent data available. A Geographic Information System (GIS) was used to collect and map data by census block for the entire study area as well as for areas within a half-mile of the stations. The analysis considers the number of persons served within a half-mile of each of the individual station areas. Where station areas are located less than one mile apart, the individual station data includes double counting where the half-mile radii of each station overlap. The total of persons served has been adjusted to account for the overlap and does not double-count.

In addition to total population and population density, data was collected for minority and low-income populations and on numbers of zero-car households. The latter criterion is reflective of the extent of transit-dependence within the Corridor. The percentages for the County for these statistics were also used as a comparison to determine areas of high concentrations of such workers and zero-car households within the study area. Housing characteristics, such as average household size, vacancy rate, and percent owner-occupied, were also compared with countywide data.

Staff at the U.S. Census Bureau was consulted to determine the appropriate definition for poverty status. They indicated that the statistic, "Ratio of Income in 1989 to Poverty Level" should be used. This statistic was derived by the Census by testing the income of each household against the appropriate poverty threshold (48 thresholds were used based on household size and number of members under 18 years) to determine the poverty status of that household. Several ranges of ratios are reported. All households below a ratio of 1.0 are considered to be in poverty. Note that 1989 income was used since it was the last full year prior to the 1990 Census. Using this statistic, it was determined that low-income households

account for 11.9 percent of the households within the County. Therefore, any locations within the study area with higher percentages than the County's were considered low-income areas.

4.4.3 Impacts

4.4.3.1 No-Build Alternative

The No-Build Alternative would not induce growth nor would it displace or substantially alter the distribution of the population in the study area. Neighborhood cohesion and access also would not be affected. However, the No-Build Alternative would not offer study area residents enhanced mobility, regional connectivity, and accessibility provided by the LRT Build Alternative.

4.4.3.2 LRT Build Alternative

Option A

Regional and Corridor Population and Demographics

Projected growth (2020) for the Corridor is anticipated to increase at a somewhat slower pace (25 percent) than for Los Angeles County (38 percent). The growth is expected to occur with or without the implementation of the light rail line. By permitting infill development that is compatible with the surrounding communities (as established in local community plans), the number of new businesses and residences that could be accommodated at station locations would not be expected to substantially increase the population or alter its distribution in the study area. Therefore, no growth-inducing or adverse cumulative impacts are anticipated. The degree to which the projected population and housing growth would be accommodated at LRT stations is discussed in Section 4.1, Land Use and Development. The effect of project-related housing displacement on the Corridor housing stock is described in Section 4.3, *Land Acquisition/Displacement*.

Corridor Socio-Economic Characteristics

The Corridor is populated primarily by minority residents, most of whom live within walking distance of the proposed light rail stations (refer to Table 4.4-3). Over 6,000 low-income households, most without automobiles, are within one-half mile of the stations. The LRT Build Alternative would provide new transit connections and increased mobility for these transit-dependent residents. Light rail would produce beneficial impacts on the community without substantially altering the existing socio-economic characteristics of the Corridor. No adverse impacts are expected.

Corridor Housing Characteristics

Construction of new housing is expected to occur in the Corridor with or without the implementation of light rail. Since the Corridor east of the Los Angeles River is essentially built-out, new development would occur on vacant parcels or in redevelopment areas. City and County of Los Angeles land use and economic development policies could promote transit-oriented development and encourage new housing to be constructed around light rail stations (refer to Section 4.1, *Land Use and Development*). The new development would not substantially alter the density or character of the neighborhood. Although the placement of stations may influence the market for surrounding commercial and residential property, the LRT Build Alternative by itself is not expected to sufficiently change market and other conditions necessary to cause significant changes in neighborhoods under CEQA.

Neighborhoods

By fostering a closer linkage among East Los Angeles communities, the light rail line may serve to unify and enhance the cohesiveness of study area neighborhoods that were previously divided by construction of the freeway system. Study area businesses would benefit from improved access for their patrons and could market their goods and services to a larger area. Community facilities may also capture a larger service area because of the light rail line. Beneficial cumulative impacts may result from other transportation and transit projects planned for the region.

Adverse impacts on neighborhood traffic and pedestrian circulation and curb parking, described in Chapter 3, can be mitigated with the exception of several traffic intersections as discussed in that chapter. The noise and vibration analysis concludes that ground-borne noise and vibration impacts on many residences and businesses immediately adjacent to the alignment will be created by light rail operation. Under Option A, a total of 12 buildings will be severely impacted by noise from the locations of the special trackwork, six structures will be affected by ground-borne noise, and 35 buildings will be affected by ground-borne vibration impacts. In addition, wheel squeal from tight radius trackwork has the potential for causing severe impacts on 11 residences as well as a planned hotel and condominium complex. Under Option A, 18 residential units, 20 active businesses, one vacant commercial building, and two outdoor advertising signs will be displaced. A partial take of one business is also planned.

Significance of Impacts

Option A would produce beneficial mobility impacts for the community, especially for transit-dependent populations. However, neighborhoods would be subjected to traffic, parking, pedestrian circulation, noise, vibration, displacement, and historic resource impacts that are significant.

Option B

The impacts on regional and Corridor population demographics and Corridor socio-economic and housing characteristics are the same as Option A. With regard to impacts on neighborhoods, the impacts will be the same as those described for Option A, with the exception of noise and vibration and displacement impacts. Under Option B, the same numbers of buildings will be impacted by wayside, wheel squeal, and ground-borne noise as Option A. However, a total of 27 structures, instead of 35 structures as in Option A, will be affected by ground-borne vibration impacts. Nine fewer single and two-family residences would be affected than under Option A. However, one additional building (Kaiser Clinic) would be affected by vibration under Option B. With Option B, 18 residential units, 20 active businesses, one vacant commercial building, and two outdoor advertising signs will be displaced. A partial take of one business is also planned. The total numbers of acquisitions are the same as Option A. The exception is that Option B requires the acquisition of one more business along Indiana Street and one less business at Beverly/Atlantic than Option A. The significance of the impacts is also the same as Option A.

4.4.4 Mitigation

The mitigation measures for both build Options A and B are essentially the same. Accordingly, measures for both options will be discussed jointly as the LRT Build Alternative. For a complete list of mitigation measures that relate to the aforementioned transportation, pedestrian circulation, noise/vibration, displacement, and cultural resource impacts that may affect study area neighborhoods, refer to the respective technical analyses in Chapters 3 and 4. Note also that enhancements to station interface through alternative routing for pedestrians that allow completion of access to the station and to destinations in the immediate vicinity of the station will be identified through the Community Linkages Study that is being funded by MTA to enhance the LRT project. As part of this study, MTA will work

with the community to identify access improvements to the LRT project that may include additional pedestrian linkages, urban design enhancements, way-finding methods, bicycle enhancements, traffic management tools, park-and-ride, and other facilities that will enhance access and interface of the LRT project beyond the immediate station areas and beyond levels required by ADA and as required by the State of California and local jurisdictions. The recommendations of the study will be implemented through coordination between MTA, the City of Los Angeles, and the County of Los Angeles. The study will also include identification of preferred connections to bus services in the immediate vicinity of the rail station.

4.4.4.1 Significance of Impacts Remaining after Mitigation

One impact on neighborhoods, worsening of conditions at several traffic intersections cannot be mitigated. In addition, while sound insulating those buildings that are severely impacted by noise will mitigate interior noise levels, this form of mitigation will not affect or reduce the exterior noise. All other potential impacts (i.e., transportation, pedestrian circulation, other noise/vibration, displacement, and cultural resources) on neighborhoods resulting from the operation of the LRT Build Alternative can be mitigated to a level that is less than significant.

4.5 EQUITY AND ENVIRONMENTAL JUSTICE CONSIDERATIONS

4.5.1 Affected Environment

4.5.1.1 Introduction

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President Clinton on February 11, 1994, requires that federal agencies consider and address disproportionately high adverse environmental effects of proposed federal projects on the health and environment of minority and low-income populations to the greatest extent practicable by law. The Executive Order requires that each federal agency shall:

- Make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations (Subsection 1-101);
- Conduct its programs, policies and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying person (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies and activities because of their race, color or national origin (Subsection 2-2); and
- Work to ensure that public documents, notices, and hearings relating to human health or the environment are concise, understandable, and readily accessible to the public {Subsection 5-5(c)].

The U.S. Department of Transportation has issued guidance on complying with Executive Order 12898 during the environmental review process. In addition to complying with the Executive Order, the Department of Transportation is committed to Title VI of the Civil Rights Act, which provides that no person in the United States shall, on the grounds of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance.[4]

On April 21, 1997, President Clinton signed Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, which directs federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children. Health and safety risks are defined as risks that are attributable to products or substances that a child is likely to come in contact with or ingest. Although no guidelines have been published to date, this environmental document has evaluated the anticipated impacts by comparing the presence of children in the study area to the presence in the county at large and by looking at impacts of the alternatives that may disproportionately affect concentrations of children in the study area.

Executive Orders 12898 and 13045 as well as guidance from the U.S. Department of Transportation encourages wherever possible the use of existing requirements and procedures to accomplish the goals of the Executive Orders. The Environmental Justice analysis presented in this document uses the aforementioned guidelines in accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) framework. The analysis identifies the beneficial and adverse impacts on minority and low-income populations in the Los Angeles Eastside Corridor if the LRT Build Alternative were implemented. In accordance with the provisions of Subsection 5-5 (c) of Executive Order 12898, a discussion and identification of the public involvement activities that have

[4] Federal Highway Administration, Federal Transit Administration, Interim Region 9 Guidance: *Addressing Environmental Justice in the Environmental Impact Statement*; May 9, 1997.

fostered and encouraged input from minority and low-income communities in the formulation and analysis of corridor alternatives is also included.

FTA will make the final determination whether adverse impacts fall disproportionately on minority and low-income populations. FTA will make this determination after having reviewed the Final SEIS/SEIR, the alternatives considered, public comments and testimony, and the public involvement process itself. If adverse impacts of the project fall disproportionately on minority and low-income populations, additional mitigation measures beyond those already identified may be required. If strategies cannot be taken to adequately minimize these impacts, then selection of an alternative with less adverse impacts may need to be considered.

The Environmental Justice analysis and the FTA determination for this project do not reduce or diminish previous commitments made by the Los Angeles County Metropolitan Transportation Authority (MTA) to redress grievances submitted by the Bus Riders Union to the U.S District Court for the Central District of California. The Consent Decree, ordered by the Court in October 1996, identified specific actions to be taken by MTA over a ten-year period to improve transit quality and maintain fare levels (with the exception of Consumer Price Index adjustments) for the transit dependent population in Los Angeles County. Specific actions, such as the purchase and placement of new buses on overcrowded routes, establishment of new routes, and the improvement of passenger amenities, will continue as authorized in the Consent Decree. The MTA has already added substantial new bus service in response to the Consent Decree. There currently is a dispute between the parties to the Consent Decree as to the exact amount of service required, and this dispute will be resolved by the courts. The MTA is prepared to implement such new service as is ultimately ordered by the courts regardless of whether the MTA moves forward with the construction of the Eastside Light Rail Project. Nothing in the Consent Decree limits the ability of the MTA to construct new rail lines. To the contrary, the Consent Decree specifically states "Capital improvement and programming for MTA shall include attention to all modes of transportation."

4.5.1.2 Study Area Demographics

Of the total study area population of 103,289, 96.7 percent of the population living in the Corridor according to the 1990 U.S. Census data is considered minority (refer to Table 4.4-3 in Section 4.4, Communities/Neighborhoods). Minorities include all people of the following origins: Black; American Indian, Eskimo, or Aleut; Asian or Pacific Islander; other races; White Hispanic; Black Hispanic; American Indian, Eskimo, or Aleut Hispanic; Asian or Pacific Islander Hispanic; and other race Hispanic. People of Hispanic origin are the largest minority living within the study area. With the exception of areas west and south of the proposed 1st/Alameda Station and areas to the east and north of 3rd/Eastern, the high proportion of minorities occurs throughout the study area.

In the study area, 25.8 percent of total households were below the poverty level, compared with 11.9 percent for the county as a whole. With the exception of four scattered pockets in Boyle Heights (near 1st/State, 1st/Soto, 1st/Evergreen, and 3rd/Lorena), and three small areas in East Los Angeles (3rd/Downey, 1st/Eastern, and Atlantic south of Beverly), the distribution of low income households in the study area is consistently well above the countywide average.

An indicator often used to determine extent of transit dependence is the number of zero-car households, or occupied housing units with no available vehicles. Within the study area, 30.1 percent of households do not have access to a car, compared with 11.2 percent for the county as a whole (refer to Table 4.4-3 in Section 4.4). The lack of access to automobiles increases to 50 to 100 percent of all households in sections of the Central City and Boyle Heights neighborhoods and also one section in East Los Angeles.

4.5.1.3 Major Issues of the Eastside Communities

After World War II, the Boyle Heights and East Los Angeles communities were subjected to 30 years of freeway construction as a result of implementing the current regional freeway network. Five freeways traverse these communities, mostly through residential areas, resulting in impacts on neighborhood cohesiveness, pedestrian and traffic circulation impacts, visual, and noise impacts on nearby residences, schools, parks, and other public facilities. In addition, the area has been exposed to increases in automobile and truck traffic due to the location of freeway on- and off-ramps and the East Los Angeles freeway interchange.

It has been estimated that about 2,900 housing units were removed and 10,000 persons were displaced as a result of the freeway construction in the Boyle Heights community alone. Because the freeways were built prior to enactment of NEPA and CEQA, no environmental impact documentation was prepared for any of these freeway projects. Current provisions for relocation benefits to displaced persons were non-existent. These issues are of major concern to both current and former residents of the Boyle Heights and East Los Angeles communities, who bore the burden of the major transportation investments without receiving the benefits of improved mobility and enhanced regional connections.

4.5.1.4 Public Involvement Program

Opportunities for public participation in the Los Angeles Eastside Corridor Study have been provided by the MTA since the initiation of the study in July 1999. A series of community meetings have been held within the affected neighborhoods of Boyle Heights, East Los Angeles, Montebello, and Pico Rivera. These meetings occurred at locations most accessible to area residents, including the Resurrection Parish Hall, Saint Alphonsus School Auditorium, Centro Maravilla Community Service Center, Boyle Heights Senior Center, and the Montebello Council Chambers. The meetings had interpreters available, as needed, to translate the proceedings into Spanish.

Initially, three community scoping meetings were held in August and September 1999 at locations in Boyle Heights, East Los Angeles, and Montebello. About 70 people attended the meeting in East Los Angeles. Over 100 persons attended each of the other two meetings. The purpose of the scoping meetings was to solicit input regarding the range of alternatives and transit modes being considered, the study area, and major social, economic, or environmental issues related to the alternatives.

A second round of public meetings was held in October 1999 in Boyle Heights, East Los Angeles, and along Whittier Boulevard in the East Los Angeles commercial core district. Approximately 60 persons attended the meeting in Boyle Heights, 35 persons attended the meeting in East Los Angeles, and 50 persons attended the meeting on Whittier Boulevard. The purpose was to discuss the narrowed list of eight build alternatives and station locations being considered in the Re-Evaluation/MIS document and to solicit additional public input. Focus meetings were held in the City of Montebello and the City of Pico Rivera the third week of November 1999 to discuss the alternative routes and the impacts along their commercial corridors.

A third round of public meetings was convened in early January 2000. The meetings were held in Boyle Heights, Little Tokyo Arts District, East Los Angeles, and Montebello. The purpose was to present the findings of the comparison of the alternatives and to again solicit public input prior to the presentation of the findings to the MTA Board of Directors and their selection of a preferred alternative(s) to be carried forward for further evaluation. Since January 2000, additional community meetings have been held in various parts of the Corridor. In early 2001, three public hearings were held during circulation of the Draft SEIS/SEIR as follows: 1) on March 29 at the Japanese American National Museum (100 attendees);

2) on April 4 at Roosevelt High School (150 attendees); and 3) on April 5 at Garfield High School (140 attendees).

One of the primary committees whose role is to inform MTA of the important issues and concerns of the Eastside communities related to the planning, design, construction, and operation of the transit project is the Review Advisory Committee (RAC). The RAC, which was originally formed during the initial planning phase of the suspended Red Line project, is comprised of local residents, business owners, elected official representatives, and community organizations. It has met on a monthly basis to discuss the progress of the study and to request input from its members and attending community members.

In addition, focus meetings have also been held with individual community groups and organizations as well as with elected officials at various times since the inception of this study. Local churches, Chambers of Commerce, the Little Tokyo Service Center, and various community groups have helped to distribute over 67,000 flyers. In order to reach minority communities, flyers, project fact sheets, and meeting announcements have been published in Spanish. A complete list of community and agency meetings and the number of people attending is presented in Chapter 6.

4.5.2 Methodology for Impact Evaluation

For this evaluation, definitions of minority and low-income areas were established based on guidance provided by the Council on Environmental Quality (CEQ). CEQ's *Environmental Justice Guidance Under the National Environmental Policy Act*, December 10, 1997, states, "Minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis." The CEQ further states that "The selection of the appropriate unit of geographic analysis may be a governing body's jurisdiction, a neighborhood, a census tract, or other similar unit that is chosen so as to not artificially dilute or inflate the affected minority population."

For this analysis, Los Angeles County was selected as the unit of geographic analysis for comparison. The U.S. Census Bureau provided the definition of minority populations to be used to identify locations within the study area with higher percentages of minority populations than the County's (refer to Section 4.5.1.2, *Study Area Demographics*). Staff at the Census Bureau advised use of the statistic, "Ratio of Income in 1989 to Poverty Level" to indicate low-income populations. This statistic was derived by testing the income of each household against the appropriate poverty threshold (48 thresholds were used based on household size and number of members under 18 years) to determine the poverty status of that household. All households below a ratio of 1.0 were considered to be in poverty. Using this statistic, it was determined that low-income households account for 11.9 percent of the households within the County. Locations within the study area with higher percentages of low-income households than the County's were considered low-income areas. Data was also collected on numbers of zero-car households, an indicator of the transit dependent population in the Corridor.

In determining whether a project will have "disproportionately high adverse environmental effects," a number of factors were considered including its potential adverse impacts; mitigation and enhancement measures that will be incorporated into the project; and off-setting benefits. Adverse impacts were examined in these critical areas: 1) property acquisition and displacements; 2) transportation; 3) air quality; 4) noise and vibration; 5) community facilities/parklands; 6) hazardous materials; and 7) construction impacts. To estimate the extent of the benefits derived from the LRT Build Alternative, the following criteria were employed:

- Equity
- Daily transit trips/mobility
- Travel time savings
- Regional connectivity
- Economic revitalization
- Employment opportunities

Equity was examined by comparing regional transportation investments with the benefits of those investments relative to the study area. To assess transit mobility, regional connectivity, and accessibility, computer modeling was used to estimate the daily person trips, transit trips, and transit mode share within the Corridor for 2020, the planning horizon year. The results for the LRT Build Alternative were compared with the No-Build Alternative. Although these measures apply to the entire Corridor, they can also be used as an indicator of transit mobility and accessibility within minority and low-income areas since much of the Corridor fits these definitions. Land use data as well as economic and fiscal projections were examined to determine the potential for economic revitalization and increased employment resulting from the LRT Build Alternative.

In accordance with Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, a determination of whether the potential for contact with hazardous products or substances used in the construction or operation of the LRT Build Alternative or whether other impacts would disproportionately affect children in the study area was made.

The evaluation summarizes the beneficial and adverse impacts for the LRT Build Alternative, including the efforts to date to solicit input from the public in considering the alternatives. A preliminary determination whether adverse impacts will fall disproportionately on minority and low-income populations is made at the end of the evaluation. After reviewing the Final SEIS/SEIR, FTA will decide if they concur with this determination.

4.5.3 Potential Beneficial Impacts

4.5.3.1 No-Build Alternative

The No-Build Alternative would not offer study area residents enhanced mobility, regional connectivity, and accessibility provided by the LRT Build Alternative.

4.5.3.2 LRT Build Alternative

Option A

Equity

Indicators of transit dependence, such as low-income households and zero-auto households, are nearly three times higher in the Corridor than for Los Angeles County as a whole. The need for and reliance on transit has not been balanced by regional public transportation investments that would benefit this transit dependent community. For example, MTA rail services extend to Western Avenue and to North Hollywood, to Norwalk and El Segundo, to Long Beach and ultimately to Pasadena. Metrolink serves suburban destinations in all directions. Yet, no major investment in transit service, either bus or rail, has been made in the Eastside Corridor. A concerted effort to extend the Metro Red Line to the Corridor was suspended in 1998. In addition, the Corridor has borne the disproportionate effects of a regional freeway system that has cut through its neighborhoods to reach suburban destinations. Implementing LRT service

in the Corridor would help restore the balance of regional capital transportation expenditures as well as compensate for the adverse impacts that previous transportation planning decisions have caused.

Mobility/Transit Travel Times/Regional Connectivity

Option A of the LRT Build Alternative, which includes the additional bus system improvements, is expected to increase the number of daily transit trips in the region by 25,000 compared with the No-Build Alternative and will reduce travel times. Travel times between the Corridor and major travel destinations, such as Hollywood, Wilshire Boulevard, Downtown Los Angeles, and Pasadena, would decrease with Option A of the LRT Build Alternative. For two representative trip origins in the Corridor, 1st/Soto and 3rd/Mednik, travel times for Option A could be reduced by as much as 16 percent over the No-Build Alternative (Table 4.5-1). This increase indicates the value of quality transit service in attracting riders. It also indicates that light rail service offers improved access for area residents to local destinations as well as to the regional rail and bus system and, therefore, to regional destinations. The LRT Build Alternative also would serve many educational and community centers in the Corridor, enhancing mobility for young adults and school age children.

TABLE 4.5-1
REGIONAL TRANSIT TRAVEL TIMES (IN MINUTES) FROM SELECTED ORIGINS IN THE EASTSIDE CORRIDOR

Trip Origin	Hollywood/Highland		Wilshire/ Fairfax		1st/Hill		Fair Oaks/Colorado	
	No-Build	LRT Option A	No-Build	LRT Option A	No-Build	LRT Option A	No-Build	LRT Option A
1st/Soto	62	53	70	60	26	25	67	55
3rd/Mednik	67	60	75	67	39	32	47	45

Economic Revitalization

Option A includes eight new stations as well as the current Union Station. With proper incentives and with favorable market conditions, developers may consider the merits of constructing housing and commercial developments that are oriented to the light rail stations and that take advantage of the new light rail service. Station areas that have vacant land resulting from right-of-way acquisition for the suspended Metro Red Line project or for the construction of the LRT Build Alternative can be developed, in accordance with City and County of Los Angeles planning and redevelopment policies, Community Plans, and the MTA Joint Development Policy, to benefit the surrounding neighborhoods. In a Corridor that has an extremely low vacancy rate and a great demand for affordable housing, such development could provide needed housing and space for retail and social service uses. The new development could offer larger units for families with children, helping to meet a dire need in the community. In addition, landscape treatments along the light rail line could enhance the urban design of the community, making opportunities for development more attractive.

Employment Opportunities

Option A is anticipated to generate approximately 47,000 new construction jobs and, within the first 14 years of operation, over 1,000 permanent jobs to operate and maintain the LRT line. In addition, MTA is formulating a local hiring policy for the construction and operational related job opportunities for the Corridor. Such a program will include resources for job development and training. MTA currently offers a series of programs designed to encourage minority and women-owned businesses to participate in the

construction and operation of new transportation projects. More information on employment benefits generated by Option A is provided in Section 4.2.

Option B

The impacts of Option B are the same as those described for Option A with the exception that Option B will generate 28,000 more daily transit trips in the region compared to the No-Build Alternative. This represents about 3,000 more trips than Option A would provide.

4.5.4 Adverse Impacts and Mitigation Measures

4.5.4.1 No-Build Alternative

The No-Build Alternative would maintain the existing transportation system in the Corridor and, as a result, would not address the transportation deficiencies experienced by area residents or correct the imbalance of transit expenditures that have benefited other portions of the region without providing similar improvements in the Corridor. In addition, the No-Build Alternative could not compensate for the burdens imposed on the area by the construction of the regional freeway and railroad systems that traverse the Corridor.

4.5.4.2 LRT Build Alternative

The LRT Build Alternative would produce construction and operation impacts throughout the Corridor. Because the transportation improvements are being done in a largely minority and low-income area, the construction and operation impacts will fall almost exclusively on Corridor residents. Construction and operation impacts on children would have the greatest likelihood to occur at schools during daytime hours. Key impacts of concern include residential displacements, traffic circulation and pedestrian safety, noise, vibration, parklands, hazardous materials, and air quality. The impacts and associated mitigation measures for these areas are described below for each option.

Option A

Acquisitions and Displacements

Construction of light rail facilities and acquisition of property for construction staging areas would displace 72 residents and 20 active businesses for Option A. The displacements, although not extensive, represent affordable housing units and businesses that are often neighborhood establishments serving the local population. The displacements would fall largely on low income and minority residents. Federal and state statutes require the agency responsible for the displacements to finance acceptable, equivalent replacement housing and business relocation. However, the low vacancy rate in the study area and the limited availability of affordable replacement housing has prompted MTA to provide additional assistance (See Section 4.3.4). MTA will be formulating a local employment policy for construction and operations-related job opportunities in the Corridor. Such a program will include resources for job development and training and will be made available to persons unable to find a new job as a result of the business relocations.

Traffic Circulation and Pedestrian Safety

Adverse impacts on neighborhood traffic and pedestrian circulation and curb parking, described in Chapter 3, can be mitigated with the exception of the worsening of traffic conditions at several traffic intersections. Refer to Chapter 3.0, *Transportation*, and Sections 4.14.4, *Safety and Security*, and 4.16.4,

Community Facilities/Parklands, for mitigation measures that relate to traffic, parking, and pedestrian circulation impacts.

Construction activities would temporarily interfere with normal traffic flow, causing some lanes and streets to be closed to vehicles for various durations of time. However, these temporary lane closures are not expected to restrict access to schools located along or near 1st Street. There will be temporary curb parking restrictions along Indiana Street by Ramona High School. Although most temporary construction-related impacts can be mitigated, certain locations may experience traffic experience traffic and parking impacts that cannot be fully mitigated (refer to Section 4.19.2, *Construction Period Impacts and Mitigation*).

Noise and Vibration

At-grade and subway operations are not expected to generate noise and vibration impacts on schools or other community facilities except for moderate noise impacts are expected at Evergreen Cemetery and the Los Angeles Music and Art School. Vibration impacts are anticipated at the LA Music and Art School due to the location of special trackwork nearby. Since these facilities are regional, the impacts would not necessarily fall primarily on minority or low-income residents or children. For moderate noise impacts, mitigation is recommended when deemed cost-effective and feasible. Noise mitigation for moderately impacted buildings is normally in the form of sound-absorptive trackside noise barriers. However, trackside noise barriers, such as sound walls, etc., are not reasonable or feasible for this project since the LRT alignment runs in the street when it is at grade. Trackside noise barriers in the street would interfere with traffic and pedestrian movements. Severe noise impacts are anticipated at 12 receptors due to the proximity of special trackwork, which includes switches, crossover diamonds, and turnouts. The use of wayside noise barriers is not feasible as previously discussed. Therefore, those buildings that are projected to be severely impacted will be sound insulated to reduce the interior noise levels from the train operations and mitigate interior noise impacts. Exterior noise levels will not be mitigated with this form of mitigation. The sound insulation will use the Housing and Urban Development interior Ldn=45 dBA as the reference value for noise reduction. All occupied spaces within severely impacted buildings will be provided with sound insulation to achieve an interior noise level of Ldn=45 dBA or lower. In addition, wheel squeal from tight radius trackwork has the potential for causing severe impacts on 11 residences as well as a planned hotel and condominium complex. Dry-stick friction modifiers or wayside lubrication will be applied if necessary before the start of revenue service to reduce potential wheel squeal impacts. If the wheel squeal remains after these measures are implemented, then those buildings will also be sound insulated. A variety of vibration mitigation measures are available, as discussed in Section 4.8, that will fully mitigate the vibration impacts on the LA Music and Art School during operations. Construction activities may also produce temporary noise and vibration impacts on facilities located adjacent to the alignment. Section 4.19.2.7 presents mitigation measures that will be taken to minimize adverse impacts.

Parklands

Ornamental streetlights are present in the Mariachi Plaza area. Removal of these poles would result in a significant visual impact. Curb parking displaced at the portal location on 1st Street adjacent to Pecan Park would not affect access to the park since excess parking capacity exists along the streets surrounding the park. Similarly, access to parks would not be affected by the temporary traffic, bus, and pedestrian reroutings or the closure of Pleasant Avenue that borders the plaza on the north. Parklands bordering the proposed alignment, such as Pecan Park and Belvedere Park, may undergo temporary noise, vibration, visual, air quality, and circulation impacts due to construction activities. The use of Mariachi Plaza would be temporarily disrupted by excavation and finishing work on the eastern end of the plaza for the 1st/Boyle subway station. However, the gazebo and adjacent area on the western portion of this facility would remain intact throughout construction. The amount of differential settlement from the tunneling is

not expected to cause structural or architectural damage to facilities at Pecan and Belvedere Parks or Mariachi Plaza. The parkland impacts would fall primarily on minority and low-income residents in the Boyle Heights community. Refer to Sections 4.15.4, *Historic/Archaeological/Paleontological Resources*, and 4.16.4, *Community Facilities/Parklands*, for mitigation measures that relate to the aforementioned impacts.

Air Quality

Temporary air quality impacts may be generated by construction activities that would fall largely on area residents. Refer to Section 4.19.2.6, *Air Quality*, for appropriate mitigation measures.

Hazardous Materials

Hazardous materials may be present in construction areas, including tunnel segments and staging areas. Standard procedures for addressing the storage and removal of hazardous materials from construction areas would prevent local residents, particularly children, from being exposed to or ingesting hazardous materials. Standard procedures for safe storage and transportation of hazardous materials are presented in Section 4.10, *Hazardous Materials.*

Option B

The traffic circulation and pedestrian safety, air quality, and potential for hazardous materials contamination impacts as well as impacts on parklands are similar to that described under Option A. The differences for the other impact categories are presented below.

Acquisitions and Displacements

Under Option B, 72 residents and 20 active businesses, the same number as under Option A, would be displaced. In addition, Ramona High School would be displaced and need to be reconstructed or relocated. MTA will provide funding to LAUSD to either purchase a new school site (whether with a new or existing building) acceptable to LAUSD or to reconstruct the school at its present location. It is not feasible for MTA to analyze the impacts of this proposed school replacement at this time because LAUSD has not undertaken any programmatic planning for the new school and the timing, location, and extent of work required to undertake this replacement are unknown. MTA staff has conferred with LAUSD staff, and LAUSD has agreed that, upon its completion of programmatic planning and identification of potential new sites, LAUSD will conduct all required environmental studies as a condition to its determination of whether to relocate or reconstruct the school. Because of the indeterminate nature of the school project, it is beyond the scope of the analysis for the Eastside Corridor Project. However, MTA will monitor LAUSD progress with regard to Ramona High School decision-making and will work with LAUSD to address any conflicts which may arise between LAUSD's Ramona High School and MTA's Eastside Corridor project.

Noise and Vibration

The long term and short term noise and vibration impacts associated with Option B are the same as Option A except for vibration impacts and moderate noise impacts expected at the Kaiser Medical Center on Pomona Boulevard. As stated for Option A, trackside noise barriers are not feasible for this project since the LRT alignment runs in the street when it is at grade. Trackside noise barriers in the street would interfere with traffic and pedestrian movements. As discussed under Option A, mitigation measures are available to fully mitigate the adverse vibration impacts.

4.5.5 Conclusion

Adverse impacts from either Options A or B would fall primarily on low income and minority populations since they represent the primary population groups residing in the Corridor. The potential long-term impacts for Options A and B could be mitigated with the exception of traffic impacts at 12 intersections for Option A and 10 for Option B. In addition, while the interior noise levels for those buildings that are severely impacted by noise can be mitigated with sound insulation, this type of mitigation is not effective in reducing exterior noise levels. Although most temporary construction-related impacts can be mitigated, certain locations may experience traffic, parking, noise, and vibration impacts that cannot be fully mitigated.

In view of the considerable project benefits and local support for implementing the LRT Build Alternative Options A or B, the impacts would not be disproportionate to the mobility, regional connectivity, equity, and economic gains either Option A or B could offer. In addition, the Eastside Corridor Project, with proper mitigation, would not increase the risk to children's health or safety that is attributable to products or substances that a child is likely to come in contact with or ingest. Public input related to project benefits and impacts has been solicited throughout the study, attracting over 1,000 community members at numerous public meetings held throughout the Corridor.

4.6 VISUAL AND AESTHETICS

4.6.1 Affected Environment

4.6.1.1 Regional Context

The Eastside Corridor is located in a dense urban area, with slightly rolling topography. The Los Angeles River divides the regional visual study area in two: west of the river, which includes Union Station, Central City, and Little Tokyo; and east of the river, which includes Boyle Heights and East Los Angeles. The numerous freeways that cross this area also tend to divide the area, especially the large "canyon" created by US 101 where it separates the Central City/Little Tokyo areas from the Union Station area.

4.6.1.2 Viewshed

The viewshed for the Eastside Corridor defines the actual study area for visual analysis. This viewshed answers the basic question of "from where would the project be visible?" In some areas, due to the rolling topography, there are wider areas visible, especially when looking down streets. An example of this is the long view available when looking west on 1st Street towards the Central Business District. Elsewhere, flat topography and existing development and landscaping narrow the views available to just those immediately adjacent to the roadway.

4.6.1.3 Applicable Policies

The City of Los Angeles *Citywide General Plan Framework* includes an Urban Form and Neighborhood Design chapter that encourages the incorporation of small-scaled public open spaces within transit-oriented development, both as plazas and small parks associated with transit stations, and as areas of public access in private joint development at transit stations. In addition, the *City of Los Angeles Land Use/Transportation Policy* provides the framework to guide future development around transit stations. The framework identifies prototypical stations that could be applicable to the LRT Build Alternative:

- **Major Urban Center Prototype** geared for an intensely developed urban area characterized typically by diverse land uses, high-rise buildings, high population density, automobile and pedestrian congestions, insufficiency of parks and open space, diverse social and demographic characteristics, buildings of varying age and physical condition, and intensive concentrations of employment; and
- **Neighborhood Center Prototype** suitable for commercial and residential mixed land uses characterized by commercial, educational, entertainment, or other activities that cater to the surrounding residential community.

Community plans in the study area with applicable urban design guidelines include:

- The *Central City Community Plan*, which focuses on three themes – preserving/enhancing open space; preserving and referencing historical heritage; and creating a pedestrian-friendly environment;
- The *Central City North Community Plan* includes an objective that encourages the preservation and enhancement of the varied and distinctive character of the community and its landmarks;
- The *Los Angeles Civic Center Shared Facilities and Enhancement Plan* includes streetscape and development standards applicable to the Central City area, which can be used to enhance the physical environment of the Civic Center;
- The *Boyle Heights Community Plan* states that the unique character of community streets should be maintained and enhanced by improved design characteristics such as street trees, landscaped median strips, traffic islands, and special paving; and

- The *East Los Angeles Community Plan* establishes a framework of goals, policies, and programs designed to provide guidance to those making decisions affecting the allocation of resources and the pattern, density, and character of development in East Los Angeles. The plan envisions a community that would remain substantially as it is today, but with objectionable uses removed from residential neighborhoods. The plan calls for community-wide standards that regulate the size, heights, location, density, and signage of structures and other uses.

The Los Angeles County Metropolitan Transportation Authority has a policy that recognizes that the inclusion of art in the design of public spaces creates a more inviting environment and contributes a positive experience for the system's riders. In concert with this policy, MTA has established the Public Art Program:

- To enhance the everyday act of commuting and expand the public experience of art through the commissioning of the highest-quality art in pubic spaces;
- To enrich the rail transit system for both residents and visitors by creating a unique visual identity for each station through works of art that contribute to a sense of community identity and pride;
- To heighten public awareness of the unique cultural and ethnic resources of the communities surrounding the stations;
- To foster the creation of a wide variety of visual art, conceived in any medium or material
- To foster the creation of art that is integrated into the design of each site and to foster collaborations between artists and architects in the creation of stations;
- To ensure the equitable distribution of commissions among artists of both genders, as well as among artists of diverse cultural heritage, and to express commitment to artists of diverse cultural heritage; and
- To express commitment to artists residing in California by restricting the program to California artists, with the exception of a limited number of international competitions.

4.6.1.4 Viewers

Different types of viewers have different perceptions of the visual environment. Perceptions vary with the familiarity, sense of ownership, and activity of the viewer. The viewers in the Eastside Corridor viewshed range from residents to office workers, and retail and industrial employees.

4.6.1.5 Visual Resources in the Corridor

Important visual resources include important views, places where visual quality is important to the use of the property, and recognized historical architecture. Below are the important visual resources within the Eastside Corridor viewshed (refer to Section 4.16, *Community Facilities/Parklands*, for Figures 4.16-1 and 4.16-2 that indicate the locations of these visual resources).

- Union Station
- Hompa Hongwanji Temple
- 1st Street Bridge over the Los Angeles River
- Pecan Park
- Mariachi Plaza
- Evergreen Cemetery
- Our Lady of Lourdes Catholic Church
- Calvary Cemetery
- Serbian Cemetery
- East Los Angeles Civic Center and Belvedere Park

Murals

Throughout the Eastside Corridor viewshed, there are numerous murals, painted on building facades and other structures. These murals are important visual resources commissioned by private businesses, public agencies, religious organizations, parents, and community groups, or self-sponsored by the artists themselves. Much of the wall art has been created since 1960. At least 250 murals are located in the neighborhoods of Boyle Heights, Lincoln Heights, City Terrace, and East Los Angeles.

Skyline Views

In the western portion of the Eastside Corridor viewshed, west of the Los Angeles River, there are views of the downtown skyline. East of the river, views of the skyline are limited to upper levels of buildings.

4.6.2 Methodology for Impact Evaluation

Visual analysis considers such existing conditions as the area that can view the LRT Build Alternative, the viewers within these areas, the quality of the existing visual environment, and policies from local jurisdictions applicable to the project site.

To analyze potential long-term (permanent) visual impacts, the physical changes that would be visible are considered. How these physical changes would affect the visual quality is also considered. The type of viewers and their sensitivity to these visual changes are then considered. Special attention is given to visual changes that would occur in the view of important visual resources, such as historic resources, cultural facilities, and important views. Compatibility with visual policies is also considered. For this analysis, the LRT Build Alternative is assumed to be compatible with policies that have been adopted or approved by MTA, unless project plans specifically demonstrate that the alternative is not compatible. Short-term (construction) impacts include those visual impacts that would only occur during the construction period, such as demolition, excavation, and construction staging.

For this analysis, significant visual impacts under CEQA would occur in the following circumstances:

- **Policy Impacts:** If the project would conflict with applicable policies related to vista protection, scenic resource protection, conflict with adopted design criteria, or conflict with other visual policies of local or regional agencies;
- **Important Visual Resources Impacts:** If the project would substantially alter or obstruct existing public views of important visual resources;
- **Impacts Affecting Use:** If the project would change the existing visual quality or character in such a way that use of adjacent land is adversely affected;
- **Light or Glare Impacts:** If the project would result in light or glare in the project vicinity in such a way that it causes a hazard or nuisance;
- **Shade or Shadow Impacts:** If the project would adversely affect uses of adjacent land by the introduction of shade or shadow patterns; or
- **Historical Resources Impacts:** If the project would result in indirect impacts on properties that are listed in the National Register of Historic Places or the state Office of Historic Preservation register.

4.6.3 Impacts

4.6.3.1 No-Build Alternative

There would be no impacts on visual resources under the No-Build Alternative because this alternative only includes improvements to the transportation network that have already been approved and funded. Since no new capital improvements would occur, this alternative would produce no changes to the visual environment within the study area.

4.6.3.2 LRT Build Alternative

Option A

Table 4.6-1 lists the physical changes that would be visible within the viewshed of Option A. Potential impacts are described below according to the type of change.

Aerial Structure

One aerial structure would be constructed to carry the LRT from the Union Station platform across US 101 towards Alameda Street. On the Union Station side, the visual impact would be minimal because the structure would be at a similar elevation to the existing platforms. To the motorists on US 101, viewing this structure would be similar to other nearby structures crossing the freeway. Viewed from industrial land, parking lots, and the jail to the south of the freeway, the structure would not be obtrusive. Therefore, the visual impact of the aerial structure would be less than significant.

Street Widening

Widening of Alameda Street would remove sidewalks, portions of parking lots, street trees and landscaping. A privacy wall protecting one parking lot/maintenance yard area would also be removed. It would also require removal of the service station in the southeast quadrant of the intersection of Alameda Street and Commercial Street. Sidewalks, privacy wall, and street trees/landscaping would be replaced. The visual impacts resulting from the removal and replacement would be minimal. In addition, removal of the service station would have a minimal visual impact in this commercial area.

Widening of 1st Street from Alameda to Vignes Streets would remove sidewalks, street trees and landscaping, including approximately four ficus trees in front of the parking lot for the Hompa Hongwanji Temple. Of particular note would be the removal of large mature street trees along the north side of 1st Street. These trees have created a nuisance due to overgrown roots creating a safety hazard. Smaller trees will be planted to replace them. Sidewalks and street trees/landscaping would be replaced. Viewers in this area, including the future users in the planned First Street South Plaza adjacent to First Street, are mostly commercial users. The visual impacts resulting from the removal and replacement would be minimal.

Street-level Trackwork and Overhead Catenary System

Tracks for the LRT would be installed in the existing streets, mostly within the center of the street (several streets in the project area historically had rail service in the center of the street). This trackwork would not result in visual impacts. The catenary system would have significant visual impacts in some locations, such as on the 1st Street Bridge, which has been determined to be eligible for the National

Register of Historic Places, and in narrow rights-of-way near residential areas. In these areas the visual clutter created by the wires and their supports would be significant.

TABLE 4.6-1
VISIBLE PHYSICAL CHANGES – OPTION A

Type of Change	Description	Location(s)
Aerial structure	1,000-foot-long structure approximately 25 feet high at highest point, including foundations, support columns, girders, and deck slabs.	• Near Union Station, crossing US 101
Street widening	Widening of street beyond current rights-of-way	• Alameda St. (would remove commercial building and landscaping on east side) • 1st St. between Alameda and Vignes Streets (would remove landscaping on north side)
Street-level trackwork; Overhead catenary system	Within streets for aboveground portions; generally requires conversion of one general-purpose lane in each direction; includes track bed, track slab, rail, fasteners, and infill concrete. Wires, support poles, brackets, and other components	• Alameda St., 1st St. west of Clarence St. • 1st St. east of Lorena St. • Indiana St., between 1st St. and 3rd St. • 3rd St., between Indiana St. and Beverly Blvd. • Beverly Blvd., between 3rd St. and Via Campo
Bridge Seismic Retrofit	Additional reinforced concrete infilling of bents and concrete cast-in-drilled-hole piles.	• 1st Street Viaduct
Portals	Entrances to underground sections; include a U-shaped trench with protective railing at the transition points from street-level to underground sections.	• 1st St., near Gless St. • 1st St., near Lorena St.
Street-level stations	High-floor, 270-foot-long platforms and station amenities, including canopies, fare-vending equipment, station furniture, ramps, landscaping, signage, crosswalks, lighting, etc.	• Alameda St. near 1st St. • 1st St. near Utah St. • 3rd St. near Rowan Ave. • 3rd St. near Mednik Ave. • Beverly Blvd. near Atlantic Blvd.
Subway station entrances	Includes elevators, escalators, stairs, landscaping, railing, signage, lighting, etc.	• 1st St. at Soto St., in southwest quadrant (would remove residences and commercial buildings)
U-section station	Station located in the portal; otherwise similar to street-level station.	• 1st St. near Lorena St.
Removal of parking	On-street parking would be removed and sidewalks made narrower.	• Indiana St.
New parking facilities	Replacement parking in areas of high utilization	• Replacement parking on 1st St. near Lorena St. • Replacement parking on Indiana St. (would remove commercial and residential structures) • Park-and-ride facility at Pomona and Atlantic Boulevards near Kaiser Hospital (would remove commercial and medical-office structures, and utilize Pep Boys parking lot)
Traction power substations	Electrical power substations, one-story enclosures on a concrete foundation, attached to electrical distribution lines (either aerially or underground), approximately 11 feet by 25 feet on a leveled site no smaller than 40 feet by 55 feet, with a perimeter fence at least 14 feet outside the enclosure.	• Within the MTA Maintenance Yard, north of First Street Viaduct • Near the 1st/Soto Station (would remove commercial building) • Near 1st St./Lorena St. intersection (on vacant property) • Near the SR-60/3rd St. interchange at Sunol Ave. (would remove vacant commercial building) • Near 3rd St./Arizona St. intersection (would remove auto sales business) • At northeast corner of Beverly Blvd./Atlantic Blvd. (would remove commercial building/parking lot)

Historically, the 1st Street Bridge carried an electrically powered rail system, which included overhead catenary wires. This system was removed approximately 35 years ago. Thus, to replace the catenary system on the bridge would not represent a significant impact to the historical nature of the bridge, but would add to the more recent urban clutter (including the existing overhead transmission lines), a significant impact. In addition, catenary wires in residential areas may add to the visual clutter of existing telephone, electrical, and cable television wires. This would be especially significant in narrow roadway areas with adjacent homes along Indiana Street and in some locations on 1st and 3rd Streets.

Bridge Seismic Retrofit

MTA has conducted additional seismic analysis of the 1st Street Bridge and found that the bridge does not meet Caltrans revised (1999) criteria for seismic design. The LRT project does not add significantly to the bridge loadings, and seismic retrofitting would otherwise be required by the City of Los Angeles Bureau of Engineering to bring it up to the current Caltrans criteria. In 1996, Caltrans and the City retrofitted the bridge to meet previous Caltrans standards. As a part of the retrofit, they added reinforced concrete infill to some of the openings in the bridge bents. To meet the new standards will require additional infill of the bents and construction of additional concrete cast-in-drilled-hole piles behind the original concrete abutments. The piles will not be visible following repair of the road surface. However, the additional infill will be visible to viewers underneath the bridge and in the nearby area. The infilling of the openings of the bents is a significant impact.

Portals

Portals are the locations where the LRT goes from above ground to underground. Because the portals take advantage of existing topographic changes, the extent of this U-section would be limited. Therefore, the portals would not result in significant visual impacts.

Street-level Stations

The street-level stations associated with Option A would generally result in minimal visual impacts. Most are located in commercial areas. Even for those with residential land uses nearby, the relatively open nature of the stations would prevent significant visual impacts. The 1st/Alameda Station would be located on the east side of Alameda Street, north of 1st Street. This location is directly across the street from the Japanese American National Museum and across Banning Street from the future Mangrove Estate 24-floor hotel. At this location, the overall open design of the street-level station would avoid significant visual impacts.

Subway Station Entrances

The 1st/Soto Station would be entered from an entrance at the southwest quadrant of the 1st/Soto Streets intersection. Several buildings at this urban intersection would be removed, including residences and businesses. One business in the southeast quadrant of this intersection would also be removed for vent structures. (As discussed below, a traction power substation would also be placed immediately to the west of the station plaza, removing another business located in a converted single-family residence.) This would represent a significant change in the dense urban character of this intersection, especially with the loss of sidewalk-side businesses in the southeast quadrant of 1st and Soto Streets, resulting in a significant visual impact.

U-section Station

The 1st/Lorena Station under Option A would be located within the eastern portal. At this location, the alignment would be along the north side of 1st Street. This would locate the station and the portal on the far side of the street from existing residential uses on the south side of 1st Street and against the retaining wall for Evergreen Cemetery on the north side of 1st Street. Visual impacts related to this station would be minimal due to this location.

Removal of Parking/Narrowing of Sidewalks

Under Option A, parking would be removed along Indiana Street and the sidewalk width would be reduced in order to accommodate the LRT. The removal of this parking alone would be a positive visual impact. Because alternative parking would be provided under Option A on the east side of Indiana Street, the adjacent land uses, especially the single-family residences, would remain usable and would not deteriorate. The reduction of sidewalk width in this area would be a visual impact because the area has a great deal of pedestrian traffic related to the residences, commercial and institutional land uses, and, especially, related to Ramona High School. (Refer to Chapter 3 for a discussion of impacts and mitigation for parking and pedestrian facilities.)

New Parking Facilities

On Indiana Street, replacement parking would be provided Under Option A by removing two commercial structures and two multi-family buildings on the east side of the street. This would potentially expose residences east of the new parking lot to view from Indiana Street and create new views from these residences of the street and parking lot. Currently these residential properties are separated from the adjacent commercial properties that would be displaced by boundary fencing or walls. These boundary fences/walls would be retained or replaced when the commercial properties are demolished and the parking lot is constructed. Therefore, visual impacts would be minimal. A park-and-ride facility at the eastern terminus near Kaiser Hospital would be provided and would displace four commercial and two medical-office buildings. Minimal visual impacts are anticipated at this area because the surrounding area is mainly commercial in nature. Elsewhere, proposed replacement parking would result in minimal physical changes and no significant visual impacts.

Traction Power Substation

Traction power substations would be used in the project to assist in electrical uses of the LRT. Substation equipment includes high-voltage switchgear, transformers, rectifiers, breakers, and other related equipment. All equipment would be covered in an approximate 11- by 25-foot building (or smaller) on a site no smaller than 40 feet by 55 feet, with a perimeter fence at least 14 feet outside the enclosure. Only the aboveground substations have the potential to result in visual impacts.

A substation would be located in the existing MTA maintenance yard near the 1st Street Bridge. Because the type of use – industrial-type service facility – would be similar to the surrounding uses on the property, and because it is generally not visible to sensitive viewers, this substation would not result in a significant visual impact. The substation near the 1st/Soto Station would require the removal of a commercial structure. This structure would be directly adjacent to the 1st/Soto Station, which would also remove several commercial structures. In combination with the removal of buildings for the station, this commercial neighborhood would undergo a significant visual transformation, from a dense, urban environment with sidewalk side businesses to an open plaza area set well back from the street. This represents a significant visual impact.

The substation proposed at 1st and Lorena Streets would be located on vacant property owned by MTA. Surrounding uses are commercial, residential, and the Evergreen Cemetery. The site is not visible from most of the cemetery because of elevation changes and landscaping. The cemetery embankment and landscaping also screens the site from most of the surrounding residential areas. Because the substation would not be visible to most sensitive viewers, no significant visual impact would occur. Another aboveground substation would be located on the small, triangular parcel of land bordered by 3rd Street on the south, SR-60 on the northwest, and Sunol Drive on the east. This site would be visible from the extreme northwest corner of Calvary Cemetery. Construction of a new building in place of the existing structure, which is not well maintained, would be a positive visual impact.

The substation at the intersection of 3rd and Arizona Streets would require the removal of an auto sales business. Surrounding land uses vary, but are mostly commercial. The substation would be similar to the current use and would be compatible with the surrounding development. Therefore, no significant visual impact would occur. Finally, there would be a substation located at the northeast corner of Beverly and Atlantic Boulevards. It would require the removal of a commercial property and parking lot. This area is entirely commercial. Due to the surrounding commercial land uses and the lack of sensitive viewers, this substation location would not result in a significant visual impact.

Visual Impacts on Important Visual Resources

The physical changes to the visual and aesthetic environment of important visual resources in the study area are as follows:

- **Union Station** building and courtyards would be visually separated from the LRT platforms and would, therefore, not produce significant visual or aesthetic impacts on the historic station.
- **Hompa Hongwanji Temple** would have landscaping (about four ficus trees) removed from in front of their parking lot to allow street widening. Through coordination between the designers and the temple, the landscaping would be redesigned and replaced and would, therefore, no produce significant visual or aesthetic impacts on the temple.
- **1st Street Bridge** (refer to *Street-level Trackwork* and *Overhead Catenary System* and *Bridge Seismic Retrofit* discussions***).***
- **Pecan Park** would be adjacent to the western portal for the subway portion of the LRT Build Alternative. The portal would not result in significant visual impacts.
- **Mariachi Plaza** Ornamental streetlights are present in the Mariachi Plaza area. Removal of these poles would result in a significant visual impact.
- **Evergreen Cemetery** has large trees along the 1st Street side of the cemetery, and the trees would screen most of the views of the LRT catenary system, resulting in minimal visual impacts.
- **Our Lady of Lourdes Catholic Church** is set back from 3rd Street and a lawn in front of it. Because of this relatively spacious streetscape, there would be less than significant visual impacts related to placing the station and the catenary system within view of the church under any LRT option.
- **Calvary Cemetery** would border the LRT alignment and a substation on 3rd Street. The visual impacts related to the catenary system, trackwork, and substation would be relatively minor due to the distance of most viewers.
- **Serbian Cemetery** is partially screened from view from 3rd Street so that the impacts of the catenary system and trackwork would be minor.
- **East Los Angeles Civic Center and Belvedere Park** would have the catenary system, trackwork, and the 3rd/Mednik Station located immediately in front of the main Civic Center building. Although these physical changes would be visible from the grounds, the street is relatively wide and there is considerable open space on either side of the street. As a result, visual impacts on either facility would be less than significant.

Murals

None of the murals in the Eastside Corridor would be acquired for Option A, nor would they be blocked from view by project elements. Therefore, there would be no visual impacts on existing murals or public art.

Skyline Views

In the western end of the project, generally west of the Los Angeles River, there are views of the Los Angeles skyline. Because none of the structures proposed by Option A would block views of the skyline, visual impacts on these views would be minimal.

Consistency with Visual Resource Policies

Table 4.6-2 indicates whether Option A is consistent with the urban design policies of the appropriate local jurisdictions. As presented in the table, Option A would be consistent with applicable visual resource policies with appropriate mitigation.

Light, Glare, Shade, and Shadow

Option A would not add new light sources in areas that are currently dark. Generally, the areas through which this option would pass currently have street lights that are sufficient for visibility and safety. There would be new lighting in the vicinity of stations and station entrances, but these areas are not currently dark and the additional lighting would not change the overall lighting levels in the vicinity of the stations. In most areas, Option A would not result in headlight glare into sensitive uses because the guideway would be in the middle of the streets. However, guideway vehicles traveling west on 3rd Street and turning north on Indiana Street would shine their headlamps into the adjacent residential land uses. This would be a significant impact. The only major change to shade and shadows would occur where the elevated structure crosses US 101, near Union Station. This would be a minor impact because the motorist that would view this shadow would only do so momentarily, while passing under it on the freeway.

Graffiti

The project would introduce surfaces that could potentially be subjected to vandalism, specifically graffiti. The most susceptible surfaces would be those at the subway portals, the enclosures for the street-level stations, aboveground and underground surfaces associated with the subway stations, and the traction power substation enclosures. Graffiti on these surfaces can not only detract from the visual appearance of the transit facilities, but also contribute to a general decline of the surrounding properties.

Significance of Impacts

Most visual impacts resulting from implementation of the Option A would be part of the urban landscape and would not significantly alter views or change the visual landscape. However, significant visual impacts would be expected on the 1st Street Bridge, Mariachi Plaza, 1st/Soto, and along Indiana Street (due to narrowing of sidewalk widths and light glare from the light rail vehicle at night for residences on Indiana Street near 3rd Street).

TABLE 4.6-2
CONSISTENCY WITH VISUAL POLICIES

Agency	Policy	Consistent? Yes/No	Comments
City of Los Angeles (citywide)	Area around transit stations should be designed to support commercial/residential development to support that transit system (*Citywide General Plan Framework*).	Yes	The LRT Build Alternative would be designed to allow nearby development and to be visually compatible with surrounding development.
	Encourage incorporation of small-scaled public open spaces within transit-oriented development, both as plazas and small parks and as areas of public access in private joint development at transit stations (*Citywide General Plan Framework*).	Yes	The street-level stations would not utilize new right-of-way, so they would neither provide nor preclude use of adjacent areas for open space/recreational space. There is existing open space or vacant land available for use as open space/recreation at the Union Station, 1st/Alameda Station, and 1st/Lorena Station. The 1st/Boyle Station would create new "open space" by removing an existing building and constructing a subway entrance plaza.
City of Los Angeles (citywide) and MTA	Create pedestrian-oriented environment in context of an enhanced urban environment (*Land Use/Transportation Policy*).	No (Yes, with mitigation proposed in Section 4.6.4)[1]	Pedestrian environment would be affected in several locations, including along Indiana Street and in the Soto Street area.
	Develop and apply urban design standards to ensure the development of a high-quality and safe and secure urban environment (*Land Use/Transportation Policy*).	Unknown (Yes, with mitigation proposed in Section 4.6.4)[1]	Mitigation proposed in Section 4.6.4 will make the project consistent.
	Provide open space and recreational space around transit station areas (*Land Use/Transportation Policy*).	Yes	See discussion of open space around transit stations above.
	Reflect the unique cultural and physical identity of each community (*Land Use/Transportation Policy*).	Unknown (Yes, with mitigation proposed in Section 4.6.4)[1]	Mitigation proposed in Section 4.6.4 will make the project consistent.
	Urban design guidelines for transit stations, including landscaping, public art, enhanced pedestrian environment, adequate walkway widths, set-asides for public open space, and conservation of historic character and structures (*Land Use/Transportation Policy*).	Unknown (Yes, with mitigation proposed in Section 4.6.4)[1]	Mitigation proposed in Section 4.6.4 will make the project consistent.
	Transit Station Area Prototypes are offered to guide development of Major Urban Center Transit Stations and Neighborhood Center Transit Stations (*Land Use/Transportation Policy*).	Unknown (Yes, with mitigation proposed in Section 4.6.4)[1]	Mitigation proposed in Section 4.6.4 will make the project consistent.
City of Los Angeles (Central City North)	Encourage the preservation and enhancement of varied and distinctive character of the community and its landmarks (*Central City North Community Plan*).	Yes	The LRT Build Alternative would not result in visual impacts within the Central City North community.

TABLE 4.6-2 (continued)
CONSISTENCY WITH VISUAL POLICIES

Agency	Policy	Consistent? Yes/No	Comments
City of Los Angeles (Central City)	Improve Central City's competitiveness as location for offices, business, retail, industry by maintaining safe, clean, attractive, and lively environment (*Central City Community Plan*).	Yes	The LRT Build Alternative would not result in visual impacts within the Central City community.
	Numerous policies related to improving the pedestrian environment. (*Central City Community Plan*).	Yes	Pedestrian environment would not be significantly affected in the Central City area.
	Establish urban design guidelines and set up preservation priorities that strike a balance between historic preservation and new development (*Central City Community Plan*).	Yes	The LRT Build Alternative would not result in impacts on historic resources in the Center City community.
City of Los Angeles (Boyle Heights)	It is the city's policy that the unique character of community streets should be maintained and enhanced by improved design characteristics such as street trees, landscaped median strips, traffic islands, and special paving (*Boyle Heights Community Plan*).	No (Yes, with mitigation proposed in Section 4.6.4)[1]	The placement of the guideway in the center lanes of 1st Street would preclude landscape medians and traffic islands.
County of Los Angeles (East LA)	Retain the single-family residential lifestyle of the community (*East Los Angeles Community Plan*).	Yes	The LRT Build Alternative would not affect adjacent land uses. For the most part, stations are located within existing commercial or institutional land use areas.
	Encourage high standards of development and improve aesthetics qualities of the community (*East Los Angeles Community Plan*).	Unknown (Yes, with mitigation proposed in Section 4.6.4)[1]	Mitigation proposed in Section 4.6.4 will make the project consistent.
	Maintain and enhance the quality of healthy and stable residential neighborhoods (*East Los Angeles Community Plan*).	Yes	The LRT Build Alternative would not affect adjacent land uses. For the most part, stations are located within existing commercial or institutional land use areas.
	Provide new development that is compatible with and complements existing uses (*East Los Angeles Community Plan*).	Unknown (Yes, with mitigation proposed in Section 4.6.4)[1]	Mitigation proposed in Section 4.6.4 will make the project consistent.
	Improve the image of the major corridors by use of landscaping, lighting, graphics, and/or other streetscape treatments (*East Los Angeles Community Plan*).	Unknown (Yes, with mitigation proposed in Section 4.6.4)[1]	Mitigation proposed in Section 4.6.4 will make the project consistent.
Los Angeles County MTA	Required allocation of 0.5 percent of construction cost for creation of original art works.	Yes	This required MTA program will be incorporated into the project.

[1]Per mitigation detailed in Section 4.6.4, MTA will create station-specific conceptual master plans that will include landscaping and artwork consistent with the surrounding neighborhood character. The development of the plans will be conducted with substantive community input. MTA's design guidelines for transit stations, including landscaping, public art, enhanced pedestrian environment, adequate walkway widths, set-asides for public open space, and conservation of historical character and structures will be implemented and will ensure a safe and secure urban environment. It is MTA's intent to ensure that the project would be designed with consideration of various local agencies' visual resource policies.

Option B

Table 4.6-3 lists the physical changes that would be visible within the viewshed of Option B. The impacts of the aerial structure near Union Station, street level trackwork and overhead catenary system, 1st Street Bridge seismic retrofit, portals, subway station entrances, graffiti, and light, glare, shade, and shadow would be the same as described for Option A, with the exception that the potential glare of the light rail vehicle headlamps along Indiana Street under Option B would be reduced because the LRT would be further from the residences on the west side of the street. In addition, visual impacts on important visual resources, murals, and skyline views would be the same as Option A. Like Option A, Option B would be consistent with applicable visual resource policies with appropriate mitigation. The major differences between the options are discussed below.

Street Widening

The impacts of widening Alameda and 1st Streets would be the same as described for Option A. However, the widening of Indiana Street to maintain one through travel lane in each direction and parking on each side of the street under Option B would result in the removal of all the businesses, residences, and the high school on the east side of the street. (Ramona High School would either be rebuilt on-site as a multi-story structure or moved to another location.) Removal of all of these structures would result in a significant change in the character of the street. Currently, it is a relatively narrow, busy area, with a combination of land uses. The Option B physical changes would create a very open streetscape, with the back of properties to the east set back at some distance from the edge of the street. These properties, which are currently screened from view from Indiana Street, would be more open to view from the street, screened partially by the boundary fences and walls. In addition, the visual anchor of the street, Ramona High School, would either be moved out of the neighborhood or would be rebuilt as a taller structure. The combination of all of these physical changes could affect adjacent land uses and would result in a significant visual impact.

Street-level Stations

The visual impacts related to the 1st/Alameda, 1st/Utah, and 3rd/Mednik Stations would be the same as those discussed for Option A. Under Option B, a station would be located along Indiana Street, on the property of Ramona High School, which would either be moved or rebuilt as a multi-story structure. The station by itself would not result in significant visual impacts, but in combination with the street widening and removal of commercial and residential structures, along with the relocation or rebuilding of the high school, significant visual impacts would occur. The 3rd/Ford Station associated with Option B would be located in the center of 3rd Street in an area with a popular restaurant on the south side and a large parking lot on the north side. Because this area is primarily commercial, and because the street cross section is relatively wide at this location, visual impacts would be less than significant. The Pomona/Atlantic Station under Option B is in a commercial area, and the street cross section is relatively wide. On either side of Pomona Boulevard, the commercial uses are generally set back from the street behind parking lots or do not face Pomona Boulevard. Therefore, the location of a station on Pomona Boulevard would result in minimal visual impacts.

New Parking Facilities

The visual impacts of the planned parking facilities would be the same as those described under Option A, with the exception that no replacement facilities would be needed along Indiana Street under Option B since this option maintains the current on-street parking.

TABLE 4.6-3
VISIBLE PHYSICAL CHANGES – OPTION B

Type of Change	Description	Location(s)
Aerial structure	1,000-foot-long structure approximately 25 feet high at highest point, including foundations, support columns, girders, and deck slabs.	• Near Union Station, crossing US 101
Street widening	Widening of street beyond current rights-of-way	• Alameda St. (would require removal of existing service station and landscaping on east side) • 1st St. between Alameda and Vignes Streets (would require removal of landscaping on north side) • Indiana Street (would require removal of businesses, residences, and high school; school would be relocated elsewhere or rebuilt on remainder property)
Street-level trackwork; Overhead catenary system	Within streets for aboveground portions; generally requires conversion of one general-purpose lane in each direction; includes track bed, track slab, rail, fasteners, and infill concrete. Wires, support poles, brackets, and other components	• Alameda St., 1st St. west of Clarence St. • 1st St. east of Lorena St. • Indiana St., between 1st St. and 3rd St. • 3rd St., between Indiana St. and Beverly Blvd. • Pomona Blvd., between 3rd St. and Atlantic Blvd.
Bridge Seismic Retrofit	Additional reinforced concrete infilling of bents and concrete cast-in-drilled-hole piles.	• 1st Street Viaduct
Portals	Entrances to underground sections; include a U-shaped trench with protective railing at the transition points from street-level to underground sections.	• 1st St., near Gless St. • 1st St., near Lorena St.
Street-level stations	High-floor, 270-foot-long platforms and station amenities, including canopies, fare-vending equipment, station furniture, ramps, landscaping, signage, crosswalks, lighting, etc.	• Alameda St. near 1st St. • 1st St. near Utah St. • Off Indiana St. near 3rd St., on Ramona High School property • 3rd St. near Ford Blvd. • 3rd St. near Mednik Ave. • Pomona Blvd. near Atlantic Blvd.
Subway station entrances	Includes elevators, escalators, stairs, landscaping, railing, signage, lighting, etc.	• 1st St. at Soto St. (existing residences/businesses to be removed)
New parking facilities	Park-and-ride surface lot to be build near eastern terminus and Pomona/Atlantic Station Replacement parking in areas of high utilization	• Replacement parking on 1st St. near Lorena St. • Park-and-ride facility at Pomona and Atlantic Boulevards near Kaiser Hospital (would remove commercial and medical-office structures)
Traction power substations	Electrical power substations, one-story enclosures on a concrete foundation, attached to electrical distribution lines (either aerially or underground), approximately 11 feet by 25 feet on a leveled site no smaller than 40 feet by 55 feet, with a perimeter fence at least 14 feet outside the enclosure.	• Within the MTA Maintenance Yard, north of First Street Viaduct • Near the 1st/Soto Station (would remove commercial building) • Near 1st St./Lorena St. intersection (on vacant property) • Near the SR-60/3rd St. interchange at Sunol Ave. (would remove vacant commercial building) • Near 3rd St./Arizona St. intersection (would remove auto sales business) • Northwest corner of Pomona Blvd./Atlantic Blvd. (as part of park-and-ride facility)

Traction Power Substations

The impacts of these substations would be the same as that discussed under Option A, except that no substation would be provided at Beverly/Atlantic. Instead, the substation would be provided at the northwest corner of Pomona/Atlantic Boulevards at the site of the planned park-and-ride facility. Minimal visual impacts are anticipated because the area is mainly commercial.

