Section 4.0 Affected Environment and Environmental Issues

4.1 Introduction

The alternatives evaluated for the Regional Connector AA would have direct and indirect effects on the physical environment. This section of the AA describes the existing resource environment and analyzes the potential environmental impacts associated with implementation of the promising build alternatives: At-Grade Emphasis LRT and Underground Emphasis LRT. At the conclusion of this document – Section 4.20 – is a summary and comparison of the build alternatives with the No Build Alternative and the TSM Alternative.

The specific environmental impact resource areas analyzed in this section include: land use and economic development, displacement and relocation of existing uses, community and neighborhood, visual and aesthetics, air quality, noise and vibration, ecosystems/biological resources, geotechnical (including subsurface and hazardous materials), water resources, energy, historic, archaeological and Paleontological resources, parklands and other community facilities, economic and fiscal, safety and security, construction impacts, growth inducing, environmental justice, and major utilities.

The following analysis discusses the potential environmental impacts from the construction and operation of the alternatives. Construction impacts would be temporary, while operational impacts would be on-going. As appropriate, the potential site-specific impacts are described based on available information and the current planning effort. As subsequent efforts become more detailed, revised and/or further assessments of the potential environmental effects will be prepared, evaluated and described in a future (EIR/EIS) for the project.

4.2 Land Use and Economic Development

This section examines the existing land uses and associated policies within the Regional Connector PSA, and evaluates their compatibility with the build alternatives. The section also identifies areas for potential growth in response to the new transit service, as well as other impacts that the project might have on development within downtown Los Angeles. Refer to Section 4.3, Displacement and Relocation of Existing Uses, and Section 4.4, Community and Neighborhood Impacts, for additional discussion related to land use and economic development.

4.2.1 Affected Environment

4.2.1.1 Regulatory Framework

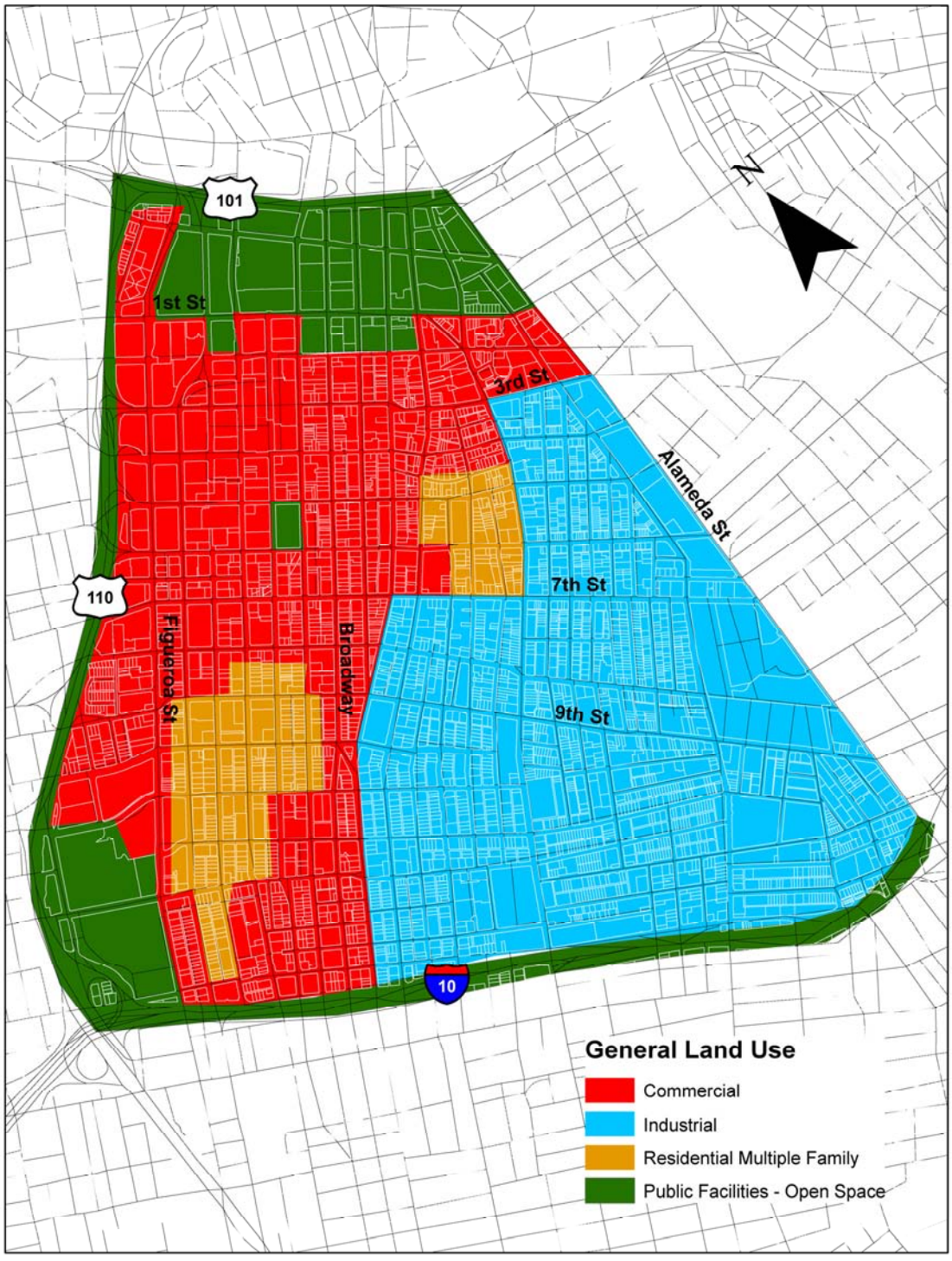
The following are the land use plans, community plans, and redevelopment plans and projects affecting the PSA, as well as brief assessments of their compatibility with the two build alternatives.

General Plan Framework: The Los Angeles General Plan Framework, adopted in December 1996, is the citywide portion of the City's General Plan, which is intended to guide the City's long-range growth and development. The General Plan Framework anticipates fast-paced population growth and outlines methods for directing growth toward selected high-density areas where infrastructure is readily available, rather than allow all areas of the City to grow in an uncontrolled fashion. The study identifies downtown as one of the key growth areas, and calls for enhancements to the County's rail system, including extensions and additional feeder bus service.

Central City Community Plan: The Land Use Element of the General Plan splits the City into 35 community plan areas, each with detailed programs targeted at local growth and neighborhood improvements. The entire Regional Connector PSA lies within the Central City Community Plan district. This plan calls for creating dense residential neighborhoods with a variety of housing types, improving the functionality of the area's commercial districts, encouraging the development of additional rail transit, retaining the scale and appearance of existing areas, and encouraging job-rich land uses. As shown in Figure 4-1, the Central City Community Plan area is bounded by Cesar Chavez Ave. on the north, the Santa Monica Freeway (I-10) on the south, the Harbor Freeway (SR-110) on the west, and Alameda St. on the east. In response to the recent increase in housing units downtown, the plan seeks to develop neighborhood-supporting businesses and enhance the safety and cleanliness of the area. The plan heavily promotes transit supportive land uses, such as high-density residential developments, regional entertainment and cultural centers, space for small start-up businesses, retail plazas, nighttime entertainment venues, hotels, and dense industrial and wholesale districts. Of particular importance to the Regional Connector Transit Corridor, the plan notes that most of the traffic in the area is generated by pass-through travel between areas outside of downtown. As such, the plan expressly recommends providing better connections through downtown from the SR-110 corridor, including a light rail extension from 7th St./Metro Center Station to Union Station via Flower St., Bunker Hill, and Little Tokyo.

Transportation Element: The Transportation Element of the General Plan lists objectives and programs aimed at improving accessibility and long-term mobility within the City of Los Angeles. In the document, the city encourages the development of high capacity transit service along several corridors, including a "Downtown Connector" from either the San Pedro or Washington Stations to Union Station.

Figure 4-1 General Land Use



Civic Center Shared Facilities and Enhancement Plan: In 1997, the Civic Center Shared Facilities and Enhancement Plan established goals for creating a cohesive concentration of public office buildings linked by visually enhanced streets. The plan outlines a public services and business district which pedestrians could traverse in ten minutes or less. Central to the plan are linkages to other parts of downtown, including Union Station, the Historic Core, and the Music Center.

Feasibility Study for the Resurrection of the Red Car Trolley Services in the Los Angeles Downtown Area: The Community Redevelopment Agency of the City of Los Angeles (CRA) published the Feasibility Study for the Resurrection of the Red Car Trolley Services in the Los Angeles Downtown Area in July 2006, which examines their proposal to introduce a historic streetcar line running in a northeast-southwest direction from Chinatown to the Fashion District. The study discusses the usefulness of additional rail transit coverage within downtown, and emphasizes the importance of connectivity with other Metro Rail lines.

Business Improvement Districts (BIDs): The PSA also contains portions of six BIDs: Fashion BID, Downtown Industrial BID, Toytown BID, Historic Downtown BID, Downtown Center BID, and Little Tokyo BID. These organizations are funded by property assessments, and they seek to improve commerce in their areas through the provision of services such as security patrols, street and sidewalk cleaning, and promotional advertising. Stimulating business growth increases the number of jobs and shopping opportunities, which translates to higher volumes of trips to the district. As such, BIDs are generally supportive of better transit connections, since high quality transit service makes it easier for potential customers to travel to the area.

4.2.1.2 Existing Conditions

The PSA contains the financial core of downtown Los Angeles, and is one of the most job-dense areas in the City. In addition to being a major employment center, the PSA encompasses several retail, entertainment, and residential districts. Income levels of the residents vary greatly, from new luxury condominium developments in the western half of the PSA to single room occupancy hotels and homeless shelters in the eastern portion.

The land use patterns in the PSA consist of mostly commercial office buildings in the southwestern portion, public office buildings in the northern portion, and commercial manufacturing buildings in the southeast. There are pockets of residential uses, including adaptive reuse of older non-residential buildings, scattered through the PSA. The highest floor-area ratio, about 5.0, can be found in the Bunker Hill Redevelopment Area, the area roughly bounded by 1st St., Hill St., 7th St., and SR-110.

Just east of Bunker Hill lies an older office district (Historic Downtown) dating from the early part of the 20th century. Nearly all of the buildings contain ground floor retail establishments, making for a busy streetscape. The buildings in this area are substantially shorter than those on Bunker Hill, due to the city's 12-story height limit at the time of their construction.

In the easternmost part of the PSA lies one of the oldest industrial areas in the region. The buildings are short, usually only one to three stories, and vacant lots are more prevalent than in other parts of the PSA. Many of the empty lots are used as storage yards or surface parking lots. Though zoned for industrial manufacturing, some of the buildings have been converted into loft condominiums and rental housing units.

The PSA is already served by two rail lines and numerous bus lines run by ten operators. Transit riders in the PSA can reach most areas of the county on a single vehicle during peak hours.

As part of the redevelopment plans in the PSA, CRA has undertaken the following projects in the PSA, all of which would yield new transit-supportive land uses:

- 2nd St. Connection – This recently completed project connects two previously un-joined segments of Upper 2nd St. between Grand Ave. and Olive St. The connection was financed mostly by Metro and Surface Transportation Program-Local funds.

- Bunker Hill Design for Development – This proposal would amend the 1971 Design for Development (DFD) and increase the maximum floor area ratio in the Bunker Hill Redevelopment Area from 5.0 to 6.0. This would allow 20 percent more square footage that the current DFD. The proposal is currently in the Environmental Impact Report (EIR) phase.

- Grand Avenue Project – This large-scale redevelopment project is scheduled to break ground in Summer 2008 and will be complete by 2016. The project consists of a full-scale redesign of Grand Ave. as well as the addition of a 16-acre park in the Civic Center and 3.9 million square feet of retail, hotel, and office space.

- Parcel Y-1 Development –The existing Angels' Knoll Park would be developed into a third California Plaza office tower, potentially with retail and residential space. The project is currently in the DFD and EIR phase.

- Los Angeles Sports and Entertainment District/L.A. Live! – This project seeks to create a major sports and entertainment destination just south of the financial district, surrounding the existing Convention Center and Staples Center. Additional auditoriums and theaters, as well as retail and office space will be added by 2009. Condominium and rental apartment buildings are presently under construction. This redevelopment project is located one block south of the PSA.

- Colburn School Phase II – The new expansion to the performing arts school was completed in Fall 2007, and consists of a new dormitory, rehearsal hall, 12-story tower, library, teaching space, and performance lab. This project is located on the southeast corner of 2nd St. and Grand Ave.

- Park Fifth – An EIR is currently being prepared for a new high-rise residential building on 5th St. between Hill and Olive Sts. This project will contain market-rate condominium units, a five-star hotel, and ground floor commercial space.

- 8th & Grand Ave. – This is a condominium project with ground floor restaurants and retail located on 8th St. between Grand Ave. and Olive St. This project was approved by the CRA/LA Board and the City Council in 2006.

- Mangrove Site – CRA/LA issued a request for proposals which closed in late 2007 for the parcel adjoining the future Metro Gold Line Little Tokyo/Arts District Station at 1st and Alameda St. CRA/LA hopes to pursue a mixed-use project on the site with market rate and affordable residential units, commercial space, and public parking. The site is located across Alameda St. from the PSA.

- Block 8 Mixed Use – This parcel in Little Tokyo is located between 2nd, 3rd, San Pedro, and Los Angeles Sts. The proposed development will include affordable rental units, market-rate condominium and rental units, commercial space, and open space. The site plan includes a mid-block walkway between San Pedro and Los Angeles Sts.

- Metropolis Project – Located on the southwest corner of 8th and Francisco Sts., this recently-approved development will add 2.8 million square feet of new condominium, office, hotel, and retail space.

- Little Tokyo Central Avenue Art Park – This project involves redeveloping the closed section of Central Ave. between Temple and 1st Sts. into a landscaped community park and underground parking facility linking the existing Museum of Contemporary Art to the Japanese American National Museum.

- The Medallion – This project seeks to replace a surface parking lot with market-rate apartments and commercial space on a site located between Main, Los Angeles, 3rd, and 4th Sts. Construction on Phase 1 of the project has begun, and Phase 2 relies on the demolition of the existing Downtown Women's Center (see the following project).

- Downtown Women's Center Relocation/Expansion – This project will remove the existing Downtown Women's Center on San Pedro St. between 4th and 5th Sts. in order to make way for the Medallion project. The city will renovate its Renaissance Building as the new Women's Center, and will provide an additional 75 permanent housing units and eight day rest beds for homeless women. CRA/LA is currently reviewing development plans for the relocation/expansion project.

- Residential Hotels Rehabilitation Program – Under this plan, CRA/LA will acquire approximately 30 single-room occupancy hotels, lease them to non-profit housing operators, and preserve the units as low-income housing. CRA/LA cites public ownership as a means of cleaning up crime-ridden slum hotel areas within the PSA.

4.2.2 Evaluation Methodology

The following analysis addresses the compatibility of each build alternative with the existing land use patterns along the alignment, as well as the compatibility with existing land use plans and potential future development projects and trends. The analysis also

reviews the transit coverage provided with each alignment and associated economic costs. The existing land use information is based on land use maps and field surveys.

4.2.3 Environmental Issues

Because the build alternatives – At-Grade Emphasis LRT and Underground Emphasis LRT - all follow similar routes through downtown, the land use patterns in the areas they pass through do not vary significantly.

The Underground Emphasis LRT Alternative would have fewer negative impacts on the existing land use patterns than the at-grade alternative, since the Underground Emphasis LRT Alternative would not involve reducing the number of lanes available to automobile traffic on any streets or pose conflicts with the autos, as would the At-Grade Emphasis LRT Alternative. Further, reduction of traffic lanes on some streets associated with the At-Grade Emphasis LRT Alternative could create additional congestion (i.e. fewer lanes of travel) and costs associated with traffic management, which in turn could negatively affect downtown developers. However, the costs associated with construction of at-grade light rail would be less significant than costs associated with construction of the underground alignment.

Additionally, the underground alignment would have lower noise levels than an at-grade alternative during the operation phase. The Underground Emphasis LRT Alternative, as such, would be more compatible with existing and potential future residential development, the pace of which has sharply increased in the area over the last several years. However, an at-grade alignment and at-grade stations would still be consistent with the overall existing urban character of the area. Additionally, the at-grade stations on the At-Grade Emphasis LRT Alternative are more visible to potential riders and would impose fewer impediments to pedestrians quickly moving between the sidewalk and the boarding platform than underground stations.

As presented in Section 4.2.1.1, there are various land use plans, community plans, and redevelopment plans and projects affecting the PSA. The plans and projects are all generally supportive of improved transit linkages and mobility. Both of the build alternatives would be compatible with these goals and policies.

Because the station locations of both the at-grade and underground alternatives are proximate to each other, all of the alignments would provide nearly equivalent levels of transit coverage within the downtown area. Between the build alternatives, the station locations vary by only a block, at most. The At-Grade Emphasis LRT Alternative would incur a longer trip time than the Underground Emphasis LRT Alternative, but the connectivity and the potential for single-vehicle service from Pasadena, Long Beach, East Los Angeles, and Culver City would be the same. It is important to note that downtown Los Angeles is already heavily served by transit, and the Regional Connector's primary purpose is to improve the connection between the light rail lines in the area and reduce the need for transfers, not necessarily to provide access to areas previously un-served by the transit system. In any event, the density of transit service would be increased in the areas around the stations, and this would bring added development, jobs, and mobility.

4.3 Displacement and Relocation of Existing Uses

This section addresses the land ownership and leasing agreements that may change due to the project. Existing conditions and implications for displacement and relocation of existing uses within the PSA will be addressed in this section. Although the build alternatives under consideration are intended to maximize the use of publicly owned rights-of-way, certain features of these alternatives have the potential to impact persons and businesses on private property within the PSA.

4.3.1 Affected Environment

4.3.1.1 Regulatory Framework

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), mandates that certain relocation services and payments be made available to eligible residents, businesses, and nonprofit organizations displaced as a direct result of projects undertaken by a federal agency or with federal financial assistance. The Uniform Act provides for uniform and equitable treatment of persons displaced from their homes and businesses and establishes uniform and equitable land acquisition policies.

Owners of private property have federal 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 purposed for which the property is reasonably adaptable and available." (Code of Civil Procedure Section 1263.320a)

The provisions of the California Relocation Act (California Act), applies in the absence of federal funds and/or involvement if a public entity undertakes a project and consequently must provide relocation assistance and benefits. The California Act, which is consistent with the intent and guidelines of the Uniform Act seeks to, (1) ensure the consistent and fair treatment of owners of real property, (2) encourage and expedite acquisition by agreement to avoid litigation and relieve congestion in the courts, and (3) promote confidence in the public land acquisitions. As stated above under federal regulations, owners of private property have similar State constitutional guarantees regarding property takes, damages, and just compensation.

4.3.1.2 Existing Conditions

Section 4.2 describes the existing land uses within the PSA. In addition, Section 4.4, Community and Neighborhood Impacts, describes the neighborhoods within the PSA.

4.3.2 Evaluation Methodology

Table 4-1 shows typical sources and causes of land acquisition and displacement that could potentially occur with the PSA. When an acquisition occurs, it typically results in either a full or partial take of a parcel. A partial taking would occur if the project did not require the acquisition of the entire parcel, but just enough of the parcel to accommodate the proposed project. This would occur if, for example, a portion of a commercial parking lot fronting the alignment is required, but not the adjacent commercial building located away from the alignment. Partial takings may result from the widening of a street or intersections due to inadequate right-of-way widths, limited cross-sections, and vertical circulation needs adjacent to subway stations. The widening of intersections are often required for the addition of left-turn lanes that have been relocated due to the installation of at-grade station platforms within the street median, adjacent to the transit tracks. Street widening may be necessary when the existing horizontal alignment contains insufficient right-of-way. Vertical circulation is needed near underground stations as additional land is needed to bring passengers to the surface.

Table 4-1 Sources and Causes of Displacement

Source	Type of Acquisition	Cause/Process
Horizontal alignment	Full/Partial	Not enough right-of-way for alignment
Vertical circulation above subway station	Partial	Additional area needed adjacent to subway station to bring passengers to surface
Street widening	Partial	Aerial structures requiring columns
Illegal encroachment	Full	Unauthorized use of private property
Access to a businesses (driveway or road)	Full	Damages resulting from reduced or restricted access
Storage Yards	Full	Additional area required to perform maintenance
Widening of intersections	Partial	Additional area to maintain traffic volumes, turn lanes, or platforms
Tunneling easement	Easement	Subway travels off public right-of-way
Source: Terry A. Hayes & Associates, 2008		

A full taking would occur under two circumstances: (1) when the majority of the property is required for the horizontal alignment because of insufficient public right-of-way or the need to construct storage or maintenance facilities, and (2) when the damage caused to the property (e.g., driveway access to a property is eliminated or reduced due to the construction of transit that travels down the side of a street, as opposed to the median) is so great that the owner is deprived of all beneficial use. Damages to a property would typically result from restricted access or demolition of improvements.

Metro would need to obtain easements instead of acquiring or displacing the uses on those parcels under which the underground segments would travel.

The analysis assesses the potential need for acquisition along each alignment.

4.3.3 Environmental Issues

The project would typically use existing rights-of-way when developing the proposed alternatives. However, where the proposed alignments transition from underground to at-grade, as well as at stations, there is the potential to displace properties. Although the Underground Alternative avoids most surface conflicts, property acquisition may be needed for portals and station entrances. Acquisitions for station entrances could occur at underground stations for each alternative. Other potential displacement includes the following:

At-Grade Emphasis LRT Alternative

- Potential right-of-way acquisitions may be necessary at Flower and 3rd Sts. (Option A) or Flower and 5th Sts. (Option B) for the tracks to transition from underground to at-grade. Additionally, there are potential right-of-way acquisitions on 2nd St. According to preliminary station and alignment design the stations will need an area approximately five feet deep along the street frontage for the length of the station for construction.

- Potential for parking displacement exists along 2nd, Main, Los Angeles and Temple Sts. associated with the At-Grade Emphasis LRT Alternative.

Underground Emphasis LRT Alternative

- Potential acquisition of the entire block bounded by Central Ave., Alameda St., 1st St., and 2nd St. may be necessary for the portal to transition from underground to at-grade to connect to Metro's Gold Line Extension (Gold Line). These are no residences in this block, but it is across the street from the Japanese American National Museum and from residences on Alameda St. Although no displacement is anticipated on the east side of Alameda St. (Arts District), removal of commercial businesses could indirectly impact the residents in the area.

- Parking displacement along areas adjacent to the portal at Little Tokyo may potentially impact businesses and residents of Little Tokyo and the Arts Districts, as well as visitors to the museums, shops, and restaurants located in Little Tokyo.

- As identified in the Initial Screening Report, given the need for acquisitions for underground station entrances, the Underground Emphasis LRT Alternative would require a greater amount of property acquisition than the At-Grade Emphasis LRT Alternative.

- Any potential acquisition or displacement as a result of the project would occur in compliance with the Uniform Act and/or California Act, as applicable.

4.4 Community and Neighborhood Impacts

This section discusses the effects of the build alternatives on the neighborhoods within the PSA. Particular attention is paid to demographic characteristics, community division, and mobility.

4.4.1 Affected Environment

As mentioned earlier, the PSA is an extremely built out area with unique neighborhood characteristics among all the districts. Although the PSA is composed of the central core of downtown, the area of influence includes surrounding communities and the region as a whole, which will benefit from the Regional Connector. Also, the recent resurgence and development, such as the Arts District and the LA Live Development, greatly influence and affect the patterns of development and the characteristics that are introduced into these neighborhoods.

In the same way, the Regional Connector will introduce new elements, not only of physical design, but of mobility and travel characteristics and patterns that may affect the way people interact in these spaces. The proceeding sections provide a detailed description of the districts which make up the Regional Connector PSA as well as the current travel and housing characteristics in each.

4.4.1.1 Existing Conditions

Community and Neighborhoods

The following neighborhoods comprise the PSA:

Bunker Hill

The Bunker Hill District is located generally between 1st St. on the north, Hill St. on the east, 3rd St. on the south, and Figueroa St. on the west. Major downtown destinations located within Bunker Hill include the Walt Disney Concert Hall, Museum of Contemporary Art (MOCA), several high-rise office towers, senior and market rate housing, hotels, and commercial/retail centers. Bunker Hill has over 3,200 residential units, mainly in mid- and high-rise buildings. Large development projects planned for this area include Civic Park and the Grand Avenue Development Project, which will transform this area into a regional arts, entertainment, and residential destination. The Grand Avenue Development is a $3 billion project that includes 3.6 million square feet of development with 449,000 square feet of retail. It is currently planned for 2,600 housing units, almost doubling the existing number of units in the area.

Civic Center

Bordering Bunker Hill to the northeast is Civic Center, which serves as a hub for city, county, state, and federal government offices and services, with the second largest concentration of civic buildings in the country. The Cathedral of Our Lady of the Angels, completed in 2002, the Ahmanson Theater, Mark Taper Forum, and the Dorothy Chandler Pavilion are other major destinations in this district. Civic Center is undergoing active redevelopment as the new headquarters for the state Department of Transportation (Caltrans) District 7 has recently been completed, development of the new Los Angeles Police Department Headquarters is underway, and construction of a U.S. Federal Courthouse is soon to begin.

Little Tokyo

East of Civic Center is Little Tokyo, which is the center of the largest Japanese-American community in the continental United States. The Japanese American National Museum and Geffen Museum of Contemporary Art are located here, along with a lively shopping district. There is active residential development underway within Little Tokyo, with recently completed and current projects adding more than 2,000 residential units. Significant developments in the early planning stages include a 4.5-acre site adjacent to the Gold Line's future Little Tokyo Arts District Station. Early concepts from developers identified high-density combination of office and housing with a strong connection to the Metro Gold Line.

Toy District

The Toy District is a 12-block shopping area with over 500 retail businesses located south of Little Tokyo and north of Central City East. Development here is primarily comprised of mixed-use projects. The proposed Medallion project will provide 192 residential lofts and over 200,000 square feet of retail space.

Financial Core

The Financial Core District is located south of Bunker Hill and is dominated by high-rise office buildings. The Central Library is located here, and has been recently restored and expanded. Other landmarks in this district include the Millennium Biltmore Hotel and Pershing Square. The proposed 2.7 million square foot Metropolis mixed-use development is located in the southwestern end of the Financial District. Phase I of this project, scheduled to begin construction in 2008, will provide 360 residential units. Park Fifth is another major planned 76-story high-rise development across from Pershing Square and will include over 700 condominiums and a 200 room hotel.

Historic Core

To the east of the Financial Core is the Historic Core District, containing a large concentration of historic and architecturally significant buildings, including the Bradbury Building. The Grand Central Market and the Broadway Historic Theater District are destinations in this district. Development here is focused on conversion of old neglected buildings into lofts and apartments.

Jewelry District

The largest Jewelry District in the U.S. and second largest in the world is located southwest of the Historic Core, comprised of 5,000 businesses with billions of dollars in revenue. Development in this area includes the proposed construction of 875 condominium units at 8th and Grand Sts.

Central City East

Central City East is located south of the Toy District and consists primarily of commercial uses, including wholesale buildings and warehouses. The Flower Market, produce, fish and food processing industries, and import/export businesses employ nearly 20,000 people in this area. Housing in this district consists mainly of the 6,500 single room

occupancy hotel units. This area also has social services, including alcohol treatment, mental health services, and job training.

4.4.1.2 Transit-Relevant Demographic Characteristics

The PSA makes up 1.6 square miles, or 0.03 percent of the 4,752 square miles of Los Angeles County. As shown in Table 4-2, in 2005, the total population of the PSA was 17,795, which comprised 0.18 percent of the total Los Angeles County population of over ten million. Despite its small size, the PSA sustained 3.62 percent of the county's employment, or 168,328 jobs, in 2005. The average population density within the PSA was 11,685 people per square mile, significantly higher than the 2,107 people per square mile population density found in Los Angeles County in 2005. Employment density in the PSA was 110,529 employees per square mile, which was also significantly higher than the county's overall employment density of 977 employees per square mile.

Table 4-2 Population and Employment in the Project Study Area

Demographics	Project Study Area	L.A. County	Percent of County
Population	17,795	10,010,315	0.18
Population Density	11,685	2107	NA
Total Employment	168,328	4,644,010	3.62
Employment Density	110,529	977	NA

Source: Southern California Association of Governments (SCAG), 2005

Residences in the area have been categorized as single-family homes, multi-family homes, or group quarter residences, which include military barracks, dormitories, and institutional housing. Data for the number of low, medium, and high-income households in the PSA were available for single-family and multi-family residences only, of which there were 9,673 households in 2005 with a median household income of approximately $45,000. Group quarters added an additional 5,466 residences. As shown in Table 4-3, based on these 2005 data, the PSA is primarily composed of low-income households, with a moderate medium-income household population. As mentioned above, recent development of the PSA continue to bring about demographic changes that may not be reflected in data from 2005.

Table 4-3 Income Status within the Project Study Area		
Demographics	Project Study Area	Percent
Total Residences	15,136	N/A
Total Households	9,673	100
Low Income Households	7,244	75
Medium Income Households	2,009	21
High Income Households	417	4

Source: SCAG, 2005

In 2005, only 5.5 percent of the young people in Los Angeles County lived within the PSA. Comparatively, 29.4 percent of the population of Los Angeles County in 2005 was age 18 and under. As downtown resurgence attracts those seeking an urban lifestyle, a rise in the number of young people living downtown will likely occur.

As shown in Table 4-4, the PSA also demonstrates a higher percentage of elderly residents (19.7 percent) when compared to Los Angeles County (9.7 percent). The young and the elderly have a higher propensity for using public transportation since these groups are less likely to have drivers' licenses or access to private automobiles. Although the PSA has a lower total proportion of these groups when compared to Los Angeles County, the Regional Connector is expected to improve transit connectivity and accessibility for members of these groups living outside the PSA who would wish to commute into it.

Table 4-4 Population Age				
AGE	Project Study Area	Percent	L.A. County	Percent
18 and under	976	5.5	2,798,604	29.4
65 and over	3,497	19.7	926,670	9.7

Many of the households in the PSA, approximately 69 percent, have no car and rely on public transit for commuting needs. Additionally, there is a high volume of transit ridership in the PSA, including 23 percent of employed residents age 16 and over, as well as a large number of commuters from outside the PSA who utilize transit to get to employment and other opportunities within the project study area. When comparing vehicle accessibility and public ridership patterns in the PSA, the trends suggest that even households in the PSA with one or more cars have a higher propensity to use public transportation than similar households elsewhere in Los Angeles County.

Table 4-5 presents demographic information for the PSA as compared to the County as a whole.

Table 4-5 Transit Dependent Demographic Information			
	Study Area	LA County	Study Area % of LA County
Population	17,795	10,010,315	0.18
Under 18 years	976	2,798,604	0.03
Over 65 years	3,497	926,670	0.38
Households	9673	3,298,210	0.29
No vehicle households	8,586	671,214	1.28
Use public transportation	1,025	254,091	0.40
Low income households	7,244	1,481,896	0.49
Total employment	168,328	4,644,010	3.62

Source: SCAG, 2005 data and 2030 projections

4.4.2 Evaluation Methodology

The following analysis considers the potential impacts of the project on demographic characteristics, community division, and mobility within the PSA to assess whether the Project would disrupt, divide, or isolate existing communities or land uses.

4.4.3 Environment Issues

Depending on which alternative is selected, the neighborhoods within the PSA will incur varying levels of potential environmental impacts, particularly along the streets under consideration for rail alignments. Because both alternatives follow similar routes, their impact on transit ridership, employment, residential population, and mobility would be nearly identical.

As discussed in detail in Section 4.16, Construction Impacts, temporary impacts are primarily associated with the construction of the at-grade alignment and underground and at-grade stations, which would last for approximately three to four years. These temporary impacts include significant noise and vibration during business hours, dust, and traffic congestion due to closed streets and the movement of construction vehicles. However, some of these impacts may be less intrusive downtown as they might be in other parts of the city, since there is already a high level of activity and traffic noise throughout the PSA. Also, the temporary environmental impacts would be similar for both the at-grade and the underground alignments, since both would require heavy construction activity.

The impacts of the operation of the project will vary based on whether the at-grade or underground alignment is chosen. The At-Grade Emphasis LRT Alternative involves placing tracks in either the center lanes of the street or the curb lanes, as well as erecting 25-foot tall catenary poles above the street level and placing traction power substations every mile alongside the tracks. High-platform stations with canopies would be located in the roadway medians or curb lanes, and would stretch across the majority of the city block. As such, there would be a visual change to the neighborhoods through which the tracks pass, as well as potential mobility impacts for pedestrians who may lose the ability

to use existing crosswalks. Given the placement of tracks along 2nd, Main, and Los Angeles Sts. outlined for the At-Grade Emphasis LRT Alternative, it is conceivable that pedestrian mobility from the Civic Center to Little Tokyo and the Historic Core could be reduced. Also, removing traffic lanes from these streets may also add to auto congestion and bus trip times. Current operating hours for the Metro Rail system are 4 a.m. to 1 a.m. daily, and it is expected that trains will generate noise (bells, horns, public address announcements, and rail squealing) along the project right-of-way during these hours.

The Underground Emphasis LRT Alternative on the other hand, is entirely underground except for a short portion of the tracks, just southwest of the Metros Gold Line's Little Tokyo station at 1st and Alameda Sts. As such, there will be no prominent surface impacts, aside from station portals along the sidewalks or in plazas adjacent to the street. The operational noises discussed above may still emanate from the ventilation shafts embedded in the roadway or sidewalk as well as the portal at 1st and Alameda Sts., but the levels would be minor compared to an at-grade alignment. Overall, the Underground Emphasis LRT Alternative would cause little change in community division and pedestrian mobility within the neighborhood.

4.5 Visual and Aesthetic Impacts

Transportation infrastructure has the potential to enhance pedestrian activity, create pedestrian-friendly environments, enliven streetscape through architecture, signage, lighting, and landscaping and help in the support for revitalizing areas in need of rejuvenation. However, transportation infrastructure also has the potential to negatively alter the visual landscape when a proposed project is out of scale with its immediate surroundings, and results in development of unwanted infrastructure such as overhead wires or structures that may detract from the visual setting, or block views of existing scenic vistas, historical structures, or other visual resources.

4.5.1 Affected Environment

4.5.1.1 Regulatory Framework

As discussed in Section 4.2.1.1, the PSA is within the Central City Community Plan of the General Plan's Land Use Element. The Central Community Plan includes an Urban Design chapter that contains objectives and policies support the development and re-enforcement of a pedestrian-friendly environment and streetscape.

4.5.1.2 Existing Conditions

The alternative alignments are located in a highly urbanized setting surrounded by a variety of land uses. The primary visual features in the area are historical buildings, contemporary buildings with notable architecture, and street trees. The street characteristics of the PSA, although concentrated in the dense downtown setting, differ from district to district; for example the modern high rise architecture of the financial district to the Art Deco City Hall and the period characteristics of the historic core.

The proceeding section summarizes the characteristics of both alignments and their potential impacts on surrounding environments.