Significance of Impacts

Most visual impacts resulting from implementation of Option B would be part of the urban landscape and would not significantly alter views or change the visual landscape. However, significant visual impacts would be expected on the 1st Street Bridge, Mariachi Plaza, 1st/Soto, and along Indiana Street (due to removal of buildings on the east side of the street and potential light glare from the light rail vehicle at night for residences on Indiana Street near 3rd Street).

4.6.4 Mitigation

4.6.4.1 Option A

1st Street Bridge

Significant visual impacts would result from the placement of the catenary system, including supports and catenary wires, on the historic 1st Street Bridge. Span wire cannot be used due to objections of the LA Bureau of Street Lighting and the potential impacts to the historical resource from replacement of the existing light standards with new standards incorporating the catenary supports that would require intense structural reconfiguration of the bridge. Mitigation previously proposed in the Draft SEIS/SEIR is not possible. Coordinating with the utility providers to consolidate wiring, where possible; compliance with the Metro Art Program and MTA's design guidelines; and designing the catenary supports in a manner compatible with the historic character of the bridge will help to reduce impacts. However, even with these measures, the impacts related to visual clutter on the First Street Viaduct, specifically the placement of poles to support the catenary system in the center of the bridge, cannot be fully mitigated. A significant visual impact would remain. To mitigate the infilling of the openings in some of the bents underneath the bridge required for the seismic retrofit, the infill concrete will be tinted to match the color of the existing infill that was previously done in the mid 1990s by the City. In addition to mitigate the historic features of the bridge, MTA, in consultation with the State Historic Preservation Office and the National Park Service, will record the bridge according to Historic American Engineering Record (HAER) standards and will provide opportunities for public interpretation as discussed in Section 4.15, *Historic/Archaeological/Paleontological Resources*.

Visual Clutter in Residential Areas

The catenary systems proposed in the Eastside Corridor require overhead wiring. Thus, to reduce visual clutter in narrow residential areas with visual clutter from existing wires, the project planner will work with utility providers to consolidate wiring or to underground wiring where possible. Although some clutter would remain, there would not be a net increase in the amount of clutter, thereby reducing impacts to less than significant.

Mariachi Plaza

Removal of the ornamental streetlights in the Mariachi Plaza area would result in a significant visual impact. These electroliers will be re-used or replaced with similar fixtures. If not re-used, the electroliers

will be returned to the Los Angeles Bureau of Street Lighting. The lighting measures discussed later in this section would prevent impacts related to lighting standards.

1st/Soto Station Area (including the traction power substation)

The pedestrian environment will be re-established at the 1st/Soto Station transit plaza so that the linear sidewalk element along 1st Street is re-created. This can be accomplished through the use of such edge elements as landscaping, street furniture, planters, etc., but the preferable method would be to re-establish a pedestrian-oriented commercial element into the plaza, either with permanent retail facilities or with portable commercial uses such as kiosks or carts. Incorporation of this mitigation into station plans will reduce visual impacts to less than significant.

Quality of Urban Environment Around Transit Stations

To ensure that a high-quality and safe and secure urban environment is provided in the transit station areas, MTA's urban design standards will be incorporated into the station-specific conceptual master plans, including landscaping and artwork consistent with the surrounding neighborhood character. MTA's design guidelines for transit stations, including landscaping, public art, enhanced pedestrian environment, adequate walkway widths, set-asides for public open space, and conservation of historical character and structures will be implemented. The Transit Station Area Prototypes will guide development of the transit stations. MTA is also funding a Community Linkages Study to enhance access and interface of the LRT project within and beyond the immediate station areas. Additional information about the study can be found in Section 4.4.4. This mitigation will reduce visual impacts at transit stations to less than significant.

Streetscapes

The *Boyle Heights Community Plan* calls for maintenance and improvement of streetscapes with such design elements as street trees, landscape median strips, traffic islands, and special paving. In addition, the *East Los Angeles Community Plan* includes a policy calling for improvement of the image of major corridors by use of landscaping, lighting, graphics, and/or other streetscape treatments. Although some of these elements would be precluded by the project (such as median treatments), other street elements can be used. MTA will replace any streetscape features removed by the project in the same or similar locations and will work with the City and County of Los Angeles so as not to preclude streetscape features except for the median treatments and to incorporate streetscape features into project plans, where applicable. This would reduce potential visual impacts to the street environments to less than significant.

Indiana Street Glare Impacts

To shield properties against glare from headlamps on Indiana Street, landscaping or other screening material will be planted in the path of the headlamps. This would reduce impacts to less than significant.

Lighting

Designs for lighting systems for pedestrians and park-and-ride facilities will comply with the City of Los Angeles standards and the *Land Use/Transportation Policy* (City of Los Angeles/MTA). In general, any street or pedestrian lighting improvements within the city of Los Angeles that create new assessments or increase existing assessments to property owners require the Proposition 218 process. This process not only requires community participation, but also public approval through a ballot process. Not all lighting improvements require the process. Lighting improvements associated with Option A will be reviewed for

eligibility by the City of Los Angeles prior to installation. The lighting assessment is paid by property owners through the county property tax.

Only full cut-off fixtures will be specified for all lighting improvements. Lighting levels will range from 2.0 to 2.5 foot-candles along the LRT alignment, with 3.0 to 4.0 foot-candles at intersections, and 1.0 to 2.0 foot-candles at sidewalks. Uniformity ratios will be in the range of 3:1 to 6:1. Lighting equipment and design of lighting systems will be closely evaluated in terms of added value to public lighting, including light trespass, light pollution, glare, equipment maintenance, equipment energy efficiency and others. This evaluation will be coordinated with and approved by the City and County of Los Angeles.

Metro Art Program

Public Art

As part of the process of designing the stations, artists will be hired to participate from the earliest stages of design. Reports that were prepared by Metro Art working with the Eastside Community Advisory Group will be presented to the design team. As needed, these will be updated and supplemented to reflect the new project area and impacted neighborhoods. These reports will assist the design team in adhering to FTA policy (Circular 9400.1A), which states:

> . . . To create facilities that are integral components of communities, information about the character, makeup, and history of the neighborhood should be developed and local residents and businesses could be involved in generating ideas for the project. . . .

A budget will be established for public art, which will be based on a percentage of the hard costs (construction costs) for the project. Again, as directed by the FTA (Circular 9400.1A), "Funds spent on the art component of the project should be appropriate to the overall costs of the transit project and adequate to have an impact. MTA's policy is to spend one half of one percent of hard costs on public art. FTA also recommends that the agency "provide adequate administrative and technical support."

Artwork and artist ideas will be presented as part of the overall design. Fabrication of art elements and their future conservation will be the responsibility of Metro Art. Metro Art will ensure that the community continues to participate and is educated about the artwork and design before, during, and after the construction process.

Design Excellence

Following policies established by FTA for design and art in transit projects (Circular 9400.1A), MTA commits to the idea that:

> . . . Good design and art can improve the appearance and safety of a facility, give vibrancy to its public spaces, and make patrons feel welcome. Good design and art will also contribute to the goal that transit facilities help to create livable communities. . . .

Graphics and Wayfinding

The quality of graphic signage and wayfinding within the system and within the adjacent neighborhood greatly affects the ease and comfort with which patrons will use the system. Station names, station identification, directional signage, logos, maps, and informational signage will adhere to the MTA Graphics Standards. The guiding principals for the standards are to simplify Metro signage systems in a

way that makes sense for patrons, using uniformity in text styles, a rational hierarchy of sign sizes, clear directional arrows, etc. Compliance with the Metro Art Program would result in a beneficial visual impact.

Graffiti Prevention

The following techniques will be used to prevent graffiti impacts within the project area:

- Project designers will take special consideration of graffiti prevention during project design, reducing as much as possible large, flat surfaces accessible to and viewable by the public.
- Where large, flat surfaces accessible to the public cannot be eliminated, special graffiti-resistant surfaces, such as highly textured surfaces, will be incorporated into the project design.
- Use of mural and other art will be incorporated into areas where there is high graffiti potential to discourage vandalism. Use of locally known and respected artists is often effective in discouraging graffiti. Murals will be coated with a sealer to allow later clean-up, should the artwork be vandalized by graffiti.
- Where there is a high potential for graffiti, security systems, such as closed-circuit monitoring, will be utilized to discourage graffiti and to facilitate apprehension of the vandals.
- If the Eastside Corridor facilities are subjected to graffiti, the maintenance staff will clean up the vandalism as rapidly as possible to discourage repeat occurrences.

The graffiti-prevention program discussed above would reduce graffiti impacts to less than significant.

Significance of Impacts Remaining After Mitigation

By applying the aforementioned mitigations, all visual impacts of Option A would be reduced to an insignificant level, with the exception of the 1st Street Bridge. There would be impacts remaining due to visual clutter from the catenary system. Compliance with the Metro Art Program would result in a beneficial impact.

4.6.4.2 Option B

The mitigation measures discussed for Option B will be the same as that described for Option A. However, additional mitigation for Indiana Street will be implemented due to the removal of residences and businesses on the east side of that street. Indiana Street will be designed to provide a visual asset to the remaining neighborhood rather than an adverse impact. The excess property will be landscaped to provide a linear plaza/park-like setting with sidewalks and street furniture. Landscaping will include trees and vines along the eastern edge of the corridor to screen the backyards and rear facades of the adjacent residences from view from Indiana Street. Striped crosswalks between the residential area west of Indiana Street and the landscaped corridor will be provided. The visual compatibility of Ramona High School, if it is rebuilt on the site as a multi-story structure, cannot be determined at this time and will be assessed in the environmental document for the school that the Los Angeles Unified School District (LAUSD) would prepare. If requested by LAUSD, MTA will coordinate the design of the proposed station at this location with the design of the high school, with the station and the landscaping providing a transition between the multi-story high school and the mostly single-story surrounding development. By providing a visual asset to the remaining neighborhood, visual impacts along Indiana Street will be reduced to less than significant. The visual impacts of the high school, if reconstructed on the site, will be assessed in a separate environmental document, prepared by LAUSD.

Significance of Impacts Remaining After Mitigation

By applying the aforementioned mitigations, all visual impacts of Option B would be reduced to an insignificant level, with the exception of the 1st Street Bridge. There would be impacts remaining due to visual clutter from the catenary system. Compliance with the Metro Art Program would result in a beneficial impact.

4.7 AIR QUALITY

4.7.1 Affected Environment

4.7.1.1 Regulatory Setting

Air quality in the United States is governed by the Federal Clean Air Act (CAA) and is administered by the United States Environmental Protection Agency (USEPA). In addition to being subject to the requirements of the CAA, air quality in California is also governed by the more stringent regulations under the California Clean Air Act (CCAA).

The CCAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain State Ambient Air Quality Standards. The CCAA is administered statewide by the California Air Resources Board (CARB). The State of California has also established ambient air quality standards, known as the California Ambient Air Quality Standard (CAAQS). These standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. California has established a statewide agency (CARB) to regulate mobile air pollution sources (such as motor vehicles). CARB also oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level. The CCAA is administered by CARB at the state level and by the Air Quality Management Districts at the regional level.

U.S. Environmental Protection Agency

The USEPA is responsible for establishing the national ambient air quality standards and enforcing the Clean Air Act. It also regulates emission sources under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The USEPA has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California.

California Air Resources Board

CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for ensuring implementation of the California Clean Air Act, meeting state requirements of the federal Clean Air Act, and establishing state ambient air quality standards. It is also responsible for setting emission standards for vehicles sold in California and for other emission sources such as consumer products and certain off-road equipment.

Nonattainment and State Implementation Plans

CARB will designate an area as non-attainment for a pollutant if air quality data show that a State standard for a pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard, and are not used as a basis for designating areas as non-attainment.

On the basis of regional monitoring data, the Los Angeles County portion of the South Coast Air Basin, also known as SCAB, (Figure 4.7-1) has been designated as a non-attainment area for ozone, carbon monoxide, and suspended particulates (PM_{10}), but is an attainment area for nitrogen oxide and sulfur dioxide.[5]

[5] California Air Resources Board: Proposed Amendments to the Designation Criteria and Amendments to the Area Designations for State Ambient

FIGURE 4.7-1
SOUTH COAST AIR BASIN

Air Quality Standards and Proposed Maps of the Area Designations for the State and National Ambient Air Quality Standards, August 1998.

Federal clean air laws require areas with unhealthy levels of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and inhaleable particulate matter to develop plans, known as State Implementation Plans (SIPs), describing how they will attain national ambient air quality standards (NAAQS). The 1990 amendments to the federal Clean Air Act set new deadlines for attainment based on the severity of the pollution problem and launched a comprehensive planning process for attaining the NAAQS.

Within the SCAB, SIPs were developed for ozone, PM_{10}, and carbon monoxide. The SCAB portion of the 1997 Ozone SIP was partially approved by the USEPA in January 1999. As a result of this partial approval and a lawsuit by three environmental groups, amendments to the 1997 Ozone SIP, which is referred to as the 1999 Amendments to the 1997 Ozone SIP, were adopted by the SCAQMD in December 1999. The 1999 Amendments were approved by the USEPA in 2000.

The USEPA has not acted on the PM_{10} SIP, and it is not certain if or when they will act on it. The USEPA conditionally approved the Carbon Monoxide SIP, pending changes to the California smog check program. However, these changes have not occurred, and it is uncertain when the Carbon Monoxide SIP will be completely approved by the USEPA.

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) was created by the 1977 Lewis Air Quality Management Act, which merged four county air pollution control agencies into one regional district to better address the issue of improving air quality in Southern California. Under the act, the SCAQMD is the agency principally responsible for comprehensive air pollution control in the Basin, including monitoring air quality and planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district.

The SCAQMD has jurisdiction over a 10,743 square mile area, commonly referred to as the South Coast Air Basin (SCAB). This area includes all of Orange County, Los Angeles County, except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County.

Air Quality Management Plan

Within the project area, the SCAQMD and the Southern California Association of Governments (SCAG) have responsibility for preparing the Air Quality Management Plan (AQMP), which addresses federal and state Clean Air Act requirements. The AQMP details goals, policies, and programs for improving air quality and establishes thresholds for daily operation emissions. Environmental review of individual projects within the region must demonstrate that daily construction and operational emissions thresholds as established by the SCAQMD would not be exceeded, nor would the number or severity of existing air quality violations.

In August of 1996 the SCAQMD submitted its AQMP to CARB for inclusion in the SIP. As mentioned earlier, the AQMP also meets CCAA requirements. The AQMP addressed CCAA requirements, which are intended to bring the SCAQMD into compliance with federal and state air quality standards. The AQMP focused on ozone and carbon monoxide emissions, which would be reduced through public education, vehicle and fuels management, transportation controls, indirect source controls, and stationary source controls programs.

The 1997 Draft Air Quality Management Plan, amended in 1999, has been prepared to reflect the requirements of the 1990 Clean Air Act Amendments and is consistent with the approaches taken in the 1994 AQMP. The Plan is expected to replace, in part or in whole, many of the proposed measures set

forth in the SIP and anticipates the attainment of all criteria pollutants by 2010. The overall control strategy for the 1997 AQMP was designed to meet applicable state and federal requirements and to demonstrate attainment with ambient air quality standards. The 1997 AQMP is the first plan required by federal law to demonstrate attainment of the federal PM_{10} ambient air quality standards and therefore, places a greater focus on PM_{10}.

National and State Ambient Air Quality Standards

As required by the Clean Air Act, National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: carbon monoxide, nitrogen oxides, ozone, particulate matter (PM_{10} and $PM_{2.5}$), sulfur oxides and lead. The State of California has also established ambient air quality standards, known as the California Ambient Air Quality Standards (CAAQS). These standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. The state and national standards are presented in Table 4.7-1. Because the CAAQS are more stringent than the NAAQS, they are used as the comparative standard in the analysis contained in this report.

4.7.1.2 Study Area Setting

Regional Setting and Climate

The SCAB is an area of high air pollution potential due to its climate and topography. The Basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. In addition, the mountains and hills within the area contribute to the variation of rainfall, temperature, and winds throughout the region. The region experiences frequent temperature inversions. Temperature inversions prevent air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, an upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. In addition, hydrocarbons and nitrogen dioxide react under strong sunlight, creating smog. Light, daytime winds, predominantly from the west, further aggravate the condition by driving the air pollutants inland, toward the mountains.

Pollutants and Effects

Air quality studies generally focus on five pollutants that are most commonly measured and regulated:

- **Carbon monoxide** (CO), a colorless gas, interferes with the transfer of oxygen to the brain. It is emitted by motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. Automobile exhausts release most of the CO in urban areas.
- **Ozone** (O_3), a colorless toxic gas, interferes with the transfer of oxygen to the brain. It forms in the atmosphere through a chemical reaction between reactive organic compounds and nitrogen oxides (NO_x), which are emitted from industrial sources and from automobiles. Substantial O_3 formation generally requires a stable atmosphere with strong sunlight.
- **Nitrogen Dioxide** (NO_2), a brownish gas, can cause breathing difficulties at high concentrations. It is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as nitrogen oxides (NO_x) and are major contributors to ozone formation.
- **Suspended Particulate Matter** (PM_{10}), refers to particulate matter less than 10 microns in diameter, about one/seventh the thickness of a human hair. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when industry and gases emitted from motor vehicles undergo

TABLE 4.7-1
STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	California Standard	Federal Standards	
			Primary	Secondary
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m^3)	0.12 ppm (235 µg/m^3)	Same as Primary Standard
	8 hour	--	0.08 ppm (157 µg/m^3	
Respirable Particulate Matter (PM_{10})	Annual Geometric Mean	30 µg/m^3	--	Same as Primary Standard
	24 hour	50 µg/m^3	150 µg/m^3	
	Annual Arithmetic Mean	--	50 µg/m^3	--
Fine Particulate Matter ($PM_{2.5}$)	24 hour	No Separate Standard	65 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean		15 µg/m^3	
Carbon Monoxide(CO)	8 hour	9.0 (10 mg/m3)	9.0 (10 mg/m3)	None
	1 hour	20 ppm (23 mg/m3)	35 ppm (40 mg/m3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	--	0.053 ppm (100 µg/m^3)	Same as Primary Standard
	1 hour	0.25 ppm (470 µg/m^3)	--	
Sulfur dioxide (SO_2)	Annual Arithmetic Mean	--	0.03 ppm (80 µg/m^3)	--
	24 hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	--
	3 hour	--	--	0.5 ppm (1300 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	--	--
Lead	30 day average	1.5 µg/m^3	--	--
	Calendar Quarter	--	1.5 µg/m^3	Same as Primary Standard
Visibility Reducing Particulates	8 hour (10 am to 6 pm, PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer - visibility of ten miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.	No Federal Standards	
Sulfates	24 hour	25 µg/m^3		
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)		

Source: California Air Resources Board, Federal and State Air Quality Standards 1999 (1/25/99)

chemical reactions in the atmosphere. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract.

- **Sulfur Oxides**, primarily sulfur dioxide (SO_2), which is an irritant gas that attacks the throat and lungs, is a product of high-sulfur fuel combustion. The main sources of SO_2 are coal and oil used in power stations, industry and for domestic heating. Industrial chemical manufacturing is another source of SO_2.

Local Setting

The SCAQMD monitors air quality conditions at 37 locations throughout the SCAB. For the purposes of this report, data from the Downtown Los Angeles and Pico Rivera monitoring stations were used to characterize existing conditions in the vicinity of the proposed project location, and to establish a baseline for estimating future conditions both with and without the proposed project. A summary of the data recorded at these stations is presented in Table 4.7-2 and graphically portrayed in Figure 4.7-2 for existing levels of carbon monoxide, ozone, and particulate matter.

TABLE 4.7-2
AIR QUALITY SUMMARY FOR STUDY AREA MONITORING STATIONS, 1998-2000

Pollutant	Federal and State Standard	Los Angeles-North Main Street			Pico Rivera		
		1998	1999	2000	1998	1999	2000
Carbon Monoxide (CO)	Maximum 8-hr concentration (ppm)	6.18	6.37	5.98	6.07	5.50	5.11
	Days > 9 ppm (federal 8-hr. standard)	0	0	0	0	0	0
	Days > 9 ppm (state 8-hr. standard)	0	0	0	0	0	0
Ozone (O^3)	Maximum 1-hr Concentration (ppm)	0.148	0.128	0.136	0.183	0.119	0.139
	Maximum 8-hr. Concentration (ppm)	0.111	0.108	0.103	0.120	0.098	0.114
	Days > 0.12 ppm (federal 1-hr. standard)	5	1	1	10	0	2
	Days > 0.08 ppm (federal 8-hr. standard)	9	2	4	12	2	4
	Days 0.09 ppm (state 1-hr. standard)	17	13	8	31	6	11
Nitrogen Dioxide (NO^2)	Maximum 1-hr Concentration (ppm)	0.170	0.212	0.152	0.140	0.155	0.150
	Days > 0.09 ppm (state 1-hr. standard)	0	0	0	0	0	0
Sulfur Dioxide (SO^2)	Maximum 24-hr Concentration (ppm)	0.006	0.010	0.007			
	Days > 0.14 ppm (federal 24-hr standard)	0	0	0	n/a	n/a	n/a
	Days > 0.05 ppm (state 24-hr. standard)	0	0	0			
Suspended Particulates (PM^{10})	Maximum 24-hr. concentration ($\mu g/m^3$)	80.0	88.0	80.0			
	Calculated > 150 $\mu g/m^3$ (federal 24-hr standard)	0	0	0	n/a	n/a	n/a
	Calculated > 50 $\mu g/m^3$ (state 24-hr standard)	66	114	90			

Note: n/a = pollutant not monitored

Source: California Air Quality Data Summaries 1998-2000, California Air Resources Board, www.arb.ca.gov/adam

Sensitive Receptors

The California Air Resources Board has identified children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases as the most likely to be affected by air pollution. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include hospitals, daycare facilities, elder care facilities, elementary schools, and parks.

FIGURE 4.7-2
CARBON MONOXIDE, OZONE, AND PARTICULATE MATTER LEVELS

4.7.2 Methodology for Impact Evaluation

4.7.2.1 Analysis Methodology

The following calculation methods and estimation models were utilized in ascertaining air quality impacts: SCAQMD construction emissions calculation formulas, the CARB Motor Vehicle Emission Inventory 7G (MVEI7G) emissions model, the Caltrans EMFAC emissions factor model, and the USEPA CAL3QHC dispersion model software. This air quality analysis is consistent with procedures described in the SCAQMD CEQA Handbook (1993 edition).

4.7.2.2 Impact Evaluation Criteria

A project would have a significant impact if its daily construction and/or operation emissions were to exceed significance thresholds for carbon monoxide (CO), reactive organic gas (ROG), nitrogen oxides (NO_X), sulfur oxides (SO_X) or particulates (PM_{10}) as established by the SCAQMD. Significance thresholds appear in Table 4.7-3. In addition, a project would have a significant impact if it were to cause any criteria pollutant concentration to exceed the (CAAQS) at any sensitive receptor location.

TABLE 4.7-3
SCAQMD DAILY EMISSIONS THRESHOLDS [1]

Criteria Pollutant	Construction	Operations
Carbon Monoxide (CO)	550	550
Reactive Organic Gas (ROG)	75	55
Nitrogen Dioxides (NO_X)	100	55
Sulfur Oxides (SO_X)	150	150
Particulates (PM_{10})	150	150

[1] Expressed in pounds per day. The LRT Build Alternative does not contain lead, hydrogen sulfide, or sulfate emissions sources; therefore, emissions and concentrations related to these pollutants were not analyzed in this report.
Source: South Coast Air Quality Management District

A Federal air quality standard for $PM_{2.5}$ was adopted in 1997. Presently, no methodologies for determining impacts relating to $PM_{2.5}$ have been developed. In addition, no strategies or mitigation programs for this pollutant have been developed or adopted by federal, state, or regional agencies. Currently, this standard is not enforceable, but may be reinstated in the future. Thus, this air quality analysis does not analyze $PM_{2.5}$.

4.7.2.3 Conformity Analysis

According to 40 CFR Part 93.102, conformity determinations are required for projects that require the approval, funding, or implementation of FHWA/FTA projects. The proposed project would be funded by the FTA and would be required to comply with the EPA Transportation Conformity Rule (40 CFR Part 93). A project-level conformity determination is required for the proposed project because it is a nonexempt project in a nonattainment area for CO and PM_{10}.

4.7.3 Impacts

4.7.3.1 No-Build Alternative

Burden Emissions

There is a direct relationship between vehicle miles of travel (VMT) and air pollution. In urbanized regions, such as the Los Angeles Metropolitan area, mobile emissions are the primary source of air pollution. A major transportation project that will increase or decrease regional VMT will also degrade or improve air quality within the transportation Corridor. Criteria pollutant emissions were estimated for the No-Build Alternative using estimated VMT and emission factor data.[6] Results, which are used as a baseline to compare with the LRT Build Alternative, are presented below in Table 4.7-4.

Carbon Monoxide Hot Spot Analysis

Within the urban setting, vehicle exhaust is the main source of CO. Therefore, the highest concentrations of CO are found within close proximity to busy intersections. To provide a worst-case simulation of CO concentrations within the study area, the CO concentration at sidewalk locations adjacent to 15 study intersections that operate at LOS E and F and, therefore, have a higher concentration of air pollutants were modeled and compared to ambient air quality standards. The analysis found that no CO concentrations are anticipated to exceed the State 1-hour or 8-hour standard of 20 ppm or 9 ppm, respectively, under the No-Build Alternative (more detailed information regarding this analysis can be found in the *Air Quality Technical Report*, MTA, Los Angeles, Ca., December, 2000).

4.7.3.2 LRT Build Alternative

Option A

Burden Emissions

Criteria pollutant emissions were estimated for Option A using estimated VMT and emission factor data.[7] Results are presented in Table 4.7-4. When compared to the No-Build Alternative, the annual regional VMT is anticipated to decrease by approximately 16 million under Option A, reducing CO and ROG by 57 tons and one ton per year, respectively. NO_X and PM_{10} emissions reductions would be negligible.

TABLE 4.7-4
CRITERIA POLLUTANT EMISSIONS COMPARISON

Project Alternative	Annual VMT (millions)			Criteria Pollutant Emissions (tons per year)			
	Passenger Vehicles	Urban Bus	Commuter Rail/Diesel	CO	NO_X	ROG	PM_{10}
No-Build	143,772	154.0	3.8	499,458	72,421	28,072	3,194
LRT (Options A and B)	143,755	155.3	3.8	499,401	72,421	26,071	3,194
Change	-17	+1.3	0	-57	0	-1	0

Source: Terry A. Hayes Associates

[6] Regional VMT for the No-Build and LRT Build Alternatives were estimated using the LACMTA transportation model.
[7] Regional VMT for the No-Build and LRT Build Alternatives were estimated using the LACMTA transportation model.

Emergency Burden Emissions

In the unlikely event of a subway fire (subway is designed for low flammability), emergency fans would emit toxic fumes in areas designed to be away from residents or other occupied spaces. Vent shafts are located in plazas and in one place (1st/Lorena) on the north side of 1st Street. During final design the ventilation shafts will be designed to ensure safe separation distances by use of landscaping, hard surfaces, or signage.

Carbon Monoxide Hot Spot Analysis

Carbon monoxide concentrations at the 15 study intersections were calculated using the USEPA CAL3QHC micro scale dispersion model. CO concentrations at each study intersection include future ambient one-hour and eight-hour CO concentrations of 4.5 ppm and 3.2 ppm respectively.[8] Table 4.7-5 compares the 1- and 8-hour CO concentrations at the 15 study intersections for the LRT Build Alternative (both options) and the No-Build Alternative. As shown in the table, implementation of the proposed project would incrementally increase CO concentrations over "no-build' conditions at two study intersections: Atlantic/Cesar Chavez and Atlantic/1st Street. The incremental increases in CO concentrations are primarily attributed to the increase in traffic at the two intersections. However, none of the study intersections are anticipated to exceed the State 1-hour or 8-hour CO standard of 20 ppm or 9 ppm, respectively.

TABLE 4.7-5
WORST-CASE CO CONCENTRATIONS – LRT BUILD ALTERNATIVE [1]

Intersection	1-Hour Concentration		8-Hour Concentration	
	No-Build	LRT Build (Options A or B)	No-Build	LRT Build (Options A or B)
Mednik/Cesar Chavez	6.7	6.7	4.7	4.7
Atlantic/Cesar Chavez	7.0	7.5	4.9	5.2
Alameda/Temple	6.8	6.6	4.8	4.6
Alameda/1st Street	7.5	7.1	5.2	5.0
Vignes/1st Street	6.0	5.8	4.2	4.1
Mission/1st Street	6.1	6.2	4.3	4.3
Lorena/1st Street	6.0	5.9	4.2	4.1
Indiana/1st Street	5.9	5.7	4.1	4.0
Atlantic/1st Street	6.7	7.3	4.7	5.1
Indiana/3rd Street	6.2	6.1	4.3	4.3
Eastern/3rd Street	6.6	6.4	4.6	4.5
Ford/3rd Street	6.5	6.2	4.5	4.3
Mednik/3rd Street	6.9	6.4	4.8	4.5
Atlantic/Pomona	7.0	7.1	4.9	5.0
Atlantic/Beverly	6.8	6.9	4.9	4.8
State Standard	20.0		9.0	

[1] Expressed in parts per million.
Note: Includes the background concentration of 4.5 ppm and 3.2 ppm for the 1- and 8-hour averaging period, respectively.
Source: Terry A. Hayes Associates

[8] Future ambient CO concentrations were calculated by applying the proportion of future CO emissions in the SCAB, as projected by the CARB, to the existing one- and eight-hour CO concentrations of 8.2 ppm and 5.8 ppm, respectively. Ambient CO concentrations were estimated using the methodology as discussed in the "Transportation Project-Level Carbon Monoxide Protocol" (Institute of Transportation Studies, University of California, Davis, May 1996). This document is the protocol for all projects that are subject to NEPA.

PM_{10} Hotspot Analysis

For the proposed project, diesel buses are the major source of PM_{10}. Areas within close proximity to transit stations experience increased concentrations of PM_{10} due to buses idling as passengers board or leave the buses. Eight transit stations are proposed for Option A. Based on headways assumed in the network and existing and planned bus routes, between 520 and 1,800 transit buses would travel to and from the eight transit stations daily depending on the specific LRT station. It should be noted that all of the transit buses operated by the MTA would be converted to compressed natural gas (CNG) by year 2004, and only buses that are used for contracted services with the MTA would be diesel. However, not all of the 150 diesel buses would operate within the proposed project area. For the purposes of analyzing the worst-case scenario, it is assumed that approximately 150 diesel buses would travel to and from each of the eight transit stations daily. PM_{10} concentrations at the transit stations were calculated using the USEPA SCREEN3 dispersion model. The transit station was modeled as an area source, rather than a point or volume source, since the idling of buses would occur within the transit station. It is assumed that the transit stations are approximately 270 feet in length and 50 feet in width, and sensitive receptors are approximately 5.2 feet in height. The emissions release height for the buses is estimated to be about ten feet, which is the approximate height of the exhaust. Additionally, to determine the highest ground level concentration of PM_{10}, all five stability classes and its associated wind speeds were examined.[9] PM_{10} concentrations were calculated from the edge of the transit stations to 500 feet of the transit stations, with distances increasing in increments of 25 feet.

Results of the modeling indicate that the highest concentration of PM_{10} would occur at a distance of approximately 150 feet from the edge of the transit stations. At this distance, the idling of diesel buses would incrementally increase PM_{10} concentrations by approximately 1.3 ug/m^3 over the existing ambient concentrations of 39.2 ug/m^3.[10] Thus, the introduction of additional diesel buses would result in a 24-hour average PM_{10} concentration of approximately 40.5 ug/m^3 at a distance of approximately 150 feet from each of the eight transit stations. This concentration is below the NAAQS of 150.0 ug/m^3. Since PM_{10} concentrations at the eight transit stations would not exceed the NAAQS, it is not likely that the idling of diesel buses at any of the transit stations would create significant PM_{10} impacts.

Significance of Impacts

Overall, as indicated in the burden emissions analysis, above, the proposed project would decrease VMT and, therefore, emissions reductions would be achieved in the Corridor. Small increases in localized concentrations of CO and PM_{10} are anticipated from Option A.

Option B

Burden emissions are a function of VMT, CO hotspots are a function of local intersection level of service (LOS), and PM_{10} hotspots are a function of the numbers of diesel buses serving the LRT stations. The project changes proposed under Option B would not materially change the regional VMT, local intersection LOS estimates, or the idling of buses at LRT stations predicted under Option A. Thus, there would be no material change in burden emissions under Option B.

[9] The SCREEN3 dispersion model examines five stability classes for urban settings. The stability classes range from A to E, where stability classes A, B, and C represent very unstable conditions and correspond to hot, calm days. Stability class D represents neutral conditions and corresponds to windy days. Stability class E represents very stable conditions and corresponds to days with low winds.
[10] The ambient PM_{10} concentration is defined by CARB as the annual geometric mean.

Significance of Impacts

Overall, as indicated in the burden emissions analysis, above, the proposed project would decrease VMT and, therefore, emissions reductions would be achieved in the Corridor. Small increases in localized concentrations of CO and PM_{10} are anticipated from Option B.

4.7.4 Mitigation

Operation of the LRT Build Alternative (Options A and B) is anticipated to have a beneficial effect on regional air quality; no mitigation measures are required.

4.7.5 Conformity Analysis

The FTA cannot approve funding for project activities beyond preliminary engineering unless the project is in conformity with the EPA transportation conformity regulations (40 CFR Part 93). Based on 40 CFR Part 93.109: 1) there must be a currently conforming transportation plan and Transportation Improvement Program (TIP) (49 CFR Part 93.114); 2) the proposed project was included in the most recently conforming transportation plan and TIP (40 CFR Part 93.115); 3) the proposed project would not result in or exacerbate localized exceedances of the Federal CO or PM_{10} standards (40 CFR Part 93.116); and 4) the proposed project complies with PM_{10} control measures that are contained in the applicable implementation plan (40 CFR Part 93.117).

(1) There must be a currently conforming transportation plan and TIP (40 CFR Part 93.114).

The most recently conforming transportation plan is the 2001 Regional Transportation Plan (RTP). The RTP is a 20-year transportation plan for six counties within the Southern California region (Ventura, Los Angeles, Orange, San Bernardino, Riverside, and Imperial counties). The RTP provides long-term solutions to the region's transportation needs under a framework that meets mobility, air quality regulations, and other regional goals. The RTP is a critical document for projects to qualify for future federal, state, and local funding sources. The Southern California Association of Governments (SCAG) revises the RTP every three years. The last updated plan was adopted by SCAG on April 12, 2001, and reflects changes in regional demographics, environmental factors, land-use forecasts, technology, and sub-regional planning. The FHWA and FTA made a conformity determination for the 2001 RTP on June 8, 2001 for all areas with the exception of Coachella Valley and San Bernardino. The FHWA and FTA made a conformity determination for those areas on August 3, 2001.

The Regional Transportation Improvement Program (RTIP) is a short-term federal transportation improvement program, which includes a list of proposed transportation projects. The RTIP is submitted by SCAG to the California Transportation Commission (CTC) as a request for state funding. Individual projects are first proposed by the local jurisdictions. Then, the projects are evaluated and prioritized by SCAG for submission to the CTC. The RTIP is updated every two years and has a seven-year planning horizon. The most recent adopted RTIP is the 2001 RTIP. The FHWA and FTA made a conformity determination for the 2001 RTIP on September 25, 2001. The 2001 RTIP is for the fiscal years 2000/2001 to 2005/2006.

(2) The proposed project was included in the most recently conforming transportation plan and TIP (40 CFR Part 93.115).

The proposed project is included in the 2001 RTP and 2001 RTIP. The design concept and scope of the LRT Build Alternative have not changed from the project that is included in the RTP and RTIP.

(3) The proposed project would not result in or worsen localized exceedances of the Federal CO and PM_{10} standards (40 CFR Part 93.116).

The federal one-hour and eight-hour CO standards are 35.0 ppm and 9.0 ppm, respectively. The federal 24-hour PM_{10} standard is 150.0 ug/m^3. As stated previously in the carbon monoxide hot spot analysis in Section 4.7.3, CO concentrations at study intersections would not result in localized exceedances of the Federal one- and eight-hour CO standards. Additionally, as indicated in the PM_{10} hot spot analysis in Section 4.7.3, the idling of buses at transit stations would not result in localized exceedances of the Federal 24-hour PM_{10} standard. Therefore, the proposed project is consistent with this conformity criterion.

(4) The proposed project must comply with PM_{10} control measures that are contained in the applicable implementation plan (40 CFR Part 93.117).

Section 4.19.2.6 lists the fugitive dust mitigation measures that will be included in the proposed project. These mitigation measures include all PM_{10} control measures in the AQMP, which is part of the SIP.

Based on the above, FTA and MTA have determined that the proposed project conforms to the applicable air quality implementation plans and satisfies the project-level requirements in the EPA's implementing regulations (40 CFR Part 93).

4.8 NOISE AND VIBRATION

4.8.1 Affected Environment

Prior to performing an analysis of the future noise and vibration levels associated with the LRT Build Alternative, it was necessary to establish the existing baseline noise levels along the Corridor. This was accomplished by performing a series of measurements at representative locations along the Corridor. FTA Vibration Impact Criteria (discussed in Section 4.8.2.2) were used to identify locations where potential impacts may occur based on existing land use activities.

Noise measurements were taken on May 22 through May 24, 2000 at nine noise-sensitive locations along the Corridor (Table 4.8-1). These locations were deemed to be a good representation of all noise-sensitive land uses along the project Corridor. Seven long-term (24-hour) noise readings and two short-term (15-minute) measurements readings were taken, and their locations are shown in Figure 4.8-1.

TABLE 4.8-1
NOISE MEASUREMENT LOCATIONS

Site I.D.	Site Description		Measured Ldn (dBA)	Measured Peak-Hour Leq (dBA)
Long-term (24-Hour) Noise Measurement Locations				
NM-1	L.A. Housing Authority		72	73
NM-2	Pecan Park		75	75
NM-3	Evergreen Cemetery		68	67
NM-4	Ramona High School (Indiana Street)		70	68
NM-5	Our Lady of Lourdes School		71	69
NM-6	Guadalupe Church		72	71
NM-7	Casa Telacu Apartments		65	64
Short-Term (15-Minute) Noise Measurement Locations				
Site I.D.	**Location Description**	**Time Measurement Taken**	**Measured Leq (dBA)**	**Adjusted Peak-Hour Leq (dBA)[1]**
NM-A	L.A. Hompa Hongwanji Buddhist Temple	2:15 PM	66	68
NM-B	Single-Family Residences, 3rd Street at I-710	1:45 PM	70	73

[1]Each 15-minute sample is compared to the closest 24-hour sample at the same hour of the day. The 15-minute samples are then adjusted relative to the 24-hour samples in order to develop a peak Leq and Ldn for each of the 15-minute measurement locations.

The highest levels were recorded at Pecan Park located along 1st Street near the US 101 Freeway, while the lowest levels were noted at Casa Telacu Apartments on 3rd Street at Dangler Avenue near the eastern end of the planned alignment. Section 4.8.2 provides further information regarding the noise descriptors used in the measurements.

FIGURE 4.8-1
NOISE MEASUREMENT LOCATIONS

4.8.2 Methodology for Impact Evaluation

This section presents the methods used to estimate noise and vibration levels and the criteria used to assess impacts.

4.8.2.1 Noise

Noise Impact Criteria

The FTA Noise Impact Criteria are divided into three groups, which place noise sensitive land uses into the following three categories:

- Category 1: Buildings or parks, where quiet is an essential element of their purpose.
- Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
- Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, churches, parks, certain historical sites, and recreational facilities.

The Day-Night Equivalent Sound Level (Ldn) is used to characterize noise exposure for residential areas (Category 2) and maximum 1-hour Leq is used for other noise sensitive land uses, such as school buildings (Categories 1 and 3) during the period that the facility is in use. The Leq (or equivalent noise level) is the level of a constant sound level in dBA, which in a given situation and time period, has the same sound energy as does the time-varying sound over the same period. One-hour equivalent noise levels measured every hour over a continuous 24-hour period are sometimes used to calculate a composite 24-hour noise exposure measure, or Ldn, which applies a 10-dBA penalty to nighttime sound levels between the hours of 10:00 PM and 7:00 AM to account for the increased noise-sensitivity of people during sleeping hours. Use of Leq and Ldn is appropriate for transportation noise analysis because these levels are sensitive to both the frequency of occurrence and duration of noise events, including rail and bus operations, which may be characterized by infrequent noise. Typical Ldn noise levels are presented in Figure 4.8-2.

There are two levels of impact included in the FTA criteria, as shown in Figure 4.8-3. The interpretation of these two levels of impact are summarized below:

- Severe: Severe noise impacts are considered "significant" as this term is used in the National Environmental Policy Act (NEPA) and implementing regulations. Noise mitigation will normally be specified for severe impact areas unless there is no practical method of mitigating the noise.
- Impact (Moderate): In this range, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels. For purposes of clarification, this impact category will be referred to as moderate impact to better differentiate from severe impact.

The noise impact criteria for transit operations are summarized in Table 4.8-2. The first column shows the existing noise exposure, and the remaining columns show how much additional noise exposure from the transit project is necessary to cause either a moderate or severe impact. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the LRT Build Alternative.

Figures 4.8-2 through 4.8-4 (all figures are on one page)

TABLE 4.8-2
FTA NOISE IMPACT CRITERIA

Existing Noise Exposure Leq or Ldn [1]	Project Noise Exposure Impact Thresholds, Ldn. or Leq [1] (Noise levels in dBA)			
	Category 1 or 2 Sites		Category 3 Sites	
	Moderate Impact	Severe Impact	Moderate Impact	Severe Impact
<43	Amb.+10	Amb.+15	Amb.+15	Amb.+20
43-44	52	<58	57	<63
45	52	<58	57	<63
46-47	53	<59	58	<64
48	53	<59	58	<64
49-50	54	<59	59	<64
51	54	<60	59	<65
52-53	55	<60	60	<65
54	55	<61	60	<66
55	56	<61	61	<66
56	56	<62	61	<67
57-58	57	<62	62	<67
59-60	58	<63	63	<68
61-62	59	<64	64	<69
63	60	<65	65	<70
64	61	<65	66	<70
65	61	<66	66	<71
66	62	<67	67	<72
67	63	<67	68	<72
68	63	<68	68	<73
69	64	<69	69	<74
70	65	<69	70	<74
71	66	<70	71	<75
72-73	66	<71	71	<76
74	66	<72	71	<77
75	66	<73	71	<78
76-77	66	<74	71	<79
>77	66	<75	71	<80

[1] Ldn is used for land uses where nighttime sensitivity is a factor; Daytime Leq is used for land use involving only daytime activities.
Source: *Transit Noise and Vibration Impact Assessment*, FTA, April 1995.

Noise Assessment Methodology

Noise impact from transit operations is a function of the transit vehicle, speed, and the number of vehicles in the daytime and nighttime hours, and the distance of the alignment from sensitive receptors. Type of track and number of cars per train are also important. Initial service would likely operate with 2-car consists, and the ultimate configuration would be 3-car consists. For the LRT vehicle, the interaction of the vehicle wheels with the guideway, propulsion system, and ancillary equipment (i.e. ventilation and air-conditioner fans) are the major sources of noise. The FTA Detailed Noise Analysis procedure was used to develop the projections of impact and the recommended mitigation measures for Eastside Corridor transit operations. The predicted future LRT noise levels are based on twelve 3-car trains per hour, operating in each direction during the peak hours of 6:00 a.m. to 9:00 am and 3:00 p.m. to 7:00 p.m., and five 3-car trains per hour, operating in each direction during the off-peak hours of 5:00 a.m. to 6:00 a.m., 9:00 a.m. to 3:00 p.m., and 7:00 p.m. to 1:00 a.m. The operating assumptions used in the noise analysis are the same as those used in estimating ridership, fare revenue, and other impacts of the project.

Regarding traffic noise, there is less than a one percent change in both projected vehicle miles traveled (VMT) and vehicle hours traveled (VHT) for the entire project Corridor, between the 2020 No-Build and LRT Build Alternatives. Therefore, there will be very minimal, if any, changes in traffic noise between the two alternatives. No further traffic noise analysis was prepared.

4.8.2.2 Ground-Borne Noise and Vibration

Ground-Borne Noise and Vibration Impact Criteria

The FTA has developed the impact criteria shown in Table 4.8-3 for acceptable levels of ground-borne noise and vibration. Some buildings, such as concert halls, TV and recording studios, and theaters, can be very sensitive to vibration, but they do not fit into any of the three land use categories shown in the table. Because of the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a transit project. Criteria for acceptable levels for various types of special buildings are also presented in Table 4.8-3.

TABLE 4.8-3
FTA GROUND-BORNE VIBRATION and NOISE IMPACT CRITERIA

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro inch/sec)		Ground-Borne Noise Impact Levels (dB re 20 micro pascals)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[3]	65 VdB[3]	--[4]	--[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	83 VdB	40 dBA	48 dBA
Special Buildings and Facilities[5]				
Concert Halls	65 VdB	65 VdB	25 dBA	25 dBA
TV Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

[1]"Frequent Events" is defined as more than 70 vibration events per day.
[2]"Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
[3]This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC system and stiffened floors.
[4]Vibration-sensitive equipment is not sensitive to ground-borne noise.
[5]If the building will rarely be occupied when the trains are operating, there is no need to consider impact.
Source: *Transit Noise and Vibration Impact Assessment*, FTA, April 1995.

Ground-borne vibration consists of oscillatory waves that propagate from the source through the ground to adjacent buildings. On steel-wheel steel-rail train systems, ground-borne vibration is created by the interaction of the steel wheels rolling on the steel rails. Although the vibration is sometimes noticeable outdoors, it is almost exclusively an indoor problem. Ground-vibration is of such a low level that, for this project, there is almost no possibility of structural damage to buildings near the route. The low-frequency noise is caused by sound being radiated from vibrating room surfaces and is referred to as ground-borne noise. Ground-borne vibration and ground-borne noise are really the same phenomenon, yet they only

differ in the manner in which the building occupants perceive them. As noted, the vibration from trains is almost never of sufficient amplitude to cause even minor cosmetic damage to buildings. The primary concern is that the vibration and radiated noise can be intrusive and annoying to building occupants. Factors that influence the amplitudes of ground-borne vibration include vehicle suspension parameters, condition of the wheels and rails, type of track, track support system, type of building foundation, and the properties of the soil and rock layers that the vibration propagates through. Use of continuously welded rail eliminates wheel impacts at rail joints and results in significantly lower vibration levels than with jointed track.

Train vibration is virtually always characterized in terms of the root-mean-square (RMS) amplitude. RMS is a widely used but sometimes confusing method of characterizing vibration and other oscillating phenomena. It represents the average energy over a short time interval; typically, a one-second interval is used to evaluate human response to vibration. RMS vibration velocity is considered the best available measure of potential human annoyance from ground-borne vibration. Figure 4.8-4 gives a general idea of human and building response to different levels of vibration. Existing background building vibration is usually in the range of 40 to 50 VdB, which is well below the range of human perception. Although the perceptibility threshold is about 65 VdB, human response to vibration is usually not significant unless the RMS vibration velocity level exceeds 70 VdB, a typical vibration level 50 feet from a rapid transit or light rail system. Buses and trucks rarely create vibration that exceeds 70 VdB unless there are large bumps or potholes in the road.

Ground-borne Noise and Vibration Assessment Methodology

Impacts were assessed based on the procedure outlined in the FTA manual, *Transit Noise and Vibration Impact Assessment.* The projections are based on characterizing the magnitude of the vibration forces generated by a 3-car transit train in terms of a force density and characterizing the propagation through the soil with a transfer mobility function. The force density is assumed to represent the combined effects of the vehicle suspension, the wheel and rail condition, and the track support system and is assumed to be independent of the local geologic conditions. Vibration measurements of the Nippon Sharyo vehicles operating on the Long Beach Blue Line and the Siemens vehicles operating in Portland were used to develop a force density level function. The measured data were modified above 40 Hz to represent the increased ground vibration levels of embedded and direct fixation trackwork. The transfer mobility functions used for the projections were based on the vibration propagation measurements conducted at three sites along the underground tunnel section (1st/Boyle, 1st/Soto, and 1st/Savannah) and four sites along the at-grade sections of the alignment (1st/Alameda, 3rd/Townsend, 3rd/Humphreys, and 3rd/Dangler). The combination of the force density and transfer mobility functions provides an estimate at the ground surface as a function of distance from the tracks, the horizontal distance for surface tracks and the diagonal (slant) distance for subways. All estimates of ground-borne vibration are projected to the foundation of each building and do not include any estimates of building coupling loss. In addition, a 5-decibel safety factor has been incorporated into all of the ground-borne vibration and ground-borne noise projections. The purpose of the safety factor is to account for the normal fluctuations in ground-borne vibration due to normal wheel and track wear, and unexpected differences in the local soil and geology that were not represented by the transfer mobility tests. For a complete description of the vibration analysis methods, see the *Addendum to the Noise and Vibration Technical Report,* which is included herein by reference.

4.8.2.3 CEQA Significance Impact Criteria

Under CEQA, a substantial noise increase may result in a significant adverse environmental effect and, if it does, it must be mitigated or identified as a noise impact for which it is likely that no, or only partial, abatement measures are available. Specific economic, social, environmental, legal, and technological

conditions may make additional noise mitigation measures infeasible. For the purposes of this study, a severe noise impact, as defined by FTA and shown in Table 4.8-2 and Figure 4.8-3, is used to determine the CEQA significance of the noise impact of the proposed project. The FTA vibration criteria presented in Table 4.8-3 will be used as the CEQA significance impact criteria for ground-borne noise and vibration. Federal law requires reasonable mitigation of all adverse impacts, regardless of their CEQA significance under California law.

4.8.3 Impacts

4.8.3.1 No-Build Alternative

The principal transportation-related source of future noise levels under the No-Build Alternative would be traffic movements on the local arterials in the project area. In general, it would require a doubling of the traffic activity for the noise levels to increase by 3 dBA. Traffic levels are not expected to experience such an increase between now and 2020. Therefore, no noise impacts are anticipated. Although all rubber tire transit vehicles and vehicular traffic can cause ground-borne vibration, the vibration is not usually perceptible because of the vibration isolation. Therefore, vibration impacts are also not anticipated.

4.8.3.2 LRT Build Alternative

Option A

Noise

Table 4.8-4 displays anticipated project-related noise levels for both Options A and B at the sensitive receptor locations shown in Figures 4.8-5 through 4.8-7. The buildings listed in the table represent those structures that are adjoining the at-grade section of the alignment. Where the alignment is located in an underground subway section, airborne noise levels from train operations would not be audible. Potential noise impacts at each location have been identified as: no impact, moderate impact, or severe impact, in accordance with FTA Noise Impact Criteria. Note that the noise analysis for the Final SEIS/SEIR reflects the most recent design information for the LRT Build Alternative. As a result, the number of noise-impacted buildings is lower than presented in the Draft SEIS/SEIR because of changes in operating schedule, design speeds have been updated, and distances between the track and sensitive receivers have been modified. In addition, the location of special trackwork (crossovers and turnouts) has been identified, and the impacts of that trackwork are presented in this section. Table 4.8-5 provides a summary of the noise impacts. Under Option A, severe impacts have been identified at 12 buildings due to the location of the special trackwork, which was not assessed during the Draft SEIS/SEIR phase since their locations were unknown at that time. Moderate impacts would occur at 48 buildings.

Special Trackwork

Special trackwork, which include switches, crossover diamonds, and turnouts, will generate higher passby noise levels than tangent track. An impact noise is generated on special trackwork as the wheel of the vehicle traverses a switch frog or crossover diamond gap. Wayside noise levels are estimated at 7 dBA to 10 dBA higher than normal tangent track operations at those buildings that are closest to the special trackwork. The receivers that are closest to the point of impact of the special trackwork are Sites 1a, 9, 10, 11, 26, 27 and seven of the twelve single-family residences at Site 28. The project generated noise at these sites is presented in Table 4.8-4 as a range of levels 7 dBA to 10 dBA higher than the predicted noise levels would be for tangent track locations.

TABLE 4.8-4
PROJECT NOISE LEVELS AT BUILDINGS ALONG THE AT-GRADE SEGMENTS

Receiver	Street that Alignment Follows	Type of Building Structure	Number of Buildings	FTA Noise Sensitive Category (1,2,3)	Train Speed (mph)	Distance of Trackwork to Receiver (feet)	Existing Noise Level[1] (dBA)	Project Generated Noise[1] (dBA)	FTA Level of Noise Impact
1a	Alameda	Veterans Clinic	1	3	25	95[3]	73	63 to 66[2]	no impact
1	Alameda	Geffen Museum	1	3	25	90	73	56	no impact
2	Alameda	Japanese American National Museum	1	3	25	90	73	56	no impact
2a	Alameda	Mangrove Estates (Planned Hotel)	1	2	25	70	69	58	no impact
2b	1st Street	First Street South Plaza (Planned Office Building)	1	3	25	50	70	60	no impact
2c	1st Street	First Street South Plaza (Planned Condominium Building)	1	2	25	250	63	52	no impact
5 (NM-A)	1st Street	Hompa Hongwanji Buddhist Temple	1	3	35	80	68	60	no impact
8	1st Street	Multi-Family Residence	1	2	35	35	74	66	**moderate**
9[2] (NM-1)	1st Street	Future Telacu Pico Aliso Housing	1	2	25	40[3]	72	72 to 75[2]	**severe**
11[2]	1st Street	Multi-Family Residence	1	2	25	30 to 70[3]	73	67 to 71[2]	**moderate**
12	1st Street	Single- and Two-Family Residences	3	2	25	35	76	65	no impact
12a	1st Street	Utah Elementary School	1	3	25	200	69	51	no impact
13 (NM-2)	1st Street	Pecan Park	None	3	25	40	75	62	no impact
18a	1st Street	Evergreen Cemetery	None	3	35	40	69	65	**moderate**
19 (NM-3)	1st Street	Single-Family Residence	1	2	25	65	68	64	**moderate**
20	1st Street	Single- and Two-Family Residences	4	2	35	50	68	66	**moderate**
21	Indiana Street	Single- and Two-Family Residences	5	2	35	25/55[4]	72	71/65[5]	**moderate/** no impact[5]
22	Indiana Street	Single- and Two-Family Residences	4	2	35	25/55[4]	72	71/65[5]	**moderate/** no impact[5]
23 (NM-4)	Indiana Street	Ramona High School	1	3	15	40/20[4]	68	60/61[5]	no impact/ no impact[5]
26[2]	3rd Street	LA Music and Art School	1	3	35	70[3]	69	67 to 70	**moderate**
27[2]	3rd Street	Single- and Two-Family Residences	3	2	35	40 to 60[3]	72	72 to 75	**severe**
28	3rd Street	Single- and Two-Family Residences	4	2	35	40 to 60	71	65 to 67	No impact to **moderate**
28[2]	3rd Street	Single- and Two-Family Residences	8	2	35	60 to 70[3]	71	71 to 75[2]	**severe**
29	3rd Street	Single- and Two-Family Residences	15	2	35	35 to 50	72	66 to 68	**moderate**
30	3rd Street	Paraiso Spanish Congregation	1	3	35	80	68	60	no impact

TABLE 4.8-4
PROJECT NOISE LEVELS AT BUILDINGS ALONG THE AT-GRADE SEGMENTS

Receiver	Street that Alignment Follows	Type of Building Structure	Number of Buildings	FTA Noise Sensitive Category (1,2,3)	Train Speed (mph)	Distance of Trackwork to Receiver (feet)	Existing Noise Level[1] (dBA)	Project Generated Noise[1] (dBA)	FTA Level of Noise Impact
31	3rd Street	Single-Family Residence	1	2	35	65	72	64	no impact
32 (NM-5)	3rd Street	Our Lady of Lourdes Church/School	1	3	35	60	69	62	no impact
34	3rd Street	Single-Family Residence	1	2	35	60	72	65	no impact
35	3rd Street	Single- and Two-Family Residences	7	2	35	50	75	66	**moderate**
36	3rd Street	Multi-Family Residences	2	2	35	65	72	64	no impact
37 (NM-6)	3rd Street	Guadalupe Church	1	3	35	75	71	60	no impact
38	3rd Street	Single- and Two-Family Residences	4	2	35	50	74	66	**moderate**
39 (NM-B)	3rd Street	Single- and Two-Family Residences	6	2	35	50	74	66	**moderate**
40	3rd Street	Calvary Cemetery	None	3	35	50	73	63	no impact
41	3rd Street	Serbian Cemetery	None	3	35	50	73	63	no impact
42	3rd Street	Single- and Two-Family Residences	2	2	35	50	74	66	**moderate**
43	3rd Street	Single- and Two-Family Residences	2	2	35	65	73	64	no impact
44	3rd Street	Single-Family Residence	1	2	35	40	70	67	**moderate**
45	3rd Street	Single- and Two-Family Residences	2	2	35	50 to 105	66	60 to 66	no impact to **moderate**
46 (NM-7)	3rd Street	Casa Telacu Apartments	1	2	35	85	65	63	**moderate**
47	3rd Street	Single- and Two-Family Residences	2	2	35	45	69	67	**moderate**
48	3rd Street	Single- and Two-Family Residences	2	2	35	40 to 100	68	61 to 67	no impact to **moderate**
49	3rd Street	Sala Evangelica	1	3	35	48	65	63	no impact
50	3rd Street	Griffith Junior High School	1	3	35	280	60	52	no impact
51	3rd Street	Iglesia El Siloe	1	3	35	50	68	63	no impact
52	3rd Street	East L.A. Library, Belvedere Park, Sheriff's Station	3	3	35	55	66	62	No impact
52a	Pomona Boulevard	Kaiser Medical Center (Option B)	1	2	35	40	68	67	**moderate**

[1] Category 3=Leq; Category 1 and 2=Ldn.
[2] These receivers are in close proximity to special trackwork.
[3] Distance of special trackwork switch frog to receiver.
[4] Distance of trackwork to receiver under Option B.
[5] Project generated noise levels and noise impacts under Option B.
Note: Sites 3, 4, 6, 7, 10, and 33, commercial land use activities, have been deleted because they are not considered by FTA as noise-sensitive receivers.

Figure 4.8-5
Noise and Vibration Building Receiver Locations

Figure 4.8-6
Noise and Vibration Receiver Locations

Figure 4.8-7
Noise and Vibration Receiver Locations

TABLE 4.8-5
SUMMARY OF NOISE-IMPACTED BUILDINGS
(WITHOUT MITIGATION)

Level of Impact	Type of Impacted Building	Option A	Option B
Moderate Impact	Single- and Two-Family Residences	44	35
	Multi-Family Residences	3	3
	Other	1	2
	Total:	**48**	**40**
Severe Impact	Single-Family Residences	11	11
	Multi-Family Residences	1	1
	Other	0	0
	Total:	**12**	**12**

Wheel Squeal

In general, sections of track with tight curves potentially can create a nuisance noise condition referred to as wheel squeal. The sliding or rubbing of the steel wheels of the LRT cars across the head of the steel rail causes wheel squeal. Wheel squeal impacts could occur along tight curves in the track with radii of less than 400 feet. In addition, there are other factors affecting the potential for wheel squeal, including: speed of the LRT train; rail vehicle truck geometry and rigidity; the conditions of the wheels and tracks; wheel damping technology; and contact-surface frictional characteristics. The maximum single-event noise level (L_{max}) for wheel squeal associated with the passby of an LRT vehicle would be in the range of 80 dBA at 100 feet to 94 dBA at 25 feet. This data is based on recent measurements taken of the Tri-Met Eastside and Westside LRT lines. There are five locations along the proposed LRT alignment with tight radius curves where there is the most potential for wheel squeal to occur. At two of these locations, Hewitt Street at Commercial Street and Commercial Street at Alameda Street, the existing land use activities, industrial and commercial, are not considered noise sensitive.

However, at three of these locations, Alameda Street at 1st Street, 1st Street at Indiana Street, and Indiana Street at 3rd Street, there are proposed and existing hotel and residential buildings that would be noise impacted. Based on the FTA reference level for wheel squeal, the projected noise level at 200 feet will be an Ldn = 85 dBA. If wheel squeal occurs at these three radius curves the following buildings will be severely noise impacted:

- Proposed Mangrove Estates Hotel at the northeast corner of Alameda Street and 1st Street;
- Proposed First Street South Plaza Condominiums at the southwest corner of Alameda Street and 1st Street;
- Nine existing residential buildings on Indiana Street between 1st Street and 3rd Street (Sites 21 and 22); and
- Two existing residential buildings on 3rd Street between Indiana Street and Alma Avenue (west of Site 26).

Vent Shafts

Both normal and emergency air ventilation would be supplied to the tunnel section and underground stations by fans located in the two underground stations, 1st/Boyle and 1st/Soto. The same fans used for emergency ventilation will also be used for normal ventilation at reduced speeds. Potential noise levels from the ventilation systems would be from the passby of trains transmitting through the vent shaft to the street, the operation of the ventilation fans under normal conditions, and the testing of the emergency ventilation fans. The vent shaft and the emergency ventilation fans will be designed to control noise levels from these sources to the noise guidelines required by the MTA Systemwide Design Criteria for a for a residential area: 60 dBA for train passby noise levels and 50 dBA for the fan noise, at a distance of 50 feet or to the nearest residential building, whichever is closer. The predicted noise levels from these vent shafts, an Ldn = 55 dBA at 50 feet or the nearest residential building, whichever is closer, is in the range of 13 dBA to 17 dBA lower than the existing ambient noise levels along 1st Street and will not exceed the FTA Noise Impact Criteria. Therefore, no adverse impacts are expected.

Ancillary Facilities

The proposed project includes six traction power substations (TPSS) and one emergency diesel generator. The TPSS will be located at the following sites:

1. MTA Maintenance Yard north of the 1st St. Bridge – There are no noise sensitive receivers at this location.
2. Near the 1st/Soto Station – existing commercial building will be acquired and demolished.
3. At 1st/Lorena - MTA owned property.
4. Near the SR-60/3rd Street interchange at Sunol Avenue – existing vacant commercial building will be acquired and demolished.
5. At 3rd Street and Arizona Street – existing auto sales business will be acquired and demolished.
6. At northeast corner of Beverly Boulevard and Atlantic Boulevard – existing commercial building and parking lot will be acquired and demolished.

For Option B the first five TPSS sites are the same. Site 6 will be located on the property to be purchased on the northwest corner of Pomona and Atlantic Boulevards as part of the park-and-ride for Option B.

Each TPSS will be designed to control operating noise levels to the noise guidelines required by the MTA Systemwide Design Criteria: 50 dBA at 50 feet or the nearest residential building, which ever is closer. The operating noise levels of each TPSS, an Ldn = 54 dBA, will be substantially lower than either the existing traffic noise or LRT train passby noise, and will not exceed the FTA Noise Impact Criteria. Therefore, no adverse impacts are expected.

The proposed location of the emergency diesel power generator is the northeast corner of 1st Street and Lorena Avenue. This location is primarily commercial land uses with the nearest residences over 100 feet on the opposite side of 1st Street. The generator equipment will be tested during the time of day when existing ambient noise is at its maximum level. Maintenance personnel will usually test the equipment for about 30 minutes each month, but occasionally the testing will last longer. During times of periodic testing, the emergency power generator equipment will be limited to no more than 10 dBA sound level above the MTA Systemwide Design Criteria for continuous noise: 55 dBA for a commercial area and 50 dBA for a residential area, at a distance of 50 feet from the generator or at the nearest building or occupied area, whichever is closer. Noise control measures used to meet the MTA Systemwide Noise Criteria will include fully enclosing the emergency power generating equipment in masonry buildings with sound rated doors, high grade engine exhaust mufflers for diesel engine generators, and providing sound attenuation on all ventilation openings. Therefore, no adverse impacts are expected.

Ground-Borne Noise and Vibration

Table 4.8-6 shows the projected ground-borne vibration levels for those building structures along the at-grade section of the alignment. Table 4.8-7 presents the projected ground-borne noise and vibration levels for those building structures along the underground subway section of the alignment. The levels are shown for both Options A and B. Option B impacts are discussed in a separate section below. Ground-borne noise impacts are limited to the underground subway segments. Vibration impacts will be limited to interior land use activities and will not be perceptible for outdoor land uses such as parks and recreation facilities. The building receivers that are listed in Tables 4.8-6 and 4.8-7 are shown on Figures 4.8-5 through 4.8-7. The projected number of impacts from ground-borne vibration are substantially lower than those presented in the Draft SEIS/SEIR for two reasons: 1) Design efforts subsequent to the Draft SEIS/SEIR have resulted in more detailed information on track location and subway depths; and 2) the effect of local geology was determined by borehole and surface vibration propagation tests. Another change, not known during the preparation of the Draft SEIS/SEIR, resulting in an increase in ground-borne vibration levels is the location of special trackwork, such as crossovers and turnouts, near vibration in close proximity to residential and commercial buildings.

TABLE 4.8-6
GROUND-BORNE VIBRATION ANALYSIS: AT-GRADE SECTIONS

Site No.	Street Location	Type of Building	Number of Buildings	Distance to Track (feet)	Train Speed (mph)	FTA Vibration Criteria (VdB)	Predicted Vibration Levels (VdB)
1a	Alameda	Veterans Clinic	1	95	25	75	64/74[1]
1	Alameda	Geffen Museum	1	90	25	75	64
2	Alameda	Japanese American National Museum	1	90	25	72	64
2a	Alameda	Mangrove Estates (Planned Hotel)	1	70	25	75	64
2b	1st Street	First Street South Plaza (Planned Office Building)	1	50	25	72	67
2c	1st Street	First Street South Plaza (Planned Condominium Building)	1	250	25	75	<58
5	1st Street	Hompa Hongwanji Buddhist Temple	1	80	35	75	64
8	1st Street	Multi-Family Residence	1	35	35	72	72
9	1st Street	Future Telacu Pico Aliso Housing	1	40	25	72	70/**80**[1]
11	1st Street	Multi-Family Residence	1	30 to 70[4]	25	72	72/**75**[1]
12	1st Street	Single- and Two-Family Residences	3	35	25	72	71
12a	1st Street	Utah Elementary School	1	200	25	75	<58
13	1st Street	Pecan Park	None	40	25	N/A	N/A
18a	1st Street	Evergreen Cemetery	None	40	35	N/A	N/A
19	1st Street	Single-Family Residence	1	65	35	72	69
20	1st Street	Single- and Two-Family Residences	4	50	35	72	72
21	Indiana Street	Single- and Two-Family Residences	5	25/55[2]	35	72	**80**/71[3]
22	Indiana Street	Single- and Two-Family Residences	4	25/55[2]	35	72	**80**/71[3]
23	Indiana Street	Ramona High School	1	40/20[2]	15	75	67/75[3]
26	3rd Street	LA Music and Art School	1	55	35	75	71/**81**[1]
27	3rd Street	Single- and Two-Family Residences	3	40 to 60[4]	35	72	**75/80**[1]
28	3rd Street	Single- and Two-Family Residences	13	40 to 60[4]	35	72	72/**80**[1]
29	3rd Street	Single- and Two-Family Residences	15	35 to 50	35	72	72 to **76**
30	3rd Street	Paraiso Spanish Congregation	1	80	35	75	67
31	3rd Street	Single-Family Residence	1	65	35	72	69
32	3rd Street	Our Lady of Lourdes Church/School	1	60	35	75	70
34	3rd Street	Single-Family Residence	1	60	35	72	70

TABLE 4.8-6
GROUND-BORNE VIBRATION ANALYSIS: AT-GRADE SECTIONS

Site No.	Street Location	Type of Building	Number of Buildings	Distance to Track (feet)	Train Speed (mph)	FTA Vibration Criteria (VdB)	Predicted Vibration Levels (VdB)
35	3rd Street	Single- and Two-Family Residences	7	50	35	72	72
36	3rd Street	Multi-Family Residences	2	65	35	72	69
37	3rd Street	Guadalupe Church	1	75	35	75	68
38	3rd Street	Single- and Two-Family Residences	4	50	35	72	72
39	3rd Street	Single- and Two-Family Residences	6	50	35	72	72
40	3rd Street	Calvary Cemetery	None	50	35	N/A	N/A
41	3rd Street	Serbian Cemetery	None	50	35	N/A	N/A
42	3rd Street	Single- and Two-Family Residences	2	50	35	72	72
43	3rd Street	Single- and Two-Family Residences	2	65	35	72	69
44	3rd Street	Single-Family Residence	1	40	35	72	**77**
45	3rd Street	Single- and Two-Family Residences	2	50 to 105	35	72	65 to **74**
46	3rd Street	Casa Telacu Apartments	1	85	35	72	68
47	3rd Street	Single- and Two-Family Residences	2	45	35	72	**76**
48	3rd Street	Single- and Two-Family Residences	2	40 to 100	35	72	65 to **77**
49	3rd Street	Sala Evangelica	1	48	35	75	75
50	3rd Street	Griffith Junior High School	1	280	35	75	53
51	3rd Street	Iglesia El Siloe	1	50	35	75	74
52	3rd Street	East L.A. Library, Belvedere Park, Sheriff's Station	3	55	35	75	73
52a	Pomona Blvd	Kaiser Medical Center (Option B)	1	40	35	72	**77**

[1] The predicted vibration levels for the special trackwork at sites 1a, 9, 10, 11, 26, 27 & 28 are indicated after the slash.
[2] Distance of trackwork to receiver under Option B.
[3] Project generated vibration levels under Option B.
[4] Distance of special trackwork switch frog to receiver.
Notes: Boldface numbers indicate impacts.
Sites 3, 4, 6, 7, 10, and 33, commercial land use activities, have been deleted because they are not considered by FTA as vibration-sensitive receivers.

A summary of the buildings impacted under both Options A and B is presented in Table 4.8-8. Under Option A, 35 buildings will be impacted by vibration and six buildings will be impacted by ground-borne noise. Option B is discussed in a separate section below.

CEQA Significance of Impacts

With regard to noise, the 12 buildings that will be severely impacted according to FTA criteria due to their proximity to the special trackwork would be considered significant impacts per CEQA. The proposed Mangrove Estates Hotel, proposed First Street South Plaza Condominium, and the 11 existing residential buildings that would be severely impacted if wheel squeal occurs at the tight radius curves on Alameda Street at 1st Street, 1st Street at Indiana Street, and Indiana Street at 3rd Street would also be considered significant impacts per CEQA. All exceedances of the FTA ground-borne noise and vibration criteria are considered significant impacts under CEQA.

Option B

Noise

As shown in Tables 4.8-4 and 4.8-5, 12 buildings will be severely impacted (the same as Option A) due to the special trackwork. There are 40 buildings that will be moderately noise impacted. Moderate noise

impacts are the same as Option A with the exception of the following buildings which are not impacted on Indiana Street: five single- and two-family residences at Site 21, and four single- and two-family residences at Site 22. The Kaiser Medical Center (currently under construction) on Pomona Boulevard between Woods Avenue and Atlantic Boulevard (Site 52a) will be affected under Option B. A moderate noise impact is expected at this receiver location. The medical center is not adversely affected under Option A. The impacts of wheel squeal, vent shafts, and ancillary facilities are the same as that discussed for Option A.

Ground-Borne Noise and Vibration

Under Option B, ground-borne noise impacts are the same as predicted for Option A (six buildings). Vibration impacts are the same as predicted for Option A with the exception of Site 21 (five single- and two-family residences) and Site 22 (four single- and two-family residences) where the impacts have been eliminated and the addition of one other impacted receiver, Site 52a, the Kaiser Medical Center that is currently under construction. Refer to Tables 4.8-6 through 4.8-8 for further information.

CEQA Significance of Impacts

With regard to noise, like Option A, the 12 buildings that will be severely impacted according to FTA criteria due to their proximity to the special trackwork would be considered significant impacts per CEQA. The proposed Mangrove Estates Hotel, proposed First Street South Plaza Condominium, and the 11 existing residential buildings that would be severely impacted if wheel squeal occurs at the tight radius curves on Alameda Street at 1st Street, 1st Street at Indiana Street, and Indiana Street at 3rd Street would also be considered significant impacts per CEQA. All exceedances of the FTA ground-borne noise and vibration criteria are considered significant impacts under CEQA.

4.8.4 Mitigation

4.8.4.1 Option A

Noise

There are several operational measures that can be taken to assure that noise and vibration levels related to light rail operation remain at the levels projected in the analysis. Table 4.8-9 provides a list of measures that could be performed on a regular basis and the benefit that each of the measures will provide. Regular attention to these costly maintenance activities is difficult to sustain during the inevitable times of tight budgets for operations and maintenance. Therefore, these operational measures, though potentially effective in reducing noise impacts, are not considered as mitigation.

For severe noise impacts, mitigation is always recommended, whether it is sound-absorptive trackside noise barriers or sound insulation for the impacted buildings. For moderate noise impacts, noise mitigation is recommended when cost-effective and feasible. Noise mitigation for moderately impacted structures is normally in the form of sound-absorptive trackside noise barriers. However, trackside noise barriers are not reasonable or feasible for this project since the LRT alignment runs in the street when it is at grade. Trackside noise barriers in the street would interfere with traffic and pedestrian movements.

TABLE 4.8-7
GROUND-BORNE NOISE AND VIBRATION ANALYSIS: UNDERGROUND SECTION

Site No.	Cross Street Location	Type of Building	Number of Buildings	Depth to Top of Rail (feet)	Train Speed (mph)	FTA Ground-Borne Vibration Criteria (VdB)	Predicted Vibration Levels (VdB)	FTA Ground-Borne Noise Criteria (dBA)	Predicted Noise Levels (dBA)
53	US 101 Freeway	Single and Two-Family Residences	3	40	25	72	65	35	30
54	US 101 Freeway	Multi-Family Residence	1	40	25	72	64	35	29
55	US 101 Freeway	Residential/Commercial	1	45	25	72	65	35	30
1st/Boyle Station									
56	Boyle Avenue	Residential/Commercial	1	45	55	72	70	35	35
57	Boyle Avenue	Mixed Use	1	45	55	72	66	35	31
58	Boyle Avenue	Single-Family Residence	1	45	55	72	**74**	35	**39**
59	Boyle Avenue	Multi-Family Residence	1	50	55	72	70	35	35
60	Boyle Street	Pentecostal Church	1	50	55	75	70	40	35
61	I-5 Freeway	Multi-Family Residence	1	60	55	72	66	35	31
62	I-5 Freeway	Mixed Use	1	60	55	72	63	35	28
63	I-5 Freeway	Mixed Use	3	65	55	72	64	35	29
64	I-5 Freeway	Ben Franklin Library	1	60	55	75	60	40	25
1st/Soto Station									
65	Soto Street	Mixed Use	2	50	55	72	69	35	34
66	Soto Street	Single-Family Residences	1	50	55	72	65	35	30
67	Mathews Street	Single- and Two-Family Residences	6	50	55	72	68	35	33
68	Mathews Street	Mixed Use	2	55	55	72	66	35	31
69	Fickett Street	Multi-Family Residence	1	65	55	72	61	35	26
70	Fickett Street	Multi-Family Residence	1	65	55	72	62	35	27
71	Fickett Street	Single-Family Residence	1	70	55	72	62	35	27
72	Mott Street	Konko Church	1	75	55	75	60	40	25
73	Mott Street	1st Street School	1	75	55	75	61	40	26
74	Mott Street	Single- and Two-Family Residences	3	75	55	72	61	35	26
75	Mott Street	Single- and Two-Family Residences	3	70	55	72	62	35	27
76	Evergreen	Single- and Two-Family Residences	5	50	55	72	64	35	29
77	Evergreen	Single- and Two-Family Residences	10	50	55	72	64	35	29
78	Fresno Street	Single- and Two-Family Residences	5	50	55	72	64	35	29
79	Fresno Street	Single- and Two-Family Residences	3	45	55	72	64	35	29
80	Fresno Street	Single- and Two-Family Residences	3	40	55	72	67	35	32
81	Fresno Street	Single- and Two-Family Residences	5	25	55	72	71	35	**36**
82	Fresno Street	Single- and Two-Family Residences	6	15	55	72	67	35	29
1st/Lorena Station									

Note: Boldface numbers indicate impacts.

TABLE 4.8-8
SUMMARY OF GROUND-BORNE VIBRATION AND GROUND-BORNE NOISE IMPACTS (WITHOUT MITIGATION)

Type of Impact	Type of Impacted Building	Option A	Option B
Ground-Borne Vibration	Single- and Two-Family Residences	33	24
	Multi-Family Residences	1	1
	Other	1	2
	Total:	**35**	**27**
Ground-Borne Noise	Single- and Two-Family Residences	6	6
	Multi-Family Residences	0	0
	Other	0	0
	Total:	**6**	**6**

All the buildings that are severely impacted are in close proximity to special trackwork. The use of wayside noise barriers is not feasible as a noise mitigation measure for any of these buildings, which are located along the at-grade sections of the alignment. Relocating the special trackwork to other sections of the alignment where there are no noise-sensitive receivers has been evaluated. Special trackwork crossovers within the tunnel segment of the alignment would not be feasible because of the additional cost of tunneling and construction. Therefore, to avoid the added cost of providing a crossover in the underground section of the alignment, system operations require crossovers at both ends of the tunnel. At the east side of the tunnel special trackwork crossovers are required between the east portal and the first at-grade station east of the tunnel, 3rd Street/Rowan Avenue. There are no other locations between the east tunnel portal and the 3rd Street/Rowan Avenue Station where there is sufficient track length for a crossover that is not near any noise-sensitive receivers. The same is true of the special trackwork crossovers on the west side of the tunnel between the 1st Street/Utah Street Station and the west portal. During final design, consideration will be given to replace the two single crossovers on each side of the tunnel with a double crossover. This will reduce the length of special trackwork and the number of buildings that will be noise impacted.

The buildings that are projected to be severely impacted by the special trackwork will be sound insulated to reduce the interior noise levels to the Housing and Urban Development (HUD) interior noise criteria of Ldn=45 dBA. The sound insulation measures will consist of providing air-conditioning, double-paned windows, and adding insulation to the walls and ceiling of each severely impacted building. All occupied spaces within severely impacted buildings will be provided with sound insulation measures to achieve an interior noise level of Ldn=45 dBA or lower. This form of mitigation will not affect or reduce the exterior train noise. The noise impact in the front yards of these buildings will not be mitigated.

The potential for wheel squeal has been identified at three locations, Alameda Street at 1st Street, 1st Street at Indiana Street, and Indiana Street at 3rd Street, where tight radius curve trackwork is in close proximity to residential buildings. . Since it is only possible to anticipate, but not to predict the occurrence of wheel squeal, mitigation measures will be immediately available to treat a potential problem as soon as pre-revenue system operations begins. During pre-revenue testing of LRT operations, wayside noise levels will be measured at the nearest residential building to these tight radius curve locations. These measurements will be compared to measurements taken along tangent sections of trackwork, at the same operating speed and distance to the track, to determine if the tight radius curves are increasing the wayside noise levels. If audible wheel squeal or higher noise levels are present, then either of the following measures, whichever is more appropriate, will be implemented before the start of revenue service:

- Dry-stick friction modifiers. Apply friction modifiers on the wheel tread or directly on the running surface of the rail.
- Lubrication. Wayside lubrication applied to the rail gauge face and wheel flange.

TABLE 4.8-9
OPERATIONAL MITIGATION MEASURES

Operational Measure	System Benefit
Rail Grinding and Replacement	As rails wear, both noise levels from light rail by-passes and vibration levels can increase. By grinding down or replacing worn rail, noise and vibration levels will remain at the initial operating levels. Rail grinding or replacement is normally performed every three to five years.
Wheel Truing and Replacement	Wheel truing is a method of grinding down flat spots (commonly called "wheel flats") on the light rail's wheels. Flat spots occur primarily because of hard braking. When flat spots occur they can cause increases in both the noise and vibration levels produced by the light rail vehicles.
Vehicle Maintenance	Vehicle maintenance includes performing scheduled and general maintenance on items such as air conditioning units, bearings, wheel skirts, and other mechanical units on the light rail vehicles. Keeping the mechanical system on the light rail vehicles in top condition will also help to control noise and vibration levels.
Operator Training	Operators will be trained to maintain light rail travel speeds at those speeds given in the operation plan and to avoid "hard-braking" whenever possible. As stated, "hard-braking" can cause wheel flats and may also damage track. Furthermore, by training operators to identify potential wheel flats and other mechanical problems with the trains, proper maintenance can be performed in a more timely manner.

If the wheel squeal remains after these measures have been implemented, then the following buildings will be sound insulated to reduce the interior noise levels:

- Proposed Mangrove Estates Hotel at the northeast corner of Alameda Street and 1st Street;
- Proposed First Street South Plaza Condominiums at the southwest corner of Alameda Street and 1st Street;
- Nine existing residential buildings on Indiana Street between 1st Street and 3rd Street (Sites 21 and 22); and
- Two existing residential buildings on 3rd Street between Indiana Street and Alma Avenue (west of Site 26).

The sound insulation measures will consist of providing air-conditioning, double-paned windows, and adding insulation to the walls and ceiling of each severely impacted building. All occupied spaces within severely impacted buildings will be provided with these sound insulation measures to achieve an interior noise level of Ldn=45 dBA or lower. This form of mitigation will not affect or reduce the exterior noise. The noise impact in the front yards of these buildings will not be mitigated.

The decision to provide the sound insulation mitigation measures will be made by MTA before revenue services begin, and notification of this action will be sent to the occupants of the impacted buildings. The sound insulation measures will be installed within one-year of the start of revenue service. For those impacted buildings that are proposed and may not be completed by the startup date, MTA will coordinate with the developer to provide the sound insulation measures, where required, when these buildings are completed.

Ground-Borne Noise and Vibration

Vibration impacts will be mitigated to the FTA criteria using the trackwork design measures described below.

- At-Grade Sections – An elastomeric trackwork isolation mat, also known as a ballast mat, will be installed under the concrete supporting the embedded trackwork at those locations where ground-borne vibration impacts have been projected. The trackwork mat will be used for both tangent track and special trackwork.
- Tunnel Sections – A high resilience (soft) direct fixation fasteners will be used in the underground subway tunnel at those locations where ground-borne vibration and ground-borne noise have been projected.

CEQA Significance of Impacts Remaining After Mitigation

Residual impacts after mitigation are those that would remain either because no mitigation is proposed for a moderate noise impact or because the impacts will not be fully mitigated by proposed mitigation. All severe noise impacts will be mitigated by either sound insulating those noise-impacted buildings to an interior noise level of Ldn=45 dBA or lower. However, the exterior noise levels at these severely impacted buildings will remain unmitigated. Mitigation measures for moderate noise impacts will not be feasible or reasonable because the alignment will be operating in a shared right-of-way with traffic vehicles. Vibration impacts, both ground-borne noise and vibration, will be fully mitigated to a level of no significance.

4.8.4.2 Option B

Mitigation measures will be the same as Option A with the exception of the proposed Kaiser Medical Center. The medical center may have vibration sensitive equipment or activities that will be affected by ground vibration. During preliminary and final engineering MTA will coordinate with the Kaiser Medical Center to further study this issue and to ensure that potential ground vibration impacts will not interfere with any sensitive medical equipment or surgical activities. The ground-borne vibrations at this location will be mitigated to a level that is below the FTA vibration criteria of 72 VdB for occupied spaces and for vibration sensitive equipment and medical instrumentation to a level that is below the manufacturer's recommended sensitivity threshold.

CEQA Significance of Impacts Remaining After Mitigation

Same as Option A.

4.9 GEOLOGIC AND SEISMIC CONDITIONS

4.9.1 Affected Environment

This section summarizes the geologic setting and the general topographic, geologic materials, groundwater features, and faults and seismic characteristics of the study area.

4.9.1.1 Geologic Setting

The study area is located in the north-central portion of the Los Angeles Coastal Plain. The coastal plain is an alluviated lowland area that is bounded on the north by the Santa Monica Mountains and the Elysian, Repetto, and Puente Hills; and on the east and southeast by the Santa Ana Mountains and the San Joaquin Hills. A deep structural basin underlies the coastal plain. Parts of the basin have undergone deposition of sediments since late Cretaceous time and continuous marine deposition and subsidence of the basin have been ongoing since middle Miocene time. Numerous oil fields are located in the basin and within the study area.

The study area is located along the southern flank of the Elysian and Repetto Hills and generally traverses a dissected Pleistocene age terrace in an east-west direction. The Los Angeles River traverses the LRT Build Alternative. Younger Holocene age (within the last 11,000 years) alluvial deposits are present in the vicinity of the river.

Regionally, the study area is in the Peninsular Ranges geomorphic province, which is characterized by northwest-trending mountain ranges separated by sediment-floored valleys (Yerkes et al., 1965). The northwest trend is further indicated by the dominant geologic structural features of the province, which include northwest to west-northwest trending faults and fault zones such as the Newport-Inglewood fault zone and the Whittier fault zone.

The study area is underlain by the Elysian Park Thrust, which is generally accepted as the source of the 1987 Whittier Narrows earthquake. This thrust fault is a concealed, deep thrust fault that, in part, expresses itself at the surface as the Elysian Park Hills and the Repetto Hills and results in active folding along the trace of the Coyote Pass Escarpment. The escarpment is a gentle south-facing and east-west trending topographic feature northeast of downtown Los Angeles (Woodward-Clyde Consultants, Seih, 1997, 1998). The result of the fault investigations along the Coyote Pass Escarpment performed for the project indicate that this structure is active, resulting in monoclinal folding and deformation of the near-surface alluvial deposits and the underlying Fernando Formation and Puente Formation bedrock.

4.9.1.2 Topography

The Los Angeles Coastal Plain slopes gently southward toward the ocean. The gently sloping topography is interrupted by the Palos Verdes Peninsula in the southwest, a northwest-trending series of low-lying hills (associated with the Newport-Inglewood fault zone) in the west, and the Coyote Hills in the northeastern portion of the coastal plain, respectively. Along the LRT Build Alternative, the topography generally slopes gently to the south or south-southwest. The exception is in the area between the Los Angeles River and Atlantic Boulevard where the topography consists of low-lying hills.

4.9.1.3 Geologic Materials

The LRT Build Alternative traverses the physiographic features known as the Downey Plain (west of the Los Angeles River) and the Montebello Plain (east of that river) and numerous river and stream drainages. The Downey and Montebello Plains are mantled by Pleistocene age terrace and alluvial

deposits and form an alluvial fan originating from the Repetto and Merced Hills. These hills are comprised of sedimentary bedrock of the Pliocene age Fernando Formation. The bedrock that underlies the LRT Build Alternative consists of the Fernando Formation and the older Miocene age Puente Formation. The numerous river and stream drainages that are traversed by the alignment dissect the Downey Plain and the Montebello Plain and include the Los Angeles River. These drainages are in-filled with Holocene age alluvial deposits. Locally, artificial fills mantle the Pleistocene age terrace deposits and Holocene age alluvial deposits.

4.9.1.4 Groundwater

Groundwater levels vary beneath the project alignment. Groundwater levels east of Lorena Street have been historically greater than 50 feet beneath the existing ground surface. Groundwater levels west of Lorena Street have been previously documented in geotechnical reports by GeoTransit Consultants (1995, 1996a, 1996b, 1996c, 1996d). The measured groundwater levels along the tunnel sections and portals generally range from approximately 25 to 85 feet below ground surface (BGS). Assuming the groundwater levels during construction are the same as the most recently measured data, the portion of the tunnels approximately between State and Dacotah Streets will be partly or entirely below the groundwater levels. The groundwater levels measured at the 1st/Boyle Station area were 50 to 60 feet BGS, which is about two (2) feet above the planned bottom of the station. Groundwater level measurements in borings and monitoring wells at the 1st/Soto Station indicate that the current groundwater level at the station is at about 24 feet BGS; about 30 feet above the bottom of the proposed station structure. Based on review of groundwater levels at the 1st/Lorena Station location, groundwater levels are expected to range from 82 feet BGS at the west end of the station to 62½ feet BGS at the east end. Potentially perched groundwater conditions were observed in recent and previous investigations and may be locally present along portions of the alignment.

4.9.1.5 Subsurface Gases

Based on maps from the California Division of Oil and Gas, the LRT Build Alternative will traverse two existing oil fields. Also, based on available publications and subsurface information from previous geotechnical investigations in the vicinity of the proposed tunnel segment, there is documented subsurface methane and hydrogen sulfide gases, free oil and tar, and petroliferous bedrock in the area between Union Station and the Los Angeles River. Further discussion of subsurface gases is included in Section 4.10.

Recent investigations for the LRT Build Alternative have not found significant measurements of methane or hydrogen sulfide gases. At the time the Draft SEIS/SEIR was written, site-specific geotechnical investigations had not been initiated, and results of the investigation for the suspended project were used. Since May, 2001 borings and monitoring wells have been placed along 1st Street, and gas concentrations monitored. Data thus far shows that the highest methane level measured was 1,700 parts per million (ppm), in one location. The lower explosive limit for methane is 50,000 ppm. All other locations were below 100 ppm. No hydrogen sulfide gas has been measured in the borings for the 1st Street alignment to date.

4.9.1.6 Corrosivity

Based on results of chemical testing performed as part of the previous investigations for the suspended Metro Red Line project (GeoTransit Consultants, 1996a, 1996b, 1996c, 1996d), subsurface materials along the LRT Build Alternative are classified as corrosive to severely corrosive to metals and moderately deleterious to concrete.

4.9.1.7 Faults and Seismicity

The numerous faults in Southern California include active, potentially active, and inactive faults. The criteria for these major groups are based on criteria developed by the California Division of Mines and Geology (CDMG) for the Alquist-Priolo Earthquake Fault Zoning Program (Hart, 1997). By definition, an active fault is one that has had surface displacement within Holocene time (about the last 11,000 years). A potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (last 1.6 million years). Inactive faults have not moved in the last 1.6 million years. A list of nearby active and potentially active faults and the distance in miles between the LRT Build Alternative and the nearest point on the fault, the maximum magnitude, and the slip rate for the fault is listed in Table 4.9-1.

Figure 4.9-1 shows the locations of major faults and earthquake epicenters in southern California. Several earthquakes of moderate[11] to major magnitude have occurred within the last 65 years that have produced significant ground shaking in the vicinity of the study area. The earliest of these was the March 10, 1933 magnitude 6.4 Long Beach earthquake. The epicenter of this earthquake was located about 26 miles south-southeast of the proposed alignment. The epicenter of the February 9, 1971, San Fernando earthquake, magnitude 6.6, was about 26 miles north-northwest of the LRT Build Alternative. Surface rupture occurred on various strands of the San Fernando fault zone as a result of this earthquake, including the Tujunga and Sylmar faults. The magnitude 5.9 Whittier Narrows earthquake occurred on October 1, 1987, on a previously unrecognized fault, now believed to be the Elysian Park Thrust. The earthquake epicenter was located about 2.4 miles north of the proposed alignment. The Sierra Madre earthquake occurred on June 28, 1991, along the Sierra Madre fault zone. The epicenter of the magnitude 5.8 earthquake was located in the San Gabriel Mountains about 17 miles north-northeast of the alignment.

On June 28, 1992, two major earthquakes occurred east of Los Angeles. A magnitude 7.5 earthquake occurred in the High Desert region and is known as the Landers earthquake. The epicenter was located about 91 miles east-northeast of the LRT Build Alternative. The second event occurred near Big Bear Lake and had a magnitude of 6.6; the epicenter was about 71 miles east-northeast of the LRT Build Alternative. On January 17, 1994, a magnitude 6.7 Northridge earthquake occurred on a previously unknown blind thrust fault that is now known as the Northridge Thrust. The Northridge Thrust is located beneath the majority of the San Fernando Valley and is considered to be the eastern extension of the active Oakridge fault. The epicenter of the Northridge earthquake was located about 20 miles northwest of the LRT Build Alternative. Most recently, the magnitude 7.1 Hector Mine earthquake occurred on October 16, 1999. The earthquake is believed to have occurred on the Lavic Lake fault, previously thought to have been inactive.

4.9.2 Methodology for Impact Evaluation

Categories of potential geotechnical impacts are set forth by the California Environmental Quality Act (CEQA), the California Public Resources Code, and State CEQA Guidelines. Potential impacts associated with geotechnical considerations have been identified from a review of available published and unpublished geotechnical literature pertinent to the proposed project. These include, but are not limited to: the safety elements of the general plans for the City and County of Los Angeles, and the Cities of Commerce and Montebello aerial photographs; Official Alquist-Priolo Earthquake Fault Zone Maps; Official Seismic Hazard Zone Maps; geologic and topographic maps and other publications by the California Division of Mines and Geology, U.S. Geological Survey, and California Division of Oil and Gas; Wildcat Oil and Gas Maps; and available geotechnical reports pertinent to the project.

[11] Moderate earthquakes are those with magnitudes of 6.0 to 6.9; major earthquakes are those with magnitudes of 7.0 to 7.9; great earthquakes are those with magnitudes of 8.0 or greater (California Division of Mines and Geology, 1986).

TABLE 4.9-1
MAJOR NAMED FAULTS CONSIDERED TO BE ACTIVE[1] OR POTENTIALLY ACTIVE[1] IN SOUTHERN CALIFORNIA

Fault (in alphabetical order)	Maximum Magnitude[2]	Fault Type[6]	Slip Rate (mm/r.)	Approximate Distance From LRT Build Alternative (Miles)	Direction From Alternative
Considered Active:					
Anacapa-Dume	7.3	RO	3.0	26	WSW
Compton-Los Alamitos Thrust	6.8	RO	1.5	4.4	SW
Cucamonga	7.0	RO	5.0	24	NE
Elsinore (Glen Ivy Segment)	6.8	SS	5.0	24	ESE
Elysian Park Thrust	6.7	RO	1.5	0.0	---
Hollywood	6.4	RO	1.0	4.5	NNW
Malibu Coast	6.7	RO	0.3	24	W
Newport-Inglewood Zone	6.9	SS	1.0	6.2	SW
Northridge Thrust	6.9	RO	1.5	15.5	NW
Oak Ridge	6.9	RO	4.0	38	NW
Palos Verdes	7.1	SS	3.0	17.5	SW
Raymond	6.5	RO	0.5	4.7	N
San Andreas (Southern Segment)	7.4	SS	24.0	33	NE
San Cayetano	6.8	RO	6.0	40	NW
San Fernando	6.7	RO	2.0	16	NW
San Gabriel	7.0	SS	1.0	17	N
San Jacinto (San Bernardino Segment)	6.7	SS	12.0	38	NE
Santa Monica	6.6	RO	1.0	9.2	W
Sierra Madre	7.0	RO	3.0	11.0	NE
Simi-Santa Rosa	6.7	RO	1.0	31	NW
Verdugo	6.7	RO	0.5	7.0	N
Whittier	6.8	SS	2.5	1.8	NNE
Considered Potentially Active:					
Fault (in alphabetical order)	**Maximum Magnitude**	**Fault Type[6]**	**Slip Rate (mm/yr.)**	**Approximate Distance From LRT Build Alternative (Miles)**	**Direction From Alternative**
Charnock	6.5[1]	SS	0.1	11.0	SW
Chino-Central Avenue	6.7[2]	NO	1.0	19.0	E
Clamshell-Sawpit	6.5[2]	RO	0.5	12.5	NNE
Coyote Pass	6.7[3]	RO	0.1	0.2	N
Duarte	6.7[1]	RO	0.1	11.5	NE
Holser	6.5[2]	RO	0.4	35	NW
Indian Hill	6.6[3]	RO	0.1	14.0	NE
Los Alamitos	6.2[3]	SS	0.1	11.0	SSW
MacArthur Park	5.7[4]	RO	3.0	0.8	WSW
Northidge Hills	6.6[5]	SS	1.2	17.5	NW
Norwalk	6.7[1]	RO	0.1	5.2	SSW
Overland	6.0[1]	SS	0.1	9.5	SW
San Jose	6.5[2]	RO	0.5	14.5	NE
Santa Cruz Island	6.8[2]	RO	1.0	57	W
Santa Susana	6.6[2]	RO	5.0	24	NW

[1]Slemmons, 1979.
[2]CDMG, 1996.
[3]Mark, 1977.
[4]Hummon et al., 1994
[5]Wesnousky, 1986.
[6]SS=Strike Slip NO=Normal Oblique RO=Reverse Oblique

Figure 4.9-1 Regional Seismicity

The analysis of potential geologic and seismic impacts along the project alignment was determined specifically from: 1) the Los Angeles County Seismic Safety Element (1990); 2) the City of Los Angeles Safety Element (1996); 3) the Seismic Hazard Zone Maps published by the California Division of Mines and Geology (1999); 4) Alquist-Priolo Earthquake Fault Zone Maps; and 5) reports prepared for the MTA for the suspended Metro Red Line project and other Law/Crandall projects in the vicinity.

The determination of significance was based on guidelines established by CEQA. Per Section 15358 of the CEQA Guidelines, a significant geotechnical impact on the environment is defined as a substantial or potentially substantial adverse change in the physical environment due to the LRT Build Alternative. A significant impact on the project is defined as one having a substantial or potentially substantial adverse effect on the LRT Build Alternative.

4.9.3 Impacts

4.9.3.1 No-Build Alternative

No impacts are anticipated as a result of the No-Build Alternative.

4.9.3.2 LRT Build Alternative

Option A

Potential operational impacts are discussed below, generally in order of significance.

Corrosivity

Subsurface materials along the underground segment of the project are classified as corrosive to severely corrosive to ferrous metals and non-deleterious to concrete. Subsurface materials along the at-grade portion of the project are classified as corrosive to severely corrosive to ferrous metals and moderately deleterious to concrete. The corrosivity of subsurface materials is anticipated to have a potentially significant impact under CEQA on Option A, depending on materials selected for construction of underground segments.

Groundwater

Shallow and perched groundwater may be encountered above design elevations for tunnels and underground stations, creating hydrostatic pressure on tunnel sections and station walls and floors below the groundwater table. Groundwater is anticipated to have a potentially significant impact under CEQA on Option A.

Ground Shaking

Significant ground shaking could occur along the proposed alignment as a result of earthquakes on any of the documented or undocumented nearby active or potentially active faults. The Seismic Shaking Hazard Map of California (CDMG, 1999) indicates the estimated peak ground acceleration with a 10 percent probability of being exceeded in 50 years in the study area ranges from 0.4g to 0.6g. The location of Option A in relation to known active or potentially active faults indicates that the alignment is not exposed to a greater seismic risk than other sites in Southern California.

MTA Design Criteria (Rail and Transit Design Criteria and Standards, 1996) requires that for important structures such as the LRT Build Alternative, special earthquake protection criteria be followed. "The

guiding philosophy of earthquake design for the Metro Rail projects is to provide a high level of assurance that the overall system will continue to operate during and after an Operating Design Earthquake (ODE)." Operating procedures assume safe shut down and inspection before returning to operation. "Further, the system design will provide a high level of assurance that public safety will be maintained during and after a Maximum Design Earthquake (MDE)." The ODE is defined as the earthquake event with a 40 percent probability of exceedance in 100 years, which corresponds to an average recurrence interval of 200 years. Such an event can reasonably be expected to occur during the 100-year facility design life. The MDE is defined as the earthquake event with a 5 percent probability of exceedance in 100 years, which corresponds to an average recurrence interval of 2000 years.

Investigations for the suspended Metro Red Line project provided site specific acceleration data, and design criteria were developed for the Little Tokyo, 1st/Boyle, 1st/Lorena, and Chavez/Soto Stations. For these stations, horizontal peak ground accelerations of 0.45g and 0.95g were the design values used for the ODE and MDE, respectively (Woodward-Clyde Consultants, 1997). Similar ground motions are anticipated for Option A, as it is nearly coincident with the suspended project. Thus, ground shaking is anticipated to have a potentially significant impact under CEQA on Option A.

Ground Deformation

The alignment parallels and is in close proximity of the Coyote Pass escarpment near the 1st/Soto underground station. The Coyote Pass escarpment is an area of surface deformation believed to be a result of movement along an underlying shallow thrust fault (Oskin et al., 2000). The buried thrust is considered active, and there is a potential for ground deformation (active folding) of the bedrock and the overlying alluvial sediments in the vicinity of the escarpment during the design life of the proposed project. An evaluation of the deformation potential for the Coyote Pass escarpment and its impact on the planned 1st/Soto Station was recently completed (Earth Consultants International, Inc., 2001). The results indicate that the station design should address the potential ground deformation induced by movement of the thrust fault. Therefore, ground deformation is anticipated to have a potentially significant impact under CEQA on Option A.

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. Based on the investigations performed to date along the project alignment, the potential for liquefaction along both the underground and at-grade segments is considered negligible. Accordingly, liquefaction is not expected to be a significant impact under CEQA.

Seismically Induced Settlement

Seismically-induced settlement is often caused by loose to medium-dense granular soils densified during ground shaking. Based on the investigations performed to date, there is a potential for seismically-induced settlement along the at-grade portions of the LRT Build Alternative west of the underground segment. (The potential for seismically-induced settlement beneath the planned underground structures along the LRT Build Alternative alignment is negligible.) There is also a potential for seismically-induced settlement in localized areas of non-engineered fills. The total seismically-induced settlement of these vulnerable areas is estimated to be less than one inch, which the planned at-grade structures in these areas should be able to accommodate without damage. Accordingly, seismically-induced settlement is not anticipated to have an impact.

Subsurface Gas

No evidence of subsurface gases was noted along the at-grade portions of the project (Group Delta Consultants, 2001). Field monitoring to date along the underground segment detected only low levels of methane gas and did not detect hydrogen sulfide gas. However, because the alignment crosses the Boyle Heights Oil Field, there exists the potential that subsurface gases such as methane and hydrogen sulfide may be encountered along the underground segment within and near the oil field. Accordingly, subsurface gas is anticipated to have a potentially significant impact under CEQA on Option A. Further discussion of subsurface gases appears in Section 4.10.

Other

This discussion focuses on potential impacts on existing landforms, loss of mineral resources, potential for surface fault rupture, slope instability, subsidence, and inundation. Significant long-term impacts under CEQA are not anticipated in connection with any of these issues. With regard to existing landforms, tracks and stations will be located along existing streets. Tunnels and underground stations will not be visible from the surface, and the aerial structure crossing US 101 from Union Station to Alameda Street will be within an already highly developed industrial area.

Regarding loss of mineral resources, the LRT Build Alternative traverses two oil fields, the Union Station and Boyle Heights Fields. However, the access and recovery of the potential mineral resources associated with these fields will not be affected, and no loss of potential petroleum or gas resources will result from the proposed construction, especially since most of the route for the LRT alignment is located within existing street rights-of-way. All of the alignment traverses areas underlain by geologic materials such as sand and gravel that might be considered mineral resources, and which could be used as construction aggregate. However, these materials have not been previously mined in the area of the proposed alternative because of the low mineral value of these materials and their location within fully urbanized areas. Therefore, mining these materials is considered uneconomical. There is a potential for re-use of the excavated materials from the tunnels for fills.

Option A is not within, and does not traverse, a currently established Alquist-Priolo Earthquake Fault Zone for surface fault rupture hazards. The nearest Alquist-Priolo Earthquake Fault Zone, established for the East Montebello Hills fault, is located 1.8 miles to the north of Option A. Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located within the study area. The potential for surface fault rupture due to fault plane displacement propagating to the surface across the planned LRT alignment during the design life of the project is considered low.

According to the Los Angeles County Seismic Safety Element (1990) and the City of Los Angeles Safety Element (1996), Option A is not within an area identified as having a potential for slope instability. Additionally, Option A is not located within an area identified as having a potential for seismic slope instability (California Division of Mines and Geology, 1999). There are no known landslides near the alignment, nor is it in the path of any known or potential landslides. The LRT alignment is also not within an area known to be susceptible to subsidence due to the withdrawal of fluids (petroleum or groundwater) or peat oxidation.

According to the City of Los Angeles Safety Element (1996) and the Los Angeles County Seismic Safety Element (1990), a portion of Option A in the western portion of the alignment is located within a potential inundation area (potential flood area) for an earthquake-induced dam failure from Hansen, Whittier Narrows, and Sepulveda Dams, and from Garvey Reservoir. The area is from Alameda and Banning Streets to 1st and Utah Streets. However, the referenced dams and reservoirs, as well as others in

California, are continually monitored by various governmental agencies (such as the State of California Division of Safety of Dams and the U.S. Army Corps of Engineers) to guard against the threat of dam failure. The possibility of a dam failure during an earthquake has been addressed by the California Division of Mines and Geology in the earthquake planning scenarios for a magnitude 8.3 earthquake on the San Andreas Fault zone (Davis et al., 1982) and a magnitude 7.0 earthquake on the Newport-Inglewood fault zone (Toppozada et al., 1988). As stated in both reports, catastrophic failure of a major dam as a result of an earthquake is regarded as unlikely.

Current design and construction practices and ongoing programs of review, modification, or total reconstruction of existing dams are intended to ensure that all dams are capable of withstanding a maximum credible earthquake (MCE) on a nearby fault. The MCE is defined as an event with a ten percent probability of exceedance in 100 years, which corresponds to a 950-year average recurrence interval. Therefore, inundation is not anticipated to have a significant impact under CEQA on Option A. Furthermore, because the distance to the nearest retention structure is over ¾ mile, Option A is not anticipated to impact these retaining structures nor influence their potential for causing inundation.

Significance of Impacts

Corrosivity, groundwater, ground shaking, ground deformation, and subsurface gases are anticipated to have a potentially significant impact under CEQA on the LRT Build Alternative. Significant long-term impacts are not anticipated with regard to liquefaction, seismically-induced settlement, existing landforms, loss of mineral resources, potential for surface fault rupture, slope instability, subsidence, and inundation.

Option B

The impacts and significance of the impacts are the same as described for Option A.

4.9.4 Mitigation

From a geologic and seisimic conditions perspective, both build Options A and B essentially are the same. Accordingly, mitigation for both options are discussed jointly as the LRT Build Alternative.

Measures to address corrosivity and groundwater will include:

- Concrete resistant to sulfate exposure and corrosion protection for metals will be used where required for underground structures in areas where corrosive groundwater or soil could potentially cause deterioration of tunnel liners and station walls.
- Tunnel liners and station walls and floors below groundwater will be designed for hydrostatic pressures and to minimize water leakage according to MTA Design Criteria and Standards.

The ground shaking hazard is common in Southern California, and structural elements will be designed to resist or accommodate appropriate site-specific ground motions and to conform to MTA Design Standards. In addition, portions of the LRT Build Alternative impacting bridge structures under the jurisdiction of the California Department of Transportation (Caltrans) will be designed to conform to Caltrans Design Standards.

Site-specific studies are currently being undertaken to determine the anticipated ground displacement (racking displacement) at underground station locations due to the MDE and ODE ground motions. The design of the underground station locations will incorporate mitigation measures for the anticipated site-specific ground displacement. Operational elements of the existing Red Line system are also designed to

detect and respond automatically during earthquakes. If sensors detect ground shaking over a prescribed acceleration, the Emergency Gas Operations System (EGOP) is activated. This activates an un-interruptible power supply (UPS) which is in place such that, in the event of an earthquake or other emergency and the local (DWP) supply is interrupted, the subway lighting and ventilation systems will operate for several hours. Back-up power generators can be activated if power is lost beyond this time. Train operators will be instructed by the Rail Operations Center to reduce speed and bring trains to the nearest station if possible.

To address potential impacts from ground deformation, the design will comply with standards set forth in the MTA Design Criteria and Standards, using the MDE criteria described in Section 4.9.3.2. The amount of ground deformation corresponding to the MDE design event was estimated based on the results of the project-specific evaluation of deformation potential for the Coyote Pass escarpment discussed in Section 4.9.3.2. The 1st/Soto Station will be designed to accommodate the estimated ground deformation corresponding to the MDE design event.

A barrier system similar to that designed for the suspended Metro Red Line project or the existing Red Line System will provide the primary protection from hazardous gases during operations. Further discussion of hazardous subsurface gases and liner design is contained in Section 4.10.

4.9.4.1 Significance of Impacts Remaining After Mitigation

The mitigation measures would reduce impacts to less than significant.

4.10 HAZARDOUS MATERIALS

4.10.1 Affected Environment

4.10.1.1 Regulatory Setting

Hazardous substances are defined as substances, materials or waste, the exposure to which results, or may result, in adverse effects on health or safety. This generally includes substances defined as hazardous substances under the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and under Sections 25316 and 25317 of the California Health and Safety Code, which identifies substances, materials, or waste requiring hazardous substance removal, including petroleum and petroleum by-products, waste oil, crude oil, and natural gas. Other pertinent regulations include the Resource Conservation and Recovery Act, the Clean Water Act, and any Department of Transportation standards.

4.10.1.2 Study Area Setting

The LRT Build Alternative traverses urbanized areas containing small commercial buildings, parking lots, gasoline stations, and interspersed residential developments. The potential for encountering pre-existing hazardous waste materials is present during any construction project, particularly within an urban area. Although no hazardous substances were reported in the recent explorations and monitoring along the underground segments of the LRT Build Alternative (Law/Crandall, 2001), it is possible that some hazardous substances, such as natural gases and petroleum contaminated soil and ground water, may be encountered between boring locations and below boring depths. Field monitoring of gas probes and laboratory test results to date indicate low levels of methane gas and hydrogen sulfide gas concentrations below detectable levels. The highest methane level measured was 1,700 parts per million (ppm), in one location. (The lower explosive limit for methane is 50,000 ppm). All other locations were below 100 ppm. No hydrogen sulfide gas has been measured in the explorations and monitoring to date for the underground segment. Explorations performed to date have not encountered evidence of abandoned oil well and pipe casings or mud pits. Nonetheless, because the underground segment of the alignment traverses the Boyle Heights oil field, there exists a potential for local soils and water inflows (between explorations and monitoring locations to date) to be contaminated with oil field related contaminants that, if encountered, will require treatment and disposal to approved facilities.

Recent explorations for the at-grade portions of the LRT Build Alternative (Group Delta Consultants, 2001) did not encounter groundwater or subsurface gases. Although soil contamination was encountered, the concentrations were low enough to be considered non-hazardous and would require remediation only for off-site disposal. Unidentified petroleum deposits may be encountered (between explorations and monitoring locations to date) during excavation of the tunnel and deep foundations for the aerial structure, which is planned to be adjacent to the Union Station oil field. The numerous potential sources of petroleum based contamination and migration of the contaminants via ground water flow could make it difficult to precisely determine the impacted areas. Further environmental testing for this section of the LRT Build Alignment is currently in progress. Figure 4.10-1 and the following discussion present the former oil fields and sources of potential hazardous substances by project segment that were identified through the regulatory search.

Figure 4.10-1 Sites with Potential for Environmental Hazards, LRT Build Alternative

Union Station to Boyle Avenue

Government buildings, parking lots, and a gasoline station are located along Alameda Street between Union Station and 1st Street. A portion of the LRT Build Alternative in this segment will be elevated to pass over US 101. The Division of Oil and Gas maps, historical topographic maps, aerial photographs, and previous reports indicate that portions of the active former Union Station oil field and a former coal gasification plant are located along this segment. Small office buildings, warehouses, automotive service stations, the concrete-lined Los Angeles River channel and interspersed residential neighborhoods are located along 1st Street between Alameda Street and Boyle Avenue. The tunnel section of the LRT Build Alternative begins near the intersection of 1st and Clarence Streets.

Boyle Avenue to Indiana Street

Small commercial buildings, gasoline stations, automotive service stations, and interspersed residential neighborhoods are located in this segment of the LRT Build Alternative. A large cemetery is located north of 1st Street between Evergreen Avenue and Lorena Street. The underground portion of the project is included in this segment. The California Division of Oil and Gas and Munger Oil Field maps as well as historical topographic maps indicate that portions of the inactive Boyle Heights oil field are included in this segment of the LRT Build Alternative.

Indiana Street to Atlantic Boulevard

Option A of the LRT Build Alternative ends approximately at the junction where 3rd Street becomes Beverly Boulevard, just past Atlantic Boulevard. Option B continues along 3rd Street to Pomona Boulevard terminating at Pomona/Atlantic. Small commercial buildings, gasoline stations, automotive service stations, and interspersed residential neighborhoods are located in this segment. The California Division of Oil and Gas and Munger Oil Field maps as well as historical topographic maps and aerial photographs do not indicate known oil field operations in this segment.

4.10.2 Methodology for Impact Evaluation

The methods used to identify existing hazardous substances included a field reconnaissance of the LRT Build Alternative route (including both Options A and B) and a review of the following:

- Federal, State, and County regulatory databases,
- Historical aerial photographs,
- Portions of previous reports prepared for the suspended Metro Red Line Project alignment,
- Historic oil field maps, and
- Area topographic maps.

Refer to the *Hazardous Materials Technical Report* and *Addendum to the Hazardous Materials Technical Report* that were prepared for this project for the comprehensive list of sources that were reviewed. No specific regulatory agency files were viewed to determine the status of the listed sites. Such files will be reviewed during subsequent design phases of the project. The regulatory databases reviewed included:

- National Priorities List (NPL) of the U.S. Environmental Protection Agency;
- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS);
- Emergency Response Notification System (ERNS);

- Resource Conservation and Recovery Information System (RCRIS) including transport, storage, and disposal (TSD) facilities;
- California Department of Health Bond Expenditure Plan (BEP) for Hazardous Substance Clean-up;
- California Environmental Protection Agency and the Department of Toxic Substances (CAL-SITES);
- California Regional Water Quality Control Board, Leaking Underground Storage Tank (LUST) Listings; and
- Underground Storage Tank (UST) Listings.

Potential impacts are defined as the potential exposure of human health and/or wildlife to hazardous waste or naturally occurring petroleum compounds by project activities or an increase in the likelihood of hazardous substance or petroleum compound migration. The operational and construction activities are most likely to encounter pre-existing hazardous substances where subsurface construction activity will be required near:

- Known formerly active oil fields, or
- Areas with known historic soil and groundwater contamination, gasoline stations, auto repair facilities, dry cleaners, and commercial manufacturing, or shipping facilities.

To assist in identifying the potential impacts, each contaminated or potentially contaminated site that was identified with respect to its proximity to the LRT Build Alternative was classified as high, moderate, or low based on its potential for detrimental environmental impacts. The classification of each site is based on type of operation, proximity to the alignment, anticipated hydrogeologic gradient, field observations, and historical and regulatory information. In general, the classification criteria is:

- High – sites with known or probable soil/groundwater contamination (e.g. LUSTs), and sites where remediation is incomplete or undocumented.
- Moderate – sites with identified or potential soil contamination (e.g. LUSTs), remediation is in progress, or groundwater contamination that does not appear to be migrating.
- Low – sites that have completed remediation or have historically utilized only small amounts of known contaminants (e.g., Resource Conservation and Recovery Act Information System [RCRIS] small quantity generators or underground storage tanks).

4.10.3 Impacts

4.10.3.1 No-Build Alternative

No impacts are anticipated as a result of the No-Build Alternative.

4.10.3.2 LRT Build Alternative

Option A

Potential impacts along the LRT Build Alternative would include migration of subsurface gases into the tunneled portions of the alignment and migration of future soil contamination. At-grade or elevated portions of the alignment will generally not be impacted by soil or groundwater contamination during operations. It is not likely hazardous materials will be placed on the tracks as the alignment is located in a major arterial street subject to public view. The results of the preliminary environmental investigations indicate that the project area has no significant soil or groundwater contamination requiring remedial action. However, because the alignment traverses the Boyle Heights oil fields, there exists a potential for

local soils and water inflows to be contaminated with oil field related contaminants (i.e., hydrocarbons, hydrogen sulfide, etc.) that, if encountered, will require treatment and disposal to approved facilities.

Significance of Impacts

Although unlikely, the migration of subsurface gases into the tunneled portions of the alignment and migration of future soil contamination could be potentially significant under CEQA.

Option B

The impacts of Option B are the same as Option A. Although Option B's at-grade alignment along Indiana Street is offset slightly to the east, the difference is not significant with respect to environmental contamination. Similarly, the eastern terminus for Option B is anticipated to encounter essentially the same geo-environmental conditions as the eastern terminus for Option A.

Significance of Impacts

Although unlikely, the migration of subsurface gases into the tunneled portions of the alignment and migration of future soil contamination could be potentially significant under CEQA.

4.10.4 Mitigation

The mitigation measures for Options A and B will be the same. Therefore, the measures are discussed collectively for both options as mitigation for the LRT Build Alternative. The operation of the tunneled elements will require addressing infiltration of hazardous gases and providing adequate ventilation procedures to maintain a safe environment. These issues are discussed below.

4.10.4.1 Monitoring

To detect and identify hazardous gases, the following measures will be implemented:

- Installation of automatic gas detection systems, including discrete sensors throughout the system, to allow early detection of infiltrating hazardous gases. Alert levels would be set well below dangerous concentrations.
- Emergency ventilation systems would automatically activate upon gas detection at alert levels.
- Installation of audible and visible alarm systems would alert employees when gases are detected.

4.10.4.2 Ventilation

Ventilation systems similar to those provided in the operating Metro Red Line System would:

- Provide an adequately sized ventilation system to prevent accumulation of hazardous gases.
- Provide an auxiliary ventilation system to rapidly evacuate hazardous gases.
- Prepare and implement a ventilation plan to provide adequate fresh airflow into the tunnels.

4.10.4.3 Gas Barriers

A barrier system, which includes use of bolted, gasketed, pre-cast tunnel liners, similar to that designed for the suspended Metro Red Line project or the existing Red Line System will provide the primary protection from hazardous gases during operations. This type of system has been found to be effective in

minimizing migration of hazardous gases. Refer to the separate *Hazardous Materials Technical Report* and *Addendum to the Hazardous Materials Technical Report* that were prepared for the Eastside Corridor for additional information about the effectiveness of this system. Additionally, natural ventilation, ventilation created by train movements, and ventilation fans will be provided in the stations and tunnels to mitigate migration of hazardous gases during operation.

4.10.4.4 Safety and Security

A comprehensive health and safety and emergency response plan will be developed to meet the City and County of Los Angeles standards, and will be coordinated with the City and County Fire Departments. MTA Fire Life Safety Committee, composed of members from the Los Angeles City and County Fire Departments, as well as MTA safety specialists, will approve the plan. At a minimum, the plan will address air monitoring, health risk assessment, refuge centers or tunnel cross passages, escape routes, communication, and training.

4.10.4.5 Significance of Impacts Remaining After Mitigation

The mitigation measures would reduce impacts to less than significant.

4.11 WATER RESOURCES

4.11.1 Affected Environment

4.11.1.1 Regulatory Setting

There are several Federal and State laws and regulations that provide for the protection of water and water-related resources. The following is a listing of the applicable laws and the agencies responsible for protection of the water resources.

Federal

The United States Army Corps of Engineers (COE) under Section 404 of the Clean Water Act is responsible for a permit program for the discharges of dredged or fill material into waters of the U.S. The current plans for the Los Angeles Eastside Corridor does not call for discharge of any dredged or fill material into the Los Angeles River.

State

The State Water Resources Control Board, under Section 402 of the Clean Water Act, establishes a permitting system for the discharge of any pollutant (except for dredge or fill) into the waters of the United States. The permit is also called the National Pollution Discharge Elimination System (NPDES) permit. In California, the Regional Water Quality Control Board (RWQCB) oversees the permitting process. The jurisdiction of the RWQCB relative to the NPDES permits extends to "waters of the U.S." which is defined as: (1) navigable waters, (2) tributaries of navigable waters, and (3) wetlands. Potential project impacts on the Los Angeles River may include construction activities related to seismic strengthening of existing roadway bridges, and the discharge from dewatering activities related to structures or below ground rail construction.

The California Department of Fish and Game (CDFG) under Sections 1601 through 1603 of the California Fish and Game Code requires agencies to notify the CDFG of "…any project which will divert, obstruct or change the natural flow of bed, channel or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit, or will use material from the streambed designated by the department…" Seismic retrofitting of the bridge may occur for the 1st Street Bridge over the Los Angeles River. Such activity may classify the project as being within the CDFG's jurisdiction regarding Section 1601. If required, MTA will work in cooperation with the CDFG to obtain project clearances.

Local

The Los Angeles River is designed and owned by the COE and maintained by the County of Los Angeles. No further flood control permitting activity is required with the City of Los Angeles regarding the river crossing, although any construction on the 1st Street Bridge would require a Public Works Permit from the City's Department of Public Works. MTA will work in cooperation with the regulating agencies and will obtain any required permits prior to construction. Because the Los Angeles River is maintained by the County, any activity in the waterway would require a permit from the County's Department of Public Works. The project would not require the placement of additional bridge piers into the waterway.

4.11.1.2 Study Area Setting

Surface Water

General Watershed Conditions

The Los Angeles River, which runs from north to south along the western portion of the project area, is the only major surface water feature in the project area. The area adjacent to the river is densely populated with residential, commercial, and industrial development. Surface runoff has increased as a consequence of the impervious surfaces related to the development. Peak runoff rates for the coastal plain areas have also increased due to elimination of natural ponding areas and improved hydraulic efficiency of water carriers such as streets and storm drain systems.

The topography of the coastal plain is gradually sloped from the foothills of the San Gabriel Mountains to the Pacific Ocean with a few exceptions of rising hills and depressed areas. Ground elevations range from 10,000 feet in the San Gabriel Mountains, to 330 feet near the Arroyo Seco confluence, to mean sea level at the mouth of the Los Angeles River. The average annual rainfall ranges from 13.8 inches at the ocean to 28.2 inches in the San Gabriel Mountains. Two prominent hill formations are located in the lower reach of the Los Angeles River watershed, the Dominguez Hills on the west side of the river about four miles north of the coast (elevation 200 feet), and Signal Hill in the city of Long Beach (elevation 110 feet).

The soil is considered alluvial and varies from coarse sand and gravel to silty clay and gravel or clay. The land is generally well drained with relatively few perched water or artesian areas. Large deposits are present along the coast. Extensive pumping for oil has caused land subsidence in the lower reach. The Los Angeles River is a flood control facility emptying into the Pacific Ocean. It was not constructed to serve as conveyance for domestic water supplies. Percolation and water recharge basins are located along portions of the river, generally upstream of the Los Angeles Eastside Corridor study area.

Los Angeles River

The Los Angeles River originates at the western end of the San Fernando Valley in Southern California. The channel extends through the heart of Los Angeles County by flowing east to Glendale where it turns and flows south to the Pacific Ocean. The river is part of a network of dams, reservoirs, debris collection basins, and spreading grounds built (beginning in the late 1930s) by the Los Angeles County Flood Control Department (LACFCD) and the COE to minimize the flooding in the county. Through the project area, the channel has a concrete bottom and sides. The channel is trapezoidal with an additional smaller trapezoidal low flow channel. At the top of the banks the channel is approximately 250 feet wide and 25 to 30 feet deep. The low flow channel is 28 feet wide. The river flow is partially regulated by the Sepulveda, Pacoima, Big Tejunga, Hansen, and Devil's Gate dams and by several spreading grounds, reservoirs, and debris basins located along the length of the river. The river is also subject to flow diversions from Big Tejunga Creek, Arroyo Seco, and other domestic and irrigation diversions. The portion of the river that is located in the Los Angeles Eastside Corridor study area extends from Cesar Chavez Avenue on the north to Washington Boulevard on the south, just east of Union Station. The study area is considered in the middle reach of the Los Angeles River (the reach between U.S. Highway 101 and the confluence with the Rio Hondo River).

Floodplains

The floodplain of the Los Angeles River is extensively studied and mapped in the recent Federal Emergency Management Agency (FEMA) Flood Insurance Study for the City of Los Angeles, dated May

4, 1999. Figure 4.11-1 displays the existing defined 100-year floodplain for the Los Angeles River as presented in the current Flood Insurance Studies. The Los Angeles River basin has a long history of flooding which has caused extensive property damage and loss of lives. The major storms include January 1914, 1934, 1943, and 1956, February 1978 and 1980, and March 1938 and 1983. As previously mentioned, the portion of the river located in the study area is considered in the middle reach of the Los Angeles River. The channel capacity of the middle reach can safely convey the 100-year flow within the channel banks.

The upper reach of the Los Angeles River, the reach immediately upstream of the Los Angeles Eastside Corridor study reach, is not certified to adequately handle the 100-year flood. Overbank areas are susceptible to flooding caused by overtopping and failure of levee structures. Water escaping the channel in the left overbank of the upper reach may result from levee failure between the Santa Fe Railroad crossing and the Broadway Street Bridge immediately north of the study area. As identified on the current FEMA floodplain mapping, the 100-year flow in the Los Angeles River is fully contained in the channel at the 1st Street Bridge.

Groundwater

The LRT Build Alternative alignment is located in the Los Angeles Forebay groundwater area of the Central Basin along the Coastal Plain of Los Angeles County. The forebay area extends generally in a fan pattern around the Los Angeles River. The study area is underlain by the Lakewood and San Pedro (lowest) 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 formation, which consists of sand, sandy clay, clay, and gravel, ranges in thickness from 0 to 100 feet and extends to depths of 100 to 375 feet (up to 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 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 formation in the Los Angeles Forebay area. The aquifers of the San Pedro formation consist of various amounts of sand, sandy clay, clay, gravel and gravelly sand that range in thickness of 0 to 430 feet and extends to depths of 475 to 1600 feet (up to 1440 feet below sea level). This formation, which contains the Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside aquifers, 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 water supply. This aquifer is protected from contamination from the surface by overlying low permeable strata.

The Coastal Plain of the Los Angeles County groundwater supply is consumed mainly by municipal users for drinking water 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. 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 seawater intrusion created by an overdrawn water table. This process of injecting surface water not only prevents seawater intrusion, but also contributes to the fresh water supply in the basin and thereby mitigates overdraft of water supplies.

Groundwater aquifers would be expected to be approximately 150 to 200 feet below the ground surface. Surface water sources can also contribute to the groundwater level as revealed by well data in the vicinity of the Los Angeles River. Additional information about groundwater levels can be found in Section 4.9.1.4.

Figure 4.11-1 Water Resources and Floodplain

4.11.2 Methodology for Impact Evaluation

4.11.2.1 Surface Water

Construction and operational impacts on surface waters were assessed with regards to degradation of water quality and changes in surface water flow. Effects on future water quality, both with and without implementation of the LRT Build Alternative, have been estimated based on the potential for runoff surface water resources and the types of pollutants anticipated. Anticipated impacts have been compared to applicable water quality standards. The LRT Build Alternative would have a significant impact under CEQA on surface water resources if:

- Uncontrolled runoff from project facilities results in substantive erosion and subsequent sedimentation of downstream water bodies.
- Altered drainage patterns cause the reduction of existing vegetation.
- The project results in changes in water quality that could have human health and safety impacts.

4.11.2.2 Floodplains

An assessment of floodplains has been performed to determine the impacts of the LRT Build Alternative on identified floodplains by overlaying the project on floodplain maps and identifying areas of floodplain encroachment. An analysis has been performed on the anticipated changes in drainage patterns, potential for flooding, and structures that could be affected. The proposed alignments would have significant impacts under CEQA on floodplains if the project results in flood hazards on other properties.

The 1998 FEMA Flood Insurance Study for the Los Angeles River was reviewed to determine the boundaries of the 100-year floodplain relative to the location of the LRT Build Alternative alignment (both Options A and B). The conceptual plans for the LRT Build Alternative were also reviewed to determine if the planned design would have any effect on the floodplain. The plans were evaluated with respect to the floodplain issues defined in Federal Regulation 23 CFR 650A to determine if potential impacts are possible.

4.11.2.3 Groundwater

Under CEQA, the proposed alternatives would have significant impacts on groundwater resources if the project:

- Results in a net deficit in aquifer volume or reduction in the local groundwater table.
- Significantly reduces the area available for aquifer recharge.
- Results in changes in groundwater quality that could have human health and safety impacts.

4.11.3 Impacts

4.11.3.1 No-Build Alternative

The No-Build Alternative assumes that no improvements would be made to the Los Angeles Eastside Corridor study area beyond those already planned and approved. There would be no operation activities related to the Los Angeles Eastside Corridor project, and would therefore not affect or be affected by surface waters, floodplains, or groundwater.

4.11.3.2 LRT Build Alternative

Option A

Surface Water

The introduction of new impervious surfaces resulting from stations and maintenance areas would increase runoff and associated contaminants, potentially resulting in some degradation of downstream water quality. Pollutants associated with transit projects include oil and grease. The highest concentration of these pollutants would be greatest following the first substantial rainfall of the season because long dry periods common to Southern California allow greater accumulation of compounds on paved surfaces than during periods of more frequent rainfall. Given that Option A would run primarily with the rights-of-way of existing streets, runoff would be collected by the storm sewer system already in place along these streets.

The Los Angeles River is the only major waterway within the LRT Build Alternative impact area. At the Los Angeles River, the LRT facility would utilize the 1st Street Bridge to cross the river. No new bridges are planned as part of Option A.

The effect on water quality would be minor because the watershed within the project Corridor is urban. Since the area is urban, most of the alignment would be built on existing impervious surfaces and would not significantly alter surface water drainage patterns. The amount of impervious surfaces and additional runoff would be small compared to the region as a whole. However, surface water impacts could be potentially significant on water quality, human health, or safety unless measures are taken to control runoff.

Floodplains

FEMA has defined the 100-year floodplain for the Los Angeles River as illustrated in Figure 4.11-1. The floodplain issues, discussed below for Option A, are defined in Federal Regulation 23 CFR 650A as important for the consideration of impacts on floodplains.

Is the action a significant longitudinal encroachment? No. A significant encroachment is an encroachment and any direct support of likely base floodplain development that would involve construction or flood-related impacts. Option A would not be considered a longitudinal encroachment on the 100-year floodplain of the Los Angeles River. No fill will be placed in, or encroachment made to, an existing floodplain. No emergency vehicle access or evacuation routes would be affected, and no natural or beneficial floodplain values would be impacted. The transit improvements that are a part of this alternative would not significantly increase the existing depth or limits of flooding.

Are the risks associated with the action significant? No. Risk is defined as the consequences associated with the probability of flooding attributable to an encroachment. The transit improvements that are a part of this alternative would not significantly increase the existing depth or limits of flooding. The transit facility would utilize the existing 1st Street Bridge over the Los Angeles River.

Will the action support probable incompatible floodplain development? No. The project is consistent with local and regional land use and transportation planning. The defined floodplain for the Los Angeles River within the study area is predominantly within the defined, improved channel.

Is the action a significant floodplain encroachment? No. A significant encroachment is a highway encroachment and any direct support of likely base floodplain development. At the Los Angeles River

crossing, the transit facility would utilize an existing bridge over the waterway. No fill would be placed in, or encroachment made to, the existing floodplain, nor emergency vehicle access affected, nor impact natural or beneficial floodplain values. The transit facility would not significantly increase the existing depth or limits of flooding.

Are non-routine measures required to minimize floodplain impacts associated with the action? No. There are no identified significant impacts on the floodplain. No non-routine measures are required.

Are there significant impacts on natural and beneficial floodplain values? No. For Option A, no significant impacts are anticipated on natural and beneficial floodplain values. Such values include, but are not limited to: fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

Are non-routine measures required to restore and preserve the natural and beneficial floodplain values impacted by the action? No. No non-routine measures are required to restore or preserve the floodplain values.

Groundwater

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. Option A involves an underground section under 1st Street from the U.S. Highway 101 to Lorena Street. The subway section is not within the Los Angeles River 100-year floodplain.

No impacts would occur on groundwater levels or quality that is used for consumption by municipal, industrial, and irrigation purposes. Although unlikely during the operations phase, groundwater dewatering activities and subsequent discharge may occur. During operation, any water leaks into the tunnel would be pumped out by sump pumps. Therefore no residual impacts on groundwater are anticipated. Refer to Section 4.9 for additional information regarding impacts on groundwater during operation.

Significance of Impacts

Option A would have potentially significant impacts during operations on surface waters and groundwater and no impact on floodplain.

Option B

The water resources impacts and significance of impacts of Option B would be the same as those described for Option A.

4.11.4 Mitigation

The mitigation measures for Options A and B will be the same. Therefore, the measures are discussed collectively for both options as mitigation for the LRT Build Alternative.

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, and would therefore have no adverse impact on surface waters. Treatment methods will include the use of oil/water separators with siltation basins or similar equipment.