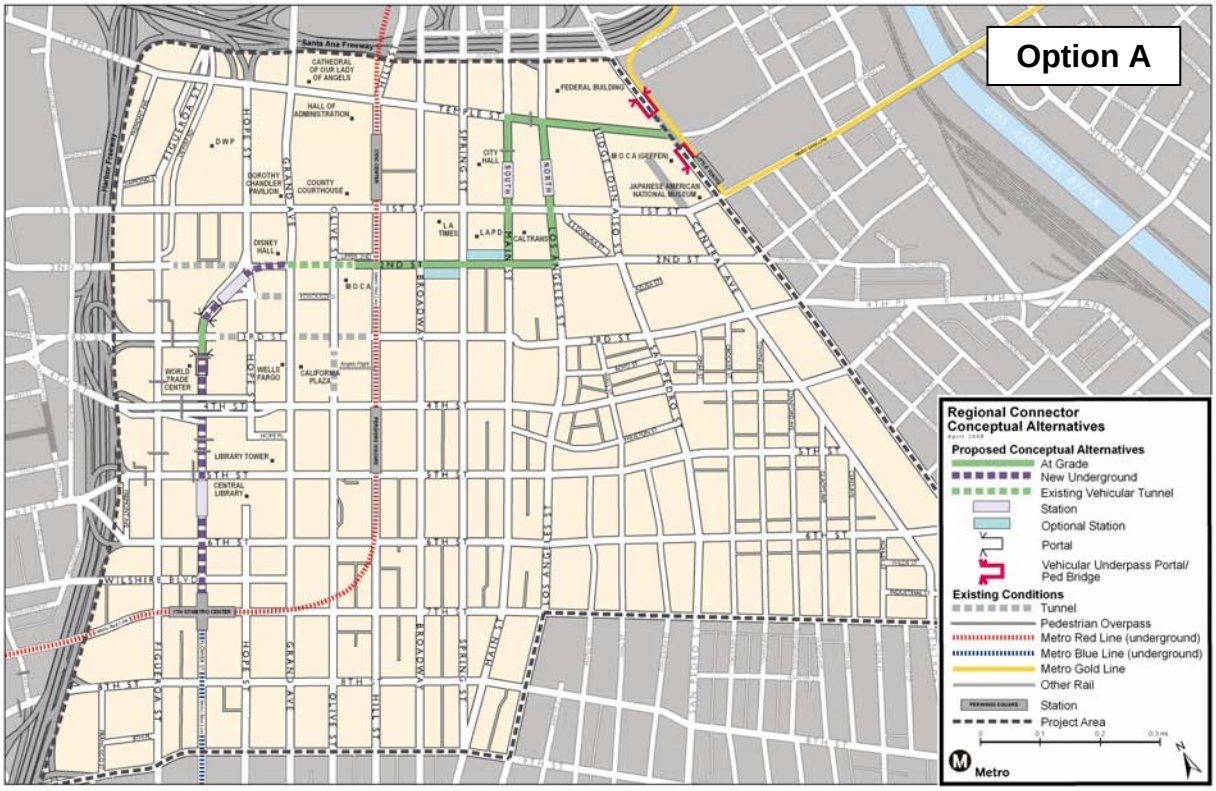
4.5.1.3 Potential Impacts

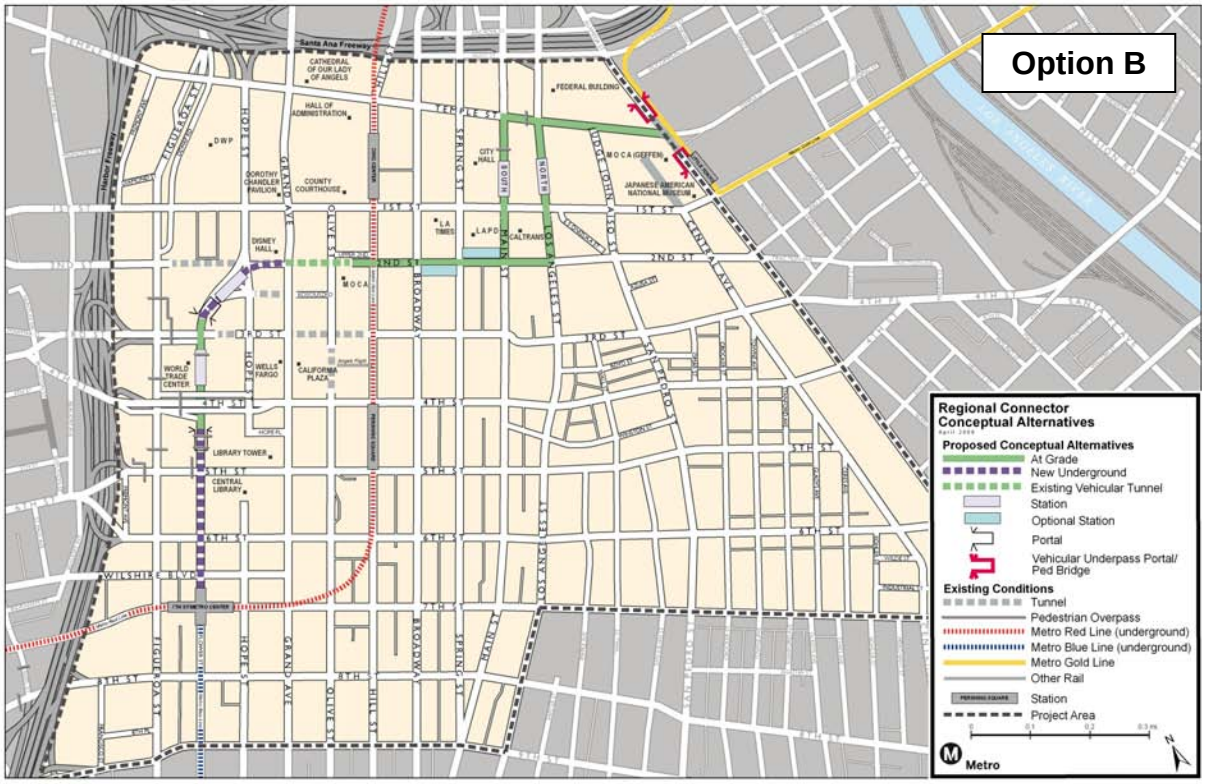
The development of the At-Grade Emphasis LRT Alternative or the Underground Emphasis LRT Alternative has the potential to affect the immediate surroundings by adding new features to the visual landscape, including the introduction of catenary poles and wires, at-grade track, station platforms, and/or off-street portals leading to underground stations. Roadway modifications to accommodate at-grade track would also change the existing visual landscape.

Aboveground stations and portals to underground stations would also introduce a new source of nighttime lighting.

At-Grade Emphasis LRT Alternative

Figure 4-2 At-Grade Emphasis LRT Alternative





The At-Grade Emphasis LRT Alternative would run mostly at the same elevation as the surrounding road network and would include tracks located in a dedicated right-of-way or an arterial street median, with catenary wires located above the tracks. Catenary poles would be approximately 25-feet tall above the street level, and traction power substations would be located every mile along the tracks. With the At-Grade Emphasis LRT Alternative Option A, approximately 64 percent of the alignment would operate at grade and the remaining 34 percent would be underground. With Option B, approximately 79 percent of the alignment would operate at grade, with the remaining 21 percent located underground.

The At-Grade Emphasis LRT Alternative is located within one-quarter mile of two National Historic Landmarks, five National Register Districts, 75 individual National Register properties/resources, 98 California Register designations, and 37 local landmarks. The total number of potentially impacted notable architectural resources is 217. Of these resources, the greatest potential visual impacts would be on the resources located adjacent to an alignment and in the vicinity of the stations.

The Initial Screening Report describes Option A as being located within one-quarter mile of 13 buildings with notable architecture, and Option B as being located within one-quarter mile of 11 buildings with notable architecture. Of these sites, eleven are located directly adjacent to both of the At-Grade Emphasis LRT Alternative alignment options. The 11 sites are listed below and the relationship to the alignment is briefly described. Any differences between Option A and Option B are noted. For additional information on historical resources, see Section 4.12, Historic, Archeological, and Paleontological Resources.

- Edward R. Roybal Federal Building - located northeast corner of the Temple St. and Los Angeles St. intersection. The alignment would be at grade to the south of the site along Temple St.

- Fletcher Bowron Square – Los Angeles Mall - located in the 300 block of Main St. between Temple St. and Aiso St. The alignment would be at grade to the south of the site along Temple St.

- Caltrans Building - located at the northside of 2nd St. between Main St. and Los Angeles St. The alignment would be at grade to the east, west, and south of the site.

- Los Angeles Civic Center - generally located north of 1st St. and south of Aiso St. or Temple St. between Figueroa St. and Alameda St. The alignment would run at grade through the Civic Center on Main St., Los Angeles St., and Temple St. east of Main St.

- Los Angeles City Hall – located at northwest corner of 1st St. and Main St., within the Los Angeles Civic Center. The alignment would run at grade to the east of City Hall on Main St.

- Higgins Building – located at the southwest corner of the 2nd St. and Main St. intersection. The alignment would be at grade to the north of the site along 2nd St. The optional eastbound Spring St. Station platform would be on the north side of 2nd St., opposite the site.

- (Former) Saint Vibiana's Cathedral – located on Main St. south of 2nd St. The alignment would be at grade to the north of the site along 2nd St. The optional eastbound Spring St. station platform would be on the north side of 2nd St. to the west of the site.

- Disney Concert Hall – located on 2nd St. between Grand Ave. and Hope St. The alignment would be below grade to the south of the site, and would transition to at-grade at Grand Ave. to the east. A station would be located to the southwest.

- Westin Bonaventure Hotel – located on Flower St. between 4th St. and 5th St. The alignment would run below-grade (Option A) or would transition from at-grade to below-grade (Option B) to the east of the site on Flower St. A belowground station would be located to the south (Option A) or an aboveground station would be located to the north (Option B) along Flower St.

- Los Angeles Central Library Building and Grounds – located on 5th St. to the east of Flower St. The alignment would run below-grade to the west of the site on Flower St. A station would be located to the west of the library site (Option A).

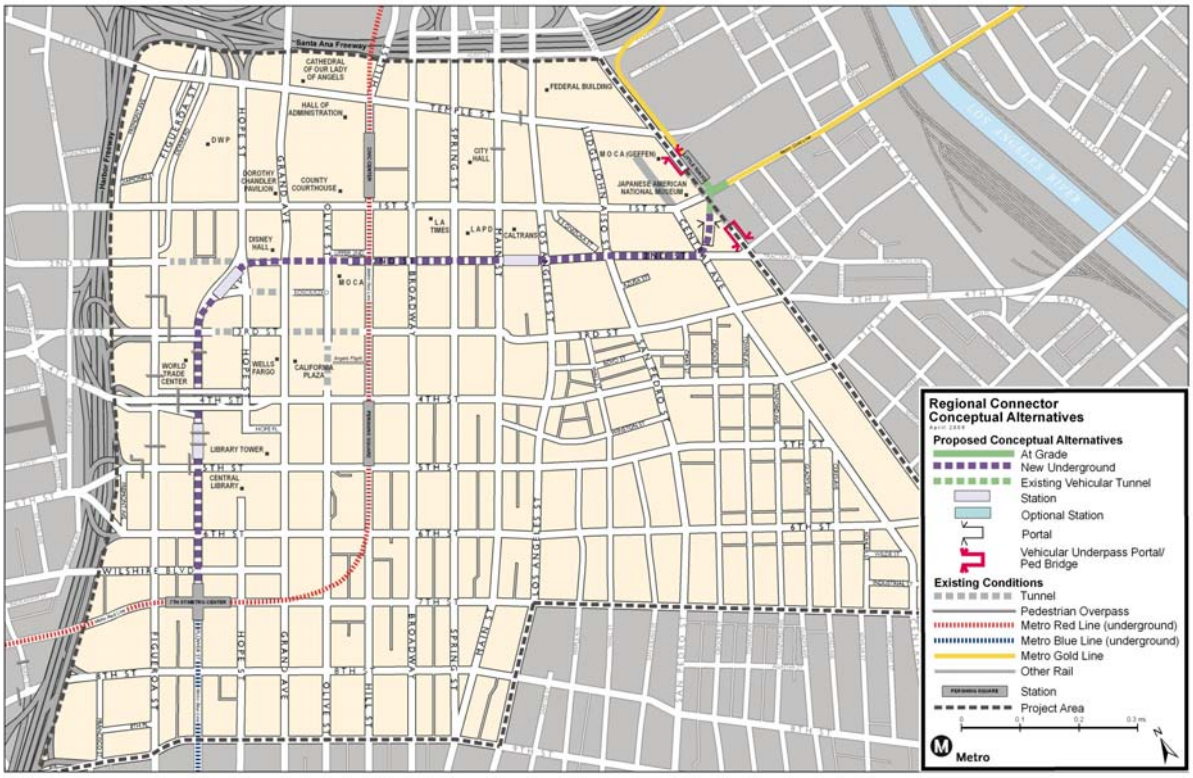
- California Club Building – located on Flower St. north of 6th St. The alignment runs below-grade to the west of the site on Flower St. A station is located to the north along Flower St. (Option A only).

- Additionally, there are numerous outdoor public works of art, such as sculptures, murals, and fountains, associated with development located along the alignments such as the Civic Center, Central Library, Fletcher Brown Square, and museums. Some of the art works are visible from the adjacent streets and sidewalks.

With the At-Grade Emphasis LRT Alternative, roadway modifications would be necessary to accommodate the at-grade track, including the reduction of lane widths, altering of existing lane configurations, and removal or displacement of left-turn pocket lanes. As Option B has a greater percentage of at-grade service, versus underground service, it would require a greater number of roadway modifications.

Underground Emphasis LRT Alternative

Figure 4-3 Underground Emphasis LRT Alternative



The Underground Emphasis LRT Alternative is primarily underground (approximately 91 percent) with a small portion operating at grade (9 percent), and therefore, along most of the alignment, trains and track would not be visible. Furthermore, given the limited portion of track located at grade, roadway modifications would be minimal. The Underground Emphasis LRT Alternative has three underground stations, all of which would have at grade portals.

The Underground Emphasis LRT Alternative would be within one-quarter mile of two National Historic Landmarks, four National Register Districts, 78 individual National Register properties/resources, 88 California Register designations, and 31 local landmarks. The total number of notable architectural resources is 203.

The Underground Emphasis LRT Alternative would be located within one-quarter mile of nine buildings with notable architecture. Ten sites with notable architecture are located adjacent to the alignment. The sites are listed below and the relationship to the alignment is briefly described. Unless noted, the alignment is belowground. For additional information on historical resources, see Section 4.12, Historic, Archeological, and Paleontological Resources.

Japanese American National Museum – located at the northwest corner of 1st and Alameda Sts. The alignment transitions from belowground to aboveground south of the

site and connects to the proposed Little Tokyo/Arts District Station to the east (transfer station to the Gold Line) and proposed maintenance and operations facility. The proposed station would require existing Alameda St. to be constructed below-grade under the Alameda St. and 1st St. intersection where an LRT junction and pedestrian bridges are proposed to be built.

- Little Tokyo Historic District – generally located north of 2nd St. between San Pedro St. and South Central Ave. The alignment would run to the south of the District.

- The Geffen Contemporary at MOCA - located on Alameda St. north of the Japanese American Museum on 1st St. The alignment would end at the proposed Little Tokyo/Arts District Station and maintenance and operations facility on Alameda Ave., to the east of the site. The station and alignment would be at grade.

- Caltrans Building - located at the north side of 2nd St. between Main and Los Angeles Sts. At least one portal would be located adjacent to the Caltrans building along 2nd St.

- Higgins Building – located at the southwest corner of the 2nd St. and Main St. intersection. The alignment would be to the north of the site along 2nd St. A station would be located to the west of the site.

- (Former) Saint Vibiana's Cathedral – located on Main St. south of 2nd St. The alignment and station would be located to the north of the site along 2nd St. One possible portal location would be on the Saint Vibiana site.

- Disney Concert Hall – located on 2nd St. between Grand Ave. and Hope St. The alignment would be south of the site on 2nd St. A station would be located to the southwest.

- Westin Bonaventure Hotel – located on Flower St. between 4th and 5th Sts. The alignment and a station would be located to the east of the site. An at-grade portal may be located on or near the Westin Bonaventure Hotel site.

- Los Angeles Central Library Building and Grounds – located on 5th St. to the east of Flower St. The alignment would be to the west of the site on Flower St. A station would be located to the north of the library site.

- California Club Building – located on Flower St. north of 6th St. The alignment is to the west of the site on Flower St.

4.5.2 Evaluation Methodology

The evaluation of potential aesthetic impacts involves determining if changes would occur to the aesthetic character of the area surrounding the alignments. This entails reviewing the aboveground infrastructure associated with each alternative and analyzing if it would affect the overall character of the area and result in the obstruction of views of or removal of any visual resources along the alignment, and to what degree. Obstruction of important

views or introduction of elements inconsistent with the existing visual character would result in visual impacts.

To determine the notable architectural resources within one-quarter mile of each alignment, information was gathered from the City of Los Angeles, Department of City Planning's Historic-Cultural Monument Report for the Central City Community Plan Area, Metro's Angels Walk L.A. Program (a walking trail that links Los Angeles' landmarks with transit), the Los Angeles Convention Center's list of landmarks to visit while in Los Angeles, and a field survey conducted on February 1, 2008.

4.5.3 Environmental Issues

Both alignments would involve some changes to the existing visual landscape, however, the degree to which this would occur varies between the alternatives. Notably, the at-grade alignment has a greater potential for visual impacts as it involves substantially more aboveground infrastructure than the underground alternative. However, given that the existing setting is highly urbanized, the introduction of new infrastructure and roadway modifications associated with any of the alternative would not be out of character with the existing setting and therefore is not anticipated to substantially degrade the existing visual quality, nor would it substantially impair the quality of the pedestrian environment. Further, none of the alternatives would result in removal of notable architectural resources. However, potential impacts related to visual resources could involve impeding line of sight of notable architectural resources and removal of street trees. These potential impacts are discussed further below as related to the specific alternatives.

At-Grade Emphasis LRT Alternative

The At-Grade Emphasis LRT Alternative has the potential to impact views through the introduction of new aboveground infrastructure such as train track, caternary wires and poles, and station platforms. Station portals and associated signage would be required for underground stations along the alignment. Catenary poles for the proposed project may in some cases, replace existing utility poles, however, given catenary wires and support requirements, the wires and poles could increase visual clutter, particularly at curves and corners. The catenary wires and poles may obstruct views of notable architectural resources, as well as modifying the visual character of the area.

The At-Grade Emphasis LRT Alternative would also require substantial roadway modifications to accommodate the track and related infrastructure associated with the at-grade segments of the alignment. While roadway modifications and construction would result in visual disruption during the construction period, this new infrastructure would be consistent in character with the existing urban setting.

Views of the individual architectural resources listed in Section 4.5.1 may be interrupted by station platforms, portals to underground stations, and catenary wires and poles, however, the wires, portals, and platforms would not fully impede views. Views may be completely blocked when a train is stopped at a platform when located between an on-looker and the notable structure, but this would occur on a temporary basis as once a train had departed a station, limited views of the structure would be available. The new

infrastructure would be consistent with the overall urban streetscape along the alignments, and while it would partially block some views of notable architecture when the infrastructure is between the viewer and the visual resource, views would only be fully impeded temporarily at select locations near station platforms.

Views of public art work from streets and sidewalks on opposite sides of the street could potentially be obscured by at-grade infrastructure associated with the alternative. It is anticipated that public art work would still be accessible for viewing from the sidewalks immediately adjacent to the art work and from within the public sites, potential visual obstruction of notable public artwork would require further evaluation.

The At-Grade Emphasis LRT Alternative calls for the construction of an automobile underpass and a pedestrian overpass at the intersection of Temple and Alameda Sts. The pedestrian overpass in particular would impose some visual impacts for onlookers in all directions, though these effects would be limited due to the visual impacts of the existing Metro Gold Line Eastside Extension overpass located immediately northeast of the intersection. Also, pedestrians using the overpass would have a new vantage point for viewing the Little Tokyo and Civic Center areas.

The At-Grade Emphasis LRT Alternative could result in the loss of existing street trees. Mitigation or adoption of project design features to preserve or replace street trees as feasible may be required to ensure that this is not a significant visual impact.

At-grade stations could incorporate urban design elements consistent with surrounding structures and being destination points integrated into the surrounding urban streetscape. The stations would thereby contribute to a pedestrian-friendly environment.

Given the amount of existing lighting sources within the PSA, new lighting associated with the proposed alternatives is not anticipated to result in a noticeable change in the overall lighting levels.

Of the two At-Grade Emphasis LRT Alternative options, a larger percentage of the Option B is located aboveground (79 percent) than Option A (64 percent), and therefore Option B has a greater potential for visual impacts.

Underground Emphasis LRT Alternative

Although the Underground Emphasis LRT Alternative is almost entirely underground, it would have portals and signage directing transit riders to underground stations that would be visible aboveground, and thereby cause some alteration of the existing streetscape. Portals to underground stations would typically be located either on the sidewalk or pedestrian plaza, where passengers enter the station via escalators, elevators, or stairs away from at-grade views. Compared with at-grade stations, portals leading to underground stations would be less visually intrusive and may actually improve the streetscape through the use of lighting, landscaping, plazas, kiosks, public art, and other elements. Further, while portals would alter the existing views, they would be consistent with the urban character of the surroundings and would not be of sufficient size and height to fully block views of the surrounding architecture and therefore, potential effects

on notable architecture is anticipated to be minimal. However, specific portal locations near buildings with notable architecture (i.e., former Saint Vibiana's Cathedral and Caltrans buildings) would need to be further evaluated. In addition, evaluation would also be required to determine if any of the portals would obscure views of notable public art work from streets or sidewalks.

The Underground Emphasis LRT Alternative also calls for an automobile underpass and pedestrian overpass at the intersection of 1st and Alameda Sts. Pedestrians using the overpass would have a new, elevated structure from which to view the Little Tokyo area, but the line of sight between the 1st St. bridge and the historic Little Tokyo retail strip on East 1st St. would be obstructed.

Construction related to an underground alignment could have a potentially greater visual impact than at-grade construction due to the longevity of construction and work necessary to create underground tunnels. However, visual disturbance resulting from construction activities would be temporary.

Therefore, while temporary construction impacts may be more visually disruptive under the Underground Emphasis LRT Alternative, the operational impacts would be substantially less with the Underground Emphasis LRT Alternative versus the At-Grade Emphasis LRT Alternative, given that the Underground Emphasis LRT Alternative entails substantially less aboveground infrastructure, thereby resulting in fewer alterations to the existing visual setting.

4.6 Air Quality Impacts

In response to concerns about air pollution, Federal, State, and local authorities have adopted various rules and regulations requiring evaluation of air quality impacts of projects and appropriate mitigation for air pollutant emissions. The following discussion focuses on ambient air quality standards, the existing setting of the PSA, and potential impacts.

4.6.1 Affected Environment

4.6.1.1 Regulatory Framework

Federal Clean Air Act: Air quality in the United States is governed by the Federal Clean Air Act (CAA) and is administered by the USEPA. Under the authority granted by the CAA, USEPA has established national ambient air quality standards (NAAQS) for the following criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). Table 4-6 presents the National Ambient Air Quality Standards (NAAQS) that are currently in effect for criteria air pollutants. O_3 is a secondary pollutant, meaning that it is formed from reactions of "precursor" compounds under certain conditions. The primary precursor compounds that can lead to the formation of O_3 include volatile organic compounds (VOC) and oxides of nitrogen (NO_x).

The CAA also specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met.

The City of Los Angles is included in the South Coast Air Basin (SCAB), which is designated as a federal non-attainment area for O3, PM10, and PM2.5.

California Clean Air Act: In addition to being subject to the requirements of the Federal CAA, air quality in California is also governed by the more stringent regulations under the California CAA. The California CAA is administered statewide by the California Air Resources Board (CARB). CARB oversees the functions of local air pollution control districts and air quality management districts, who in turn administer air quality activities at the regional, or air district, level. The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the State to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CAAQS are at least as stringent, and often more stringent than the NAAQS. The currently applicable CAAQS are presented with the NAAQS in Table 4-6 for each pollutant.

Table 4-6 South Coast Air Basin Attainment Status

Pollutant	National Standards	California Standards
Ozone (O3)	Non-attainment – Severe 17	Non-attainment
Carbon monoxide (CO)	Attainment – Maintenance	Non-attainment – Transitional
Nitrogen dioxide (NO2)	Attainment – Maintenanceb	Attainment
Sulfur dioxide (SO2)	Attainment	Attainment
Respirable particulate matter (PM10)	Non-attainment – Serious	Non-attainment
Fine particulate matter (PM2.5)	Non-attainment	Non-attainment
Lead (Pb)	Attainment	Attainment

a. Status as of June 15, 2007.
b. The USEPA redesignated the SCAB as attainment for the CO NAAQS in 2007 (72 FR 26718).
c. The Los Angeles County portion of the SCAB was redesignated by CARB as attainment for the CO CAAQS, awaiting final State administrative process to officially change designation.
Source: CDM 2007

The California Air Resources Board (CARB) has been granted jurisdiction over several air pollutant emission sources that operate in the State. Specifically, CARB has the authority to develop emission standards for on-road motor vehicles, as well as for stationary sources and some off-road mobile sources. In turn, CARB has granted authority to the regional air pollution control and air quality management district's to develop stationary source emission standards, issue air quality permits, and enforce permit conditions.

Assembly Bill 32: The California Global Warming Solutions Act of 2006, also known as Assembly Bill (AB) 32, requires CARB to adopt regulations to require the reporting and verification of statewide greenhouse gas (GHG) emissions and to monitor and enforce compliance with the program. In general, the bill requires CARB to reduce statewide GHG

emissions to the equivalent of those in 1990 by 2020. CARB is required to adopt regulations for mandatory GHG emissions reporting by January 1, 2008 and to adopt a plan indicating how emission reductions will be achieved by January 1, 2009. Major rulemakings for reducing GHGs must be developed by January 1, 2011, while the rules and market mechanisms adopted by CARB do not take effect until January 1, 2012. Since CARB is still in the rulemaking process for AB 32, information about project compliance at the state-level is currently not available.

An individual project, even a very large one, does not generate enough greenhouse gas emissions on its own to significantly influence global climate change; therefore, the issue of global climate change is, by definition, a cumulative environmental impact.

Air Quality Management Plan: At the local level, the South Coast Air Quality Management District (SCAQMD) has jurisdiction over a 10,743 square mile area consisting of Orange County, the non-desert portions of Los Angeles, Riverside, and San Bernardino counties, and the Riverside County portions of the Salton Sea Air Basin and Mojave Desert Air Basin. SCAB is a sub region of the SCAQMD's jurisdiction, which covers an area of 6,745 square miles and includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. While air quality in this area has improved, the Basin requires continued diligence to meet air quality standards.

The SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the CAAQS and NAAQS. These plans require, among other emissions-reducing activities, control technology for existing sources; control programs for area sources and indirect sources; a permitting system designed to ensure no net increase in emissions from any new or modified permitted sources of emissions; transportation control measures; sufficient control strategies to achieve a five percent or more annual reduction in emissions (or 15 percent or more in a three-year period) for reactive organic compounds (ROC), NOx, CO, and PM10; and demonstration of compliance with the CARB's established reporting periods for compliance with air quality goals[1]. On June 1, 2007, the SCAQMD adopted a comprehensive update, the 2007 AQMP for the Basin. The 2007 AQMP outlines the air pollution control measures needed to meet the federal PM2.5 standard by 2015 and the federal eight-hour ozone standard by 2024.

The SCAQMD also adopts rules to implement portions of the AQMP. Several of these rules may apply to construction or operation of the project. For example, Rule 403 requires the implementation of best available fugitive dust control measures during active operations capable of generating fugitive dust emissions from on-site earth-moving activities, construction/demolition activities, and construction equipment travel on paved and unpaved roads. In addition, Regulation XI from the SCAQMD contains source-specific standards for different operations that may be completed under the jurisdiction of the SCAQMD. Rule 1166 contains requirements related to VOC emissions from

[1] Reactive organic compounds (ROC) and volatile organic compounds (VOC) are designations made by CARB and USEPA, respectively, for organic compounds that react with NOx in the presence of sunlight to form O_3. Slight variations exist between the two designations; for example, the CARB definition of ROC includes ethane while the USEPA definition of VOC does not.

decontamination of soil. The rule sets requirements to control the emission of VOC from excavating, grading, handling, and treating VOC-contaminated soil.

4.6.1.2 Existing Conditions

Table 4-7 below provides air quality data for 2006 (most recent available air quality data from SCAQMD), for the Central Los Angeles monitoring location (Station Number 087), the closest monitoring station to the proposed project site.

In addition to the criteria pollutants traditionally considered, greenhouse gas emissions need to be evaluated. Different from criteria pollutants, GHG considerations are not based on maintaining or achieving an ambient air quality standard, but instead focus on achieving reductions, regardless of increases in population or operations. While there are currently no specific regulatory requirements specific to greenhouse gases beyond mandatory reporting requirements per the guidelines developed in response to AB 32, the SCAQMD is currently in the process of developing thresholds of significance that would require all projects to provide a minimum reduction over the existing conditions. As the project is further evaluated, it will be important to estimate existing levels of GHG emissions versus the change in GHG emissions resulting from implementation of the alternatives.

Table 4-7 South Coast Air Quality Management District - Air Quality Data Central Los Angeles Station (Station Number 087) – 2006

		Maximum Concentration (ppm)	Days of AAQS Exceeded	
			Federal	State
Ozone	1-hour	0.11	0	8
	8-hour	0.079	0	4
NO2	1-hour	0.11		
	24-hour	0.06		
	Annual Average	0.0288		
SO2	1-hour	0.03		
	24-hour	0.006		
	Annual Average	0.0019		
		Maximum Concentration (ug/m3)	**Days of AAQS Exceeded**	
			Federal	**State**
PM10	24-hour	59	0	3
	Annual Average	30.3		
PM2.5	24-hour	56.2	11	
	Annual Average	15.6		

4.6.2 Evaluation Methodology

This air quality evaluation is qualitative, based on experience with emissions associated with construction activities and transit systems' operational air quality emissions. A more comprehensive quantitative air quality and greenhouse gas emissions assessment will be required once additional specific analysis is performed during the EIS/EIR phase.

The subsequent analysis will evaluate the alternatives regarding criteria pollutants in accordance with SCAQMD CEQA guidelines and GHG in accordance with draft guidance as available by SCAQMD. Emissions under the current year and existing conditions will be provided as a baseline point of comparison. Criteria pollutants, specifically NOx, CO, PM2.5, and PM10, will be evaluated using SCAQMD's localized significance thresholds (LST) methodology as detailed in the Final LST Methodology document, dated June 2003. It is assumed that dispersion modeling for operational emissions will not be required as part of this evaluation, with the potential exception of localized CO impacts resulting from changes in intersection configurations and congestion resulting from any of the alternatives. If deemed necessary due to potential future decreases in level of service, localized CO impacts may be evaluated using the Cal3HQC roadway CO dispersion model.

While CEQA guidance does not currently exist detailing a methodology for estimating construction or operational GHG emissions, GHG CEQA thresholds of significance are

currently being considered and drafted for the SCAQMD. Assuming a finalized, official SCAQMD methodology may not be available during this evaluation, current CARB AB 32 reporting requirements, methodologies, and emission factors will be utilized to estimate GHG emissions for all years and scenarios. Where CARB methodologies or emission factors are not available for specific sources, available USEPA factors will be reviewed for use in the analysis.

4.6.3 Environmental Issues

Based on at-grade versus tunnel construction, it is anticipated that construction emissions and impacts associated with the Underground Emphasis LRT Alternative would be greater than those associated with the At-Grade Emphasis LRT Alternative. Underground construction requires excavation and disposal or reuse of greater amounts of dirt than at-grade construction. The moving of this dirt generates fugitive dust emissions as well as engine emissions from the equipment needed to dig the hole, remove the dirt, and place elsewhere. At-Grade construction does require moving dirt; however the quantity is significantly less.

Annual regional vehicle miles traveled (VMT) is expected to decrease under both the At-Grade Emphasis LRT and Underground Emphasis LRT Alternatives, and therefore, emissions related to vehicle exhaust (CO, CO2, and NOx) are expected to also decrease as compared to existing conditions and the future no action scenario. As a result, none of the project alternatives are predicted to exceed operational conformity or CEQA operational thresholds.

Localized impacts, specifically localized CO concentrations at specific intersections, may occur for various alternatives due to changes in intersection configurations and levels of service (LOS). These localized impacts may result in CO hot spots. If the future traffic analysis indicates that specific intersections may suffer a decrease in the LOS, those intersections will be evaluated further for localized CO impacts in the EIS/EIR.

4.7 Noise and Vibration

This section addresses the potential impacts of the project on noise at or in the PSA. The analysis describes the regulatory setting and the existing setting as it relates to noise. The potential impacts that could result to surrounding land uses from noise from construction and operation of each of the components are also addressed.

4.7.1 Affected Environment

4.7.1.1 Regulatory Framework

A number of federal agencies maintain noise regulations and guidelines. These agencies include USEPA, the U.S. Department of Housing and Urban Development (HUD), the Federal Highway Administration (FHWA), the Federal Aviation Administration (FAA), and the Federal Transit Administration (FTA) among others. The applicability of noise regulations depends on the nature of the agency. USEPA regulations, for instance, generally apply to interstate rail, interstate commercial mobile vehicles, or to certification procedures for "low-noise emissions products." HUD noise regulations apply to HUD-assisted projects and actions, while FHWA noise regulations pertain to federally aided highway projects. Federal regulations are not applicable to the proposed Project because it does not involve interstate activities, is not assisted by HUD, and does not involve construction of highways.

The California Office of Noise Control has developed guidelines showing a range of noise standards for various land use categories. Cities within the state have incorporated these guidelines into their General Plan noise elements. These guidelines are meant to maintain acceptable noise levels in a community setting based on the type of land use. Noise compatibility by different types of land uses is a range from "Normally Acceptable" to "Clearly Unacceptable" levels. The guidelines are used by cities within the state to help determine the appropriate land uses that could be located within an existing or anticipated ambient noise level, and are primarily considered in general plans.

The project has the potential to affect noise levels within the City of Los Angeles. Noise within the City is regulated by noise ordinances, which are found in the LAMC. These noise ordinances limit intrusive noise and establish sound measurements and criteria, minimum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses (such as radio, television, vehicle repairs, and amplified equipment), hours of operation for certain activities (such as construction and trash collection), standards for determining noise deemed a disturbance of the peace, and legal remedies for violations. The noise ordinance for the City of Los Angeles can be found in Chapter XI of the LAMC. In addition, the General Plan Noise Element for the City of Los Angeles provides noise management goals, objectives, policies, and programs to achieve.

The City has incorporated the California Office of Noise Control noise compatibility guidelines into their Noise Element.

4.7.1.2 Existing Conditions

Sound is defined as any pressure variation detected by the human ear. Noise is defined as any unwanted sound. The degree to which noise can affect the human environment range from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise; the amount of background noise present before the intruding noise; and the nature of work or human activity that is exposed to the noise source. The preferred unit for measuring sound is the decibel (dB). The dB expresses the logarithmic ratio of the amount of energy radiating from a source in the form of an acoustic wave. The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. Sound intensity is measured in decibels that are A-weighted (dBA) to correct for the relative frequency response of the human ear. The range of human hearing extends from approximately three to 140 dBA.

The following describes the existing (baseline) environmental noise setting information presented for the two build alternatives currently identified as At-Grade Emphasis LRT and Underground Emphasis LRT.

The PSA encompasses approximately two square miles of downtown Los Angeles and includes the communities of Little Tokyo, the Arts District, the Historic Core, the Toy District, Bunker Hill, the Financial District, the Jewelry District, and Civic Center. It extends from the Metro Blue Line terminus at 7th St. and Wilshire Blvd. in downtown Los Angeles to the vicinity of the Gold Line station at 1st and Alameda Sts.

The existing noise and vibration environment of an area (without the project) is generally established by the type and intensity of the existing land use and related transportation system activity. The PSA and specifically the area of potential effect located immediately adjacent to or above the alternative alignments, is best described as an intensely developed urban core. The structure type is predominately steel and concrete high-rise buildings, attached and detached parking structures, plus a limited number of masonry low-rise multi-story buildings. There is also a small number of street-level pedestrian plazas. The land uses are office/commercial, institutional, and government plus some hotels and mixed commercial/retail with upper floor residential apartments/condominiums.

The area's transportation network is essentially a grid pattern of street-level roads plus a few elevated ramps and below surface traffic tunnels. Both the At-Grade Emphasis LRT Alternative and the Underground Emphasis LRT Alternative are located between one and two blocks from major freeways, the I-101 (below grade) and I-110 (western edge). Because of the characteristics of the downtown fabric and the existing buildings located in-between the alignments and the freeways, very little additional noise would be expected for either alignment. In addition, truck heavy routes which exist on the eastern edge of the

PSA (such as Alameda St.) do not produce greater noise than regular cars due to the slow level of speeds by which trucks travel. Most noise is created by tires, which are louder the faster a vehicle goes, speed bumps, dips, or potholes in the roads. Because these elements are minimal, there are no significant impacts. One key note is the underpass element which is introduced in the Underground Emphasis LRT and the option for the At-Grade Emphasis LRT. The underpass would direct through north-south traffic on Alameda St. (the only truck heavy street in the PSA) underground, thus minimizing traffic noise impacts even more. The estimated average ambient noise level is a Day Night Average Noise Level (Ldn) of approximately mid/upper 60's to low 70's, dBA.

The promising alternatives and proximate land use categories are shown on Figure 4-1.

4.7.2 Evaluation Methodology

This noise and vibration evaluation is qualitative, based on substantial experience with ambient and transit systems' environmental noise plus a "windshield" survey of the alternative alignments conducted during April 2008. A more comprehensive quantitative noise and vibration impact assessment will be required once additional specific analysis is performed during the EIS/EIR phase. The subsequent analysis will follow the Federal Transit Administration (FTA) guidelines contained in Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), issued as a Final Report May 2006.

Table 4-8: Land Use Categories and Metrics for Transit Noise Impact Criteria

Land Use	Noise Metric	Description of Land Use Category
1	Outdoor	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be utmost importance.
3	Outdoor	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interferences with such activities as speech, meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.

***Leq for the noisiest hour of transit-related activity during hours of noise sensitivity.**
Source: Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06), Chapter 3, issued as a Final Report May 2006.

4.7.3 Environmental Issues

Noise and vibration associated with the two build alternatives (at-grade and underground) would be generated by a LRT system with associated stations and ancillary structures (e.g., discharge vent for tunnel ventilation of underground alternative). The main noise sources of the LRT vehicle are the wheel/track interface, vehicle brakes, and the propulsion system of the trainset. For stations the primary noise sources are mechanical HVAC plus station platform paging. An additional noise source for subway systems is the tunnel ventilation system. Additional noise sources for street-level operations are grade-crossing warning bells and track horns. In general, the noise from trainsets operating at street level (with concomitantly low relative speeds compared to subway operation) would be about the same as a medium truck or a bus operating at similar speeds. The noise emission from a trainset operating in a tunnel section could be slightly louder because of a higher allowable travel speed, but the noise escaping to street level and higher, including noise from tunnel vents, would be minimal and likely inaudible compared to the existing urban ambient noise. With the exception of grade-crossing bells, noise emission from either sub-grade or street level stations would likely blend into the existing ambient noise currently generated by traffic and the myriad of high-rise buildings in the project area. Vibration generated by the operating trainsets is expected to be low for the slower speed street-level alternatives. Vibration and resulting ground-borne noise from subway operation might be of interest in the vicinity of the Disney Concert Hall but is likely to be insignificant.

At-Grade Emphasis LRT Alternative

For purposes of noise and vibration impact analysis, the potential noise and vibration impacts associated with Options A and B are the same. As discussed above, LRT vehicles generate more potentially audible noise when running at street level. The normal trainset noise is similar in nature and sound level to the existing street traffic traversing the area. However, "wheel squeal", train platform paging systems and any at-grade crossing bells would add noise of a different character to the existing ambient noise. When the hustle and bustle of daytime street traffic and activity subsides the operation of a street-level LRT system could become more audible. The phenomenon of wheel squeal occurs when a steel-wheeled LRT vehicle traverses a tight-radius steel track curve and high-pitched vibration and noise emission occurs. Wheel squeal can be avoided or minimized during design by considering the radius of necessary curved track sections. This may be difficult in a densely developed urban environment. For a given track layout with tight curves, the squeal can usually be mitigated at extra expense and maintenance costs but can be a stubborn problem. In general, the At-Grade Emphasis LRT Alternative has a slightly higher potential for noise impacts than the Underground Emphasis LRT Alternative.

Underground Emphasis LRT Alternative

As discussed above, subway LRT noise is generally not of concern to noise-sensitive street-level land use because the noise from the train and below-grade stations/platforms is well contained within the tunnel structure and at-grade crossing bells would not be necessary, with the exception of the 1st and Alameda St. intersection. This at-grade intersection may experience higher levels of noise and vibration due to the volume of

trains passing through. In addition to the at-grade impacts mentioned above, the trains will be surfacing in a portal located in the 'Office Depot' parcel and this may affect surrounding businesses and/or residences due to vibration.

The potential noise emissions from tunnel ventilation structures is readily attenuated by application of established design principles and the common practice of locating the vent shafts such that their exits are in or adjacent to parking structures or building service areas. Because of potentially higher train speeds and closer proximity to the foundations of ground-born-noise-sensitive structures, the potential concern for these issues should be evaluated when more project details become available. In general, the Underground Emphasis LRT Alternative has a low potential for noise impacts and a slightly higher potential for vibration/ground-born noise impacts at critical receptors than the At-Grade Emphasis LRT Alternative.

4.8 Ecosystems/Biological Resources

The PSA traverses the highly developed downtown area. As such, biological resources are limited to landscaped areas where mature trees or other vegetation could support wildlife species that are adapted to the urban environment. This section discusses potential issues associated with biological resource impacts in the PSA.

4.8.1 Affected Environment

4.8.1.1 Regulatory Framework

Endangered Species Act: The Endangered Species Act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Section 7 of the Endangered Species Act requires federal agencies to aid in the conservation of listed species, and to ensure that the activities of federal agencies will not jeopardize the continued existence of listed species or adversely modify designated critical habitat. At the federal level, the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration are responsible for administration of the Endangered Species Act.

Migratory Bird Treaty Act: The Migratory Bird Treaty Act decrees that all migratory birds and their parts (including eggs, nests and feathers) are fully protected. Nearly all native North American bird species are protected by the act. Under the act, taking, killing, or possessing migratory birds is unlawful. Activities that would require such a permit would include destruction of migratory bird nesting habitat during the nesting season when eggs or young are likely to be present.

California Endangered Species Act: The California Department of Fish and Game is responsible for administration of the California Endangered Species Act. Unlike the federal Endangered Species Act, there are no state agency consultation procedures under the California Endangered Species Act. For projects that affect both a state and federal listed species, compliance with the federal Endangered Species Act will satisfy the California Endangered Species Act if the California Department of Fish and Game determines that the federal incidental take authorization is "consistent" with the California Endangered

Species Act. Projects that result in a take of a state only listed species require a take permit under the California Endangered Species Act.

California Fish and Game Code Sections 3500 - 3705, Migratory Bird Protection: Sections 3500 through 3705 of the California Fish and Game Code regulate the taking of migratory birds and their nests. These codes prohibit the taking of nesting birds, their nests, eggs, or any portion thereof during the nesting season. Typically, the breeding/nesting season is from March 1 through August 30. Depending on each year's seasonal factors, the breeding season can start earlier and/or end later.

Los Angeles County General Plan: The Los Angeles County General Plan identifies Significant Ecological Areas containing biological resources and sets forth the goal of conserving these areas. While development within a Significant Ecological Area (SEA) is not prohibited, the general plan does require development to be limited and controlled in order to avoid impacting valuable biological resources.

City of Los Angeles Native Tree Protection Ordinance: The City of Los Angeles enacted an oak tree protection ordinance in 1982 to protect oak trees in the City. Although the ordinance slowed the oak tree decline, the oak population, as well as other native tree species, continued to decline. In an effort to further slow the decline of native tree habitat, the City passed an amended Native Tree Protection Ordinance (Ordinance No. 177,404), which became law on April 23, 2006. The Native Tree Protection Ordinance protects all native oak tree species (Quercus spp), California Sycamore (Platanus racemosa), California Bay (Umbellularia californica), and California Black Walnut (Juglans californica); applies to protected trees four inches or greater in diameter at 4.5 feet above ground (multiple trunk trees are calculated by cumulative diameter); applies to protected trees on private lots; and, requires that a protected tree report be submitted by a registered consulting arborist, landscape architect, or pest control advisor who is also a certified arborist.

Protected tree removal requires a removal permit by the Board of Public Works. Any act that may cause the failure or death of a protected tree requires inspection by the City's Urban Forestry Division. Although the law does not require a permit for the pruning of protected trees, the City recommends consultation with a certified arborist to ensure that the pruning of protected trees is performed carefully.

4.8.1.2 Existing Conditions

Due to its densely developed and urbanized nature, the PSA provides little opportunity for wildlife species or other biological resources to exist. There are no Habitat Conservation Plans for this area, and no SEAs located within one-quarter mile of either side of the At-Grade Emphasis LRT or Underground Emphasis LRT Alternatives. There are no wildlife corridors within this area to support movement of wildlife species. There are no wetlands, oak woodlands, or coastal sage scrub habitat within the PSA. Due to the lack of habitat, sensitive species are not known to occur here. The Los Angeles River, which is contained within a concrete channel through the downtown area, is located more than one-quarter mile away from the build alternatives.

In general, biological resources within the PSA are limited to a few green spaces consisting of landscaped vegetation where highly-adaptive urban wildlife species may exist. Native plant species are mainly limited to those few that are maintained in these small green spaces. A small number of large mature trees located within the PSA may provide potential roosting and nesting sites for birds, including raptors.

4.8.2 Evaluation Methodology

To evaluate potential impacts related to the project construction and operation, the possible plant species that could occur in the PSA were reviewed, and their respective values as protected species or habitat that supports a protected species was evaluated.

4.8.3 Environmental Issues

Because of the general lack of biological resources in the PSA, as described above under Section 4.8.1.2, there are few environmental issues to consider in this regard. However, trees that may provide potential roosting and nesting sites for birds may exist within one-quarter mile of the promising alternatives. If construction of the project would require removal of these trees during nesting season, focused surveys for nesting birds would be required. Compliance with the City of Los Angeles Native Tree Ordinance would also be required. For these reasons, the Underground Emphasis LRT Alternative could be preferable to the At-Grade Emphasis LRT Alternative if it would avoid disturbance or destruction of protected trees and nesting birds. In addition, design elements would be incorporated that could add more trees and vegetation than currently exist in either alternative.

4.9 Geotechnical: Subsurface and Hazardous Materials

This section discusses potential issues associated with geology and subsurface conditions and hazardous materials within the PSA.

4.9.1 Affected Environment

4.9.1.1 Geology and Subsurface Conditions Geologic Features and Soils

The PSA is located in the northern portion of the Los Angeles Basin. This basin is a major elongated northwest-trending structural depression that has been filled with sediments up to 13,000 feet thick since middle Miocene time. On a regional scale, the PSA lies within the northernmost portion of the Peninsular Ranges geomorphic provinces near its boundary with the Transverse Ranges geomorphic provinces. The Peninsular Ranges province is characterized by elongate northwest-trending mountain ridges separated by sub-parallel, sediment-filled valleys. This province is bounded by the San Jacinto fault zone on the east, the Pacific Ocean coastline on the west, and the Transverse Ranges geomorphic province on the north. In contrast, the adjacent Transverse Ranges are characterized by east-west trending geologic structures and mountain ranges that include the Santa Ynez, San Gabriel, San Bernardino, and Santa Monica Mountains, and associated valleys. The Transverse Ranges province is a composite structural block bounded by the Big Pine fault on the north, the San Andreas fault zone on the east, the Pacific Ocean on the west, and the Malibu Coast, Santa Monica, Hollywood, Raymond,

Sierra Madre, and Cucamonga faults on the south. The regional geology in the site vicinity is shown on Figure 4-4, Regional Geology.

On a local geologic setting, the proposed alignments would traverse the southeastern end of the Elysian Park Hills and the ancient floodplain of the Los Angeles River. The Elysian Hills comprise the low-lying hills west of the Los Angeles River and southeast of the eastern end of the Santa Monica Mountains. The Hollywood fault separates the northern end of the Elysian Hills from the Santa Monica Mountains. The Elysian Hills are comprised largely of Miocene age sedimentary rocks with Pliocene age rocks flanking the southeastern edge of the hills. Previous geologic mapping identified several major geologic structures within the Elysian Hills, including the Elysian Park anticline and northwest trending faults. The proposed project located on the southwestern flank of the northwest trending Elysian Park anticline. The southerly limb of the anticlinorium contains apparent secondary folds of relatively shorter wavelength and lesser continuity of fold axes. In the vicinity of the project alignment, bedding within the Fernando and Puente formations strike approximately east-west to slightly north of east and dips moderately to steeply to the south.

The geomorphology along the proposed alignments ranges from gently sloping alluvial floodplain surfaces to hill-side slopes of moderate relief and grade. The steepest slopes along the alignment surface are between 3rd St. (at Flower St.) and Olive St. (at 2nd St.). Review of the historical U.S. Geological Survey topographic map of the Hollywood Quadrangle shows a relatively narrow alluvial valley follows Flower St. from 6th St. up-gradient to 3rd St., then diverges to the northwest toward Glendale Blvd. (west of the 110-Harbor Freeway). This alluvial valley appears to be a tributary drainage course to an ancestral course of the Los Angeles River (i.e., prior to channelization of the modern Los Angeles River). The Los Angeles River floodplain covers the broad, gently sloping, alluvial terrain east of the Bunker Hill area. Artificial fill of variable thickness underlies the alignment in the near surface. The fill consists of mixtures of sand, silt, clay, with variable amounts of construction debris. Deep areas of fill to depths of approximately 25 feet below ground surface are locally present at abandoned tunnels (5th St.) and storm drain excavations that have been backfilled.

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 Geological Survey (CGS - previously the California Division of Mines and Geology) for the Alquist-Priolo Earthquake Fault Zoning Program. 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. Active and potentially active faults that are located within ten miles of the alignment are discussed below with respect to their known recency of displacement and location relative to the proposed alignments along Flower St. to 2nd St. Based on our review of the available data, no known Holocene Active or Latest Pleistocene Active faults trend through the PSA. The PSA is not located within a currently

established Alquist-Priolo earthquake fault zone for surface fault rupture. The faults in the vicinity of the site are shown in Figure 4-5, Regional Faults and Seismicity.

Figure 4-4 Regional Geology

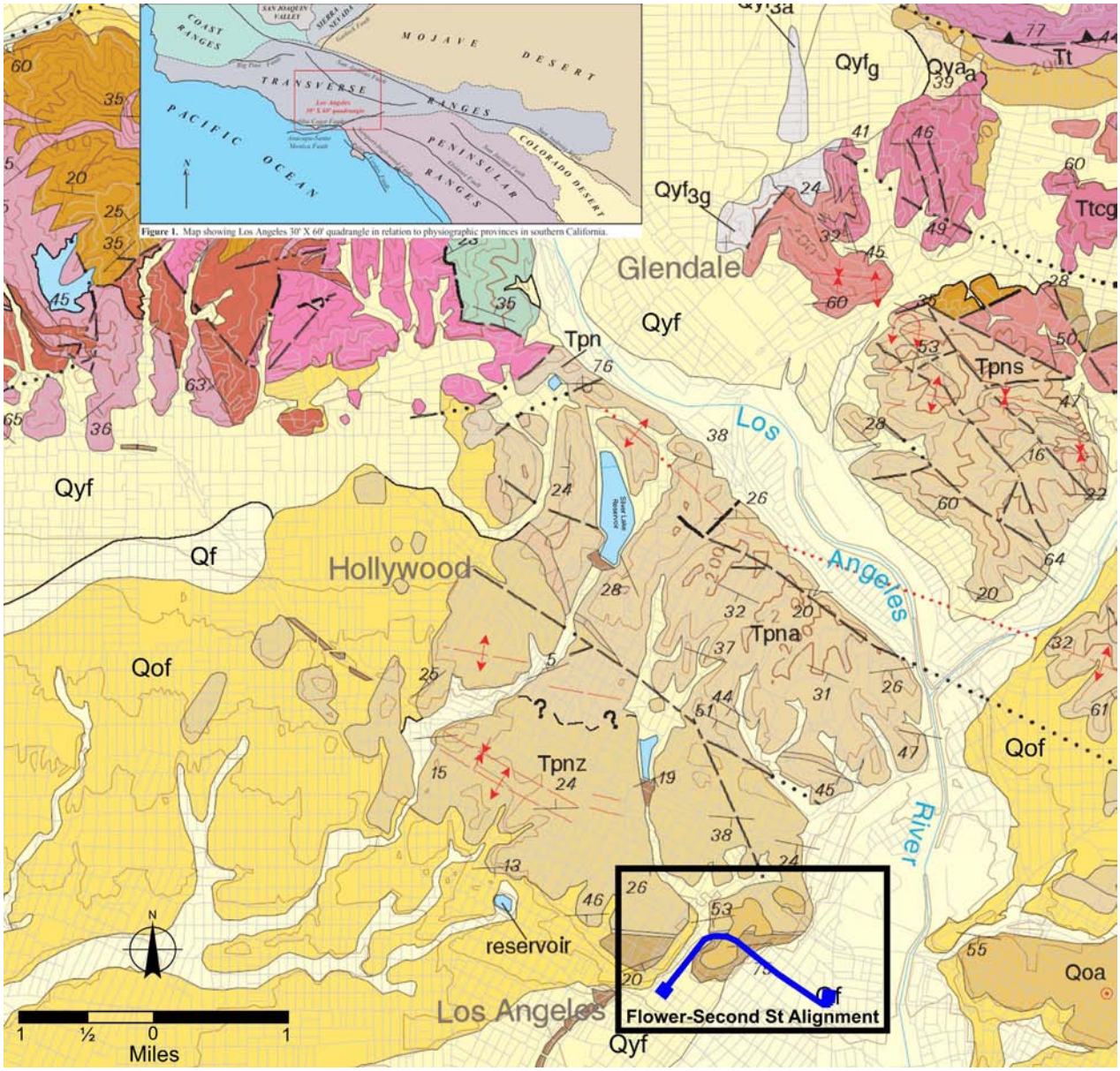
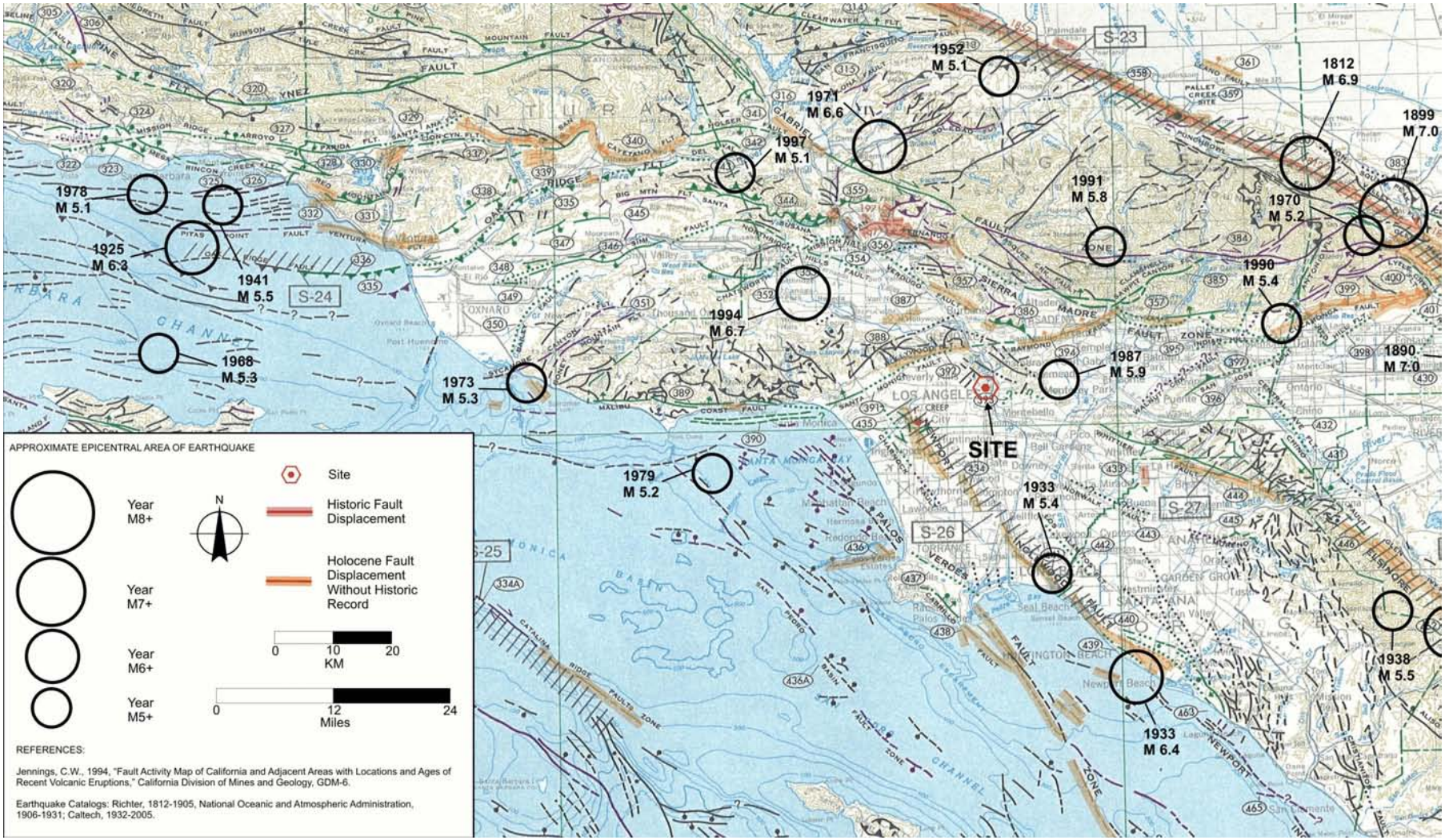


Figure 4-5 Regional Faults and Seismicity



Active Faults

The Holocene active fault with surface expression closest to the PSA is the Hollywood fault, located approximately 3.9 miles to the northwest. Active blind thrust faults in vicinity of the site are discussed separately below. Holocene Active faults within ten miles of the planned alignment include the Raymond fault, the Newport-Inglewood fault zone, Verdugo fault and the Santa Monica fault. These faults, respectively, are located the following approximate distances from the proposed alignment; 5.9 miles southeast, 7.8 miles west-northwest, 8.4 miles north-northeast, and 9.6 miles west. The active Hollywood fault trends east-west along the base of the Santa Monica Mountains from the West Beverly Hills Lineament in the West Hollywood-Beverly Hills area to the Los Feliz area of Los Angeles. The fault is a groundwater barrier within Holocene sediments. Studies by several investigators have indicated that the fault is active based on geomorphic evidence, stratigraphic correlation between exploratory borings, and fault trenching studies. Although the Hollywood fault is considered active by the State Geologist, an Alquist-Priolo Earthquake Fault Zone has not yet been established for the Hollywood fault due to the poorly defined location along its length. The City of Los Angeles considers the Hollywood fault active for planning purposes and the CGS includes the fault in its database of seismic sources.

Potentially Active Faults

The inferred trace of the MacArthur Park fault is located approximately 0.5 miles southeast of the proposed alignment. The fault has not been definitively proven to exist. It is inferred west of downtown Los Angeles and has been located based on south-facing scarps, truncated drainages, and other geomorphic features. The Eagle Rock fault, a latest Pleistocene active fault is located approximately eight miles to the northeast.

Blind Thrust Fault Zones

Several buried thrust faults, commonly referred to as blind thrusts, underlie the Los Angeles Basin at depth. These faults are not exposed at the ground surface and are typically identified at depths greater than three kilometers. These faults do not present a potential surface fault rupture hazard, however, they are considered active and potential sources for future earthquakes. The nearest thrust is the Elysian Park Thrust. The Elysian Park Thrust, previously defined as the Elysian Park Fold and Thrust Belt, was postulated to extend northwesterly from the Santa Ana Mountains to the Santa Monica Mountains, extending westerly and paralleling the Santa Monica-Hollywood and Malibu Coast faults. The Elysian Park Thrust is now believed to be smaller in size, only underlying the central Los Angeles Basin. The Elysian Park Thrust underlies the PSA at depth (approximately six to nine miles below ground surface). Like other blind thrust faults in the Los Angeles area, the Elysian Park Thrust is not exposed at the surface and does not present a potential surface rupture hazard; however, the Elysian Park Thrust should be considered an active feature capable of generating future earthquakes with associated significant ground shaking and possible deformation of the near surface materials.

In addition the Elysian Park fault a blind thrust fault located northeast of and at a shallower depth than the Elysian Park Thrust. The up-dip edge of the blind thrust fault tip is located about 0.6 miles north of downtown Los Angeles. The estimated, average

recurrence-interval for events of the Elysian Park fault ranges from 500 to 1,300 years, with an estimated moment magnitude of up to 6.7. Evidence to define the activity of the Elysian Park fault is lacking, however, given the history of seismic events on blind thrust faults in the greater Los Angeles area (i.e. Whittier Narrows and Northridge earthquakes) and proximity to the PSA of this newly defined fault, the Elysian Park fault is considered active for planning and design of the project.

Coyote Pass Escarpment

The Coyote Pass Escarpment is a gentle south-facing, east-west trending topographic lineament that forms the southern flank of the Repetto Hills, from the Los Angeles River channel eastward to the Monterey Park area. The escarpment is an area of young, near-surface monoclinal folding, believed to be a result of fault rupture on the Elysian Park Thrust and/or the shallower Elysian Park fault. Although the trend of the escarpment beneath the floodplain, west of the Los Angeles River has not been well defined, it has been inferred that the escarpment may align in the subsurface with the MacArthur Park escarpment, located west of the Harbor Freeway. The results of recent investigations of the Coyote Pass Escarpment indicate that the Elysian Park fault is active. Future fault rupture at depth along the Elysian Park fault and/or the Elysian Park Thrust could result in near-surface folding of the alluvial sediments and underlying bedrock in the area of the escarpment. Thus, no ground rupture is anticipated along the Coyote Pass Escarpment, but there is a potential for ground deformation (active folding) of the bedrock and the overlying alluvial sediments along the mapped location of the escarpment.

Landslides

Landslides occur in the City of Los Angeles and slope failures were instrumental in Los Angeles being one of the first municipalities in the nation to adopt hillside-grading ordinances. Rapid uplift of the mountainous areas of Los Angeles from past and ongoing tectonic movements gives rise to a geologic setting conducive to mass wasting. The variable nature of sediments and rocks exposed throughout Los Angeles, and the slope conditions created by uncontrolled grading, have led to frequent landslides of a variety of types. The hillside areas of Los Angeles, especially the central and eastern Santa Monica Mountains, have geologic and topographic conditions that are conducive to the development of surficial and gross landslides. The City of Los Angeles Department of Building and Safety regulates construction and development in hillside areas of Los Angeles. As part of the City of Los Angeles Building Code, and review process, the City has established a Hillside Ordinance, which specifies that a geologic report is required for proposed construction within hillside areas. The northwest portion of the PSA (area east of the 101/110 interchange) is within the Hillside Ordinance area.

Liquefaction

Liquefaction-induced ground failure has historically been a major cause of earthquake damage in Southern California. Significant damage to roads, utilities, pipelines, and buildings that occurred during the 1971 San Fernando and 1994 Northridge earthquakes was caused by liquefaction-induced ground displacement. Localities most susceptible to liquefaction-induced ground displacement are underlain by loose, water-saturated granular sediment within 50 feet of the ground surface. Liquefaction susceptibility

generally decreases as the percentage of clay size particles in the soil increases and / or the coarse sand and gravel content increases. In areas within the PSA, sediments susceptible to liquefaction comprise the young (Holocene to late Holocene age) alluvial fan deposits and young (Holocene) alluvial floodplain sediments. The older alluvial deposits are generally medium dense to dense and are considered by the CGS (1998, 2001) to have a low liquefaction susceptibility. The CGS has prepared seismic hazard maps for the Los Angeles Basin. The maps delineate liquefaction zones which have been defined by the CGS as areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacement such that mitigation (as defined in the Public Resources Code) would be required. The CGS uses criteria developed by the Seismic Hazard Mapping Act Advisory Committee in delineating liquefaction zones on the seismic hazard maps. In areas of limited or no geotechnical data, susceptibility zones are evaluated using a combination of geologic considerations. The CGS has rated the liquefaction susceptibility for the Holocene age sediments in the PSA as high if saturated within 40 feet of the ground surface and, if not saturated, the susceptibility is rated as low. In contrast, the liquefaction susceptibility of older alluvial sediments (terrace deposits) is rated as low or not likely irrespective of ground-water levels. In this framework, the CGS has identified the Holocene sediments along Flower St. between Wilshire Blvd. and 2nd St. to be within a potential liquefaction zone. Likewise, the CGS has identified the Holocene sediments along 2nd St. between Hill St. and San Pedro St. to be within a potential liquefaction zone. The young (Holocene) age deposits along the alignment, where present, are on the order of five to 35 feet thick. Preliminary alignment profiles show the tunnel crown elevations appear to be below the young alluvial deposits that are rated as highly susceptible to liquefaction. For station locations with shallow groundwater and younger alluvial deposits, station walls may have to be designed for greater than usual lateral earth pressures to account for liquefaction potential. Settlement beneath the planned stations due to liquefaction is considered remote due to the depth of the Fernando formation beneath the Holocene alluvium at preliminary station depths.

4.9.1.2 Hazardous Materials

The PSA is located in a highly developed area with a long history of commercial and industrial land use. As such, there is potential for the presence of hazardous materials in soil and groundwater within one-quarter mile of the build alternatives. Contaminated soil and groundwater could be found at former and current gas stations, dry cleaners, or manufacturing facilities, and may include, but are not limited to, petroleum hydrocarbons, volatile and semi-volatile organic compounds, and metals.

Naturally-occurring hazardous materials may also exist within the PSA from known oil and gas fields and geologic formations. These may include petroleum hydrocarbons, methane, and hydrogen sulfide, as well as other hazardous materials associated with historic or current production operations.

Soil contamination can result from spills at industrial facilities or leaks from underground storage tanks. Initially, soil contamination would be primarily located at the point of release, which typically would not be within existing streets. However, depending on the

amount of the release, the type of contamination, the soil type, and location of groundwater, contaminants can move vertically and laterally and become located within right-of-ways where the project would be constructed.

A regulatory database search was conducted to identify potential or existing conditions, including soil and/or groundwater contamination that would present environmental health and safety concerns within one-quarter mile of the two build alternatives. Table 4-9 below provides the regulatory databases included in the search.

Table 4-9 Transit Dependent Demographic Information		
FEDERAL RECORDS		# of sites
NPL	National Priority List	0
Proposed NPL	Proposed National Priority List Sites	0
Delisted NPL	National Priority List Deletions	0
NPL LIENS	Federal Superfund Liens	0
CERCLIS	The Comprehensive Environmental Response, Compensation and Liability Information System	1
CERC-NFRAP	Archived sites removed from the CERCLIS inventory	1
LIENS 2	CERCLA Lien Information	0
CORRACTS	Corrective Action Report	0
RCRA-LQG	RCRA- Large Quantity Generator	2
RCRA-SQG	RCRA- Small Quantity Generator	65
RCRA-NonGen	RCRA-Sites which do not presently generate hazardous waste	9
RCRA-TSDF	RCRA - Transporters, Storage and Disposal	0
RCRA-CESQG	RCRA - Conditionally Exempt Small Quantity Generator	0
ERNS	Emergency Response Notification System	3
FTTS	FIFRA/TSCA Tracking System	2
HIST-FTTS	Historical FIFRA/TSCA Tracking System	2
US ENG CONTROLS	Engineering Controls Sites List	0
US INST CONTROL	Sites with Institutional Controls	0
HMIRS	Hazardous Materials Information Reporting System	0
DOT OPS	Incident and Accident Data	0
US CDL	Clandestine Drug Labs	0
US BROWNFIELDS	A Listing of Brownfields Sites	0
DOD	Department of Defense Sites	0
FINDS	Facility Index System	16
FUDS	Formerly Used Defense Sites	0
LUCIS	Land Use Control Information System	0
CONSENT	Superfund (CERCLA) Consent Decrees	0
ROD	Records Of Decision	0
UMTRA	Uranium Mill Tailings Sites	0
ODI	Open Dump Inventory	0
DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations	0
MINES	Mines Master Index File	0
TRIS	Toxic Chemical Release Inventory System	0
TSCA	Toxic Substances Control Act	0
SSTS	**Section 7 Tracking Systems**	**0**
ICIS	**Integrated Compliance Information System**	**0**

Table 4-9 Transit Dependent Demographic Information		
FEDERAL RECORDS		# of sites
PADS	PCB Activity Database System	0
MLTS	Material Licensing Tracking System	0
RADINFO	Radiation Information Database	0
RAATS	RCRA Administrative Action Tracking System	0
STATE AND LOCAL RECORDS		
AIRS	Toxics and Criteria Pollutant Emissions Data	16
HIST-Cal-Sites	Replaced with Envirostor	1
CA BOND EXP. PLAN	Bond Expenditure Plan	0
CA WDS	California Water Resources Control Board- Waste Discharge System	6
CA FID UST	Active and Inactive Underground Storage Tank Locations	79
CHMIRS	California Hazardous Material Incident Report System	2
Cortese	No longer updated	35
DRYCLEANERS	Registered Drycleaner Related Facilities	3
ENVIROSTOR	DTSC Site Mitigation and Brownfields Reuse Database	20
LUST	Leaking Underground Storage Tank Incident Reports	34
HAZNET	DTSC Hazardous Waste Manifest Records	66
RESPONSE	DTSC Involved in Remediation	1
SCH	School Property Evaluation Program	0
SWRCY	Recycling Facility Sites	1
Toxic Pits	Toxic Pits Cleanup Act Sites	0
SWF/LF	Solid Waste Information System	0
SLIC	Spills, Leaks, Investigation and Cleanup Sites	7
SWEEPS UST	Statewide Environmental Evaluation and Planning System	84
UST	Underground Storage Tank Database	39
HIST UST	Historical Underground Storage Tank Database	30
AST	Aboveground Storage Tank Database	1
WMUDS/SWAT	Waste Management Unit Database	0
L.A. CO SML	Los Angeles County Site Mitigation Log	1
L.A. CO HMS	Los Angeles County Industrial Waste and Underground Storage Tank Sites	4
AOCONCERN	San Gabriel Valley Areas of Concern	0
LIENS	Environmental Liens Listing	0
Notify 65	Proposition 65 Records	0
DEED	Deed Restriction Listing	0
VCP	Voluntary Cleanup Program Properties	0
WIP	Well Investigation Program Case List	0

Table 4-9 Transit Dependent Demographic Information		
FEDERAL RECORDS		# of sites
CDL	Clandestine Drug Labs	0
HAULERS	Registered Waste Tire Haulers Listing	0
TRIBAL RECORDS		
INDIAN RESERV	Indian Reservations	0
INDIAN ODI	Report on the Status of Open Dumps on Indian Lands	0
INDIAN LUST	Leaking Underground Storage Tanks on Indian Land	0
INDIAN UST	Underground Storage Tanks on Indian Land	0
EDR PROPRIETARY RECORDS		
Manufactured Gas Plants		5

Results of the search indicated there are approximately 500 regulatory database listings in the PSA. Many sites are listed on more than one regulatory database. The listings include all past and present generators, transporters, treaters, storers, and disposers of hazardous waste. In addition, properties where contamination has been remediated and is no longer present in soil and/or groundwater are listed.

The PSA would potentially cross the Union Station Oil Field (along 2nd St. east of Central Ave.). In addition, there are seven oil wells located between 1st and 2nd Sts. on the west side of Garey St. and west of Vignes St. Six of these wells were abandoned in June 2005 and the seventh well was abandoned prior to 2005. The Union Station Oil Field has been delineated as a Methane Zone by the City of Los Angeles Department of Public Works, Bureau of Engineering. Due to the proximity to the oil field, the potential for methane gas exists along the proposed alignments. The proposed alignments would cross this buffer zone north of 3rd St. and west of Grand Ave.

4.9.2 Evaluation Methodology

Geologic-related issues include subsurface geology and soils, seismicity, landslides, and liquefaction. All available data was reviewed in identifying potential geologic impacts within the PSA. As detailed above, a regulatory database search was conducted to identify potential or existing conditions, including soil and/or groundwater contamination that would present environmental health and safety concerns within one-quarter mile of the build alternatives.

4.9.3 Environmental Issues

4.9.3.1 Geology and Subsurface Conditions

As part of standard practice and the predesign process, a geotechnical study would be prepared to identify geotechnical conditions and design features (such as foundation requirements and the maximum credible design earthquake) that would have to be included as part of the project design. The seismicity of Southern California is dominated by movements on the intersecting northwest-southeast trending San Andreas fault system and the east-west trending faults of the Transverse Ranges fault system. The Los Angeles

Basin is located south of the intersection of these two systems. All the promising alternatives would be potentially impacted by the fault systems. Both the At-Grade Emphasis LRT Alternative and Underground Emphasis LRT Alternative would be designed and constructed in accordance with all applicable earthquake standards to ensure the greatest protection from earthquakes. As it relates to landslides, if the most western portion of the At-Grade Emphasis LRT Alternative is within the Hillside Ordinance area, then design and construction would be in accordance to all applicable standards and ordinances. Where liquefaction concerns are present, final engineering specifications would determine the proper footings and/or foundations along the alignment, as well as at the station locations.

Neither the construction nor the operation of the project would be expected to cause, accelerate, or exacerbate geologic hazards that would result in substantial damage to structures or infrastructure, or that would expose people to increased risk of hazards. Construction and operation would not cause or accelerate instability from erosion, expansion or settlement or offsite sediment runoff.

4.9.3.2 Hazardous Materials

A large number of sites where hazardous materials may be present are located within one-quarter mile of the two build alternatives, indicating that localized areas of contaminated soils and groundwater could be encountered during the construction of the project.

The At-Grade Emphasis LRT Alternative may offer an advantage over the Underground Emphasis LRT Alternative in avoidance of soil contamination from sources such as underground storage tanks. In addition, naturally-occurring hazardous materials such as petroleum hydrocarbons, methane (portions of the PSA are within a methane zone), and hydrogen sulfide would be less of a concern with the At-Grade Emphasis LRT Alternative. However, hazardous materials in surface soils and potentially shallow groundwater would be a potential concern with construction of any of the promising alternatives.

4.10 Water Resources

This section provides an overview of water resources within the PSA, regulatory requirements, and the potential environmental issues associated with each alternative. Water resources include surface water hydrology, flood hazards, tsunamis, inundation, seiches, and groundwater.

4.10.1 Affected Environment

4.10.1.1 Regulatory Framework

Clean Water Act: The USEPA regulates water quality under the Clean Water Act (CWA) also known as the Federal Water Pollution Control Act. Enacted by the EPA in 1972, the CWA is designed to restore and maintain the chemical, physical, and biological integrity of waters of the United States. The CWA provides the legal framework for several water quality regulations including National Pollution Discharge Elimination System (NPDES) Permits, effluent limitations, water quality standards, pretreatment standards, antidegradation policy, non-point source discharge regulation, and wetlands protection.

USEPA has delegated the responsibility of portions of the CWA to state and regional agencies, including the State of California; therefore the primary regulations resulting from the CWA are discussed in the state and local regulation descriptions that follow.

National Flood Insurance Act: The U.S. Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act of 1968. NFIP is based on the minimal requirements for flood plain management and is designed to minimize flood damage within Special Flood Hazard Areas. Flood Insurance Rate Maps are developed by FEMA to determine if a particular parcel lies in a designated Special Flood Hazard Zone.

Porter-Cologne Water Quality Control Act: The Porter-Cologne Water Quality Control Act (embodied in the California Water Code [CWC]) established the principal California legal and regulatory framework for water quality control. The CWC authorizes the State Water Resources Control Board (SWRCB) and Regional Boards to implement the provisions of the federal CWA. The alternative alignments are located in Region 4, also known as the Los Angeles Regional and governed by the Los Angeles Regional Water Quality Control Board (LARWQCB).

NPDES Permit Program: The NPDES program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. In California the permits are issued by the SWRCB or Regional Boards. The applicable permits include:

- NPDES General Permit for Storm Water Discharges Associated with Construction Activities issued by the SWRCB. The General Permit includes measure to eliminate or reduce pollutant discharges through a Stormwater Pollution Prevention Plan (SWPPP), which describes the implementation and maintenance of Best Management Practices (BMPs) to control stormwater and other runoff during and after construction.

- NPDES Los Angeles County Municipal Storm Water Discharge Permit issued by the LARWQCB. Under the MS4 Permit, the County and City are required to implement development planning guidance and control measures that control and mitigate stormwater quality and quantity impacts to receiving waters as a result of new development and redevelopment. The MS4 Permit requires permittees to implement a Standard Urban Stormwater Management Plan (SUSMP) that designates BMPs that must be used in specified categories of development and redevelopment projects to infiltrate, filter, or treat stormwater runoff, control peak flow discharges, and reduce the post-project discharge of pollutants from stormwater conveyance systems.

Basin Plan: As required by the CWC, the Regional Board adopts and periodically updates a plan entitled "Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties" (Basin Plan). The Basin Plan designates beneficial uses for bodies of water, sets numerical (quantitative) and narrative (qualitative) water quality objectives applicable to inland surface waters and enclosed bays

and estuaries, and includes implementation provisions, programs, and policies to protect all waters in the Los Angeles region.

California Toxics Rule: The EPA has established water quality criteria for certain toxic substances via the California Toxics Rule (CTR). The CTR established acute (i.e. short term) and chronic (i.e. long term) standards for bodies of water such as inland surface waters and enclosed bays and estuaries that are designated by the LARWCB as having beneficial uses protective of aquatic life or human health, such as the Los Angeles River.