During preliminary engineering, construction, and operation of the Eastside LRT project, the MTA will strive to minimize storm water runoff within construction areas and within the parking lots and platforms of the finished project. The MTA will comply with storm water regulations of the State Water Resources Control Board (SWRCB) and the Los Angeles Regional Water Quality Control Board (LARWQCB) during construction and operation of the project. Storm water regulations applicable to the project include the General NPDES Storm Water permit program, and the use of structural best management practices (BMPs) as specified by the LARWQCB's newly adopted Standard Urban Storm Water Mitigation Plan (SUSMP). Construction, drainage, and landscaping techniques consistent with storm water runoff minimization will also be employed during construction and operation of the project. These measures are anticipated to reduce impacts on surface waters to less than significant.

No above ground or underground facilities will be located within the Los Angeles River 100-year floodplain. The LRT Build Alternative will utilize the existing 1st Street Bridge to cross the river. No mitigation related to floodplains is required.

In the event that discharge is expected, the proposed project will require preparation of a Report of Waste Discharge (ROWD), required by the State Water Resources Control Board (SWRCB) for any type of discharge affecting groundwater. This would ensure that any project-related discharges are regulated and therefore would not impact local groundwater.

Prior to excavation and construction, negotiations with the California Department of Water Resources (CDWR) and the Water Replenishment District of Southern California (WRD) will be initiated regarding water rights and pumping assessment. It is expected that coordination with CDWR and WRD will provide sufficient oversight to prevent environmental impacts due to over-withdrawing groundwater from the project area. These measures are anticipated to reduce impacts on groundwater to less than significant.

4.11.4.1 Significance of Impacts Remaining After Mitigation

The mitigation measures would reduce impacts on surface waters and groundwater to less than significant.

4.12 NATURAL RESOURCES AND ECOSYSTEMS

4.12.1 Affected Environment

4.12.1.1 Regulatory Setting

Environmental laws governing biological resources relevant to the proposed project are summarized below.

Federal

Federal Endangered Species Act (FESA). Species listed as endangered and threatened by the U.S. Fish and Wildlife Service (USFWS) under this act are protected under this legislation. No species currently listed by FESA are expected to be affected directly or indirectly by the proposed project. Thus, although the project is a federal action under the National Environmental Policy Act (NEPA), no consultation with the USFWS under Section 7 of the FESA would be required.

California Endangered Species Act (CESA). This act was designed after FESA and is intended to provide additional protection to endangered and threatened species in California. No "take" of a species as defined per CESA would occur during construction or operation of the proposed project.

Migratory Bird Treaty Act (MBTA). The MBTA, first enacted in 1916, prohibits any person to: "pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase . . ." any migratory bird. It is illegal under MBTA to directly kill, or destroy a nest of, nearly any bird species, not just endangered species. Activities that result in removal or destruction of an active nest (a nest with eggs or young being attended by one or more adults) would violate the MBTA. Removal of unoccupied nests, or bird mortality resulting indirectly, would not represent violations of the MBTA. However, if nesting birds are present during construction, such as under bridges, and construction activities were allowed to result in destruction of such nests, these activities may violate the MBTA.

Section 404 of the U.S. Clean Water Act. The objective of the Clean Water Act of 1977 is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Section 404 of the Act regulates activities that result in discharge of dredged, fill, or excavated material into "waters of the United States." This generally includes any waterway, intermittent stream, man-made wetland, or reservoir. Projects that include physical modification of a "water of the United States" must generally comply with Section 404 which is under the jurisdiction of the U.S. Army Corps of Engineers (Corps). Impacts on streambeds are calculated in terms of the area that would be modified between "mean high water" marks of the streambed.

State

California Fish and Game Code Sections 1600 through 1607. California Department of Fish and Game (CDFG) oversees streambeds and their associated habitats pursuant to Sections 1600 to 1607 of the code, which manages activities that would "substantially change" the " . . . bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource, or from which these resources derive benefit." In addition to complying with Section 404 of the Clean Water Act, any modification of streambed habitat may require a Streambed Alteration Agreement from CDFG.

California Fish and Game Code Sections 4150 through 4154. CDFG's regulations address how nongame mammals may be taken. Nongame mammals include all mammals occurring naturally in California that are not game mammals, fully protected mammals, or fur-bearing mammals. These sections allow CDFG to enter into cooperative agreements with agencies of the state or the United States for the purpose of controlling nongame mammals.

California Code of Regulations, Title 14, Natural Resources. Under the provisions of Section 251.1, Harassment of Animals, no person is allowed to harass any game or nongame bird or mammal or fur-bearing mammal, except as otherwise authorized by regulations (such as under Section 4150 through 4154, above.) Harassment is defined as an intentional act that disrupts an animal's normal behavior patterns, which includes breeding, feeding, or sheltering. This regulation would require the project to avoid construction work on bridges if roosting bats or nesting birds are present or sign cooperative agreements with CDFG under the California Fish and Game Code Sections 4150 through 4154.

4.12.1.2 Study Area Setting

Vegetation

The Eastside Corridor is located within a highly developed setting limiting vegetation to mainly ruderal and ornamental plant species. The majority of plant species found during the survey were non-native. Landscaped areas were dominated by exotic ornamental species such as date palm (*Phoenix* sp.), bamboo (*Bambusa* sp.), pine (*Pinus* sp.), ficus (*Ficus* sp.), eucalyptus (*Eucalyptus* sp.), fan palm (*Washingtonia* sp.), magnolia (*Magnolia grandiflora*), dracaena (*Dracaena* sp.), and oleander (*Nerium oleander)*. Non-landscaped areas capable of supporting vegetation were dominated by invasive weedy species including black mustard (*Brassica nigra*), yellow star thistle (*Centaurea solstitialis),* and wild oats (*Avena fatua*). Sycamore (*Platanus racemosa),* a native species, was found within a landscaped site north of 1st Street.

Sensitive Plants

Prior to the survey, the most recent records of the California Natural Diversity Data Base (CNDDB) (2000) and the California Native Plant Society's Electronic Inventory (CNPSEI) (1999) were reviewed regarding the potential presence of threatened, endangered, candidate, or other sensitive species within the study area. The results of the record searches and a characterization of suitable habitat are found on Table 4.12-1. As shown, eight sensitive plant species have the potential to occur in the vicinity of the Los Angeles Eastside Corridor. However, due to the highly developed nature along the Corridor, suitable habitat for these species is not present.

Wildlife

No native mammals were observed during the site visit. The Corridor runs through a highly developed area. Mammals that may utilize portions of the proposed Corridor include the California ground squirrel (*Spermophilus beecheyi*), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*). No amphibians or reptiles were observed during the survey. Reptiles that may utilize portions of the proposed Corridor include the western fence lizard (Sceloporus occidentalis). Because of the highly disturbed nature of the Los Angeles Eastside Corridor, it is unlikely that any amphibians would occur along its length. Avian species comprised the majority of wildlife species observed onsite. Seven avian species were observed during the site visit including house finch (*Carpodacus mexicanus*), rock dove (*Columba livia*), mourning dove (*Zenaida macroura*), house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), American crow (*Corvus brachyrhynchos),* and Brewer's blackbird (*Euphagus cyanocephalus)*.

Sensitive Wildlife Species

Prior to the survey, a record search was conducted using a current version of the CNDDB for information on sensitive wildlife species known to occur in the vicinity of the project area. The USFWS, U.S. Forest Service (USFS), and CDFG sensitive wildlife lists were also referenced. Sensitive wildlife species include all federal and state endangered and threatened species, former federal candidate species, and California Species of Special Concern. The results of the record searches and a characterization of suitable habitat are found on Table 4.12-2. As noted, five sensitive wildlife species have the potential to occur in the vicinity of the Los Angeles Eastside Corridor. Suitable habitat for any of the above listed wildlife species does not occur in or adjacent to the project Corridor. Therefore, potential for occurrence is low.

Jurisdictional Waters

One Corps/CDFG jurisdictional water body was encountered during the survey. The Los Angeles River crosses under the Corridor along 1st Street in the western portion of the study area. This portion of the river has been highly modified to fit an urban setting. The stream bottom and banks consist of paved concrete, supporting no streamside vegetation. The Los Angeles River flows on a perennial basis and is fed substantially by urban runoff and treated waste water. No other features falling under the jurisdiction of the Corps or CDFG were detected during the survey. Storm drains are situated along the city streets on which the proposed project has been designed. These drains are not Corps/CDFG jurisdictional but do potentially flow into such jurisdictional waters.

The Los Angeles County Department of Public Works was contacted to determine if the Master Plan for the Los Angeles River, completed in 1996, identified wetland restoration projects. Additional information about wetland restoration was provided by the California Coastal Conservancy, which is currently working with several non-governmental agencies and community groups to implement wetland and open space projects along the Los Angeles River. North of I-10 along the Los Angeles River, several wetland restoration projects are being planned at the following locations: the mouth of Arroyo Seco, Chinatown Yard, and Taylor Yard (Kroll, 1999). Wetland restoration is also being planned north of I-10 along an abandoned rail spur that apparently used a former streambed to traverse Hazard Park west of Soto Street (Woods, 1999).

4.12.2 Methodology for Impact Evaluation

4.12.2.1 Biological Resources

Prior to conducting biological reconnaissance surveys, a literature review was performed to review previous studies of biological resources in the area and to determine whether there were existing records of sensitive species and habitats at or within the vicinity of the project site. The CNDDB and the CNPSEI were reviewed for information in the project area. Physical characteristics of the project site were noted during the field surveys conducted on May 18, 2000. Attributes recorded included existing land use onsite and in adjacent areas, slope and aspect, topographical characteristics, and existing disturbances. A plant and wildlife species list was compiled and vegetation communities were described.

Prior to the survey, the most recent records of the following sources were reviewed to establish the potential presence of threatened, endangered, candidate, or other sensitive species in the study area:

- The California Natural Diversity Database (CNDDB 2000, Hollywood, El Monte, Los Angeles); and
- The California Native Plant Society's Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPSEI 1999, Hollywood, El Monte, Los Angeles).

TABLE 4.12-1
SENSITIVE PLANT SPECIES POTENTIALLY OCCURRING ALONG THE LOS ANGELES EASTSIDE CORRIDOR

Common Name *Scientific Name*	Status	PFO	Habitat	Comments
Davidson's saltbush *Atriplex serenana* var. *davidsonii*	CNPS 1B	L	Typically occurs in coastal bluff scrub and coastal scrub communities with alkali soils.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
Santa Barbara morning-glory *Calystegia sepium* ssp. *binghamiae*	CNPS 1B	L	Typically occurs in coastal marshes and wetland areas.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
Parish's gooseberry *Ribes divarcatum* var. *parishii*	CNPS 1B FSOC	L	Typically occurs in riparian woodlands.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
Brand's phacelia *Phacelia stellaris*	CNPS 1B	L	Typically occurs in coastal scrub and coastal dunes habitats. This species prefers open areas within the above habitats.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
Southern skullcap *Scutellaria bolanderi* ssp. *austromontana*	CNPS 1B	L	Typically occurs in chaparral, cismontane woodlands, and lower montane coniferous forests. It is mainly found in gravelly soils located on stream banks.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
Plummer's mariposa lily *Calochortus plummerae*	CNPS 1B FSOC	L	Typically occurs in various habitats including coastal scrub, chaparral, valley and foothill grasslands, cismontane woodlands, and lower montane coniferous forests.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
Braunton's milk-vetch *Astragalus brauntonii*	CNPS 1B FE	L	Typically occurs in various habitats including coniferous forests, chaparral, coastal scrub, and valley and foothill grasslands.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
Los Angeles sunflower *Helianthus nuttallii* ssp. *parishii*	CNPS 1A FSOC	L	Typically occurs in coastal and freshwater marshes and wetlands.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.

Status Codes

Federal
FE = Federally listed; Endangered
FT = Federally listed; Threatened
FSOC = Federal Species of Concern

State
ST = State listed; Threatened
SE = State listed; Endangered
CSC = California Species of Special Concern

CNPS = California Native Plant Society Listed
List 1A = plants presumed extinct in California and elsewhere.
List 1B = plants that are considered rare, threatened or endangered in California and elsewhere.

Potential for Occurrence (PFO)

L = Low potential for occurrence - No recent or historical records exist of the species occurring in the project area or its immediate vicinity (within approximately 5 miles) and the diagnostic habitat requirements strongly associated with the species do not occur in the project area or its immediate vicinity.

M = Moderate potential for occurrence - Either a historical record exists of the species in the project area or its immediate vicinity or the diagnostic habitat requirements associated with the species do occur in the project area or its immediate vicinity.

H = High potential for occurrence - Both a historical record exists of the species in the project area or its immediate vicinity and the diagnostic habitat requirements strongly associated with the species do occur in the project area or its immediate vicinity.

P = Species present - The species was observed in the project area at the time of the survey.

Sources: California Natural Diversity Data Base, 2000; California Native Plant Society Electronic Inventory, 1999.

TABLE 4.12-2
SENSITIVE WILDLIFE SPECIES POTENTIALLY OCCURRING ALONG THE LOS ANGELES EASTSIDE CORRIDOR

Common Name *Scientific Name*	Status	PFO	Habitat	Comments
REPTILES — CLASS REPTILIA				
WATER TURTLES — EMYDIDAE				
southwestern pond turtle *Clemmys marmorata pallida*	FSOC	L	Typically occurs in aquatic habitats that contain suitable basking sites. Found within woodlands, grasslands, and open forests.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
IGUANID LIZARDS — IGUANIDAE				
San Diego horned lizard *Phrynosoma coronatum blainvillei*	FSOC, CSC	L	Typically occurs in coastal sage scrub, open chaparral, riparian woodland, annual grassland habitats that support adequate invertebrate prey species.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
BIRDS — CLASS AVES				
KINGLETS, GNATCATCHERS, BABBLERS — MUSCICAPIDAE				
coastal California gnatcatcher *Polioptila californica californica*	FT, CSC	L	Typically occurs in coastal sage scrub vegetation on mesas, arid hillsides, and in washes. It nests almost exclusively in California sagebrush.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
CUCKOOS, ANIS — CUCULIDAE				
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	SE	L	This species is a riparian forest nester. It is typically found along the broad, lower flood-bottoms of larger river systems. Also prefers thickets of willow mixed with cottonwood.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.
VIREOS — VIREONIDAE				
least Bell's vireo *Vireo bellii pusillus*	FE, SE	L	Typically occurs in moist thickets and riparian areas dominated by willows and mulefat.	Due to the highly developed nature along the proposed corridor, suitable habitat for this species is not present.

Status Codes

Federal
FE = Federally listed; Endangered
FT = Federally listed; Threatened
FSOC = Federal Species of Concern

State
ST = State listed; Threatened
SE = State listed; Endangered

CSC = California Species of Special Concern
-- Taxa that are biologically rare, very restricted in distribution, declining throughout their range, or at a critical stage in their life cycle when residing in California.
-- Population(s) in California that may be peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California.
-- Taxa closely associated with a habitat that is declining in California (e.g., wetlands, riparian, old growth forest).

Potential for Occurrence (PFO)

L = Low potential for occurrence - No recent or historical records exist of the species occurring in the project area or its immediate vicinity (within approximately 5 miles) and the diagnostic habitat requirements strongly associated with the species do not occur in the project area or its immediate vicinity.

M = Moderate potential for occurrence - Either a historical record exists of the species in the project area or its immediate vicinity or the diagnostic habitat requirements associated with the species do occur in the project area or its immediate vicinity.

H = High potential for occurrence - Both a historical record exists of the species in the project area or its immediate vicinity and the diagnostic habitat requirements strongly associated with the species do occur in the project area or its immediate vicinity.

P = Species present - The species was observed in the project area at the time of the survey.

Source: California Natural Diversity Data Base, 2000

Based on the database searches and the field surveys, a list of sensitive wildlife species potentially inhabiting the project area was developed. The potential for each species to inhabit the project area was assessed.

Impacts on biological resources were analyzed with respect to CEQA guidelines, which were recently revised to include a checklist (Appendix G of the guidelines) of environmental effects that may be considered significant. In order to determine the level of project impacts on biological resources under CEQA, the checklist includes several questions, presented in the impacts section, which are answered with respect to the LRT Build Alternative with one of the following possible checklist answers: significant impact, potentially significant unless mitigation included, less than significant impact, or no impact.

4.12.2.2 Jurisdictional Waters

The project site was examined on May 18, 2000 to determine the limits of (1) Corps jurisdiction pursuant to Section 404 of the Clean Water Act, and (2) CDFG jurisdiction pursuant to Division 2, Chapter 6, Section 1603 of the Fish and Game Code. Prior to beginning the field delineation USGS topographic maps were examined to determine the locations of potential areas of Corps/CDFG jurisdiction. Suspected jurisdictional areas were field checked for the presence of definable channels and/or wetland vegetation, soils and hydrology.

4.12.3 Impacts

4.12.3.1 No-Build Alternative

There would be no impacts on vegetation, wildlife, or jurisdictional waters because this alternative only includes improvements to the transportation network that have already been approved and funded. No capital improvements are included under this alternative and would therefore not result in any changes to biological resources within the Los Angeles Eastside Corridor study area.

4.12.3.2 LRT Build Alternative

Option A

Impacts were analyzed with respect to CEQA guidelines as discussed in the methodology section. The results of the evaluation are presented in Table 4.12-3.

Vegetation and Wildlife

No sensitive plant communities or suitable habitat for sensitive plants or wildlife occurs within the Los Angeles Eastside Corridor. Therefore, development of this alternative is not expected to adversely affect any sensitive plants and plant communities.

Jurisdictional Waters

The LRT Build Alternative traverses urban areas in Los Angeles County where urban development has often eliminated wetlands and associated natural vegetation and wildlife habitat. The study Corridor is contained in existing public, particularly street, rights-of-way or in tunnel. Operation of the LRT Build Alternative is not expected to have an effect on any Corps or CDFG jurisdictional waters because the LRT would be built on an existing bridge over the Los Angeles River. As a result, jurisdictional waters would not be affected by project implementation. Operation of the bridge after proposed retrofitting for the project is not anticipated to significantly affect flow or discharge of the Los Angeles River, and thus

would not negatively affect biological resources associated with the river. Coordination between COE and CDFG is anticipated to verify that no biological impacts will occur. If, during the later stages of design, it is determined that bridge widening or additional piers may be required, then impacts on jurisdictional waters are likely and possible conflict with the Migratory Bird Treaty Act unless suitable mitigation is adopted by MTA (MTA will undertake such mitigation if the design proves it necessary).

Significance of Impacts

Option A would have no impact with regard to all of the criteria listed in Table 4.12-3.

Option B

The impacts and the significance of the impacts of Option B would be similar to those described for Option A.

4.12.4 Mitigation

No mitigation is required for operational impacts of the LRT Build Alternative for either Options A or B on vegetation, wildlife, or jurisdictional waters.

TABLE 4.12-3
BIOLOGICAL IMPACTS FACTORS CONSIDERED
LRT BUILD ALTERNATIVE (OPTIONS A AND B)

Criterion	Significance of Impact
Sensitive and Special Status Species. Would the project have a significant adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or CDFG or USFWS?	No impact
Riparian Habitat and Other Sensitive Natural Communities. Would the project have a significant adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS?	No impact
Wetlands. Would the project have a significant adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrologic interruption, or other means?	No impact
Waters of the United States. Section 404 of the Clean Water Act addresses "waters of the United States," which is a broader category than wetlands. All wetlands are waters of the United States, but a water of the United States may or may not be a wetland. CEQA Guidelines do not specifically address waters of the United States. The one waterway in the study area is concrete-lined, and therefore does not contain sensitive biological resources.	No impact
Movement of Species. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	No impact
Conflict with Local Policies or Ordinances. **W**ould the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	No impact
Conflict with Conservation Plans. Would the project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional or state habitat conservation plan?	No impact
Conflict with Migratory Bird Treaty Act. CEQA guidelines do not specifically address the MBTA, which is discussed in Section 4.12.1.	No impact

4.13 ENERGY

4.13.1 Affected Environment

California's overall energy consumption continues to be dominated by transportation, which is growing faster than the population. Since 1973, the number of vehicles within the state has increased by 75 percent. Although the average fuel economy of these vehicles has improved, the fuel savings achieved are less noticeable due to an increase in the number of miles traveled (California Energy Commission, 2000). Currently, California's 17 million automobiles consume more than 13 billion gallons of gasoline, making California the third largest consumer of gasoline in the world (California Energy Commission, 2000).

The number of vehicle miles traveled (VMT) is directly related to energy use and is the main contributor to air quality pollutants in the SCAG (Southern California Association of Governments) region. Vehicle miles of travel are also important in determining the demand for infrastructure improvements. SCAG estimates the VMT for the agency's transportation plans. Their data shows a 19 percent increase in daily VMT between 1994 and 1997, from 283 million to 337 million miles (SCAG, 2000). This equates to a daily energy use of approximately 304,000 barrels of crude oil in 1994 to over 351,000 barrels of crude oil in 1997 (PBQD, 2000).

4.13.2 Methodology for Impact Evaluation

The analysis estimates the total amount of energy expected to be consumed in the region in 2020 by each of the alternatives. The direct (operational) energy impacts were assessed using the following methodology.

Direct energy consumption involves energy used by the operation of vehicles (automobile, truck, bus, or train) within the region. In assessing the direct energy impact, consideration was given to the following factors:

- Annual vehicle miles traveled (VMT) for automobiles, trucks, buses, LRT, and commuter rail vehicles
- Variation of fuel consumption rates by vehicle type.

The direct energy analysis for each alternative was based on projected year 2020 regional traffic volumes and total VMT. The 2020 daily traffic volumes for the region were provided by the MTA model and annualized using a factor of 315 days per year. The VMT fuel consumption method utilized for this project is outlined in the *Technical Guidance on Section 5309 New Starts Criteria* (FTA, 1999). Energy consumption factors for the various modes identified in Table 4.13-1 were developed by Oak Ridge Laboratory and published in the 1996 *Transportation Energy Book: Edition 16.*

Direct energy, measured in British thermal units, BTUs[12], was converted to the equivalent barrels of crude oil for comparison of alternatives. The change in annual BTUs was also calculated for the LRT Build Alternative vs. the No-Build Alternative.

By comparing the alternatives' energy demands to current and anticipated energy supplies, it is possible to determine whether the alternatives would have a significant effect on energy supplies. Although no clear significance standards or thresholds are established, a one-percent demand increase in the relative supply would be significant.

[12] One BTU is the quantity of energy necessary to raise one pound of water one degree Fahrenheit.

TABLE 4.13-1
ENERGY CONSUMPTION FACTORS

Mode	Factor
Passenger Vehicles (auto, van, light truck)	6,233 BTU/Vehicle Mile
Heavy Truck	22,046 BTU/Vehicle Mile
Transit Bus (all vehicle types)[1]	41,655 BTU/Vehicle Mile
Rail (light or heavy)	77,739 BTU/Vehicle Mile
Commuter Rail (Metrolink)	100,000 BTU/Vehicle Mile

[1]FTA recommends utilizing a transit bus energy consumption factor of 41,655 BTUs/VMT for all bus types (including alternative fueled buses). Sufficient data has not been available to develop consumption factors for alternative fuels such as CNG (compressed natural gas), LNG (liquefied natural gas), and others.

Source: Oak Ridge Laboratory, 1996.

4.13.3 Impacts

Potential energy consumption of the LRT Build Alternative was compared to the No-Build Alternative in order to assess the impacts within the Los Angeles Eastside Corridor. The annual energy savings are expressed in British thermal units (BTUs).

The determination of California Environmental Quality Act (CEQA) importance for energy resources has until now been based on the criteria in Appendix G of CEQA: *Will the proposal use fuel, water, or energy in a wasteful manner?* On January 1, 1999, Appendix G was replaced by new guidelines implementing revisions to CEQA made by the legislature in 1992. While there are now no energy-specific criteria within the amended guidelines, one related to mineral resources would apply:

- Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the state?

4.13.3.1 No-Build Alternative

Under the No-Build Alternative, the annual 2020 VMT for automobiles within the region is forecast to be 138.02 billion miles, 5.75 billion miles for trucks, 235.8 million miles for buses, about 10 million miles for LRT, and 4.89 million miles for commuter rail. The annual VMT for automobiles and trucks would be slightly higher than for the LRT Build Alternative resulting in higher energy usage for these modes. The VMT for buses and rail, however, would be lower than for the LRT Build Alternative. Given the VMT and vehicle fuel consumption on an annual basis, vehicles operating within the region are anticipated to consume approximately 172.096 million barrels of oil or approximately 998,161 billion BTUs (Table 4.13-2). As shown in Table 4.13-2, the No-Build Alternative would have lower operational energy consumption compared to the LRT Build Alternative.

Significance of Impacts

While the No-Build Alternative would have lower overall operational energy consumption compared to the LRT Build Alternative, it would have a higher consumption of fossil fuels due to a higher VMT of automobiles and trucks. Fossil fuels will continue to be of future value to the region and the residents of the state. As discussed above, California obtains almost half of its crude oil supply from inside the state and the rest from Alaska.

TABLE 4.13-2
ANNUAL 2020 OPERATIONAL ENERGY CONSUMPTION

	No-Build Alternative	LRT Build Alternative Options A and B
Vehicle Miles Traveled (VMT)		
Daily Auto and Truck VMT	425,828,072	425,778,055
Annual Auto VMT (billions)	*138.02*	*138.01*
Annual Truck VMT (billions)	*5.75*	*5.75*
Daily Bus VMT	696,380	712,132
Annual Bus VMT	*235,821,535*	*241,329,646*
Daily LRT VMT	29,955	31,742
Annual LRT VMT	*9,985,940*	*10,574,707*
Daily Commuter Rail VMT	14,639	14,639
Annual Commuter Rail VMT	*4,894,084*	*4,894,084*
Energy Consumption (BTUs)[1] (billions)		
Annual Auto BTUs[1]	860,288	860,187
Annual Truck BTUs[1]	126,784	126,769
Annual Bus BTUs[1]	9,823	10,052
Annual LRT BTUs[1]	776	822
Annual Commuter Rail BTUs[1]	489	489
TOTAL ANNUAL DIRECT BTUs (billions[2])	**998,161**	**998,320**
TOTAL ANNUAL BARRELS OF OIL[3]	**172,096,668**	**172,124,128**
CHANGE IN BTUs vs. NO-BUILD (billions[2])	**N/A**	**159**
CHANGE IN BARRELS vs. NO-BUILD	**N/A**	**27,460**

[1]One British thermal unit (BTU) is the quantity of energy necessary to raise one pound of water one degree Fahrenheit.
[2]Rounded.
[3]One barrel of crude oil is equal to 5.8 million BTUs.

Sources: Vehicle Miles Traveled (PBQD, 2000); Energy Consumption Factors (Oak Ridge National Laboratory, 1996)

4.13.3.2 LRT Build Alternative

Option A

Under Option A, the 2020 annual VMT for automobiles within the region is forecast to be 138.01 billion miles, 5.75 billion miles for trucks, 241.3 million miles for buses, 10.6 million miles for LRT, and 4.89 million miles for commuter rail. For Option A, the daily VMT for automobiles and trucks is about 50,000 miles less than the No-Build Alternative, while the VMT for buses and rail is considerably higher (15,000 miles for buses and 1,800 miles for LRT). Given the VMT and vehicle fuel consumption on an annual basis, vehicles operating within the region are anticipated to consume approximately 172.124 million barrels of oil or approximately 998,320 billion BTUs. Overall, Option A would have a slightly higher annual operational energy consumption (about 27,460 barrels of crude oil) compared to the No-Build Alternative.

Table 4.13-3 shows a breakdown of energy use in Kilowatt hours (Kwh) with and without the stations and maintenance and storage facility. Stations for Option A would use approximately 1.4 billion BTUs (112,378 Kwh or 241.4 barrels of oil) annually during the operation of the project (this is based on eight stations multiplied by 175,000,000 BTUs, using FTA's *Technical Guidance on Section 5309 New Starts Criteria*, July 1999). The maintenance and storage facility would use approximately 8.7 billion BTUs

(698,346 Kwh, 1,500 barrels of oil) annually during the operation of the project (Caltrans Division of Engineering Services, Office of Transportation Laboratory, *Energy and Transportation Systems*, Table G-3, July 1983).

TABLE 4.13-3
ANNUAL 2020 ENERGY CONSUMPTION (Kwh) FOR SPECIFIC FACILITIES

Alternative	Energy Without Stations	LRT Stations	Maintenance and Storage Facility	Total
No-Build	62,313,130	N/A	N//A	62,313,130
LRT Build	65,987,088	112,378	698,346	66,797,812

MTA is hopeful that bus fuel economy will improve in the future with the introduction of composite fiber (lighter weight) buses, in which case, energy consumption would decrease for this mode across both alternatives. In addition, if Option A were constructed and ridership grew (as has been the case with the Blue Line), MTA anticipates that increased auto diversion to transit would result in an energy savings for this alternative. Given that automobile ownership in the Eastside Corridor is relatively low, as compared to other areas where the average income is higher, any future extensions of the LRT eastward through areas of higher automobile ownership may result in a higher diversion to transit and additional energy savings.

Note that Option A would mostly draw on electrical power from the Los Angeles Department of Water and Power (DWP) for its rail, station, and MS&F facilities. The DWP is on a transmission grid that is separate from the state grid maintained by the California Independent System Operator (ISO). The DWP has 24 major thermal generating units and 27 hydroelectric generating units, presently delivering power to its service area in Los Angeles without any rolling blackouts. The DWP anticipates consistent service for years to come even in ISO power deficits, by maintaining and expanding its electrical sources. The project would also draw on electrical power from Southern California Edison where county facilities would be located (stations, transit powered substations, etc.), but would be able to draw on DWP supplies if Edison supplies dramatically decrease or blackouts are experienced. Thus, no rolling blackouts, rate hikes, significant cumulative electrical deficiencies, or other burdens to electrical supplies are anticipated for Option A.

Option A would result in a net annual energy demand in the area of 3.78 million kilowatt hours (kwh), compared to the No-Build Alternative. When this number is compared to the DWP service area annual demand of 22,200 million kwh, it is clearly less than one percent of the current energy demand. Furthermore, the DWP anticipates a one- to two-percent increase in electricity demand over the next decade and has increased its abilities to serve the area for years to come by adding new facilities and increasing its energy supplies.

Significance of Impacts

While Option A would result in slightly greater energy consumption than the No-Build Alternative during operation, it would not result in a significant impact to the availability of fossil fuels or electricity within the region or the state given the current and projected available resources.

Option B

The impacts and significance of the impacts of Option B are the same as those described for Option A.

4.13.4 Mitigation

From an energy perspective, Options A and B are the same, and mitigation to further reduce already less than significant impacts is discussed collectively for the LRT Build Alternative.

As can be seen in Table 4.13-2, both the No-Build and LRT Build Alternatives are relatively equal in energy consumption. The LRT Build Alternative is only slightly higher in energy consumption. Under the LRT Build Alternative, schedule coordination and modal interface between LRT, commuter rail, and local buses will be optimized to conserve energy. Furthermore, every aspect of station design will be reviewed to minimize lighting, heating, ventilating and air conditioning loads. Passenger areas within stations will be designed so that lights can be turned off during off-service hours. Cold water, instead of warm water, will be used to wash the vehicles. The track layout will be designed to minimize non-revenue vehicle movements. All major facilities, except the car washing facility, will have electric meters to monitor energy consumption and conservation.

Regarding street lighting, the Los Angeles Bureau of Street Lighting requires that high-energy efficient fixtures only are to be specified in all public lighting improvements. This allows for the use of High-pressure Sodium, Metal Alloid, and Fluorescent lamps. This excludes the use of Mercury Vapor, Low-pressure Sodium, and incandescent lamps.

4.14 SAFETY AND SECURITY

4.14.1 Affected Environment

4.14.1.1 Existing MTA Safety and Security Program

MTA operates a bus, light rail, and heavy rail subway service for daily passenger boarding, and owns railroad right-of-way over which Metrolink trains are currently operating. Security services for MTA's customers, employees, and facilities are currently provided by the Los Angeles Police Department Transit Police Service Bureau and the Los Angeles County Sheriff's Department Transit Police Services Bureau. Both special officers and deputies are assigned to MTA to provide law enforcement services. Sheriff's special officers have limited peace officer powers. They provide field response to minor incidents involving MTA vehicles, as well as regular patrols of MTA property. The Sheriff's Department also provides special enforcement deputies, who work both in uniform and plain clothes, depending on the type of enforcement conducted.

Security, cameras, and law enforcement for MTA facilities is provided on a 24 hour per day, seven-day per week basis or as needed to solve specifically targeted problem areas. Criminal reports or arrests, other than those accomplished by special enforcement deputies, remain the jurisdiction of the local law enforcement agency where the activity occurs.

4.14.1.2 Existing Police Services in the Corridor

The Los Angeles Police Department handles police duties and activities in the City of Los Angeles portion of the Corridor. The Los Angeles Police Department Hollenbeck Police Station is located at the intersection of 1st Street and St. Louis Street that is two blocks west of the proposed 1st/Soto Station. In addition, Parker Center, the Los Angeles Police Department headquarters and central administration facility, is located at 1st Street and Los Angeles Street, approximately one quarter mile west of the proposed 1st/Alameda Station.

The Los Angeles Sheriffs Department handles police duties and activities in the County of Los Angeles portion of the Corridor. The Sheriff Department's East Los Angeles Station is located at the intersection of 3rd Street and La Verne Avenue adjacent to the East Los Angeles Community Center, and approximately one half mile from the eastern terminus of the LRT route.

4.14.1.3 Existing Fire and Emergency Services in the Corridor

Fire suppression and emergency services in the City of Los Angeles portion of the Corridor are handled by the City fire station located at the intersection of Cesar Chavez Avenue and Britannia Street. Fire suppression and emergency services in the County of Los Angeles portion of the Corridor are handled by two County fire stations: 1) Station 3 located at 930 South Eastern Avenue; and 2) Station 22 located at 928 Gerhart Avenue. In the event of a fire occurring at the boundary of the City and the County, the two departments are working on a common communications frequency to facilitate joint operations.

4.14.2 Methodology For Impact Evaluation

4.14.2.1 Accidents and Safety Issues

Input on safety and security issues has been obtained from MTA staff members who have developed considerable expertise in dealing with many of the safety and security impacts expected to result from construction and operation of light rail on the surface and in subway. In addition, input from the

community through the scoping process raised concerns about pedestrian and transit patron safety and the safety of LRT operation. The major concern was the presence of light rail trains operating on city streets, particularly the number of trains running during weekday peak hours.

In response to these concerns, an estimate of the possible number of light rail accidents that might be expected in the Corridor was made using data from the MTA Operations Safety department report *Summary of Metro Blue Line Train/Vehicle and Train/Pedestrian Accidents (7/90-09/99)* dated October 29, 1999. Based on the data presented in the report, the average number of on-street accidents per year per mile for fiscal years 1993 to 1999 was approximately 4.0 per mile. For fiscal year 1999 only, the accident rate was approximately 5.1 per mile. The vast majority of the accidents were auto conflicts with LRT vehicles. Only five percent of the accidents involved pedestrians.

For safety impacts that have been identified for the LRT Build Alternative under both Options A and B, MTA project design features are analyzed to determine which safety enhancement measures could be included in the project design to mitigate any significant impacts under CEQA. MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX, would be used to develop these design features.

4.14.2.2 Security and Crime Prevention Issues

The analysis of security issues focuses on the potential for violent crimes, property theft, fare evasion, and vandalism. This analysis reviews project design features in the context of MTA procedures and prior experience of other rail systems to assess impacts. FTA and Los Angeles County crime data related to light rail operations are examined. Most crimes on existing MTA LRT lines appear to be thefts, especially auto thefts, near stations or parking areas. For the existing light rail system operating within the County of Los Angeles, 67 thefts, 69 auto thefts, ten burglaries, and two arsons were reported in 1999, a rate that is four percent lower than the previous year.

4.14.2.3 Fire Services and Emergency Response

Station and track design (access, layout, exits, alarms, evacuation) and operational procedures (interagency agreement, training, evacuation) are pertinent to the effectiveness and timeliness of emergency response.

4.14.3 Impacts

4.14.3.1 No-Build Alternative

The No-Build Alternative would maintain the current MTA routes and service in the Corridor, and, therefore, would not have an immediate impact on public safety or accidents.

4.14.3.2 LRT Build Alternative

Option A

Accidents and Safety Issues

Input on safety and security issues has been obtained from MTA staff members who have developed considerable expertise in dealing with many of the safety and security impacts expected to result from construction and operation of light rail on the surface and in subway. In addition, input from the community through the scoping process raised concerns about pedestrian and transit patron safety and the

safety of LRT operation. The major concern was the presence of light rail trains operating on city streets, particularly the number of trains running during weekday peak hours.

In response to these concerns, an estimate of the possible number of light rail accidents that might be expected in the Corridor was made using data from the MTA Operations Safety department report *Summary of Metro Blue Line Train/Vehicle and Train/Pedestrian Accidents (7/90-09/99)* dated October 29, 1999. Based on the data presented in the report, the average number of on-street accidents per year per mile for fiscal years 1993 to 1999 was approximately 4.0 per mile. For fiscal year 1999 only, the accident rate was approximately 5.1 per mile. The vast majority of the accidents involved autos making left turns in front of the LRT vehicles. Only five percent of the accidents involved pedestrians.

For safety impacts that have been identified for Option A, MTA project design features are analyzed to determine which safety enhancement measures could be included in the project design to mitigate any significant impacts under CEQA. MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX, will be used to develop these design features. Input will also be sought from the local fire and police departments to assist in the design, as discussed in Section 4.14.4.

Security and Crime Prevention Issues

Operation of Option A can be expected to concentrate people around stations and parking facilities as well as the LRT vehicles themselves. The potential for car thefts, robberies, vandalism, loitering and other crimes exists. If measures were not taken to create a safe, protected environment for LRT patrons and other citizens, the potential for criminal activity around station areas and in vehicles would be significant.

Fire Services and Emergency Response

LRT vehicles will contain a state-of-the-art communication system to enhance response time by fire, police, and emergency services. As a result, patrons of the system should not face a negative impact from delays in arrival of emergency assistance. However, the possibility of delaying an emergency vehicle responding to a call elsewhere must be considered a potentially significant impact.

Significance of Impacts

Safety features would be included in the design of LRT vehicles, station areas, and other facilities. Safety risk remains a consideration that could generate significant impacts. The possibility of delaying an emergency vehicle responding to a call elsewhere must be considered a potentially significant impact.

Option B

Accidents and Safety /Security and Crime Prevention Issues

The impacts of Option B will be the same as Option A, with the exception of potential impacts on Ramona High School if the school is relocated to another site removed from the LRT project. If that were to occur, then there would be no potential impacts from students and faculty crossing the tracks in the vicinity of the school and no potential security and crime prevention impacts at the school. The impacts will be similar to those discussed in Option A if Ramona High School is reconstructed except that the 3rd/Indiana Station will be closer to the high school than the 1st/Lorena Station planned with Option A. Also, the station area changes to 3rd/Indiana, 3rd/Ford, and Pomona/Atlantic under Option B will result in changes to locations (not severity of impacts) where pedestrian/LRT conflicts and crime activity could potentially occur around the stations.

Fire Services and Emergency Response

The impacts will be the same as those described for Option A.

Significance of Impacts

Safety features would be included in the design of LRT vehicles, station areas, and other facilities. Safety risk remains a consideration that could generate significant impacts. The possibility of delaying an emergency vehicle responding to a call elsewhere must be considered a potentially significant impact.

4.14.4 Mitigation

4.14.4.1 Option A

Accidents and Safety Issues

Mitigation measures will be developed to conform to MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX. To diminish the risk of collisions between light rail vehicles and automobiles on the street portion of the system, MTA will work with the Los Angeles City and the Los Angeles County traffic control departments and comply with the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD). Automobile movements across the LRT tracks will be minimized by allowing movements across the tracks, including left turns, only at major thoroughfares. This measure should also reduce the number of auto/auto accidents that would otherwise occur mid-block and at non-signalized intersections. Appropriate traffic controls will be installed. At major intersections Los Angeles City and Los Angeles County will control left turns with green arrows. MTA will also implement methods the same or better than that done for the Blue Line along Washington Boulevard including "next train coming" automatic signs; intersection surveillance cameras; and ticketing of violators.

Pedestrians will be discouraged from crossing at mid-block on major roads by concentrating crossings at major intersections and by installing physical pedestrian barriers. This could help minimize pedestrian accidents with autos as well as with trains. MTA will provide designated/signalized pedestrian crosswalks at appropriate locations near schools or where warranted. Installation of pedestrian gates will be considered on a case-by-case basis. For example, pedestrian gates may not be appropriate for stations in the center of the street. In any event, MTA will comply with PUC safety standards for pedestrian crossings. In addition, though not an impact of the LRT project, MTA will address an existing pedestrian safety issue at the Santuario de Nuestra Señora de Guadalupe Church located along 3rd Street near Marianna Avenue (across from the Calvary Cemetery). During worship services, people park their vehicles across 3rd Street and illegally cross the street to go to church. To avoid the illegal crossings, MTA will install a pedestrian signal at Marianna Avenue and provide a crossing guard on weekends during services.

Station platforms will be designed to reduce the risk of injury for persons waiting for trains. At Ramona High, Utah Elementary, Our Lady of Lourdes Elementary, and Griffith Middle Schools, MTA will provide a crossing guard during daily arrival and dismissal times if requested by the school administrators for as long as their presence is requested. All locations for crossing guards will be reviewed by the MTA Fire Life Safety Committee for adequacy during both construction and operation. This committee includes a fire chief each from the City and County of Los Angeles Fire Departments. The Fire Life Safety Committee will approve the crossing guard plan prior to the start of construction, and if either fire chief rejects the plan, it will not be approved nor construction commenced until the fire chiefs concerns are met.

MTA will also provide at no charge to the Los Angeles Unified School District**,** as well as neighborhood senior centers upon request, an instructional rail safety program with materials to all affected schools in the study area. The program will cover safety issues relative to both construction and operation of the LRT project. As part of this commitment, MTA will permanently fund school zone safety programs and law enforcement for the light rail project. The existing Red, Blue, and Green lines have law enforcement contracts, as will the Pasadena Blue Line project and the Eastside Corridor Light Rail Project. MTA will consult with LAPD, LA County Sheriff, and the California Highway Patrol (CHP) during project development and operation to ensure that input from all agencies relative to safety concerns is received.

Appropriate lighting will be provided at locations where there is conflict between movement of pedestrians, vehicles, bicycles, and trains. In addition, lighting shall provide excellent visibility for train operators to be able to react to possible conflicts, especially to pedestrians crossing the track. In areas where the street is widened or sidewalks are modified, MTA will replace street lights as necessary and will reproduce conditions that are currently in place and conform to existing conditions.

In the areas directly adjacent to the rail stations: (1) sidewalk widths will be designed with the widest dimensions feasible in conformance with the LA City/MTA's adopted "Land Use/Transportation Policy", and with widths up to and exceeding ten feet; (2) minimum widths will not be less than those allowed by the State of California Title 24 access requirements, or the Americans with Disability Act (ADA) design recommendations where existing building lines or landscape areas periodically preclude these preferred widths; (3) accommodating pedestrian movements and flows will take priority over other transportation improvements including automobile access where physical conditions present potential restrictions in pedestrian access, compliance with ADA, or Title 24 minimum requirements; (4) physical improvements will ensure that all stations are fully accessible as defined in the Americans with Disabilities Act; and (5) alternative routing for pedestrians that allows completion of access to the station and to destinations in the immediate vicinity of the station will be developed through the Community Linkages Study. See Section 4.4.4 for additional information about the study.

A fence will be put in place at the U-section trenched locations of the alignment near Utah Elementary School to prevent access to the tunnel. For both portals, MTA will evaluate during final design either an automatically closing gate, an alarm, or other advanced security measures against trespassing. The result will be reviewed by the MTA Fire Life Safety Committee including fire chiefs from the city and county fire departments. In addition, MTA will install distinctive signs and lights to warn pedestrians of trains emerging from the tunnel.

MTA will apply other mitigation measures in accordance with MTA, Public Utility Commission (PUC), MUTCD, and State of California Highway Design Manual (HDM) criteria that will minimize potential operations safety and accident impacts. They include:

- Design programmed visibility train signals that are not visible to cars making left turns and are visible only to train operators;
- Design photo enforcement camera equipment;
- Design the train priority signal system;
- Design crosswalks, stand behind the line markings, etc. Provide for an entire safe path from stations to sidewalks for pedestrians and patrons;
- Design alignment, grade, horizontal and vertical curves to minimize or eliminate any visibility and/or operational problems;
- Design active warning devices for pedestrians; and
- Install rumble strip/cobblestone distinctive design for pedestrian crossings.

The MTA has initiated a rail safety and pedestrian safety analysis/study near light rail facilities that includes the development of crossing control devices for automobiles and pedestrians. The MTA will direct that study to include specific application to locations along this rail Corridor. Safety improvements specified by PUC and the HDM will be included in the construction of the rail system. In addition to improvements specified above, the project will include additional safety devices in priority areas identified in the rail safety and pedestrian study. Funding for pedestrian safety devices beyond those specified by the PUC and HDM has been identified for demonstration of new technology safety devices on the Pasadena Blue Line and could be incorporated into the Eastside Corridor project.

In addition, to increase light rail vehicle safety, the light rail vehicles will be provided with front and rear safety fenders to minimize or prevent the potential for pedestrian contact with the vehicle coupler and/or the potential to fall under the vehicle.

For subway operation, the MTA Fire Life Safety Committee has developed the following safety-related design criteria for the proposed LRT subway stations:

- Fire alarm protection within the station area;
- Minimum of two fire emergency routes from each station;
- Emergency station ventilation and lighting;
- Communication systems between adjoining fire agencies; and
- A methane detection system for each station.

Building construction for underground stations shall not be less than Type I Construction as defined in the Uniform Building Code (UBC). Enclosure of patron use stairways, escalators, and protection of floor openings are not required within areas of the public occupancy. Stations having more than two levels below-grade or more than 80 feet to the lowest occupied level from grade will require protected level separation or other protection features to provide safe egress to the exits.

In public occupancy areas, fire separations will be provided and maintained. Station public occupancy will be separated from station ancillary occupancy by a minimum two-hour fire rated wall. The only exception is that a maximum of two station agents, supervisors, or information booths may be located within station public occupancy areas when constructed of approved noncombustible materials and limited in floor area to 100 square feet.

Security and Crime Prevention Issues

Mitigation measures will be developed to conform to MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX. Increased policing, well-placed lighting, installation of cameras to monitor activities, and clear visibility of the station area from the street and sidewalk will substantially minimize criminal activity at LRT stations. Large concentrations of people and street level activity around stations may actually decrease crime rates. MTA will involve the LAPD and the County Sheriff in the planning and design of stations and parking facilities to improve station area security. The enforcement agencies are also obligated to provide a safe environment.

Consideration will be given to procuring one agency to provide on-board security for the LRT vehicles. While the LAPD or County Sheriff can cover the areas around stations and park-and-ride facilities, contracting for security with a single agency has proven to be an efficient method of patrolling LRT vehicles that cross jurisdictional boundaries. MTA will fund all law enforcement and security needs of the Project as it does for the existing Red, Blue, and Green Lines.

Fire Services and Emergency Response

Mitigation measures will be developed to conform to MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX. During the project design phase, all public safety agencies will have input on street modifications or access limitations for emergency vehicles resulting from LRT operation. All limited access devices (gates, etc.) will conform to LA County and LA City Fire Department standards. MTA will ensure that the Fire Departments are able to verify this to their satisfaction, in the drawings and after the project is constructed. MTA personnel will train with firefighters in preparing for project-related emergencies at MTA expense prior to project opening. Training will include simulated fires, simulated passenger with a heart attack etc., to the satisfaction of the MTA Fire Life Safety Committee.

In addition, MTA will ensure, through compliance with MTA Design Criteria (including MTA Fire Life Safety Criteria), that all emergency requirements are met specifically in regards to problems that may occur outside of the day-to-day construction and operational activities such as utility emergencies, natural disasters, and subsidence. The MTA Fire Life Safety Committee will review project drawings. No facilities will be built or operated which the fire chiefs deem unsafe. If initial designs contain flaws, MTA will meet with the fire chiefs until they certify that the design is correct. In addition, all designs will meet MTA Board adopted Fire Life Safety Criteria. A fire chief from each of the Los Angeles City and County Fire Departments will be on-hand to ensure the project meets all City and County Codes. A combination of proper facility design, operating equipment, hardware, procedures and software subsystems would reduce potential fire and emergency service response impacts to a less than significant level.

Significance of Impacts Remaining After Mitigation

With mitigation, the aforementioned safety and security impacts would be reduced to an insignificant level.

4.14.4.2 Option B

Accident and Safety Issues

Mitigation measures taken will be the same as those described under Option A. As noted, MTA will provide a crossing guard in the vicinity of Ramona High School during arrival and dismissal times if requested by LAUSD and the school administrator to ensure pedestrian safety around the high school, especially in light of the proximity of the 3rd/Indiana Station.

Security and Crime Prevention Issues

Mitigation measures taken will be the same as those described under Option A with the exception that MTA, in concert with the LAPD and County Sheriff, will provide increased security in the vicinity of Ramona High School to minimize potential crime activity in the vicinity of the 3rd/Indiana Station.

Fire Services and Emergency Response

The mitigation measures will be the same as those described for Option A.

Significance of Impacts Remaining After Mitigation

With mitigation, the aforementioned safety and security impacts would be reduced to an insignificant level.

4.15 HISTORIC/ARCHAEOLOGICAL/PALEONTOLOGICAL RESOURCES

4.15.1 Affected Environment

4.15.1.1 Historic/Archaeological Resources

Regulatory Setting

Regulations that address potential effects on historic, archaeological, and paleontological resources include Section 106 of the National Historic Preservation Act (NHPA), Section 4(f) of the Department of Transportation Act, and the California Environmental Quality Act (CEQA). Each of these acts as they pertain to cultural resources is briefly described below.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966, as amended through 1992 (16 U.S.C. Section 470), and 36 CFR Part 800 requires that federal agencies take into account the effect of carrying out federally funded, assisted, or licensed projects on resources identified as included in, or determined eligible for, the National Register of Historic Places (NRHP), and, if a project adversely affects those characteristics qualifying a resource for inclusion on the NRHP Register, feasible alternatives are investigated.

The Section 106 review process follows these steps: 1) determine that the Section 106 provisions apply to the undertaking or proposed action; 2) determine whether the undertaking has the potential to create effects; 3) define the Area of Potential Effects (APE); 4) identify historic, archaeological and cultural resources, and evaluate their significance to determine eligibility for listing in the National Register; 5) Coordinate Section 106 with other reviews such as NEPA and Section 4(f); 6) apply the criteria of effect and adverse effect to determine impacts on identified resources; 7) consult with the State Historic Preservation Officer (SHPO) and other interested persons, agencies, and tribes to agree on appropriate mitigation measures; 8) execute a Memorandum of Agreement (MOA) with the SHPO that specifies the mitigations and identifies those responsible for carrying out the specific measures; and 9) submit the MOA to the Advisory Council for Historic Preservation to determine if they have comments. The letters of concurrence from SHPO regarding determination of eligibility and finding of effect and the proposed final MOA are presented in Appendix G.

When evaluating a property against *National Register* criteria (Criteria of Effect), significance is defined as the importance of a property to the history, architecture, archaeology, engineering, or culture of a community, a State, or the nation. In order for a property to be considered eligible for inclusion on the *National Register*, it must meet at least one of four specific criteria (A through D) for evaluation identified in 36 CFR Part 60 of the NHPA, and certain other conditions. The *National Register* criteria for evaluation are defined below.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design setting, materials, workmanship, feeling and association, and that are: A) associated with events that have made significant contributions to the broad pattern of our history; or B) that are associated with lives of persons significant in our past; or C) that embody the distinctive characteristics of type, period or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or D) that have yielded or may be likely to yield information important in prehistory or history.

California Environmental Quality Act

In September 1992, Section 21084 of CEQA was amended to categorize projects that may cause substantial adverse changes in the significance of historical resources as projects that may have significant effects on the environment and, therefore, are not exempt from CEQA. Historic resources were defined as any resource listed, or determined to be eligible for listing, in the California Register of Historical Resources (California Register). According to CEQA, Section 21084.1 of the Public Resources Code, historical resources listed in the California Register that are determined eligible for listing in the National Register or included in local registers of historical resources, are presumed to be historically or culturally significant.

Section 4(f) of the Department of Transportation Act of 1966

Section 4(f) was established in order to limit the circumstances where protected lands and historic site areas can be used for transportation purposes. In this discussion, "historic site areas" refers to those areas where a historic structure is located and/or where a group of historic structures is located. This applies to those guidelines presented by the National Historic Preservation Act of 1966, and observes the guidance of the SHPO. Since the Eastside Project may affect historic structures either visually, partially or completely, a Section 4(f) evaluation is required. Specific Section 4(f) issues are discussed in detail in Section 4.17 of the Final SEIS/SEIR.

Area of Potential Effects

The APE (Figures 4.15-1 through 4.15-3) includes the immediate properties along each side of the roadway proposed to accommodate the system and those properties, which have an unobstructed view of the alignment. The APE includes properties directly affected by project construction or right-of-way acquisition, as well as properties that may be indirectly affected by visual or noise/vibration impacts. For the subway segment the APE includes properties, which lie directly over the alignment and properties adjacent to the properties over the alignment. The APE was defined to satisfy the requirements of Section 106 of the NHPA and CEQA.

Properties Identified within the APE

A review of archival records, background literature, and field survey have identified two types of cultural resources (King 1998:221-222). These types include:

- Historic Properties – Places included in or eligible for the National Register of Historic Places by virtue of their historical, archaeological, architectural, engineering, or cultural significance; and
- Community cultural norms, values, and beliefs, and their expressions in the ways people work, play, relate to one another, organize to meet needs, and generally participate in society. This kind of resource, which may or may not involve historic properties or some other kind of resource, or use of the natural environment, is subject to NEPA.

The preliminary architectural/historical reconnaissance undertaken as part of the Draft SEIS/SEIR process identified over 150 properties within the APE for the various LRT Build Alternative options as significant, or potentially significant and warranting additional investigation. The intensive architectural survey, conducted in March to August 2001, evaluated 74 significant, or potentially significant individual buildings, structures, or objects. The State of California, Department of Parks and Recreation, Historic

FIGURE 4.15-1 AREA OF POTENTIAL EFFECTS

FIGURE 4.15-2 AREA OF POTENTIAL EFFECTS

FIGURE 4.15-3 AREA OF POTENTIAL EFFECTS

Resource Inventory form for each building is presented in the *Revised Cultural Resources Technical Report* that was prepared in support of the Final SEIS/SEIR. One building was identified as currently on the National Register of Historic Places. Two structures were previously determined eligible for the National Register as part of the Caltrans Historic Bridge Inventory. Eight properties had previously been determined eligible for National Register listing as a result of the FEIS/FEIR for the suspended Metro Red Line project. The present survey identified 13 properties that appear to meet the criteria for listing in the National Register, four buildings were found to be conditionally eligible for listing (currently ineligible), and 46 additional properties were found not to meet the National Register criteria, but appear significant at the state or local level. All other buildings, structures, and objects within the APE were found to have lost substantial integrity of design through alteration, or were less than 50 years of age and without significant overriding qualities of design and/or association.

Table 4.15-1 presents a summary of the 74 built resources, 12 murals and four archaeological sites that have been identified in the vicinity of the LRT Build Alternative for Options A and B. Those that are determined to be eligible, appear to be eligible, or are conditionally eligible to the National Register or are ineligible but may be eligible for state or local listing are identified below. The reference number that appears after each built resource corresponds to the resources identified in Figures 4.15-1 through Figures 4.15-3.

Table 4.15-1
SUMMARY OF SITE TYPES

Site Type[1]	Number Present
Archaeological Site, Determined Eligible to the National Register	1
Archaeological Sites that Appear Eligible to the National Register	3
Murals, Not Eligible to the National Register	12
Properties Listed in the National Register	1
Properties Determined Eligible to the National Register	10
Properties that Appear Eligible to the National Register	13
Properties Conditionally Eligible to the National Register	4 [2]
Ineligible Properties (may be eligible for state or local listing)	46

[1] "Properties" may include buildings, structures, or objects.
[2] = Currently ineligible

Recorded Archaeological Sites Determined Eligible for the National Register of Historic Places

- CA-LAN-1575H; Historic Chinatown

Recorded Archaeological Sites

- CA-LAN-887H; La Placita: Zanja Madre foundations and historical deposits
- CA-LAN-7H; Native American and Chinese historic deposits
- CA-LAN-2563H; Historical Deposits

Historic Property Previously Listed on the National Register of Historic Places

- Union Station, #1 (800 North Alameda)

Historic Properties Determined Eligible for Listing in the National Register

- 1st Street Viaduct, #5 (900 E. 1st Street)
- 4th Street Viaduct, #70 (100 E. 4th Street)

- Hotel Mount Pleasant, #8 (103-105 N. Boyle Avenue)
- Walter and Lillie Webb Residence, #9 (125 S. Boyle Avenue)
- Jewish Home for Wayfarers, #10 (127 S. Boyle Avenue)
- Simon Gless Farmhouse, #11 (131 S. Boyle Avenue)
- George and Emma Launders Residence, #16 (1853 E. 1st Street)
- Alfred Guest Cottage, #72 (319 N. Mathews Street)
- Charles Fisher Residence, #74 (334 N. Pickett Street)
- Evergreen Cemetery and Ivy Chapel, #41 (204 N. Evergreen Avenue)

Historic Properties Found to Appear Eligible for Listing in the National Register

- J.R. Newberry Company Building, #4 (900 E. 1st Street)
- James Hill & Sons Pickle Works, #6 (1001-1007 E. 1st Street)
- Hollenbeck Masonic Lodge #319/Chicago Plaza, #21 (2130 E. 1st Street)
- Peabody/Werden House, #25 (2415-2417 E. 1st Street)
- Lloyd Champion Residence, #27 (2631 E. 1st Street)
- Martha Sindell Residence, #28 (2508 E. 1st Street)
- James Scott Residence, #38 (2631 E. 1st Street)
- 3rd Street Market, #61 (3750 E. 3rd Street)
- Our Lady of Lourdes Church, #62 (3772 E. 3rd Street)
- William Goodhue Residence, #63 (3886 E. 3rd Street)
- Santuario de Nuestra Senora de Guadalupe Church, #65 (4101-4103 E. 2nd Street)
- St. Sava Serbian Eastern Orthodox Church and Cemetery, #66 (4355 3rd Street)
- New Calvary Cemetery, #69 (4201 E. Whittier Boulevard)

Historic Properties Found to be Conditionally Eligible for the National Register (As a Result of this Survey Pending Reversal of Alteration of the Historic Property)

- Joseph Kozinsky Block Building, #18 (2028-2036 E. 1st Street)
- Harvey Gregory Residence, #30 (2516 E. 1st Street)
- Apartment House, #32 (2601-2607 E. 1st Street)
- C.E. Bacon Residence and Max Glickman Barbershop, #35 (2625 E. 1st Street)

Properties Found not to Meet the Criteria for Listing in the National Register or the California Register but Should be Considered for Local Listing

- Granite Curbstones, #2 (500-800 Blocks, East 1st Street)
- Forthmann Est./Nippon Co. Building, #3 (702 E. 1st Street)
- Mrs. S. Uttly Residence, #7 (1613-1623 East 1st Street)
- Mariachi Plaza, #12 (1800 E. 1st Street)
- Mrs. L. Murstein Residence, #13 (1806-1812 Pennsylvania Avenue)
- George B. Kellick Block Building, #14 (1832 East 1st Street)
- Joseph Joyeria, #15 (1832 East 1st Street)
- St. Louis Drug Co., #17 and #19 (2001 and 2100 East 1st Street)
- T. Wooden Block Building, #20 (2106 East 1st Street)
- Charles N. Poundstone Residence, #22 (113 South Soto Street)
- Brengartner Residence, #23 (121 South Soto Street)
- James M. Brayton Apartment House, #24 (2409 East 1st Street)
- Walter B. Thompson Residence, #26 (2505 East 1st Street)
- Samuel Wise Residence #29 (2511 East 1st Street)
- Maria E. Murdock Residence, #31 (2537 East 1st Street)

- Sophie Rochewald Residence, #33 (2611 East 1st Street)
- Dr. John W. Bacon Residence, #34 (2612 East 1st Street)
- Frederick W. Hamlin Residence, #36 (2626 East 1st Street)
- Harvey H. Vincent Residence, #37 (2630 East 1st Street)
- First Street School, #39 (2820 East 1st Street)
- Charles Engle Residence, #40 (2908 East 1st Street)
- Mt. Carmel Missionary Baptist Church Rectory, #42 (3068 East 1st Street)
- Albina Kerbee Residence, #43 (3138 East 1st Street)
- L.E. Parkam Residence, #44 (3222 East 1st Street)
- F.M. Davis Residence, #45 (3228 East 1st Street)
- William J. King Residence, #46 (3258 East 1st Street)
- George and J. Hollis Residence, #47 (3310 East 1st Street)
- Patrick Dooley Residence, #48 (3318 East 1st Street)
- John Harris Residence, #49 (3322 East 1st Street)
- Del Burridge Residence, #50 (3340 East 1st Street)
- George Potter Residence, #51 (3434 East 1st Street)
- W. A. Cunningham Service Station, #52 (3454 East 1st Street)
- G.E. Platt Dairy Residence, #53 (3464 East 1st Street)
- DWP Station No. 23, #54 (123 South Indiana Street)
- Maria Martone Residence, #55 (147 South Indiana Street)
- Wm. I. And M.A. Adams Residence, #56 (205 South Indiana Street)
- Residence, #57 (3644 East 3rd Street)
- Residence, #58 (3672 East 3rd Street)
- Residence, #59 (3744 East 3rd Street)
- Residence, #60 (3747 East 3rd Street)
- Residence, #64 (216 Sunol Drive)
- Residence, #67 (214 Marianna Avenue)
- Residence, #68 (4219 East 3rd Street)
- Rosen Block & Lodge, #71 (2334 East Cesar Chavez Avenue)
- Ferdinand Gottschalk Residence, #73 (329 No. Fickett Street)

Historical Background

Prehistoric settlement in the Los Angeles basin appears to have been patterned in relation to environmental attributes that favored subsistence practices and may represent either villages or temporary/seasonal camps of special functions. Native American inland sites were often distributed near springs or seeps, or in proximity to oak groves. Other sites, many undocumented, were located to take advantage of desirable faunal, mineral, wild plant and seed resources. With the arrival of the Spaniards and formation of the missions, the area was soon depopulated.

Los Angeles was established near the Los Angeles River in 1769. The settlement was close to a ford and a place to ascend the bluffs on the east side of the river, the direction of Mission San Gabriel. The core of the settlement was on the lower river terraces, with the lowest terraces and floodplain serving as fields. As time passed, settlement spread upslope and westward away from the periodic flooding.

The archaeological record of California history is extensive throughout the area along the river. Earlier excavation documented one section of *Zanja 3*, part of the first Los Angeles water delivery system (Cultural Resource Group 1987). The complexity of the archaeological record is seen in La Placita (CA-LAN-887H), a stratified site between Alameda Street and the Plaza area (Costello and Wilcoxon [1978])

and in adjacent historic Chinatown (Greenwood 1996). Borings made at the northwest corner of Temple and Alameda produced architectural remains of a mill, late nineteenth century domestic artifacts, and refuse bone (Padon 1986).

After the achievement of California statehood in 1850, the city continued to develop around the early core. The street grid was expanded as new tracts were surveyed and bridges were built across the river. The heart of the city continued to move upslope, both east and west, and former vineyards on the river terraces were subdivided for homes and businesses. Industries such as meat packing, gas generation, and brickyards were relegated to the lowlands along the river, which came to be known as "the Flats." The architectural (and potential archaeological) history of the study area reflects patterns of urban growth and maturation. The area of the Flats is the most intensively utilized, with documented multiple occupations. Remnants of several waves of construction are present at and below the surface.

By the 1880s, suburban development began on the bluffs above the river. New housing tracts were served by street railways, and business establishments followed along transportation corridors (refer to Section 4.4.1.5, *Communities/Neighborhoods* for more information about historic settlement patterns in the Corridor). While evidence of early land use and cultural patterns has become part of the architectural and archaeological record, many land use and cultural patterns established by the 1880s have persisted. An example of such a pattern is commercial development along east-west arteries serving adjacent residential neighborhoods. Development of a transportation node on the flats and the two main waves of construction on the Boyle Heights bluffs, the 1880s through the 1890s and the 1920s, are visible in numerous structures.

The study area illustrates the strong American pattern of single-family detached dwellings prevalent through the middle of the twentieth century, nearly always of wood frame construction. These residences reflect trends in style, seen in the Queen Anne style of the 1890s, the Craftsman bungalows of the early twentieth century, the pre-World War II Mission Revival and other revival styles, and the Frank Lloyd Wright-influenced ranch style of the post-war period. Commercial architecture shows differences from dwellings; historic enterprises in the study area were frequently constructed of brick, often two stories in height. Unlike dwellings, which were set back from the street behind a fence demarcating the property, commercial structures were built to meet the property lines, with the entry on the main street. Commercial architecture can demonstrate the material correlates of marketing and consumer behavior.

Mural artwork, although used since the study area was settled by Spanish speakers, has in recent decades become an important element of the urban landscape. Some outstanding examples of mural artwork have already been lost, reinforcing the importance to the community and the special value of those murals that survived. Documented dates span more than 20 years, indicating that this is a tradition that speaks to the residents of the area and for which they have affinity and special concern.

Since the founding of the pueblo, the multicultural composition of the population, changing with patterns of migration and immigration, has left an impression on the city and its surroundings. The evidence is both visible, in the form of structures and wall art, and obscured, in the subsurface archaeological remains. The potential for discovery of subsurface historical remains is high from the area of Union Station to the foot of the Boyle Heights bluffs, is less along 1st Street from the Los Angeles River to the city boundary at Indiana Street, and decreases further along 3rd Street east to the end of the Corridor.

4.15.1.2 Paleontological Resources

Regulatory Setting

Paleontologic resources, including fossil remains, associated specimen data and corresponding geologic and geographic site data, fossil sites, and the fossil-bearing stratigraphic rock units, are a limited, nonrenewable, and very sensitive scientific and educational resource and, particularly with regard to fossil sites, are afforded protection under the following federal and state environmental legislation, as indicated below.