California Impaired Water Bodies: Under Section 303(d) of the CWA, the SWRCB identifies impaired bodies of water that do not meet water quality standards and together with the Regional Boards prioritizes and schedules them for development of Total Maximum Daily Loads (TMDLs).

California Nonpoint Source Pollution Control Program: The State Board and the California Coastal Commission (CCC) developed the Nonpoint Source Pollution Control Program in California, which contains management measures for categories of land use/development. Under the Nonpoint Source Program Strategy and Implementation Plan 1998-2013, a three-tier system of BMPs is used as a means of implementing nonpoint source water quality management measures and strategies.

State Antidegradation Policy: In accordance with the federal Antidegradation Policy discussed above, the State Board adopted Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California (more commonly referred to as the State Antidegradation Policy) which restricts the degradation of surface waters of the state and protects bodies of water where the existing water quality is higher than necessary for the protection of present and anticipated designated beneficial uses. The State Antidegradation Policy is implemented by the Regional Board.

Flood Control: Drainage and flood control structures and improvements in the City of Los Angeles are subject to review and approval by the City of Los Angeles Bureau of Engineering. The City utilizes a 50-year design storm for flood control design purposes, which is a predicted storm event estimated using the City's methodology and assumption, which are considered to be conservative.

4.10.1.2 Existing Conditions

The two build alternatives are in the general vicinity of each other when viewed from a water resources perspective. For purposes of this section, the environmental setting is discussed for the general vicinity and not for the individual alternatives, except where differences in the alternatives may result in potential environmental issues.

Surface Water Hydrology

Hydrologic conditions in the area, natural and man-made, cause runoff within the watershed to drain to a receiving water body. For purposes of the municipal NPDES Stormwater Permit, the LARWQCB has defined Watershed Management Areas (WMA). The alternatives are located in the Los Angeles River WMA.

The alternative alignments are located in the downtown portion of the City of Los Angeles. This area is characterized as highly urban with no or limited pervious surfaces. Surface runoff is characterized as either dry weather or wet weather flows. Water quality of the runoff is determined by the quality of water of the water discharged and by the materials runoff collects on its way to a waterbody. The Los Angeles River watershed and many of its tributaries are on the CWA Section 303(d) list of impaired uses for not meeting water quality standards.

Flood Hazards

The City of Los Angeles, in coordination with Los Angeles County, state, and federal agencies has an extensive system for providing protection against flood hazards. The system drains wet and dry weather runoff from impervious surface areas, such as streets, and routes flows into underground pipes and drains discharging to various inland streams and channels. According to FEMA, there are no 500- or 100-year flood zones within the general vicinity of the alternatives.

Tsunami, Inundation, Seiche

Tsunamis are large ocean waves generated by major displacement of the ocean, such as earthquakes, volcanic eruptions, and submarine landslides. Low lying coastal areas of the City of Los Angeles are potentially at risk from tsunamis. A seiche is a standing wave in an enclosed or partially enclosed body of water, including water storage facilities. Seiches have multiple causes including earthquakes and wind. Inundation is flooding related to a tsunami, seiche or other event. The alternatives are located more than 15 miles from the ocean and are not within a tsunami inundation area as determined in the City of Los Angeles Safety Element. Two small lakes, Hollenbeck Lake and Echo Park Lake, are the closest enclosed bodies of water and are located more than one mile from the vicinity of the alignments. The Los Angeles River is the closest body of water and is located at a distance greater than 2,000 feet to the east of the PSA.

Multiple flood control facilities are located upgradient of the PSA in the San Fernando Valley portion of the Los Angeles River watershed. According to the City of Los Angeles Safety Element Exhibit G, failure of upgradient flood control basins could potentially cause inundation in the vicinity of the alignments. Both build alternatives are at the edge of an indundation area where the alignments cross (as an underpass) Alameda St. under Temple St. (At-Grade) and under 1st St. (Underground).

Groundwater

The Coastal Plain of Los Angeles Basin underlies the PSA. This groundwater basin is divided into four subbasins, with the Central Subbasin directly underlying the study area. The Central Subbasin has a surface area of approximately 277 square miles with an estimated storage capacity of 13,800,000 acre-feet. Potable water production occurs throughout the majority of the basin via approximately 497 wells. Most groundwater production occurs in deep aquifers of the San Pedro Formation. No production wells are located in the vicinity of the PSA. In addition, aquifer recharge, which flows mainly in the permeable sediments at the ground surface, is not an issue for the PSA as the closest

recharge area is located in the northern portion of the subbasin where the Los Angeles River enters the subbasin at the Los Angeles Narrows.

Groundwater levels vary across the subbasin. According to the EDR report, depth to groundwater in the project vicinity is approximately 37 feet and groundwater flows in a southeast direction. Exploratory borings drilled for many building sites adjacent to Flower St. between 7th and 2nd Sts. encountered seepage at relatively shallow depths ranging from approximately 15 to 35 feet below ground surface. Groundwater, probably perched, has been reported in borings at depths between approximately 18 to 27 feet below ground surface adjacent to Flower St. in the area between 2nd and 5th Sts. In the portion of the proposed alignment along 2nd St., groundwater seepage water has been reported in borings at depths between approximately 14 to 36 feet below ground surface in the area between Hill St. and Alameda St. The seepage water encountered in the borings appears to be groundwater that is perched on the underlying Fernando formation bedrock. It should be noted that shallow groundwater levels are influenced by seasonal rainfall and infiltration in addition to possible nearby groundwater extraction.

Water quality in the main production zones is generally good with localized areas of poor water quality. Constituents of concern present in localized areas are total dissolved solids, volatile organic compounds (tetrachloroethylene and trichloroethylene), perchlorate, nitrate, iron and manganese, and chromium. According to the EDR report, there are localized areas that have experienced groundwater contamination in the vicinity of the PSA.

4.10.2 Evaluation Methodology

To determine potential environmental issues associated with water resources in relation to the alternatives, regulatory requirements and laws were reviewed at the federal, state, and local level.

4.10.3 Environmental Issues

Potential environmental issues related to water resources are discussed for the PSA and where applicable for specific alternatives.

Surface Water Hydrology

As stated above the general vicinity of the PSA is highly impervious with limited or no pervious areas. The alternatives are not expected to increase imperviousness or increase runoff volumes within the Los Angeles River WMA. The alternatives are not expected to alter existing flow patterns.

Construction and operation of the alternatives is not expected to significantly impact surface water quality. Construction of any of the alternatives will require filing a Notice of Intent, preparation of a SWPPP, and compliance with the NPDES General Construction Permit and SUSMP requirements. BMPs will be identified to provide for temporary stormwater management during construction preventing the construction process from exposing people or property to water related hazards and keeping pollutants from being discharged to receiving water. Any dewatering discharges to the storm drain system

and/or sewer system associated with tunneling will be required to meet minimum discharge requirements to not adversely impact surface waters. Construction and operation of the alternatives is not expected to adversely impact any designated beneficial uses of the Los Angeles River.

Flood Hazards

The alternative alignments are not located in a 100- or 500-year flood zone as determined by FEMA. Construction and operation of the alignments would not alter any existing flood zones.

Tsunami, Inundation, Seiche

The build alternatives are not located within a tsunami inundation zone as the alternatives are not in vicinity of the coast as discussed above.

The alternatives are partially located within the outlying edges of the inundation zone established for the unlikely failure of an upgradient flood control facility. The area between the intersection of 1st and Alameda Sts. and Temple and Alameda Sts. is at the edge of the inundation zone. Mitigation during engineering would include appropriate design features to alleviate any hazards associated with the inundation zone.

Inundation from a seiche is not a potential hazard as the nearest enclosed or partially enclosed bodies of water are greater than one mile from the alternative alignments and the size of the waterbodies is limited.

Groundwater

The exact depths to groundwater in the PSA are not currently known. If groundwater is encountered any dewatering activities are not anticipated to adversely affect groundwater flow, recharge, nor production. Dewatering activities would not affect management of the subbasin. As discussed above, no groundwater production occurs in the PSA. Recharge in the area is restricted due to the lack of pervious surfaces.

If any groundwater is encountered all groundwater will be discharged, and if necessary treated prior to disposal, in accordance with all applicable regulations. Dewatered groundwater requires treatment prior to discharge to comply with an NPDES permit issued by the LARWQCB or pretreatment requirements for discharge to the sewer system.

Localized groundwater contamination occurs on a limited basis in multiple areas in the downtown vicinity. Local contamination sources in the vicinity of the alignments include underground storage tanks and former manufactured gas sites. Contaminant may include gasoline, diesel fuel, and waste oil among other pollutants. Therefore, there is the potential that if groundwater is encountered and dewatering is required water could be contaminated and may need to be treated prior to discharge. During construction any tunneling could potentially serve as a preferential pathway for contaminated groundwater if it is encountered, thereby spreading groundwater contamination at higher rates than would normally occur. This can be mitigated during the engineering process with specifications for impermeable concrete-based grouting materials to fill the gap between the tunnel and surrounding earth. The permeability of the grouting materials would be

lower than the surrounding soil types reducing the need possibility that the tunnel would serve as a preferential pathway for contamination migration.

At-Grade Emphasis LRT Alternative

This alternative is at grade for the majority of the proposed alignments and would have a low probability of encountering groundwater during construction. Portions of the alignments for the At-Grade Emphasis LRT Alternative that are below grade traverse the same proposed alignment as the Underground Emphasis LRT Alternative. Engineering and design specifications would mitigate any previously discussed potential issues associated with groundwater dewatering.

Underground Emphasis LRT Alternative

The Underground Emphasis LRT Alternative is below grade for the entire alignment except for a limited portion at grade at the connection point with the Metro Gold Line. Construction of the Underground Emphasis LRT Alternative would result in a higher probability of encountering groundwater during construction. Engineering and design specifications would mitigate any previously discussed potential issues associated with groundwater dewatering.

4.11 Energy

The transportation sector is responsible for approximately half of the energy consumed in the State of California[2]. Transportation energy consumption estimates consider:

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

Fuel consumption has grown approximately 50 percent over the last 20 years, and is projected to continue to increase over the next 20 years. The proposed alternatives are anticipated to reduce energy consumption by providing an alternative to dependence on personal automobiles, thereby reducing VMT.

4.11.1 Affected Environment

Each alternative would require the installation of an overhead catenary system (OCS), suspended above the track-way to supply electricity to the trains. Traction power substations would be situated approximately every mile along the corridor to transmit and distribute electricity. Signaling and communication systems would also be required. Energy consumption would also be associated with operation of stations, stations and transit service maintenance, and construction activities to provide the required infrastructure.

[2] The California Energy Commission, Consumer Energy Center website. Accessed on June 23, 2008. http://www.consumerenergycenter.org/transportation/index.html.

Within the PSA, the Los Angeles Department of Water and Power (LADWP) provides electricity services. Electrical services are readily available to the project area, with existing lines located along each of the proposed alignments.

4.11.2 Evaluation Methodology

To determine potential environmental issues associated with energy, a general review of energy requirements associated with operation and construction of the new alignments was conducted. The energy needs were considered in conjunction with the potential benefits associated with a diversion of automobile traffic to transit.

4.11.3 Environmental Issues

While construction and operation of all proposed alignments would have associated electrical energy expenditures associated with construction and operation, the provision of a new transit alignment is anticipated to decrease vehicle miles traveled and thereby decrease the consumption of fossil fuels.

Depending on the number of rail cars and frequency of operations, propulsion of each alternative would have similar energy consumption needs. The at-grade open air platforms associated with the At-Grade Emphasis LRT Alternative would have lesser energy needs than the underground stations, which would have escalators, elevators, and heating and cooling systems. The Underground Emphasis LRT Alternative would require more energy resources during construction when compared to the At-Grade Emphasis LRT Alternative. The primary source of additional energy consumption is a result of the use of earthmoving equipment for excavating tunnels in the underground option. Also, the extensive amount of haul trucks and haul truck travel of excavated earthwork would require additional energy consumption.

To maximize potential benefits associated with a reduction in vehicle miles traveled for each alternative, issues that should be considered in the environmental analysis is interface between other Metro commuter rail lines, LRT, and bus connections and schedules that optimize efficiency and convenience to minimize energy consumption.

A further consideration is projected ridership for each alternative. The greatest potential benefit associated with a reduction in VMT would be associated with any alternative that achieves a higher ridership level, thereby achieving the greatest reduction in the use of personal automobiles.

4.12 Historic, Archaeological & Paleontological Resources

This section addresses archaeological and built environment resources that qualify as “historic properties” as defined in Section 106 of the National Historic Preservation Act of 1966 (as amended) and “historical resources” as identified in CEQA, and are located in the PSA. The definitions for both historic properties and historical resources include archaeological as well as built resources. In addition, the section discusses paleontological resources located in the PSA.

4.12.1 Affected Environment

4.12.1.1 Regulatory Framework

Historical Resources

- **National Historic Preservation Act**: The National Historic Preservation Act (NHPA) of 1966 (16 United States Code, USC 470-470), as amended, created the Advisory Council on Historic Preservation (Advisory Council) to advise the President and Congress on historic preservation. This Act also expanded the National Register of Historic Places (National Register) to include sites not only of national, but of state and local significance. The NHPA is a national policy to protect, rehabilitate, restore, and reuse districts, sites, buildings, structures, and objects significant in American architecture, history, archaeology, and culture, and it mandates (under Section 106) that federal agencies take into account the effect of an undertaking on properties that are listed in, or determined eligible for inclusion in the National Register of Historic Places.

- **Section 106**: Section 106 of the NHPA requires that Federal agencies take into account the effects undertakings are expected to have on historic properties. It requires that the Advisory Council be afforded a reasonable opportunity to comment on such undertakings, when they are expected to result in effects on historic properties.

- **National Register of Historic Places**: The National Register is the nation's official list of districts, sites, buildings, structures, and objects worthy of preservation. Currently, the National Register includes approximately 80,000 listings, including icons of American architecture, engineering, culture, and history. Overseen by the National Park Service (NPS), under the Department of the Interior, the National Register was authorized under the NHPA, as amended. National Register guidelines for the evaluation of significance were developed to be flexible and to recognize accomplishments of all who have made significant contributions to the history and heritage of the nation. Its criteria are designed to guide state and local governments, federal agencies, and others in evaluating potential entries in the National Register.

- **National Historic Landmarks**: National Historic Landmarks (NHL) are cultural properties designated by the Secretary of the Interior as having national significance. They are acknowledged as being among the most significant historic places, and these buildings, sites, districts, structures, and objects possess exceptional value or quality in illustrating or interpreting the heritage of the United States in history, architecture, archaeology, engineering, and culture. NHL designation is an official recognition by the federal government of the significance of historic properties. By definition, the properties designated as National Historic Landmarks are the most significant places in American history.

- **United States Department of Transportation Act of 1966 – Section 4(f)**: Historic properties are also governed under Section 4 (f) of the United States Department of Transportation Act of 1966 (recodified as amended at 49 USC Section 303), which

regulates the "use" of land from historic properties. In 49 USC 303 Section 771.135, Section 4(f) asserts:

(a) (i) The Administration may not approve the use of land from a significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that:

(i) There is no feasible and prudent alternative to the use of land from the property; and

(ii) The action includes all possible planning to minimize harm to the property resulting from such use.

- **California Code of Regulations**: As defined by state law in Title 14 *California Code of Regulations* Section 4850, the term "historical resource" means "any object, building, structure, site, area, place, record, or manuscript, which is historically or archaeologically significant, or which is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural history of California. Thus the phrase historical resources includes archaeological sites as well as the built environment.

- **California Register of Historical Resources**: Under PRC §5024.1, the California Register was established to serve as an authoritative guide to the state's significant historical and archaeological resources. In order for a property to be considered eligible for listing in the California Register, resources must retain "substantial" integrity to identified periods of significance, and it must be found by the State Historical Resources Commission to be significant under at least one of the below-listed criteria.

  - Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

  - Is associated with the lives of persons important in our past.

  - Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual or possesses high artistic values.

  - Has yielded, or may be likely to yield, information important in prehistory or history.

There are two principal categories of local designation for historically significant properties in the City of Los Angeles. Properties may be designated as Historic-Cultural Monuments and/or may be contributors to designated local historic districts, known as Historic Preservation Overlay Zones (HPOZs). The Historic Preservation Overlay Zone designation applies to specific bounded areas of historic or cultural significance and generally includes both properties which contribute to the significance of the district and

non-contributing properties which because of alterations, not having been built outside the period of significance, or not sharing the unifying characteristics of the district do not contribute to its significance.

Historic-Cultural Monuments: In the City of Los Angeles, Historic-Cultural Monument designation is equivalent to local landmarks in other communities and is reserved for individually significant properties. Listing as an HCM is subject to review and recommended approval by the Cultural Heritage Commission, review by an additional committee of City Council, and requires final approval by the City Council.

Historic Preservation Overlay Zones: The Historic Preservation Overlay Zone Ordinance was adopted by the City of Los Angeles in 1979, and revised in 1997. As defined in the Cultural Heritage Masterplan (adopted by City Council in 2000), as, "a planning tool which recognizes the special qualities of areas of historic, cultural, or architectural significance. An HPOZ does not change the underlying zoning, rather it lays an added level of protection over a zone through local board oversight." There are currently 22 designated Historic Preservation Overlay Zones in Los Angeles, incorporating more than 5,000 separate properties and many more are currently proposed in various stages of development. Because HPOZs have "special character or special historical, cultural, architectural, archeological, community or aesthetic value," they are presumed to be historically or culturally significant and are therefore listed in the California Register.

Paleontological Resources

Federal protection for scientifically significant paleontological resources applies to projects if any construction or other related project impacts occur on federally owned or managed lands, involve the crossing of state lines, or are federally funded. The following federal protections may apply to paleontological resources within the proposed Project area:

- **American Antiquities Act of 1906**: The American Antiquities Act of 1906 (6 USC 431 433) establishes a penalty for disturbing or excavating any historic or prehistoric ruin or monument or object of antiquity on federal lands as a maximum fine of $500 or 90 days in jail.

- **National Historic Preservation Act of 1966**: The National Historic Preservation Act of 1966 (Pub. L. 89 665; 80 Stat. 915, 16 U.S.C. 470 et seq.) provides for the survey, recovery, and preservation of significant paleontological data when such data may be destroyed or lost due to a federal, federally licensed, or federally funded project.

- **Federal Land Management and Policy Act of 1976**: The Federal Land Management and Policy Act of 1976 (43 U.S.C. 1712[c], 1732[b]); sec. 2, and 30 U.S.C. 611; Subpart 3631.0 et seq.), defines significant fossils as: unique, rare or particularly well-preserved; an unusual assemblage of common fossils; being of high scientific interest; or providing important new data concerning [1] evolutionary trends, [2] development of biological communities, [3] interaction between or among

organisms, [4] unusual or spectacular circumstances in the history of life, or [5] anatomical structure.

- **Public Resources Code (Chapter 1.7), §5097.5 and §30244:** These statutes prohibit the removal of any paleontological site or feature on public lands without permission of the jurisdictional agency, define the removal of paleontological sites or features as a misdemeanor, and require reasonable mitigation of adverse impacts to paleontological resources from developments on public (state) lands.

City of Los Angeles General Plan: The Conservation Element of the City of Los Angeles General Plan (adopted September 2001) specifically addresses paleontological resources in Section 3 of Chapter 2. The Plan's paleontological objective is to "protect the city's archaeological and paleontological resources for historical, cultural, research and/or educational purposes." And its policy is to "continue to identify and protect significant archaeological and paleontological sites and/or resources known to exist or that are identified during land development, demolition or property modification activities."

4.12.1.2 Existing Conditions

Historical Resources

Historically, the PSA falls within the Gabrieliño/Tongva (also known as the Tongva) tribal boundaries. The Tongva established large, permanent villages in the fertile lowlands along rivers and streams, and in sheltered areas along the coast, stretching from the foothills of the San Gabriel Mountains to the Pacific Ocean. The fundamental economy of the Tongva was one of subsistence gathering and hunting. The ethnographic and historic literature indicates that the Native American village of Yangna is located in the general vicinity of the project area. It is assumed to be on the west bank of the Los Angeles River, just south of the Pueblo of Los Angeles.

Settlement of the Los Angeles region continued in the early American Period (1848–Present). On April 4, 1850, only two years after the Mexican-American War and five months prior to California achieving statehood, the City of Los Angeles was formally incorporated. Los Angeles maintained its role as a regional business center in early American Period and the transition of many former rancho lands to agriculture, as well as the development of citriculture in the late 1800s, further strengthened this status. These factors combined with the expansion of port facilities and railroads throughout the region contributed to the impact of the real estate boom of the 1880s on the City of Los Angeles. Los Angeles continued to grow in the twentieth century in part due to the discovery of oil in the area and its strategic location as a wartime port. The county's mild climate and successful economy continued to draw new residents in the late 1900s, with much of the County transformed from ranches and farms into residential subdivisions surrounding commercial and industrial centers. Hollywood's development into the entertainment capitol of the world and southern California's booming aerospace industry were key factors in the County's growth in the twentieth century.

The PSA is located entirely within the downtown area of the City of Los Angeles. The development of downtown Los Angeles occurred sequentially from north to south. In the

Los Angeles Architectural Guide, there are three principal downtown commercial building periods: 1900-1917, early 1920s through 1931, and from the late 1960s through the present. The first two major periods of activity were characterized principally by classical *Beaux Arts* style, based on great buildings of Western Europe and most of those efforts were focused on Broadway and Spring St. The 1920s and 1930s brought development patterns west on 7th St. and included the geometrical-based Art Deco and sweeping Streamline Moderne styles. Finally, high rises constructed from the early 1960s until the present have been a variety of Contemporary styles, encompassing approaches from glass curtain wall Corporate Modern to Post Modern styles.

The first Sanborn Fire Insurance Company maps prepared for Los Angeles in 1888, portrayed north-south streets in the below-listed west-to-east order: Pearl St. (now Figueroa St.), Flower St., Hope St., Bunker Hill Ave. (not applicable to current street name), Grand Ave., Olive Ave., Hill St., Fort St. (now Broadway), Spring St., Main St. and Los Angeles St.

For the purposes of discussion, the PSA was divided into four segments, arranged from south to north, and then east, and are described below:

Flower St., between 4th and 7th Sts.

In 1888, the streets in the southern portion of the project area were located on the outskirts of town. Figueroa St. was one of a handful of great boulevards of Los Angeles that were expanded in the 1920s. An early alignment of Figueroa St. was part of the famed U.S. Route 66, and is currently a component of the Pasadena Freeway (Interstate 110). The notable Figueroa St. tunnels, nearby Chinatown were built in 1931 and were once a part of Figueroa St. as well. Figueroa St. is said to be one of the longest avenues in the United States, with a length of more than 30 miles, stretching between Eagle Rock to the Los Angeles Harbor. The 2nd St. tunnel which extends from Figueroa St. on the west side to Hill St. in the east was completed in 1925.

Among the ambitious 1920s building projects in downtown that announced Los Angeles as a major city, the Los Angeles Central Library (630 West 5th St., Bertram Goodhue with Carleton Winslow) was completed in 1926. The "light of learning" architectural theme was a remarkable architectural collaboration and remains one of the largest library systems in the nation.

The Harbor Freeway (Interstate 110) on the western side of downtown was completed in 1952, and coined "downtown's new Main St." Construction of that freeway, along with repeal of the limiting building height ordinance together created a significant new concentration of high- and mid-rise buildings, concentrated on Figueroa and 7th Sts.

Flower St., between 4th St., and 2nd St. East to Hill St.

By the end of the second World War, as suburbs became increasingly desirable as residential and commercial hubs, downtown Los Angeles lost some of its *caché* as a business and retail destination. The CRA/LA was established in 1948, in part to cure economic "blight" by funding and overseeing redevelopment. Like the rest of downtown, Bunker Hill, which had been one of the more exclusive residential neighborhoods at the

turn of the twentieth century, fell into disrepair and out of fashion by the 1960s. Although the action was controversial, Victorian era buildings on Bunker Hill were cleared in the 1960s by CRA/LA, the streets were reconfigured and high-rises have been constructed over time in their places.

2nd and Temple Sts. between Hill and San Pedro Sts.

As Los Angeles developed from an agrarian settlement to a more diverse economy, single-family homes were typically built without regard to their surroundings in the area now identified as downtown. By the early 1900s, those residences stood side-by-side with commercial blocks, and residential use eventually diminished. Broadway evolved as a main retail thoroughfare, served by Pacific Electric (PE) interurban rail lines. Many of the PE's routes terminated at 4th St. and Broadway. Public use of the PE peaked in 1924 and its configuration made the intersection and corridor valuable commercial property, concentrated in one confined area. Broadway was developed with commercial uses, specifically retail and theater buildings between the 1910s and the 1940s and was the center of retail commerce in the growing city of Los Angeles. After the end of World War II, the decentralization of the community, coupled with demise of the interurban railroad, caused major stores and small shops to relocate to 7th St. later disbursing to outlying suburbs. As of the millennium, Broadway continues to be a busy retail center, although patronage changed since the early nineteenth century from American-born to Latino. The customer base of the area is primarily a Mexican-American and South American. The Broadway Theater & Commercial District comprised of office, retail and theater buildings was listed in the National Register in 1979, and includes portions of the PSA.

Business blocks of the late nineteenth century were replaced by the Civic Center, whose buildings, most of contemporary design are flanked by multi-acre parking lots. The Civic Center has encroached westward upon Bunker Hill. The resulting Civic Center, the plan for which was adopted in 1947, has an east-west axis and is roughly bounded on the north by Aiso St., on the south by 2nd St., Grand Ave. to the west and Alameda St. on the east side.

2nd and Temple Sts. between, San Pedro and Alameda Sts.

The City's oldest areas, just east of Main St. exhibit the imperfect platting that dates before 1848. The 33 degree "skewed" grid orientation of downtown Los Angeles characterizes the north-south streets east of Hoover Ave. and west of Indian St. When Los Angeles converted from a Mexican pueblo to an American town, public authority rather than private enterprise became the influence behind development. As enumerated in *California: A Land of Contrast*, "few vestiges of the original community remain; the much-altered plaza is a tiny park with adjacent Olvera St. 'restored' as a tourist attraction." The original Chinatown was replaced in the 1938 by the Union Passenger Terminal (now Union Station), relocated and reconstructed in a stylized Chinese theme. The construction of Union Station also alleviated the need for multiple passenger railroad stations in downtown Los Angeles. The first Japanese-American resident came to Los Angeles in 1886 and started a restaurant on East 1st St. By the end of the nineteenth century, the area known as Little Tokyo was home to more than 2,000 Japanese-Americans, and a thriving community had been established. Many of those residents moved to the area to lay track for the Pacific Electric interurban streetcar system. During World War II, Executive Order

9066 gave the Army authority to relocate more than 110,000 Japanese Americans on the west coast to internment camps in isolated and barren areas. This action eradicated Japanese settlements until after the end of the war and caused interned families to start their lives over once they were released. Little Tokyo Historic District was listed in the National Register of Historic Places, and became a National Historic Landmark district in 1995.

In summary, the development of downtown Los Angeles, which began with the city's founding in the eighteenth century, continues to evolve in diverse ways over time. Early downtown Los Angeles was primarily residential and commercial in nature. In the twentieth century uses in the "core" grew to be retail and with a large amount of office use in upper floors of large buildings. In the latter part of the 1900s, aside from the few skyscrapers built, office, retail and entertainment uses dwindled and the popularity of downtown waned. As economic forces became more obviously cyclical (including recession and strong influence of interest rates), commercial development in downtown was replaced in large part by public investment. Since the last decades of the twentieth century, tax incentives, with changes in federal legislation, state regulations and local ordinances have made reuse of long-vacant office buildings and their conversion to apartments and condominium use possible. The result of those factors has been a rebirth in downtown of a significant residential population, spurred by renewed interest in urban lifestyles and "loft-style" living.

Known Historical Resources within One-Quarter Mile of the Project

A search of the California Historical Resources Information System (CHRIS) was conducted for the PSA. In addition, a literature and archival records search for previously recorded historical resources and investigations within one-quarter mile radius were performed. Tables 4-10 and 4-11 indicate the existence of at least two (2) National Historic Landmarks, four (4) National Register Districts, at least 76 to 78 separate National Register properties, 89 to 99 California Register properties, and 34 to 37 locally designated properties previously identified within the preferred project alternatives.

As indicated in Table 4-10, 21 known archaeological resources of unknown historical significance are located within the identified proposed project study area, which is approximately one quarter-mile beyond the proposed project alternatives. Twenty-one (21) archaeological resources have been previously recorded within one quarter-mile of the At-Grade Emphasis LRT Alternative. Eleven (11) of these sites are also within one-quarter mile of Underground Emphasis LRT Alternative (Table 4-10). A majority of the archaeological sites were identified by archaeological monitoring of construction activities related to recent construction projects. Most of these sites that have been encountered during ground disturbances contain historic period building or structure foundations or construction materials, and/or historic refuse deposits. One (1) isolated prehistoric burial was encountered at considerable depth during trenching. The burial was found eleven feet below the ground surface, consisting of nine feet of overburden and 2 feet of natural stratigraphy. No archaeological properties listed in the National Register, Archaeological Determinations of Eligibility, or Historic Property Data File are located within the boundaries of the project alternatives or within a quarter-mile of the alternatives.

The precise location of the village of Yagna is unknown; however, the village is assumed to be on the west bank of the Los Angeles River just south of the Pueblo of Los Angeles. A Native American cemetery (CA-LAN-1575/H) was encountered during construction-related ground disturbances on Alameda St. next to Union Station in the immediate vicinity of the original pueblo. In addition, a single Native American burial was recorded near the intersection of Temple and Hill Sts. during construction-related ground disturbances.

A review of historic literature indicates that the city's original water system built in 1781 during the Spanish Period crosses the PSA. The original water system consisted of the main ditch, the Zanja Madre, and several branch ditches that flowed south and southwest into the city and beyond. A circa 1880 map of the Zanja system indicates that the Zanja Madre, and Zanja Numbers three, four, five, and nine cross the northeastern portion of the PSA. In addition, the Woolen Mill Ditch and the West Branch Zanja Number 8R, cross the two build alternative alignments in the southwestern portion of the PSA.

The results of the records search and literature review indicate that the build alternatives are located in areas that are highly sensitive for buried archaeological resources from both prehistoric and historic time periods.

Table 4-10 Known Historic Properties/Historical Resources Within One-Quarter Mile of the At-Grade Emphasis LRT Alternative

	TOTALS	National Register of Historic Places	California Register of Historic Places	City of Los Angeles Historic-Cultural Monuments
Known historic properties and/or historical resources within one-quarter mile of proposed alignments	**2** National Historic Landmarks 4 National Register Districts **76** separate National Register **99** California Register **37** local landmarks **highly sensitive** archaeological resources3	National Historic Landmarks 1. Little Tokyo Historic District, north side of 200-300 E 1st St. 2. Bradbury Building, 300-310 S Broadway National Register Districts 1. Southern California Gas Company Complex, 800-830 S Flower St. 2. Los Angeles Plaza-Los Angeles State Historic Park, Spring, Alameda, Macy and Sunset 3. Little Tokyo Historic District, north side of 200-300 E 1st St. 4. Spring Street Financial District, 354-704 S Spring St. <u>Separate</u> 1. Figer 8 Bar, 746 S Figueroa 2. Louis Brownstein Building, 751 S Figueroa 3. So. Calif Gas Co Building, 830 S Flower St. 4. So. Calif. Gas Co Building, 820 S Flower St. 5. So. Calif. Gas Co Building, 810 S Flower St. 6. So Calif. Gas Co Building, 800 S Flower St. 7. 816 S Grand Av. Bldg. 8. Engine Co No 28, 644 S Figueroa 9. Fine Arts Building, 807-811 W 7th St. 10. Roosevelt Building, 727 W 7th St. 11. Barker Brothers Building, 800-818 W 7th St. 12. Los Angeles Central Library, 630 W 5th St. 13. Jonathan Club Building, 545 S Figueroa St.	1. 218 Main St. Bldg 2. 275 W 1St. St. Building 3. 5th St. Retaining Wall betw...(near L.A. Central Library) 4. 811 Wilshire Bl. Bldg 5. Pantages/Warner Brothers Theatre, 401 W 7th St. 6. 816 S Grand Av. Bldg 7. Angel's Flight Railway, 300 block S Hill St. 8. AP Giannini - Bank of America, 505 W 7th St./649 S Olive 9. Associated Realty Building, 510 W 6th St. 10. AT & T Telecommunications Facility, 420 S Grand 11. Baker Detweiler Bldg, 412 W 6th St. 12. Barker Brothers Building, 800-898 W 7th St./709-711 S Flower St. 13. Bible Institute, 550 S Hope 14. Biltmore Bldg, 515 S Olive 15. Biltmore Hotel, 503-539 S Olive St./ 512 W 5th St./ 514-530 S Grand Av. 16. Boston Dry Goods Store, 237 S Broadway 17. Boston Stores - J.W. Robinson Co., 600-632 W 7th St. 18. Brack Shops, 527 W 7th St. 19. Bradbury Building, 300 S Broadway 20. Brock Jewelers - Clifton's, 513-515 W 7th St. 21. California Club Building, 532-538 S Flower St. 22. Commercial Exchange Bldg., 416 W 8th St. 23. Coulter Dry Goods Co, 500 W 7th St. 24. Edison Bldg, 601 W 5th St. 25. Edwards-Wildey Bldg.- National Oil Bldg, 600-609 S Grand Av., 600 W 6th St.	1. Nuestra Senora de Los Angeles-Plaza Church, 100-110 Cesar Chavez Av/535 N Main St. 2. First Cemetery of Los Angeles, 521 N Main St. 3. Los Angeles Plaza Park, Cesar Chavez Av 4. Los Angeles City Hall, 200 N Spring St. 5. Bradbury Building, 300-310 S Broadway 6. St. Vibiana's Cathedral, 110 E 2nd St. 7. California Club Building, 532-538 S Flower St. 8. Los Angeles Central Library Building and Grounds, 630 W 5th St. 9. Biltmore Hotel, 503-539 S Olive St./ 512 W 5th St./ 514-530 S Grand Av. 10. Philharmonic Auditorium (site of), 421-433 W 5th St. 11. Saint Paul's Cathedral (site of) (901-915 Wilshire Bvd.) 12. Los Angeles Athletic Club Building, 425-437 W 7th St. 13. Fine Arts Building (Global Marine House), 807-815 W 7th St. 14. Subway Terminal Building, 416-424 S Olive St. 15. James Oviatt Building, 615-617 S Olive St. 16. Original Pantry, 811 W 9th St. 17. Mayflower Hotel 531-535 S Grand Av. 18. Embassy Auditorium and Hotel, 501 W 9th St./ 839-861 S Grand Av. 19. One Bunker Hill Building, 455 S Grand Av. 20. AP Giannini - Bank of America, 505 W 7th St. 21. Roosevelt Building, 727 W 7th St. 22. Barker Brothers Building, 800-898 W

[3] Archaeological resources have not necessarily been evaluated for National or California register significance.

Table 4-10 Known Historic Properties/Historical Resources Within One-Quarter Mile of the At-Grade Emphasis LRT Alternative

TOTALS	National Register of Historic Places	California Register of Historic Places	City of Los Angeles Historic-Cultural Monuments
	14. General Petroleum Building, 612 S Flower 15. Superior Oil Co Building/Bank of California, 550 S Flower St. 16. Biltmore Bldg, 515 S Olive 17. Oviatt Building, 617 S Olive 18. Subway Terminal Building, 417 S Hill St. 19. AP Giannini - Bank of America, 649 S Olive 20. Ville de Paris Store, 712 S Olive 21. So. Calif. Telegraph Co, 716 S Olive 22. AT & T Telecommunications Facility, 420 S Grand 23. Mayflower Hotel, 533 S Grand 24. Pacific Mutual Garage & Annex, 540 S Grand 25. Edwards Widney Bldg., 609 S Grand 26. New York Cloak & Suit House/Brockman Bldg/Brooks Bros., 708 S Grand Av./, 520 W 7th St. 27. 816 S Grand Av. Bldg. 28. Embassy Auditorium, 843 S Grand 29. Embassy Hotel Auditorium, 851 S Grand 30. Woodward/Bristol Hotel, 423 W 4th St. 31. Title Guarantee Bldg, 401 W 5th St. 32. Wells Fargo Bank, 415 W 5th St. 33. Philharmonic Auditorium, 427 W 5th St. 34. Edison Bldg, 601 W 5th St. 35. Los Angeles Central Library, 630 W 5th St. 36. "5th St. Retaining Wall betw..." (near Central Library) 37. Baker Detweiler Bldg, 412 W 6th St. 38. Warner Theatre, 460 W 6th St. 39. Associated Realty Building, 510 W 6th St. 40. Pacific Mutual Bldg, 523 W 6th St. 41. Edwards-Wildey/National Oil Bldg, 600 W 6th St. 42. Edwards-Wildey Bldg Addition, 612 W 6th St.	26. Edwards-Wildey Bldg Addition, 612 W 6th St. 27. Embassy Auditorium and Hotel, 501 W 9th St./ 839-861 S Grand Av. 28. Embassy Auditorium, 843 S Grand Av. 29. Embassy Hotel Auditorium, 851 S Grand Av. 30. Engine Co No 28, 644 S Figueroa 31. Figer 8 Bar, 746 S Figueroa 32. Fine Arts Building (Global Marine House), 807-815 W 7th St. 33. Fire Department HQ, 219 S Hill St.. 34. First Baptist Church of San Pedro (Facade & Stained Glass Window), 555 W 7th St. 35. First Cemetery of Los Angeles, 521 N Main St. 36. Fort Moore Pioneer Memorial, 400 block N Broadway 37. Garnier Block, 419 N Main St. 38. General Petroleum Building, 612 S Flower St. 39. Grand Central Market, 315 S Broadway 40. Higgins Building, 108 W 2nd St. 41. Home Telephone, 246 S Hill St. 42. Homer Laughlin Bldg. , 317 S Broadway 43. Irvine Block-Byrne Bldg, 249 S Broadway/301 W 3rd St. 44. Italian Hall, 650 N Main St.. 45. James Oviatt Building, 615-617 S Olive St. 46. Jonathan Club Building, 545 S Figueroa St. 47. Joyeria Esmerelda Jewelry, 332 S Hill St. 48. Kerckhoff Annex, address unknown 49. King Edward Hotel, 121 E 1St. St. 50. LA Soap Co. 617 E 1St. St. 51. Lindy Hotel, 419 W 8th St. 52. Los Angeles 3rd Church of Christ., 734 S Hope St.	7th St./709-711 S Flower St. 23. Boston Stores - J.W. Robinson's, 600-632 W 7th St. 24. Brock Jewelers - Clifton's, 513-515 W 7th St. 25. Title Insurance & Trust Company Building and Annex, 433 S Spring St. 26. Pacific Mutual Building, 523 W 5th St. 27. First Baptist Church of San Pedro (Facade & Stained Glass Window), 555 W 7th St. 28. Spanish - American War Memorial (Pershing Square), 5th, 6th Olive & Hill 29. Angel's Flight, 300 block of S Hill St. 30. Irvine-Byrne Building, 249-259 S Broadway/ 301 W 3rd St. 31. Superior Oil Company Building, 550 S Flower St. 32. South Park Loft Building, 816 S Grand Av. 33. State Theater Building, 300-314 W 7th St. 34. Edwards-Widney Building, 609 S Grand Av. 35. General Petroleum Building, 612 S Flower St. 36. Southern California Gas Company complex, 800-830 S Flower St. 37. Higgins Building, 108 W 2nd St.

Table 4-10 Known Historic Properties/Historical Resources Within One-Quarter Mile of the At-Grade Emphasis LRT Alternative

TOTALS	National Register of Historic Places	California Register of Historic Places	City of Los Angeles Historic-Cultural Monuments
	43. Kerckhoff Annex, address unknown 44. 811 Wilshire Bl Bldg Pantages/Warner Brothers Theatre, 401 W 7th St. 45. Los Angeles Athletic Club, 431 W 7th St. 46. Coulter Dry Goods Co, 500 W 7th St. 47. Brock & Co. Jewelry Store/Clifton's Cafeteria, 513 W 7th 48. Brack Shops, 527 W 7th St. Quinby Bldg., 529 W 7th St. 49. San Pedro 1St. Baptist Church, 543 W 7th St. 50. Boston Stores/J.W. Robinson Co., 600 W 7th St. 51. Union Oil Bldg, 617 W 7th St. 52. Commercial Exchange Bldg., 416 W 8th St. 53. Lindy Hotel, 419 W 8th St. 54. Bible Institute, 550 S Hope St. 55. Los Angeles 3rd Church of Christ, 734 S Hope St. 56. Angel's Flight Railway, 300 block of Hill St. 57. Los Angeles City Hall, 200 N Spring St. 58. US Courthouse and Post Office, 312 N Spring St. 59. Garnier Block, 419 N Main St. 60. Plaza Park, 500 N Main St. 61. Nuestra Senora de la Reina de Los Angeles, 535 N Main St. 62. Italian Hall, 650 N Main St. 63. Temple Mishkon Tephillo, 206 Main St. 64. 218 Main St. Bldg. 65. Plaza Substation, 10 Olvera St. 66. Los Angeles Times Building, 202 W 1St. 67. 275 W 1St. St. Building 68. King Edward Hotel, 121 E 1St. St. 69. Newark Brothers/Uyeda Building, 312 E 1St. St. 70. Progressive Theatre, 320 E 1St. St.. 71. LA Soap Co. 617 E 1St. St.	53. Los Angeles Athletic Club Building, 425-437 W 7th St. 54. Los Angeles Central Library Building and Grounds, 630 W 5th St. 55. Los Angeles City Hall, 200 N Spring St. 56. Los Angeles Plaza Park, Cesar Chavez Av. 57. Los Angeles Times Building, 202 W 1St. Los Angeles Union Passenger Terminal, 800 N. Alameda 58. Louis Brownstein Building, 751 S Figueroa 59. Mayflower Hotel 531-535 S Grand Av 60. Million Dollar Theater, 301 S Broadway 61. Temple Mishkon Tephillo, 206 Main St. 62. New York Cloak & Suit House-Brockman Bldg-Brooks Bros., 708 S Grand Av/520 W 7th St. 63. Newark Brothers-Uyeda Building, 312 E 1St. St. 64. Nuestra Senora de Los Angeles-Plaza Church, 100-110 Cesar Chavez Av/535 N Main St. 65. One Bunker Hill Building, 455 S Grand Av 66. Original Pantry, 811 W 9th St. 67. Oviatt Building, 617 S Olive 68. Pacific Mutual Bldg, 523 W 5th St. 69. Pacific Mutual Garage & Annex, 540 S Grand Av. 70. Philharmonic Auditorium (site of), 421-433 W 5th St. 71. Pío Pico House, 424 N Main St. 72. Plaza Park, 500 N Main St. 73. Plaza Substation, 10 Olvera St. 74. Progressive Theatre, 320 E 1St. St. 75. Quinby Bldg., 529 W 7th St. 76. Roosevelt Building, 727 W 7th St. 77. So. Calif Gas Co Bldg, 800 S Flower St. 78. So. Calif Gas Co Bldg, 810 S Flower St.	

Table 4-10 Known Historic Properties/Historical Resources Within One-Quarter Mile of the At-Grade Emphasis LRT Alternative

TOTALS	National Register of Historic Places	California Register of Historic Places	City of Los Angeles Historic-Cultural Monuments
	72. St. Vibiana's Cathedral, 110 E 2nd St. 73. Pío Pico House, 424-430 N. Main St. 74. Terminal Annex, 900 Alameda 75. Los Angeles Union Passenger Terminal, 800 N. Alameda 76. US Post Office- Los Angeles Terminal Annex, 900 Alameda St.	79. So. Calif Gas Co Bldg, 820 S Flower St. 80. So. Calif Gas Co Bldg, 830 S Flower St. 81. So. Calif Gas Co complex, 800-830 S Flower St. 82. S Calif Telegraph Co, 716 S Olive 83. Saint Paul's Cathedral (site of), address unknown (possibly 901-915 Wilshire Blvd.) 84. San Pedro 1St. Baptist. Church, 543 W 7th St. 85. South Park Loft Building, 816 S Grand Av. 86. Spanish - American War Memorial (Pershing Square), 5th, 6th Olive & Hill 87. St. Vibiana's Cathedral, 110 E 2nd St. 88. State Theater Building, 300-314 W 7th St. 89. Subway Terminal Building, 416-424 S Olive St./417 S Hill St. 90. Superior Oil Co Building-Bank of California, 550 S Flower St. 91. The Aldine/Myrick Hotel, 324 or 342 S Hill St. 92. The Whipple/ Markham Hotel, 326 S Hill St. 93. Title Guarantee Bldg, 401 W 5th St. 94. Union Oil Bldg, 617 W 7th St. 95. US Courthouse and Post Office, 312 N Spring St. 96. Ville de Paris Store, 712 S Olive St. 97. Warner Theatre, 460 W 6th St. 98. Wells Fargo Bank, 415 W 5th St. 99. Woodward/Bristol Hotel, 423 W 4th St. 100. US Post Office- Los Angeles Terminal Annex, 900 Alameda St.	

Source: SWCA Environmental Consultants, 2008

Table 4-11 Known Historic Properties/Resources Within One-Quarter Mile of Underground Emphasis LRT Alternative

	TOTALS	National Register of Historic Places	California Register of Historic Places	City of Los Angeles Historic-Cultural Monuments
Known historic properties and/or historical resources within one-quarter mile of proposed alignment	**2** National Historic Landmarks **4** National Register Districts **78** separate National Register **89** California Register **34** local landmarks **Highly sensitive** archaeological resources4	<u>National Historic Landmarks</u> 1. Little Tokyo Historic District, 200-300 E 1st St. 2. Bradbury Building, 300-310 S Broadway <u>National Register Districts</u> 1. Broadway Theater & Commercial District, 242-947 S Broadway 2. Spring Street Financial District, 354-704 S Spring St. 3. Southern California Gas Company Complex, 800-830 S Flower St. 4. Little Tokyo Historic District, 200-300 E 1st St. <u>Separate</u> 1. Figer 8 Bar, 746 S Figueroa Av. 2. Louis Brownstein Building, 751 S Figueroa Av. 3. So. Calif. Gas Co Building, 830 S Flower St. 4. So. Calif. Gas Co. Building, 820 S Flower St. 5. So. Calif. Gas Co. Building, 810 S Flower St. 6. So. Calif. Gas Co. Building, 800 S Flower St. 7. 816 S Grand Av Bldg. 8. Engine Co No 28, 644 S Figueroa Av. 9. Fine Arts Building, 807-811 W 7th St. 10. Roosevelt Building, 727 W 7th St. 11. Barker Brothers Building, 800-818 W 7th St. 12. Los Angeles Central Library, 630 W 5th St. 13. Jonathan Club Building, 545 S Figueroa St. 14. General Petroleum Building, 612 S	1. 275 W 1st St Building 2. 5th St Retaining Wall (near L.A. Central Library) 3. 811 Wilshire Bl Bldg 4. Pantages/Warner Brothers Theatre, 401 W 7th St. 5. 816 S Grand Av. Bldg. 6. AP Giannini - Bank of America, 505 W 7th St./649 S Olive St. 7. Angel's Flight Railway, 300 block S Hill St. 8. Associated Realty Building, 510 W 6th St. 9. AT & T Telecommunications Facility, 420 S Grand Av. 10. Baker Detweiler Bldg, 412 W 6th St. 11. Barker Brothers Building, 800-898 W 7th St./709-711 S Flower St. 12. Bible Institute, 550 S Hope St. 13. Biltmore Bldg, 515 S Olive St. 14. Biltmore Hotel, 503-539 S Olive St./ 512 W 5th St/ 514-530 S Grand Av. 15. Boston Dry Goods Store, 237 S Broadway 16. Boston Stores - J.W. Robinson Co., 600-632 W 7th St. 17. Brack Shops, 527 W 7th St. 18. Bradbury Building, 300 S Broadway 19. Brock Jewelers - Clifton's, 513-515 W 7th St. 20. California Club Building, 532-538 S Flower St. 21. Commercial Exchange Bldg., 416 W 8th St. 22. Coulter Dry Goods Co, 500 W 7th St. 23. Edison Bldg, 601 W 5th St. 24. Edwards Wildey Bldg.- National Oil Bldg, 600-609 S Grand Av, 600 W 6th St.	1. Bradbury Building, 300-310 S Broadway 2. St Vibiana's Cathedral, 110 E 2nd St. 3. Los Angeles City Hall, 200 N Spring St. 4. California Club Building, 532-538 S Flower St. 5. Los Angeles Central Library Building and Grounds, 630 W 5th St. 6. Biltmore Hotel, 503-539 S Olive St./ 512 W 5th St/ 514-530 S Grand Av. 7. Philharmonic Auditorium (site of), 421-433 W 5th St. 8. Saint Paul's Cathedral (site of) 9. Los Angeles Athletic Club Building, 425-437 W 7th St. 10. Fine Arts Building (Global Marine House), 807-815 W 7th St. 11. Subway Terminal Building, 416-424 S Olive St. 12. James Oviatt Building, 615-617 S Olive St 13. Original Pantry, 811 W 9th St. 14. Mayflower Hotel 531-535 S Grand Av. 15. Embassy Auditorium and Hotel, 501 W 9th St/ 839-861 S Grand Av. 16. One Bunker Hill Building, 455 S Grand Av. 17. AP Giannini - Bank of America, 505 W 7th St. 18. Roosevelt Building, 727 W 7th St. 19. Barker Brothers Building, 800-898 W 7th St/709-711 S Flower St. Boston Stores - J.W. Robinson's, 600-632 W 7th St. Brock Jewelers - Clifton's, 513-515 W 7th St.

[4] Archaeological resources have not necessarily been evaluated for National or California register significance.

Table 4-11 Known Historic Properties/Resources Within One-Quarter Mile of Underground Emphasis LRT Alternative

TOTALS	National Register of Historic Places	California Register of Historic Places	City of Los Angeles Historic-Cultural Monuments
	Flower 15. Superior Oil Co Building/Bank of California, 550 S Flower St. 16. Biltmore Bldg, 515 S Olive 17. Oviatt Building, 617 S Olive 18. Subway Terminal Building, 417 S Hill St. 19. AP Giannini - Bank of America, 649 S Olive 20. Ville de Paris Store, 712 S Olive 21. So. Calif. Telegraph Co, 716 S Olive 22. AT & T Telecommunications Facility, 420 S Grand 23. Mayflower Hotel, 533 S Grand 24. Pacific Mutual Garage & Annex, 540 S Grand 25. Edwards Widney Bldg., 609 S Grand 26. New York Cloak & Suit House/Brockman Bldg/Brooks Bros., 708 S Grand Av/, 520 W 7th St. 27. 816 S Grand Ave Bldg 28. Embassy Auditorium, 843 S Grand 29. Embassy Hotel Auditorium, 851 S Grand 30. Woodward/Bristol Hotel, 423 W 4th St. 31. Title Guarantee Bldg, 401 W 5th St. 32. Wells Fargo Bank, 415 W 5th St. 33. Philharmonic Auditorium, 427 W 5th St. 34. Edison Bldg, 601 W 5th St. 35. Los Angeles Central Library, 630 W 5th St 36. "5th St Retaining Wall betw..."(near L.A. Central Library) 37. Baker Detweiler Bldg, 412 W 6th St. 38. Warner Theatre, 460 W 6th St. 39. Associated Realty Building, 510 W 6th St. 40. Pacific Mutual Bldg, 523 W 6th St. 41. Edwards-Wildey/ National Oil Bldg,	25. Edwards-Widney Bldg Addition, 612 W 6th St 26. Embassy Auditorium and Hotel, 501 W 9th St/ 839-861 S Grand Av. 27. Embassy Auditorium, 843 S Grand Av. 28. Embassy Hotel Auditorium, 851 S Grand Av. 29. Engine Co No 28, 644 S Figueroa 30. Figer 8 Bar, 746 S Figueroa 31. Fine Arts Building (Global Marine House), 807-815 W 7th St. 32. Fire Department HQ, 219 S Hill St. 33. First Baptist Church of San Pedro (Facade & Stained Glass Window), 555 W 7th St. 34. General Petroleum Building, 612 S Flower St. 35. Grand Central Market, 315 S Broadway 36. Higgins Building, 108 W 2nd St. 37. Home Telephone, 246 S Hill St. 38. Homer Laughlin Bldg. , 317 S Broadway 39. Irvine Block-Byrne Bldg, 249 S Broadway/301 W 3rd St. 40. James Oviatt Building, 615-617 S Olive St. 41. Jonathan Club Building, 545 S Figueroa St. 42. Joyeria Esmerelda Jewelry, 332 S Hill St. 43. Kerckhoff Annex, address unknown 44. King Edward Hotel, 121 E 1st St. 45. LA Soap Co. 617 E 1st St. 46. Lindy Hotel, 419 W 8th St. 47. Los Angeles 3rd Church of Christ, 734 S Hope 48. Los Angeles Athletic Club Building, 425-437 W 7th St 49. Los Angeles Central Library Building and Grounds, 630 W 5th St. 50. Los Angeles City Hall, 200 N Spring St. 51. Los Angeles Times Building, 202 W 1st	Title Insurance & Trust Company Building and Annex, 433 S Spring St. Pacific Mutual Building, 523 W 5th St. First Baptist Church of San Pedro (Facade & Stained Glass Window), 555 W 7th St. Spanish - American War Memorial (Pershing Square), 5th, 6th Olive & Hill Angel's Flight, 300 block of S Hill St. Irvine-Byrne Building, 249-259 S Broadway/ 301 W. 3rd St. Superior Oil Company Building, 550 S Flower St. South Park Loft Building, 816 S Grand Av State Theater Building, 300-314 W 7th St. Edwards-Wildey Building, 609 S Grand Av. General Petroleum Building, 612 S Flower St. Southern California Gas Company complex, 800-830 S Flower St. Higgins Building, 108 W 2nd St.

Table 4-11 Known Historic Properties/Resources Within One-Quarter Mile of Underground Emphasis LRT Alternative

TOTALS	National Register of Historic Places	California Register of Historic Places	City of Los Angeles Historic-Cultural Monuments
	600 W 6th St. 42. Edwards-Wildey Bldg Addition, 612 W 6th St. 43. 811 Wilshire Bl Bldg Pantages 44. Warner Brothers Theatre, 401 W 7th St. 45. Los Angeles Athletic Club, 431 W 7th St. 46. Coulter Dry Goods Co, 500 W 7th St 47. Brock & Co. Jewelry Store/Clifton's Cafeteria, 513 W 7th 48. Brack Shops, 527 W 7th St. 49. Quinby Bldg., 529 W 7th St. 50. San Pedro 1st Baptist Church, 543 W 7th St. 51. Boston Store/JW Robinson Co., 600 W 7th St. 52. Union Oil Bldg, 617 W 7th St 53. Commercial Exchange Bldg., 416 W 8th St 54. Lindy Hotel, 419 W 8th St 55. Fire Department HQ, 219 S Hill 56. Home Telephone, 246 S Hill 57. The Aldine/Myrick Hotel, 324 or 342 S Hill 58. The Whipple/ Markham Hotel, 326 S Hill 59. Angel's Flight Railway, 300 block of S Hill St 60. Joyeria Esmerelda Jewelry, 332 S Hill 61. Bible Institute, 550 S Hope 62. Los Angeles 3rd Church of Christ, 734 S Hope 63. Boston Dry Goods Store, 237 S Broadway 64. Irvine Block-Byrne Bldg, 249 S Broadway 65. Bradbury Building, 300 S Broadway 66. Million Dollar Theater, 301 S Broadway 67. Bradbury Building, 300-310 S Broadway 68. Grand Central Market, 315 S Broadway	52. Louis Brownstein Building, 751 S Figueroa 53. Mayflower Hotel 531-535 S Grand Av. 54. Million Dollar Theater, 301 S Broadway 55. New York Cloak & Suit House-Brockman Bldg-Brooks Bros., 708 S Grand Av/520 W 7th St 56. Newark Brothers-Uyeda Building, 312 E 1st St. 57. One Bunker Hill Building, 455 S Grand Av 58. Original Pantry, 811 W 9th St 59. Oviatt Building, 617 S Olive 60. Pacific Mutual Bldg, 523 W 5th St 61. Pacific Mutual Garage & Annex, 540 S Grand 62. Philharmonic Auditorium (site of), 421-433 W 5th St 63. Produce Exchange Building, 333 S Central 64. Progressive Theatre, 320 E 1st St. 65. Quinby Bldg., 529 W 7th St 66. Roosevelt Building, 727 W 7th St 67. St Vibiana's Cathedral, 110 E 2nd St 68. Saint Paul's Cathedral (site of), address unknown 69. So. Calif. Gas Co. Bldg, 800 S Flower St 70. So. Calif. Gas Co. Bldg, 810 S Flower St 71. So. Calif. Gas Co. Bldg, 820 S Flower St 72. So. Calif. Gas Co. Bldg, 830 S Flower St 73. So. Calif. Gas Co. complex, 800-830 S Flower St. 74. San Pedro 1st Baptist Church, 543 W 7th St. 75. S Calif. Telegraph Co, 716 S Olive 76. South Park Loft Building, 816 S Grand Av 77. Spanish - American War Memorial (Pershing Square), 5th, 6th Olive & Hill 78. State Theater Building, 300-314 W 7th	

Table 4-11 Known Historic Properties/Resources Within One-Quarter Mile of Underground Emphasis LRT Alternative

TOTALS	National Register of Historic Places	California Register of Historic Places	City of Los Angeles Historic-Cultural Monuments
	69. Homer Laughlin Building , 317 S Broadway 70. Los Angeles City Hall, 200 N Spring St. 71. US Courthouse and Post Office, 312 N Spring St. 72. Produce Exchange Building, 333 S Central 73. Los Angeles Times Building, 202 W 1st 74. 275 W 1st St. Building 75. King Edward Hotel, 121 E 1st St 76. Newark Brothers/Uyeda Building, 312 E 1st St. 77. Progressive Theatre, 320 E 1st St. 78. LA Soap Co. 617 E 1st St. 79. St Vibiana's Cathedral, 110 E 2nd St.	St. 79. Subway Terminal Building, 416-424 S Olive St/417 S Hill St 80. Superior Oil Co Building-Bank of California, 550 S Flower St. 81. The Aldine/Myrick Hotel, 324 or 342 S Hill Av. 82. The Whipple/ Markham Hotel, 326 S Hill Av. 83. Title Guarantee Bldg, 401 W 5th St 84. Title Insurance & Trust Company Bldg and Annex, 433 S Spring St 85. Union Oil Bldg, 617 W 7th St. 86. Ville de Paris Store, 712 S Olive St. 87. Warner Theatre, 460 W 6th St. 88. Wells Fargo Bank, 415 W 5th St. 89. Woodward/Bristol Hotel, 423 W 4th St.	

Source: SWCA Environmental Consultants, 2008

While specific conclusions regarding project-related effects to these historic properties and identification of all previously unevaluated properties cannot made at this level of project development, it must be noted that future project development should coordinated with a consulting, qualified architectural historian and qualified archaeologist, in order to identify all previously unevaluated properties to in order to evaluate project effects. Detailed plans of the project, developed to a sufficient level of detail to guide effects findings will be necessary to prepare the next environmental review steps (e.g. identification and analysis) for the project. Refer to Table 4-12 through Table 4-14 for the preliminary results.

Paleontological Resources

The PSA is situated in the southwestern block of the Los Angeles basin. The Los Angeles basin is one of many basins comprising the Neogene continental borderland of southern California. It extends from the Santa Ana Mountains in the north to the San Joaquin Hills to the south, and includes the southern foothills of the San Gabriel Mountains, the Puente Hills, and the Palos Verdes Hills. The Los Angeles basin is a structural depression that has been the site of discontinuous deposition since the Late Cretaceous and of continuous subsidence and primarily marine deposition since the middle Miocene. This and other sedimentary basins formed during Miocene and Pliocene as a result of an early San Andreas-type phase of transform motion along the western margin of North America. According to geologic mapping and museum collections records, the PSA are immediately underlain by the following geologic units, from oldest to youngest: (1) Miocene Puente Formation, (2) Pliocene Fernando Formation, and (3) Quaternary alluvium. These geologic units, and their paleontological resource potential, are discussed in more detail below.

Puente Formation

The Puente Formation is middle to late Miocene (14 to 5 million years ago [Ma]) in age. The Puente Formation is known to produce significant paleontological resources including fossilized remains of sharks, fish, marine and terrestrial mammals; as well as some of the most complete collections of marine algae and terrestrial flora. It has been assigned a high paleontological resource sensitivity for its proven potential to yield scientifically significant fossil resources.

Fernando Formation

The Pliocene (5–1.8 Ma) age Fernando Formation is present in the eastern Puente Hills and much of the northeastern Los Angeles basin. In addition to numerous invertebrate fossils collected from the Fernando Formation, some marine vertebrate material has also been documented including fossilized specimens of great white shark, dolphin, herring, hake, lanternfish, mackerel, swordfish, flounder, and whale. The presence of these fossils within this geologic unit, as well as it's proven potential to yield vertebrate remains in the vicinity of the study area, has resulted in the designation of the Fernando Formation as having a high paleontological sensitivity.

Table 4-12 Known Archaeological Resources within One-Quarter Mile of the PSA					
Primary Number	Trinomial	Other Designation	Resource Description	Recorded by/Date	Alignment(s)
19-000007	CA-LAN-7H	—	Los Angeles Chinatown dump area, mid 19th century	Meighan 1951	At-Grade & Underground
19-000887	CA-LAN-887H	Las Placitas	1880s Zanja Madre and structural remains from Spanish occupation through early 1900s	Costello 1978	At-Grade
19-001112	CA-LAN-1112H		Structural remains adjacent to Old Plaza Church dating to early 1800s	NARC 1981	At-Grade
19-001575	CA-LAN-1575/H		1860s-1930s Chinatown, Native American features and cemetery	Foster 1989, Horne 2000, Warren 2005	At-Grade
19-002791	CA-LAN-2791H	Pico-Garnier Block, El Pueblo de Los Angeles	Historic archaeological deposits present within the basement of the Merced Theater and the Garnier Building and beneath Sanchez Alley	Foster 1999	At-Grade
19-002928	CA-LAN-2928H	Brunswig Drug Co.	Historic gas tank, portions of a brick structure, miscellaneous iron pipes, the Brunswig Warehouse reinforced concrete foundations, and a small trash deposit	Hale 2001	At-Grade
19-003097*	CA-LAN-3097H		Mid to late 19th century privies and structural foundations	Warren 2003	At-Grade & Underground
19-003129	CA-LAN-3129H		Four historic refuse concentrations that date to the late 19th and early 20th centuries, may have been associated with the Modjeska Building that once occupied the area	Turner 2003	At-Grade & Underground
19-003169	CA-LAN-3169H		Two segments of the AT&SF railroad, turn of the century to early 20th century	Harris 2003	At-Grade
19-003337	CA-LAN-3337H		Oyster shell lens and historic glass, brick and stoneware fragments	Humphries 2000	At-Grade & Underground
19-003338	CA-LAN-3338H		Dense charcoal lens with associated historic artifacts	Humphries 2000	At-Grade & Underground
19-003339	CA-LAN-3339H		Historic trash lens with oyster shell, animal bones, glass, bricks, and stoneware, age unknown	Humphries 2000	At-Grade & Underground
19-003352	CA-LAN-3352H		Historic features including a segment of the Zanja No. 6-1, an artifact scatter, and a concrete foundation, dating to c. 1900	Foster 2005	At-Grade & Underground
19-003353	CA-LAN-3353H		Trash deposit with glass and ceramics, turn of the 20th century	Foster 2005	At-Grade & Underground

Table 4-12 Known Archaeological Resources within One-Quarter Mile of the PSA					
Primary Number	Trinomial	Other Designation	Resource Description	Recorded by/Date	Alignment(s)
19-003549	CA-LAN-3549H	El Pueblo de Los Angeles Winery	Adobe structure remnants and cistern filled with bottles, turn of the 20th century	Cordner 2006	At-Grade
19-003588	CA-LAN-3588H		Brick foundations and a historical artifact deposit	Foster 2006	At-Grade & Underground
19-003660	CA-LAN-3660H		Fragmented household refuse and building material debris associated with the occupation of a number of no longer extant buildings that existed from the 1890s onward	Hogan, Tan and Smallwood 2007	At-Grade & Underground
19-100301			Isolated black glass bottle fragment, dating to the late 19th Century	Michalsky 1998	At-Grade & Underground
19-100515		Republic Street Isolate	Historic artifact concentration with bricks, animal bone, metal, glass, ceramics, dating to 19th century	Slawson 2005	At-Grade
19-120014		Merced Theater	Pit feature containing historic artifacts	Eisentraut 1996	At-Grade
19-120015			Prehistoric human remains, no artifacts	Wlodarski 1978	At-Grade

Quaternary Alluvium

Quaternary alluvium of Holocene (10,000 years before present [BP] to Recent) age underlies much of the eastern portion of the PSA from approximately the intersection of 2nd and Hill Sts. and eastward. Holocene-aged deposits contain the remains of modern organisms and are generally too young to contain fossils. Fossil localities in older Quaternary alluvium deposits throughout southern California have yielded terrestrial vertebrates such as mammoths, mastodons, ground sloths, dire wolves, short-faced bears, saber-toothed cats, horses, camels, and bison. Fossilized invertebrates and plant remains have also been collected from this unit. Younger alluvium is determined to have a low potential for paleontological resources but is often underlain by older alluvium, which is determined to have a high potential for paleontological resources.

4.12.2 Evaluation Methodology

Information in this section is based primarily on the record searches and a reconnaissance-level field survey of the Area of Potential Effects[5] (APE) which included the area in the immediate vicinity of the PSA. Both historic and archaeological resources were considered during the survey. For the proposed alternatives, a paleontological collections records search was conducted by the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County (LACM). A detailed review of museum collections records was performed in order to identify any known vertebrate fossil localities within one mile of the proposed alternatives and to identify the geologic units within the PSA. In addition, published geologic maps were consulted.

4.12.3 Environmental Issues

Historical Resource

Significant built and archaeological resources have the potential to be impacted by both build alternatives to approximately the same extent. The following discussion of potential project-related environmental impacts provide an example of some issues that may apply to the proposed alternatives.

4.12.3.1 Construction

For any rail segments that require tunneling or cut-and-cover construction, an equation will be established, in conjunction with project engineers to determine what the expected "settlement trough" for the proposed project will be. That settlement trough will show the distance from the proposed area of direct ground disturbance that additional project-related land deformation can be expected to occur. The establishment of a settlement trough is an important component of the effects analysis, which will be among the many factors taken into consideration in evaluating the proposed project. Effects from tunneling near historic buildings can include, but not be limited to cracks and other damage resulting from differential settlement, tunnel-induced displacement and

[5] The study area, called Area Potential Effects (APE) in this report is a blanket ¼-mile buffer from the proposed project alignments. The APE was not established in coordination with the California State Historic Preservation or in accordance with 36 *Code of Federal Regulations* (*CFR*) Part 800.16 (d). 36 *CFR* defines an APE as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." Once project plans are developed to an appropriate level of detail, a project-specific APE will be developed for SHPO review and concurrence.

construction as well as operational vibration. A particularly challenging aspect of tunneling activities, is that full effects of differential settlement on fragile buildings and other features may not be realized for years after construction activities have been completed.

For most elements of the project's construction phase, significant effects to historic properties are anticipated. Typical construction effects for this type of project are temporary loss of access, and effects of vibration caused by use of heavy equipment and use of multiple equipment types simultaneously, as well as uneven earth movement (differential settlement) and uncontrolled dust that can damage buildings or other features, such as curbs, sidewalks and retaining walls. Standard construction control methods are recommended to control traffic, reduce noise, vibration and dust resulting from construction activities that will be associated with the proposed project. Vibration may be caused by use of tunneling and grading equipment, jackhammers and other heavy equipment, and by vehicle movement. It is recommended that vibration be monitored in areas of historic properties to limit its effects to below the Federal Transit Administration threshold for damage to fragile historic buildings and that detailed pre-construction surveys be conducted by qualified historical architects or engineers with specialized training and demonstrated experience in historic building reuse of interiors and exteriors of each historic property.

Although project plans have not been completed to sufficient detail to analyze these effects, it is expected that no historic properties would be demolished, relocated or acquired for the proposed project.

4.12.3.2 Operation

Visual impacts may result if the project introduced elements that were inconsistent with the visual character of the project area, or if a project component, such as a station, were to obstruct important views or connections between buildings and features in settings or an historic district. Placement of catenary poles used to support at-grade train cross spans and catenary wires present the possibility for effects on historic properties. It is recommended that all catenary poles be placed immediately next to street curbs (within the public right of way), and that existing utility poles be replaced where feasible. Placement of catenary poles has yet to be determined and should be reviewed by cultural resources specialists to reduce effects. No proposed project catenary poles should be located within the boundaries of historic properties or historic districts. As previously cited, catenary poles for the proposed project should in some cases, replace existing utility poles. This type of replacement may reduce visual clutter in the vicinity of historic resources near the proposed project. Because of support requirements of catenary wires, particularly at curves and corners, there is the potential for an overhead "spider web effect" to result, where numerous wires and stays result in increased visual clutter. For this project, obstruction or impeded views (toward or from the resources), and their respective settings may be impaired by the placement of catenary poles and wires.

A project option may involve using cross span wires that would be anchored to the street facades of buildings to support catenary wires, particularly at street corners. This "eyelet"

method was a common technique used to support wires for historic trolley systems. There is a possibility that such eyelets would be proposed to be affixed to historic buildings, which could have a potential significant impact on historic resources.

- Both of the build alternatives call for a vehicular underpass and pedestrian overpass to be constructed on Alameda St., either at Temple St. (At-Grade Emphasis LRT Alternative) or 1st St. (Underground Emphasis LRT Alternative). The overpass/underpass structure will interrupt lines of sight along both streets at the intersection where constructed and may conflict with the historic appearance of the neighborhood, especially on 1st St.

- Additional project-related effects on historical resources include potential impacts from excavation-induced ground settlement and other ground-movement-related building damage. Each of these could affect fragile historic properties, resulting in adverse effects findings. Additionally, effects of new station construction and the introduction of catenary wired and poles in historic districts or adjacent to historic properties could each result in changes in settings, and thus in findings of adverse effects.

4.12.3.3 Paleontological Resources

According to geologic mapping and museum collection records, the build alternatives are underlain by the paleontologically sensitive Puente Formation, Fernando Formation, and Quaternary older alluvium. Museum collections records maintained by the Natural History Museum of Los Angeles County (LACM) were searched and four previously recorded vertebrate fossil localities were discovered either along the proposed alternative routes or within a one-mile radius (Table 4-13). In addition, the records search results revealed that at least eleven vertebrate fossil localities have been previously documented in the general vicinity of the PSA and were discovered within the same geologic units that are present within the proposed alternative alignments (Table 4-14).

With regard to paleontological resources, adverse impacts to paleontological resources would be greater during the construction of the Underground Emphasis LRT Alternative, as this alternative would require substantial excavations into paleontologically sensitive geologic units. Digging for the automobile underpass on Alameda St. at either Temple St. or 1st St. will have similar effects. However, both build alternatives traverse paleontologically sensitive units and have the potential to impact non-renewable paleontological resources. Implementation of proper mitigation measures can, however, reduce the impacts to the paleontological resources to below the level of significance.

Table 4-13 Paleontological localities located within a one-mile radius of the Build Alternatives			
LACM Locality Number (s) and Approximate Location	Geologic Formation	Age	Taxa
LACM 6971; 6th and Flower Sts.; LACM 4726; 4th and Hill Sts.	Fernando Formation	Pliocene	Myliobatis (eagle ray), Carcharodon carcharias (white shark), Isurus oxyrinchus (bonito shark), Carcharhinus (requiem shark), Semicossyphus (sheepshead)
LACM 5961; 1st and Hill Sts.	Puente Formation	Late Miocene	Cyclothone (bristlemouth fish)
LACM 3868; Wilshire Blvd. and Lucas Ave.	Fernando Formation	Pliocene	Carcharodon sulcidens (white shark)

Table 4-14 Paleontological localities located outside of on--half-mile radius and in the general vicinity of the Build Alternatives			
LACM Locality Number (s) and Approximate Location	Geologic Formation	Age	Taxa
LACM 6198- 6203; Wilshire Blvd. from intersection of Alvarado St. west to past Vermont Ave.	Puente Formation	Late Miocene	Osteichthyes (bony fish), Cetacea (whale)
LACM 3250; east of Vermont Ave. near Madison Ave. and Middlebury St.	Quaternary alluvium	Pleistocene	Mammuthus (fossil mammoth)
LACM 5845; Western Ave. and Beverly Blvd.	Quaternary alluvium	Pleistocene	Mammutidae (fossil mastodon)

4.13 Parklands and Other Community Facilities

Public transit service increases the accessibility of parklands and community facilities within the area, thereby providing a benefit to the community. However, the establishment of a new transit system, has the potential for negative impacts resulting from the need for physical acquisition, displacement or relocation of parkland or a community facility. Negative indirect impacts may involve changes to roadways and public right-of-ways that reduce pedestrian or vehicular access to facilities.

Other potential indirect or secondary impacts on parklands and community facilities such as pedestrian safety, air quality, or noise impacts are discussed in Sections 4-15, 4-6 and 4-7 respectively.

4.13.1 Affected Environment

4.13.1.1 Regulatory Framework

Public parklands, significant cultural resources, and natural wildlife refuges are given protection under Section 4(f) of the U.S. Department of Transportation Act of 1966. Direct use (i.e. encroachment or acquisition) of Section 4(f) lands by federally funded transportation projects is prohibited unless it can be demonstrated that no prudent alternatives are available. If no prudent alternatives exist, the effects must be reduced through project design and mitigation measures. Indirect effects to Section4(f) lands may involve obstruction or alteration of access, introduction of significant noise or vibration sources, casting of shadows, or other substantive changes to the visual setting.

4.13.1.2 Existing Conditions

There are currently four emergency facilities (three fire stations and one police station) located within one-quarter mile of both alignment alternatives. Additional community facilities (museums, performing arts centers, religious facilities, and schools) within one-quarter mile of both alignments include:

- California Academy for Liberal Studies Early College High School (700 Wilshire Blvd., 4th Floor)
- Los Angeles Downtown Public Library (630 W 5th St.)
- Los Angeles Downtown Public Library Park (630 W 5th St.)
- Pershing Square (532 South Olive St.)
- MOCA Museum of Contemporary Art (MOCA) - Grand Ave.
- The Colburn School of Music and Performing Arts (200 S Grand Ave.)
- The Disney Concert Hall
- The Dorothy Chandler Pavilion
- City Hall Park (200 N Spring St.)
- Fletcher Bowron Square (300 block of N. Main St.)
- Union Center for the Arts (120 North San Pedro St.)
- Little Tokyo Library (203 S Los Angeles St.)
- Japanese American National Museum (369 East 1st St.)
- James Irvine Garden (244 S. San Pedro St.)
- Japanese American Cultural and Community Center (244 S. San Pedro St.)

- The Geffen Contemporary at MOCA (152 North Central Ave.)
- El Pueblo de Los Angeles State Historical Monument (500 block of N. Main St.)
- Higashi Honganji Buddhist Temple (505 East 3rd St.)
- Koyasan Buddhist Temple (342 East 1st St.)
- Union Church of Los Angeles (401 East 3rd St.)