- National Environmental Policy Act of 1969 (NEPA) (P.L. 91-190; 31 Stat. 852, 42 U.S.C. 4321-4327). Requires that important natural aspects of our national heritage be considered in assessing the environmental consequences of a proposed project.

- Archaeological and Historic Data Preservation Act of 1974 (P.L. 86-253, as amended by P.L. 93-291; 88 Stat. 174, U.S.C. 469). Provides for the survey, recovery, and preservation of significant paleontologic data when such data might be destroyed or lost due to a federal, federally licensed, or federally funded project.

- California Environmental Quality Act of 1970 (CEQA) (13 Public Resources Code: 21000 *et seq.*). Requires that public agencies and private interests identify the environmental consequences of their proposed projects on any object or site of significance to the scientific annals of California (Division I, Public Resources Code: 5020.1 [b]).

- Guidelines for the Implementation of CEQA, as amended March 29, 1999 (Title 14, Chapter 3, California Code of Regulations: 15000 *et seq.*). Define procedures, types of activities, persons, and public agencies required to comply with CEQA, and include definitions of significant impacts on a fossil site (Section 15023, Appendix G [5.c]).

- Public Resources Code, Section 5097.5 (Stats. 1965, c. 1136, p. 2792). Defines any unauthorized disturbance or removal of a fossil site or remains on public land as a misdemeanor.

- Public Resources Code, Section 30244. Requires reasonable mitigation of adverse environmental impacts that result from development of public land and that affect paleontologic resources.

Paleontological Setting

Although no previously recorded fossil site has been documented in the study area, there exists a moderate to high potential to encounter fossil remains at previously unrecorded fossil sites by construction-related earth-moving activities where these activities will disturb previously undisturbed rock strata. At or near the surface, the younger alluvium probably is too young to contain remains old enough to be considered fossilized and, therefore, there probably is only a low potential for any fossil remains or previously unrecorded fossil site being encountered by shallow earth-moving activities in areas underlain by this rock unit.

East of Highway 101, the study area is underlain by older alluvium, except along some of the passes and in the eastern end of the study area (refer to Section 4.9, *Geologic and Seismic Conditions* for more information about soils in the study area). In other sections of Los Angeles outside the study area, the older alluvium has yielded fossilized bones and teeth representing a diversity of continental vertebrate species, including extinct late Pleistocene (Ice Age) land mammals species, at a number of previously

recorded fossil sites (including La Brea tar pits) west of downtown Los Angeles and in the Hollywood area (Hay, 1927; Jefferson, 1991a, -b; Lander, 1994, in press; Miller, 1971). Some of these fossil remains were recovered at newly discovered fossil sites encountered by tunneling under Hollywood and Wilshire Boulevards during construction of the Metro Red Line tunnels. One of these fossil sites, which yielded extinct bison remains, was encountered by tunneling immediately west of Union Station during construction of the Metro Red Line tunnel between Union Station and the Tom Bradley/Civic Center Station (Lander, in press).

4.15.2 Methodology for Impact Evaluation

Archaeological/Historic Resources

The approach used to conduct this analysis began with the identification of known historic resources within the APE. A field survey was conducted to provide a preliminary evaluation of resources that have not been previously recorded, and to map the identified resources relative to the proposed alignments. All historic buildings and structures that, from the windshield survey appear to possess characteristics that may warrant evaluation, have been recorded for this work effort. Properties that meet the age criteria, but do not possess visual characteristics that appear important/significant have been considered and are included in this analysis. Final Determinations of Eligibility have been made through consultation with the State Historic Preservation Officer (SHPO).

Following background research and development of the project area's historical context, an intensive architectural/historical survey of the APE was conducted, and the results recorded according to the following methods:

- Review of previous surveys conducted in the vicinity of the APE and inventories of significant historical resources;
- Field investigation consisting of a visual on-site examination of each building, structure, and object within the APE boundaries;
- Photography and recordation of architectural attributes, condition, and level of alteration of all buildings and properties previously documented as significant, or dating to before 1951 and displaying integrity of design, and/or appearing to have historic/cultural significance;
- Background historical research for each building identified by the field survey, including building permits maintained by the City and County of Los Angeles Departments of Building and Safety, Los Angeles County Assessor's Records, local construction journals, historic Sanborn Map Company insurance maps, Los Angeles City Directories, and other sources; and
- Preparation of California Historic Resource Inventory forms (DPR 523) for all structures potentially eligible for listing on the National Register of Historic Places or the California Register of Historical Resources.

An adverse effect is found when an undertaking may alter, directly or indirectly, those characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.

For the analysis of historic properties, an adverse effect occurs if there is:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property which causes its deterioration; and
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The agency official may propose a finding of no adverse effect if the undertaking is modified or conditions are imposed to avoid adverse effects (36 CFR 800.5 (b)). If avoidance is not possible, then the agency official shall consult further to resolve the adverse effect pursuant to 36 CFR 800.6.

Paleontological Resources

Geologic maps, cross sections, and reports covering the Los Angeles Eastside Corridor study area were reviewed to determine the stratigraphic rock units underlying the study area. Surficial geological mapping of the study area is provided by Dibblee (1989). An archival search was conducted at the Natural History Museum of Los Angeles County (LACM) Vertebrate Paleontology Section (VP) to determine the locations of previously recorded fossil sites in each rock unit in and near the study area, as well as the taxa represented by the fossil remains recovered at these sites.

The potential for fossil remains being uncovered at previously unrecorded fossil sites that might be encountered by construction-related earth-moving activities, if any, for each alternative in previously undisturbed strata was assessed. This assessment is based on the type of transportation mode (subway, aerial, at-grade) and construction method to be implemented for Options A and B of the LRT Build Alternative, the depths at which earth-moving activities will occur, and the paleontologic productivity of the stratigraphic rock unit in which these activities will occur.

4.15.3 Impacts

4.15.3.1 No-Build Alternative

There would be no construction related impacts on cultural resources because this alternative only includes improvements to the transportation network that have already been approved and have environmental clearance. No capital improvements are included under this alternative, and it would therefore not result in any changes to historic properties within the study area.

4.15.3.2 LRT Build Alternative – Option A

Tables 4.15-2 and 4.15-3 summarize impacts on cultural resources. Table 4.15-2 displays the archaeological site or area of sensitivity, the type of impact anticipated and the effect of the impact. Table 4.15-3 identifies architectural properties, the type of potential impact, either caused by the construction or operation of the LRT Build Alternative or the visual impact to the historic setting, and whether the impact

creates an adverse effect or not pursuant to Section 106 of the NHPA. The determination of effect shown in the table assumes that mitigation (as discussed in Section 4.15.4) is implemented.

TABLE 4.15-2
SUMMARY OF IMPACTS ON ARCHAEOLOGICAL PROPERTIES

Location/Activity	Resource	Type of Impact	Type of Effect
Known Archaeological Sites			
Aerial Structure	Archaeological Site, CA-LAN-1575H (Determined Eligible)	Ground Disturbance	Unknown
Alameda/101 Fwy	Archaeological Site, CA-LAN-7H	Ground Disturbance	Unknown
Alameda/101 Fwy	Archaeological Site, CA-LAN-887H	Ground Disturbance	Unknown
Maintenance and Storage Facility	Archaeological Site, CA-LAN-2563H	Ground Disturbance	Unknown
Areas of High Archaeological Sensitivity			
1st/Alameda	Possible Historical Remains (stone curbing, structural remains, and historic rail track).	Ground Disturbance	Unknown
1st Street at Alameda to Rowan	Historic Transportation	Ground Disturbance	Unknown
All stations on 1st and Indiana Streets	Historic Transportation	Ground Disturbance	Unknown
Cut and cover between Gless and Pecan Streets	Historic Transportation	Ground Disturbance	Unknown
1st/Boyle, MTA property, southwest corner	Historical Resources	Ground Disturbance	Unknown
1st/Boyle, MTA property, northeast corner	Historical Resources	Ground Disturbance	Unknown
1st/Bailey Street, MTA property on northwest corner	Historical Resources	Ground Disturbance	Unknown
Bailey/Pennsylvania, MTA property on southeast corner	Historical Resources	Ground Disturbance	Unknown
1st/Soto, property acquisition on southwest corner	Historical Resources	Ground Disturbance	Unknown
1st/Soto, property acquisition on southeast corner	Historical Resources	Ground Disturbance	Unknown

Archaeological Resources

Any disturbance of the ground surface has the potential to impact archaeological resources, whether this results from permanent change such as excavation for a station or tunnel entrance, or only temporary use for parking, storage or lay-down yards. Potential archaeological impacts could occur during construction of Option A of the LRT Build Alternative at the following locations:

- At the intersection of Alameda and 1st Streets, earthmoving could potentially remove or destroy archaeological remains below the roadbed and parking lot at the northeast corner of 1st/Alameda.
- The industrial area of the Flats, from Union Station to the foot of the Boyle Heights bluffs near the Los Angeles River has the highest likelihood of subsurface resource disturbance.
- The beginning of the LRT alignment and the station platform at Union Station are on historic Chinatown, archaeological site CA-LAN-1575H.

- Earth moving activities may affect archaeological site CA-LAN-7H, which may extend from west of Union Station into the APE, and along Alameda Street east of the 101 Freeway.
- The alignment along Alameda Street will abut archaeological site CA-LAN-887H, historical site La Placita. Although the site is recorded only on the west side of Alameda, other remains have since been discovered on the east side of the street.
- Earth moving along 1st Street as far as the 1st Street Viaduct may encounter unrecorded archaeological remains.
- Within the maintenance and storage facility site south of the 1st Street Viaduct and west of the Los Angeles River lies historic site CA-LAN-2563H, which was the location of the Santa Fe Railroad's La Grande Station and related features.
- Cut and cover activities between Clarence and Pecan Streets as well as construction of the 1st/Utah Station could remove or destroy buried rails and other cultural remains.
- Construction of a station at 1st/Boyle and staging area at Bailey and Pennsylvania could encounter buried remains relating to the mixed commercial and residential uses during the 19th and early 20th centuries.
- Construction near 1st/Soto Station could potentially reveal buried remains since this area has historically been a densely built-up residential area prior to evolving into a major neighborhood shopping location during the first decades of the last century.
- Features from operating street railways and trolleys along 1st Street to Rowan Street and along Indiana Street may be encountered along these streets during LRT construction.

TABLE 4.15-3
SUMMARY OF IMPACTS ON ARCHITECTURAL PROPERTIES[1]

Property/Impact	Construction	Operation[2]	Visual	Effect[3]
Union Passenger Terminal, 800 N. Alameda Street (Map Reference #1)	X	X	X	No Adverse Effect
1st Street Viaduct, 900-1100 Blocks of E. 1st Street (Map Reference #5).	X	X	X	No Adverse Effect
Fourth Street Viaduct, 100-1700 Blocks of E. 4th Street (Map Reference #74)		X	X	No Adverse Effect
Hotel Mount Pleasant, 103-105 N. Boyle Avenue (Map Reference #8).			X	No Adverse Effect
Walter and Lillie Webb Residence, 125 S. Boyle Avenue (Map Reference #9)	X			No Adverse Effect
Jewish Home for Wayfarers, 127 S. Boyle Avenue (Map Reference #10).	X			No Adverse Effect
Simon Gless Farmhouse, 131 S. Boyle Avenue (Map Reference #11).	X			No Adverse Effect
George E. and Emma Launders Residence, 1853 E. 1st Street (Map Reference #16)				No Effect
Alfred Guest Cottage, 319 N. Mathews Street (Map Reference #72).	X			No Adverse Effect
Charles W. Fisher Residence. 334 N. Fickett Street (Map Reference #74).	X			No Adverse Effect
Evergreen Cemetery/Ivy Chapel, 204 N. Evergreen Avenue (Map Reference #41).		X	X	No Adverse Effect
J.R. Newberry Company Building, 900 E. 1st Street (Map Reference #4).		X		No Adverse Effect
James K. Hill & Sons Pickle Works, 1001-1007 E. 1st Street (Map Reference #6).		X		No Adverse Effect

TABLE 4.15-3
SUMMARY OF IMPACTS ON ARCHITECTURAL PROPERTIES[1]

Property/Impact	Construction	Operation[2]	Visual	Effect[3]
Hollenbeck Masonic Lodge#319/ Chicago Plaza, 2130 E. 1st Street (Map Reference #21).				No Effect
Peabody/Werden House, 2415-2417 E. 1st Street (Map Reference #25).		X		No Adverse Effect
Loyd Champion Residence, 2507 E. 1st Street (Map Reference #27).				No Effect
Martha Sindell Residence, 2508 E. 1st Street (Map Reference #28).				No Effect
James J. Scott Residence, 2631 E. 1st Street (Map Reference #38).				No Effect
3rd Street Market, 3750 E. 3rd Street (Map Reference # 61).		X		No Adverse Effect
Our Lady of Lourdes Church, 3772 E. 3rd Street (Map Reference #62)		X	X	No Adverse Effect
William C. Goodhue Residence, 3886 E. 3rd Street (Map Reference #63).		X		No Adverse Effect
Santuario de Nuestra Señora de Guadalupe, 4101-4103 E. 2nd Street (Map Reference #65).		X	X	No Adverse Effect
New Calvary Cemetery, 4201E. Whittier Boulevard (Map Reference #66).		X	X	No Adverse Effect
St. Sava Serbian Orthodox Church and Cemetery, 4355 E. 3rd Street (Map Reference #69)		X	X	No Adverse Effect

[1] Settlement and Noise/Vibration Impacts have been assessed as less than significant for all properties and, therefore, are not included in this table.
[2] Operation includes track and catenary elements, traction power substations, and passenger stations.
[3] Effect as determined pursuant to Section 106 of the NHPA. The determination of effect assumes that mitigation (as discussed in Section 4.15.4) is implemented.

The tunnel itself will be at a sufficient depth that it will not directly impact cultural resources. However, any excavation near the surface and settlement has the potential to affect buried remains and/or standing structures. Further connections of the tunnel to the surface, such as air shafts or emergency exits, and new or relocated utilities will require close attention.

Significance of Impacts

These impacts on archaeological resources are potentially significant.

Architectural/Historic Resources

The potential architectural/historical resource impacts resulting from the implementation of Option A are described below.

Property Acquisition Impacts on Architectural Resources

A standing commercial structure on 1st Street near Bailey Street, the Ranch Market, which was previously acquired by MTA for the suspended Red Line Extension project and environmentally cleared in the Final EIS/EIR for that project (1994), would be demolished to construct the portal entrance and construction

staging area for the 1st/Boyle Station. Since the market has lost architectural integrity and is not historically or architecturally significant, its removal will not constitute an effect on cultural resources.

Alteration of the Historic 1st Street Bridge

One of 15 significant bridges/viaducts over the Los Angeles River, the 1st Street Viaduct was opened to traffic on January 1, 1929. It was influenced by the principles of the City Beautiful movement, the bridges were built in Period Revival styles and included the Macy Street Bridge (1926), which was designed in the Spanish Colonial style, the 1st Street Viaduct (1929), designed in Neo-Classical style, and the 4th Street Bridge (1931), rendered in the Gothic Revival style. Other character defining features of the 1st Street Viaduct include large Roman triumphal arches that rise from the arch and girder abutments, within which are projecting balconies with benches. Spandrel columns constructed within the mainspans above the Los Angeles River terminate in arches and are highly decorative. Openings in 13 of the 23 bridge piers are also arched, in keeping with the structure's Neo-Classical style, as are openings of the central pier and abutments. The Neo-Classical detail extends to the entablature pattern on the fascia girders and to the bracketing for the sidewalk. The handrails along the outer edges of the walkways are arcaded and interspersed with roundels. Lampposts are integrated with the handrails and have fluted shafts that rise well above the height of lighting fixtures and originally carried streetcar catenary lines.

The 1st Street Viaduct is eligible for the National Register of Historic Places under Criterion A as an important element in the development of the Los Angeles transportation system. Designed in the Neo-Classical style, it is also eligible under Criterion C, Design/Construction, as one of a subset of Period Revival structures.

Following the January 1994 Northridge earthquake, the City of Los Angeles conducted a seismic evaluation and retrofit of the structure of the 1st Street Viaduct. With the exception of minor patching and repair, work was limited to the substructure of the viaduct. The seismic retrofit of the 1st Street Viaduct was assessed as constituting an adverse effect on the resource (Lee 1995). Mitigation measures implemented as a result of the finding of effect included completion of Historic American Engineering Record documentation for the structure. Additional measures designed to preserve or highlight, as much as possible, the character defining features of the structure specified that infill of the bent openings should be completed with black pigmented concrete (later amended to dark gray) to suggest the missing openings. Further, the shear walls were recessed three inches from the face of the columns on either side to create a reveal that would accentuate the outline of the opening.

As part of the Los Angeles Eastside Corridor project, MTA would conduct supplemental seismic retrofit work for the 1st Street Viaduct to meet the upgraded Caltrans Bridge Design Specifications (1999) as follows:

- Bents 1-5 and 17-21: Reinforced concrete infill shear walls will be constructed between columns. Central bent openings (one of three) have previously been infilled. Proposed work would completely infill the remaining two openings of each bent.
- Bents 6-16, 22, and 23: Reinforced concrete infill shear walls will be constructed between columns. The two central bent openings (of six) have previously been infilled. Proposed work would completely infill two additional intermediate cells of each bent, leaving only the outermost cells open.
- Arch Span Central Pier, East and West Arch Abutments: Reinforced concrete infill shear walls will be constructed between columns. The two central bent openings (of four) have previously been infilled. Proposed work would completely infill the remaining two openings of each bent.

- East and West Girder Abutments: Additional concrete cast-in-drilled-hole piles will be constructed behind the original concrete abutments. This upgrade will not be visible following repair of the road surface.

The proposed seismic retrofit of the 1st Street Viaduct, consisting of additional infill of viaduct pier openings with reinforced concrete shear walls at Bents 1-23, infill of center pier and arch abutment openings, and construction of additional cast-in-drilled-hole piles at viaduct end abutments, will result in an adverse effect on the viaduct's integrity of design with respect to the qualities of significance under Criterion C. An essential character-defining quality of the design is the visual effect of the columns supporting the span. Construction of the concrete infill walls will close off the open spaces between the columns, leaving the columns substantially less distinct.

Settlement Impacts

Settlement impacts could occur from tunnel excavation due to loss of ground. Such impacts could be cracking of buildings or subsidence over areas of tunnel construction, affecting standing structures directly over or immediately adjacent to the tunneled area between 1st/Gless and 1st Lorena.

Visual Impacts

Visual resources include important views, places where visual quality is important to the use of the property, and recognized historical resources. The following resources have special circumstances that require a more detailed explanation.

Union Station

Because the platform area of Union Station is visually separated from the historic station building itself and from the courtyards around, and because rail tracks and train operation is a historic and continuing present activity at Union Station, there would be no visual impacts on Union Station resulting from Option A of the LRT Build Alternative.

1st Street Viaduct

To address the concerns of the LA Bureau of Street Lighting and other concerned parties, a catenary system utilizing poles along the roadbed centerline will be utilized. The reuse of the original poles to suspend catenary lines from the street lamp supports along the outer edge of the bridge was not possible for modern light rail since it would have resulted in the replacement of the original poles and required structural augmentation potentially impacting the historic fabric of the bridge. The catenary supports will be designed in a manner compatible with the historic character of the viaduct. Because the Viaduct was once used for an earlier street rail system, placement of the catenary system on the historic 1st Street Viaduct will not result in a visual impact on the resource or surrounding resources.

4th Street Viaduct

The light rail maintenance and storage facility for the LRT line will extend under the 4th Street Viaduct in the form of track extensions and utility pits. There are no anticipated direct impacts to the Viaduct. The visual setting of the Viaduct has already been affected by construction of the Metro Red Line Maintenance Yard.

Evergreen Cemetery

The LRT Corridor along the Evergreen Cemetery's 1st Street side transitions from an underground to above grade alignment at the eastern end of the cemetery property. Physical changes visible from Evergreen Cemetery would be the rail trench, trackwork, catenary system and, under Option A only, the 1st/Lorena Station, which would be located within a U-section trench near the eastern end of the cemetery. Although the trench, tracks, and catenary system would be partially visible from the southeast corner of the cemetery property, large trees along the 1st Street side of the cemetery would screen most of the views, resulting in minimal visual impacts. In addition, screening and the distance from viewers would minimize visual impacts of the station. Option A would restore the historic setting along 1st Street since this area was served by street cars that used an overhead catenary system.

Our Lady of Lourdes Catholic Church

Our Lady of Lourdes is an historic church located on E. 3rd Street, east of Rowan Avenue. Physical changes visible from the church grounds include the catenary system and trackwork along 3rd Street. A station at 3rd/Rowan would be associated with Option A only. The street-level, center-lane station would be located about a block away from the church. Since 3rd Street is relatively wide at this location and since the church is set back from the street with a lawn in front, no visual impacts would occur by placing the station and the catenary system within view of the church.

Santuario de Nuestra Señora de Guadalupe

The Santuario de Nuestra Señora de Guadalupe is a historic church located on the north side of E. 3rd Street, between Sunol Drive and Eastern Avenue. Physical changes visible from the property include the rail trench, trackwork, and catenary system along 3rd Street. Because the church is set back from the street and elevated considerably above street level, and because trees and other landscaping on the intervening slope largely screen it from view from E. 3rd Street, the impacts of the catenary system, trench, and light rail tracks would be minor. The mural associated with the church is also elevated and would not be blocked from view by the LRT facilities.

New Calvary Cemetery

Along New Calvary Cemetery's 3rd Street frontage the light rail track bed is depressed. Physical changes visible from the cemetery grounds would include the rail trench, tracks, and catenary system. While the trench and catenary system would be partially visible from the cemetery, an existing perimeter wall topped by fencing, along with trees and other landscaping, would screen most of the views. The existing 3rd Street is relatively wide at this location, and this relatively spacious streetscape, combined with perimeter barriers and landscaping, would minimize visual impacts related to Option A.

St. Sava Serbian Orthodox Church and Cemetery

St. Sava Serbian Orthodox Cemetery borders E. 3rd Street, between Eastern Avenue and I-710. An associated church on the north side of E. 2nd Street is well-removed from the proposed LRT alignment. Physical changes visible from the Serbian Cemetery would be the catenary system and trackwork in E. 3rd Street. Because this property is partially screened from view from E. 3rd Street, the impacts of the catenary system and trackwork would be minor.

Murals

None of the murals in the Eastside Corridor would be acquired for the project, nor would any of them be blocked from view by project elements. Therefore, there would be no visual impacts on existing murals or public art.

Noise and Vibration Impacts on Cultural Resources

The results of the vibration and noise study, that was conducted for the operation of the LRT Build Alternative, does not indicate any adverse effects on cultural resources that would diminish the integrity of the property's significant historic features. The noise analysis found that some historic properties that appear eligible for listing on the National Register of Historic Places would be moderately impacted as defined by FTA criteria. None would be severely impacted. With regard to CEQA significance impact criteria, a significant impact occurs only if a noise-sensitive receptor is severely impacted according to FTA criteria. For moderate noise impacts, mitigation is only recommended when deemed cost-effective and feasible. Noise mitigation for moderately impacted buildings is normally in the form of sound-absorptive trackside noise barriers. However, trackside noise barriers are not reasonable or feasible for this project since the LRT alignment runs in the street when it is at grade. Trackside noise barriers in the street would interfere with traffic and pedestrian movements. In addition, all construction activities within 200 feet of a historic building or cultural resource structure will have to meet the vibration limits and monitoring requirements presented in Section 4.8, *Noise and Vibration.*

Significance of Impacts

Impacts as a result of the seismic retrofit required for the 1st Street Bridge are significant without mitigation. Other visual, property acquisition, settlement, and noise and vibration impacts on historic structures would be less than significant.

Paleontological Resources

Impacts will result from the construction of Option A in those parts of the study area where earth-moving activities will be conducted in previously undisturbed strata. These activities will occur primarily in the tunnel segment between Clarence Street (just east of 1st/Utah Station) and Lorena Street (just east of 1st/Lorena Station). The activities also will occur in the aerial segment in the area of the Santa Ana (101) Freeway adjacent to Union Station, and also could occur in the at-grade segment. In the tunnel segment, these activities will include (but not necessarily be limited to) open cut excavation for the tunnel portals, 1st/Lorena Station box, and line vent structures; cut-and-cover excavation for the 1st/Boyle and 1st/Soto Station boxes and those portions of the tunnels adjacent to one or both of the portals; possible mining (instead of cut-and-cover excavation) of that portion of the tunnel segment between the western portal and the 1st/Boyle Station without using a tunnel boring machine (TBM); and tunneling of the remaining portions of the tunnel segment using a TBM. In the aerial segment, these activities will include drilling or driving piles for aerial guideway column foundations. In the at-grade segments and at other at-grade facility sites in the tunnel segment, these activities might include grading and trenching or other shallow excavation in some track segments (such as 60 Freeway undercrossing), at least some of the at-grade station and traction power substation sites, etc.

The potential impact on the paleontologic resources of the older alluvium and, at depths greater than five feet below grade, the younger alluvium as a result of the construction of Option A probably will be of moderate to high significance because there probably will be a moderate to high potential for the loss of paleontologic resources as a result of earth-moving activities in previously undisturbed strata. On the other hand, the potential impact on the paleontologic resources of the younger alluvium at depths less

than five feet below grade probably will be only of low significance because there probably will be no more than a low potential for the loss of paleontologic resources as a result of shallow earth-moving activities in previously undisturbed strata.

Significance of Impacts

Many of the construction-related impacts on paleontological resources are potentially significant.

4.15.3.3 LRT Build Alternative – Option B

Impacts on significant cultural resources are the same as Option A. Because Option B will require an off-street at-grade alignment on the east side of Indiana Street between 1st and 3rd Streets, Ramona High School, located at the northeast corner of Indiana and 3rd Streets, will either be relocated to another site or reconstructed on the existing site. One additional structure, a medical office, currently standing along Indiana Street would also be removed. Neither Ramona High School nor the other structure appears eligible for national, state, or local historic listing. Their demolition will not be considered an adverse effect on cultural resources.

Regarding paleontological impacts, construction of Option B will affect the paleontologic resources of the study area similarly to those of Option A. However, under Option B, fewer fossil-bearing strata will be encountered by cut-and-cover excavation because the 1st/Lorena Station box will be replaced by the at-grade 3rd/Indiana Station platform.

Significance of Impacts

The significance of the impacts on cultural and paleontological resources is the same as Option A.

4.15.4 Mitigation

Since the impacts on cultural and paleontological impacts are the same for Options A and B, mitigation measures discussed in this section apply to both options. The MTA is in the Section 106 process that will lead to an Memorandum of Agreement (MOA) between MTA, FTA, and SHPO for any adverse effects that are determined. The MOA specifies mitigation measures and otherwise resolves impacts. The proposed final MOA is presented in Appendix G. The final MOA will be completed before the Record of Decision (ROD) is issued for the Final SEIS/SEIR.

4.15.4.1 Archaeological

In the event that archaeological and buried historic sites are encountered, evaluation of the site is often accomplished through test level excavation designed to determine the horizontal and vertical extent of the site, and to characterize the content of the site. If the site is determined to be potentially eligible for listing on the National Register, and project plans cannot be altered to avoid impacting the site, then an adverse effect would result pursuant to 36 CFR 800.5 (d) (2). To resolve an adverse effect it will be necessary to implement a MOA per 36 CFR 800.6 (c) to resolve the adverse effect (refer to Appendix G). Under CEQA, significant archaeological sites can be mitigated to a level of less than significant impact through the preparation and implementation of a data recovery plan. When any potentially significant archaeological evidence is observed, work will be halted in the immediate vicinity and the procedures set forth in the MOA will be followed.

Significance of Impacts Remaining after Mitigation

With proper mitigation, impacts on archaeological resources would be less than significant.

4.15.4.2 Architectural/Historic

Ground Surface Settlement Resulting from Tunneling

To limit surface settlement to acceptable levels, pressure-face Tunnel Boring Machines (TBMs), and pre-cast, bolted, gasketed lining systems were proposed for the suspended Metro Red Line project. The pressure-face TBM technology maintains positive fluid or soil pressure on the tunnel face, which decreases the potential for soil movement and surface settlement. Where conditions warrant, for example, shallow tunnels directly below sensitive structures or utilities, additional methods to reduce settlement would be specified. Such methods could include permeation grouting to improve the ground prior to tunneling; compaction grouting as the tunnel is excavated; compensation grouting involving the carefully controlled injection of grout between underground excavations and structures requiring protection from settlement; or underpinning the structure's foundation. More detailed information regarding mitigation of potential settlement impacts is presented in Section 4.19.2, *Potential Construction Period Impacts and Mitigation*.

During construction, instrumentation, e.g., ground surface, and building monitoring programs, will be in place to measure movements and provide information to the contractor on tunneling performance as well as to document that the settlement specifications are met. If measurements indicate settlement limits will be exceeded, the contractor will be required to change or add methods and/or procedures to comply with those limits. Application of these measures will result in a less than significant effect under CEQA.

Visual

The placement of the catenary system on the historic 1st Street Viaduct (bridge over the Los Angeles River) would not result in a visual impact because the catenary supports will be designed to be compatible with the historic street lamp standards and other stylistic features of the bridge. Second, because the 1st Street Viaduct was once used for an earlier street rail system, references to this predecessor of the LRT Build Alternative can be made in the style of the catenary supports. Either of these methods will reduce the visual impacts on the bridge, and to a less than significant degree. The track/pole installation may result in direct impacts on the bridge through removal of original fabric, and installation of support hardware. While Historic American Engineering Record (HAER) documentation has been accomplished for the structure, the Secretary of the Interior's Standards for Rehabilitation will be used in designing the system.

Noise and Vibration

The Contractor will be responsible for the protection of vibration sensitive historic buildings or cultural resource structures that are within 200 feet of any construction activity. The maximum peak particle vibration (PPV) velocity level, in any direction, at any of these structures should not exceed 0.12 inches/second for any length of time as recommended by FTA guidance for extremely fragile historic buildings. The Contractor will be required to perform periodic vibration monitoring at the closest structure to any construction activities using approved seismographs. For any fragile historic properties within 200 feet of the Eastside LRT tunnels, MTA will evaluate the vibration results from the excavated materials train as it passes under historic properties. If the vibration levels emanating from the train exceed 0.1 inches/second PPV, the contractor will take action to reduce the vibration levels to 0.1 inches/second or less as soon as possible. If vibration levels exceed 0.12 inches/second PPV, the

contractor will cease excavation operations until (s)he takes action to reduce levels below 0.1 inches/second. Such action could include reducing the excavated materials train speed, additional rail and tie isolation, and more frequent rail and wheel maintenance. These measures will not apply to the noise or vibrations from the tunnel boring machine, but only to operations resulting from the train hauling excavated materials under or near fragile historic properties. Which historic properties are to be deemed fragile will be determined through a pre-construction survey. Application of these measures will result in a less than significant effect under CEQA.

Architectural Documentation for Changes in Historic Setting

1st Street Bridge

Seismic retrofit work will incorporate the following design and construction features:

- Bents 1-5 and 17-21: Concrete infill shear walls between columns closing the remaining two cells constitutes an adverse effect. All concrete infill walls must be recessed three inches from the face of existing columns on either side, matching the reveals of the central cells created by the earlier City of Los Angeles seismic retrofit. Concrete used for the infill walls will be tinted to match the color of the existing infill walls.
- Bents 6-16, 22, and 23: Concrete infill shear walls between columns closing two additional cells constitutes an adverse effect. All concrete infill walls must be recessed three inches from the face of existing columns on either side, matching the reveals of the central cells created by the earlier City of Los Angeles seismic retrofit. Concrete used for the infill walls will be tinted to match the color of the existing infill walls.
- Arch Span Central Pier, East and West Arch Abutments: Concrete infill shear walls between columns closing two additional cells constitutes an adverse effect. All concrete infill walls must be recessed three inches from the face of existing columns on either side. Concrete used for the infill walls will be tinted to match the color of the existing infill walls.
- New work, which will of necessity become a permanent part of the bridge, should be done so that if it is removed in the future, essential form and integrity of the bridge will be unimpaired.

The MTA, in consultation with the State Office of Historic Preservation (SHPO) and the National Park Service (NPS), will record the 1st Street Viaduct according to Historic American Engineering Record (HAER) standards. HAER documents utilize the Secretary of the Interior's *Standards for Architectural and Engineering Documentation*, which are linked to the Secretary's *Guidelines* for Architectural and Engineering Documentation and the HABS/HAER Procedures Manual for more specific guidance and technical information. Recording of the viaduct will be consistent with Documentation Level 1, as defined by the *Secretary's Standard*, including:

- A full set of measured drawings depicting existing and historic conditions;
- Photographs with large format negatives of exterior and interior views, photocopies with large format negatives of select existing drawings or historic views where available; and
- Written data, history and description.

HAER recordation for the 1st Street Viaduct will update and augment previously completed documentation of the structure, with particular attention paid to areas of proposed seismic retrofitting. Documentation will be completed within 120 days of release of FTA funding for the Los Angeles Eastside Corridor project. The product will be submitted to the NPS for review and addition to the HABS/HAER collection maintained by the Library of Congress. Copies of the document will also be

provided to local institutions or agencies (Los Angeles Public Library, Los Angeles Conservancy) and made available for public review.

The MTA, in consultation with the City of Los Angeles and SHPO, will create a permanent display within an Eastside Corridor station area, or other MTA facility readily accessible to the public, and a traveling interpretive exhibit for display at various public venues within Los Angeles County, such as public libraries, museums, or schools. The exhibits will interpret the history and construction of the 1st Street Viaduct and its historical context as one of 15 significant Los Angeles River bridges constructed between 1910 and 1934. The interpretive displays will consist of durable panels and will include items such as: reproductions of historical photographs of the bridges, original construction drawings, drawings and photographs that are part of HAER documentation previously completed for the various bridges and as part of the current mitigation measures, and explanatory text. Items such as reproductions or casts of bridge architectural elements, discarded hardware, lighting fixtures, or other items used in the original bridge construction may also be included. The interpretive displays will be completed and in place prior to initiation of service on the Eastside Corridor LRT line.

Significance of Impacts Remaining after Mitigation

With proper mitigation, all potential impacts to historic properties would be reduced to an insignificant level.

4.15.4.3 Paleontological Resources

Mitigation measures discussed below are the same for Option B as for Option A, except that, under Option B, a paleontologic construction monitor will not be required to monitor open cut excavation for the 1st/Lorena Station box since this station will be replaced by the at-grade 3rd/Indiana Station.

The following mitigation measures will reduce the potentially significant (including cumulative) construction impacts on the paleontologic resources to an insignificant level by allowing for the recovery of fossil remains and associated data that might be uncovered by earth-moving activities in the tunnel and aerial segments. These measures will ensure project compliance with mitigation measures stipulated in the MTA Specifications Section 01170 and with Society of Vertebrate Paleontology (SVP, 1995, 1996) standard measures for mitigating construction-related impacts on paleontologic resources and for the museum repository acceptance of a mitigation program fossil collection.

- Prior to any earth-moving activity in the study area, the MTA will retain the services of a vertebrate paleontologist approved by the Natural History Museum of Los Angeles County Vertebrate Paleontology Section (LACMVP) to manage a paleontologic resource impact mitigation program in support of earth-moving activities associated with construction of the Eastside Corridor.
- The paleontologist will develop a storage agreement with the LACMVP regarding permanent storage and maintenance of any vertebrate fossil remains recovered as a result of the mitigation program.
- The paleontologist or his/her designated representative will present an environmental awareness training session to construction workers regarding the appropriate procedures to be implemented if fossil remains are uncovered by earth-moving activities, particularly tunneling and/or when mitigation program personnel are not on site.
- A paleontologic construction monitor will monitor earth-moving activities in areas underlain by older alluvium and those extending beyond five feet in younger alluvium. Monitoring will include the inspection of strata freshly exposed by these activities and will allow for the recovery of larger fossil remains uncovered by the activities. Although tunneling will not be monitored because of the confined working space and safety concerns, tunneling debris will be inspected for larger fossil

remains if an earth pressure balance TBM is used. In areas underlain by younger alluvium, monitoring will not begin until earth-moving activities have reached a depth five feet below grade.

- The monitor will recover fossil remains uncovered by earth-moving activities.
- The monitor or a paleontologic technician will recover and process rock samples to allow for the recovery of smaller fossil remains. The total weight of all samples recovered from each rock unit and subsequently processed will not exceed 6,000 pounds (12,000 pounds combined total for older and younger alluvium).
- The monitor will have the authority to temporarily divert any earth-moving activity around a newly discovered fossil site or a sampling site until the fossil remains or a rock sample have been recovered and the earth-moving activity has been allowed to proceed through the site by the monitor.
- The monitor will record associated specimen/sample data (taxon, element) and corresponding geologic (stratigraphic rock unit, stratigraphic level, lithology) and geographic site data (location, depth), and will plot site locations on maps of the study area.
- All identifiable fossil remains will be fully treated. Treatment will include preparation of the remains by a paleontologic technician to the point of identification; identification to the lowest taxonomic level possible by knowledgeable paleontologists; curating and cataloguing the remains, plotting fossil site locations on maps of the study area, and entry of associated specimen data and corresponding geologic and geographic site data into appropriate computerized data bases by the technician; and placement of the remains in the appropriate museum repository fossil collection for permanent storage and maintenance. Any vertebrate and invertebrate fossil remains will be placed in the LACMVP and LACM Invertebrate Paleontology Section (IP), respectively. Fossil plant remains will be placed in the University of California Museum of Paleontology (UCMP). Associated data will be archived at the appropriate museum repository, where the data, along with the fossil remains, will be made available for future study by qualified scientific investigators.
- The paleontologist will prepare a comprehensive final report of results and findings that describes study area geology/stratigraphy, summarizes field and laboratory methods used, includes a faunal list and an inventory of curated/catalogued fossil remains, evaluates the scientific importance of the remains, and discusses the relationship of any newly recorded fossil site in the study area to relevant fossil sites previously recorded from other areas.

Significance of Impacts Remaining After Mitigation

With these mitigation measures, earth-moving activities associated with construction of Options A or B of the LRT Build Alternative could result in beneficial effects, including the recovery of scientifically highly important fossil remains that would not even have been exposed without the project and, therefore, would not have been available for future study. However, significant impacts on the paleontologic resources of the study area could remain after mitigation. If implemented, drilling using the slurry displacement method for cast-in-place caissons or the impact driving of piles for the aerial guideway column foundations in the aerial segment, and the use of a slurry TBM in the tunnel segment will destroy any fossil remains and associated data.

4.16 COMMUNITY FACILITIES/PARKLANDS

4.16.1 Affected Environment

A variety of parks and community type facilities exist in or near the proposed LRT alignment in the study area. Community facilities and parklands within one-half mile distance north and south of the LRT alignment are identified in this section. The types of facilities noted include neighborhood and community parks, cemeteries, schools, hospitals, public facilities, such as libraries, fire and police stations, and other community facilities such as churches, youth centers, and museums. The facilities and their locations are identified in Tables 4.16-1 through 4.16-5 and displayed in Figures 4.16-1 and 4.16-2.

4.16.1.1 Parks and Recreation Facilities

A total of eleven parks and recreation facilities are in the study area; one is designated as a State Historic Park. The El Pueblo de Los Angeles State Historic Park is located in the City of Los Angeles along Alameda Street, just north of the Hollywood Freeway.

With the exception of Mariachi Plaza and LANI Park, all parks and recreation facilities located in the City of Los Angeles are under the jurisdiction of the City's Department of Recreation and Parks. Mariachi Plaza is owned by MTA. LANI Park, a traffic island that has been beautified and converted into open space as part of the Los Angeles Neighborhood Initiative (LANI), is under the jurisdiction of the Department of Public Works. Parks located in the unincorporated communities of East Los Angeles are under the jurisdiction of the County of Los Angeles Department of Parks and Recreation.

Three of the eight parks and recreation facilities in the study area are located within the City of Los Angeles immediately adjacent to the LRT alignment along 1st Street. These include Pecan Park, Mariachi Plaza, and LANI Park. One of the three parks in the community of East Los Angeles, Belvedere Park, is located adjacent to the alignment along 3rd Street. This park, which extends to the north side of the Pomona Freeway, is part of the East Los Angeles Civic Center.

TABLE 4.16-1
PARKS AND RECREATION FACILITIES
WITHIN O.5 MILE OF LRT ALIGNMENT

No.[1]	Facility	Location	City/Community
1	Belvedere Park	3rd Street & La Verne Avenue	East Los Angeles
2	Atlantic Park	Atlantic Boulevard & 6th Street	East Los Angeles
3	Obregon Park	1st Street & Sunol Avenue	East Los Angeles
4	Evergreen Park	4th Street & Evergreen Avenue	Boyle Heights
5	LANI Park	1st Street & Chicago Street	Boyle Heights
6	Pecan Park	1st Street & Pecan Street	Boyle Heights
7	Prospect Park	Bridge Street & Enchandia Street	Boyle Heights
8	Hollenbeck Park	4th Street & Saint Louis Street	Boyle Heights
9	Aliso Pico Rec. Center	4th Street & Clarence Street	Boyle Heights
10	El Pueblo De Los Angeles State Historic Park	Alameda Street & Cesar Chavez Avenue	Central City
66	Mariachi Plaza	1st Street & Boyle Avenue	Boyle Heights

[1]No. corresponds to numbers shown in Figures 4.16-1and 4.16-2.

FIGURE 4.16-1
STUDY AREA COMMUNITY FACILITIES/PARKLANDS IN LOS ANGELES

FIGURE 4.16-2
STUDY AREA COMMUNITY FACILITIES/PARKLANDS IN EAST LOS ANGELES

4.16.1.2 Cemeteries

There are four cemeteries (Table 4.16-2) in the study area. Calvary Cemetery and Serbian Cemetery in the East Los Angeles Community and Evergreen Cemetery in Boyle Heights are located immediately adjacent to the proposed alignment.

TABLE 4.16-2
CEMETERIES
WITHIN 0.5 MILE OF LRT ALIGNMENT

No.[1]	Facility	Location	City/Community
11	Calvary Cemetery	3rd Street & Eastern Avenue	East Los Angeles
12	Serbian Cemetery	3rd Street & Eastern Avenue	East Los Angeles
13	Chinese Cemetery	1st Street & Eastern Avenue	East Los Angeles
14	Evergreen Cemetery	1st Street & Evergreen Avenue	Boyle Heights

[1]No. corresponds to numbers shown in Figures 4.16-1 and 4.16-2.

4.16.1.3 Schools

A total of thirty schools (Table 4.16-3) including public elementary, intermediate, and high schools, and several parochial schools are located in the study area. The Los Angeles Unified School District has jurisdiction over public schools located in communities within the City of Los Angeles and the unincorporated community of East Los Angeles. In the East Los Angeles community, Griffith Intermediate School, Ramona High School, Belvedere School, and Our Lady of Lourdes Church and School are all located adjacent to or near the LRT alignment. In Boyle Heights, Utah School is in close proximity of the alignment, and First Street School is adjacent to the subway segment of the project.

4.16.1.4 Hospitals/Clinics

There are three hospitals and four clinics (Table 4.16-4) located within a 0.5-mile distance of the proposed LRT alignment. White Memorial Medical Center, with approximately 310 beds, is located within 400 feet of the proposed 1st Street alignment and the 1st/Boyle Station in the Boyle Heights community. The Roybal Comprehensive Health Center is located adjacent to the 3rd Street alignment and proposed 3rd Street/Mednik Station in the East Los Angeles community. The Veterans Clinic is located in the Central City at Temple and Alameda Streets, next to the Alameda Street alignment.

4.16.1.5 Law Enforcement

The Los Angeles Police Department provides law enforcement services in the City of Los Angeles. Two facilities (Table 4.16-5) are in the study area, including Parker Center Headquarters in the Central City and the Hollenbeck Police Station, which is located on 1st Street in Boyle Heights. The Los Angeles County Sheriff's Department, which provides law enforcement services in the East Los Angeles community; is located along the 3rd Street portion of the alignment.

4.16.1.6 Fire Protection

There is only one fire station located in the study area. Fire Station 2, in Boyle Heights, is located at Cesar Chavez Avenue and Britannia Street. In the East Los Angeles community, all existing fire stations are located beyond the half-mile distance.

TABLE 4.16-3
SCHOOLS
WITHIN 0.5 MILE OF LRT ALIGNMENT

No.[1]	Facility	Location	City/Community
15	Fourth Street School	4th Street & Amalia Avenue	East Los Angeles
16	Saint Alphonsus School	6th Street & Amalia Avenue	East Los Angeles
17	Garfield High School	6th Street & Woods Avenue	East Los Angeles
18	Humphreys Avenue School	6th Street & Humphreys Avenue	East Los Angeles
19	Griffith Junior High School	3rd Street & Arizona Avenue	East Los Angeles
20	Lane School	Cesar E. Chavez Avenue & Westcott Avenue	Monterey Park
21	Morris Hamasaki School	1st Street & Mednik Aenue	East Los Angeles
22	Brooklyn Avenue School	Cesar E. Chavez Avenue & McDonnel Avenue	East Los Angeles
23	A. Perez Special Ed. Center	1st Street & Ford Blvd.	East Los Angeles
24	Belvedere Intermediate School	Cesar E. Chavez Avenue & Record Avenue	East Los Angeles
25	Marianna Avenue School	Gleason Avenue & Marianna Avenue	East Los Angeles
26	Our Lady of Lourdes School	3rd Street & Rowan Avenue	East Los Angeles
27	Belvedere School	1st Street & Rowan Avenue	East Los Angeles
28	Ramona High School	3rd & Indiana Streets	East Los Angeles
29	Rowan Avenue School	6th Street & Rowan Avenue	East Los Angeles
30	Malabar Street School	Malabar Street & Fresno Street	Boyle Heights
31	Our Lady of Talpa School	4th Street & Evergreen Avenue	Boyle Heights
32	Roosevelt High School	4th & Mott Streets	Boyle Heights
33	First Street School	1st & Savannah Streets	Boyle Heights
34	Hollenbeck Intermediate School	6th & Soto Streets	Boyle Heights
35	Breed Street School	4th & Breed Streets	Boyle Heights
36	St. Mary's School	4th & Chicago Streets	Boyle Heights
37	Second Street School	2nd & State Streets	Boyle Heights
38	Sheridan Street School	Sheridan & Breed Streets	Boyle Heights
39	Bridge Street School	Bridge & Enchandia Streets	Boyle Heights
40	San Antonio De Padua School	Cesar E. Chavez Avenue & Bridge Street	Boyle Heights
41	Seventh Day Adventist School	Cesar E. Chavez Avenue & Enchandia Street	Boyle Heights
42	Utah Street School	Clarence Street & Via Las Vegas	Boyle Heights
43	Dolores Mission School	3rd Street & Gless Street	Boyle Heights
44	Maryknoll School	Hewitt & 2nd Streets	Central City North

[1]No. corresponds to numbers shown in Figures 4.16-1 and 4.16-2.

TABLE 4.16-4
HOSPITALS/CLINICS
WITHIN 0.5 MILE OF LRT ALIGNMENT

No.[1]	Facility	Location	City/Community
45	Veterans Clinic	Alameda & Temple Streets	Central City
46	Lincoln Hospital	Soto Street (South of 4th Street)	Boyle Heights
47	White Memorial Medical Center	Cesar E. Chavez & Boyle Avenues	Boyle Heights
48	Roybal Health Center	3rd Street & Fetterly Avenue	East Los Angeles
49	Santa Marta Hospital	New York Street & Humphreys Avenue	East Los Angeles
50	Kaiser Clinic	5220 E. Teleford Street	East Los Angeles
51	Alta Med Health Services	5425 E. Pomona Avenue	East Los Angeles

[1]No. corresponds to numbers shown in Figures 4.16-1 and 4.16-2.

TABLE 4.16-5
COMMUNITY FACILITIES
WITHIN 0.5 MILE OF LRT ALIGNMENT

No.[1]	Facility	Location	City/Community
	Law Enforcement		
52	ELA Sheriffs Station	3rd Street & La Verene Avenue	East Los Angeles
53	Hollenbeck Police Station	1st Street & St. Louis Street	Boyle Heights
54	Parker Center	1st Street & Los Angeles Street	Central City
	Fire Protection		
55	Fire Station #2	Cesar Chavez Avenue & Britania Street	Boyle Heights
	Libraries		
56	ELA Library	3rd Street & Fetterly Avenue	East Los Angeles
57	Benjamin Franklin Library	1st Street & Chicago Street	Boyle Heights
58	Little Tokyo Library	1st Street & Crocker Avenue	Little Tokyo
	Places of Worship		
79	Union Church	4th & San Pedro Streets	Little Tokyo
80	Jodoshin Temple	Boyd Street & Omar Street	Little Tokyo
81	Zenshuji Soto Mission	Hewitt Street (South of 1st Street0	Central City-North
82	Hompa Hongwanji Buddhist Temple	1st & Vignes Streets	Central City North
83	Our Lady of Queen of Martyrs	1339 Pleasant Avenue	Boyle Heights
84	Pentecostal Church	1917 E. 1st Street	Boyle Heights
85	Seventh Day Adventist	Cesar Chavez Avenue & State Street	Boyle Heights
86	Spanish Seventh Day Adventist	1815 Bridge Street	Boyle Heights
87	Talmud Torah Temple	247 N. Breed Street	Boyle Heights
88	Tenrikyo So. Pacific Church	219 N. Chicago Street	Boyle Heights
89	Iglesia Bautista Unida	2923 E. 2nd Street	Boyle Heights
90	Calvary Baptist Church	206 S. St. Louis Street	Boyle Heights
91	Church of the Nazarene	213 S. Breed Street	Boyle Heights
92	Rissho Kosei-Kai Buddhist Church	118 N. Mott Street	Boyle Heights
93	Konko Church	2924 E. 1st Street	Boyle Heights
94	Evergreen Baptist Church	2923 E. 2nd Street	Boyle Heights
95	Free Methodist Church	3012 E. 2nd Street	Boyle Heights
96	Mt. Carmel Baptist Church	3064 E. 1st Street	Boyle Heights
97	Iglesia Evangelica	3501 Gleason Avenue	Boyle Heights
98	Paraiso Spanish Congregation	3684 E. 3rd Street	East Los Angeles
99	La Trinidad Methodist Church	3565 E. 1st Street	East Los Angeles
26	Our Lady of Lourdes Church/School (See Table 4.16-3)	3rd Street & Rowan Avenue	East Los Angeles
100	Baptist Church	Michigan & Marianna Avenues	East Los Angeles
101	Pius X Church	1st Street & McDonnel Avenue	East Los Angeles
102	La Luz Del Mundo	1st Street & Arizona Avenue	East Los Angeles
103	Sala Evangelica	3rd Street & Arizona Avenue	East Los Angeles
104	Iglesia El Siloe	3rd Street & Arizona Avenue	East Los Angeles
105	Sanctuario de Guadalupe Church	3rd Street (near Marianna Avenue)	East Los Angeles
106	Iglesia Cristiana Ejercito de Salvacion	Beverly Blvd. & Hillview Avenue	East Los Angeles
	Other Community Facilities		
59	Japanese American National Museum	1st & Alameda Street	Little Tokyo
60	Geffen Contemporary Museum	Alameda Street (North of 1st Street)	Little Tokyo
61	Japanese American Cultural Center	San Pedro & Azuza Streets	Little Tokyo
62	Roybal Center & Federal Building	Temple & Los Angeles Streets	Central City
63	St. Elizabeth Day Nursery	Mission Road (North of 1st Street)	Boyle Heights
64	Aliso Pico Multipurpose Center	1st & Clarence Streets	Boyle Heights

TABLE 4.16-5 (Continued)
COMMUNITY FACILITIES
WITHIN 0.5 MILE OF LRT ALIGNMENT

No.[1]	Facility	Location	City/Community
65	CYO Brown Stone House Teen Club	Cesar Chavez & Pennsylvannia Avenues	Boyle Heights
66	(refer to Table 4.16-1)		
67	Japanese Retirement Home	325 S. Boyle Avenue	Boyle Heights
68	International Institute	435 S. Boyle Avenue	Boyle Heights
69	PUENTE Learning Center	South Boyle Avenue	Boyle Heights
70	Social Security Office	240 N. Breed Street	Boyle Heights
71	Hollenbeck Youth Center	1st Street (West of St. Louis Street)	Boyle Heights
72	Variety Boys & Girls Club	Cincinnati Street (East of Soto Street)	Boyle Heights
73	Plaza Community Center	648 S. Indiana Street	East Los Angeles
74	Eastside Boys & Girls	N. McDonnel & Michigan Avenues	East Los Angeles
75	Maravilla Service Center	Cesar Chavez & N. Dangler Avenues	East Los Angeles
76	Centrode Ninos	Cesar Chavez Avenue (East of Mednik Avenue)	East Los Angeles
77	ELA Municpal Courts	Fetterly Avenue (North of 3rd Street)	East Los Angeles
78	Probation Department	Fetterly Avenue (North of 3rd Street)	East Los Angeles
79	Salesian Youth and Family Center	4th and Breed Streets	Boyle Heights

[1]No. corresponds to numbers shown in Figures 4.16-1 and 4.16-2.

4.16.1.7 Libraries

Of the three libraries located within one-half mile of the alignment, two are adjacent to the alignment. The East Los Angeles Library is on 3rd Street and Fetterly Avenue, and the Benjamin Franklin Library in Boyle Heights is located on 1st Street at Chicago.

4.16.1.8 Places of Worship

Of the twenty-eight places of worship identified in the study area, those that are located adjacent to the proposed alignment include the Hompa Hongwanji Buddhist Temple in Central City North; Pentacostal Church, Konko Church, and Mt. Carmel Baptist Church on 1st Street in Boyle Heights; and Pariaso Spanish Congregation, Sala Evangelica, Iglesia Cristina Ejercito de Salvacion, Iglesia El Siloe, and Guadalupe Church on 3rd Street in East Los Angeles.

4.16.1.9 Other Community Facilities

Also within one-half mile of the alignment are twenty other types of community facilities. These facilities range from child care centers to museums. Four of these facilities are located immediately adjacent to the proposed alignment including the Japanese American National Museum and Geffen Contemporary Museum both located near 1st and Alameda Streets, and the Aliso Pico Multipurpose Center and Hollenbeck Youth Center located on 1st Street in Boyle Heights.

4.16.2 Methodology For Impact Evaluation

Significant impacts on community services and facilities would result if construction or operation of the LRT Build Alternative (Option A or B) displaced or altered a community facility, restricted access to that facility, or hindered the operation or services offered at the facility. Similarly, parks and recreational facilities would be significantly affected if they were altered or displaced or if their use or function were diminished. Parklands as well as cultural and recreational facilities are subject to guidelines established by Section 4(f) of the U.S. Department of Transportation Act (USC 1653 (f)). Use of parkland or

recreational property for the implementation of the LRT Build Alternative would be a significant impact, requiring consultation with the U.S Department of Transportation, U.S. Department of the Interior, State Department of Parks and Recreation, and the Los Angeles City and County departments that have jurisdiction over parks and recreational facilities in the Corridor. An assessment of the project pursuant to Section 4(f) appears in Section 4.17, *Section 4(f) Evaluation*.

In addition, community facilities, parklands, and recreational facilities may be significantly affected by the noise and vibration from construction activities or from operation of light rail vehicles. Community, parklands, and recreational facilities within one-half mile of the proposed LRT facilities, including the tunnel alignment, or construction staging areas were considered to determine whether light rail operation would produce significant noise and vibration impacts on these facilities. Construction activities could also produce temporary, but significant, air quality and traffic and transportation impacts at these facilities. The potential for significant construction impacts on these facilities increases as the distance between that facility and the light rail facility decreases. In addition to distance, a number of factors could affect the level of impact, including construction requirements for the tunnel and stations, structural characteristics of the community or recreational facility, and the schedule and level of activity at the facility. Recognizing the highly variable potential for significant impacts under CEQA, a conservative estimate of 350 feet from a light rail construction site or staging area was used to identify facilities that may be subject to some level of impacts.

4.16.3 Impacts

4.16.3.1 No-Build Alternative

The No-Build Alternative would not alter or displace community and recreational facilities or parklands in the Corridor or hinder or disrupt activities at these facilities. However, the No-Build Alternative would not provide any beneficial effects, in terms of improved access to community and recreational facilities and services, to Corridor residents.

4.16.3.2 LRT Build Alternative

Option A

Parks and Recreation Facilities

Increased access to park and recreational facilities would be a beneficial impact of Option A. However, adverse impacts may also occur. At Mariachi Plaza, potential noise and vibration impacts from a vent shaft and emergency ventilation fans, located across the street from the Plaza, would be attenuated through design of these facilities. Noise and vibration due to LRT operation in the subway is not expected to affect the use of either Mariachi Plaza or LANI Park.

Option A would eliminate curb parking at the portal location on 1st Street adjacent to Pecan Park. Since excess parking capacity exists along the streets surrounding the park, this would not be a significant impact (refer to Chapter 3). No long-term noise, vibration, or visual impacts are expected at Pecan, Mariachi Plaza, or Belvedere Parks.

Cemeteries

A subway portal would be located at 1st/Lorena bordering Evergreen Cemetery. Although curb parking would be eliminated adjacent to the portal location, it is not expected to affect access to the cemetery. None of the cemeteries would be adversely affected by the LRT Build Alternative.

Schools

Increased access to educational facilities would be a benefit of Option A. Most schools are not located adjacent to the alignment and, therefore, would not be affected by LRT operation. The noise and vibration analysis conducted for Option A indicated that there would be no noise impacts on any of the schools situated along the alignment (refer to Section 4.8, *Noise and Vibration*). However, due to the location of the special trackwork along 3rd Street, the Los Angeles Music and Art School would be subjected to vibration impacts. The visual setting and the historic integrity of First Street School, Ramona High, and Our Lady of Lourdes School would not be affected by light rail.

Traffic and pedestrian circulation at school sites would be maintained except in the vicinity of Ramona High School where curb parking would be displaced along Indiana Street, a significant impact without mitigation since the parking utilization is high at this location.

For schools that are located near the alignment, the safety and security of the students crossing is a concern of the Los Angeles Unified School District. The safety and security issues could represent potentially significant impacts. Mitigation measures that would reduce potential safety and security impacts at light rail stations and pedestrian crossings near area schools are described in Section 4.16.4 and also in Section 4.14.4.

Hospitals/Clinics

Increased access to Corridor medical facilities would be a beneficial impact of Option A. No other impacts from LRT operation are anticipated.

Libraries

Option A would provide improved access to community libraries, a beneficial impact. The noise, vibration, and visual analysis have determined that light rail operation would not affect Ben Franklin Library, located along the subway alignment, and the East Los Angeles Library and the Little Tokyo Library, located near at-grade segments of the alignment (refer to Sections 4.6, *Visual and Aesthetics* and 4.8, *Noise and Vibration*).

Places of Worship

Option A would provide improved access to places of worship, a beneficial impact. Of the 28 places of worship located within one-half mile of the LRT alignment, only LA Hompa Hongwanji Buddhist Temple, Mount Carmel Missionary Baptist Church, Konko Church, Our Lady of Lourdes Church, Santurio de Guadalupe Church, and Sala Evangelica Church would be situated along the alignment. The visual setting and the historic nature of these structures would not be affected by LRT operation.

Due to the center alignment of the LRT in the vicinity of Our Lady of Lourdes Church, the center turn lane will be removed, and traffic will be prohibited from making left- or U-turns mid-block. Access from 3rd Street in front of the church will still be possible by making a right turn from the eastbound lanes. Left- and U-turns will still be possible at nearby signalized intersections. On-street parking will not be removed during the operation of the line. Current peak period parking restrictions will remain in effect. A split-phase signal operation will be used to accommodate the left-turn demand at Vignes Street near Hompa Hongwanji Buddhist Temple. Therefore, access will not be adversely affected. However, to accommodate four through lanes on 1st Street plus the LRT track, Option A will require a strip of land to be taken from the parking lot of the temple resulting in the loss of about seven parking spaces. Sufficient

underutilized parking is available in the vicinity of the temple; therefore, the loss of parking is not a significant impact. See Chapter 3 of the Final SEIS/SEIR for more information regarding parking utilization. Parking will not be affected near any other places of worship.

Other Community Facilities

Option A would provide improved access to many other community facilities, a beneficial impact. None of the youth and child care centers, judicial facilities, senior centers, and other community facilities located within one-half mile of the LRT alignment would be adversely affected by light rail operation. Although curb parking would be removed in front of the Aliso Pico Multipurpose Center near the portal location on 1st/Gless, excess parking capacity exists on the surrounding streets (refer to Chapter 3). Therefore, the removal of curb parking at this location would not be a significant impact.

Significance of Impacts

Option A would produce beneficial impacts for the community by improving access to parklands and other community facilities. However, other impacts on parklands and schools, such as vibration, curb parking, and historic resource impacts, are potentially significant.

Option B

The impacts of Option B will be the same as those described for Option A with regard to parks and recreation facilities, cemeteries (with the exception that parking spaces will no longer be removed in the vicinity of Evergreen Cemetery), libraries, places of worship, and other community facilities.

The impacts on schools will also be the same except for Ramona High School. Option B will involve either relocation of the school or reconstruction on the existing site. MTA will commit to the mitigation measures described in Section 4.16.4 below. LAUSD will conduct the necessary studies that may be required by the local jurisdiction (County or City) for the appropriate environmental clearances or building permits once it is determined whether to relocate or reconstruct the school. The actions of LAUSD in replacing the school are beyond the scope of the impact analysis for the Eastside Corridor LRT since LAUSD will be directing that program. However, MTA will monitor LAUSD progress with regard to Ramona High School decision-making and will work with LAUSD to address any conflicts which may arise between LAUSD's Ramona High School and MTA's Eastside Corridor project. Regardless of whether the school is relocated or reconstructed on site, curb parking would not be displaced along Indiana Street under Option B since the track will be placed off-street along the eastern side of Indiana Street. If the school is relocated to an alternate site, the issue of students crossing the LRT tracks is no longer a concern. However, if the school remains but is reconstructed, the safety and security of students crossing the tracks could represent potentially significant impacts. As discussed under Option A, the mitigation measures that would reduce potential safety and security impacts at light rail stations and pedestrian crossings near area schools are described in Sections 4.16.4 below and 4.14.4.

The Pomona/Atlantic Station will be located in the middle of the street adjacent to Kaiser Clinic. The clinic is anticipated to experience vibration impacts due to LRT operations.

Significance of Impacts

The significance of the impacts of Option B is the same as those described for Option A with the exception of impacts on hospitals/clinics. The vibration impact on Kaiser Clinic is potentially significant without mitigation.

4.16.4 Mitigation

4.16.4.1 Option A

To mitigate the impacts related to schools, MTA will:

- Inform the Los Angeles Unified School District and private institutions along the light rail alignment of changes to MTA bus routes, school bus routes, and pedestrian crossings prior to construction;
- Work with LADOT, LAPD, LA Bureau of Street Lighting, and the County Sheriff to implement mutually agreed upon measures, such as posting of clearly marked signs, pavement markings, lighting as well as implementing rail safety instructional programs, to enhance the safety of pedestrians, particularly in the vicinity of schools, crossing the LRT alignment. MTA will provide funds for these measures. The measures will be developed to conform with MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX;
- Provide a crossing guard during arrival and dismissal times at Ramona High School, Griffith Middle School, Utah Elementary School, and Our Lady of Lourdes School if requested by the LAUSD or Our Lady of Lourdes School for as long as their presence is requested (MTA will permanently fund school zone safety programs);
- Provide funds for City LADOT/LAUSD review of the "Safest Routes to School" (STEPS) maps for necessary revisions and development of mitigation at crossings;
- Purchase three parcels of land north of Ramona High School to utilize as surface off-street parking and to relieve the high utilization of on-street parking demand on Indiana Street;
- MTA will provide at no charge to LAUSD an instructional rail safety program with materials to all affected elementary and middle schools;
- LAUSD Transportation will be contacted regarding potential impact of the LRT operations, if any, upon existing school bus routes.

MTA will provide an on-going informational program to nearby senior centers, if requested by the centers to enhance safety. The program will be similar to that described for the schools except the information and materials provided will be geared toward senior citizens.

In addition, though not an impact of the LRT project, MTA will address an existing pedestrian safety issue at the Santuario de Nuestra Señora de Guadalupe Church located along 3rd Street near Marianna Avenue (across from the Calvary Cemetery). During worship services, people park their vehicles across 3rd Street and illegally cross the street to go to church. To avoid the illegal crossings, MTA will install a pedestrian signal at Marianna Avenue and provide a crossing guard on weekends during services.

Other mitigation measures that pertain to vibration, cultural resource, and safety and security impacts are presented in Sections 4.8, *Noise and Vibration*, 4.14, *Safety and Security*, and 4.15, *Historic/Archaeological/Paleontological Resources*.

Significance of Impacts Remaining After Mitigation

Mitigation measures would reduce impacts on parklands and community facilities to an insignificant level.

4.16.4.2 Option B

The mitigation measures described under Option A would be the same for parks and recreation facilities, cemeteries, libraries, places of worship, and other community facilities. With regard to schools, some

differences in mitigation for Ramona High School are associated with Option B. MTA will provide funding to LAUSD to either purchase a new school site (whether with a new or existing building) acceptable to LAUSD or to reconstruct the school at its present location. It is not feasible for MTA to analyze the impacts of this proposed school replacement at this time because LAUSD has not undertaken any programmatic planning for the new school and the timing, location, and extent of work required to undertake this replacement are unknown. MTA staff has conferred with LAUSD staff, and LAUSD has agreed that, upon its completion of programmatic planning and identification of potential new sites, LAUSD will conduct all required environmental studies as a condition to its determination of whether to relocate or reconstruct the school. Because of the indeterminate nature of the school project, it is beyond the scope of the analysis for the Eastside Corridor Project. However, MTA will monitor LAUSD progress with regard to Ramona High School decision-making and will work with LAUSD to address any conflicts which may arise between LAUSD's Ramona High School and MTA's Eastside Corridor project. No parking replacement is necessary near Ramona High School along Indiana Street between 1st and 3rd Streets under Option B since no curb parking will be displaced.

Mitigation measures, described in Section 4.8, *Noise and Vibration*, will be implemented to reduce ground-borne vibration on the Kaiser Clinic to a less-than-significant level.

Significance of Impacts Remaining After Mitigation

Mitigation measures would reduce impacts on parklands and community facilities to an insignificant level.