Of these resources within one quarter mile from the alignment, the greatest potential direct or indirect impacts would be related to the resources located adjacent to an alignment and in the vicinity of the stations.

Parklands and community facilities adjacent to the At-Grade Emphasis LRT Alternative alignment are listed below. Any differences between Options A and B are noted.

- Los Angeles Central Library Building and Park – located on 5th St. to the east of Flower St. The alignment runs below-grade to the west of the site on Flower St. A station is located to the west of the library site (Option A).
- MOCA Museum of Contemporary Art (MOCA) – located near the southeast corner of 2nd St. and Grand Ave. The alignment runs at-grade along 2nd St. to the north.
- The Colburn School of Music and Performing Arts - located at the southeast corner of 2nd St. and Grand Ave. The alignment is below grade to the north of the site, and transitions to at-grade at Main St. the east.
- Disney Concert Hall – located on 2nd St. between Grand Ave. and Hope St. The alignment is below grade to the south of the site, and transitions to at-grade at Grand Ave. the east. A station is located to the southwest.
- City Hall Park – located on the City Hall grounds at northwest corner of 1st and Main Sts. The northbound alignment runs at grade along Main St. to the east. There is a station at this location on Main St. The station would be a side platform located on the east-side of the street, opposite the park.
- Fletcher Brown Square – Los Angeles Mall - located in the 300 block of Main St. between Temple and Aiso Sts. The alignment is at grade to the south of the site along Temple St. A pedestrian overcrossing spans 2nd St., linking Fletcher Brown Square to the Civic Center.
- Little Tokyo Library – located at the southwest corner of 2nd and Los Angeles Sts. The alignment runs at grade along 2nd St. and turns north onto Los Angeles St. There is an optional station located to the northwest of the site.
- The Geffen Contemporary at MOCA – located near the southwest corner of Temple and Alameda Sts. The alignment runs along Temple St. to the north and turns south

on Alameda St. where in connects to the Gold Line. The Little Tokyo/Arts District Station is located on Alameda St. immediately to the east of the site.

Parklands and community facilities potentially impacted by the Underground Emphasis LRT Alternative alignment and station locations are listed below. Unless otherwise noted, the alignment and stations are below-grade:

- Los Angeles Central Library Building and Park – located on 5th St. to the east of Flower St. The alignment runs below-grade to the west of the site on Flower St. A station is located to the north of the library site.
- MOCA Museum of Contemporary Art (MOCA) – located near the southeast corner of 2nd St. and Grand Ave. The alignment runs at grade along 2nd St. to the north.
- The Colburn School of Music and Performing Arts - located at the southeast corner of 2nd St. and Grand Ave. The alignment is to the north of the site.
- Disney Concert Hall – located on 2nd St. between Grand Ave. and Hope St. The alignment is to the south of the site. A station is located to the southwest.
- Little Tokyo Library – located at the southwest corner of 2nd and Los Angeles Sts. The alignment runs along 2nd St. to the north. A station is located adjacent to the site.
- Japanese American National Museum – located near the northwest corner of 1st and Alameda Sts. The alignment transitions from belowground to at-grade to the south of the site and extends at grade to the east along Alameda St., where it connects to the Little Tokyo/Arts District Station.
- The Geffen Contemporary at MOCA – located near the southwest corner of Temple and Alameda Sts., to the north of the Japanese American Nation Museum. The alignment terminates immediately to the south of the site at Little Tokyo/Arts District Station.

4.13.2 Evaluation Methodology

The evaluation of potential impacts on parklands and community facilities involves determining what facilities are located near the proposed alignments and if the alignments would directly impact any of the facilities through encroachment or acquisition, or indirectly impact the facilities by limiting access.

The information regarding parklands and community facilities were found through Navigate LA, a City of Los Angeles Bureau of Engineering web-based mapping application which identifies all types of community facilities within City boundaries.

4.13.3 Environmental Issues

Public transit serves to increase the accessibility to parklands and community facilities within the general area. Potential direct impacts on parklands and other community facilities would arise from the need for physical acquisition, displacement or relocation of

parkland or a community facility. Indirect impacts involve changes to pedestrian or vehicular access. Direct impacts would only occur at facilities located adjacent to the alignments and stations. Similarly, indirect impacts would be most likely to occur at facilities adjacent to or in closest proximity to the alignments.

Construction of either alternative would primarily occur within existing streets and public rights-of-way, and/or underground which would limit the needs for direct acquisition of parkland or other community facilities. However, some direct acquisition would be required for at-grade alignments when street widths are narrow or where additional width is needed to accommodate turns and curves. Acquisition is also required for underground alignments at underground station locations to accommodate station access portals. As such, the At-Grade Emphasis LRT Alternative would require less property acquisition than the Underground Emphasis LRT Alternative. However, both Option A and the Underground Emphasis LRT Alternative have potential property acquisition associated with providing portal locations in the vicinity of the Central Library. The Underground Emphasis LRT Alternative may also require acquisition for portals in the vicinity of the Little Tokyo Branch Library and The Japanese American National Museum. Further evaluation would be needed to determine potential direct impacts associated with property acquisitions.

Reduction in vehicle or pedestrian access to parkland and community facilities, or an unacceptable reduction in emergency services response time related to roadway modifications would be potential adverse impacts. While each alternative could reduce access during the construction period, the operation of the At-grade Emphasis LRT Alternative would have greater potential impact on access than the Underground Emphasis LRT Alternative. Roadway modifications associated with the At-Grade Emphasis LRT Alternative may include reductions in the number of traffic lanes, removal or modification of existing left turn pockets, and impacts on existing driveways. Reductions in roadway capacity and changes in traffic configuration could reduce access to parkland or communities facilities in the immediate vicinity. Conflicts related to emergency service access could also result. Adequate review will need to be conducted in order to assure the maintenance of acceptable levels of ingress/egress and emergency response access for police and fire stations, and adequate public access to parklands and community facilities.

Access to parklands and community facilities could be further impacted by loss of currently available street parking. The At-Grade Emphasis LRT Alternative would result in the loss of approximately 90-100 on-street parking spaces. Further evaluation would be required to determine if this loss of parking would adversely affect the public's ability to access parklands and community facilities, and if so, if alternative parking could be provide elsewhere.

Reduction in pedestrian access to parklands and community facilities would also be a potentially adverse impact.

The Underground Emphasis LRT Alternative would have greater potential direct impacts on parklands and community facilities related to the need for direct acquisition for portals

to underground stations. The At-Grade Emphasis LRT Alternative would have greater potential indirect impacts on parklands and communities facilities as a result of needed roadway modifications to accommodate the alignment which could potentially reduce parking for and access to parklands and community facilities.

Both alternatives would reduce access to parklands and communities facilities during the construction phase. Given the intensity of construction associated with underground transit development, construction impacts related to the Underground Emphasis LRT Alternative may be greater than with the At-Grade Emphasis LRT Alternative.

4.14 Economic & Fiscal Impacts

The project area is at the heart of the downtown Los Angeles resurgence. With more than 12,000 households and close to 200,000 employment opportunities projected for the year 2030, a more comprehensive transportation system is becoming an economic necessity. While there is the potential for the project to impact the current environment, it is important to consider the positive impacts construction would have on the local and regional economy including employment, construction spending, and indirect spending as well. This section will survey the economic and fiscal impacts of the Regional Connector including the following:

- Tax revenue impacts
- Construction-Related Economic Impacts
- Construction-Related Employment
- Construction Spending on the Regional Economy

4.14.1 Affected Environment

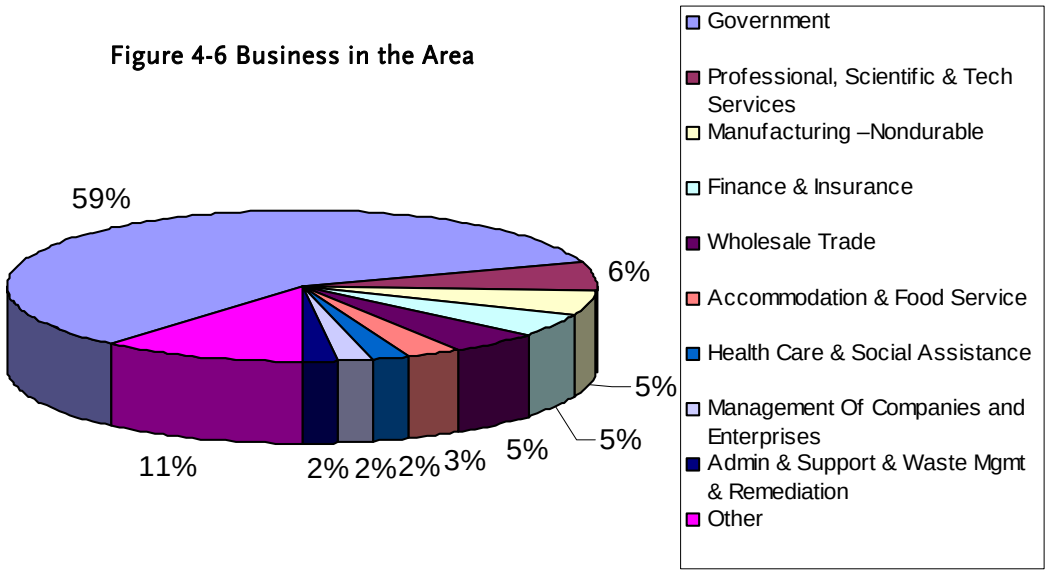
4.14.1.1 Existing Conditions

- The PSA, located within the Central City region, consists primarily of high-density commercial and industrial uses. Within this region, many of the traditional commercial areas are being transformed into medium to high density multi-family residential units and mixed use developments.

- A mixture of light and heavy industrial land uses exist along the eastern half of the Central City, east of Main St., and adjacent to the Alameda District. The remaining land uses within the downtown area are designated for public facilities and open space. Figure 4-6 gives a more detailed breakdown of the type of businesses in the PSA.

- The PSA makes up approximately .03 percent of the 4,752 square miles of Los Angeles County. Although small in size, the area is a densely populated employment center comprised of mostly government jobs. The two build alternatives travel through the Civic Center and along Temple St., providing access to the majority of these employment opportunities. There were approximately 168,000 employees in

Figure 4-6 Business in the Area



the PSA in 2005, which is expected to increase to over 188,000 in 2030. Current projected employment within the PSA is between three and four percent of total Los Angeles County employment. Employment density in the PSA was 110,529 employees per square mile, which was significantly higher than the employment density of 977 for the County as a whole. The tax revenue base in the PSA is approximately $85.9 million.

In 2005 the total population of the PSA was 17,795 people, which was only 0.18 percent of the Los Angeles county population of over ten million. PSA population is expected to grow to 21,000 people in 2030.

There were 9,673 households in the PSA in 2005 with a median household income of approximately $45,000. Group quarters added an additional 5,466 residences. Total households are projected to increase 26.1 percent from about 9,700 in 2005 to 12,200 in 2030, which is higher than the 24.8 percent projected growth for Los Angeles County as a whole.

4.14.2 Evaluation Methodology

General assumptions are based upon available existing data from various sources, and verified by windshield survey. Information sources include the SCAG, American Public Transit Association, County Assessors Records, and Damar.

- For the purposes of this report tax revenue losses were estimated using available information from the Los Angeles County Assessor's Office. The Assessor's Parcel Number, land value, improvement value, square footage, 2007 tax payments, and owner's information were identified for all affected parcels of land. Using this information the per square foot land value and the corresponding 2007 land tax

payment made on each square foot were estimated. These estimates were used together to find loss in tax revenue due strictly to land acquisition.

- Potential construction related impacts were identified using conceptual site maps and station design. This information was used to identify potentially affected businesses in the area.

4.14.3 Environmental Issues

4.14.3.1 Tax Revenue Impacts

The alternatives identified in this report effectively use the public right of way for track construction and station sites, minimizing the need for land acquisition. However, as discussed below, some acquisition is required for each alternative.

At-Grade Emphasis LRT Alternative

According to preliminary station and alignment design the stations will need an area approximately five feet deep along the street frontage for the length of the station for construction. Total tax revenue loss due to land acquisition for these alternatives is estimated to total $71,802.61 (see Table 4-15). This is approximately.084 percent of the $85,929,841.00 tax revenue base of the PSA. Tax revenue loss should not be a significant criteria in the selection of the preferred alternative.

Underground Emphasis LRT Alternative

In this stage of the study the station sites and design for the Underground Emphasis LRT Alternative have not been finalized, therefore the land acquisition requirements for this alternative considered herein are limited to the proposed construction staging area near Alameda St. Total tax revenue loss due to land acquisition for this alternative is estimated to total $163,130.29 (see Table 4-16). This is approximately .190 percent of the $85,929,841.00 tax revenue base of the PSA. Tax revenue loss should not be a significant criterion in the selection of the preferred alternative.

Table 4-15 Estimated Loss of Tax Revenue Due to Land Acquisition
At-Grade Emphasis LRT Alternative

Assessor's Parcel #	Address	Property Type	Land Sq.Ft	Land Value	Sq. Ft.	Improvement Value	2007 Tax Payment	Ownership	TAX REVENUE LOSS
South of LA Times									
5149-008-032	201 S. Spring St. LA, CA 90012	Commercial/Industrial	25898	$1,927,273	195	$5,735.00	$35,709.70	LA Times Communications LLC	$1,847.55
5149-008-031	200 S. Broadway LA, CA 90012	Commercial/Industrial	5419	$401,513	5400	$5,735.00	$7,706.52	LA Times Communications LLC	$961.62
Behind LAPD									
5161-026-023	200 S Main St.	Other	7607	$435,929		$5,735.00	$6,398.84	Old Cathedral LLC	$1,135.59
5161-026-024	114 E 2nd	Other	6325	$326,946	17333	$200,756.00	9471.36	Old Cathedral LLC	$540.47
5161-026-033		Commercial/Industrial	5480	$203,163	5480	$1,123.00	3840.58	Old Cathedral LLC	$473.06
Landscaped Property to the Northeast of 3rd and Flower									
5151-014-033		Vacant Land		$3,959,546			$66,744.32	Fiveplants Associates and central plants inc	$66,744.32

Table 4-16 Estimated Loss in Tax Revenue Due to Land Acquisition
Underground Emphasis LRT Alternative

Assessor's Parcel #	Address	Property Type	Land Sq.Ft.	Land Value	ImprovementSq. Ft.	Improvement Value	2007 Tax Payment	Ownership	TAX REVENUE LOSS
Block Bounded By Central Ave., 1st St., Alameda, and 2nd St.									
5161-018-002	402 E. 1st St. LA,CA 90012	Commercial/Industrial	13673	$221,415	13320	$4,186	$3,369.60	Volk, Robert D TR	$3,369.60
5161-018-001	416 E. 1st St. LA, CA 90012	Commercial/Industrial	4792	$79,032	3921	$16,084	$1,489.34	Volk, Robert D TR	$1,489.34
5161-018-021		Vacant Land		$221,451	7256	$62,536	$4,477.40	Volk, Robert D TR	$4,477.40
5161-018-008	105 S. Alameda St. LA, CA 90012	Vacant Land	3829	$27,918			$453.06	Volk, Robert D TR	$453.06
5161-018-009		Commercial/Industrial	2496	$15,504	2115	$5,497	$311.98	Volk, Robert D TR	$311.98
5161-018-010		Commercial/Industrial	3223	$20,157	2735	$7,395	$404.92	Volk, Robert D TR	$404.92
5161-018-020		Commercial/Industrial		$2,106,233	26444	$2,496,078	$57,320.62	401 E 2nd St LLC	$57,320.62
5161-018-007	401 E. 2nd St. LA, CA 90012	Commercial/Industrial	17424	$740,114	17400	$17,971	$9,951.36	401 E 2nd St LLC	$9,951.36
5161-018-011	437 E. 2nd St. LA, CA 90012	Commercial/Industrial	33610	$1,427,786	33600	$35,749	$18,617.68	401 E 2nd St LLC	$18,617.68
Landscaped Property to the Northeast of 3rd and Flower									
5151-014-033		Vacant Land			$3,959,546.00		$66,744.32	Fiveplants Associates and central plants inc	$66,744.32

4.14.3.2 Construction-Related Economic Impacts

- Construction related impacts are likely to occur throughout the PSA, and will increase in severity near the proposed station sites due to more construction activity and sidewalk closure impeding circulation in the area immediately surrounding construction areas and impacting access to adjacent land uses. Although the alignment stays within the public right-of-way, the nature of the proposed project and the land use characteristics of the PSA will inherently lead to adverse affects for businesses, inhabitants and industry within close proximity. The businesses that will be most directly affected by construction are at grade store fronts that cater to pedestrian foot traffic.

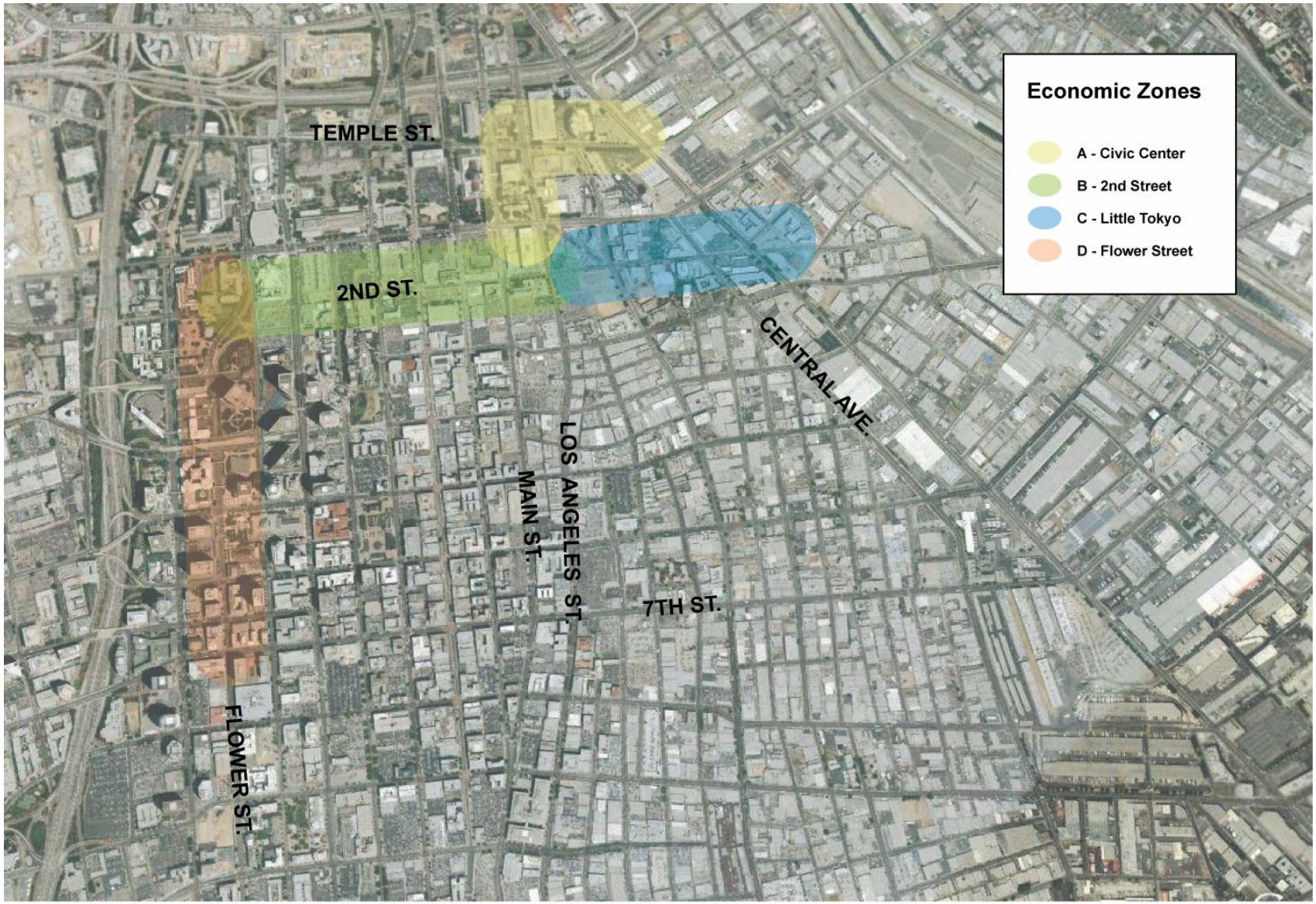
- The following are some of the potential PSA construction impacts:

  - Traffic disruption
  - Increased noise, vibration and dust
  - Modified vehicular and pedestrian traffic patterns
  - Modified parking areas
  - Utility disruptions
  - Reduction in business access/visibility of signs and businesses
  - General disinterest in area businesses due to construction

- At this time it is assumed that the project will be fully implemented by 2018. Depending on the phasing schedule the PSA will be affected by construction at different intervals throughout the ten year period.

- The overall PSA can be broken up into four distinct sections that will help in analyzing these differing scenarios and their impacts.

Figure 4-7 Economic Zone Map



A. Civic Center:

- Downtown Los Angeles is predominately occupied by government offices and government employees. The majority of these employment opportunities are concentrated within the Civic Center area. For the purposes of this analysis the Civic Center area is considered Temple St. between Main St. and Alameda St., and Los Angeles St. and Main St. between Temple St. and 2nd St. City Hall, City Hall East, the Caltrans Building, VA Hospital, Los Angeles Police Department Headquarters, Federal building, and Courthouse can be found with-in these boundaries.

B. 2nd St:

- The land uses in the area 2nd St. between Los Angeles and Flower Sts. is comprised of commercial space, including retail and office buildings, as well as minimal high-density residential. 2nd St. between Broadway and Figueroa Ave. goes through a tunnel that runs underneath Bunker Hill. The segment of 2nd St. through the tunnel two lanes in each direction.

C. Little Tokyo:

- 2nd St. between Los Angeles and Alameda Sts. runs through the heart of Little Tokyo. The street is lined with ethnic eateries, Japanese markets, and retail stores.

D. Flower St:

- Flower St. between 3rd St. and Wilshire Blvd. runs through the heart of downtown. The street is lined with hotels, street level retail space, and medium to high density multi-family residential units.

- The following sections will analyze the construction affects of the two build alternatives, and the specific businesses impacted. Options A and B of the At-Grade Emphasis LRT Alternative use the same alignment in majority of the PSA, therefore their analysis will be combined in regards to the Civic Center, 2nd St., and Little Tokyo economic zones. The differences between the two will be made clear in the discussion of the Flower St. economic zone.

At-Grade Emphasis LRT Alternative

A. Civic Center

In this segment of the PSA, Option A provides for at-grade track construction with a dual track configuration for the majority of the section, and single track configuration on Main St. and Los Angeles St. between 2nd and Temple Sts. The alternative also proposes two stations in the Civic Center area: 1) a southbound station on Los Angeles St. between Temple and 1st Sts., and 2) a northbound station on Main St.

For the most part the LRT track stays within the public right-of-way, thereby limiting land acquisition and the need for pedestrian walkway closures during construction. Depending on final design, technology, and construction techniques employed there will need to be phased street closure to complete the track construction. Traffic disruption will decrease access to the business in the area; however the government entities located within the

Civic Center do not depend on pedestrian or automobile traffic to generate revenue, decreasing the severity of the economic impacts in this area. Traffic disruption will make it difficult for employees to access their offices, but in the next phase of this study, mitigating measures will be identified to alleviate these impacts.

The proposed at-grade stations will require pedestrian walk-way closures, causing more severe construction impacts within the proximity of proposed station locations. The proposed station sites are on Main St. and Los Angeles St. between 1st and Temple Sts. There will also be pedestrian and roadway detours at the intersection of Temple St. and Alameda St. for the construction of the automobile underpass and pedestrian overpass. Again it is important to stress that the businesses in the area predominantly engage in government activity and do not rely on traffic to generate customers. Table 4-17 below gives a detailed breakdown of the businesses in the area that will be temporarily affected by the construction of the station sites.

Table 4-17 Businesses Potentially Affected During Period of LRT Track Construction

Civic Center	
Geffen Contemporary	The main parking area for the museum is located on Temple St. Construction would cause decreased use of the parking lot and loss of parking revenue. It would also lead to parking difficulties for Geffen Contemporary patrons, which in-turn could reduce patronage. The main entrance for the museum is located on 1st St., which reduces the noise, dust and vibration affects of the construction.
LA Mall Entrance	The LA Mall located on the Corner of Temple St. and Los Angeles St. would be affected by track construction. The entrance located on Main St. is within the proximity of the proposed northbound station in this area. The construction impacts will decrease access to the mall adversely affecting the businesses located in the Mall.
New Otani Hotel	The New Otani Hotel located on Los Angeles St. between 1st and 2nd Sts. would be affected by at-grade construction of the LRT track on Los Angeles St. and 2nd St. The Main Entrance to the hotel Lobby as well as the parking structure is located on Los Angeles St. making construction effects more severe. The decreased access to the hotel, noise and vibration, decreased visibility of signs, and a general disinterest in the area due to construction will have adverse affects on the hotel's business.
Starbucks	Starbucks Coffee located at the corner of 1st and Los Angeles Sts. would be affected by at-grade construction of the LRT track on Los Angeles St. The decreased access to the Starbucks, noise and vibration, decreased visibility of signs, and a general disinterest in the area due to construction could adversely affect Starbucks. However, the coffee shop can still be accessed from 1st St., alleviating the affects.
Azalea Restaurant	Azalea Restaurant located at the corner of 1st and Los Angeles Sts. would be affected by Construction. The decreased access to the restaurant, Noise and Vibration, decreased visibility of signs, and a general disinterest in the area due to construction will adversely affect the Azalea Restaurant.

B. 2nd St.

This segment of the alignment is a continuation of the at-grade track construction. The alternative does not currently call for stations on 2nd St.; however station locations have not been finalized. The station sites will be finalized in the next phase of the project and further analysis will be conducted.

Within the boundaries of the PSA, a portion of 2nd St. runs through a tunnel underneath Bunker Hill. The tunnel will likely be shut down during track construction, causing traffic disturbances on 2nd St. and the overall project area. Running the tracks through the tunnel saves businesses from being directly impacted by construction.

Construction will directly impact the businesses that are located on 2nd St. between Los Angeles and Hill Sts. The new LAPD headquarters and the south side of the Los Angeles Times office buildings are located along 2nd St. Construction impacts will be more of an issue in this area only because the retail businesses along 2nd St., including Pitfire Pizza, China Bistro, and the Kawada Hotel, depend on traffic for revenue generation. Table 4-18 provides a list of businesses in the area that will potentially be affected by the at-grade track and station construction.

C. Little Tokyo

The At-Grade Emphasis LRT Alternative bypasses the Little Tokyo district, protecting the cultural center from the construction impacts of at-grade track and station construction.

D. Flower Street

The At-Grade Emphasis LRT Alternative uses a combination of at-grade and underground double track configuration to reach the 7th St./Metro Center Station and connect to the existing Metro Blue Line. In the rest of the PSA the Option A and Option B routes are identical, but in the Flower St. segment they have slight differences.

Option A

The track stays underground from the 2nd St. tunnel to Flower St., making a brief appearance above ground before 3rd St. and then returning back underground after 3rd St. all the way to the 7th St./Metro Center Station. The alternative also calls for two underground stations, between Hope and Flower Sts. and on Flower St. between 5th and 6th Sts.

Option B

In this alternative the track stays at grade until it crosses 3rd St. before going back underground, and has an at-grade station between 3rd and 4th Sts.

Unlike the at-grade track construction the underground segment of the alternatives will cause much less severe economic impacts. During construction phased street closure will likely be implemented, however depending on the tunneling technique used and location of exhaust vents there will be less traffic disruptions. Construction affects that would disrupt business activities including noise, vibration, dust, decreased view of signage and overall disinterest in the area will be limited strictly to station sites, which would employ cut and cover construction. This type of construction will cause sidewalk and street closures in the station locations, creating more severe impacts for businesses located within close proximity. See Table 4-19 for a detailed breakdown of the affected businesses.

Table 4-18 Businesses Potentially Affected During Period of LRT Track Construction	
2nd Street	
Pitfire Pizza	Located at the corner of 2nd St. and Main St., Pitfire Pizza will be affected by construction of the track and possible at-grade station. According to the preliminary design and land acquisition studies a portion of the pedestrian walkway will be required to construct the station eliminating pedestrian access to the restaurant from 2nd St. for the duration of the track and station construction. The main entrance to the restaurant is located at the corner of 2nd St. and Main St. allowing access to the restaurant from 3rd St. alleviating some of the access issues. The at-grade station will require a more intensive construction effort than the track, causing increased noise, vibration, particulate matter, decreased view of the signage, and a general disinterest in the area due to construction.
China Bistro	Located at the corner of 2nd St. and Main St., China Bistro will be affected by construction of the track and at-grade station. According to the preliminary design and land acquisition studies a portion of the pedestrian walkway will be required to construct the station eliminating pedestrian access to the restaurant from 2nd St. for the duration of the track and station construction for this phase of the project. The at-grade station will require a more intensive construction effort than the track, causing increased noise, vibration, particulate matter, decreased view of the signage, and a general disinterest in the area due to construction.
Edison Bar	Located at the corner of 2nd ST. and Main St., Edison Bar will be affected by construction of the LRT track and at-grade station. According to the preliminary design and land acquisition studies a portion of the pedestrian walkway will be required to construct the station eliminating pedestrian access to the restaurant from 2nd St. for the duration of the track and station construction for this phase of the project. The main entrance to the bar is located in an alley between 2nd St. and 3rd St. elevating some of the access issues on 2nd St. The at-grade station will require a more intensive construction effort than the track, causing increased noise, vibration, particulate matter, decreased view of the signage, and a general disinterest in the area due to construction.
Ground Worx Coffee	Located on Main St. between 2nd St. and 3rd St., Ground Worx Coffee will be affected by construction of the LRT track and at-grade station on 2nd St. According to the preliminary design and land acquisition studies a portion of the pedestrian walkway on 2nd St. will be required to construct the station eliminating pedestrian access to the coffee shop from 2nd St. for the duration of the track and station construction for this phase of the project. Access to the coffee shop will be limited to 3rd St. The at-grade station will require a more intensive construction effort than the track, causing increased noise, vibration, particulate matter, decreased view of the signage, and a general disinterest in the area due to construction.
Cigars	Located at the corner of 2nd St. and Spring St., Cigars will be affected by construction of the LRT track and at-grade station. According to the preliminary design and land acquisition studies a portion of the pedestrian walkway will be required to construct the station eliminating pedestrian access to the restaurant from 2nd St. for the duration of the track and station construction for this phase of the project. The at-grade station will require a more intensive construction effort than the track, causing increased noise, vibration, particulate matter, decreased view of the signage, and a general disinterest in the area due to construction.
Kawada Hotel	Located at the corner of 2nd St. and Broadway the Kawada hotel will be affected by track construction on 2nd St. Decreased access, noise, vibration, and dust will decrease the overall attractiveness of the hotel, making increased vacancy rates a likelihood.

Table 4-18 Businesses Potentially Affected During Period of Track Construction	
Flower Street	
World Trade Center Parking	The World Trade Center parking lot located near the corner of 3rd St. and Flower St. will have decreased access due to construction and possible street closure. The parking lot does have alternate access on Figueroa St. alleviating some of the impact.
World Trade Center Monthly Parking Entrance	The World Trade Center parking lot located near the corner of 3rd and Flower Sts. will experience decreased access due to construction and possible street closure. The parking lot does have alternate access on Figueroa St. alleviating some of the impact.
Bank of America Plaza Parking	The Bank of America Plaza parking lot located near the corner of 3rd St. and Flower St. will experience decreased access due to construction and possible street closure. The parking lot does have alternate access from Bunker Hill alleviating some of the impact.
400 S. Flower Parking	The parking lot located at 400 S. Flower St. at the corner of 4th St. and Flower St. will experience decreased access due to construction and possible street closure.
City National Plaza Parking	The City National Plaza parking lot located near the corner of 4th St. and Flower St. will experience decreased access due to construction and possible street closure.
Westin Bonaventure	The entrance to the Westin Bonaventure is located on Flower St. at the corner of 4th St. and Flower St. The track construction would decrease access to the hotel from Flower St., and construction impacts could decrease overall appeal of the hotel entrance from Flower St. The Hotel does have an entrance from Figueroa St., alleviating the severity of this impact.
Miseki Restaurant	The entrance to Miseki Restaurant is located on Flower St. near the corner of 4th St. and Flower St. The track construction would decrease access to restaurant from Flower St., and construction impacts could decrease overall appeal of the restaurant. The restaurant does have access from the Westin Bonaventure Hotel alleviating the severity of this impact.
Suede	The entrance to Suede Restaurant is located on Flower St. near the corner of 4th St. and Flower St. The track construction would decrease access to the restaurant from Flower St., and construction impacts could decrease overall appeal of the restaurant. The restaurant does have access from the Westin Bonaventure Hotel alleviating the severity of this impact.
City National Plaza Parking	The City National Plaza parking lot located near the corner of 4th St. and Flower St. will experience decreased access due to construction and possible street closure.
Westin Parking Entrance	The Westin Hotel parking lot located at the corner of 5th St. and Flower St. will experience decreased access due to construction and possible street closure. The parking lot does have alternate access on Figueroa St. alleviating some of the impact.
Standard Hotel Parking Entrance	Standard Hotel parking lot located near the corner of 6th St. and Flower St. will experience decreased access due to construction and possible street closure.
Standard Hotel Entrance	The Standard Hotel Entrance located on Flower St. will be affected by the construction impacts; however the main entrance to the hotel is on 6th St.
Floyd's Barbershop	Floyd's Barbershop located on the ground floor of the Standard Hotel has an entrance on Flower St., which will be affected by construction; however the barber shop can also be accessed from the hotel.
Pegasus	The Pegasus Apartments will be affected by street closures and construction in the area. Traffic disruptions and construction impacts would cause difficulties for the tenants of this building and could impact leasing activities.
Daily Grill	The entrance to the Daily Grill is located at the corner of Flower St. and 7th St. Street closure in this area would make accessing the restaurant difficult from Flower St.; however patrons will be able to access the restaurant from 7th St.
Roosevelt Lofts	Access to the Roosevelt Lofts will be difficult due to street closure on Flower St. but the development can be accessed from Hope St. Depending on the construction technique used to construct the tunnel for the underground segment of the track in this area the tenants of the Roosevelt could be impacted by increased noise, vibration, and dust. This could impact vacancy rates in the high-density residential development.
City National Plaza Valet Entrance	Access to the City National Plaza valet entrance will be limited during construction due to possible street closure.
City National Plaza	The proposed underground station location for this alternative will be located at the City National Bank branch on the ground floor of the City National Plaza building.

Table 4-18 Businesses Potentially Affected During Period of Track Construction	
Flower Street	
800 W. 6th Parking	Access to the 800 W. 6th St. parking lot will be limited during construction due to possible street closure.
Cathay Bank	Access to the Bank will be limited during construction due to possible street closure.
Vieta Café	Access to the cafe will be limited during construction due to possible street closure.
Maria's Italian Kitchen	Access to the restaurant will be limited during construction due to possible street closure.
ABC Printing	Access to ABC printing will be limited during construction due to possible street closure.
Mail Box Etc.	Access to Mail Box Etc. will be limited during construction due to possible street closure.
PCS Select	Access to PCS Select will be limited during construction due to possible street closure.
Big Mamma's Pizza	Access to Big Mamma's Pizza will be limited during construction due to possible street closure.
Coffee Bean	Access to the Coffee Bean will be limited during construction due to possible street closure.
Wockano	Access to the Wockano restaurant will be limited during construction due to possible street closure.
800 Wilshire Parking	Access to the parking lot will be limited during construction due to possible street closure.
Pacific Res. Credit Union	Access to the credit union will be limited during construction due to possible street closure.

Underground Emphasis LRT Alternative

The construction of the Underground Emphasis LRT Alternative will cause minimal adverse economic impacts in the PSA. Depending on the tunneling and construction techniques used to construct the tunnel, there may be a need for phased street closure, however the effects will not be as severe as at-grade track construction. Boring of the tunnel might also cause noise and vibration, but it will not be severe enough to impact business and inhabitants in the area.

The economic impacts caused by the Underground Emphasis LRT Alternative will be limited to the station sites. For this section of the report it is assumed that a cut-and-cover technique will be used to construct the stations. This technique will generate temporary inconveniences such as increased noise, vibration, dust and particulate matter, decreased view of signage, limited or no access to business within close proximity of the station area construction and a general disinterest in the area when constructing the stations. Like the At-Grade Emphasis LRT Alternative, the Underground Emphasis LRT Alternative calls for the construction of a pedestrian overpass and automobile underpass, but the location would be at 1st and Alameda Sts. Construction of the overpass and underpass would necessitate additional pedestrian and roadway detours nearby. Although severe, these affects will be limited in duration and limited to the station sites, decreasing the overall effects of construction of this alternative.

If street closure is necessary to complete tunnel construction, all of the businesses mentioned in the previous section, except those located within the Civic Center area will be negatively affected by decreased access. Table 4-19 below gives a detailed breakdown of the businesses within close proximity of the station sites.