4.17 SECTION 4(f) EVALUATION

4.17.1 Regulatory Setting

Federal funds will be used to help finance this transit project. Section 4(f) of the Department of Transportation Act of 1966, as amended (49 U.S.C. 303), states that federal funds cannot be used for any "program or project which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic site of national, State, or local significance as determined by such officials unless (1) there is no feasible and prudent alternative to the use of such lands, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use." The word "use" refers to either a direct or a constructive use of the property. A direct use occurs when land is permanently incorporated into a transportation facility or a partial or full acquisition or easement of the property is required. Constructive use occurs when the project's proximity impacts are so severe that the activities, features, or attributes that qualify a resource for protection under 4(f) are substantially impaired. Typically, a constructive use of a resource would involve permanent and severe noise, vibration, visual, or access impacts. As outlined in Subsection 23 CFR 771.135 (p)(4), a constructive use of a protected resource occurs under any of the following situations:

- Predicted noise level increase, attributable to the proposed project, substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource.
- Proximity of the proposed project substantially impairs the aesthetic features or attributes of a resource, where such features or attributes are considered important contributing elements to the value of the resource.
- Restricted access, which substantially diminishes the utility of a publicly owned park, recreation area, or historic site.
- Vibration associated with the proposed project impairs the use of a resource.
- Ecological intrusion of the proposed project diminishes the value of wildlife habitat in a wildlife or waterfowl refuge adjacent to the project.
- Substantial interference with the access to a wildlife or waterfowl refuge when such access is necessary for established wildlife migration or critical life cycle processes.

The following sections evaluate park, archaeological and historic resources as they relate to Section 4(f). After reviewing the 4(f) evaluation, FTA may determine that: 1) there is no prudent or feasible alternative to using 4(f) properties 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. FTA is consulting with U.S. Department of Interior and the State Historic Preservation Officer (SHPO) regarding Section 4(f) properties.

4.17.2 Section 4(f) Properties Affected by Option A of the LRT Build Alternative

This section describes the Section 4(f) properties that would be affected by Option A of the LRT Build Alternative. No such properties would be affected by the No-Build Alternative. Parklands and recreational facilities, archaeological sites, and historic properties that would be affected by Option A are identified below. For these properties, a description and the significance of the affected property and the

application of Section 4(f) criteria for use are presented. Alternatives that would avoid use, measures to minimize harm, and coordination with the appropriate agencies are also described.

4.17.2.1 Parks and Recreation Property

Eleven parks and recreational facilities are located in the study area (refer to Section 4.16, Community Facilities/Parklands). Of these, four (Pecan, LANI, and Belvedere Parks and Mariachi Plaza) are adjacent to the proposed LRT alignment. Option A of the LRT Build Alternative would include an easement for a subway section under LANI Park. Given the depth of the subway, the absence of any noise, vibration or visual impacts at the surface and that no alteration of the surface would occur, this is not considered a "use" within the intent of Section 4(f). Similarly, no long-term impacts would occur at Pecan, Mariachi Plaza, and Belvedere Parks. However, construction of a subway station at Mariachi Plaza may temporarily disrupt use of the open space.

Mariachi Plaza

Description and Significance of Affected Property

Mariachi Plaza is a 15,000 square-foot triangular plaza, bordered on the south by 1st Street, on the west by Boyle Avenue, and on the northeast by Pleasant Avenue. The Plaza, which contains a gazebo where mariachi bands perform regularly, is owned by MTA.

Mariachi Plaza is a relatively modern, mid-1990's, monument important to the community, and the area where it stands is the center of an early crossroads at the top of the bluffs that might hold cultural remains. A review of Sanborn maps revealed that this area was used as open space during the late 19th and early 20th centuries. Low-level buildings were constructed along the bordering streets, visually enclosing the Plaza. During the 20th century, the open space was encroached upon by private businesses, which were acquired and removed by MTA as part of the suspended Metro Red Line Extension project in the 1990's. The improvements to Mariachi Plaza, including the gazebo structure and kiosks were installed by MTA in 1998 using MTA funds.

Application of Section 4(f) Criteria for Use

Mariachi Plaza is a publicly owned property that is open for public use, its major use is recreation, and is therefore, a resource that is protected under Section 4(f). During the Draft SEIS/SEIR process, Mariachi Plaza was also considered to be potentially eligible for listing in the National Register of Historic Places (NRHP). However, subsequent coordination with the State Historic Preservation Office (SHPO) in accordance with Section 106 of the National Historic Preservation Act determined that the resource is not eligible (see Appendix G).

Construction of the proposed subway station at 1st/Boyle may temporarily disrupt use of the open space by musicians and local residents. In addition, access may be temporarily restricted on 1st Street during deck installation and removal. The section of Pleasant Street between Boyle Avenue and 1st Street would be closed. The station, located under 1st Street along side Mariachi Plaza, would not require space from or permanently use the Plaza. However, the entrance to the subway station and station vent shaft would be sited on property already owned by MTA across the street from Mariachi Plaza.

Alternatives that Would Avoid Use

Initially, MTA examined the opportunity to place the station entrance plaza and vent shaft for the 1st/Boyle subway station in Mariachi Plaza. By locating the subway entrance in the Plaza, no buildings

surrounding the Plaza would be demolished. However, the small Plaza would be substantially altered by this use. To avoid this impact on Mariachi Plaza, MTA moved the station entrance outside the Plaza allowing it to remain sufficiently close to provide direct access to the subway station under 1st Street at Boyle Avenue.

Measures to Minimize Harm

During construction, MTA will maintain access to Mariachi Plaza. If the need arises to close access to 1st Street and Boyle Avenue to install and remove decking, it will be done during non-peak hours. MTA will publicize that local businesses and the mariachi performers will continue during construction. If a majority of mariachis thinks that the conditions at Mariachi Plaza are not suitable for performing during construction, MTA will provide an alternative location and publicize the temporary location with signs at Mariachi Plaza. An alternative location that has been identified as a possible site for relocation is the nearby LANI Park at 1st and Chicago Streets.

After construction is completed, MTA will restore and expand Mariachi Plaza. During final design, MTA will develop a community linkages study (described in Section 4.4.4) for this station (as well as others) that will include extensive public involvement in the design for the improvements to the station area that includes Mariachi Plaza. A similar program was carried out for the 1st/Boyle Station proposed under the suspended Metro Red Line project. An architect and artist worked together and developed a design for the station that took into consideration the needs of the community and the characteristics of the surrounding environment. MTA's design guidelines for transit stations, including landscaping, public art, enhanced pedestrian environment, adequate walkway widths, and set-asides for public open space will be implemented.

4.17.2.2 Archaeological Resources

In accordance with Section 4(f), Sections 106 and 110 of the National Historic Preservation Act, Executive Order 11593 and the guidelines promulgated by the Advisory Council on Historic Preservation (ACHP), MTA has undertaken an extensive search for cultural resources that could be affected by Option A of the LRT Build Alternative. MTA has determined that four known archaeological sites and 10 areas of high archaeological sensitivity exist in the Area of Potential Effects (See Section 4.15, *Historic/Archaeological/Paleontological Resources*). Of these, one, Historic Chinatown (CA-LAN-1575H), has been determined eligible for the NRHP. All of the identified sites and areas of high archaeological sensitivity may have "use" under Section 4(f) guidelines.

Description and Significance of Affected Properties

In the vicinity of the intersection of Alameda and 1st Streets is an area where cut stone curbs, rather than poured concrete, suggest that undisturbed remains, e.g., historic track, are present below the surface. The highest likelihood of subsurface resource disturbance is in the industrial area of the Flats, from Union Station to the foot of the Boyle Heights bluffs near the Los Angeles River. At Union Station lies archaeological site CA-LAN-1575H. CA-LAN-7H, which includes Native American, historical, and Chinese components, is documented immediately west of Union Station, but could potentially extend into the APE; earthmoving activities along Alameda Street east of the 101 Freeway may encounter archaeological deposits. Nearby along the 101 Freeway may be subsurface remains, although none has been recorded to date because this area was intensively developed in the nineteenth century obscuring the surface. Along Alameda Street south of the 101 Freeway is archaeological site CA-LAN-887H, historical site La Placita. Although the site is recorded only on the west side of Alameda, other remains have since been discovered on the east side of the street. To the south of the 1st Street Viaduct and west of the Los Angeles River, within the maintenance and storage facility site, lies historical CA-LAN-2563H. The site

was the location of the Santa Fe Railroad's Le Grande Station and related features may be encountered during construction.

Breaking the surface for the tunnel at the 1st/Boyle Station could also encounter buried remains. The proposed station entrance/plaza area at the northwest corner of E. 1st and Bailey presents a potential for buried remains relating to the mixed commercial and residential use of this area during the nineteenth and early twentieth centuries. The staging area at the corner of Bailey and Pennsylvania Streets also has the potential for buried domestic remains because this was a residential neighborhood. Buried remains may lie beneath 1st/Soto since this area has historically been a major neighborhood shopping location**.**

Rail lines were a part of the historic streetscape along 1st Street as far east as Rowan Street. Streetcars ran on Indiana Street as well. Removal of the surviving rails and related elements would destroy the integrity of these historical resources.

Application of Section 4(f) Use Criteria

One of the archaeological sites, Historic Chinatown (CA-LAN-1575H), has been determined eligible for listing on the NRHP. The other three aforementioned archaeological sites appear eligible. LRT construction activities such as earthmoving eastward along 1st Street as far as the river and along Alameda Street would likely encounter unrecorded archaeological remains, as would any earthmoving along Alameda Street. Rail lines were a part of the historic streetscape along 1st Street as far east as Rowan Street. Streetcars ran on Indiana Street as well. Removal of the surviving rails and related elements would destroy the integrity of these historical resources. As commuter suburbs, Boyle Heights and East Los Angeles were among the first to be served by street railways and trolleys. There is the potential that tracks and other related light rail features may be encountered along these streets.

Alternatives that Would Avoid Use

Alternative LRT alignments that would shift construction activities from the streets where archaeological sites have been recorded or where buried remains may be found would traverse private property. Alternatives to this might include constructing the alignment on another major east-west street. However, the other major streets in the study area also previously contained rail routes of the Los Angeles Railway. The B Line was on Brooklyn Avenue (now Chavez Avenue); the F Line was on 4th St.; and the R Line was on 7th St. and also on Whittier Boulevard in the eastern portion of the study area. Therefore, historic transit features would also likely be found on any of the other streets. Features of the historic rail found during construction could be donated to a museum as has been done on previous MTA projects. If the rail alignment were to be placed outside of the street rights-of-way to avoid the historic rail routes, this would require acquisition of many private properties. Demolishing many historic properties to accommodate Option A as well as the neighborhood disruption it would cause would be an adverse impact. In addition, by avoiding the Union Station area, interface with the regional system could not occur, obviating a primary project goal.

Measures that Would Minimize Harm

In the event that archaeological and buried historic sites are encountered, evaluation of the site is often accomplished through test level excavation designed to determine the horizontal and vertical extent of the site, and to characterize the content of the site. For the suspended Metro Red Line East Side Extension FEIS/FEIR (1994), MTA adopted the *Identification Study and Treatment Plan* and a MOA authorized by the Department of the Interior (September 12, 1994) in consultation with the ACHP and SHPO. The MOA is the preferred mechanism for implementing Section 106 where alternatives under consideration consist of corridors, or where access to properties is restricted.

When identification efforts, in accordance with 36 CFR 800.4, indicate that historic properties are likely to be discovered during implementation of an undertaking, the MOA shall include a process to resolve any adverse effects upon resources discovered during the project construction (36 CFR 800.13 (a)). The MOA shall include a provision for monitoring and a mechanism for reporting its implementation (36 CFR 800.6 (c) (4)). Since it is not feasible to conduct an archaeological evaluation of the known and possible archaeological sites prior to construction, MTA will consider any sites encountered are eligible for the NRHP until an evaluation of the site can be made. MTA will manage archaeological resources encountered during construction of the Light Rail Build Alternative in accordance with the Cultural Resource Monitoring and Mitigation Plan established in concurrence with SHPO. Specific elements and measures in the Plan are indicated in the proposed final MOA presented in Appendix G.

Coordination with Other Agencies

MTA is in the Section 106 process that will lead to a MOA between MTA, FTA, and SHPO. The MOA specifies mitigation measures to resolve adverse impacts on archaeological resources. The proposed final MOA is presented in Appendix G. The final MOA will be completed before the Record of Decision (ROD) is issued for the Final SEIS/SEIR.

4.17.2.3 Historic Properties

MTA has identified 24 buildings that are listed, potentially eligible, or appear to be eligible for inclusion in the NRHP (See Section 4.15, *Historic/Archaeological/Paleontological Resources*). When a determination is made under Section 106 of the National Historic Preservation Act that an adverse effect to a historic property occurs, this would be considered a use under Section 4(f). The historic properties discussed below would be used, or with further study, may need to be used by Option A of the LRT Build Alternative. The sections that follow describe the property, the proposed use for Option A, the feasibility and prudence of alternatives that avoid Section 4(f) involvement, and the measures to mitigate project-related impacts on these historic properties.

1st and Soto Streets Altered Historic Setting

This intersection of 1st and Soto Streets, like 1st and Boyle, has historically been a major neighborhood shopping precinct. As a result of the intensive architectural/historical research, the number of potential historical resources at 1st and Soto has been reduced to one property from those identified by the Draft SEIS/SEIR. The character and integrity of the historical streetscape opposite this structure, 2415-2417 E. 1st Street, has been compromised through modern in-fill construction and alteration of the historical fabric. Therefore, there will be no adverse effect on the setting of this resource.

Alteration of the Historic 1st Street Viaduct

Description and Significance of Affected Property

The 1st Street Viaduct, which opened to traffic on January 1, 1929, is a 71 foot wide, 1300 feet long, symmetrical structure with a double arch mainspan over the Los Angeles River, and 26 lesser spans extending over rail yards and city streets to the east and west. The mainspans are reinforced concrete, open spandrel, fixed, elliptical, 125 foot, four-ribbed arches, and the approach spans are I girders. The viaduct presently carries four traffic lanes and cantilevered walkways.

The Viaduct is one of the historic bridges over the Los Angeles River built by the Bureau of Engineering of the City of Los Angeles. The structure replaced a steel truss and trestle span bridge built in 1888 that

had become inadequate for the amount of traffic being generated by the rapid growth of the downtown area. It is eligible for the National Register of Historic Places under Criterion A as an important element in the development of the Los Angeles transportation system. Because the Viaduct is designed in the Neo-Classical style, it is also eligible under Criterion C, Design/Construction, as one of a subset of Period Revival structures. The designers' choice of Neo-Classical elements reflects the desire to exhibit monumental grandeur and formal planning in architecture, particularly in municipal buildings, emphasized by the advocates of the City Beautiful Movement, a philosophy highly influential on the Los Angeles Municipal Art Commission who approved the design and plans and budgets for city projects [Lee 1995].

Application of Section 4(f) Criteria for Use

Following the January 1994 Northridge earthquake, the City of Los Angeles conducted a seismic evaluation of the 1st Street Viaduct and plans for a seismic retrofit of the structure were completed in July of that year. With the exception of minor patching and repair, work was limited to the substructure of the viaduct. The retrofit was completed in 1996. Visible modifications included construction of concrete infill shear walls within each of the 23 bents.

Because the Viaduct is an historic structure eligible for the National Register of Historic Places, the seismic retrofit conducted by the City of Los Angeles was assessed as constituting an adverse effect on the resource (Lee 1995). Mitigation measures implemented as a result of the finding of effect included completion of Historic American Engineering Record documentation for the structure. Additional measures were designed to preserve or highlight, as much as possible, the character defining features of the structure.

Since the completion of the initial seismic retrofit work, Caltrans has promulgated more substantive seismic standards for bridges in California (1999). As a result, the use of the 1st Street Viaduct for the LRT project would require supplemental seismic retrofit work to meet these new standards. The work would involve:

- Bents 1-5 and 17-21: Reinforced concrete infill shear walls will be constructed between columns. Central bent openings (one of three) have previously been infilled. Proposed work would completely infill the remaining two openings of each bent.
- Bents 6-16, 22, and 23: Reinforced concrete infill shear walls will be constructed between columns. The two central bent openings (of six) have previously been infilled. Proposed work would completely infill two additional intermediate cells of each bent, leaving only the outermost cells open.
- Arch Span Central Pier, East and West Arch Abutments: Reinforced concrete infill shear walls will be constructed between columns. The two central bent openings (of four) have previously been infilled. Proposed work would completely infill the remaining two openings of each bent.
- East and West Girder Abutments: Additional concrete cast-in-drilled-hole piles will be constructed behind the original concrete abutments. This upgrade will not be visible following repair of the road surface.

The proposed seismic retrofit of the 1st Street Viaduct, which as an historic structure is also protected under Section 4(f), will result in an adverse effect on the viaduct's integrity of design with respect to the qualities of significance under Criterion C. An essential character-defining quality of the design is the visual effect of the columns supporting the span. Construction of the concrete infill walls will close off the open spaces between the columns, leaving the columns substantially less distinct.

Alternatives that Would Avoid Use

Alternatives to the seismic retrofit work detailed above and the reasons they are not deemed prudent or feasible alternatives are indicated below:

- Use of rigid cross bracing in place of the concrete infill. This was assessed as resulting in more of a visual impact on the resource than the infill solution.
- Obtain a City of Los Angeles Bureau of Engineering exception to using the upgraded Caltrans Bridge Design Specification. Currently the bridge does not meet the Caltrans (1999) seismic criteria. This solution would result in increased liability for MTA.
- Thicken the existing infill walls (this would cause the infills to be thicker than the existing columns and cover the existing visible column reveals).
- Column strengthening. While potentially less detrimental to the historic appearance of the viaduct, this approach may not be technically feasible and would not result in the level of seismic upgrade necessary to meet the Caltrans criteria.
- Use of an alternative bridge across the Los Angeles River. Use of the Chavez Avenue Bridge (parallel and to the north of 1st Street) would require the LRT to be placed on Chavez Avenue rather than 1st Street. This alignment does not connect well with the Pasadena Blue Line, does not serve Little Tokyo and Mariachi Plaza, and would require cross-country subway to travel to 1st/Lorena. One of the objectives of the Eastside LRT project is to provide a more cost-effective alternative to the suspended project. This would not meet that objective. Use of the 4th Street Bridge (parallel and to the south of 1st Street) would require the LRT to operate on 4th Street instead of 1st Street. Fourth Street is considered a major roadway access to downtown from the eastside with a reversible middle lane across the bridge up to the freeway. It would be difficult to place fixed guideway transit on the 4th Street Bridge and maintain it as a major thoroughfare without widening or replacing this historic bridge. In addition, 4th Street would not easily provide the connection needed to the heart of Boyle Heights (1st Street).

Measures to Minimize Harm

Seismic retrofit work will incorporate the following design and construction features:

- Bents 1-5 and 17-21: Concrete infill shear walls between columns closing the remaining two cells constitutes an adverse effect. All concrete infill walls must be recessed three inches from the face of existing columns on either side, matching the reveals of the central cells created by the earlier City of Los Angeles seismic retrofit. Concrete used for the infill walls will be tinted to match the color of the existing infill walls.
- Bents 6-16, 22, and 23: Concrete infill shear walls between columns closing two additional cells constitutes an adverse effect. All concrete infill walls must be recessed three inches from the face of existing columns on either side, matching the reveals of the central cells created by the earlier City of Los Angeles seismic retrofit. Concrete used for the infill walls will be tinted to match the color of the existing infill walls.
- Arch Span Central Pier, East and West Arch Abutments: Concrete infill shear walls between columns closing two additional cells constitutes an adverse effect. All concrete infill walls must be recessed three inches from the face of existing columns on either side. Concrete used for the infill walls will be tinted to match the color of the existing infill walls.
- New work, which will of necessity become a permanent part of the bridge, should be done so that if it is removed in the future, essential form and integrity of the bridge will be unimpaired.

In addition, MTA, in consultation with SHPO and the National Park Service, will record the 1st Street Viaduct according to Historic American Engineering Record (HAER) standards. The documentation shall be performed prior to the commencement of any alteration, grading, and/or change in setting for properties determined eligible for listing in the NRHP. The documentation shall be consistent with Historic American Buildings Survey (HABS) standards, which are generally applied to specific buildings, but may also apply to streetscapes. MTA, in consultation with the City of Los Angeles and SHPO, will also create a permanent display within an Eastside Corridor station area, or other MTA facility readily accessible to the public, and set up a traveling interpretive exhibit for display at various public venues within Los Angeles County, such as public libraries, museums, or schools. The measures to minimize harm are presented in more detail in the proposed final MOA, which is included as Appendix G.

Coordination with Other Agencies

MTA is in the Section 106 process that will lead to a MOA between MTA, FTA, and SHPO (refer to Appendix G). The MOA specifies mitigation measures to resolve adverse impacts on the 1st Street Viaduct. The final MOA will be completed before the Record of Decision (ROD) is issued for the Final SEIS/SEIR.

Potential Visual Impacts

Visual resources include important views, places where visual quality is important to the use of the property, and recognized historical resources. The LRT line would pass the following major historic resources:

- Union Station
- 1st Street Viaduct
- 4th Street Viaduct
- Evergreen Cemetery
- Our Lady of Lourdes Church
- Santuario de Nuestra Señora de Guadalupe Church
- New Calvary Cemetery
- St. Sava Serbian Orthodox Church and Cemetery
- Murals

With the exception of the 1st Street Viaduct described above, none of these resources is expected to have their visual setting compromised as a result of implementing Option A of the LRT Build Alternative because of the screening, building set back, or width of the streetscape at these sites (refer to Section 4.15.3.2 for more information about the potential visual impacts on historic properties).

Potential Construction and Operation Noise and Vibration

The results of the vibration and noise study, that was conducted for the operation of Option A does not indicate any adverse effects on cultural resources that would diminish the integrity of the property's significant historic features. The noise analysis found that some historic properties that appear eligible for listing on the National Register of Historic Places would be moderately impacted as defined by FTA criteria. None would be severely impacted. With regard to CEQA significance impact criteria, a significant impact occurs only if a noise-sensitive receptor is severely impacted according to FTA criteria. For moderate noise impacts, mitigation is only recommended when deemed cost-effective and feasible. Noise mitigation for moderately impacted buildings is normally in the form of sound-absorptive trackside noise barriers. However, trackside noise barriers are not reasonable or feasible for this project since the

LRT alignment runs in the street when it is at grade. Trackside noise barriers in the street would interfere with traffic and pedestrian movements. In addition, ground-borne vibration for any type of train operation would not cause building damage, and would rarely result in even minor cosmetic damage.

The Contractor will be responsible for the protection of vibration sensitive historic buildings or cultural resource structures that are within 200 feet of any construction activity. The maximum peak particle vibration (PPV) velocity level, in any direction, at any of these structures should not exceed 0.12 inches/second for any length of time as recommended by FTA guidance for extremely fragile historic buildings. The Contractor will be required to perform periodic vibration monitoring at the closest structure to any construction activities using approved seismographs. For any fragile historic properties within 200 feet of the Eastside LRT tunnels, MTA will evaluate the vibration results from the excavated materials train as it passes under historic properties. If the vibration levels emanating from the train exceed 0.1 inches/second PPV, the contractor will take action to reduce the vibration levels to 0.1 inches/second or less as soon as possible. If vibration levels exceed 0.12 inches/second PPV, the contractor will cease excavation operations until (s)he takes action to reduce levels below 0.1 inches/second. Such action could include reducing the excavated materials train speed, additional rail and tie isolation, and more frequent rail and wheel maintenance. These measures will not apply to noise or vibrations from the tunnel boring machine, but only to operations resulting from the train hauling excavated materials under or near fragile historic properties. Which historic properties are to be deemed fragile will be determined through a pre-construction survey. Application of these measures will result in a less than significant effect under CEQA.

Settlement Impacts

Settlement impacts could occur from tunnel excavation due to loss of ground. Such impacts could be cracking of buildings or subsidence over areas of the tunnel during and after construction. These impacts would most affect standing structures directly over, or immediately adjacent to the project Corridor in the tunneled area between 1st/Gless and 1st Lorena. A variety of measures are available and will be implemented to ensure that the applicable settlement limit specifications are met. Thus, no adverse impacts are anticipated.

4.17.3 Section 4(f) Properties Affected by Option B of the LRT Build Alternative

This section describes the Section 4(f) properties that would be affected by Option B of the LRT Build Alternative. Parklands and recreational facilities, archaeological sites, and historic properties that would be affected by Option B are the same as those identified for Option A above. For the parkland, archaeological, and historic properties that would be affected by implementing Option B, refer to the description and the significance of the affected property, the application of Section 4(f) criteria for use, alternatives that would avoid use, measures to minimize harm, and coordination with the appropriate agencies described in Sections 4.17.2.1 through 4.17.2.3.

4.18 UTILITIES

4.18.1 Affected Environment

Utility lines are located underneath or immediately adjacent, parallel to and across the roadways in the study area. Utility providers include municipal agencies, special utility districts, and private companies providing electricity, water, wastewater and stormwater collection, natural gas, steam, telecommunications, and cable television services. A summary of some of the utility providers by municipality is presented in Table 4.18-1.

Electric power is provided by the Los Angeles Department of Water and Power (LADWP) within the City of Los Angeles and by Southern California Edison (SCE) for the remainder of the study area. The deregulation of the industry in the California market increased competition in the marketplace, which would benefit the utility users like MTA in the negotiation of favorable utility rates for new rail starts.

Telephone lines in urban areas are typically located within street rights-of-way, above ground on utility poles, and underground in newer areas. Other smaller utilities often share these underground trenches or duct banks. Several private companies maintain fiber optic cables and/or provide long distance/cable television and other telecommunications services in Los Angeles County.

TABLE 4.18-1
MAJOR UTILITY PROVIDERS

Municipality	Providers
City of Los Angeles	Los Angeles Department of Water and Power Pacific Bell Southern California Gas Company Los Angeles City Public Works Department, Sanitation Bureau Los Angeles City Public Works Department, Bureau of Street Lighting Los Angeles County Flood Control District
Los Angeles County	Pacific Bell Southern California Edison Southern California Gas Company California Water Service Los Angeles County Sanitation District Los Angeles County Flood Control District

4.18.2 Methodology for Impact Evaluation

Impacts on public services were evaluated for the operational and construction phase of the LRT Build Alternative (Options A and B). Operational impacts include: 1) public utility facilities to be relocated, or 2) facilities impaired as a result of the other impacts such as vibration, safety, or access. Construction impacts occur if the delivery of services provided by public utility facilities would be interrupted or substantially diminished for a prolonged period of time.

Impacts on utilities from LRT operation would result if an additional demand upon utilities were to exceed existing or planned capacity and, therefore, require substantial infrastructure improvements. Substantial interface with the existing utility infrastructure systems or a prolonged disruption of utility services resulting from construction would constitute an adverse impact.

To catalog public services and utilities along the alignment extensive field surveys will be performed as part of the preliminary and final engineering design. The data accumulated will be mapped and tabulated and potential impacts will be identified, using the criteria and considerations identified in MTA's System Design Criteria and Standards, Volumes 1 through 4.

4.18.3 Impacts

4.18.3.1 No-Build Alternative

The No-Build Alternative would maintain the current utility service in the Corridor, and therefore would not have an immediate impact on public infrastructure.

4.18.3.2 LRT Build Alternative

Option A

No significant impacts on natural gas, telephone and telecommunications, cable television, water supply, wastewater, streambeds, or solid waste collection and disposal services are expected during LRT operations. Significant service disruptions to utility customers during LRT repair and maintenance operations are not expected as a result of the sufficient capacity and strategies to provide additional service as the LRT line becomes operational.

The following measures will minimize any potential utility service interruptions and conserve resources:

- MTA and their contractors will comply with applicable utility policies and strategies as specified in the adopted operational comprehensive plans of the City of Los Angeles and the County of Los Angeles, including those provisions related to levels of service, conservation strategies, and coordination of service provisions;
- MTA will incorporate City of Los Angeles, County of Los Angeles, and California State energy code, building code, fire code, MTA's Design Criteria and Standards (Volumes I through IV), and other applicable requirements into all design aspects of the system, stations, maintenance facility, and parking areas;
- MTA and their contractors will use standard practices, including cathodic protection, to reduce the effect of stray currents from power lines that cross 1st Street near the Los Angeles River and at other locations where the potential for stray currents exists. Where necessary and possible, MTA and their contractors will install devices to reduce the impact of stray current between the traction power system and the utilities facilities, or replace particularly metallic utility infrastructure with nonmetallic materials; and
- MTA and their contractors will coordinate with affected water utilities and local fire departments to ensure that water use, especially at the maintenance facility and subway section, does not compromise flow required for fire protection.

In addition, the LRT line will be located so that access to utilities for maintenance and repair will be maintained. If necessary, manholes, pipes, vaults, and other access points may have to be relocated.

Significance of Impacts

The strategies to accommodate the LRT line and to avoid interference with normal utility operations ensure that no significant impacts will occur.

Option B

The impacts and significance of the impacts are the same as those described for Option A.

4.18.4 Mitigation

No mitigations are required under Options A or B since significant impacts to utilities are not expected as a result of LRT operation.

4.19 CONSTRUCTION IMPACTS

4.19.1 Construction Methods

The construction of the Los Angeles Eastside Corridor LRT project (Options A and B) will employ conventional construction techniques and equipment used in the Southern California region. Major project elements include construction of guideway and trackwork, at-grade station platforms, underground stations and tunnels, a new bridge across U.S. 101 to Union Station, and installation of specialty system work such as traction power, communications and signaling. All work will conform to industry specifications and standards. The equipment used in construction would include graders, dozers, cranes, concrete trucks, pumping equipment, flat bed trucks, dump trucks to haul dirt, tunnel boring machines, and rail mounted cars to transport spoil material within the tunnel. Spoil materials would be hauled away from the work sites by trucks to approved disposal sites. Traffic detours and truck routes would be required during construction. Section 4.19.2.2 discusses mitigation measures to be taken to minimize adverse traffic impacts.

The various work activities to be performed over an estimated four-to five-year construction period will include the following facility and system items:

- Construction of a bridge and elevated approach sections near Union Station (including foundations, support columns, girders, and deck slabs). This construction will be either "cast-in-place," partially precast, steel or a combination of these depending on the final design and the preferred approach of the construction contractor.
- Modifications of existing bridge structures at the 1st Street Viaduct, US 60, and the 710 Freeway
- Demolition of existing structures at underground station sites and potentially at substation locations
- Construction of retaining walls for approaches to the bridge, portal structures and shallow trenches.
- Construction of about 1.4 miles of tunnels by Tunnel Boring Machine (TBM)
- Construction of portal structures, cut and cover tunnel sections, and underground stations.
- Relocation, modification or protection in place of utilities in conflict or impacted by excavations for street level trackwork, tunnels, bridge and station construction.
- Construction of Eastside Corridor LRT high floor station platforms on street level locations using typical "cast-in-place" or pre-cast construction methods.
- Construction of underground duct banks for electrical power feeds and for signaling/communications systems.
- Construction of surface drainage systems and subdrainage.
- Construction of traction power substations with electrical power feeds.
- Construction of overhead catenary pole foundations or alternative power distribution support systems, and street lighting where required.
- Construction of a parking facility near Pomona/Atlantic to accommodate vehicles parking at the LRT's eastern terminus. Under Option A, minor improvements to an existing lot (Pep Boys) would also be made near Beverly/Atlantic.
- Installation of traffic signal and train control improvements.
- Installation of overhead catenary wires, support brackets, feeder cables, and other components or alternative power distribution systems.
- Installation of trackwork complete with preparation of track bed, track slab, rail, fasteners, and infill concrete in street level areas, and with direct fixation fasteners on the aerial guideway and 1st Street bridge.
- Construction of station finishes, such as canopies, fare vending equipment, station furniture, ramps, elevators, escalators, landscaping, art, and all other amenities necessary for a functional station.
- Conducting subsystem and system testing.

- Conducting simulated revenue operation test runs and final commissioning of the system.

More detailed information related to the LRT at-grade and subway construction activities and schedule are provided below.

4.19.1.1 Required Construction Areas and Easements

Construction of the underground stations and portal access to tunnels will require the use of existing MTA property at the 1st/Boyle, Cesar Chavez/Soto and 1st/Lorena sites, and additional properties at the 1st/Soto and 1st/Boyle sites. Temporary easements, typically a portion of the sidewalk, will be required at the portals to allow a single lane of traffic in each direction during construction. Access to residences and businesses (during business hours) will be maintained during construction. For street level LRT sections, the street area alongside the station and track areas, supplemented by adjacent off-street areas at 1st/Boyle, Cesar Chavez/Soto, and 1st/Lorena, would be used for construction staging and for equipment and material storage.

4.19.1.2 General Construction Scenario

The LRT Build Alternative would be constructed during an approximate five-year period. Surface streets would be impacted for a total of approximately 24 to 36 months; however, it is anticipated that at-grade construction will occur in one-mile segments lasting approximately four to six months each. LRT construction would begin simultaneously at several locations along the selected route to accommodate areas requiring lengthy construction times, such as the tunnels, underground stations, and aerial segments, and to bring the various segments to completion at approximately the same time.

Many contractors specializing in various methods of construction would be working on the project for the overall length of the construction period. The physical construction would involve the method that is most suitable for each segment of the project. A representative sequence of construction is shown in Table 4.19-1. Many of the project elements would be constructed in parallel for an overall duration of five years.

Construction of the project would follow all applicable local, state and federal laws for building and safety. Working hours would be varied to meet special circumstances. Standard construction methods would be used for traffic, noise, vibration and dust control, consistent with all applicable laws, and as described in the following paragraphs.

4.19.1.3 Surface Construction

Utility Relocation and Street Closures

Prior to beginning construction it would be necessary to relocate, modify or protect in place all utilities and underground structures, which would conflict with excavations for street level trackwork, subways, bridge and station structures. Shallow utilities, such as maintenance holes or pull boxes, which would interfere with guideway excavation work, will require relocation. The utilities would be modified and moved away from the proposed facilities. Temporary interruptions in services (several hours) could be experienced during re-location or re-routing of utilities. Depending on the extent of utility relocation work, estimated construction durations are four to six months for a one-mile segment of work.

An exception to the general utility relocation scenario given above would be at Indiana Street if Option A were selected. For this option, major utilities in Indiana Street would require relocation into a large underground utility box structure. Construction of the box would require a deep excavation to be

constructed similar to the cut and cover station boxes described in subsequent sections. Work will require that Indiana Street be open to only two lanes of traffic (one in each direction) and parking removed while decking is being installed and for the contractor's access to the underground section. Flaggers will be required to guide contractor's equipment in and out of the work area. Total construction duration would be approximately nine months. Complete closure of Indiana Street would be required for limited durations (several eight to 12 hour weekend periods) to move heavy equipment. Work will include removal of existing pavement, excavation and support of (install piles, lagging and bracing) the open cut excavation, installation of new utilities, place forms and concrete for the box structure, back fill the section and re-pave the street. Equipment used would include backhoes, dump trucks, cranes and pile installation equipment, concrete trucks and paving equipment. Option B would not require this work as the station would be located off-street.

TABLE 4.19-1
TYPICAL SEQUENCE OF CONSTRUCTION ACTIVITIES

Activity	Tasks	Average Time Required (months)[1]
Survey	Locate utilities, establish ROW and project control points and centerlines, and relocate survey monuments.	4 – 6
Site Preparation	Relocate utilities and clear and grub ROW (demolition), widen streets, establish detours and haul routes, erect safety devices and mobilize special construction equipment, prepare construction equipment yards and stockpile materials.	12 – 18
Heavy Construction	Construction of tunnels, aerial structures (includes bridge to Union Station), street guideways including trackbed, subway stations and portals, trenches, piles, piers and columns and disposal of excess material. Refinish roadways and sidewalks.	24 – 36
Medium Construction	Lay track, construct surface stations, drainage, backfill and pave streets.	12 – 24
Light Construction	Finish work, install all system elements (electrical, signals, and communication), street lighting where applicable, landscaping, signing and striping, close detours, clean-up and test system.	6 – 12
Pre-revenue Service	Testing of communications, signaling, and ventilation systems, training of operators and maintenance personnel	3 – 6
Open Project		

Notes:

[1] Some of these activities will be conducted in parallel.

Street Widening

Along portions of the alignment, such as along Alameda Street and portions of 1st Street, street work will be required to widen the existing roadway widths to maintain the required number of through lanes and turning lanes. All work would be initially done at the curb line to construct new curb and gutter, sidewalks and outside traffic lanes. An estimated construction duration is five months to a year depending on the extent of widening and utility relocation for a one-mile segment. During this stage of work, property owners and businesses located immediately adjacent to the work areas would also be affected. Mitigation measures for adverse impacts are discussed in Sections 4.19.2.2 and 4.19.2.9.

Surface Trackwork

For most of the alignment, the LRT tracks will be centered in the street right-of-way. The reader is referred to Chapter 2.0 for illustrations of representative LRT right-of-way cross-sections. Mountable curbs will be constructed to discourage vehicular traffic from driving on the tracks. At-grade sections are to be located primarily along Alameda, 1st, Indiana, 3rd, and Beverly (Option A) or Pomona (Option B). After any required utility relocation, rough grading would be completed within the streets, followed by trackbed excavation, and track slab placement for support of the rails. Duct banks would be installed during this time to carry communication and signaling conduits.

Trackwork construction involves work to demolish the roadway section being displaced by the LRT trackway, preparation of the track bed, construction of the supporting track slab, and laying of rails. Foundations for overhead wires poles may be installed with the track installation. At this point in construction, center lanes will be closed, which will effectively eliminate all mid block turns and street parking. One-mile segments are likely to be recommended to achieve economies of scale and minimize the schedule. Segments could be under construction both east and west of the underground section. Rail will be welded into strings at several locations along the alignments, using diesel-powered, trailer-mounted machines. The machinery will clean, straighten, prepare, weld, and grind short sections of rail into approximately one-quarter mile strings. Rails would be brought to the sites by truck, and local rail storage areas will be necessary for short-term storage and to facilitate placement of rails. Work durations are estimated to be four months to complete trackwork in each mile segment. Periodic lane closures, predominately on one side or the other of the work zone, would be required for delivery of materials and during concrete pours. Construction of station platform slabs would likely be included in line segment contracts and would be coordinated with trackwork installation within each mile segment.

Minor cross streets and alleyways may also be temporarily closed but access to adjacent properties will be maintained. Major cross streets would require partial closure, half of the street at a time, while relocating utilities if required for surface stations and constructing the light rail trackbed. Depending on allowable working hours, full blocks may require closures during excavation, preparation of subgrade, and track foundations placement. Closures would be in a staggered sequence to facilitate traffic control. Where streets are not fully closed, two-way traffic would be allowed on half of the street. After the trackbed is constructed across a local street and the roadway is restored to its permanent condition, vehicles can resume original traffic patterns. Equipment used for construction of the surface tracks (and surface stations) would be similar to what is required for relocation of the utilities with the addition of track-laying equipment, paving machines, concrete mixers, and concrete finishers.

Trench, Retaining Wall and Fill Construction

Some trenching and filling would be constructed under and between the I-710 and SR-60 freeways to minimize the rail grade. Relatively small retaining walls (estimated to be less than five feet) will be necessary to retain these sections. The excess material would be excavated using bulldozers, earthmovers, front-end loaders, and tractor-trailer rigs. Excess material would be transported to approved disposal sites.

At-Grade Stations

All stations could be constructed simultaneously with the various segments of the system. However, the contractor may elect to construct them sequentially. At-grade stations on the LRT would be constructed approximately one mile apart from each other. Construction duration for each station will be approximately 14 months. These stations would be constructed from standard building materials, such as

brick, concrete, steel, aluminum, and heavy plastic, which are durable and resistant to vandalism. The stations would be similar to the existing Long Beach Blue Line stations and proposed Pasadena Blue Line stations. The reader is referred to Chapter 2.0 for illustrations of typical station cross-sections.

Operating Systems Installation

The operating systems include traction power, an overhead catenary system, communications, and train control. Catenary systems consist of poles connected to drilled shaft foundations with overhead wires to supply power to the trains. Traction power includes six substations to provide Direct Current power for the trains. These include grounding systems and pre-fabricated units which are placed on foundation slabs by crane and connected to the system. Where existing structures must be demolished to accommodate the substation, demolition work will be completed prior to construction of the substation. Construction equipment will include highrail vehicles for installation of the wires from the guideway area. While wires are strung at cross streets, temporary street closures of a few hours during nighttime are anticipated.

Systems installation contracts are generally bid as system wide contracts and follow the completion of line segment construction. Finishing contracts for stations and landscaping would be planned to overlap with systems work and be completed prior to final testing and pre-revenue operations. The systems installation work is considered to be significantly less disruptive to communities as compared to the line segment construction work, and is estimated to be about five months for a one-mile segment

Parking Facilities

Parking facilities would be provided near the eastern terminus station providing a total of about 200 spaces. Construction of the parking lot would involve subgrade preparation of the parking area, paving, and striping. Concrete curbs, lighting, driveways, and sidewalks would be re-constructed as necessary, as well as planting the appropriate landscaping. Equipment used for construction of the parking facility would include diamond saws, pavement breakers, jackhammers, compressors, concrete pumping equipment, paving machines, dump trucks, front-end loaders, etc.

Bridge Construction

Aerial structures (bridge and elevated approach section) required for the LRT project would be constructed as the initial portion of the project from Union Station to beyond the US-101 freeway. Lower elevation portions of the bridge approach structures could be constructed on retained fills. The overall length of the elevated portion is expected to be about 1,000 feet. A 1,000-foot bridge could require as much as 18 months to complete. Typical construction methods for the bridge would involve several phases of work: foundation construction, installation of columns, and setting in place of concrete or steel girders or steel trusses.

Construction of the column foundations could begin at the same time that the utilities are relocated, providing the utilities do not directly impact the foundation locations. Once the foundations are in place, the columns would be constructed. It may be possible to conduct most of the column construction and girder placement during late night hours to minimize disruptions on the freeway and local streets. Traffic will not be allowed to pass under the structure during form and concrete placement, and temporary lane closures would be necessary during these periods.

Construction of the bridge approach structure south of the US 101 will include an aerial structure from the bridge which transitions to at-grade just before Alameda Street. Approximately one-half of Commercial Street will need to be closed during construction of this approach structure for access to the work. The

US 101 off ramp to Alameda will also be closed. Closure of the ramps will be coordinated with Caltrans who will be re-aligning the section of the 101 freeway in this area and re-locating the ramps to the east. Traffic along Commercial can be accommodated by providing one lane of traffic in each direction or by providing a temporary couplet of traffic movement along Ducommun and Commercial Streets.

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

Existing Bridge Retrofitting

1st Street Viaduct

The City of Los Angeles' 1st Street Viaduct over the LA River is now carrying five lanes of HS20 (semi-trailer) rubber tired vehicular loading. Upon completion of the MTA's Eastside LRT system, the viaduct will be required to carry two lanes of HS20 vehicular loading and two LRT system trackways. The total live load for these differing conditions is approximately the same. Rubber grade crossing panels will be installed creating embedded trackways that allow emergency traffic to travel in the LRT guideway width.

The bridge was retrofitted by the City of Los Angeles using 1996 Caltrans criteria for increased seismic strength. Since 1996, Caltrans' seismic criteria have increased somewhat. Analysis is currently underway, but the probability of avoiding major additional seismic retrofit currently appears favorable. However, modifications to the bridge abutments/bents appear likely. These would include similar elements to those provided during the 1996 retrofit: additional foundation elements (piles under existing abutments) and infill at bents. Note that the LRT project does not add significantly to the bridge loadings, and seismic retrofitting would otherwise be required by the City of Los Angeles Bureau of Engineering to bring it up to the current Caltrans criteria. The project assumes the catenary poles are to be placed in the center of the bridge.

3rd Street Underpass of the 60 Freeway and Freeway Ramps

Because of the LRT's overhead catenary system and MTA's criteria inclusion of the American Railway Engineering and Maintenance of Way Association (AREMA) code requiring barriers to protect existing bridge piers, Caltrans' 3rd Street 60 Freeway Ramp and Bridge Underpasses require Caltrans review and approval prior to construction. In addition, Caltrans 60 Freeway On- and Off-Ramps connect directly with 3rd Street, and therefore a traffic control management plan for construction of the LRT guideway on 3rd Street will be required and will require Caltrans approval prior to awarding a construction contract. A traffic signal is currently planned at the point where these ramps intersect 3rd Street.

3rd Street Overcrossing of the 710 Freeway

The 3rd Street Overcrossing of the 710 Freeway requires substantial structural strengthening or alteration in order to support the LRT vehicles. Caltrans' will require a combined Project Report/Project Study Report (PR/PSR) for this bridge overcrossing. The current approach is to reduce the dead load of the bridge to compensate for the increased live load, thereby allowing the foundations to remain unchanged for both live load and seismic forces. Nevertheless, some seismic retrofit is anticipated to be required for this bridge.

Because of the LRT's overhead catenary system, both the Caltrans' 3rd Street 710 Freeway South West Overhead Connector Ramp, and the 3rd Street 710 Freeway N.W. Overhead Connector Ramp must be included in the above report.

One of Caltrans On-Ramps to the 710 Freeway leads directly off of 3rd Street and two of Caltrans' I-710 Freeway On-Ramps connect with South Ford Boulevard, which is only 200 feet from its intersection with 3rd Street. A traffic control management plan for construction of the LRT guideway on 3rd Street (and station at 3rd/Ford in Option B) will require Caltrans approval prior to awarding a construction contract.

4.19.1.4 Underground Construction

Pre-construction activities would include building assessments (pre-construction evaluation of existing structures along the alignment) and preparation of worksite traffic control plans. During preliminary and final design of the project, subsurface (geotechnical) investigations would be undertaken to evaluate soil, groundwater, seismic, and environmental conditions along the alignment. The geologic conditions will influence design and construction methods specified for stations and tunnels as well as foundations. The studies are discussed in more detail in Section 4.19.2.13.

The stations as well as the portals would be constructed by cut-and-cover and open cut methods. The depths of the stations would be as required to allow for utilities, access to the station's center station platform, structure thickness, and for cover over the tunnels extending from the stations. Conceptual design depths range from about 50 to 60 feet. Station widths are about 60 feet to include the trackways and the center platforms. Portals are designed for accommodation of the twin tracks, station widths, traffic flow around the portals, and existing topography.

Prior to underground construction, work sites will require clearing and building demolition in some areas. Demolition equipment typically includes bulldozers and loaders. Prior to demolition, contractors may salvage items such as fixtures, mechanical equipment, and lumber, unless the contract states otherwise. Where economical, materials such as concrete and steel may be recycled.

Construction of the project would follow all applicable local, state and federal laws for building and safety. MTA Fire Life Safety Committee would approve all construction methods. The Fire Life Safety Committee is composed of members from the Los Angeles City and County Fire Departments, as well as MTA safety specialists. For several months before passenger service begins, pre-revenue operations will be conducted to familiarize train operators with the new alignment and emergency operating procedures.

Underground Utilities

Subject to other constraints, the underground stations have been located to avoid to the extent possible conflicts with the space occupied by utilities. 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. 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 re-routed temporarily to prevent accidental damage to the utilities, to construction personnel and to the adjoining community. Buried utilities are often protected in place and supported by hanging from deck beams at cut and cover sections.

Station Excavation - Initial Support

If the building assessments indicate the necessity to protect nearby structures, the first step in construction of an underground station is to support the foundations of buildings adjacent to the station excavation. This is done by underpinning (additional foundations placed under the building), or by other means such as soil grouting. In lieu of underpinning or grouting, or in combination with grouting, the support of

adjacent structures is commonly accomplished by use of excavation support systems, which in conjunction with proper excavation and bracing procedures, serve as building protection.

The excavation's initial support systems could include reinforced concrete drilled-in-place piles, braced soldier piles and lagging, tangent pile walls, diaphragm walls, and tied-back excavations. Initial support allows support of the ground while soil is removed from the excavation and for the temporary duration of tunneling and other work in the shaft. Final support includes the concrete slabs, walls, and walkways for the stations and portals. Some lateral movement of the excavation walls will occur during removal of soil. The amount of movement will depend on the contractor's excavation methods, wall design, and the height of the wall. Project specifications will call for monitoring of walls and adjacent ground for lateral movements and surface settlement. Acceptable movements, such that adjacent buildings will be protected, will be determined during final design. Specifications will call for the contractor to take appropriate action if limiting movements are approached.

Prior to installation of the ground support system, dewatering is likely to be required at the underground station sites to temporarily lower the groundwater level below the station excavation depth or to an impermeable soil layer. This facilitates installation of the piles, improves soil stability, and allows excavation in dry conditions. Groundwater is pumped from wells installed around the perimeter of the excavation. If contaminated water is encountered, it is treated at the site or hauled to a treatment facility. At the completion of the stations, pumping is discontinued and groundwater levels return to their natural level.

To install the soldier piles and 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 4.19-1. The pre-drilling of holes is necessary to eliminate pile driving and reduce project noise levels that would otherwise occur with pile driving. The contractor would occupy one side of the street to install one line of soldier piles while the other side would remain open for traffic circulation. The equipment required for installation of the soldier piles includes drill rigs, concrete trucks, cranes, and dump trucks.

After installation of soldier piles on both sides of the street for the underground stations, the contractor would proceed with installation of deck beams, installation of the deck and excavation and bracing as shown in Figure 4.19-2. Pre-cast concrete panels (decking) allows continued traffic and pedestrian circulation since they will be installed flush with the existing street or sidewalk levels. However, deck installation would require lane and night street closures at the stations. The concrete decking would be installed in progressive stages. Portal construction would follow similar construction methods as for the station excavations and retaining walls. The portal would remain permanently open, and thus no decking will be used during construction.

Excavation, Bracing, and Hauling of Soil

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. Spoils from the station site will be moved sideways out from under the deck onto an off street work site and loaded from there into hauling trucks. Spoils will not be loaded in the street, except during the initial drilling of soldier piles and deck installation.

Figure 4.19-1
Installation of Soldier Piles

Figure 4.19-2
Excavation and Bracing

The majority of the soil will be removed through the 1st and Boyle Street location. The soil excavated from the 1st/Boyle Station area and the 1.4-mile tunnel will most likely be removed via the nearby US 101 freeway. The soil excavated from the 1st/Soto and 1st/Lorena Stations will have to be removed using surface streets, then freeways. Haul routes to disposal sites would be predetermined by agreement with local authorities before construction. They would follow streets and highways forming the safest or shortest route with the least adverse effect on traffic, residences and businesses.

Table 4.19-2 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 that material. It has been assumed that each truck would haul 20 cubic yards of material. Excavation at the station area and portal areas is estimated to take six to eight months per 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 and LADOT must approve haul routes

TABLE 4.19-2
ESTIMATED AMOUNTS OF EXCAVATED MATERIALS FOR STATION AND CUT AND COVER CONSTRUCTION

Station	Estimated Cubic Yards[1]	Estimated Maximum Number of Daily Truck Trips[2]	Estimated Number of Total Truck Loads[3]
1st /Boyle[3]	141,000	45	7,100
1st /Soto	60,000	20	3,000
East Portal	17,000	20	850

Notes:
[1]This column includes an estimated 1.3 expansion factor for the soil due to excavation and handling.
[2]It has been assumed that each truck could haul up to 20 cubic yards.
[3]Includes adjacent cut and cover station and west portal.

Construction of Station and Portal Final Structures

The construction sequence for the final station structure would include installation of the station floor, also known as the base slab, followed by the installation of exterior walls and any interior column elements. Slabs are poured as the columns and intermediate floor and roof wall pours progress. Portal structures will use similar construction methods involving placement of concrete inverts, walls, and walkways. 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.

Street Restoration/Site Restoration

After the subway station structure has been completed and the roof slab allowed to cure for a specified period, the backfilling operation can begin. 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. After backfilling, the permanent street would be installed and the sidewalks and pavement restored to City standards.

Tunnel Construction

The 1st Street tunnels would be constructed from the portal west of the US 101 Freeway and ending at the 1st/Lorena Street cut-and-cover section, a tunneling distance of about 1.4 miles for each tunnel, which excludes the 1st/Soto Station and cut and cover section lengths. Tunnel boring machine(s) (TBM) would

be lowered into the shaft by a crane and would mine from the shaft along the alignment from the 1st/Boyle Street excavation to 1st/Lorena (Figure 4.19-3). It is anticipated that the 1st/Soto Station would be excavated prior to the arrival of the TBMs, allowing the machines to be transported through the excavation and resume mining east of the extended excavation. An alternative second sequencing option could be to drive the tunnels the entire distance from 1st/Boyle to 1st/Lorena, and follow with the station excavation.

Tunnel driving operations consist of a series of activities. The TBM is advanced a small distance (typically 4 to 6 feet) by means of hydraulic jacks, which react against the previously installed tunnel lining ring. Tunnel lining rings are typically pre-cast concrete segments bolted together in place. Elastomeric gaskets are placed at segment joints to prevent groundwater inflows during and after construction. The machine is advanced and the process is repeated until the entire length of tunnel has been excavated. The pre-cast concrete liners are fabricated off-site and delivered by truck to the site. Segment loads are estimated to be 400 to 500 total truck loads. Several days' production of segments may be stored at the worksites to allow continuous tunneling.

Excavated material (muck) is taken to the rear of the TBM and deposited on a conveyor belt. The conveyor belt drops the excavated materials into mine cars, which are then taken back to the shaft by a locomotive operating on temporary rail tracks laid or fastened to the bottom of the tunnel. At the shaft, the mine cars are lifted out by a crane or hoist and the material is put into trucks for off-site disposal or temporarily stockpiled for later disposal. Alternatively, belt conveyor systems could be used to transport excavated material through the tunnel and/or from the shaft to the surface. Table 4.19-3 presents the estimated amount of excavated materials and number of daily truck trips required for the tunnel construction.

TABLE 4.19-3
ESTIMATED AMOUNTS OF EXCAVATED MATERIALS
FROM TUNNEL CONSTRUCTION

Tunnel Section	Estimated Total Cubic Yards[1]	Estimated Maximum Number of Daily Truck Trips[2]
1st /Boyle to 1st/Soto	105,000	40-80
1st/Soto to East Portal	150,000	40-80

Notes:
[1]This column includes an estimated 1.3 expansion factor for the soil due to handling.
[2]It has been assumed that each truck could haul up to 20 cubic yards, range of number of daily trips doubles depending if one or two tunnels are mined simultaneously.

The pressure face tunnel boring machines to be used on the project may require that soil is "conditioned" in the pressure chamber of the machine. These conditioners (which include surfactants, polymers, bentonite, and the like) help provide a more fluid material which aids in adjusting the earth or fluid pressure on the tunnel face. In addition, the lubrication reduces wear of the equipment. When the conditioned excavated soil reaches the ground surface, it is still wet, and transport to dump sites could require that dump trucks be lined to prevent water leaking onto the roadway.

FIGURE 4.19-3
EARTH PRESSURE BALANCE TUNNEL BORING MACHINE

If a slurry face tunneling machine is selected by the contractor for the project, excavated material would be treated at the site in a slurry separation system. This tunneling system requires that enough bentonite (clay) slurry is added to the face to provide hydrostatic pressure to stabilize the tunnel face. Depending on the ground encountered, conditioners may also be added to the bentonite slurry. Excavated material mixes with the fluid and is pumped out through the tunnel. The soil is then separated from the slurry fluid at a separation plant constructed at the work site. After separation, the soil can be transported in trucks to a disposal site. These trucks may also require lining.

Ground Surface Settlement Resulting from Tunneling

Geologic conditions for most of the alignment are sands, clays and gravels, which in tunneling terms are described as "soft ground," as opposed to solid rock, known as "hard ground." During tunneling, some ground loss will occur, producing surface settlement. The amount of settlement measured at the surface will be a function of the tunnel depth, size, tunneling techniques, and geology.

To reduce surface settlement and the potential for ground loss and soil instability (sloughing, caving) at the tunnel face, pressure-face TBMs and pre-cast, bolted, gasketed lining systems would be employed. In combination with the face pressure, grout is installed immediately behind the TBM between the installed precast concrete liners (tunnel rings) and the ground. The pressure-face TBM can tunnel below the groundwater table without requiring dewatering or lowering of the groundwater table. Where conditions warrant, for example, shallow tunnels directly below sensitive structures or utilities, additional methods to reduce settlement would be specified and are discussed in Section 4.19.2.13.

Mined (non-TBM) Excavated Tunnels

Because of the long TBM set-up times, the relatively short tunnel section west of the 1st /Boyle Station extending to the cut and cover and portal section could be constructed by non-TBM mining methods such as the sequential excavation and support method. Cut and cover techniques are also an option, but would be more disruptive to surface traffic. Sequential excavation and support methods call for the ground to be excavated in small areas and supported with shotcrete and steel supports. After the crown (roof) area is excavated and supported, the larger area of the tunnel is completed. Whereas TBMs can only excavate a fixed (circular) shape, the sequential method permits a tunnel of horseshoe or rounded shape. This construction technique is useful in areas where the tunnel shape or size needs to change, such as where the single bore tunnel from the portal separates into two tunnels to allow the center platform station.

Ventilation Shafts and Emergency Exits

The subway or tunnel segment of the LRT Build Alternative includes a number of ventilation and emergency exit areas for the subway segment in the vicinity of the subway stations. The locations for emergency exits and exhausts on MTA property and public rights-of-way (sidewalks or street) are shown in Appendix E. In Appendix E, Drawing No. A-3001 shows the locations for the area around the 1st/Boyle subway station; Drawing No. A-4001 shows the locations around the 1st/Soto subway station; Drawing No. A-5001 shows the emergency exhaust location for the 1st/Lorena at-grade station area; and Drawing No. A-5002 shows the locations around the 1st/Lorena subway station for the extended subway option.

The stations will house emergency ventilation fan shafts as well as separate emergency exit shafts at both ends of the stations. Ventilation fans are used for extracting smoke from the tunnels and stairs for evacuation in the event of an emergency – such as a fire in the underground areas. The exact location of these facilities would be determined during the final design. These shafts are constructed as extensions of the station excavation, using cut and cover construction methods.

The two-level vent structure is generally a 45-foot-wide, approximately 70-foot-deep concrete box at two ends of the station, 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, as well as the emergency exit stairs, would be housed in this horizontal concrete box. The area of the shaft will be dependent on the height of the box. Where shafts vent at ground level the area is typically about 400 sq. ft. reducing to about half this area where towers are provided. Minimum tower height would be about ten feet. In some cases vent structures are incorporated with other structures and the height may be adjusted to match or compliment the structure. Since these fans are operated only for emergencies and for maintenance, noise is not considered a significant impact.

It is assumed that each subway station at each end will have two exit hatches connected to emergency stairs. Each exit hatch is about 6 feet wide. Currently most of these hatches and gratings are shown at the station entrance plazas or right-of-way to be acquired for the construction staging areas. During the preliminary engineering design phase, further coordination with the City of Los Angeles will be required to determine if some or all of these hatches and gratings could be located within the public right-of-way. This may require variances from City codes.

4.19.2 Construction Period Impacts and Mitigation

This section discusses the potential impacts during construction and includes mitigation measures that would minimize adverse effects that cannot be avoided. The evaluation focuses on the LRT Build Alternative and its Options A and B. There would be no construction-related activities associated with the No-Build Alternative because this alternative only includes improvements to the transportation network that have already been approved and funded. No capital improvements are included under this alternative and would therefore not result in any construction-related impacts within the Los Angeles Eastside Corridor study area. However, it should be noted that the No-Build Alternative would not provide short-term benefits, such as construction and residual employment, associated with the LRT Build Alternative. Note that Options A and B of the LRT Build Alternative are similar with regard to most category of impacts during construction. Therefore, the analysis focuses on impacts and mitigation for the LRT Build Alternative. For those areas where the two options vary, the differences are stated.

4.19.2.1 Transit

Impacts

During construction of the LRT system, it may be necessary for traffic lanes to be temporarily closed. Night closures of several blocks on certain streets may also be required. Pre-construction activities that include the relocation of utilities and the construction of the trackway and stations would require the temporary closure of lanes on Commercial Street, Alameda Street, 1st Street, Indiana Street, 3rd Street, and Beverly Boulevard (Option A) or Pomona Boulevard (Option B). When traffic lanes are closed during the day, transit bus service would be maintained where feasible. Travel times may be increased due to the potential for increased traffic congestion due to construction activities and lane closures. During night closures of entire street blocks, transit bus service may be affected, and buses would be re-routed. Bus stops may also need to be temporarily relocated due to construction in some areas.

Significance of Impacts

Although these impacts may be temporary, they would be significant under CEQA.

Mitigation

MTA is working closely with the City, the County, and the affected transit operators in developing mitigation plans. Bus lines that will be affected by lane closures due to construction activities will continue to operate where feasible in the remaining traffic lanes. Bus stops that will be affected by sidewalk construction will be temporarily relocated, and construction activities will be phased to consider the maintenance of bus service and minimize disruption. During periods at night when entire blocks may be closed to traffic, bus lines will be re-routed to adjacent streets in a manner that minimizes the inconvenience to bus passengers. If a block is closed that includes a bus stop, the bus stop will be temporarily relocated to the portion of the street segment that is still open to bus service. Before any significant re-routing changes are made to East Los Angeles buses as a result of the construction of the Eastside Corridor project, fliers will be provided on buses at least two weeks in advance notifying riders of route modifications. In addition, hoods will be placed over the bus-stop signs, also notifying riders of what modifications have been made to the bus route.

Note also that the MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community. While keeping the community informed of all construction activities, especially for those that affect the public, the program also includes a hotline number for a direct connection to MTA Public Affairs staff familiar with the community and the project. The same Public

Affairs staff will provide individual consultation for residents, facilities, and businesses for remedies appropriate to the impacts. The Public Affairs staff will identify community/business needs prior to and during the construction period through the use of surveys and community meetings. In addition, field offices will be available at particular locations and will contain information regarding recent construction activities.

Significance of Impacts Remaining After Mitigation

After the implementation of the aforementioned mitigation measures, there would continue to be potentially significant impacts during construction due to the possibility of increased transit travel times.

4.19.2.2 Traffic

Impacts

Construction of the LRT would temporarily interfere with the normal traffic flow, causing some lanes and streets to be closed to vehicles for various durations. At least one street, Pleasant Avenue between Boyle Avenue and 1st Street, would be closed for the duration of station and tunnel construction (estimated 3 to 4 years). It is possible that in some instances, block-long sections of streets would be closed temporarily for utility relocation, guideway and station construction, and laying rail. Additional information on street restrictions, access issues, and impacts of bridge/overpass/underpass construction can be found in Section 4.19.1.3 in the discussions of utility relocation and street closures, street widening, surface trackwork, bridge construction, and existing bridge retrofitting.

For street level LRT sections, the street area within and alongside the station areas, supplemented by adjacent off-street areas, will be used for construction staging and for equipment and material storage. In general, some areas under the LRT elevated section near Union Station may be used as a construction staging area and equipment and materials storage area. The minimum construction area or "footprint" required will be the width of the structure plus a temporary 20-foot construction easement on at least one side of the guideway. Haul and delivery truck routes will affect residents and commuters along the alignment. Tunnel spoil hauling, rail and catenary deliveries, and general construction traffic will affect traffic patterns as well. In addition to affecting traffic patterns, there may be slight physical damage to the roads from hauling trucks.

Significance of Impacts

The impacts during construction would be considered significant under CEQA.

Mitigation

Site and street specific Worksite Traffic Control Plans that meet LADOT and County DPW requirements will be developed during final design in cooperation with those agencies and the City of Monterey Park to accommodate required pedestrian and traffic movements. In the event that freeway access ramps are affected by construction, Traffic Control Plans will be developed in coordination with Caltrans as well. Because Caltrans' Route 60 Freeway on- and off-ramps connect directly with 3rd Street, a traffic control management plan for construction of the LRT guideway on 3rd Street will require Caltrans approval prior to awarding a construction contract. To the extent practical, traffic lanes will be maintained in both directions, particularly during peak traffic hours. Signage and flaggers will be incorporated where needed to ensure accessibility. Access to homes and businesses will be maintained throughout the construction period.

In some cases, specific construction techniques will be utilized that minimize the construction envelopes such as the use of segmental construction, which minimizes the need for extensive falsework on the ground. At least one traffic lane in each direction in addition to pedestrian access will be maintained during construction. A quick response tow truck service, funded by MTA, will target Indiana Street, 1st Street Bridge, and where warranted, to minimize any impacts during construction or operation.

Designated haul routes for trucks and hours of operation will be established by LADOT, County DPW, and Caltrans and identified during final design. These routes will be situated to minimize noise, vibration, and other possible impacts. Oversize and overweight vehicles will obtain Transportation Permits from Caltrans if their routes require the use of any State Highways. Following completion of the Eastside LRT, if slight physical damage to the haul route roads is found, the road will be repaved as necessary. The MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community as described in Section 4.19.2.1.

Significance of Impacts Remaining After Mitigation

After the implementation of the aforementioned mitigation measures, there would continue to be potentially significant traffic impacts, although they would be temporary.

4.19.2.3 Parking

Impacts

It may be necessary to prohibit curb parking when traffic lanes are closed due to construction activities. During sidewalk construction along 1st Street, parking will be prohibited. Along other streets that are wider, such as 3rd Street and Beverly Boulevard (Option A) or Pomona Boulevard (Option B), it may not be necessary to temporarily prohibit parking. Indiana Street will have temporary parking prohibitions during construction between 1st and 3rd Streets. Contractors will be required to have all employees park off-street at MTA approved locations to minimize the loss of crucial commercial parking.

The width of the streets along the LRT alignment largely determine whether curb parking spaces will be removed and during which time period during the day. Indiana Street will have parking removals during all periods of the day under Option A. There will be no parking impacts on Commercial Street, Alameda Street, 3rd Street, Beverly Boulevard, or Pomona Boulevard in both options. Option A has the greatest number of spaces removed, which is due to the removal of parking on Indiana Street during all three time periods.

Significance of Impacts

The impacts during construction would be considered significant under CEQA.

Mitigation

A parking mitigation plan will be developed to the standards of, and reviewed by, LADOT and County DPW prior to construction to minimize impacts on curb parking. It may be possible to sequence construction activities so that multiple blocks of on-street parking are not temporarily removed at one time. This will make various on-street parking spaces available in an area under construction for a period of time. Some of the parking mitigation measures outlined in Chapter 3 will be developed early so that they may be utilized during the period of construction. For example, the MTA-owned parcel near 1st and Lorena Streets will be utilized for replacement parking during construction. The park-and-ride facility proposed for development at the eastern project terminus will be developed in time to provide for

replacement parking for on-street spaces that may be removed during construction. The contractor will be required to lease parking lots for construction employees if necessary, in order to minimize the loss of crucial commercial parking. In addition, the MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community as described in Section 4.19.2.1.

Significance of Impacts Remaining After Mitigation

After the implementation of the aforementioned mitigation measures, there would continue to be potentially significant parking impacts, although they would be temporary.

4.19.2.4 Other Modes

Impacts

Pedestrian access to adjoining properties will be maintained during construction, although in some instances, at subway station locations, portions of the sidewalks may be closed temporarily for decking construction. Temporary night sidewalk closures may be necessary in some locations. Some existing crosswalks may be temporarily closed. Lane and street closures may inhibit the flow of bicycle traffic during construction.

Significance of Impacts

Although temporary, the impacts during construction on pedestrian and bicycle movement would be considered significant under CEQA.

Mitigation

Special facilities, such as handrails, fences, and walkways will be provided for the safety of pedestrians in areas where construction activities will impact sidewalk areas. All underground stations will have covered wood sidewalks, or MTA approved equal, on both sides of the street. Covered sidewalks will be of new material and will meet the appropriate strength requirement. If crosswalks are temporarily closed, pedestrians will be directed to use one that is in close proximity to the one being temporarily closed. Several adjacent crosswalks will not be closed at the same time to allow for pedestrian movement across the streets. Bicyclists will be encouraged through signage in the area to ride with caution in the streets, ride with caution on sidewalks, or choose other routes during construction activities. Site and street specific Worksite Traffic Control Plans that meet LADOT and County DPW requirements will be developed during final design in cooperation with those agencies and the City of Monterey Park to accommodate required pedestrian and bicycle movements. In addition, the MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community as described in Section 4.19.2.1.

Significance of Impacts Remaining After Mitigation

After implementation of the aforementioned mitigation measures, there would continue to be potentially significant impacts on pedestrian circulation and bicycle movement, although they would be temporary.

4.19.2.5 Land Use and Development

Impacts

Compatibility with Local Plans and Policies

Short-term impacts associated with construction would include community disruptions from noise, dust, and traffic congestion caused by construction equipment and activities. Access to local facilities, services, and residences could be obstructed during the short-term. Although these impacts would not be permanent, they would not generally support goals and policies for improving the study area. Similarly, congestion around construction staging areas could interfere with plans and policies intended to attract new businesses and residents to the area. These impacts would conclude when construction of the LRT Build Alternative is complete. While there would be short-term impacts, the long-term benefits would further goals and policies within the study area.

Compatibility with Redevelopment Areas/Specialized Zones

Construction activities also would not generally be compatible with objectives for redevelopment zones and specialized zones, especially where work efforts are concentrated such as around construction staging areas. Community disruptions during construction may delay potential revitalization efforts until activities are near completion. When completed, the LRT project would likely support, and perhaps reinforce, goals for redevelopment as indicated in the discussion of operational impacts in Section 4.1.

Impacts of Stations and Ancillary Facilities

Station construction for the LRT Build Alternative may result in concentrations of activity in these areas and would potentially result in similar disruptive impacts as identified above.

Significance of Impacts

Construction has the potential to divide the community for limited durations. This would result from some street closures and traffic detours, especially in areas of tunnel construction. Land uses around the construction staging areas would also be temporarily impacted because of potential traffic, noise, air quality, and visual effects. Overall, however, these are anticipated to be less than significant impacts because they would end at the completion of project construction. Although the LRT construction would not generally be compatible with local plans, policies, or redevelopment objectives or could delay potential revitalization efforts until construction activities are near completion, these land use impacts would be less than significant due to their temporary duration.

Mitigation

The LRT Build Alternative will be built in stages thereby diminishing the overall impact of construction activity on land use. MTA will coordinate with local businesses and residents to provide advanced notification of traffic detours and delays, and potential utility disruptions associated with construction. Measures to reduce noise and dust are identified in Sections 4.19.2.6, *Air Quality* and 4.19.2.7, *Noise and Vibration*. Measures to reduce visual and aesthetics and traffic impacts are discussed in Sections 4.19.2.8 and 4.19.2.1, respectively. In addition, the MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community as described in Section 4.19.2.1. Mitigation measures would reduce short-term land use impacts to less than significant.

Significance of Impacts Remaining After Mitigation

After the implementation of the aforementioned mitigation measures, temporary land use impacts would be reduced to an insignificant level.

4.19.2.6 Air Quality

Impacts

The project would generate pollutant emissions from the following construction activities: 1) the demolition of existing structures, 2) excavation related to cut-and-cover and tunneling operations, 3) welding related to continuously welded rail (CWR) operations, 4) mobile emissions related to construction worker travel to and from project sites, 5) mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites, and 6) stationary emissions related to fuel consumption by on-site construction equipment.

Table 4.19-4 presents the estimated worst-case daily emissions associated with each construction phase. As indicated in the table, NO_X and PM_{10} emissions are anticipated to exceed SCAQMD significance thresholds during most of the construction period. Short-term dust nuisance impacts would also occur as a result of construction activity.

TABLE 4.19-4
DAILY CONSTRUCTION EMISSIONS[1]

Construction Phase	Duration [2]	CO	ROG	NO_X	SO_X	PM_{10}
SCAQMD Threshold		**550**	**75**	**100**	**150**	**150**
Demolition	1	17	4	38	3	26
Cut-and-Cover (Underground Excavation)	14	37	8	67	4	186
Tunnel Boring (Dual Operation)	12	100	23	172	10	109
Finish Stations and Tunnels	15	54	11	99	8	54
Continuously Welded Rail Operations	26	42	14	100	11	12
At-Grade Platforms and Rail Installation	26	74	16	141	10	461
Simultaneous Excavation and Tunnel Boring	6	137	31	239	14	295
Simultaneous Excavation, Tunnel Boring & Demolition	1	154	35	277	17	321
Simultaneous CWR and Rail Installation	26	116	29	241	21	473
Potential Threshold Violation?		**No**	**No**	**Yes**	**No**	**Yes**

[1] Expressed in pounds per day
[2] Expressed in months.

Source: Terry A. Hayes Associates.

Although the total construction period will last about four to five years, air quality impacts would still be localized and short-term. This is because construction equipment, and, therefore, air quality impacts, would move throughout the six-mile project alignment area. Thus, impacts on individual receptor locations within the area that may be affected by the proposed project would be short-term. Furthermore, because of the nature of construction activity and the phased construction schedule, some days will experience a higher level of construction activity (which in turn generates a higher level of emissions), while others will not.

Significance of Impacts

Air quality impacts during construction are potentially significant.

Mitigation

PM_{10} is a significant source of air pollution during construction. The 1997 Air Quality Management Plan (AQMP), which is part of the State Implementation Plan (SIP), includes PM_{10} control measures for construction activities. Control measures that are applicable to the construction phase of the proposed project have been included in the mitigation measures, below. These mitigation measures will be taken to minimize construction-related air quality impacts. Additionally, the construction contract will require specific stipulations that the contractor must follow to meet criteria included in MTA's Systems Design Criteria and Standards, Volumes I through IV, to minimize adverse affects during construction.

- **Diesel Equipment Usage.** The LACMTA will require contractors as part of their contract to minimize use of on-site diesel construction equipment, particularly unnecessary idling.
- **Electric Powered Equipment.** The LACMTA will require contractors to replace diesel-powered machinery with electrically powered machinery, where feasible.
- **Equipment Emissions.** Construction equipment will be shut off to reduce idling when not in direct use. Diesel engines, motors, or equipment will be located as far away as possible from existing residential areas. Low sulfur fuel will be used for construction equipment.
- **Location of Staging Areas.** If required, haul truck staging areas will be approved by the Los Angeles Department of Transportation. When feasible, haul trucks will be staged in non-residential areas away from school buildings and playgrounds.
- **Fugitive Dust Control.** Maintain a fugitive dust control program consistent with the provisions of SCAQMD Rules 403 and 1186 for any grading or earthwork activity that may be required.
- **Site Watering.** Site wetting shall occur often enough to maintain a twelve percent (12%) surface soil moisture content throughout any site grading or excavation activity. All unpaved parking or staging areas shall be watered at least four times daily, and all on-site stockpiles of debris, dirt, or dusty material shall be covered or watered in accordance with SCAQMD Rule 403.
- **Truck Covering.** Require all trucks hauling dirt, sand, soil, or other loose substances and building materials to be covered.
- **Street Sweeping.** Utilize efficient street sweeping equipment at site access points and all adjacent streets used by haul trucks or vehicles that have been on site in compliance with SCAQMD Rule 403.
- **Phasing.** To the extent feasible, phase construction activities to minimize concurrent dust generating activities within a twenty-five hundred foot (2,500) radius of shaft site locations.
- **Wheel Washing Equipment.** MTA will require the contractor to install wheel/undercarriage-washing equipment or a functional equivalent at tunnel excavations as the first method by which to ensure that haul trucks have clean wheels and undercarriages before entering public roadways. The installation of wheel washers alone will not relieve the contractor of their responsibility to eliminate (remove) all track-out from public roadways. Should use of the wheel/undercarriage washing equipment not be effective, the contractor will be responsible for providing alternative solutions in addition to, or instead of, the use of this equipment to ensure elimination (removal) of all track-out from public roadways. This could/may require the contractor to have a street-sweeper in use any time muck is being removed from the construction site and as often as is required throughout each workday to ensure that public roadways are kept clear of all track-out.
- **Suspend Operations.** Suspend grading operations during first and second stage smog alerts, and during high winds, i.e., greater than 25 miles per hour.
- **Sidewalk and Window Cleaning.** MTA will implement a sidewalk and window cleaning program, if needed, to reduce construction-related dust impacts to local businesses and residences.
- **MTA Section 01566 Pollution Controls Mandates.** All contractors as part of their contract must meet MTA Section 01566 pollution controls mandates, which requires that all equipment engines be properly tuned at all times.

- **Coordinate Construction Activities.** MTA will coordinate construction activities with school, daycare, and convalescent centers within the area that may be affected by the proposed project to minimize air quality impacts to these sensitive receptor locations. In addition, the MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community as described in Section 4.19.2.1.
- **Signage Requirement.** Signs will be posted throughout the proposed alignment area that will include anticipated dates of construction activity, and the telephone number of a construction information desk that can log complaints, or offer additional information regarding the construction process.
- **VMT Reduction Strategy.** With regard to project construction, MTA will require (through the construction contract administration process) that all contractors implement car/van pool programs throughout the construction process to minimize worker travel related VMT.
- **Dust Suppression.** Dust suppression shall be applied in sufficient quantity and frequency to maintain a stabilized surface at all disturbed surface areas.
- **Chemical Stabilization.** Chemical stabilizers shall be applied to all unpaved areas during the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for more than four consecutive days. Water with a mixture of chemical stabilizer diluted to no less than 1/20 of the concentration shall be applied to unpaved surface areas such that a stabilized surface can be maintained for a period of six months.
- **Vehicular Speed.** Vehicle speed shall be limited to 15 miles per hour on unpaved roads.

Implementations of the above-mentioned mitigation measures are anticipated to result in a significant reduction in airborne particulate (PM_{10}) emissions; however, reductions in CO, ROG, NO_X, and SO_X emissions would be negligible. The estimated PM_{10} emissions reduction for each major construction phase is presented in Table 4.19-5.

TABLE 4.19-5
CONSTRUCTION PHASE DAILY PM_{10} EMISSIONS[1]

Construction Phase	Without Mitigation	With Mitigation	Net Reduction
Demolition	26	22	-4
Cut-and-Cover (Underground Excavation)	186	32	-154
Tunnel Boring (Dual Operation)	109	109	0
Finish Stations and Tunnels	54	54	0
Continuously Welded Rail (CWR) Operations	12	12	0
At-Grade Platforms and Rail Installation	461	197	-264
Simultaneous Excavation and Tunnel Boring	295	141	-154
Simultaneous Excavation, Tunnel Boring & Demolition	321	163	-158
Simultaneous CWR and Rail Installation	473	209	-264

[1]Expressed in pounds per day
Source: Terry A. Hayes Associates, see Appendix A

As indicated above, even with application of best available control measures, PM_{10} emissions are anticipated to exceed the SCAQMD significance threshold of 150 ppd during periods of at-grade platforms and rail installation, simultaneous excavation, tunnel boring and demolition, and simultaneous continuously welded rail and rail installation activity. Similarly, NO_X emissions are anticipated to exceed the SCAQMD significance threshold of 100 ppd during periods of tunnel boring, at-grade platform/rail installation. These short-term air quality impacts would be significant and unavoidable. Dust nuisance impacts are also anticipated to remain after application of best available control measures, although to a lesser extent.

Air Quality at Local Schools

A 1994 letter agreement between MTA and the Los Angeles Unified School District (LAUSD) on the suspended Metro Red Line project indicated that MTA would go beyond preparation of the usual analysis presented in an EIS/EIR level of study required by NEPA and CEQA and conduct additional air quality analysis for schools within 700 feet of the alignment. Although the LRT project is modified from the suspended project, MTA has conducted the additional analysis for the four schools within that distance: Utah Street, Ramona High, Our Lady of Lourdes Elementary, and Griffith Middle.

Since PM_{10} concentrations are a function of PM_{10} emissions, the emissions reduction shown in Table 4.19-5 with mitigation would lead to lower PM_{10} concentrations throughout the area that may be affected by the proposed project. Concentration estimates at the four schools nearest the alignment after application of best available control measures are presented in Table 4.19-6.

TABLE 4.19-6
MITIGATED PM_{10} CONCENTRATION ESTIMATES NEAR THE SCHOOLS

Distance from Construction Activity	Concentration (micrograms per cubic meter)		
	1st High	4th High	Average
50 feet	178.3	145.3	77.2
100 feet	108.7	83.6	50.8
200 feet	66.6	54.8	42.0
300 feet	54.2	47.7	40.5
400 feet	48.6	44.5	39.9
500 feet	45.7	42.8	39.7
California Ambient Air Quality Standard (24-hour average)	50.0		
Ambient Concentration [1]	39.2		

[1] Included in all concentrations.
Note: All concentrations are 24-hour average concentrations.
Source: Terry A. Hayes Associates.

As shown above, PM_{10} concentrations could potentially exceed the state standard of 50 micrograms per cubic meter (µg/m3) at receptor locations within a distance of approximately 350 feet from the LRT alignment right-of-way, which would include all four of the abovementioned school site locations. This would result in a short-term impact that is significant and unavoidable. It is anticipated that the at-grade portion of the LRT alignment will be constructed in one-mile segments, and that each segment will be under construction for six to eight months. Therefore, impacts on schools within the 350-foot boundary could potentially occur over a six to eight month period. To address this issue, MTA will provide a liaison to the schools to discuss specific air quality concerns as they may arise. As previously prescribed in the mitigation measures, the MTA will coordinate construction activities to minimize the effect of air quality impacts at school site locations to the greatest extent feasible.

Significance of Impacts Remaining After Mitigation

Although mitigation would be provided to the greatest extent feasible, short-term PM_{10} and NO_x emissions and dust nuisance impacts generated by construction activities would remain significant after mitigation.

4.19.2.7 Noise and Vibration

Impacts

Construction Noise and Vibration Criteria

The criteria for assessing noise and vibration impacts for construction are based on the City of Los Angeles, Draft L.A. CEQA Thresholds Guide and the MTA Baseline Specifications Section 01565, Construction Noise and Vibration Control. The noise and vibration limits specified by Section 01565 are based on eliminating or minimizing noise and vibration generated by construction activities. The criteria can be found in the separate *Noise and Vibration Technical Report* that was prepared for the Los Angeles Eastside Corridor.

Vibration, as it is related to risk of building damage, is generally assessed in terms of peak particle velocity (PPV). PPV is the appropriate metric for evaluating the potential of building damage and is often used in monitoring blasting and construction vibration since it relates to the stresses that are experienced by buildings. PPV is typically a factor of 1.7 to 6 times greater than root mean square (rms) vibration velocity. As discussed in Section 4.8, rms vibration velocity is used to assess potential human annoyance from vibration. A factor of four has been used to relate the building damage criteria used to approximate rms vibration velocity levels, which are used by FTA to define the vibration generated by LRT operations. The criteria levels, presented in Table 4.19-7 would be used to judge the potential risk of damage to historic buildings or cultural resource structures during construction of the project. The criteria are based on research to date on structural building, architectural building, and historic buildings and cultural resource structures damage. These levels are significantly greater than the FTA vibration criteria of 72 to 75 VdB for LRT operations and are also greater than the maximum vibration levels projected from the LRT operations at any structure along the alignment.

TABLE 4.19-7
DAMAGE RISK VIBRATION CRITERIA

	Peak Particle Velocity (in./sec)	**RMS Velocity – VdB (re: 1 micro inch/sec)**
Structural Building Damage	2.0	120
Architectural Building Damage	0.5	108
Damage Risk to Historic Buildings and Cultural Resource Structures	0.12 to 0.20	95 to 100
Note: Peak particle velocity (PPV) is assumed to be four times greater than root mean square (rms) vibration velocity.		

Construction Noise Levels

Noise impacts from construction will differ for the at-grade and the underground section of the project. At-grade construction noise will be generated by heavy equipment (such as bulldozers, backhoes, haul trucks, scrapers, loaders, cranes, and paving machines) used during major construction periods as close as 25 feet to existing structures along the alignment. Most of the underground tunnel activities will not be audible at street level. Support equipment for the excavation and tunneling would be located at street level and could include ventilation fans, compressors, electric generator sets, and a concrete batch plant. Construction of a tunnel vent shaft would include equipment at street level such as a crane, excavator, loader, and haul trucks. Construction activities at each of the tunnel portals could potentially affect nearby noise sensitive receivers. Tunnel excavation material will be removed and stock-piled at one of the portals. Haul trucks, used to remove the excavated material, would be a potential source of noise along city streets. LADOT and Los Angeles County are responsible for selecting the haul routes;

however, MTA will work with the agencies to develop a plan to avoid impacting residential areas, schools, and playgrounds as much as possible. In addition, heavy equipment and other construction-related vehicles moving to and from the construction staging areas may be another potential source of noise along city streets and in the vicinity of the staging areas.

Construction Vibration Levels

Common vibration producing equipment used during at-grade construction activities include, pile drivers, jackhammers, pavement breakers, hoe rams, augur drills, bulldozers and backhoes. There is not expected to be pile driving during construction of this project. Pavement breaking and soil compaction will probably be the activities that produce the highest level of vibration. The other potential vibration source would be the demolition of existing buildings or structures that will be required under the LRT Build Alternative and its two options.

Equipment used for underground construction, such as a tunnel boring machine and mine trains would generate vibration levels that could result in audible ground-borne noise levels in residential buildings at the surface. The operation of the mine trains would be the major source of underground construction vibration since it will operate continuously during the excavation, mining, and finishing of the tunnel. Since underground construction is expected to occur continuously over a 24-hour day, there is the potential for these operations, particularly the mine trains, to be audible during the nighttime sleep hours when background noise levels inside the residential buildings are very low.

The most recent transit tunneling project in Los Angeles, the Metro Red Line Project, used a driven-shield TBM for the mining work. A ground vibration study of the mining operations was conducted to estimate construction vibration both from actual excavation of the tunnel and from the trains used to haul mine spoils out of the tunnel. Similar effects from the mining operations for the LRT Build Alternative would be expected. The primary conclusions of the study are:

- Vibration from the tunnel excavation will rarely be a significant problem in adjacent communities, although the vibration can be sufficient to cause several hours of intrusive low level ground-borne vibration at residential buildings above the tunnel.
- Although well below any damage thresholds, vibration from mine trains has the potential of causing intrusive ground-borne noise inside buildings above the tunnel.

Significance of Impacts

The noise and vibration impacts during construction would be significant.

Mitigation

Noise and vibration impacts from construction of the LRT project will require mitigation to meet the Los Angeles CEQA Noise Thresholds and the MTA specified limits. The final determination of construction noise and vibration impacts will depend on the equipment and activities used by the contractor to construct this project. Since this information on means and methods of construction is not available now, noise mitigation is presented as typical noise control measures which have been used on other similar construction projects.

The Draft CEQA Thresholds Guide and MTA construction specifications define several possible mitigation measures for construction noise. They include the following:

- Use noise control devices, such as equipment mufflers, enclosures, and barriers. Natural and artificial barriers such as ground elevation changes and existing buildings can shield construction noise. Stage construction operations as far from noise sensitive uses as possible;
- Avoid residential areas when planning haul truck routes;
- Maintain all sound-reducing devices and restrictions throughout the construction period;
- Replace noisy equipment with quieter equipment (for example, a vibratory pile driver instead of a conventional pile driver and rubber-tired equipment rather than track equipment); and
- Change the timing and/or sequence of the noisiest construction operations to avoid sensitive times of the day.

MTA Baseline Specifications Section 01565, *Construction Noise and Vibration Control* requires that the contractor shall, among other provisions:

- Hire or retain the services of an Acoustical Engineer to be responsible for preparing and overseeing the implementation of the Noise Control and Monitoring Plans;
- Prepare a Noise Control Plan that includes an inventory of construction equipment used during daytime and nighttime hours, estimate of projected construction noise levels, and locations and types of noise abatement measures that may be required to meet the specified noise limits;
- In the case of nighttime construction, the contractor will comply with the provisions of the nighttime noise variance issued by the Los Angeles Police Department;
- Conduct periodic noise measurement in accordance with an approved Noise Monitoring Plan, specifying monitoring locations, equipment, procedures, and schedule of measurements and reporting methods to be used;
- During nighttime hours, use equipment at the surface of the construction site that, operating under full load, is certified to meet the specified lower noise level limits than standard equipment; and
- Erect MTA designed noise barrier walls at each construction site prior to the start of any construction activities.

As a minimum, for those portions of the alignment where the tunnel is built under residences and businesses, MTA will require the contractor to install an elastomeric isolator between the floor of the tunnel and the rails and ties on which the train carrying excavated materials operates. The isolation system must ensure that the ground borne noise and vibration from trains carrying excavated material does not exceed project criteria.

The contractor will be responsible for the protection of vibration-sensitive historic buildings or cultural resource structures that are within 200 feet of any construction activity. These structures have been identified in Section 4.15. In order to ensure proper protection, the contractor will be required to perform periodic vibration monitoring at the closest structure to any construction activities using approved seismographs. Specifically, for any fragile historic properties located within that 200-foot range, the contractor will evaluate the vibration levels resulting from the excavated-materials train, as it passes under historic properties. If the vibration levels emanating from the train exceed 0.1 inches/second maximum peak particle vibration (PPV) velocity level, the contractor will take action to reduce the vibration levels to 0.1 inches/second or less, as soon as possible. If vibration levels exceed 0.12 inches/second PPV, the contractor will cease excavation operations until (s)he takes action to reduce vibration levels below 0.1 inches/second. Such action could include reducing the speed of trains carrying excavated material, additional rail and tie isolation, and more frequent rail and wheel maintenance. Which historic properties are to be deemed fragile will be determined through a pre-construction survey. This measure will not apply to the tunnel boring machine, but only to operations resulting from the train hauling excavated materials under or near fragile historic properties.

The MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community. While keeping the community informed of all construction activities, especially for those that affect the public, the program also includes a hotline number for a direct connection to MTA staff familiar with the community and the project. The same Public Affairs staff will provide individual consultation for residents, facilities, and businesses for remedies appropriate to the impacts. These remedies may include strategic placement of sound- or vibration-absorbing materials. Section 4.19.2.1 provides additional information about the program.

The Los Angeles Unified School District (LAUSD) has expressed concern about potential noise and vibration impacts on schools in the vicinity of the construction. Although the project scope has changed, the MTA will adhere to the Letter Agreement dated June 21, 1994 and amended July 21, 1997. Specifically in regards to noise impacts, "if noise from construction activities creates disruption at schools, MTA will take action to resolve the issue through reducing or blocking noise from reaching the school, or shift construction activity to less sensitive time periods." During construction the Contractor will be required to implement mandatory mitigation measures to reduce potential noise and vibration impacts on nearby schools including: Utah Elementary, First Street, Our Lady of Lourdes, Ramona High, and Griffith Middle Schools. These measures will be based on maintaining acceptable interior noise levels within the school classrooms and occupied spaces. MTA will develop these criteria in coordination with LAUSD and individual school administrators. MTA will require the Contractor to prepare noise and vibration control plans to meet these criteria and will also require the Contractor to adhere to a plan to monitor the construction noise and vibration levels to ensure compliance.

Significance of Impacts Remaining After Mitigation

Although mitigation would be implemented to minimize the impacts, it is possible that the noise and/or vibration levels during construction at some locations still may not be reduced to the applicable criteria. Therefore, impacts remaining could be potentially significant.

4.19.2.8 Visual and Aesthetics

Impacts

Construction Staging Areas

Construction staging areas are located in areas that are primarily commercial. Mariachi Plaza is directly across the street from the 1st/Boyle Station, however, and it is possible that visual and other impacts (noise, traffic disruption, etc.) would lead to this plaza being temporarily unusable for its primary use as a bandstand for mariachi performances. This would be a significant impact, though not necessarily related to the visual impacts alone. Across from the 1st/Lorena construction staging area is Evergreen Cemetery. Residences are located diagonally across the intersection. There would be visual impacts from the construction staging, although they would not prevent use of either of these areas. Another staging area will be located on existing MTA property on the south side of Chavez Avenue between Soto and Fickett Streets. In this location there are a mixture of land uses, including commercial, residence hotels, and single-family and multi-family residences. Views into the proposed construction staging area would be possible from residential land uses on some of the adjacent parcels, either directly through fencing, through entrance gates, or over fencing from second-story windows. If not screened from view, construction staging activities could affect the use of the adjacent residential uses, at least temporarily, resulting in a significant visual impact. Lighting of the construction staging area at night could also result in significant visual impacts during the construction period for adjacent residential land uses.

Demolition

Short-term visual impacts due to demolition of the service station at Alameda and Commercial Streets in this commercial/industrial/institutional area would be less than significant. Demolition of the single remaining structure on the south side of 1st Street, between the northbound US 101 off-ramp and Boyle Avenue, would not result in significant short-term visual impacts. The structure is already bordered by vacant land and the site is not near any sensitive viewers.

Mariachi Plaza is directly across the street from where the existing grocery store would be demolished to make way for the 1st/Boyle Station. It is possible that visual and other impacts (noise, traffic disruption, etc.) would lead to this plaza being unusable for its primary use as a bandstand for mariachi performances during demolition. This would be a significant temporary impact, though not necessarily related to the visual impacts alone. Demolition at the 1st/Soto Station entrance would result in less-than-significant short-term visual impacts on the adjacent uses. Several structures would be removed, some within view of sensitive viewers (residents), but the visual impacts from this demolition would not prevent the use of adjacent properties. Demolition of the one commercial, one residence/commercial, and one residential structure on the east side of Indiana Street (Option A only) would not result in significant visual impacts.

Demolition of the vacant commercial building at 3rd Street and Sunol Drive, the auto sales facility at 3rd Street and Arizona Avenue, the auto repair facility at Beverly/Atlantic (Option A only), and multiple commercial buildings and the former Kaiser Clinic at Beverly and Pomona Boulevards would result in minimal visual impacts.

In addition, minor demolition would occur throughout the Corridor, including removal of street trees, bus shelters, pavement demolition, reconstruction of Union Station, etc. None of these would result in significant visual impacts in the short term.

Option B would involve the same demolition impacts with the exception that all of the buildings, including Ramona High School on the east side of Indiana Street between 1st and 3rd Streets would be demolished (note that the high school may be rebuilt on the site as a multi-story structure or rebuilt elsewhere). Visual impacts during demolition would be significant because of the scale of the activities and, in the case of the high school, because of the significance of the structure being removed.

Excavation

Visual impacts at the 1st/Gless excavation site may combine with other impacts (such as noise) to prevent use of at least a portion of the adjacent Pecan Park. Because children are present at this location, the construction site would also be considered an attractive nuisance, with potential safety impacts related to the visibility of the site. These would be significant visual impacts. At the 1st/Boyle excavation site, the impacts related to construction, including visual, may prevent use of Mariachi Plaza, in a similar manner as discussed for the nearby construction staging area. This would also be a significant impact. At all other locations, visual impacts would be less than significant because they would not affect use of adjacent properties.

Significance of Impacts

The LRT project would result in significant construction-related visual impacts at Pecan Park and Mariachi Plaza because it would temporarily prevent full use of these properties. Impacts at the Chavez/Soto construction staging area would be significant where viewable from adjacent residential land uses, especially those with second-story windows. On Indiana Street (Option B only), the scale and

significance of the demolition activities would result in significant visual impacts during the construction period.

Mitigation

Pecan Park

Short-term impacts on Pecan Playground would include deterioration of views and attractive nuisance impacts. To prevent both of these, solid, tamper-proof screening materials that are of good quality and will integrate with the environment will be installed along the perimeter of the park. This screening will be made as attractive as possible and could offer the opportunity for decoration by the children (playground side only, for safety purposes). (Note: The outside surfaces would also provide an opportunity for decoration, mural art, etc., unrelated to the visual impact discussed here.) Screening would allow full use of the park and would thus reduce temporary visual impacts to less than significant.

Mariachi Plaza

To mitigate the short-term visual impacts at Mariachi Plaza related to the demolition of the adjacent grocery store, construction of the 1st/Boyle Station, and the use of the nearby construction staging area, the demolition and construction staging area will be screened and construction accelerated as much as possible. In addition, if required, a suitable and nearby alternative site for mariachi performances will be provided (refer to Section 4.17, *Section 4(f) Evaluation*).

Construction Staging Area at Chavez/Soto

Lighting for nighttime operations will be the minimum necessary for security and safety. Hooded lamps will be used to direct the light downward and to prevent "spillover" into adjacent residential areas. The construction entrances will be regularly cleaned to prevent an unkempt and dirty appearance. Views into the construction site will be screened from view. Where the construction staging is adjacent to multi-story residential land uses with windows overlooking the construction site, screening materials that are of good quality and will integrate with the environment will need to be high enough to prevent these views. If this is not feasible due to the height of the residential structures and construction storage or staging must be placed directly below residential windows, resulting in the impairment of use of these residences, a significant short-term visual impact would remain.

Indiana Street (Option B only)

Visual impacts related to the scale and significance of the demolition on the east side of Indiana Street under Option B will be reduced to less than significant through a public education campaign and through screening of demolition. Information materials will be present and in plain view on the site showing how the site will look after construction is complete. This information may be on boards or at an information kiosk, and will show plans and elevations of the completed site. Screening of demolition, especially screening of views of the demolition of the high school from adjacent areas, will be used. The demolition site will be kept as clean as possible. Landscaping of the site after demolition will take place as soon as possible.

Significance of Impacts Remaining After Mitigation

With the incorporation of the aforementioned mitigation measures, short-term visual impacts, with the possible exception of the impacts of the Chavez/Soto construction staging area, would be reduced to less than significant. If screening materials cannot be provided to screen views from the taller multi-story

residential buildings with windows overlooking the construction site or if construction storage or staging must be in place directly below residential windows resulting in impairment of use of these residences, a significant short-term visual impact would remain.

4.19.2.9 Economic Activity

Impacts

Construction Employment

Table 4.19-8 presents the conceptual construction cost estimates and short-term jobs created for the LRT Build Alternative (Options A and B). Given that short-term employment is directly related to the construction cost of the alternative, the higher the construction cost, the higher the potential employment opportunities would be. Although it is likely that the majority of construction labor would come from Southern California and within Los Angeles County, recruiting short-term construction workers from within the Corridor is a priority for MTA. The number of short-term employment opportunities throughout construction would be dependent on phasing. The data in Table 4.19-7 is for a project constructed at one time. Employment generated by construction of the LRT Build Alternative would be a beneficial impact. In light of other development projects planned for the Corridor, this alternative would produce a cumulative benefit that would help offset employee displacements resulting from business acquisitions related to this project.

TABLE 4.19-8
ESTIMATED SHORT-TERM EMPLOYMENT–LRT BUILD ALTERNATIVE

Conceptual Construction Costs (1999 $millions)[1]	Estimated Direct Employment Generated[2]	Estimated Indirect Employment Generated[2]	Estimated Total Employment Generated[2]
$586.5	19,824	27,038	**46,862**

Sources:
[1] Conceptual construction costs do not include right-of-way costs (PBQD, 2000).
[2] For each $100 million investment - 3,380 direct and 4,610 indirect jobs would be generated for new rail starts (APTA, 1983).

Fire/Police Services Employment

Although construction of the project would require temporary closures and/or road blocking, and thus require fire and police units to possibly travel alternate routes for emergency response, no additional staff would be required for such temporary impacts. Furthermore, local fire and police staff and services would be affected minimally by the direct and indirect employment created by construction of the LRT Build Alternative. Standard coordination between MTA and City/County fire and police departments for construction times and locations will allow these services to anticipate changes in emergency response routes, and thus prevent the need for any new personnel and, thus, additional spending on these services. As no facilities would be affected, and only a minimal amount of fire and police employees would need to be hired in the study area, no significant impacts on fire/police services and costs are anticipated.

Fiscal Impacts

Construction of the LRT Build Alternative would not result in reduction of property tax revenue relative to the construction of the project. Business impacts could include reduced visibility of commercial signs and businesses. These construction impacts could in turn produce economic impacts to the commercial

establishments. Businesses most likely to be affected would include those that depend on on-street parking or street access, which would be limited during construction. Access, however, will be provided by MTA during construction at all times in some form or proximal location to all businesses. Businesses that are sensitive to noise/vibration/dust may also be affected by construction activities. These are potentially significant temporary impacts. Sales tax revenues may actually increase within the local communities and the county due to higher employment activity and spending. This beneficial impact is anticipated to reduce potentially significant impacts to less than significant. In addition, no reduction of business license fees is expected. Employees and contractors requiring parking during construction would use only MTA-owned parcels for parking, thus not interfering with parking for customers of businesses.

Significance of Impacts

Impacts due to the additional jobs created during construction would be beneficial. There will be no impact on fire/police staffing. Fiscal impacts would be less than significant.

Mitigation

MTA will be formulating a local employment policy for both construction-related and long-term job opportunities for the Corridor that will be reviewed by the Eastside Corridor Review Advisory Committee. Such a program will include resources for job development and training. MTA's Public Affairs Officers will be administering a construction impact program (as described in Section 4.19.2.1) for the benefit of the community. MTA will coordinate with local businesses and residents to provide advanced notification of traffic detours and delays, and potential utility disruptions associated with construction. A pre-construction survey will be performed which will include the following measures: Public affairs and construction staff will contact and interview individual businesses, allowing for knowledge and understanding of how these businesses carry out their work. This survey will identify business usage, delivery, and shipping patterns and critical times of the day or year for business activities. This survey will aid MTA in developing Worksite Traffic Control plans and identifying alternative access routes to maintain access to all businesses and ensure that critical business activities are not disrupted.

Additional measures to notify the community of temporary fiscal impacts during construction will include:

- Use MTA's Public Affairs Department to identify community/businesses needs prior to and during the construction period;
- Provide the community and businesses with the name and telephone numbers of public affairs staff who will know important information pertaining to construction;
- Participate in local events in an effort to promote public awareness of the project;
- 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;
- Provide presentations on the project;
- Respond to phone inquiries;
- Coordinate business outreach programs;
- Schedule promotional displays; and
- Participate in community committees.

In addition, MTA will provide support to those businesses most affected by the construction impacts by implementing promotions for their businesses. MTA will develop bilingual (English/Spanish and other

languages as needed) advertisements for local print and radio for affected businesses. Appropriate signage will be developed and displayed by MTA to direct both pedestrian and vehicular traffic to businesses via alternate routes. Access to businesses will be provided by MTA during construction at all times in some form or proximal location to all businesses.

MTA is currently conducting station area meetings that provide local residents, businesses, and organizations the opportunity to provide input into planning for specific station areas. The goal is to address specific station area concerns, such as impacts and mitigation measures during construction, as well as economic development opportunities, transit connections, and station plans. Employees and contractors associated with construction of the LRT Build Alternative will be required to park only in MTA-owned parcels. This measure will be monitored by MTA's construction affairs program.

One or more Metro Field Offices will be staffed by MTA to address community issues and concerns that arise during construction. More information about the office(s) can be found in Section 4.19.2.10, *Neighborhoods.* Mitigation measures for pedestrian safety and access during construction are presented in Section 4.19.2.4, *Other Modes* and 4.19.2.19, *Safety and Security.* Specific measures to reduce temporary impacts from noise and dust are identified in Sections 4.19.2.6, *Air Quality* and 4.19.2.7, *Noise and Vibration.*

Significance of Impacts Remaining After Mitigation

After the implementation of the aforementioned mitigation measures, temporary economic and fiscal impacts would be reduced to an insignificant level.

4.19.2.10 Neighborhoods

Impacts

Light rail construction activities may also generate temporary visual, air quality, and circulation impacts. For example, motorists and pedestrians may on occasion be inconvenienced by traffic delays during the construction period. In addition, temporary removal of on-street parking and rerouting of buses, as well as traffic lane and sidewalk closures, may be necessary for movement of construction equipment. Operation of construction equipment and the use of mining cars to haul excavated material from the tunnel may cause noise and vibration perceptible to adjacent residences and businesses. Operation of the tunnel boring machine is generally short-term in nature, lasting only a few days for the areas affected. Fugitive dust may result from operation of construction machines, excavation, and building demolition. These impacts are potentially significant. The impacts of Option B are as described previously with the following exceptions. Station area changes from 1st/Lorena, 3rd/Rowan, and Beverly/Atlantic under Option A to 3rd/Indiana, 3rd/Ford, and Pomona/Atlantic under Option B would result in changes to locations (not severity of impacts) where construction activity would occur in the vicinity of stations. If Ramona High School is relocated, there will be no construction impacts on the school. If the school is reconstructed on the existing site, then construction of the LRT tracks and station at 3rd/Indiana would have impacts on the students and faculty similar to those described for Option A, except that the construction activity would occur on school property that will be purchased for the LRT project instead of on the Indiana Street right-of-way.

Significance of Impacts

Certain construction-related neighborhood impacts, although temporary, are significant under CEQA.

Mitigation

Mitigation measures to reduce these impacts are presented in Sections 4.19.2.2, *Traffic*, 4.19.2.4 *Other Modes*, 4.19.2.6, *Air Quality*, 4.19.2.7 *Noise and Vibration*, and 4.19.2.8 *Visual and Aesthetics*. In addition, MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community as described in Section 4.19.2.1. Staff will be available to address community issues and concerns that arise. The program will serve multiple purposes that include:

- Provide the community and businesses with one or more field offices where information pertaining to construction can be exchanged;
- Enable MTA to better understand community/business needs during the construction period;
- Allow MTA 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 inquiries;
- Coordinate business outreach programs;
- Schedule promotional displays; and
- Participate in community committees.

The Metro field information offices will be open various days of the work week for the duration of the construction period. A schedule will be developed prior to construction. In addition, site-specific mitigation programs will be developed, as needed, to handle unanticipated impacts that may occur in the stations or construction staging areas that have not been addressed elsewhere in this document. MTA will provide the resources necessary to employ a public affairs staff to develop such programs for residences and businesses that may be adversely impacted by the construction.

Significance of Impacts Remaining After Mitigation

After the implementation of mitigation measures, temporary neighborhood impacts (with the exception of air quality, noise, transit, traffic, parking, and pedestrian and bicycle movements) would be reduced to an insignificant level. Impacts on the excepted categories would still be potentially significant after mitigation is applied. Refer to the specific sections of the Final SEIS/SEIR for more information on each impact category.

4.19.2.11 Community Facilities/Parklands

Impacts

Parklands

Parklands bordering the proposed alignment and construction staging areas, such as Pecan Park and Belvedere Park, may undergo temporary noise, vibration, visual, air quality, and circulation impacts due to construction activities. In addition, cumulative construction impacts may result at Pecan Park because of construction of an outdoor pool and gymnasium, which, if operational at the time of light rail construction, could have dust impacts that affect use of the pool. The use of Mariachi Plaza would be temporarily disrupted by excavation and finishing work on the eastern end of the plaza for the 1st/Boyle subway station. The gazebo and adjacent area on the western portion of this facility would remain intact

throughout construction. In addition, the street bordering the plaza on the north, Pleasant Avenue between Boyle Avenue and 1st Street, would be closed to traffic. Curb parking may be temporarily restricted during construction on 1st Street, which could reduce access to Pecan Park, LANI Park, and Mariachi Plaza although MTA is committed to maintaining access to these parks throughout the construction period. The impacts are potentially significant. The amount of differential settlement from the tunneling is not expected to cause structural or architectural damage to facilities at Pecan and Belvedere Parks or Mariachi Plaza. During construction, ground settlement will be monitored, and steps will be taken to ensure no structural damage occurs at these sites.

Cemeteries

Access to Evergreen Cemetery at 1st/Fresno would not be affected by temporary lane closures and night street closures along 1st Street between Lorena and Fresno Streets since MTA is committed to maintaining access to cemeteries during construction. No significant impacts would occur.

Schools

Temporary noise, vibration, air quality, circulation, and safety impacts are possible at schools located adjacent to the LRT alignment, station locations, or construction staging areas. Construction activities would temporarily interfere with the normal traffic flow, causing some lanes and streets to be closed to vehicles for various durations of time. However, these temporary lane closures are not expected to restrict access to schools located along or near 1st Street. There would be temporary curb parking restrictions along Indiana Street by Ramona High School (with the exception if the school is relocated under Option B, there would be no such impacts because the school would be relocated prior to construction in the area). If the school is reconstructed on the existing site under Option B, impacts would be similar to those described for Option A except that the construction will occur on school property that will be acquired by MTA instead of on Indiana Street right-of-way.

Ground-borne noise and vibration generated by mine cars carrying excavated material tunneling machinery may affect school activities at First Street School for a several-day period. Ground settlement from tunneling is not expected to cause structural or architectural damage to the school facilities that lie adjacent to or above the subway. However, as a precautionary measure, structural surveys will be undertaken during final design to determine building condition. Construction-related noise and vibration impacts on schools may occur along the at-grade portion of the alignment and may affect Griffith Middle School, particularly with construction of the 3rd/Mednik Station.

A 1994 letter agreement between MTA and the Los Angeles Unified School District (LAUSD) on the suspended Metro Red Line project indicated that MTA would go beyond preparation of the usual analysis presented in an EIS/EIR level of study required by NEPA and CEQA and conduct additional air quality analysis for schools within 700 feet of the alignment. Although the LRT project is modified from the suspended project, MTA has conducted the additional analysis of construction activities for the four schools within that distance: Utah Street, Ramona High, Our Lady of Lourdes Elementary, and Griffith Middle. The results of that analysis, discussed in Section 4.19.2.6, *Air Quality*, indicate that the State standards for PM_{10} concentrations could potentially be exceeded at all four of the schools. It is anticipated that the at-grade portion of the alignment will be constructed in one-mile segments. Each segment will be under construction for approximately six to eight months. Therefore, impacts near the schools are expected to last about that length of time and not throughout the entire construction period of the project.

Hospitals/Clinics

Temporary noise, vibration, and air quality impacts may occur at the Veterans Clinic on Alameda Street and at the Roybal Health Center, which are along the LRT alignment due to construction activities. These impacts are potentially significant. Temporary lane closures are not expected to affect access to these health centers.

Libraries

The Ben Franklin Library, which is located adjacent to the tunnel alignment on 1st Street, may experience noise and vibration impacts during tunnel construction, a period of several days. The East Los Angeles Library would face the LRT alignment along 3rd Street, close to the proposed 3rd/Mednik Station. Temporary noise, vibration, and air quality impacts may result from at-grade construction activities. These impacts are potentially significant. Temporary lane closures are not expected to affect access to the libraries. No construction activities would occur at the Little Tokyo Library, which is further from the alignment.

Places of Worship

Construction of traction power substations on 3rd Street at Arizona Avenue near Sala Evangelica Church and across Sunol Drive from Santuaria de Guadalupe Church may create temporary noise and vibration impacts. At-grade construction would occur on streets fronting Hompa Hongwanji Buddhist Temple, Paraiso Spanish Congregation, Our Lady of Lourdes Church, Santuaria de Guadalupe Church, Sala Evangelica, Iglesia El Siloe, and Iglesia Cristiana Ejercito de Salvacion producing temporary noise, vibration, and air quality impacts**.** Vibration impacts could result from tunnel construction under the Pentecostal Church. These impacts are potentially significant. Tunneling is not expected to cause structural or architectural damage to the Pentecostal Church due to differential settlement. Temporary lane closures are not expected to affect access to places of worship. Construction equipment and activity near Hompa Hongwanji Buddhist Temple grounds would temporarily impair its appearance. Activities and festivities are currently being planned for the 2005 Temple Centennial. Restricted access resulting from LRT construction could affect these events.

Other Community Facilities

Construction of the track and station in the vicinity of 1st/Alameda may create temporary noise, vibration, and air quality impacts for the Japanese American National Museum and the Geffen Contemporary Museum. St. Elizabeth Day Nursery is located north of 1st Street along Mission Road, removed from the effects of construction activities. Traffic delays due to construction of the subway portal at 1st /Gless Streets is not expected to disrupt access to the Aliso Pico Multipurpose Center. Short-term noise, vibration, and air quality impacts may affect use of the center. Noise and vibration impacts and possible settlement impacts from tunneling may also affect the Hollenbeck Youth Center, located on 1st Street west of St. Louis Street.

Significance of Impacts

Many of the construction-related impacts to parklands and community facilities are potentially significant impacts.

Mitigation

Mitigation measures to reduce these potentially significant temporary impacts to parklands and community facilities are presented in Sections 4.19.2.2, *Traffic* 4.19.2.3, *Parking,* 4.19.2.4, *Other Modes*, 4.19.2.6, *Air Quality,* 4.19.2.7, *Noise and Vibration,* 4.19.2.8, *Visual and Aesthetics*, 4.19.2.13, *Geologic and Seismic Conditions,* and 4.17.2.1, *Section 4(f) Evaluation—Parks and Recreation Property.* In addition, MTA will work with the City of Los Angeles to avoid construction conflicts between the LRT project and gymnasium and pool construction at Pecan Park. MTA encourages the City to move forward with these much needed projects as soon as possible and will coordinate project construction as necessary to avoid delays to either project.

With regard to mitigation measures for the schools, construction contractors will be required to inform their drivers that they must drive cautiously in areas with concentrations of school children and must stop when they encounter school buses using red flashing lights. Refer to Section 4.19.2.19 for additional safety-related mitigation measures that will be taken to minimize impacts on the schools. Regarding potential air quality impacts at the four schools closest to the alignment, MTA will provide a liaison to the schools to discuss specific air quality issues as they may arise and to coordinate construction activities with the schools to minimize air quality impacts of the construction to the extent possible. Regarding potential noise impacts during construction, MTA will take action to resolve the issue through reducing or blocking noise from reaching the school or shifting construction activity to less sensitive time periods. During construction, the Contractor will be required to implement mandatory mitigation measures to reduce potential noise and vibration impacts on nearby schools including: Utah Elementary, First Street, Our Lady of Lourdes, Ramona High, and Griffith Middle Schools. These measures will be based on maintaining acceptable interior noise levels within the school classrooms and occupied spaces. MTA will develop these criteria in coordination with LAUSD and individual school administrators. MTA will require the Contractor to prepare noise and vibration control plans to meet these criteria and will also require the Contractor to adhere to a plan to monitor the construction noise and vibration levels to ensure compliance. Other mitigation measures to be taken to minimize impacts on the schools include:

- MTA will maintain ongoing communication with administrators at impacted school sites providing sufficient notices to forewarn children and parents when currently existing school pedestrian routes will be impacted. MTA will furnish school pedestrian routes maps upon request;
- If noise from construction activities creates disruption at schools, MTA will take action to resolve the issue through reducing or blocking noise from reaching the school or shifting construction activities to less sensitive time periods;
- MTA will provide crossing guards near construction sites as warranted. This item is further defined in the Section 4.19.2.19, *Safety and Security*;
- MTA will provide at no charge to LAUSD an instructional rail safety program with materials to all affected elementary and middle schools; and
- Barriers and fencing will be installed at construction sites as needed to minimize trespassing, vandalism, and short-cut attractions. Security patrols will also be provided at construction sites.

MTA will meet with affected organizations, including Hompa Homgwanji Buddhist Temple, as well as the businesses in Little Tokyo to discuss their concerns regarding construction and will make every attempt to avoid or minimize adverse impacts. Depending on the timing of the 2005 Temple Centennial activities, it may be possible to schedule the contractor to avoid construction activities in the area during that time. Construction will likely temporarily impair the appearance of the temple. However, it will not result in any long-term impacts to its appearance and will ultimately provide worshippers with much improved transit access. In addition, the MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community as described in Section 4.19.2.1.

The above measures also apply to Option B. In addition, MTA will provide funding to LAUSD to either purchase a new school site (whether with a new or existing building) acceptable to LAUSD or to reconstruct the school at its present location. It is not feasible for MTA to analyze the impacts of this proposed school replacement at this time because LAUSD has not undertaken any programmatic planning for the new school and the timing, location, and extent of work required to undertake this replacement are unknown. MTA staff has conferred with LAUSD staff, and LAUSD has agreed that, upon its completion of programmatic planning and identification of potential new sites, LAUSD will conduct all required environmental studies as a condition to its determination of whether to relocate or reconstruct the school. Because of the indeterminate nature of the school project, it is beyond the scope of the analysis for the Eastside Corridor Project. However, MTA will monitor LAUSD progress with regard to Ramona High School decision-making and will work with LAUSD to address any conflicts which may arise between LAUSD's Ramona High School and MTA's Eastside Corridor project. Because LRT track and station construction will occur on Ramona High School property, the following mitigation measures will be taken if the school is reconstructed at the existing site:

- The construction contractor will either provide: 1) fencing or other suitable barriers around the Eastside Corridor LRT off-street construction site between 1st and 3rd Streets; or 2) a security patrol in the area that will provide security services during normal school hours; and
- MTA will make available a MTA staff person or construction contractor representative who will keep the school administrator informed about ongoing and planned construction activities in the vicinity and will act as liaison between the high school and the construction contractor regarding safety issues, as well as other issues, that may arise.

Significance of Impacts Remaining After Mitigation

Although most construction-related visual, transportation, noise, and vibration impacts on parklands and community facilities can be reduced to an insignificant level after mitigation, some impacts, though temporary, will remain significant (refer to the respective sections for more information).

4.19.2.12 Historic/Archaeological/Paleontological Resources

Refer to Section 4.15, *Historic/Archaeological/Paleontological Resources*, for a complete discussion of impacts during construction.

4.19.2.13 Geologic and Seismic

Impacts

Tunneling-Induced Ground Surface Settlement

Geologic conditions for much of the tunnel alignment are sands, clays, and gravels, which in tunneling terms are described as “soft ground.” Based on the previous geotechnical investigations for the suspended Metro Red Line project, and available publications, the proposed LRT Build Alternative tunnel sections have a potential for running ground conditions during construction. These conditions occur where poorly graded, poorly cemented sand and gravel exist in the presence of water. There is also a potential along the tunnel for slow raveling conditions in areas where silty sands and clayey sands are encountered during construction. Additionally, mixed face conditions (soil/bedrock interface) could be encountered in areas where bedrock might be shallow.

During tunneling, some “ground loss” will occur, resulting in surface settlement. The amount of ground loss and subsequent settlement measured at the surface will be a function of the tunnel depth, size,

tunneling techniques, and geology. For previous Metro Red Line projects in similar geology as the LRT Build Alternative, surface settlement measured directly above the tunnel crown was typically less than one inch (Eisenstein et. al, 1995).

Building (or utility) damage from tunneling may result when there is differential settlement of the foundation, that is, a change in elevation of one foundation element relative to another. The degree of damage is dependent on the amount of such differential settlement, the buildings construction materials, quality of construction, and age. The amount of differential settlement expected for the LRT Build Alternative is not expected to cause structural damage, although minor and repairable hairline cracks may occur on occasion. During final design, structural surveys and analyses will be completed, along with further geotechnical investigation, to determine the condition of existing buildings which are in proximity to the stations and tunnels, and to estimate the need for additional building protection. Therefore, ground surface settlement is anticipated to have a potentially significant impact under CEQA on the construction of the proposed LRT Build Alternative.

Cut-and-Cover Excavation for Station Sites and Tunnels Adjacent to Portals

Based on the previous geotechnical investigations for the suspended Metro Red Line project, and available publications, poorly graded, poorly cemented sand and gravel may be encountered. Excessive sloughing and localized caving may occur in these soils when dry or when saturated, which may have a potentially significant impact under CEQA on the construction of the LRT Build Alternative.

Groundwater

Shallow and perched groundwater may be encountered above design tunnel and station elevations creating difficult working conditions and instability in mined tunnel sections and excavation walls and bottoms. Groundwater may have a potentially significant impact under CEQA on the construction of the LRT Build Alternative. Methods for handling groundwater during construction are addressed in the Sections 4.19.1, *Construction Methods* and 4.19.2.15, *Water Resources*. Methods for disposal of groundwater, should it be contaminated, are discussed in Section 4.19.2.14, *Hazardous Materials.*

Significance of Impacts

Ground surface settlement, excessive sloughing and localized caving in poorly graded, poorly cemented sand and gravel, and groundwater may have a potentially significant impact under CEQA on the construction of the LRT Build Alternative.

Mitigation

Tunneling-Induced Ground Surface Settlement

To further limit surface settlement to acceptable levels, pressure-face TBMs, described in Section 4.19.2.1, *Construction Methods*, and pre-cast, bolted, gasketed lining systems were proposed for the suspended Metro Red Line project. The pressure-face TBM technology maintains positive fluid or soil pressure on the tunnel face, which decreases the potential for ground loss and soil instability (sloughing, caving) at the tunnel face, which in turn reduces soil movement and surface settlement. In combination with the face pressure, grout is installed immediately behind the TBM to fill the annular space between the installed precast concrete tunnel liners (tunnel rings) and the ground. This technology provides an additional measure to reduce surface settlement. An additional benefit of the pressure-face TBM is the ability to tunnel below the groundwater table without requiring dewatering or lowering of the

groundwater table. Where soil conditions are more favorable for tunneling, such as within the bedrock formations, pressure on the face may not be required.

Where conditions warrant, for example, shallow tunnels directly below sensitive structures or utilities, additional methods to reduce settlement will be specified. During preliminary design, a differential settlement criteria limiting angular distortion to 1/600 (vertical deflection over horizontal distance) was established as a threshold for implementation of mitigation measures (Jacobs Associates, 2001). These mitigation measures could include:

- Permeation grouting to improve the ground prior to tunneling: Chemical (sodium silicate) or cement grouts are injected into the ground to fill voids between soil particles – typically sandy soils - and provide greater strength and stand-up time for the soil. This grout can be placed through pipes from the surface before the tunnel reaches the grouted area, from pits or shafts adjacent to the grouted area, or in some instances from the tunnel face. In this latter case, the tunneling machine must be stopped for a period of time to drill grout placement pipes, install grout, and allow the grout to set. The permeation grouting method has been used successfully for the Metro Red Line in instances where the tunnel passed under potentially sensitive or important structures such as the US 101 freeway (downtown, Hollywood and at Universal City).
- Compaction grouting as the tunnel is excavated: This method involves injection of a stiff "grout," typically sand with small amounts of cement, above the tunnel crown as the tunnel advances. The grout densifies soil above the tunnel crown and replaces some of the lost ground, and thereby preventing settlement from propagating to the surface. This method was used in several instances for the Metro Red Line project in the Downtown Los Angeles area and along portions of Hollywood Boulevard.
- Compensation Grouting: Compensation grouting involves carefully controlled injection of grout between underground excavations and structures requiring protection to from settlements. For tunnel applications, the pipes for grouting are installed above the intended tunnel position, in advance of tunneling. A key component in controlling compensation grouting is careful monitoring of both structure and ground movements to allow the timing and quantities of grout injected to be optimized. Grout injection can take place before, during, and after tunneling activity by reusing the grout pipes.
- Underpinning: Underpinning involves re-supporting the structure's foundation on ground that will not be influenced by the tunneling. This may not be feasible where the structure is directly over the tunnel.

For compaction, permeation, and compensation grouting, surface preparation is likely to be required (removal of landscaping etc.) to allow space for drilling equipment, installation of grout pipes, and injection of grout. In cases where large structures are directly over the tunnel, access into the building or basement, where basements exist, could be required for grouting operations, and use of the area could be limited during the grouting operations. After grouting is completed, the area is restored to its existing condition. Detailed geotechnical investigations, settlement analyses, and evaluation of the structures with respect to their condition and position relative to the LRT Build Alternative will be required during final design before the TBM type is recommended and additional protection measures, if any, are designed and specified.

In addition to the building condition evaluations and analyses described above, pre-construction surveys will be performed to document the existing conditions of buildings along the alignment before the tunneling begins. During construction, instrumentation, e.g., ground surface and building monitoring programs, will be in place to measure movements and provide information to the contractor on tunneling performance as well as to document that the settlement specifications are met. If measurements indicate

settlement limits will be exceeded, the contractor will be required to change or add methods and/or procedures to comply with those limits. Construction work will be reassessed when settlements exceed action (warning) levels. Contractors will be required to modify construction methods if settlements exceed specified maximum levels.

Both action (warning) level and maximum allowable ground surface settlements are typically given in the project construction specifications. They may be specified as a maximum settlement at the ground surface over the centerline of the tunnel, or as measured near the tunnel crown by pre-installed ground instrumentation. For some structures and utilities, specific settlement limits are set based on the type of structure and any special procedures (such as grouting or underpinning) used. For the suspended Metro Red Line project, the action level for settlement five feet above the tunnel crown was 1.5 inches and 2 inches was the maximum allowable. Settlement limits similar to those used for the suspended project are anticipated for the LRT Build Alternative tunnel.

Cut-and-Cover Excavation for Station Sites and Tunnels Adjacent to Portals

If necessary, tunnel sections and excavation walls and bottoms will be stabilized during construction with specialized shoring and/or chemical grouting and dewatering.

Groundwater

Dewatering systems will likely be implemented for station construction extending below groundwater. Alternatively, the initial excavation support systems could be designed to prevent groundwater inflows if slurry walls, or other relatively impervious wall systems are used. Further discussion of the initial support systems is included in Section 4.19.1, *Construction Methods*. In any event, the methods will be in accordance with accepted engineering practice and developed under the direction and signature of a licensed engineer specializing in dewatering systems.

If dewatering methods are used and depending on the site soil conditions and groundwater level at the time of construction, some surface settlement may be experienced. For the LRT Build Alternative, settlements at the 1st/Boyle excavation are estimated to be about ¼ inch, and about ½ inch at the 1st/Soto site. These predictions corresponded to lowering the groundwater elevation about 35 feet at 1st/Boyle and about 20 feet at 1st/Soto. Dewatering will not be required for 1st/Lorena.

During construction, the MTA will monitor adjacent streets, sidewalks, and buildings for settlement and other movement. If movement is detected, the contractor will be required to take action to control it. Action levels to trigger additional measures to control settlement near station excavations are typically on the order of ½ inch to one inch, depending on the construction methods used and structures to be protected.

If contaminated water is encountered during dewatering, it will be treated at the site or hauled to a treatment facility in accordance with applicable federal, state, and local regulations. Any potential impact of dewatering on vegetation will be limited to the construction area and its immediate vicinity. Vegetation within the construction area will likely be sacrificed to facilitate construction. Mature vegetation in the immediate vicinity of the station construction area with root systems drawing moisture from the capillary fringe above the groundwater table may be affected by dewatering. If necessary, irrigation programs designed to mitigate this issue will be provided to the appropriate parties for implementation during dewatering.

At the completion of the stations, pumping is discontinued and groundwater levels return to their natural level. No permanent change in the groundwater level is anticipated as a result of dewatering during

construction. Groundwater levels along the tunnels should not be affected as the recommended TBM and tunnel liner block entry of water into the tunnels.

Encountering Subsurface Gases

It is not anticipated that specialized methods to mitigate exposure to hazardous gases during tunnel construction and deep excavations will be required for the LRT Build Alternative since field monitoring to date along the underground segment detected only low levels of methane gas and did not detect hydrogen sulfide gas. It is anticipated that tunnels will be constructed with a pressure-face Tunnel Boring Machine and precast, bolted, gasketed tunnel liners, which will essentially exclude water and gases from the assembled tunnel liner both during construction and operation. During construction, gas detection systems, alarms and emergency ventilation systems, in accordance with Cal-OSHA requirements will be in place to monitor and to protect workers if gas concentrations exceed acceptable levels in working areas. In addition, contractors will be required to use non-sparking, or intrinsically safe equipment underground. Further discussion of hazardous conditions is discussed in Section 4.19.2.14, *Hazardous Materials*.

Significance of Impacts Remaining After Mitigation

Implementation of the mitigation measures would reduce geologic and seismic impacts to a less than significant level.

4.19.2.14 Hazardous Materials

Impacts

The construction activities (i.e., tunneling, foundation excavations) are most likely to encounter pre-existing hazardous substances where subsurface construction work will be required near the following locations:

- Within known oil fields,
- In areas with known historic soil and groundwater contamination, gasoline stations, auto repair facilities, dry cleaners and commercial manufacturing or shipping facilities, or
- In locations where buildings will be demolished and asbestos and/or lead may be present.

Some pre-existing hazardous substances such as natural gases and contaminated soil and groundwater may be encountered during construction through the locations discussed below. Impacts without mitigation could be potentially significant.

Union Station Oil Field (see Figure 4.10-1 in Section 4.10)

Although no hazardous substances were reported in the recent explorations along the at-grade segments of the LRT Build Alternative (Group Delta Consultants, 2001), it is possible that some hazardous substances such as natural gases and petroleum contaminated soil and ground water may be encountered between boring locations and below boring depths during construction of pile foundations for the aerial guideway across US 101. During a prior investigation (GeoTransit Consultants, 1996d), hydrogen sulfide and methane gases were detected in the industrial area between 1st Street and US 101 and west of the Los Angeles River, to the north of the LRT Build Alternative. Prior investigations (*Environmental Summary Report*, June 1998, completed for a deep tunnel) indicated that hydrogen sulfide gas was found as a dissolved compound in ground water in the industrial area north of 1st Street and west of the Los Angeles River. In two instances, when gas was allowed to accumulate in closed gas sampling wells, studies

determined that hydrogen sulfide gas could evolve (off-gas) from groundwater to hazardous levels when exposed to air. Maximum concentrations of dissolved hydrogen sulfide in groundwater were found to be 200 mg/l. Methane gas was detected in a number of sampling wells at quantities above the LEL.

Petroleum-related hazardous substances in soils could be encountered during excavations for surface guideway construction along existing streets. Based on findings of previous investigations, surface construction of the LRT, and the planned limited subsurface construction in this segment, it appears that the Union Station oil field may present a low to moderate potential concern to the LRT Build Alternative.

Boyle Heights Oil Field (see Figure 4.10-1 in Section 4.10)

The Boyle Heights oil field is located east of the Los Angeles River. The 1998 *Environmental Summary Report* for the suspended Metro Red Line project indicated that significant concentrations of dissolved hydrogen sulfide are not expected in areas east of the Los Angeles River. The results of the most recent additional explorations also indicate that the underground segment of the LRT Build Alternative has no significant soil or groundwater contamination requiring remedial action. Nonetheless, there exists a potential for local soils and water inflows to be contaminated with such contaminants as hydrocarbons, hydrogen sulfide, etc. between boring locations that would require treatment and disposal to approved facilities.

Properties with Known or Potential Environmental Contamination

Based on the methodology for impact evaluation found in Section 4.10, a total of four properties were identified to be of high concern, six properties to be of moderate concern, and 24 properties to be of low concern. Each of the high and moderate concern properties are briefly discussed below by the segment in which they were noted, and their locations are displayed in Figure 4.10-1 in Section 4.10. The Environmental Data Resources (EDR) database listing is also indicated along with the name and address of the property of concern.

a. Properties with High Level of Concern—all properties are listed on the LUST database.

   Segment 1: Union Station to Boyle Avenue—None.

   Segment 2: Boyle Avenue to Indiana Boulevard
   1. *Vega Auto Service at 1869 East 1st Street*—The facility is noted to have impacted area groundwater and the remediation program is in the design phase.
   2. *Murray Lefkowitz at 2239 East 1st Street*—The facility is noted to have impacted soil only with no action taken.

   Segment 3: Indiana Boulevard to Atlantic Boulevard
   3. *Gonzales Service Station at 4302 East 3rd Street*—The facility is noted to have impacted soil only with no action taken.
   4. *East Los Angeles Sheriff Department at 5019 3rd Street*—The facility is noted to have impacted soil only with no action taken.

b. Properties with Moderate Level of Concern

   Segment 1: Union Station to Boyle Avenue
   1. *Union Station Oil Field/ Former Gassification Plant*—This facility is listed as the Southern California (So-Cal) Gas Company-Aliso A Manufactured Gas Plant (MGP) bounded by Keller, Vignes, and US 101 in the CAL-SITE listings. A second portion of this facility (Aliso C) is noted as

a CAL-SITE and COAL-GAS facility bound by Center, Commercial, Ducommun and Jackson Street. Union Station was noted on the CERCLIS list in relation to historic coal gassification in a prior report. H_2S gas and methane gas have been reported in the subsurface at this facility at levels beyond the Immediate Danger to Life and Health (IDLH) and LEL. The LRT segment in this area requires limited subsurface excavation and construction typically associated with a surface guideway.

2. *Mobil Gas Station* at 520 Alameda Street (at Commercial Street)–LUST (groundwater reported to be impacted. Regulatory closure of the site was granted with no further action required.)
3. *Mangrove Estate* at 617 East 1st Street–LUST (groundwater reported to be impacted. Regulatory closure of the site was granted with no further action required.)

Segment 2: Boyle Avenue to Indiana Boulevard

4. *M and Y Service Center at 2701 East 1st Street*—LUST. The facility is noted to have impacted area groundwater. Remedial action is complete or unnecessary.
5. *Boyle Heights Oil Field*: This area is noted in the CDOG maps as having been historically developed with oil and gas wells.

Segment 3: Indiana Boulevard to Atlantic Boulevard

6. *Ralph Moran Property* at 4247 East 3rd Street–LUST.

c. Properties with Low Level of Concern

The regulatory search identified 24 properties of low potential concern. A listing of these properties can be found in the separate *Hazardous Materials Technical Report* prepared for the Los Angeles Eastside Corridor. These properties are mostly auto service centers, dry cleaning facilities, and warehouses located along the LRT Build Alternative. These sites have completed remediation, have historically utilized only small amounts of known contaminants, are considered small quantity generators or own underground storage tanks. If construction were to be performed on these sites, further investigation would be needed at these properties to assess the environmental conditions.