Table 4-19 Businesses within Close Proximity to Proposed Station Sites

	2nd Street
New Otani Hotel	The New Otani Hotel would be affected by station construction at the corner of 2nd St. and Los Angeles St. Although the hotel is not in the direct station construction area, the main entrance to the hotel lobby as well as the parking structure is located on Los Angeles St. and the noise, dust, and vibration, in the area due to construction could potentially impact the hotel's business.
Starbucks	The Starbucks would be affected by station construction at the corner of 2nd St. and Los Angeles St. Although the coffee shop is not in the direct station construction area, the entrance of the Starbucks is located on Los Angeles St. and the noise, dust, and vibration, in the area due to construction will impact business.
Azalea Restaurant	The Azalea Restaurant would be affected by station construction at the corner of 2nd St. and Los Angeles St. Although the restaurant is not in the direct station construction area, the entrance is located on Los Angeles St. and the noise, dust, and vibration, in the area due to construction will impact business.
	Flower Street
Westin Bonaventure	The entrance to the Westin Bonaventure is located on Flower St. at the corner of 4th St. and Flower St. Station construction would decrease access to the hotel from Flower St., and construction impacts could decrease overall appeal of the hotel entrance from Flower St. The hotel does have an entrance from Figueroa St., alleviating the severity of this impact.
Miseki Restaurant	The entrance to Miseki Restaurant is located on Flower St. near the corner of 4th St. and Flower St. Station construction would decrease access to restaurant from Flower St., and construction impacts could decrease overall appeal of the restaurant. The restaurant does have access from the Westin Bonaventure Hotel alleviating the severity of this impact.
Suede	The entrance to Suede restaurant is located on Flower St. near the corner of 4th St. and Flower St. Station construction would decrease access to the restaurant from Flower St., and construction impacts could decrease overall appeal of the restaurant. The restaurant does have access from the Westin Bonaventure Hotel alleviating the severity of this impact.
Citi Parking Entrance	The entrance to the Citi parking lot located near the corner of 5th St. and Flower St. will have decreased access due to construction and possible street closure.
Starbucks	Starbucks located on the ground floor of the Citi Bank Center will be affected by both the track construction on Flower St. as well as the proposed underground station between 4th St. and 5th St. Starbucks is located within the station construction area, and will be affected by the noise, vibration, and dust.
Citibank	The Citibank branch located on the ground floor of the Citi Bank Center will be affected by both the track construction on Flower St. as well as the proposed underground station between 4th St. and 5th St. Citibank bank branch is located with-in the station construction area, and will be affected by the noise, vibration, and dust.
Uptown Drug Store	Uptown Drug Store located on the ground floor of the Citi Bank Center will be affected by the proposed underground station between 4th St. and 5th St. Up Town Drug Store is located with-in the station construction area, and will be affected by the noise, vibration, and dust.
California Computer Center	The California Computer Center located on the ground floor of the Citi Bank Center will be affected by the track construction on Flower St. as well as the proposed underground station between 4th St. and 5th St. Although the Computer Center is not located with-in the station construction area, it is in close proximity and might be affected by the noise, vibration, and dust.

4.14.3.3 Construction-Related Employment

Investment in transportation, including direct investment in the form of capital construction costs and operations cost, provides economic benefits in several basic ways: the creation of jobs, and investment or spending by suppliers whose goods and services are used in the project.

To quantify these affects the American Public Transportation Association commissioned the *Public Transportation and The Nation's Economy* report in the year 2000. Using the multipliers identified in this report and the construction cost estimates for the proposed alternatives the affects of the project on the regional economy were estimated. Table 4-20 summarizes the results of this analysis.

Table 4-20 Economic Affects of the Regional Connector on the Regional Economy

Economic Affects	At-Grade (Option A)	At-Grade (Option B)	Underground
Capital Cost/Job Creation	22,190 jobs	20,086 jobs	20,194 jobs
Operations Cost/Job Creation	969 jobs	969 jobs	114 jobs
Capital Cost/Sales	$2,120.04	$1,919.04	$1,929.35
Operations Cost/Sales	$54.40	$54.40	$6.40

The At-Grade Emphasis LRT Alternative Option A creates the greatest number of new jobs and generates the largest amount of sales due to construction within the PSA, approximately 10.4 percent more than Option B and 9.8 percent more than the Underground Emphasis LRT Alternative. When looking at the job creation and increase in sales due to operations costs, the impact of the At-Grade Emphasis Alternative is 7.5 times larger than that of the Underground Emphasis LRT Alternative. The true impact of these alternatives can be seen by combining the affects of both the Capital Cost and Operations Cost. The at-grade Option A creates 23,159 jobs and 2.17 billion dollars in sales, approximately ten percent more than Option B, and 14 percent more than the Underground Emphasis LRT Alternative.

4.14.3.4 Construction Spending on the Regional Economy

Direct investment in capital construction cost also leads to investment from business in the area looking to take advantage of the increase in employment activity, and purchase of supplies and equipment. This investment is considered indirect investment. Both direct investment and indirect investment streams provide businesses revenue and personal income, and income spent throughout the economy supports other jobs and related spending referred to as induced impacts. The table found in this section displays the affects of the Regional Connector on these forms of indirect investment.

Using the SCAG regional multiplier for transportation construction and capital construction cost for the project, the indirect economic impacts of the project were identified. The results of this analysis are summarized in Table 4-21.

Table 4-21 Indirect Effects of Regional Connector Direct Investment			
Alternatives	At-Grade (Option A)	At-Grade (Option B)	Underground
Indirect Investment	$213.42	$193.19	$194.23
Indirect Jobs	1193.78	1080.60	1086.40
Income from Indirect Investment	$95.18	$86.16	$86.62
Induced Investment	$307.09	$277.97	$279.47
Induced Jobs	2513.22	2274.94	2287.17
Induced Income	$182.32	$165.04	$165.92

As previously described, the direct investment made in Option A generates the largest indirect and induced investment and income in the PSA. The total impact of Option A is 520.1 million in investment and 277.5 million in income, 10.4 percent greater than Option B and 9.9 percent greater than the Underground Emphasis LRT Alternative.

4.15 Safety and Security

The purpose of this section is to characterize existing and future safety and security issues for passengers, pedestrians, motorists, and the surrounding community. This section will identify any potentially significant safety and security impacts that could occur due to transit improvements related to the project. Of concern is the potential for pedestrian and vehicular conflicts. Another aspect of this study is security, particularly whether the proposed alignment alternatives and related transit center, would compromise the security of transit patrons or surrounding communities making them more susceptible to criminal activity.

4.15.1 Affected Environment

In this study, two potential routes – the At-Grade Emphasis LRT Alternative and the Underground Emphasis LRT Alternative - are analyzed for safety and security impacts. The PSA encompasses approximately two square miles of downtown Los Angeles and includes the communities of Little Tokyo, the Arts District, the Historic Core, the Toy District, Bunker Hill, the Financial District, the Jewelry District, and Civic Center. It extends from the Metro Blue Line terminus at 7th St. and Wilshire Blvd. in downtown Los Angeles to the vicinity of the Metro Gold Line Eastside Extension station at 1st and Alameda Sts.

The At-Grade Emphasis LRT Alternative assumes street running operations, which allows the operators of light rail vehicles to operate under existing traffic signals. Typically, crossing gates and railroad warning bells and lights are not warranted for street-running operations due to the low operating speeds of light rail vehicles and vehicular traffic. This aspect of the project has not been determined. The current concept is to extend dual track service from the Metro Gold Line at Temple St. using a "Y" track configuration across Alameda St. Auto traffic would be routed into a new underpass underneath the tracks, and pedestrians would use a new overpass to traverse the intersection. The tracks would extend to the west across Alameda St. and run along the south side of Temple St. As trains continue west on Temple St. in a dual track configuration, the trackway will return to the center of Temple St. As the trackway arrives at Los Angeles St., the alignment splits into two single track alignments. One trackway would continue west to Main St. while the

other trackway continues south on Los Angeles St. The alignments would run on the eastern side of both streets and a split station would be planned for each alignment just north of 1st St. The alignment then would continue south across 1st St. At 2nd St., the alignment on Los Angeles St. heads west where it then reconnects with the alignment on Main St. Both alignments would return to a dual track configuration and be located on the northern side of 2nd St. heading west until Spring St. At Spring St., the train would move to the southern side of 2nd St. as it continues west.

As the alignment continues west past Hill St., the tracks would run along the southern side of 2nd St. and enter into the existing 2nd St. tunnel. This alignment would then reduce the 2nd St. tunnel from four travel lanes to about two travel lanes. About half-way through the 2nd St. tunnel, the alignments then would veer to the south punching through the tunnel wall. This would place the alignment in close proximity to Grand Ave. and a potential second station would be located in this vicinity.

Using the natural grade of the hillside, the alignment would then resurface just north of 3rd St. It would cross 3rd St. at grade and continue south on Flower St. A third station is contemplated either at grade or underground south of 3rd St. to just south of 5th St. Station opportunities at 3rd St. are at grade (Option B) while stations just south of 5th St. (Option A) will need to be underground. The alignment then directly connects to the 7th St./Metro Center Station under Flower St. The Option A configuration will be 46 percent underground and 54 percent at grade. The Option B configuration will be 38 percent underground and 62 percent at grade.

The Underground Emphasis LRT Alternative would run entirely underground under Flower St. and 2nd St. until just beyond Central Ave., emerging to the surface before crossing Alameda St. and 1st St. at grade and connecting to the existing station. Auto traffic would use a new underpass below the tracks at 1st St. and Alameda St. and pedestrians would cross the intersection using a new overpass. The Underground Emphasis LRT Alternative would be 94 percent underground and six percent at grade with three underground stations.

4.15.1.1 Existing Conditions

The PSA is located in Los Angeles' dense central business district. As such, it routinely experiences high volumes of pedestrian, automobile, and track traffic. Traffic volumes in downtown Los Angeles vary considerably from block to block, and tend to be highest on streets that provide direct access to one of the nearby freeways. The busiest streets in the area include 3rd, Spring, Alameda, and Figueroa Sts. Single direction traffic volumes along some blocks are in excess of 30,000 cars per day and 3,000 during the peak hour, as is the case on much of Figueroa St. One-way configuration on some streets provides some additional capacity and signal timing efficiency, but not enough to eliminate congestion during peak hours. Truck traffic frequently uses the streets in the eastern portion of the PSA to access the industrial and warehouse districts in that area. The trucks often have difficulty navigating the narrow streets in the area, especially when turning movements are necessary, thus creating additional traffic hazards.

Emergency vehicles frequently traverse the PSA, creating a need for streets to be clear and accessible for emergency vehicle movements. Emergency vehicle trips typically originate from one of the fire or police stations in the area. The PSA contains one fire station, at 1st and Figueroa Sts., and there is another near the PSA just southwest of 7th and San Pedro Sts. There are also two police stations in the PSA: one near 6th and Los Angeles Sts., and the central police headquarters at Parker Center, just north of 1st St. between Main and Los Angeles Sts. It should be noted that the Parker Center facility will be demolished and the police headquarters relocated to 1st and Main Sts. once the new building is completed. Given the density of activities and floor space in the PSA, and the concentration of emergency facilties in the Civic Center and industrial district, Regional Connector stations and right-of-way will be designed to maintain emergency vehicle response times and not impede access to stations or the surrounding streets.

4.15.2 Evaluation Methodology

Safety relates to 1) protection of people from accidental occurrences that could injure or harm them and 2) protection of property from such accidents. For this study it includes safety of motorists and pedestrians in locations where they would cross the light rail vehicles rights-of-way, enter the stations, or encounter other transit facilities.

Security relates to 1) protection of people from intentional acts that could injure or harm them and 2) protection of property from such deliberate acts. Topics discussed include crime prevention, law enforcement, and protection against terrorism.

Pedestrian and motorist safety along the alternatives are evaluated on a qualitative level based on the experience of similar LRT systems with similar alignment types such as the Metro Blue Line, Portland MAX Line, and Hudson-Bergen Weehawken Line. For the purpose of this study it is considered that a significant safety or security impact would occur if:

- Operation of the project would result in motor vehicle accident rates that would be greater than current motor vehicle accident rates;
- Operation of the project would introduce a new hazard without adequate safety measures designed into the project to prevent accidents;
- Operation of the project would introduce a hazardous situation that would encourage people to take unsafe actions, such as providing a circuitous route for pedestrians, thereby encouraging them to jaywalk, or violate traffic signals and controls;
- The project would create a condition that facilitates criminal activity; or
- The project would create an opportunity for terrorism with a moderate to high likelihood that such an act would be perpetrated.

4.15.3 Environmental Issues

4.15.3.1 Pedestrian Safety

The introduction of a new LRT alignment will have various safety impacts. Pedestrian traffic is at a relatively high level in the PSA. For the most part, pedestrian density is most concentrated in the vicinity of the commercial and governmental facilities in the downtown segment.

At-Grade Emphasis LRT Alternative

For the at grade alignment the following potential significant safety hazards are present:

- Passenger safety at station locations: The at-grade location of stations may introduce a new safety hazard for pedestrians if the stations do not adequately account for pedestrian traffic and movement. This hazard would be present irrespective of the frequency of occurrence. The occurrence of this hazard may be attributed to the inherent purpose of a station, where large numbers of people congregate at stations and cross the trackway to access or depart from the transit stations; thus, creating a potential hazard of collision between pedestrians and light rail vehicles (LRVs). Anticipated passengers loads and pedestrian counts will be used to determine the most appropriate pedestrian treatments to control and channel pedestrian/passenger movements. Additionally, stations will be appropriately sized to accommodate the anticipated number of passengers.

- Pedestrian safety near the trackway: The addition of the light rail vehicles themselves would be the primary new safety hazard for pedestrian traffic. The speed of the vehicles would be similar to or slower than the adjacent automobile traffic. The LRV would be electrically powered and, therefore, would be quieter than most of the automobile traffic and may not be easily heard. This hazard includes crossings at intersections where pedestrians cross over the light rail tracks, and intrusion on the ROW (trespassing). Channelization techniques would be used to direct pedestrians to designated pedestrians crossings and to minimize trespass. Pedestrian conflicts with trains would be minimized at the intersection of Temple St. and Alameda St. due to the construction of a new pedestrian overpass. LRVs are equipped with audible warning bells and horns, which will be used, as appropriate, to alert pedestrians of the approach of a train.

- Pedestrian safety at designated grade crossings: Pedestrian safety at designated grade crossings is a key factor to be considered in the design of LRT alignments. A number of designated pedestrian grade crossings would result from the Regional Connector. A vast majority, if not all, of these pedestrian crossings would be located at motorist crossings of the tracks. A potential safety hazard would exist if pedestrians attempt to cross the tracks at locations other than designated pedestrian crossings because of the distance between designated grade crossings. In addition, potential riders who see a train approaching may cross streets and the tracks illegally in order to avoid missing the train in much the same way as these violations occur at existing bus stops and LRT stations. Also, departing passengers may be tempted to take shortcuts from station areas to access nearby destinations

instead of crossing at the designated crossings. Pedestrian traffic control and channelization techniques would be used to control pedestrian movements at intersections and encourage the use of pedestrian crossings.

Underground Emphasis LRT Alternative

There is no significant pedestrian safety issue for the Underground Emphasis LRT Alternative. This alignment would be 94 percent underground with all underground stations and only six percent of the alignment at grade. The only at-grade crossing, at 1st St. and Alameda St., will have a pedestrian overpass that eliminates pedestrian-train conflicts. However, station designs that do not adequately account for passenger loads may cause overcrowding. Awaiting passengers may be injured by an approaching train if they do not heed warnings to stand clear of the platform edge as the train enters the station.

4.15.3.2 Motorist Safety

At-Grade Emphasis LRT Alternative

In the downtown area, the LRV would operate within the existing streets at street level. The at-grade right-of-way will be semi-exclusive as auto traffic will be generally prohibited from entering the LRT right-of-way; in general, the rail traffic would be separated from automobile traffic by curbs or other raised delineators. The only place that automobile traffic would be permitted in the right-of-way would be at street crossings. The LRV would be required to observe all traffic laws just as a car or bus would, including stopping for red lights. The LRV would also be required to yield to emergency vehicles at intersections.

Because the LRV would share the same right-of-way with automobiles and because it would be possible for automobiles to stray into the semi-exclusive rail right-of-way in other locations (by going over the curb), accidents between the LRV and motor vehicles would be possible. However, studies have shown that light rail vehicle accidents with motor vehicles at non-intersection locations are extremely rare.

At intersections, the single most frequent cause for motor vehicle/light rail accidents is when motorists turn left in front of a light rail vehicle (with the light rail vehicle traveling in the same direction). In order to reduce this risk it is assumed that a left turn from the 2nd St. or from the side streets to 2nd St. would not be permitted when LRVs are approaching the intersection from either direction.

Other accidents between LRVs and motorists stem from motorists disobeying red light signals. The LRV operators would have audible warning devices available to alert unwary drivers to the risk of accidents. Additionally, active "Train Approaching" signs may be used to further alert drivers of the approach of a train. Although all such accidents may not be totally prevented, studies have found active "Train Approaching" signs to greatly reduce the likelihood of a collision. Traffic signal phasing (all-red phase and lagging left turns) has also proven to be effective in reducing LRV and motor vehicle collisions. Train and automobile traffic would be grade separated at the intersection of Temple and Alameda Sts., thus providing increased safety. Furthermore the low operating speeds of the LRV and motor vehicles reduces the possibility of serious injury or damage.

Underground Emphasis LRT Alternative

There would be fewer adverse motorist safety issues for the Underground Emphasis LRT Alternative, and they would be concentrated around one intersection: 1st and Alameda Sts. This is the only grade crossing on the alignment, which would have all of its stations and 94 percent of its tracks underground. In order to reduce conflicts between train movement, automobile traffic, and pedestrian crossings at 1st and Alameda, a new overhead pedestrian bridge would be constructed and automobile traffic on Alameda St. would be routed into a new underpass.

4.15.3.3 Security

This evaluation was conducted by using available crime statistics for the City of Los Angeles and reviewing other transit systems in the United States that are similar to these alternatives.

A Threat and Vulnerability Analysis (TVA), recommended by the Federal Transit Administration, will be conducted for whichever alternative is selected. This process will give a more refined and detailed study/analysis of the security environment; identifying domestic and international security threats, potential vulnerabilities/shortcomings in the transit system, and then making recommendations to reduce these vulnerabilities to acceptable levels.

The process for determining vulnerabilities begins with the identification and grouping of transit agency assets based on the criticality to transit operations, their attractiveness as targets for security breaches or terrorist attack, and their vulnerability to the impacts of a successful breach or act of terrorism. Critical assets are defined as the specific assets most critical to the Authority's ability to provide transit services and to protect people. Threat types are then identified using existing crime statistics for the area as well as threat information received from local state and federal law enforcement sources. Each critical asset is then assessed for its vulnerability of each potential threat, coupled with the frequency probability of each threat actually occurring. Severity of consequences for each threat is then given a rating from catastrophic to negligible. This information is then put into a criticality matrix which organizes the resulting consequences into categories of high, serious, and low. The matrix helps to prioritize consequences and to focus available resources on the most serious threats requiring resolution while effectively managing the available resources.

The affected environment is the security on the rail system, both at the stations and in the light rail vehicles. Passengers, transit employees, vendors, contractors and the general public who come in contact with the system, as well as the transit property and equipment would be susceptible to the same crimes as experienced in the surrounding neighborhood, by both build alternatives.

The Underground Emphasis LRT Alternative; however, does present a different set of conditions than the At-Grade Emphasis LRT Alternative.

- Activity in the underground station and tunnel would be out of the general public view, and less observable by routine neighborhood security/police patrols in the general area, as compared to being at grade level.
- Tunnels offer non-domiciled persons refuge from the elements.
- Staircases and passageways may create opportunities for criminal activity.
- Tunnels offer a greater consequence to train service should trespassers enter; clearance and concealment issues may arise.

Employing CCTVs, intrusion detection systems and/or dedicated security patrols mitigate these potential vulnerabilities. Additionally, the presence of transit workers in underground stations further dissuades persons from committing offenses. Several underground systems in the United States have successfully employed security technology and patrol methods to mitigate crime conditions in below-grade systems, resulting in fewer offenses committed in the transit system than in the adjacent neighborhoods they traverse.

The Underground Emphasis LRT Alternative offers a few unique security advantages not present with grade level systems:

- One distinct advantage is service operations during civil unrest, demonstrations and other public events that may occur, and historically have occurred, in the specific area for this project. Major public events, whether they are legal or unauthorized, will have a much greater impact on grade level light rail operations than on the alternative below grade. Protesters, demonstrators and other unauthorized gatherings occur on street level, and can easily impede service, many times intentionally, for the added media exposure to their cause. This condition is highly improbable for below grade service, as experienced in many cities with tunnel operations. Additionally, civil unrest or legal demonstrations and parades pose little risk of damage to underground systems and equipment as compared to the light rail equipment and station facilities at grade level.

Another distinct security advantage the Underground Emphasis LRT Alternative has that the At-Grade Emphasis LRT Alternative does not is the ability of closing and maintaining control of the system. All activity is easily controlled when there are limited access points to a system.

4.16 Construction Impacts

This section describes the expected construction methods and existing construction conditions. The conditions described in this section would only occur during construction and would be temporary and short-term.

4.16.1 Affected Environment

4.16.1.1 Construction Methods

The construction of the proposed project would employ conventional construction techniques and equipment typically used in the Southern California region for LRT projects. Major project elements include construction of guideway and trackwork, underground stations and tunnels, at-grade station platforms, installation of specialty system work, such as traction power, communications, and signaling and an underground guideway. The equipment that would be used during construction would include rail-mounted equipment, graders, dozers, cranes, cement-mixers, flat-bed trucks, and dump trucks to haul dirt and spoil materials, and tunnel boring machines.

The construction of the proposed project would be accomplished in approximately three to four years. The various work activities to be performed over the estimated construction period would include the following facility and system items:

- Demolition of roadways along alignment
- Demolition of existing buildings (if necessary)
- Construction of retaining walls for approaches to portal structures and shallow trenches
- Construction of tunnels, 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 at-grade station platforms using typical construction methods
- Construction of underground duct banks for electrical power feeds and for signaling/communications systems
- Construction of surface drainage systems and sub-drainage
- Construction of traction power substations with electrical power feeds
- Construction of overhead catenary pole foundations or alternative power distribution support systems and street lighting
- Installation of traffic signals and train control improvements
- Installation of overhead catenary wires, support brackets, feeder cables, and other components or alternative power distribution systems

- Installation of trackwork, including preparation of track bed and slab, rail, fasteners, and infill concrete in street level area, and with direct fixation fasteners on the aerial guideways
- Construction of station finishes, such as canopies, fare vending equipment, station furniture, ramps, landscaping, public art, and all other amenities necessary for a functional station
- Conduction of subsystem and system testing
- Conduction of simulated operation test runs and final commissioning of the system
- Removal of all equipment, landscaping and structures along the alignment
- Relocation any structures or landscaping from the right-of-way as required by Metro

4.16.1.2 General Construction Scenario

Surface streets in the downtown Los Angeles area would be impacted for a period ranging from 12 to 36 months. Construction would begin simultaneously at several locations along the alignment to accommodate activities requiring lengthy constructions times, such as the tunnels and underground stations, and to complete the various segments simultaneously.

Many contractors specializing in various methods of construction would be working on the proposed project for the overall length of the construction period. The physical construction would involve the application of the most suitable method for each segment of the proposed project. A representative sequence of construction is shown in Table 4-22. Many of the project elements would be constructed simultaneously for an overall duration of three years.

Table 4-22 Typical Sequence of Construction Activities		
Activity	Tasks	Average Time Required (months)*
Site Survey	Locate utilities, establish ROW and project control points and centerlines, and relocate survey monuments	4 to 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 to 18
Heavy Construction	Construction of tunnels, street guideways including trackbed, subway stations and portals, trenches, piles, and disposal of excess material. Refinish roadways and sidewalks.	24 to 30
Medium Construction	Lay track, construct surface stations, drainage, backfill and pave streets.	12 to 24
Light Construction	Finish work, install all systems elements (electrical, signals, and communication), street lighting where applicable, landscaping, signing and striping, close detours, clean-up and test system.	4 to 6
Pre-Revenue Service	Testing of communications, signaling, and ventilation systems, training of operators and maintenance personnel	3 to 6
* Some of these activities would be completed simultaneously. SOURCE: TAHA, 2007		

4.16.1.3 Regulatory Framework

Construction of the project would follow all applicable local, state and federal laws for building and safety. The Metro Fire Life Safety Committee, composed of members from the City and County of Los Angeles Fire Departments and Metro specialists, would approve all construction methods. 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. For several months before passenger service begins, pre-revenue operations would be conducted to familiarize train operators with the new alignments and emergency operating procedures.

4.16.1.4 Existing Conditions

The proposed project would be constructed in several segments and would involve concurrent construction at each end. Each segment of the proposed project has its own set of construction constraints. The following subsections address the existing setting and some of the existing construction constraints.

7th St./Metro Center Station Area (Southern Terminus)

The southern terminus of the proposed project would be located at the existing 7th St./Metro Center Station that is currently served by the Metro Blue, Red, and Purple Lines, and, by project build-out, would also be serviced by the Metro Exposition Line. The proposed project would be built on the first underground level, where the Metro Blue Line currently operates. The proposed project would be an extension of the tracks currently in use by the Metro Blue Line and the tracks under construction for the Metro Exposition Line. For the proposed project, the tracks would utilize the same Metro Blue Line alignment underneath Flower St. The Metro Red and Metro Purple Lines operate on a level below and perpendicular to the Metro Blue Line alignment.

Flower St. to 3rd St.

Flower St. is a three- to four-lane, 80- to 100-foot-wide roadway running north-south in downtown Los Angeles. From 7th to 3rd Sts., Flower St. is one-way in the southern direction with a Bus-Only lane in the opposite direction from 4th St. to 3rd St. Flower St. is a fully urbanized street with little to no building setbacks. Fourth St. is grade separated from Flower St. There are mainly commercial sites along Flower St., including the Bonaventure Hotel, the Central Library, Wells Fargo Plaza, and National Bank Plaza.

3rd St. to 2nd St. Tunnel

From Flower St., the proposed project would transition underground by connecting to the existing 2nd St. tunnel. The area around 3rd and 2nd Sts. from Flower St. to Hill St. (where the 2nd St. tunnel daylights) is comprised mainly of residential towers, with cultural venues, such as the Disney Hall and the Music Center, in the vicinity. The 2nd St. tunnel is bi-directional, connecting Hill and Figueroa Sts.

2nd St. to Little Tokyo/Arts District Station

2nd St. from Hill to Alameda Sts. is a two-way street with one traveling lane in each direction, approximately 60 to 65 feet wide. Parking is permitted on one or both sides of 2nd St., depending on the neighborhood. There are several commercial, residential, and civic properties along 2nd St. The Los Angeles Police Department (LAPD) headquarters currently under construction and the California Department of Transportation (Caltrans) building are located adjacent to 2nd St. 2nd St. is the main street crossing Little Tokyo village, which is a cluster of restaurants and retail shops that is a visitor destination. From Central Ave. to Alameda St., 2nd St. is characterized by a commercial center and parking lots.

Main St. and Los Angeles St. to Temple St.

Main St. from 2nd to Temple Sts. is characterized mainly by civic buildings, including the LAPD headquarters currently under construction, the Caltrans building, City Hall and City Hall East, court buildings, and the Los Angeles Mall. Main St. is a one-way street in the northern direction, approximately 80 feet wide. Los Angeles St. is characterized by commercial properties. Los Angeles St. is a two-way street with two to three lanes in each direction, approximately 80 feet wide. Parking is allowed on either side of the street.

Temple St. to Little Tokyo/Arts District Station

Temple St. from Main to Alameda Sts. is a two-way street with two traveling lanes in each direction, approximately 80 feet wide. Temple St. terminates at Alameda St. Temple St. is characterized by parking lots, large skyscrapers on the northern side, civic buildings and museums (Japanese American National Museum, The Geffen Contemporary at the Museum of Contemporary Art [MOCA]).

4.16.2 Evaluation Methodology

The construction of the proposed project would employ conventional construction methods, techniques, and equipment and would conform to accepted industry specifications and standards. Major elements of the proposed project include the construction of guideways and trackwork, underground stations and tunnels, at-grade

station platforms, and below-grade separations. The analyses in this section evaluates how construction of the proposed project would affect traffic, parking, equity and environmental justice considerations, land use/neighborhoods, land acquisition/ displacement and relocation, visual quality, air quality, noise and vibration, geology, soils, and seismicity, water resources, biological resources, energy resources, safety and security, community facilities, hazards, and cultural resources.

4.16.3 Environmental Issues

Although the construction impacts for all environmental topics that are discussed in specific sections of the EIR/EIS will be discussed in this section, the following are the primary environmental issues as they relate to the proposed project alternatives.

At-Grade Emphasis LRT and Underground Emphasis LRT

- Construction Staging: The location of storage of construction materials and equipment, and spoils staging associated with the construction of the proposed project, at grade or underground, can in itself be a significant impact when space is limited. Downtown Los Angeles is a fully urbanized, mostly built out area that offers very few locations for construction staging and debris relocation for any significant period of time. Impacts associated with construction staging include impacts to traffic and existing transit circulation either by the location of the staging areas or by trucks and equipment accessing these areas, proximity to sensitive receptors, both in the daytime and nighttime, amount of storage materials and/or equipment, and length of use of staging area.

- Air Quality: Construction air quality impacts tend to be short-term and are associated mainly with fugitive dust. The portal and construction staging areas could concentrate particulate matter during the construction period and have potential impacts.

- Transportation and Traffic: Traffic and transportation impacts could be short-term (haul routes, traffic detours, street closures) or permanent (parking displacement, transit re-routing). Construction vehicles could temporarily impede traffic mobility in areas of construction. Traffic detours and truck routes would be required during construction.

- Emergency Response Times/Fire and Police Services. Potential impacts to response times or access pathways for emergency vehicles could result from street closures, detours, or from the presence of construction trucks and other equipment in the downtown area.

Underground Emphasis LRT Alternative

- Vibration: The use of boring equipment or other equipment to shore-up the tunnel and associated structures could produce vibration impacts not associated with at-grade construction.

- Soil Stability and Subsidence: Tunneling technology has come a long way and new innovations are making this type of work safer. However, the proposed project would be tunneling under a heavily urbanized area with many historic and iconic buildings in downtown Los Angeles that tend to have basements outside the parcel boundary.

- Safety and Emergency Response. Although tunneling has improved over the years, the issue of safety and the ability for emergency services to respond in a timely manner remains a significant issue.

- Historic Resources. Construction could impact historic or iconic structures in downtown Los Angeles, such as the Central Library, the Bonaventure Hotel, and National Bank Plaza. Additionally, there is a possibility of encountering archaeological and paleontological resources, as well as human remains.

4.17 Growth-Inducing Impacts

The following sections describe current conditions and possible growth inducing impacts that the Regional Connector may have, not only to the PSA, but the region as a whole.

4.17.1 Affected Environment

4.17.1.1 Regulatory Framework

Guidance for the preparation of growth-inducing impacts comes from both federal and State regulations. The regulations established by the Council on Environmental Quality (CEQ), regarding the implementation of the National Environmental Policy Act (NEPA), require the evaluation of all potential environmental consequences of all proposed federal activities and programs. This provision includes a requirement to examine the indirect consequences, or secondary impacts, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future (40 CFR 1508.8). Secondary impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project's potential to induce growth. CEQA Guidelines Section 15126.2(d) require that environmental documents "discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." Growth-inducing impacts also include removing obstacles to growth and may potentially include changes in the amount and distribution of growth.

Regional Growth Management Plans: The primary regional growth management plans are developed by the Southern California Association of Governments (SCAG), including the 2008 SCAG Regional Comprehensive Plan and Guide (RCPG). The RCPG describes an action plan for the implementation of short-term strategies and strategic, long-term initiatives and guiding principles for sustaining a livable region. The RCPG focuses on specific areas of planning or resource management, including land use and housing, open space and habitat, water, energy, air quality, solid waste, transportation, security and

emergency preparedness, and the economy. The Growth Management chapter of the RCPG addresses issues related to growth and land use in the SCAG region and describes guiding principles for development that support the overall goals of the RCPG.

Compass Growth Vision Principles for Sustaining a Livable Region: SCAG initiated a comprehensive growth visioning process called the Southern California Compass. The Compass process seeks to accommodate growth while maintaining mobility, livability, prosperity, and sustainability goals for residents in the SCAG region.

4.17.1.2 Existing Conditions

The PSA is located in the downtown area of the City of Los Angeles and includes several communities within the City of Los Angeles, including the Financial District, Bunker Hill, Civic Center, Little Tokyo, Fashion District, Toy District, Historic Core, Jewelry District, and Central City East. SCAG is the federally designated Metropolitan Planning Organization (MPO) for six counties in Southern California (Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial). SCAG's mission is to develop long-range regional plans and strategies that provide for efficient movement of people, goods, and information; enhance economic growth and international trade; and improve the quality of life for the Southern California region. SCAG is divided into 14 subregions. The PSA is in the City of Los Angeles Council of Governments (CLACG) subregion, which in addition to the City of Los Angeles, also includes the City of San Fernando and portions of the unincorporated areas of Los Angeles County.

Regional Population and Housing

As illustrated in Table 4-23, the SCAG region has an existing population of approximately 18.9 million people. For the 1990 to 2008 time period, Los Angeles County contributed the largest share of total growth for the region, at 37 percent, with the addition of 1,588,570 residents. However, in terms of the relative growth rate, Los Angeles County was the slowest growing county in the SCAG region, with an annual average growth rate of approximately one percent.

Table 4-24 demonstrates that Los Angeles County has the largest number of households (3,299,573 households) in the six-county SCAG region. The total households in Los Angeles County alone comprise 56 percent of the total SCAG region.

Table 4-23 Regional Population Growth, 1990 – 2008					
County	1990 Total Population	2000 Total Population	2008 Population	1990-2008 Population Change	1990-2008 Annual Average % Change
Los Angeles	8,863,164	9,519,338	10,451,734	1,588,570	0.99%
Imperial	109,303	142,361	187,001	77,698	3.90%
Orange	2,410,556	2,846,289	3,212,949	802,393	1.85%
Riverside	1,170,413	1,545,387	2,118,178	947,765	4.50%
San Bernardino	1,418,380	1,709,434	2,097,756	679,376	2.66%
Ventura	669,016	753,197	841,985	172,969	1.44%
SCAG Region	14,640,832	16,516,006	18,909,603	4,268,771	1.62%
Source: Southern California Association of Governments, 2008 population growth estimates					

Table 4-24 Households in the SCAG Region, 2008	
County	Number of Households
Los Angeles	3,299,573
Imperial	52,323
Orange	1,015,906
Riverside	677,256
San Bernardino	612,859
Ventura	269,066
SCAG Region	5,926,983
Source: Southern California Association of Governments, 2008 Household estimates	

Regional Employment

As demonstrated in Table 4-25, total employment in the SCAG region, including self-employment, is estimated to have increased by nearly 1.3 million jobs between 2000 and 2008.

Table 4-25 Regional Employment Growth, 2000-2008				
County	2000 Total Employment	2008 Employment	2000-2008 Employment Change	2000-2008 Annual Average % Change
Los Angeles	4,079,800	4,490,248	410,448	1.26%
Imperial	50,400	67,130	16,730	4.15%
Orange	1,396,500	1,699,475	302,975	2.71%
Riverside/San Bernardino	1,010,100	1,498,958	488,858	6.05%
Ventura	294,300	362,209	67,909	2.88%
SCAG Region	6,831,100	8,118,020	1,286,920	2.35%
Source: State of California, Employment Development Department, Labor Market Information Division, Industry Employment and Labor Force by Annual Average, March 2006 Benchmark, May 18, 2007; SCAG, 2008 Population Growth Estimates				

4.17.1.3 Regional Growth Projections

As shown in Table 4-26, the SCAG region is expected to have a population of approximately 23 million people and approximately 10.5 million jobs by 2030. Along with the population and job growth, the region is expected to have approximately 7.6 million households.

Table 4-26 Regional Population, Households, and Employment, 2030			
County	Population	Households	Employment
Los Angeles	12,221,799	4,120,270	5,660,992
Imperial	269,874	83,735	111,072
Orange	3,552,742	1,098,474	1,921,806
Riverside	3,143,468	1,127,780	1,188,976
San Bernardino	2,713,149	897,739	1,178,890
Ventura	989,765	332,109	465,466
SCAG Region	22,890,797	7,660,107	10,527,202
Source: Southern California Association of Governments, 2004 RTP			

4.17.1.4 PSA Growth Projections

Table 4-27 shows the population, housing, and employment projections that are estimated for the PSA, the City of Los Angeles, and the CLACG subregion. For population, between 2005 and 2030, the City of Los Angeles and the CLACG subregion are expected to have a slightly higher annual average population growth rates (0.4 percent) than the PSA (0.3 percent). However, for housing, during the same time period, the PSA is expected to have a higher average annual growth in the number of households (1.2 percent) compared to the City of Los Angeles and the CLACG subregions (both 1.0 percent).

Table 4-27 Population, Housing, and Employment Growth for the Project Study Area, City of Los Angeles and CLACG Subregion, 2005-2030				
Element	2005	2030	2005-2030 Population Change	2005-2030 Annual Average % Change
Population				
PSA /a/	77,823	83,492	5,669	0.3%
City of Los Angeles	3,950,347	4,309,625	359,278	0.4%
CLACG subregion	4,032,474	4,413,425	380,951	0.4%
Housing				
PSA/a/	24,049	31,244	7,195	1.2%
City of Los Angeles	1,311,134	1,637,475	326,341	1.0%
CLACG subregion	1,330,724	1,663,002	332,278	1.0%
Employment				
PSA /a/	288,990	314,936	25,946	0.4%
City of Los Angeles	1,800,766	2,223,338	422,572	0.9%
CLACG subregion	1,833,577	2,265,209	431,632	0.9%

/a/ Project Study Area is comprised of the following Census block groups: 1976, 2060.20, 2060.30, 2060.40, 2060.50, 2062, 2063, 2071, 2073, 2074, 2075, 2077.10, 2079, 2080, 2083, 2092, 2093, 2100.10, 2260
Source: SCAG 2004 Regional Transportation Plan

Table 4-27 shows projected employment growth for the PSA, the City of Los Angeles, and CLAGC subregion. It is estimated that 25,946 new jobs would be created in the PSA from 2005 to 2030, with an annual average growth rate of 0.4 percent. This rate is lower than the average annual rate for the City of Los Angeles and the CLAGC subregion over the same time period (both 0.9 percent).