Significance of Impacts

The impacts of pre-existing hazardous substances that may be encountered during construction would be potentially significant.

Mitigation

Emergency response procedures will be developed in conformance with federal, state, and local regulations in the unlikely event of a major hazardous materials release close to or within the vicinity of the proposed improvements. Construction and operations personnel will report to the appropriate regulatory agency any suspicious dumping or releases observed along the alignment. The MTA will coordinate with the California Department of Toxic Substance Control, State Water Resources Board, South Coast Air Quality Management District, and other agencies as appropriate to keep abreast of current RCRA notifications, hazardous materials spill reports, LUST reports, and results of any sampling conducted within the project vicinity.

Hazardous Subsurface Gases

During final design of the suspended Metro Red Line East Side Extension, the MTA identified several methods to mitigate exposure to hazardous gases during tunnel construction and deep excavations. These included both specialized excavation methods and gas or groundwater treatment methods.

Specialized tunnel excavation methods include the use of pressure-face Tunnel Boring Machines (TBMs) and bolted, gasketed tunnel liners. The pressure-face (slurry shield) TBM provides a contained excavation system such that worker exposure to the excavated face and spoil is reduced or eliminated. This method was specified for use on the west side of the Los Angeles River where high gas concentration was anticipated. The pressure face machine is used in combination with a gasketed, pre-cast or pre-fabricated lining system, to minimize gas intrusion during tunneling and operations. For further protection during tunnel construction and in deep excavations, continuous and automated gas monitoring will be maintained and additional ventilation provided if gas concentrations exceed action/alert levels. Similar gas monitoring and ventilation systems have been used during the construction of the operating Metro Red Line system, which was constructed through former oil fields containing natural gases.

At station sites where gases are potentially present, previous designs for the suspended Metro Red Line East Side Extension used gas impermeable liners to reduce the probability of infiltration. These special High Density Polyethylene (HDPE) Liners are currently in place in Metro Red Line Segments 1, 2, and 3. An alternate system will be used for the LRT Build Alternative stations where the potential for gas seepage exists. A precast, gasketed, bolted liner will provide a continuous barrier that reduces the impact from gas inflows to less than significant levels.

Contaminated Water

Groundwater contamination encountered during subsurface construction activities may be treated on-site to acceptable local and state criteria and then discharged into the sanitary sewer or storm water system. If on-site treatment is not feasible due to the type and severity of the contamination identified, the contaminated ground water may need to be disposed of by recycling in a permitted facility. During construction, the roles and responsibilities of the MTA and Contractor relative to water pollution controls, including operations involving the segregation, treatment and disposal of contaminated groundwater derived from dewatering, tunneling operations and any liquid derived from excavated material separation will be addressed by the project specifications. For the suspended Metro Red Line project, the Contractor was to be responsible for providing, operating and maintaining a water treatment unit (or units) to treat wastewater discharges to achieve the following effluent limitations:

- pH: between 5.5 to 11
- Dispersed oil and grease: <600 mg/L
- Floatable oil and grease: No visible sheen.

Solid residues from the Contractor's water treatment operations will also be addressed in the specifications. The MTA will be responsible for any additional water treatment required to meet National Pollutant Discharge Elimination Standards (NPDES), including organic and inorganic constituents, and will provide, operate, and maintain a water treatment system (or systems) for this purpose.

Soil

Soils containing hazardous material could be disturbed by construction activities. Mitigation of the material would be required to conform to the applicable local, state, and federal requirements. Depending upon the amount of affected material encountered, the concentrations of hazardous constituents, and the type of hazardous constituents encountered during construction activities, the following options may be considered for mitigation:

- Removal and disposal – One mitigation option will be to identify, remove, and haul and dispose of the material in a licensed Class I, II or III disposal facility.
- Recycling – Impacted material may be treated and recycled at regulated recycling facilities.
- Combination – An off-site remediation facility could be used to remediate the waste material to a Class III standard and then dispose of it as clean fill at a Class III landfill.

Operations involving the segregation, handling, transportation and disposal of contaminated soil, hazardous substances, solid waste, USTs, oil and gas wells, and other environmentally related issues encountered during earthwork operations will be addressed in the project specifications. "Contaminated soil" is determined using a risk based assessment and is site specific. It depends on the distance the contamination is located from groundwater as well as other factors, but can be loosely defined as soil that exhibits any of the following characteristics:

- Greater than (>) 100 mg/kg Total Recoverable Petroleum Hydrocarbons (TRPH) per EPA Method 418.1; *or*
- >5 mg/kg Total Petroleum Hydrocarbons as gasoline (TPHg) per EPA Method 8015; or
- >50 mg/kg direct reading from a hand held Photoionization Detector (PID) calibrated to 100 ppm isobutylene per South Coast Air Quality Management District Rule 1166; or
- Any characteristic of Toxicity per Title 22 CCR §66699 (TTLC and STLC); or
- >10 micro gram/kg Polynuclear Aromatic Hydrocarbons per EPA Method 8270.

MTA, or its designated representative, will sample and analyze excavated soil, including tunnel excavated material, for the purpose of classifying material and determining disposal requirements. If excavated soil is suspected or known to be contaminated, MTA will direct the contractor to perform the following operations:

- Segregate and stockpile the material in a way that will facilitate measurement of the stockpile volume
- Spray the stockpile with water or an SCAQMD-approved vapor suppressant and cover the stockpile with a heavy-duty plastic (e.g., Visqueen) to prevent exposure of the soil.

If required by federal, state, or local regulations, MTA will direct the contractor to load, transport, and unload contaminated soil and construction debris at an MTA-designated facility (i.e., a Class III landfill, a recycling facility or an unclassified waste management unit located within 30 miles of the project worksite). The contractor will provide qualified and trained personnel and personal protective equipment (PPE) to perform operations that require the disturbance of hazardous substances including, but not limited to, excavation, slurry/excavated material processing, segregation, stockpiling, loading and hauling.

In addition to the above, the MTA will include information regarding Resource Conservation and Recovery Act (RCRA) compliance and other State hazardous waste disposal requirements that apply to this project in the final construction documents. No on-site treatment of hazardous soils will be conducted during the project. All contaminated soils and hazardous soils will be transported off-site to the MTA's temporary storage facility regulated by the Department of Toxic Substances Control (DTSC); the MTA will follow the provisions CCR Title 22, Division 4 and CCR Title 23 Chapter 15 as it relates to the classification and disposal of hazardous wastes. All soil believed to be contaminated will be sampled in accordance with SW-846 sampling protocols, and profiled into a legally acceptable and properly permitted disposal facility.

The MTA is currently regulated as a hazardous waste generator and all manifesting of potentially hazardous materials will be conducted with the MTA as sole generator. Other government agencies

and/or the contractor will not be regulated as hazardous waste generators as it relates to this project. The MTA has an EPA Generator Number. As chemical properties and disposal classifications of contaminated soils excavated will be variable, haul routes and anticipated disposal facilities are unknown at this time. However, haul routes and waste disposal facilities will be included in the final contract documents.

Oil and Gas Wells

At this time, no known wells have been located directly in the area of tunneling or underground station construction. The nearest well was identified approximately 70 feet southwest of the 1st/Lorena intersection. Provisions will be included in the project specifications (similar to those for the suspended project and previous Red Line segments, to instruct the contractor as to procedures to be followed if a well is encountered.) Plugged and abandoned oil wells (ARCO Evergreen and Taylor Royalties) located within close proximity to the project limits will be shown on the project contract drawings. In addition, the final geotechnical report for the underground segment will include a discussion of the oil fields and any known wells.

Building Demolition

In locations where buildings will be demolished, asbestos and/or lead may be present and will be handled by specialty contractors licensed in asbestos and lead abatement.

Significance of Impacts Remaining After Mitigation

The mitigation measures would reduce impacts to less than significant.

4.19.2.15 Water Resources

Impacts

Surface Water

Potential surface water 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.

Tunneling operations and cut-and-cover construction of stations would involve dewatering (removal of water from area soils) before and during construction. If warranted, when dewatering activities occur during construction, 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 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.

With regard to erosion and sedimentation, subsurface tunneling activities 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 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.

Seismic retrofitting of the 1st Street Bridge would be performed to strengthen its columns. This construction would require equipment and vehicles to work directly in the Los Angeles River bed during construction. This construction would be located within the Los Angeles River ordinary high-water mark. Such an impact would require coordination with the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act, with the Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act, and the California Department of Fish and Game (CDFG) under Section 1600 of the California Fish and Game Code. The short-term nature of the impact would probably require only notification of the COE through a Pre-construction Notice, or possibly authorization under an existing Nationwide Permit. Coordination with the RWQCB would determine the process for complying with Section 401 of the Clean Water Act. Coordination with the CDFG would determine what permitting, if any, is necessary, considering that there is no existing habitat in the vicinity of the 1st Street Bridge.

Floodplains

Most of the construction in the Los Angeles River floodplain area is completely at-grade, and the existing 1st Street Bridge over the river would be used by the LRT alignment for crossing the river. Construction of the 1st Street Bridge seismic retrofit would not result in any floodplains impacts to the Los Angeles River 100-year floodplain.

Groundwater

There is a potential for contamination of groundwater that is used for consumption by municipal, industrial and irrigation purposes. This issue is further addressed in Section 4.9.2.14, *Hazardous Materials*. The principal engineering problems encountered in tunneling and excavation are often related to groundwater. Relatively shallow groundwater could be encountered during construction in younger and older alluvial sediments. Sediments in the vicinity of the 1st/Boyle Station are of this type and may require dewatering prior to and during the excavation of the station. 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. Refer to Section 4.19.2.13, *Geologic and Seismic*, for additional information.

Significance of Impacts

There would be no impact on floodplains. The impacts to surface waters associated with the 1st Street retrofitting may be potentially significant. The impacts due to contamination of groundwater may be potentially significant.

Mitigation

Surface Water

A Notice of Intent (NOI), along with a National Pollutant Discharge Elimination System (NPDES) permit application and detail plans, will be submitted to the RWQCB by MTA or a designated contractor 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. This permit will require the completion of a Storm Water Pollution Prevention Plan (SWPPP), and a Monitoring Program designed to check whether the measures identified in the SWPPP are adequate and properly implemented. The SWPPP for this permit will contain or identify pollutant sources, source controls, material inventory, preventative maintenance program, spill prevention and response program, employee training, facility inspections, record keeping, and elimination of non-storm water discharges. The plans will include provisions for construction process water to be treated and discharged to the Publicly Owned Treatment Works (POTW). Contaminated runoff from large paved areas such as parking lots and construction sites will be minimized through the installation of oil/water separators or siltation basins and trash filters. New standards, such as the standard urban stormwater mitigation plan, will be implemented into the project. The SWPPPs will be developed in coordination with the RWQCB. Mitigation measures are anticipated to reduce impacts on surface water quality to less than significant.

Prior to discharging into the City storm drain system, MTA will: 1) Obtain water samples from the locations and depths where the dewatering is planned; 2) perform water quality sampling tests to determine the different constituents and levels of contamination; 3) present these findings to the RWQCB to obtain an NPDES permit that will determine the allowed levels of contaminants and volume of discharges into the storm drain system; and 4) provide the City of Los Angeles with a copy of the NPDES permit.

In the event that discharge is expected, the proposed project would require preparation of a Report of Waste Discharge (ROWD), required by the State Water Resources Control Board (SWRCB) for any type of discharge affecting surface water. This would ensure that any project-related discharges are regulated and therefore would not impact local surface water. Section 4.19.2.13, *Geologic and Seismic Conditions*, addresses mitigation relating to potential subsidence from tunnel and station construction.

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, measures will be adopted to prevent accumulation of large amounts of spoil material, and spoil piles will be kept low and/or graded to minimize erosion. Mitigation measures are anticipated to reduce sedimentation impacts to surface water quality to less than significant.

Construction of the 1st Street Bridge structural retrofitting will require close coordination with the COE, CDFG, and the Los Angeles Flood Control District. The COE may require mitigation in order to comply with Section 404 of the Clean Water Act. The RWQCB may require mitigation for clearance under Section 401 of the Clean Water Act. The CDFG may also require mitigation to comply with Section 1600 of the California Fish and Game Code. Compliance with the requirements of these regulations would result in avoidance of significant impacts.

Floodplains

Mitigation of potential impacts on the Los Angeles River are not required because the alignment, which would cross the river on the existing 1st Street Bridge, poses little if any impact on the river. However, crossing the Los Angeles River will require consultation with the County and the COE.

Groundwater

Mitigation measures for dewatering and groundwater contamination are discussed in this section and in more detail in Sections 4.19.2.13 and 4.19.2.14. Field pump tests will be performed in the areas that require pre-construction dewatering for tunnel and underground station construction to determine groundwater quality and to help design suitable dewatering systems and treatment systems, if required. Through the use of a pressure-face TBM, there is the ability to tunnel below the groundwater table without requiring dewatering or lowering the groundwater table.

Potential remedial options for contaminated groundwater, if encountered, 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 volatile organic compounds (VOCs). Perched groundwater will also be treated appropriately. Treated water will then be discharged into a nearby storm drain. Remedial options will be developed in conformance with all applicable federal, state, and local regulations. Mitigation measures in the event that contaminated groundwater may be encountered are anticipated to reduce impacts to less than significant.

Prior to excavation and construction, negotiations with the California Department of Water Resources (CDWR) and the Water Replenishment District of Southern California (WRD) will be initiated regarding water rights and pumping assessment. It is expected that coordination with CDWR and WRD will provide sufficient oversight to prevent environmental impacts due to over-withdrawing groundwater from the project area.

In the event that discharge is expected, the proposed project will require preparation of a Report of Waste Discharge (ROWD), required by the State Water Resources Control Board (SWRCB) for any type of discharge affecting groundwater. This will ensure that any project-related discharges are regulated and therefore would not impact local groundwater.

Significance of Impacts Remaining After Mitigation

The mitigation measures would reduce impacts on water resources to less than significant.

4.19.2.16 Natural Resources and Ecosystems

Impacts

No sensitive plant communities or suitable habitat for sensitive plants or wildlife species occurs within the Los Angeles Eastside Corridor. Therefore, construction of the LRT Build Alternative, and its two options, are not expected to adversely affect any sensitive plants and plant communities. Construction activities along the Los Angeles Eastside Corridor are not expected to modify or affect any Corps or CDFG jurisdictional waters. An effort should be made to limit construction-related debris and sediment from entering nearby storm drains or the Los Angeles River.

Seismic retrofit work will be performed on the 1st Street Bridge within the Los Angeles River channel as part of the project. This construction may result in temporary impacts on the Los Angeles River.

Although no habitats or species are identified as occurring in the Los Angeles River at this location, impacts on surface water quality may result in potentially significant biological impacts downriver.

Significance of Impacts

There may be potentially significant impacts on biological resources associated with seismic retrofitting construction activities in the Los Angeles River channel.

Mitigation

1st Street Bridge retrofit work will be limited to the dry season in accordance with the COE and CDFG permitting procedures. Construction will also require close coordination with the COE, CDFG, and the Los Angeles Flood Control District. The COE may require mitigation in order to comply with Section 404 of the Clean Water Act. The RWQCB may require mitigation for clearance under Section 401 of the Clean Water Act. The CDFG may also require mitigation to comply with Section 1600 of the California Fish and Game Code. Construction in the dry season and compliance with the requirements of these regulations would result in avoidance of significant impacts.

Significance of Impacts Remaining After Mitigation

The mitigation measures would reduce impacts to less than significant.

4.19.2.17 Utilities

Impacts

Construction of the trackway, stations, subway and other facilities will require relocating, abandoning or otherwise avoiding utilities. Some of the impacts may potentially be significant due to added costs, disruption of service or temporary loss of access. These include relocation of utility poles supporting overhead lines and street lights; relocation of underground utilities from the track zone, station areas, subway tunneling and maintenance facility site; and inspection, repairs and encasement of underground utilities at track crossings. In cases where utilities that occupy the right-of-way pose a safety hazard or conflict with construction activities, lines may be relocated before construction.

The approximate locations of subsurface and overhead utility lines are being identified as part of preliminary engineering in accordance with MTA's System Design Criteria and Standards Volumes I through IV. Utilities include facilities belonging to government agencies, public utility corporations, and privately owned companies for the provision of sewer, water, storm drain, gas, electrical, telephone, telegraph, cable television, street lighting, pipelines, alarm systems and parking meters.

Construction of the LRT project will involve extensive renovation and construction in the streets along which the route travels. At the subway portion of the alignment, tunneling will occur. Underground utilities may be affected by these construction activities. Every effort will be made to cross utilities at 90 degrees and to position utilities that run longitudinally to the track a minimum of ten feet from the centerline of the track to the edge of the pipe. Additionally, tone wires will be attached to all non-metallic centerline utilities pipes or casings and will be terminated within the right-of-way to help in field locating buried pipes. All abandoned pipes beneath the trackbed will be filled with sand or slurry concrete and plugged. Similar type requirements will be developed for the relocation of any affected overhead utilities. Those overhead utilities in conflict with train operations will be raised to provide the required separation to the overhead contact system.

Significance of Impacts

Many of the construction-related impacts on utilities are potentially significant impacts.

Mitigation

MTA or their contractors will minimize impacts due to temporary utility service interruptions during construction by carefully scheduling the occasional interruptions and notifying affected properties prior to service interruptions. One or more of the following mitigation measures will be used to minimize the potential effects of disruption of utility service during project construction. All measures taken will follow MTA Design Criteria and Standards (Volumes I through IV), and applicable utility standards and criteria or best industry practices.

- Maintain and protect existing utilities in place during construction;
- Provide temporary connection for services that must be disconnected for extended periods of time;
- Maintain existing service as long as reasonably possible;
- Notify users well in advance of any anticipated service disruption and coordinate with the utility owner's convenient times for necessary service outages;
- Monitor the project's contractors as part of construction management/oversight and include terms in construction contracts that encourage contractors to actively seek to avoid accidental disruption of service;
- Coordinate the schedules of multiple utility rearrangements in order to minimize negative impacts on users;
- Develop a contingency plan in cooperation with the utility providers for emergency repairs of any utilities unexpectedly found or that disintegrated because of age during excavations;
- Adjust portions of the alignment of station locations, where feasible, to prevent a major utility relocation;
- Comply with the City of Los Angeles and the County of Los Angeles on procedures for utility construction, inspection, and operation; and
- Use pipe and conduit support systems, trench sheeting and shoring, and other precautionary measures during construction to minimize the potential for damage to exposed utilities.

Significance of Impacts Remaining After Mitigation

After the mitigation measures are adopted, the construction-related utility impacts would be reduced to a level that is less than significant.

4.19.2.18 Energy

Impacts

The LRT Build Alternative would result in the one-time, non-recoverable energy costs associated with subway tunneling, construction of trackwork, systems/equipment, transportation-related facilities (stations, maintenance facilities), and vehicles. Facility-related energy would account for energy consumed during the production of construction materials used in new construction and maintenance and construction of the LRT Build Alternative including structures. Short-term use of oil, gas, and electricity for construction would reduce the overall amount of fossil fuels used within the area, region, and state. Construction of the LRT Build Alternative would not result in a significant impact under CEQA to the availability of fossil fuels or electricity within the region or the state given the current and projected available resources.

Significance of Impacts

Impacts would not be significant.

Mitigation

No mitigation is required. However, through implementation of standard construction practices and techniques, fossil fuels and electricity would not be used in a wasteful or inefficient manner. MTA will work with the local solid waste vendors to investigate methods of minimizing construction and demolition waste, including recycling options. MTA will comply with all federal, state, and local requirements for separation of differing standards of waste materials. During design and construction of the LRT Build Alternative, the MTA procurement department will comply with the requirements of Resource Conservation and Recovery Act (RCRA) Section 6002 (EPA's Buy-Recycled program) where technically feasible and appropriate. The MTA will strive to incorporate the latest Comprehensive Procurement Guide (CPG) listings of recycled or re-used materials applicable to construction, landscaping, and transportation products used on the LRT Build Alternative. Procurement decisions regarding RCRA Section 6002 compliance will consider the price of designated items made with recovered materials versus typical products, the competition base of recovered goods suppliers, unusual and unreasonable delays for procurement of products, and the compliance of recovered and/or recycled goods with MTA design criteria for the LRT Build Alternative.

4.19.2.19 Safety and Security

Impacts

Accidents and Safety

Construction of the LRT at-grade alignment and subway will require a number of activities that could impact public safety. These include:

- Intensive construction activity in the center of streets along the LRT route at the location of the stations where the alignment is at the level of the street;
- Shallow excavation and construction activity along the centerline of streets along the LRT route between stations to install track and power facilities;
- Activities at the location of staging and storage of construction equipment and materials;
- Movement of construction equipment and materials between staging and storage areas and the areas of construction;
- Heavy excavation activities at the portals and along the portion of the LRT route which is below the level of the street; and
- Transport of debris from tunnel excavation along the haul route to the point that trucks enter the freeway and depart the community.

The impacts of Options A and B are similar, with the exception that the three at-grade station area changes associated with each option would result in changes to locations (not severity of impacts) where construction activity would occur in the vicinity of the stations. If Ramona High School is relocated (if this is the course of action to be taken), under Option B then construction of the LRT would have no impact on students and faculty because the relocation will be completed prior to LRT construction. However, if the school is reconstructed at the current site, then impacts will be significant unless

mitigation measures are taken. The impact of construction of the LRT system on public safety is significant.

Security and Crime Prevention

The potential adverse impacts on emergency response (medical, police, and fire) during construction relates to detours, street closures, increased traffic near emergency facilities and staging plans. Unless special provisions are in place prior to construction, these impacts could be potentially significant. Construction equipment will be stored at construction sites and staging areas close to the LRT alignment. If such areas were not adequately secured, or became attractive nuisances, they could attract individuals who might steal equipment or create other difficulties. Such a result could be considered significant.

In order to prevent people from gaining access to construction sites and thus subjecting themselves to potential injury, a chain link fence will typically enclose the sites. The fence will be new, solid, and of good quality security fencing that, if possible, will have low visual impact. Where fencing is not possible, holes, trenches or other potentially dangerous features will be barricaded. Where the construction activity would be adjacent to a sidewalk which cannot be closed, shields will be constructed to prevent falling objects from hitting pedestrians. Security lighting will be provided for emergency response around construction zones. The City of LA will require standard lighting levels for detour roadways through and around construction zones. One result of almost any kind of construction operation is that people have a tendency to stop and observe. Cars passing the site would slow possibly resulting in a traffic hazard if no mitigation measures are taken.

The impacts of Options A and B are similar, with the exception that the three at-grade station area changes associated with each option would result in changes to locations (not severity of impacts) where construction activity would occur in the vicinity of the stations. If Ramona High School is relocated (if this is the course of action to be taken), then construction of the LRT would have no impact on students and faculty because the relocation will be completed prior to LRT construction. However, if the school is reconstructed at the current site, then impacts will be potentially significant unless mitigation measures are taken.

Fire Service and Emergency Response

Potential adverse impacts on emergency response (medical, police and fire) during construction may be caused by detours, street closures, increased traffic congestion and construction staging activities. Unless special provisions are in place prior to construction, these impacts could be considered significant.

Significance of Impacts

With regard to accidents and safety issues and fire service and emergency response, impacts would be significant without mitigation. Construction-related impacts with regard to security and crime prevention are potentially significant impacts.

Mitigation

Accidents and Safety

Construction sites, especially those located in residential areas or near schools, will receive particular attention to ensure that the sites are not attractive to children. Local agencies that specialize in safety and security will review final designs to ensure the inclusion of appropriate safety features. The project will

be required to meet MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX.

- MTA will develop Worksite Traffic Control Plans in cooperation with the Los Angeles Department of Transportation (LADOT) and Los Angeles County Department of Public Works (DPW) to accommodate required pedestrian and traffic movements. The plans will be subject to those agencies' approvals based on their established criteria. LAUSD will be invited to participate as part of MTA's Third Party Coordination Group to develop the plans prior to approval by LADOT and DPW;
- LAUSD, as well as LADOT and the County DPW, will be invited to participate as part of MTA's Third Party Coordination Group to ensure safe and convenient pedestrian routes to schools are maintained, including the publication and distribution of school pedestrian route maps;
- MTA will provide sufficient notices to forewarn children and parents when school pedestrian routes are affected;
- MTA or their designated contractor will coordinate with and notify the LAUSD, to the fullest extent possible, the scheduling planned for LRT construction. With regard to hauling scheduling, LADOT and DPW are responsible for determining haul routes and times. However, most of the excavated rock and soil materials from the tunneling operation will be removed at the construction staging area near the intersection of 1st Street/Boyle Avenue. The haul trucks will be routed along the on- and off-ramps of the nearby US 101 freeway, and impacts on sensitive uses in the project area will, therefore, be minimized;
- As part of the stipulations of the construction contract, the contractor will not allow construction vehicles to stage or park along streets bordering school sites unless they contain vehicle-mounted machinery actively in use as part of construction while the vehicle is parked. Vehicles used to transport construction workers will be required to park elsewhere. The adequacy of these provisions will be reviewed with the LAUSD School Traffic and Safety Department.
- The construction contractor will be required to maintain access to community facilities affected by construction activities;
- MTA will install appropriate traffic controls (signs and signals) as needed in conformance with LADOT, County DPW, HDM, MUTCD, and PUC standards to ensure pedestrian and vehicular safety during construction
- MTA will provide at no charge to the Los Angeles Unified School District**,** as well as neighborhood senior centers upon request, an instructional safety program that will cover safety issues relative to construction of the LRT project.
- MTA will notify the LAUSD of impending impacts on existing school bus routes;
- MTA will inform the public, including LAUSD, of bus stops that are to be abandoned or changed during or after construction of the LRT line;
- Construction will generally occur between the hours of 7:00 AM and 10:00 PM. Construction will not cease during school arrival and departure times. However, the contractor will be required to inform their workers of the need to be especially cognizant of school children and others in the vicinity of the schools while they are performing their work;
- MTA will provide the funding for crossing guards in the vicinity of all construction sites and haul routes as warranted in accordance with criterion contained in the *California DOT Traffic Manual, Chapter 10-07.3, Warrants for Adult Crossing Guards*. Where the manual criterion does not warrant placement of crossing guards, MTA may provide crossing guards during school hours on a site-specific basis considering the conditions and criterion stated in the manual. MTA will provide crossing guards during school hours during construction, where related lane closures will divert traffic to residential streets utilized by elementary and middle school students;
- The construction contractor will be responsible for providing flag persons at construction sites and construction staging areas, as needed, where construction activities compromise the safety of pedestrians and/or motorists while traveling to and from school;

- The contractors will be required, in conformance with provisions in the California Vehicle Code, to inform their drivers that they must drive cautiously in areas with concentrations of school children and must stop when they encounter school buses using red flashing lights; and
- The contractor will be responsible for providing security at construction sites at a level that MTA determines to be appropriate in accordance with MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX. In addition to the strategies previously discussed, other measures could include: use of security patrols at construction staging and construction sites; installation of temporary fencing around material laydown, subway excavation, and station sites; installation of screening to block construction site views from motorists' to avoid distraction; and installation of appropriate signing and lighting as required by LADOT and DPW.
- The MTA's Public Affairs Officers will be administering a construction impact program for the benefit of the community (as described in Section 4.19.2.1) that will provide consultation to those potentially affected by safety and security issues during construction.

Temporary fencing that may need to be installed will be of good quality, capable of supporting the accidental application of the weight of an adult without collapse or major deformation. All at grade construction sites will be enclosed by new chain link fence. The fence will have horizontal top pipe above, below, and in the middle of the chain link mesh. All chain link fence will be wrapped in new green plastic glare reduction plastic commonly used on tennis courts or MTA-approved equal. All underground station perimeter fence designs will include MTA-approved gates with locks. Where major streets must be fenced, business owners will 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 artwork (e.g., by local students) on the surfaces. Where feasible and approved by local neighbors and businesses, chain link fences will be planted with vines to minimize visual impact during the construction period. Covered walkways will be installed at locations where fencing is up and must contain work.

MTA security will normally be located at construction site access points. Temporary fencing or screens will be modified at construction site access driveways to provide visibility between pedestrians and vehicles, and flag persons will be provided as required by LADOT. MTA will follow a strict construction methods manual developed as part of the Final SEIS/SEIR, which includes the use of flaggers, cones, and flashing lights, among other items, to enhance safety within the areas of construction.

The above mitigation measures apply to both Options A and B. In addition, under Option B, LRT track and station construction will occur on Ramona High School property. Particular attention to safety issues will be taken if the school is reconstructed on the existing site. Measures to be taken under these circumstances will include:

- The construction contractor will either provide: 1) fencing or other suitable barriers around the Eastside Corridor LRT off-street construction site between 1st and 3rd Streets; or 2) a security patrol in the area that will provide security services during normal school hours; and
- MTA will make available a MTA staff person or construction contractor representative who will keep the school administrator informed about ongoing and planned construction activities in the vicinity and will act as a liaison between the high school and the construction contractor regarding safety issues, as well as other issues, that may arise.

Security and Crime Prevention

The following mitigation measures will minimize criminal activities and maintain security:

- The contractor will be responsible for providing barriers at subway excavation and material laydown sites, as needed, to minimize trespassing, vandalism, and short-cut attractions. The LRT surface-running sections will involve mostly shallow excavation in the street rights-of-way. For these areas, as well as at all construction sites as applicable, such measures as the following will be taken by the contractor to increase safety during construction: secure tools and small parts during non-work hours; cover small, but deep excavations with heavy metal plates during non-work hours; and maintain tidy work sites at all times. Measures will be taken to conform to MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX.
- The contractor will be responsible for providing security at construction sites at a level that MTA determines to be appropriate in accordance with MTA Rail Transit Design Criteria and Standards, Fire/Life Safety Criteria, Volume IX. In addition to the strategies previously discussed, other measures could include: use of security patrols; installation of temporary fencing around material laydown, subway excavation, and station sites; installation of screening to block construction site views from motorists' to avoid distraction; and installation of appropriate signing and lighting as required, including providing temporary street and pedestrian lighting at all times during the construction phase.
- The contractor will be required to use equipment and facilities that are vandal and graffiti resistant to the extent possible. Graffiti will be removed within 24 hours at construction sites, facilities under construction, and from equipment.
- Citations with fines will be issued for trespassing on construction sites.
- Newsletters will be prepared and distributed to keep the public informed about safety issues during construction. In addition, information booths will be provided at local community events.
- Visibility of surrounding areas will be maintained to the extent possible to minimize the potential for crime.

The above mitigation measures apply to both Options A and B. In addition, under Option B, LRT track and station construction will occur on Ramona High School property. Particular attention to security and crime prevention issues will be taken if the school is reconstructed on the existing site. Measures to be taken under these circumstances will include the same described in the mitigation for accidents and safety issues.

Fire Service and Emergency Response

The impact of construction of the LRT system on emergency services will be mitigated by use of best practices of the construction industry. Construction staging/detour plans for the LRT Build Alternative will be reviewed with the appropriate emergency service providers and medical facilities prior to construction. The plans will be developed to satisfy their criteria/standards. MTA will provide sufficient advance notice to the emergency service providers of road and lane closures to ensure a minimum of service disruption. Requirements to maintain uninterrupted emergency vehicle access will be included in construction contract specifications. At the location of construction, proper control will be required from the contractor. All sites will have flag persons to control traffic speed and to warn of dangers. In addition:

- To satisfy LA Fire Department criteria, a minimum residual water pressure of 20 pounds per square inch is to remain in the water system, with the required gallons per minute flowing. The required fire-flow for this project has been set at 4,000 GPM from four fire hydrants flowing simultaneously.
- During any demolition activities, the Fire Department access will remain clear and unobstructed.
- Adequate public and private fire hydrants shall be required in accordance with City of Los Angeles and Los Angeles County standards.

- When the subway tunnel is under construction or major repair, all portions of the California Administration Code Industrial Relations Title 8, Sub 20, Tunnel Safety Orders shall be adhered to.
- In order to mitigate impact of street closures to an acceptable level, the LA Fire Department must know about access to street, fire hydrants, or structures. The construction contractor will be required to notify the LA Fire Department's Operations Control Dispatch Section regarding changes.
- The proposed project will comply with all applicable State and local codes and ordinances, and the guidelines found in the Fire Protection and Fire Prevention Plan, as well as the Safety Plan, both of which are elements of the General Plan of the City of LA CPC 19708.

A fire chief from each of the Los Angeles City and County Fire Departments will be on-hand to ensure the project meets all City and County Codes.

Significance of Impacts Remaining After Mitigation

With mitigation, safety and security impacts would be reduced to less than significant.

4.20 MAINTENANCE AND STORAGE FACILITIES YARD LEAD

4.20.1 Introduction

The existing Red Line maintenance yard will be used for the Maintenance and Storage Facility (M&SF) for the Eastside Corridor LRT. Excess capacity currently exists at the yard and is available to provide the needed facilities. The site was previously environmentally cleared for the Metro Red Line in the *Final Environmental Impact Statement, Los Angeles Rail Rapid Transit Project, Metro Rail*, USDOT, UMTA, and Southern California Rapid Transit District, December 1983. Chapter 2, *Alternatives Considered*, provides additional information regarding use of the Red Line M&SF for the Eastside Corridor LRT project. This section evaluates the impacts of the dual lead tracks that branch off of the LRT mainline at Alameda/Ducommun since this alignment was not a part of the existing Red Line maintenance yard project. Mitigation is also specified as appropriate. The lead tracks travel eastward on Ducommun Street from Alameda Street to a point just east of Center Street where it will turn and traverse in a northeasterly direction for a short distance to the point where it enters the Red Line maintenance yard. At this point, the lead tracks turn south and continue into the yard. Figure 2-5 in Chapter 2 and Appendix E, Sheets C-101 through C-110, show the yard lead alignment.

The following categories of impacts were considered in the evaluation: (1) traffic; (2) parking; (3) land use and development; (4) economic and fiscal; (5) land acquisition/displacements/relocations; (6) communities/neighborhoods; (7) visual and aesthetics; (8) air quality; (9) noise and vibration; (10) geologic and seismic conditions; (11) hazardous materials; (12) water resources; (13) natural resources and ecosystems; (14) energy; (15) safety and security; (16) historic/archaeological; (17) paleontological; (18) community facilities/parklands; (19) Section 4(f); and (20) utilities.

4.20.2 Traffic

All curb parking along Ducommun Street will be eliminated, and right turn access (especially trucks) to and from driveways and intersecting streets may be constricted when turning to or from the 11.5-foot curb lane. LRT operations along Ducommun Street will be much less frequent than along the LRT mainline since the track on Ducommun Street will be used only for light rail vehicles to access the M&SF. The trains will run with mixed flow; therefore, left turns will be acceptable.

Access to businesses along the Eastside Corridor right-of-way will be maintained. Delivery trucks will be able to access businesses via right-hand turns. There may be restrictions during certain hours. However, deliveries to local businesses will not be significantly impacted by the operation of the LRT on Ducommun Street due to the infrequency of LRT operations on this street. Right-hand turns are not expected to be a problem due to the design of the lead tracks allowing for mixed-flow traffic, and the entire width of the street will be available for truck turning movements.

A three-way track junction at Alameda Street and 90° turns at Center Street will require special traffic control including additional Alameda Street and Center Street signals and stop bar setbacks to prevent traffic from blocking the LRT turning movement path. Lead track crossings of Vignes Street and Center Street must be signalized to accommodate important street traffic movements, since these streets feed traffic to and under the 101 Freeway, respectively.

After the implementation of the aforementioned mitigation measures, the impacts on traffic during operations are considered less than significant under CEQA.

Construction of the LRT lead tracks will temporarily interfere with the normal flow of traffic. In order to minimize construction impacts, some streets will be subject to partial lane and total nighttime closures.

If needed, full closures will be scheduled during overnight hours and coordinated with the appropriate agencies. Site and street specific Worksite Traffic Control Plans will be developed in cooperation with the City of Los Angeles Department of Transportation (LADOT) and Los Angeles County to accommodate required pedestrian and traffic movements. These plans will be prepared using LADOT and MTA criteria. To the extent practical, traffic lanes will be maintained in both directions, particularly during peak traffic hours. Access to businesses will be maintained throughout the construction period. During utility relocation, it may be necessary to occupy additional traffic lanes at one time. It is possible that in some instances, block-long sections of streets will be closed temporarily for utility relocation and guideway construction. Pedestrian access (sidewalks) will remain open, although in some instances, portions of the sidewalks may be closed temporarily for decking construction. Temporary night sidewalk closures may be necessary in some locations for the delivery of oversized materials. Special facilities, such as handrails, fences, and walkways will be provided for the safety of pedestrians.

Minor cross streets and alleyways may also be temporarily closed but access to adjacent properties will be maintained. Major cross streets will require partial closure, half of the street at a time, while relocating utilities and constructing the light rail trackbed. Depending on allowable working hours, full blocks may require closures during excavation, preparation of subgrade, and track foundations placement. Where streets are not fully closed, one-way traffic will be allowed on half of the street. After the trackbed is constructed across a local street and the roadway is restored to its permanent condition, vehicles can resume original traffic patterns.

4.20.3 Parking

All 97 curb parking spaces will be eliminated on Ducommun Street. A windshield survey taken on a representative weekday identified approximately 70% usage of the spaces. Parking will remain available on adjacent streets. To mitigate for the parking losses, MTA will develop a metered parking lot on the northwest corner, and also possibly the northeast corner, of Ducommun and Garey Streets in the parcels that will be acquired for the project. This lot will be administered by LADOT in a manner similar to that of the metered curb parking currently in place. In addition, the remaining property to be acquired at Commercial/Alameda will also be used for replacement parking. See Section 4.20.6 for more information about the property acquisitions. After these mitigations are implemented, no significant parking impacts will remain on Ducommun Street.

Regarding construction phase impacts, the width of the streets along the LRT alignment largely determine whether curb parking spaces will be removed and during which time period during the day. All curb parking will be eliminated on Ducommun Street to allow for the construction of the dual track LRT alignment. The impacts during construction are considered significant under CEQA. To minimize parking impacts, contractors will be required to have all employees park off-street at MTA approved locations to minimize the loss of crucial commercial parking. The contractor will be required to lease parking lots for construction employees if necessary. A parking mitigation plan will be developed to the standards of, and reviewed by, LADOT prior to construction to minimize impacts on curb parking. It may be possible to sequence construction activities so that multiple blocks of on-street parking are not temporarily removed at one time. This will make various on-street parking spaces available in an area under construction for a period of time. Some of the parking mitigation measures outlined in the parking discussion in Chapter 3 will be developed early so that they may be utilized during the period of construction. The lot proposed at Ducommun/Garey will be developed prior to beginning construction on Ducommun Street in order to mitigate lost parking. After the implementation of the planned mitigation measures, construction period parking impacts are considered potentially significant under CEQA.

4.20.4 Land Use and Development

Construction and operation of the M&SF lead track would be compatible with plans or policies of the Central City North Community Plan, because it would be implemented among other industrial, commercial, and rail-related land uses. While construction would result in delaying traffic at times, less than significant impacts are anticipated due to their temporary duration. The lead track would result in one business displacement (commercial manufacturing use, designated "Commercial"). The commercial manufacturing displacement would be a less than significant land use impact, as there are other similar land uses in the vicinity. The lead track would not be located within a redevelopment area. No impacts are anticipated in the Empowerment specialized zone, as the lead track would not interfere with financing, "brownfields" deductions, or other city-aided business promotion programs supported in the Empowerment Zone. Because there are no significant impacts on land use and development, no mitigation measures are required.

4.20.5 Economic and Fiscal

The M&SF yard lead would result in displacing one business: a warehouse in an industrial area at the corner of Garey and Ducommun Streets. Although this business would result in employment reductions, long-term employment would increase due to the operation of the LRT Build Alternative associated with transit oriented development, LRT operations and maintenance, and other project-spurred employment growth. Thus, there would be less than significant long-term employment impacts. There would be no impacts on fire and police services associated with the yard lead.

4.20.6 Land Acquisition/Displacements/Relocations

One warehouse would be displaced at the northeast corner of Ducommun/Garey, part of a vacant lot would be acquired at the northwest corner of Ducommun/Garey, and there would be a partial take of an impound lot at Ducommun Street near Center Street. Reconfiguration of the impound lot will result in less than significant impacts on that business. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, mandates that certain relocation services and payments by MTA be made available to businesses displaced by construction and operation of MTA transit-related projects. Section 4.3.4 provides additional information about the Act. Implementation of the provisions of the Act will result in less than significant impacts on the displaced business.

4.20.7 Communities/Neighborhoods

The criteria considered to determine impacts includes: (1) substantial growth inducement; (2) displacement of a large number of businesses or residents; (3) substantial alteration of location, distribution, density, or growth rate of population in a manner inconsistent with public policy; and (4) disruption of neighborhood access or isolation of a portion of a neighborhood. The lead track to the M&SF, which will be located in an industrial area, will not result in adverse impacts on neighborhoods with regard to the criteria evaluated. There will be no residential displacements, one business displacement, and partial takes of one business and one vacant lot. The lead track will not disrupt neighborhood access, nor will it isolate any portion of existing neighborhoods. The impacts on neighborhoods are not significant, and no mitigation is required.

4.20.8 Visual and Aesthetics

The M&SF lead track would result in demolition of an industrial building. Other physical changes would include trackwork and the overhead catenary system along the yard lead alignment. The removal of the industrial structure would not result in a significant visual impact because the surrounding parcels are also

industrial. The street-level trackwork and the overhead catenary system would not result in significant visual impacts to the surrounding viewers because the streets are relatively wide and most of the surrounding land uses are industrial. There are no important visual resources in proximity to the yard lead. Therefore, there would be no visual impact related to important visual resources. No visual resource policies (see Section 4.6) apply to the yard lead. Therefore, there would be no visual impact related to visual resource policies. The yard lead would not introduce new light, shade, or shadow elements. Glare from headlamps would be a factor where the yard lead would turn at Center Street, but the surrounding uses are industrial, so no visual impacts would occur. The yard lead would not introduce new opportunities for graffiti, so no visual impacts would occur. Because there are no significant impacts, no mitigation measures are required.

4.20.9 Air Quality

No adverse impacts on air quality are expected during LRT operations. Similar to the LRT mainline, emissions would be generated from the following construction activities: 1) demolition of one building; 2) welding related to continuously welded rail (CWR) operations; 3) mobile emissions related to construction worker travel to and from project sites; 4) mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites; and 5) stationary emissions related to fuel consumption by on-site construction equipment. Construction emissions related to these activities were considered in the air quality analysis presented in Section 4.19.2.6. The mitigation measures discussed in that section also apply to the yard lead portion of the project.

4.20.10 Noise and Vibration

The existing buildings along the yard lead alignment are all industrial uses with no noise-sensitive receivers with the exception of one company, Heet Sound Products, a light manufacturing and recording business. This company conducts audio recordings during times when the existing daytime noise levels are at their lowest, after 4 p.m. and on the weekends. The movement of LRT vehicles along the yard lead could potentially impact their operations depending on the number of trains and time of day this would occur. The potential vibration impact on the recording studio will be based on meeting the MTA Systemwide Criteria for maximum ground-borne vibration in studios of 65 VdB. However, since there is no information at this time as to the location of the studio within the building or the construction of the room containing the studio, no assessment of vibration impact can be made. Further study will be conducted in coordination with the owners of Heet Sound Products to complete the vibration analysis. If it is determined that train operations will impact the recording studio, then vibration control measures will be provided to mitigate the ground vibration to a level where they will meet the MTA Systemwide Criteria for maximum ground-borne vibration in studios of 65 VdB. These measures will consist of either an elastomeric trackwork isolation mat installed under the embedded trackwork along Ducommun Street, or vibration isolation of the recording studio using a floating room design with floor, walls and ceiling supported on vibration isolators. Therefore, vibration levels will be fully mitigated to a level of no significance.

4.20.11 Geologic and Seismic Conditions

Near-surface soils are moderately corrosive to metals and moderately deleterious to concrete. Accordingly, the corrosivity of subsurface materials is anticipated to have a potentially significant impact under CEQA. Concrete resistant to moderate sulfate exposure and corrosion protection for metals will be used for new planned structures reducing impacts to a level that is less than significant. Groundwater is expected to be approximately 30 to 45 feet below existing grade and is not expected to have an impact under CEQA. Like the other portions of the LRT project, the lead track alignment could be subject to significant ground shaking as a result of earthquakes on any of the documented or undocumented nearby

active or potentially active faults. The alignment in relation to known active or potentially active faults indicates that the site is not exposed to a greater seismic risk than other sites in Southern California. The elements of the project will be designed in accordance with MTA's System Design Criteria and Standards, Volumes I through IV, and current building codes and standard engineering practices. This will reduce potential ground shaking impacts to a level of insignificance. The potential for liquefaction, seismically-induced settlement, and subsidence are not anticipated to be major issues. It is unlikely that construction activity will encounter subsurface gases because the lead tracks will be at grade. The project will not result in the loss of potential mineral resources. The potential for surface fault rupture due to fault plane displacement propagating to the surface across the lead track alignment is considered low. The yard lead is not located within an area identified as having a potential for seismic slope instability, and there have been no known landslides in the vicinity. Therefore, slope instability is not anticipated to have a significant impact under CEQA.

4.20.12 Hazardous Materials

No evidence of subsurface gases was noted along the at-grade portions of the LRT Build Alignment (Group Delta Consultants, 2001). Although the yard lead is located within the Union Station Oil Field; based on the explorations and monitoring to date, it is unlikely that construction activities will encounter contamination. The potential for encountering contamination between exploration locations during construction is possible but is highly contingent upon the depth of excavation required. No excavations deep enough to impact groundwater are planned. Construction of new at-grade tracks will require only shallow excavation; therefore, the likelihood of encountering contamination is considered low. Nonetheless, considering that the yard lead is located in an area with a long industrial history and is within the Union Station oil field, encountering soil contamination is a potentially significant impact under CEQA. Remediation activities, if necessary, will be similar to those described in Section 4.19.2.14. With the implementation of mitigation efforts, no significant impacts will remain that would affect the proposed construction activities for the lead track.

4.20.13 Water Resources

Operation of the M&SF lead track would not result in creating new impervious surfaces, nor significantly increase water runoff or associated contaminants. Although daily operations of the track and trains may result in some petroleum-based contaminants leaking on the track surface, this is relatively negligible and will be mitigated by implementation of the project's Storm Water Pollution Prevention Plan (SWPPP). Construction of the lead track is not anticipated to result in increased sediment sources on the storm water and/or surface water systems, nor would it increase impervious surfaces associated with construction staging. Operation and construction of the lead track would not result in impacts to the Los Angeles River 100-year floodplain or any other floodplains, as it would not be located within these areas. Operation and construction of the lead track would result in no groundwater contamination or supply impacts to the regional groundwater aquifers, as it would not increase impervious surfaces, result in contaminated runoff eventually leading to groundwater, or involve excavation that would directly threaten groundwater quality. Although less than significant impacts on water resources are anticipated with the construction and operation of the lead track, mitigation for the entire project, as discussed in Sections 4.11.4 and 4.19.2.15, will be implemented.

4.20.14 Natural Resources and Ecosystems

No impacts are anticipated on vegetation, wildlife or on jurisdictional waters as a result of construction and operation of the yard lead. Therefore, no mitigation measures are required.

4.20.15 Energy

Operation of the lead track would not result in significantly increasing the regional energy consumption resulting from implementation of the entire LRT Build Alternative (see Section 4.13 for more information). Overall, the LRT Build Alternative would have a slightly higher annual operational energy consumption (about 27,460 barrels of crude oil) compared to the No-Build Alternative. This is considered a less than significant energy consumption impact. Construction of the lead track would result in the one-time, non-recoverable energy costs associated with construction of trackwork, systems/equipment, vehicles, and other lead track-related functions. Facility-related energy would account for energy consumed during the production of construction materials used in new construction and maintenance and construction of the LRT Build Alternative including structures. Short-term use of oil, gas, and electricity for construction would unsubstantially reduce the overall amount of fossil fuels used within the area, region, and state. As with the entire LRT project, schedule coordination and modal interface between LRT, commuter rail, and local buses will be optimized to conserve energy. Furthermore, every aspect of station design will be reviewed to minimize lighting, heating, ventilating and air conditioning loads. Passenger areas within stations will be designed so that lights can be turned off during off-service hours. Cold water, instead of warm water, will be used to wash the vehicles. The track layout will be designed to minimize non-revenue vehicle movements. All major facilities, except the car washing facility, will have electric meters to monitor energy consumption and conservation. Through implementation of standard construction practices and techniques, fossil fuels and electricity will not be used in a wasteful or inefficient manner.

4.20.16 Safety and Security

The accident and safety, security and crime prevention, and fire services and emergency response impacts during both operation and construction will be similar to those cited in Sections 4.14.3 and 4.19.2.19, respectively. However, the magnitude of potential impacts will be less due to the shorter track length and because the LRT will operate much less frequently along the lead track than along the revenue mainline track. In addition, the lead track runs through a commercial/industrial area where there are few pedestrians and little through traffic. The main concern regards potential conflicts of the light rail vehicles during operations and activities during construction with delivery trucks operating in the area. The impacts are potentially significant. The mitigation measures presented in Sections 4.14.4 and 4.19.2.19 will also apply to the lead track portion of the project. However, because no schools are in the vicinity of the lead track, LAUSD will not need to be involved in this part of the project. Also, the mitigation stipulated for the subway segment will not apply to this at-grade portion of the project. With mitigation, these impacts would not be significant.

4.20.17 Historic/Archaeological

No impacts on historic or archaeological resources are anticipated as a result of construction or operation of the yard lead. Refer to Section 4.15 regarding potential impacts on the M&SF site itself.

4.20.18 Paleontological

The M&SF lead track segment is underlain by younger alluvium. There will be no potentially significant impact on paleontologic resources as a result of operation of the M&SF lead track segment because there will be no earth-moving activity in previously undisturbed strata. Therefore, no mitigation measures will be necessary. There will be potentially significant impacts as a result of construction of the M&SF lead track segment if and where earth-moving activities occur at least five feet below grade in previously undisturbed strata because of the moderate to high potential for encountering remains old enough to be

considered fossilized. Mitigation measures, if necessary, will be the same as those presented in Section 4.15.4.

4.20.19 Community Facilities/Parklands

There are no parklands or other community facilities in close proximity to the lead track for the M&SF. Therefore, no adverse impacts would occur, and no mitigation is required.

4.20.20 Section 4(f)

There are no Section 4(f) resources in close proximity to the lead track for the M&SF. Therefore, no adverse impacts would occur, and no mitigation is required.

4.20.21 Utilities

The impacts of the lead track during operations and construction will be similar to those cited in Sections 4.18 and 4.19.2.17, respectively. However, the magnitude of potential impacts will be less due to the shorter length of the lead track compared to the LRT mainline track. The strategies to accommodate the LRT lead track to the M&SF and to avoid interference with normal utility operations ensure that no significant impacts will occur during LRT operations. No mitigation measures are required. During construction, many of the construction-related impacts on utilities are potentially significant. The mitigation measures cited in Section 4.19.2.17 will also apply to the lead track construction. After the mitigation measures are adopted, the impacts would be reduced to a level that is less than significant.

4.21 SUMMARY OF IMPACTS

4.21.1 Unavoidable Significant Adverse Impacts

No significant unavoidable adverse impacts under CEQA are expected to occur for the No-Build Alternative. The following environmental impacts may remain significant after mitigation is implemented for Options A and B of the LRT Build Alternative:

- The project will require property acquisition and relocation of residents and businesses. The high housing demand and low vacancy rate in the area may limit the availability of comparable replacement housing resulting in the need for some residents to relocate outside of the Corridor. Likewise, it is possible that some displaced businesses may need to relocate outside the Corridor.
- There will be significant impacts on 12 traffic intersections in the study area under Option A and on ten intersections under Option B. This issue is discussed in Chapter 3.0, *Transportation.*
- The placement of the catenary system on the 1st Street Bridge would add to the visual clutter of overhead lines already in the area possibly affecting sensitive uses around the bridge which cannot be mitigated; however, no adverse effect on the historic features of the bridge is anticipated since the bridge was once used for an earlier street rail system, and the catenary supports will be designed in a manner compatible with the historic character of the viaduct.
- Tunneling during construction of the subway segment or pile driving for the aerial segment may result in destruction of fossils.
- Temporary impacts during construction are possible with regard to parking losses, traffic lane closures, potential bus stop relocations, partial daytime sidewalk closures, total nighttime sidewalk closures, and traffic patterns due to movement of general construction traffic.
- Temporary air quality and noise and vibration impacts are also possible during construction. Visual and aesthetics impacts are possible in the vicinity of the Chavez/Soto construction staging area if screening materials cannot be placed high enough to prevent impacts on surrounding multi-story residential land uses with windows overlooking the construction site or if staging must take place directly below nearby residential windows.
- Buildings that are severely impacted by noise and that are sound insulated will have interior noise levels that will be mitigated to a level of no significance. However, this form of mitigation will not mitigate exterior noise levels at those properties.

4.21.2 Impacts Found Not to be Significant

The following impact areas were found not to be significant or are beneficial under CEQA and require no mitigation:

- Economic and fiscal
- Air quality during operations
- Energy
- Floodplains
- Utilities during operations

The following impact areas were found not to be significant after mitigation is implemented:

- Land use and development
- Property acquisition and displacement of businesses and residents, with the possible exception if residents and businesses cannot find adequate replacement facilities within the Corridor.

- Visual and aesthetics with the possible exception of impacts on the 1st Street Bridge and on the neighborhood surrounding the Chavez/Soto construction staging area
- Noise and vibration during operations, with the exception of exterior noise levels for properties that will be sound insulated because of severe noise impacts
- Geologic/seismic issues
- Hazardous materials
- Water resources
- Natural resources and ecosystems
- Safety and security
- Historic and archaeological resources
- Utilities

4.21.3 Cumulative Impacts

Cumulative impacts are the combined effects of independent projects and the Los Angeles Eastside Corridor project on the environment. A listing of recent and future development activity in the study area is provided in Section 4.1, *Land Use and Development*. Cumulative impacts refer to those effects that "…result from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7). The anticipated cumulative impacts of Options A and B are the same, so the discussion of cumulative impacts presented below refers to both Options A and B collectively as the LRT Build Alternative.

4.21.3.1 Land Use and Development

Over the years, numerous freeways have been developed that cross the Corridor, thus dividing the area and altering development patterns. The LRT Build Alternative would tend to integrate communities in the Corridor and encourage transit-oriented development. The LRT Build Alternative would be compatible with local land use plans and policies and, as a result, would further local plan goals and policies within the study area. Construction activities would contribute to community disruptions resulting from other development projects in the area. This may result in a longer duration of noise and dust from construction, and greater traffic delays and traffic obstructions. The combined impact may heighten the perception of disruption experienced by the local community. These impacts may be concentrated in some locations at different times during construction but would diminish as the project concludes, and upon completion would no longer affect the community.

4.21.3.2 Economic and Fiscal Impacts

Over the years, the LRT Build Alternative would have long-term benefits for the communities it traverses and would further goals and policies for revitalization and investment within the study area. The fiscal benefits of operation would have a long-term impact for the communities. The loss of tax revenue would be offset by increased development near stations and along the LRT alignment. The LRT Build Alternative would not result in a cumulative adverse impact during operation and would be economically beneficial to its surrounding communities. Construction activities would contribute to community disruptions resulting from other development projects in the area. This may result in short-term economic impacts on local businesses, but would be temporary. Construction may result in overall beneficial impacts on tax revenues with increases in employment and spending that help offset any short-term economic impacts. Given that construction of the LRT Build Alternative would happen over a period of years and in different phases, impacts on fire and police services from this project and in conjunction with

other development projects in the area may result in short-term cumulative impacts that would be less than significant due to advanced notices on traffic detours and closures.

4.21.3.3 Land Acquisition/Displacement and Relocation

Other properties in the Corridor may be acquired and structures demolished as result of unrelated development projects. For example, between 1990 and 1993, 35 residential units and 11 businesses were demolished in Boyle Heights[13]. In the context of overall demolition activity in the Corridor, including the limited number of residential and commercial displacements resulting from construction of the LRT Build Alternative, these displacements do not represent significant cumulative or growth-inducing impacts.

4.21.3.4 Communities/Neighborhoods

A number of residential, commercial, and community facility projects are being planned for 1st and 3rd Streets along the LRT alignment. If these projects occur simultaneously with light rail construction, without appropriate mitigation, potentially significant cumulative impacts could occur on the surrounding neighborhoods. MTA will coordinate with other jurisdictions and agencies regarding the timing of construction activities for projects affected by or that may affect light rail construction. LADOT and the County DPW will require traffic plans to be developed and implemented to meet their requirements that will take into account construction of not only the LRT project, but other projects in the vicinity that may be simultaneously undergoing construction so that traffic impacts will be minimized to the extent possible.

4.21.3.5 Visual and Aesthetics

The addition of overhead wires related to the catenary system would contribute to existing and cumulative visual clutter in the vicinity of the Eastside Corridor. Otherwise, the project would not contribute to cumulative impacts.

4.21.3.6 Air Quality

The LRT Build Alternative would contribute to an increase in transit ridership, which would in fact reduce criteria pollutant emissions from transportation sources. While the cumulative effect of related projects may result in an overall increase in regional emissions and negative air quality impacts, the LRT Build Alternative would reduce the daily regional emissions of criteria pollutants. The LRT Build Alternative would have a beneficial cumulative effect on regional air quality.

4.21.3.7 Noise and Vibration

Noise levels in the Corridor would be increased by the presence of the LRT Build Alternative since it would involve operating transit vehicles. Some of the other planned projects in the study area would also increase noise because they would result in increased travel. However, the LRT Build Alternative was not found to produce significant adverse impacts after mitigation with the exception of exterior noise levels for those properties where the buildings will be sound insulated. There are no known project locations where related projects would also produce noise increases. The project's level of increased noise after mitigation would not be significant because it would not involve violations of FTA's noise guidelines for severe impacts (with the exception of those few properties where exterior noise levels cannot be fully mitigated) or ground-borne noise and vibration guidelines for impacts. However, the LRT Build Alternative would add to the ambient noise environment in a cumulative sense, although if

[13] City of Los Angeles Building and Safety Department, 1994

projected transit patrons were traveling by private automobile, the likely increase in ambient noise would be greater.

4.21.3.8 Geologic and Seismic Conditions

Seismic hazards may be considered to be cumulative per CEQA. For example, liquefaction is the cumulative impact of shallow groundwater and ground shaking, and seismic settlement is the cumulative impact of loose soils and ground shaking. The geologic and seismic impacts will not be compounded by the LRT Build Alternative and future projects. The primary source of the hazards, the earthquake faults affecting the site, are not and will not be affected by past, current, or future projects. Even geologic impacts that could potentially be affected by projects are also unlikely to be adversely affected because the project area is already developed and densely populated. Future projects that could potentially have an effect on geologic impacts would have to be large-scale projects, such as the LRT Build Alternative, and as such would be required to demonstrate that existing impacts will not be compounded. Accordingly, no cumulative impacts due to multiple projects are anticipated.

4.21.3.9 Hazardous Materials

Although the LRT Build Alternative has the potential to affect or be affected by potentially hazardous waste sites during operation, hazardous contamination was not encountered in explorations and monitoring performed to date in the vicinity of the alignment. Even if some hazardous contamination is encountered between exploration and monitoring locations during construction, proper mitigation will be implemented prior to operation. The operation of the electrically powered LRT vehicles is not expected to introduce hazardous materials to the project area. The proposed operation activities are not likely to present a significant cumulative impact under CEQA. The cumulative impacts which relate to the proposed construction activities are comprised of those impacts from other projects which add to existing hazardous waste (installation of hazardous materials pipelines; facilities of hazardous waste generators; transfer, storage or disposal facilities, etc.); or impacts of the proposed construction activities which add to the amount of existing hazardous waste. The 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 material detection and management practices. Hazardous materials encountered during construction will be removed or treated in place, thus reducing the potential for cumulative impacts.

4.21.3.10 Water Resources

Planned and approved projects in conjunction with the LRT Build Alternative have the possibility of short-term construction-related impacts to surface waters and groundwater. These conditions may exist until the project is completed and/or permanent protective measures are established. All facilities will be constructed pursuant to guidance published in Sections 401, 402, and 404 of the Clean Water Act and will follow the most current guidance within the NPDES program. Best Management Practices (BMPs) will be incorporated, as appropriate.

4.21.3.11 Natural Resources and Ecosystems

The entire study area is entirely within developed portions of Los Angeles County. Because no unmitigated adverse impacts on the natural environment have been identified in this study, construction and operation of the project would not contribute to the cumulative loss of native trees, shrubs, and groundcover, or to the loss of wildlife habitat supported by such vegetation.

4.21.3.12 Energy

The energy conservation measures for the Los Angeles Eastside Corridor, as discussed in Section 4.13, also apply to the other rail transit, bus fleet, and fixed facilities that would serve the entire Los Angeles region. These area-wide conservation measures would conserve large quantities of energy throughout the regional transit network. In addition, the LRT Build Alternative, in coordination with other regional public transportation improvements, would help to reduce dependency on single-occupant vehicles (SOVs). This would in turn reduce fossil fuel energy consumption and improve roadway congestion. Construction of the LRT Build Alternative in combination with other construction projects occurring within the same period and within the region may result in a short-term increase in energy consumption. This would be a temporary effect and given the available energy resources available within the region and state, no significant impact is anticipated. Some of the materials needed to construct the project may not be manufactured within the region or state and would therefore not result in the use of local or statewide energy resources.

4.21.3.13 Safety and Security

The number of vehicular accidents may increase in the Corridor due to the increased number of vehicles traveling to station locations and background growth. The potential cumulative effect of increased vehicle trips in the Corridor may be counterbalanced by a slight mode shift away from autos toward public transportation. This latter effect could be argued to reduce cumulative accident potential, rather than add to it. The addition of new LRT stations may add to the number of locations in the Corridor where crimes could occur. However, the additional activity concentrated around the stations may actually reduce crime. In any case, with proper surveillance, the possible number of increased crimes occurring at such locations is expected to be small. Even with planned development in the Corridor, the magnitude of additional criminal activities is not expected to be significant on a cumulative basis. The LRT Build Alternative could cause a slight increase in demand for additional fire or police personnel. This increase, if it occurs, would be characterized as a cumulative impact, although the magnitude is not considered significant.

4.21.3.14 Historic/Archaeological/Paleontological Resources

All proposed and projected impacts to cultural resources from other projects within all jurisdictions crossed by the LRT alignment have been or will be mitigated through application of CEQA, NEPA, and Section 106 of the National Historic Preservation Act regulations. Therefore, the LRT Build Alternative will not cause a cumulative impact on cultural resources. Construction of this alternative, in combination with other projects in the study area, could contribute to a cumulative loss of fossil remains from the older and younger alluvium that potentially would have been available for future study, a potentially significant impact. However, the mitigation measures discussed in Section 4.15.4 would reduce impacts to an insignificant level.

4.21.3.15 Utilities

A number of other development projects are currently under construction, in the planning stages, or proposed within the vicinity or adjacent to the LRT Build Alternative. To minimize potential cumulative impacts associated with these projects, coordination of all projects with the utility service providers is critical to avoid any temporary or prolonged utility service outage. The utility companies and utility customers should consider planning any service upgrades now at the beginning of these urban renewal projects rather than trying to maintain a patch work utility infrastructure until all the proposed projects are completed. If acceptable to the utility providers, MTA will create a third party arbitrator to facilitate resolution of any disagreements between MTA, major utility companies, and city agencies regarding any

utility issues. The third party arbitrator would rule on utility issues that would affect the LRT Build Alternative project or other development project within the vicinity or adjacent to the LRT Build Alternative. With proper planning and scheduling, potential cumulative impacts would be reduced to a level that is less than significant.

4.21.4 Growth-Inducing Impacts

The LRT Build Alternative, combined with other projects in the area, would improve transportation service and could promote opportunities for new development. Station locations would be the most likely areas where future growth could occur. The proposed project alignment already has several transit-oriented characteristics and uses that provide a strong base for future LRT service, and existing local policies promote transit improvements in the area. Provision of the proposed project would be consistent with goals and policies for transit service and redevelopment and revitalization locally. However, much of the adjacent project area is currently developed which may limit opportunities for additional infill. To the extent that measures to promote revitalization efforts are successful, new growth resulting from the proposed project is likely to be directed to areas most suitable for more intense land uses and is likely to occur in the form of high density, multi-unit development. This is a beneficial impact as it helps the community realize their revitalization goals. With regard to the Central Business District and Union Station, the Los Angeles Community Redevelopment Agency (CRA)[14] has indicated that the Central Business District and Union Station would be minimally affected with respect to inducing further development because there are already several modes of transportation in the area, and a new one would have little additional effects. The Little Tokyo District, however, would benefit from moderate induced growth, as the LRT Build Alternative would help to centralize and organize development along the project Corridor.

4.21.5 Irreversible and Irretrievable Commitment of Resources

Construction of the LRT Build Alternative 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 materials would be irreversibly committed to the rail line. Operation of the LRT Build Alternative would require the use of electricity for power but would also reduce vehicular energy consumption.

4.21.6 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, and increased traffic congestion and associated air quality problems. The LRT Build Alternative would involve short-term uses of the environment during the project's construction period, such as the use of fuel and construction materials (as described in Section 4.21.5). 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; and
- Improved air quality during operations.

[14] Telephone conversation with Donald Spivack, Deputy Administrator, CRA, December 14, 2000.

4.21.7 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 LRT Build Alternative would, on the other hand, provide access to a broader range of employment, shopping, educational, and cultural opportunities, consistent with the goals and objectives for the Eastside Corridor. It is likely that transit-oriented development districts would also be spurred by the project, and additional short-term (construction) and long-term employment would be generated.

The impacts of the other alternatives that were evaluated in the Re-Evaluation/Major Investment Study (refer to Chapter 2.0, *Alternatives Considered*, for more information) and the suspended Metro Red Line project vary by subject area for each alternative. Overall, none of these alternatives can be identified as necessarily superior in terms of environmental considerations. Even the suspended Metro Red Line project, which only extended 3.7 miles, instead of the approximate six-mile alignment of the LRT Build Alternative, involved more property acquisition and displacements.