4.17.2 Evaluation Methodology

Federal Transit Administration (FTA) guidelines require that regional growth projections be created by the MPO, assuming future year conditions. As mentioned in Section 4.17.1.2, SCAG is the MPO for the PSA. In order to evaluate growth-inducing impacts, the SCAG 2004 Regional Transportation Plan will be used. The RTP examines current and future transportation plans, population and employment growth, and land use data for the SCAG region to develop projections through the year 2030. The 2004 SCAG RTP serves as the basis for this analysis of growth-inducing impacts.

4.17.3 Environmental Issues

Population and Housing Growth

Downtown Los Angeles: Fundamentally, mass transit projects do not tend to induce growth directly, except at the station level where there is opportunity for transit-oriented development (TOD). Downtown Los Angeles serves as a hub for most Metro buses, Metro Rail, and for bus and rail services provided by other entities, such as the Foothill Transportation Authority, the Orange County Transportation Authority, and the Montebello Bus Line. Also, the downtown Los Angeles area has recently experienced a significant rise in high-density residential development and, consequently, an increase in the number of residents in the area. Therefore, due to the high amount of transit and the high density, both residential and commercial, downtown Los Angeles already functions

as a TOD. Implementation of the Regional Connector would not directly induce growth in the downtown Los Angeles area. However, it would facilitate certain developments, such as the Bunker Hill Design for Development and the Grand Avenue Project, reach their goals of more transit-oriented development.

Regional Level: At a regional level, the increased connectivity between the San Gabriel Valley and the Westside or Long Beach areas would not potentially induce population or housing growth. Most of these areas are already fully urbanized so it is unlikely that the increased regional connectivity would induce housing construction.

Employment Growth

Downtown Los Angeles: The downtown Los Angeles area is already a center of employment for the Los Angeles region. The implementation of the Regional Connector would create employment opportunities in the downtown Los Angeles area, particularly in the construction phase. However, these construction jobs would be temporary. Similar to population and housing growth, the proposed project would not directly induce employment growth, but it could serve to facilitate the movement of employees anticipated by projects that are already planned, such as the Grand Avenue Project in Bunker Hill.

Regional Level: The proposed project would reduce the need to make several transfers from one destination to another. This is the increased connectivity. While this alone could change some of the perceived employment opportunities for some individuals, it is unlikely that employment growth at any of the termini would occur.

4.18 Environmental Justice

This section describes the existing conditions related to environmental justice indicators within the PSA. A discussion of the Federal and State environmental justice regulations is provided along with a demographic profile of the PSA and proposed stations areas. Ultimately, the potential impacts on minority and low-income communities will be assessed to determine if there are potential impacts that would be disproportionately borne by minority or low-income communities.

4.18.1 Affected Environment

4.18.1.1 Regulatory Framework

On February 4, 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed into law. Executive Order 12898 requires federal agencies to achieve environmental justice by "identifying and addressing social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States."[6] As Executive Order 12898 applies to the United States Environmental Protection Agency (USEPA), environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and

[6]Federal Highway Administration, http://fhwa.dot.gov, accessed February 1, 2008.

policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or policies. Meaningful involvement means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health, (2) the public's contribution can influence the regulatory agency's decision, (3) the concerns of all participants will be considered in the decision making process, and (4) the decision makers shall seek out and facilitate the involvement of those potentially affected.

In response to Executive Order 12898, the U.S. Department of Transportation (USDOT) issued an Order to Address Environmental Justice in Minority Populations and Low-Income Populations. This order, issued in April 1995, sets guidelines to ensure that all federally-funded transportation-related programs, policies, or activities that have the potential to adversely affect human health or the environment involve a planning and programming process that explicitly considers the effects on minority populations and low-income populations.

Following the lead of the environmental justice movement at the federal level, a series of laws beginning in 1999 have been enacted in California to implement environmental justice. The Governor's Office of Planning and Research (OPR) has been designated the "coordinating agency in state government for environmental justice programs." As part of its new environmental justice coordinator role, OPR must now incorporate environmental justice considerations into local government planning decisions. California law requires OPR to coordinate with federal agencies regarding environmental justice based on Executive Order 12898.

4.18.1.2 Existing Conditions - Socioeconomic Characteristics

Los Angeles County

As of the 2000 U.S. Census, 9,519,338 persons lived in Los Angeles County. Approximately 69 percent of the Los Angeles County population is characterized as minority. The largest minority population is Hispanic, making up approximately 45 percent of the total population. According to the 2000 U.S. Census, approximately 18 percent of Los Angeles County is characterized as low-income.

Project Study Area

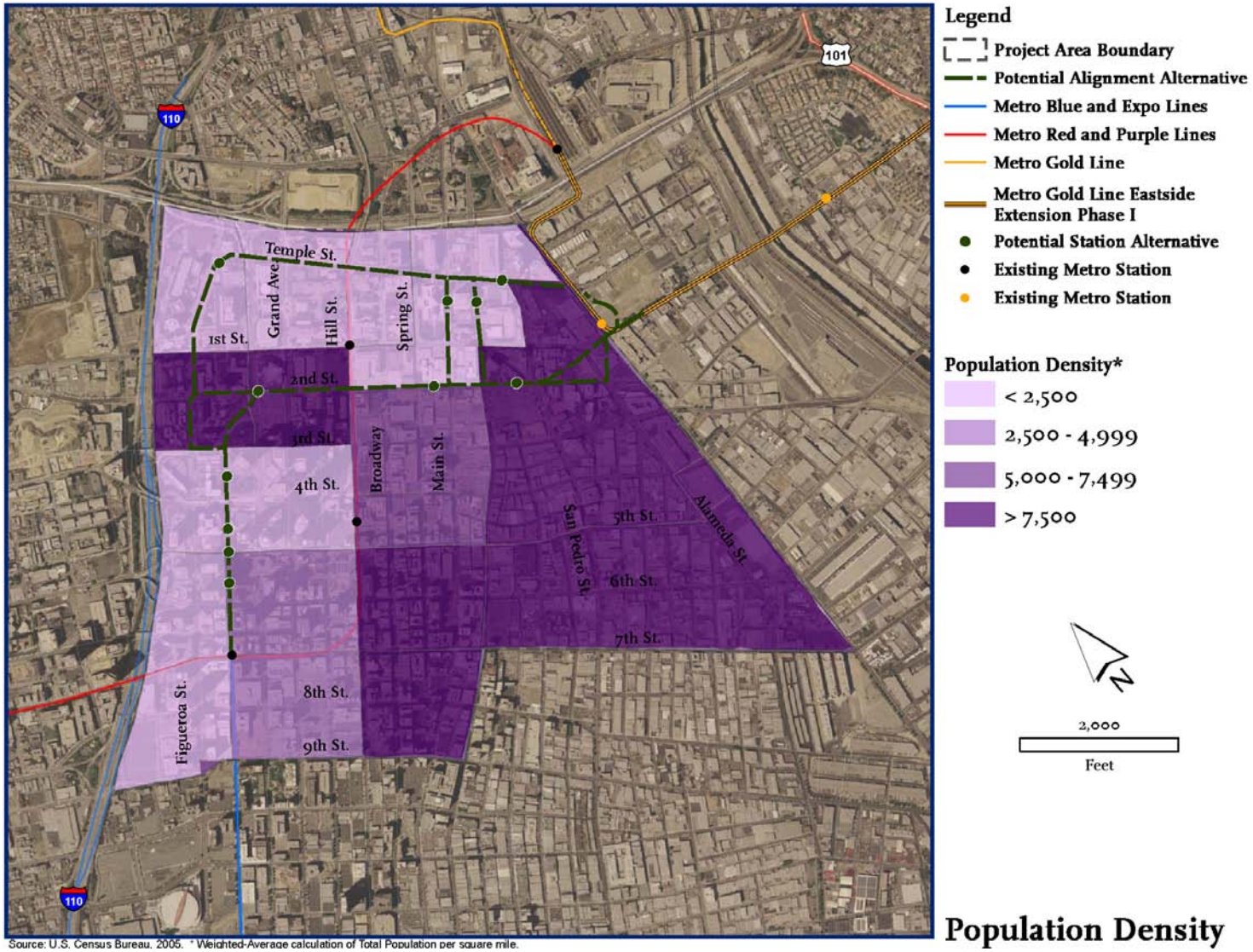
The PSA is located entirely within the City of Los Angeles and includes several districts within the City of Los Angeles, including the Financial District, Bunker Hill, Civic Center, Little Tokyo, Fashion District, Toy District, Historic Core, Jewelry District, and Central City East. Little Tokyo is the only one of these communities that has been identified as an ethnic enclave, and where disproportionate impacts could occur. As shown in Table 4-28, as of the 2000 U.S. Census, there are 18,202 persons residing within the PSA. Based on the 2000 U.S. Census data, most of the PSA has a population density of less than 250 persons per acre (Figure 4-28). In addition, there are 9,150 households and approximately

300,000 jobs[7] within the PSA. The resident unemployment rate for the PSA is 35 percent, compared to the overall Los Angeles County unemployment rate of five percent.

Approximately 80 percent of the PSA population belongs to a minority group, as shown in Table 4-28. The minority group with the largest representation in the Regional Connector PSA is African-American (29.4 percent). The second and third largest minority groups in the Regional Connector PSA are Asian (24.5 percent) and Hispanics/Latinos (21.9 percent), respectively. The Regional Connector PSA is composed of less than ten percent of the following races: American Indian or Native Alaskan, Native Hawaiian or other Pacific Islander, or other race. Of the total population, 3.2 percent identify themselves as belonging to more than one race. Additionally, the percentage of White, Non-Hispanic for the PSA is approximately 20 percent. The demographic density for the PSA is shown in Figure 4-9.

[7]Southern California Association of Governments (SCAG) 2004 Regional Transportation Plan.

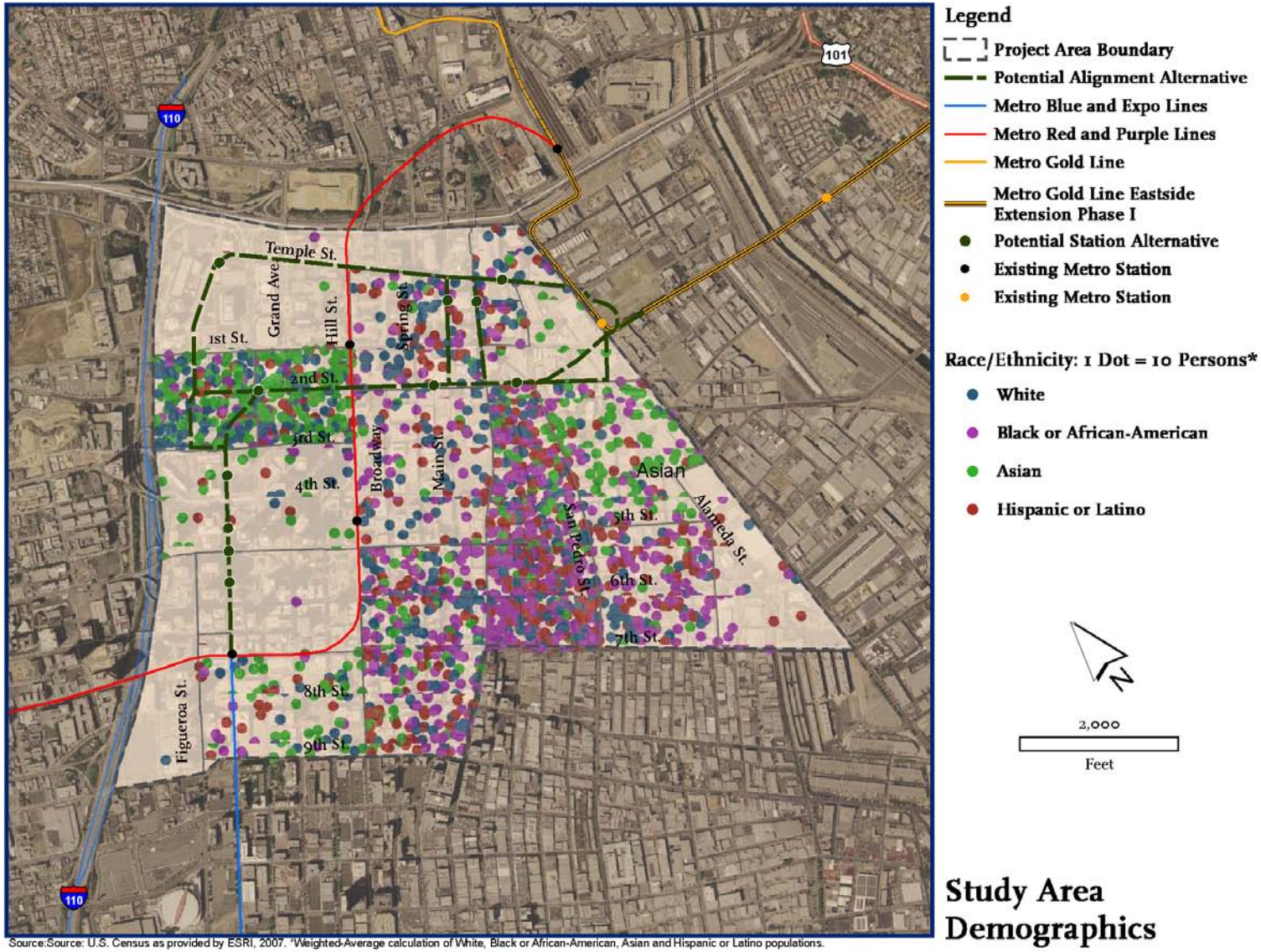
Figure 4-8 Population Density



Source: U.S. Census Bureau, 2005. * Weighted-Average calculation of Total Population per square mile.

Population Density

Figure 4-9 Study Area Demographics



Source:Source: U.S. Census as provided by ESRI, 2007. *Weighted-Average calculation of White, Black or African-American, Asian and Hispanic or Latino populations.

The median household income in the PSA was $10,295 in according to the 2000 U.S. Census. Of the various income levels shown in Table 4-28, the highest percentage of the working population (15 percent) earned less than $10,000 per year. In the 2000 U.S. Census, which is the latest census information, 92 percent of the PSA's population (16,722 persons) was evaluated for poverty status. Poverty status computations are derived by the U.S. Census using the Health and Human Services poverty thresholds (Table 4-29). As shown in the Table 4-28, 46.8 percent of the population in the PSA is living below the poverty threshold.

Table 4-28 Project Study Area Demographic Data

General		
Total Persons	18,202	
Total Households	9,150	
Race	**Persons**	**% of Total Population**
White	3,615	19.9%
Black or African American	5,354	29.5%
American Indian or Native Alaskan	122	0.7%
Asian	4,455	24.4%
Native Hawaiian and Other Pacific Islander	9	0.1%
Some Other Race	65	0.4%
Two or more Races	588	3.2%
Hispanic or Latino	3,994	21.9%
Total Minority Population	14,587	80.1%
Annual Income	**Total**	**% of Total Working Population /a/**
Less than $10,000	2,625	15%
Between $10,000 and $14,999	940	5.4%
Between $15,000 and $19,999	711	4.1%
Between $20,000 and $24,999	543	3.1%
Between $25,000 and $29,999	466	2.7%
Between $30,000 and $39,999	355	2%
Between $40,000 and $54,999	475	2.7%
Between $55,000 and $99,999	741	4.2%
Over $100,000	529	3%
Median Household Income	$10,295	
Poverty Levels	**Total**	**% of Total Population /b/**
Population below Poverty Threshold	7,853	46.8%
Population above Poverty Threshold	8,919	53.2%

/a/ The total working population is 17,447 persons.
/b/ Percentage of total population evaluated for poverty status is 16,772 persons, which is 92 percent of the total population.
SOURCE: 2000 U.S. Census

Table 4-29 2000 U.S. Census Poverty Thresholds	
Household Size	**Income Threshold**
One-Person	$8,794.00
Two-Person	$11,239.00
Three-Person	$13,738.00
Four-Person	$17,603.00
Five-Person	$20,819.00
Six-Person	$23,528.00
Seven-Person	$26,754.00
Eight-Person	$29,701.00
Nine-Person	$35,060.00
SOURCE: U.S. Census Bureau, Housing and Household Economic Statistics Division, 2000	

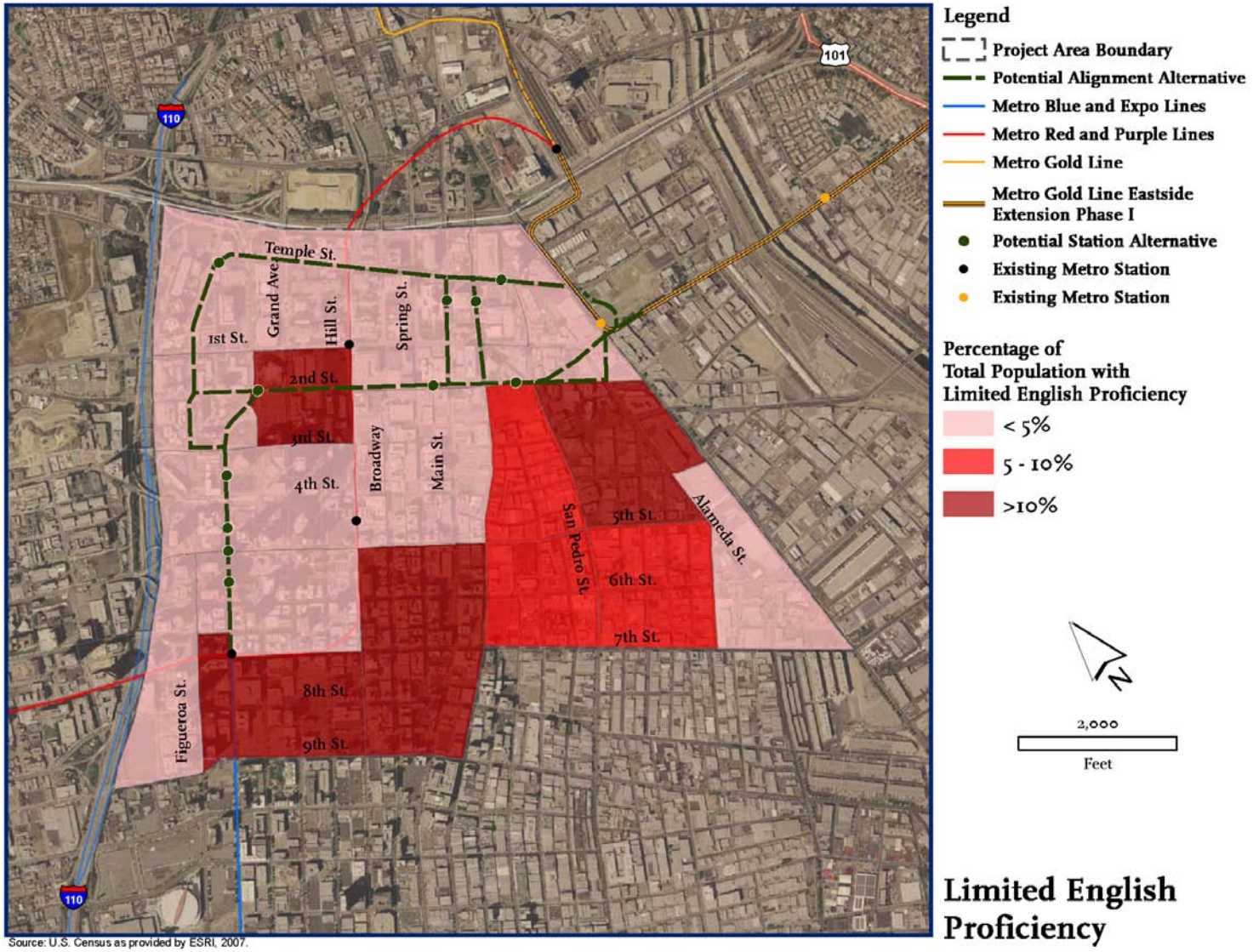
Limited English Proficiency

Executive Order 13166 requires federally assisted programs to identify any need for services to those persons with limited English proficiency (LEP) and develop and implement a system to provide those services so LEP persons can have meaningful access to them. The 2000 U.S. Census data indicates that approximately 21 percent of the population in the PSA was linguistically isolated (i.e., all household members over age five have limited English proficiency [not well to not at all]). Approximately 63 percent of this linguistically-isolated population (1,872 persons, or 14 percent of total population over five years of age) spoke an Asian or Pacific Island language and 35.44 percent (1,059 persons or 10.4 percent of total population over five years of age) spoke Spanish (Figure 4-9). The geographic distribution of linguistically isolated Asian or Pacific Island language-speaking households corresponds with the distribution of the Asian population in the area around Little Tokyo (Figure 4-9).

Elderly Population

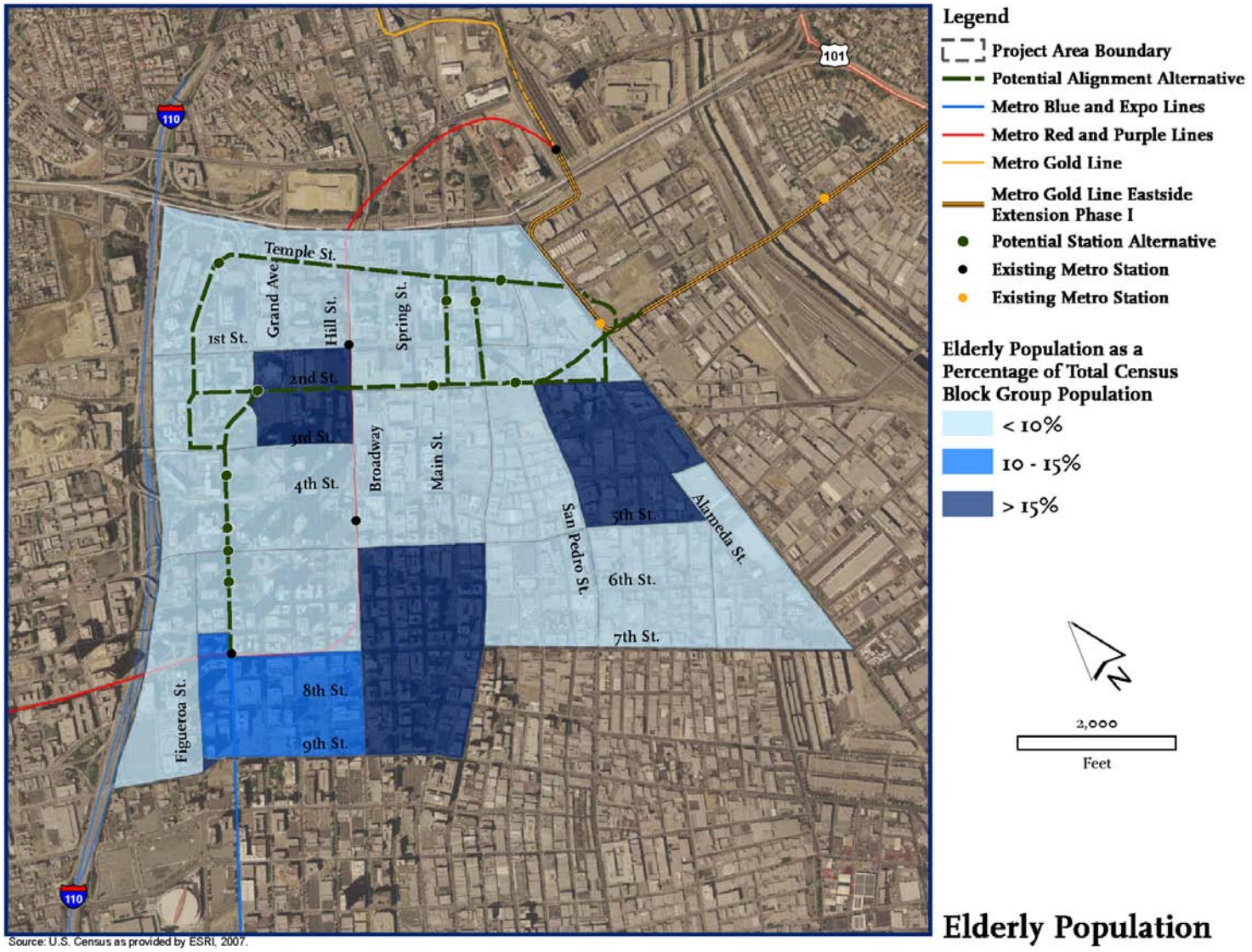
According to the 2000 U.S. Census, approximately 16 percent of the PSA population is elderly (approximately 2,625 persons). As shown in Figure 4-11, the distribution of the elderly population corresponds with the geographic distribution of LEP residents in Little Tokyo (Figure 4-10).

Figure 4-10 Limited English Proficiency



Source: U.S. Census as provided by ESRI, 2007.

Figure 4-11 Elderly Population



Elderly Population

The Homeless and Single Room Occupants

In downtown Los Angeles, a major low-income group primarily consists of the homeless. However, the 2000 U.S. Census does not include the homeless in their calculations. In 2007, the Los Angeles Homeless Services Authority released the 2007 Greater Los Angeles Homeless Count, which is a report on a physical counting effort conducted to better estimate the number of homeless in the City of Los Angeles. The count found approximately 68,600 homeless persons at any one time in the City of Los Angeles. In the area where the PSA is located, there are approximately 22,030 homeless persons, which account for 32 percent of the total homeless population of the City of Los Angeles. As approximately one-third of the total estimated homeless population is in the PSA, many services and shelters that serve this population are present as well. There are approximately four shelters, some year-round, 15 to 16 single-room occupancy establishments (SROs), and approximately nine homeless service providers within a quarter-mile of the proposed alignments. All the resources for the homeless population within the PSA are listed in Table 4-30.

Table 4-30 Alignment Areas Homeless Shelters, SROs, and Service Providers				
Name	Address	Affected Alignments*	No. of Units/ Beds	Availability
Shelters				
Emmanuel Baptist Mission - Bible Program In-House Residency	530 E. 5th St.	A,B, U	N/A	Emergency
Los Angeles Mission - Anne Douglas Center of the Los Angeles Mission	310 Winston St.	A,B, U	N/A	Transitional
Los Angeles Mission - Overnight Beds for Men	303 E. 5th St.	A,B, U	N/A	Emergency
Year Round Overnight Emergency Shelter	1208 Pleasant Ave.	A,B, U	N/A	Emergency
SROs				
Year Round Overnight Emergency Shelter	832 W. James M. Wood Blvd.	A,B, U	6	Emergency
La Posada - Emergency Shelter	1320 Pleasant Ave.	A,B, U	10	Emergency
Proyecto Pastoral	171 S. Gless St.	U	45	Emergency
Zahn New Emergency Housing Program	832 W. James M. Wood Blvd.	A,B, U	64	Emergency
Year Round Overnight Emergency Shelter	403 E. 5th St.	A,B, U	100	Emergency
Panama Hotel	403 E. 5th St.	A,B, U	221	Emergency
LTSC - Far East Building	347 E. 1st St.	A,B, U	16	Permanent
Brownstone	425 E. 5th St.	A,B, U	48	Permanent
Southern	412 E. 5th St.	A,B, U	55	Permanent
Harold Hotel	323 E. 5th St.	A,B, U	58	Permanent
Florence Hotel	310 E. 5th St.	A,B, U	61	Permanent
Leonide Hotel	512-516 S. Main St.	A,B, U	66	Permanent
Fred Jordan Missions - Men's Christian Discipleship	445 S. Towne Ave.	A,B, U	36	Transitional
JWCH Institute	515 6th St.	A,B, U	45	Transitional
Golden West Transitional Housing	417 E. 5th St.	A,B, U	61	Transitional
Casa Olivares	1208 Pleasant Ave.	A,B, U	150	Transitional
Service Providers				
Assistance for Skid Row Families	207 S. Broadway	A,B, U	N/A	Year-Round
Day Labor Program	516 S. Main St.	A,B, U	N/A	Year-Round
Downtown Women's Center	325 S. Los Angeles St.	A,B, U	N/A	Year-Round
Employment Program	516 S. Main St.	A,B, U	N/A	Year-Round
Family Transition Program	207 S. Broadway	A,B, U	N/A	Year-Round
Golden West Hotel Life Skills Program	417 E. 5th St.	A,B, U	N/A	Year-Round
LTSC Emergency Care Givers	231 E. 3rd St.	A,B, U	N/A	Year-Round
Street Works	516 S. Main St.	A,B, U	N/A	Year-Round
Weingart Access Center	506 S. Main St.	A,B, U	N/A	Year-Round

SOURCE: Community Redevelopment Agency of Los Angeles, 2008.

*** At-Grade Alternative - Option A (A)**
At-Grade Alternative - Option A (B)
Underground Alternative (U)

Alignment Areas

The total alignment is approximately 1.7 miles. Since the proposed stations would be in close proximity to each other, over the short distance of the two build alternatives, any analysis at the station level would be repetitious. Therefore, an analysis of the entire alignment was conducted for socioeconomic impacts. Census block groups within a one-quarter-mile radius of the alignment locations were evaluated. The results are summarized in Table 4-31.

As shown in Table 4-31, there are 11,369 persons and 5,482 households within a quarter-mile of the At-Grade Emphasis LRT Alternative. The unemployment rate for the area within a quarter-mile of the At-Grade Emphasis LRT Alternative is 24.1 percent compared to the overall Los Angeles County unemployment rate of five percent.

Approximately 80 percent of the population in the area within a quarter-mile of the At-Grade Emphasis LRT Alternative belongs to a minority group, as shown in Table 4-31. The minority group with the largest representation for the At-Grade Emphasis LRT Alternative is Asian (33.3 percent). The second and third largest minority groups are Hispanic/Latino (24.2 percent) and African American (19.1 percent), respectively. The area within a quarter-mile of the At-Grade Emphasis LRT Alternative is composed of less than ten percent of the following races: American Indian or Native Alaskan, Native Hawaiian or other Pacific Islander, or other race. Of the total population, 2.2 percent identify themselves as belonging to more than one race. Additionally, the percentage of White, non-Hispanic population for the area within a quarter-mile of the At-Grade Emphasis LRT Alternative is approximately 20 percent.

The median household income in the area within a quarter-mile of the At-Grade Emphasis LRT Alternative was $14,753 according to the 2000 U.S. Census. Of the various income levels shown in Table 4-31, the highest percentage of the working population (31.7 percent) earned less than $10,000 per year. In the 2000 U.S. Census, 90.3 percent of the PSA's population (10,275 persons) was evaluated for poverty status. Poverty status computations are derived by the U.S. Census using the Health and Human Services poverty thresholds (Table 4-29). As shown in the Table 4-31, 36.6 percent of the population in the area within a quarter-mile of the At-Grade Emphasis LRT Alternative is living below poverty.

Table 4-31 Alignment Areas Demographic Data				
Socioeconomic Characteristic	At-Grade Alternative General		Underground Alternative	
Total Persons	11,369		11,496	
Total Households	5,482		5,677	
Race	**Persons**	**% of Total Population**	**Persons**	**% of Total Population**
White	2,272	20.0%	2,364	20.6%
Black or African American	2,167	19.1%	2,158	18.8%
American Indian or Native Alaskan	74	0.7%	74	0.6%
Asian	3,784	33.3%	3,861	33.6%
Native Hawaiian and Other Pacific Islander	23	0.2%	23	0.2%
Some Other Race	42	0.4%	42	0.4%
Two or more Races	255	2.2%	277	2.4%
Hispanic or Latino	2,752	24.2%	2,697	23.5%
Total Minority Population	9,097	80.0%	9,132	79.4%
Annual Income	**Total**	**% of Total Working Population /a/**	**Total**	**% of Total Working Population /b/**
Less than $10,000	1,571	30.0%	1,515	27.8%
Between $10,000 and $14,999	590	11.3%	601	11.0%
Between $15,000 and $19,999	488	9.3%	527	9.7%
Between $20,000 and $24,999	344	6.6%	351	6.4%
Between $25,000 and $29,999	362	6.9%	381	7.0%
Between $30,000 and $39,999	322	6.1%	411	7.5%
Between $40,000 and $54,999	411	7.8%	468	8.6%
Between $55,000 and $99,999	643	12.3%	686	12.6%
Over $100,000	509	9.7%	509	9.3%
Median Household Income	$14,753		$18,776	
Poverty Levels	**Total**	**% of Total Population /c/**	**Total**	**% of Total Population /d/**
Population below Threshold	3,758	36.6%	3,620	34.8%
Population above Threshold	6,517	63.4%	6,782	65.2%

/a/ The total working population for the At-Grade Alternative is 10,765 persons.
/b/ The total working population for the Underground Alternative is 10,892 persons.
/c/ Percentage of total population evaluated for poverty status for the At-Grade Alternative is 10,275 persons, which is 90.3 percent of the total population.
/d/Percentage of total population evaluated for poverty status for the Underground Alternative is 10,402 persons, which is 90.5 percent of the total population.
SOURCE: 2000 U.S. Census

For the Underground Emphasis LRT Alternative, as shown in Table 4-31, there are 11,496 persons and 5,677 households within a quarter-mile. The unemployment rate for the area within a quarter-mile of the Underground Emphasis LRT Alternative is approximately 23.3 percent compared to the overall Los Angeles County unemployment rate of five percent.

Approximately 79 percent of the population in the area within a quarter-mile of the Underground Emphasis LRT Alternative belongs to a minority group, as shown in Table 4-31. The minority group with the largest representation for the Underground Emphasis LRT Alternative is Asian (33.6 percent). The second and third largest minority groups are Hispanics/Latinos (23.5 percent) and African-Americans (18.8 percent), respectively. The area within a quarter-mile of the Underground Emphasis LRT Alternative is composed of less than ten percent of the following races: American Indian or Native Alaskan, Native Hawaiian or other Pacific Islander, or other race. Of the total population, 2.4 percent identify themselves as belonging to more than one race. Additionally, the percentage of White, Non-Hispanic for the area within a quarter-mile of the Underground Emphasis LRT Alternative is approximately 20 percent.

The median household income in the area within a quarter-mile of the Underground Emphasis LRT Alternative was $18,776 according to the 2000 U.S. Census. Of the various income levels shown in Table 4-31, the highest percentage of the working population (13.9 percent) earned less than $10,000 per year. In the 2000 U.S. Census, 90.5 percent of the PSA's population (11,496 persons) was evaluated for poverty status. Poverty status computations are derived by the U.S. Census using the Health and Human Services poverty thresholds (Table 4-29). As shown in the Table 4-31, 34.8 percent of the population in the area within a quarter-mile of the Underground Emphasis LRT Alternative is living below the poverty threshold.

4.18.1.3 Public Participation

To ensure opportunities for public participation during the project development process, Metro held four public project scoping meetings, two in the early planning process and two after the alternatives screening process. The first early scoping meeting was held on November 6, 2007, at the City of Los Angeles Central Library in downtown Los Angeles, and the second on November 7, 2007, at the Japanese American National Museum in Little Tokyo. A total of 117 people attended the two meetings to provide comments on the alignment alternatives for the proposed project. Two additional meetings to provide a progress update of the alternatives screening were held at the Japanese American National Museum on February 26, 2008, and at the City of Los Angeles Central Library on February 26, 2008, respectively.

The format of the scoping meetings included an open house element where attendees could have the opportunity to review the project information prior to the start of the presentation and the comment period. Project team members were present at the display boards to address questions related to the project. Spanish and Japanese translators were made available, as appropriate. Following the open house period, a PowerPoint presentation was made to provide attendees with information regarding the purpose of the scoping meeting and the proposed project. Emphasis was placed on the importance

of the community's participation in providing comments in person at the scoping meetings, or by telephone, fax, postal mail, or e-mail. Following the presentation, the public was given the opportunity to make verbal comments, which were recorded by a transcriber. The deadline for receiving comments was November 30, 2007. A total of 88 comments were received by Metro from public agencies, community organizations, elected officials, and the general public.

Of the 88 comments received by Metro, 16 were directly related to the topic of environmental justice. Three of these 16 comments were regarding Americans with Disabilities Act (ADA) compliance and access, and regarding community impacts. There was much coordination with numerous downtown community committees, including the Little Tokyo Subcommittee and other groups. Several presentations were conducted, including those after the second round of public meetings held in October 2008, in order to keep community members informed of project updates and public participation.

Table 4-32 Public Meetings

Type of Meeting	Date	Location	Number of Attendees
Early Scoping Meeting	November 6, 2007	Central Library	68
Early Scoping Meeting	November 7, 2007	Japanese American National Museum	49
Community Update Meeting Series #1	February 26, 2008	Japanese American National Museum	59
Community Update Meeting Series #1	February 28, 2008	Central Library	55
Community Update Meeting Series #2	October 16, 2008	Central Library	109 Combined
Community Update Meeting Series #2	October 21, 2008	Japanese American National Museum	

4.18.1.4 Project Alignment Alternatives Screening Process

As part of the required screening process, segments of several proposed alignments were eliminated from consideration in the PSA. As part of the public outreach effort, 33 alternatives were presented at the early scoping meetings in November 2007. At each of the two public meetings, each alternative was presented in various ways, from poster boards to PowerPoint slides; which were accessible as well by internet through the Metro page www.metro.net. After the public input was incorporated into the screening process, eight alternatives remained and were identified for further screening. With a thorough screening process as described in the Alternative Screening Report, six of the eight alternatives were eliminated from further consideration for environmental evaluation. The two remaining alternatives were presented at the May 2008 public meetings.

4.18.2 Evaluation Methodology

In assessing compliance of the proposed project with the intent of Executive Order 12898 regarding environmental justice, there are three major considerations:

- Whether the project provides transit service equity;
- Whether any potential adverse impacts would be disproportionately borne by low-income and minority communities; and
- Whether low-income and minority communities have had opportunities to actively participate in the planning of the project.

The analysis of impacts also considers:

- Adverse impacts to human health;
- Adverse environmental impacts to natural resources;
- Impacts that would adversely affect the stability and economic and social functioning of a community or neighborhood; and
- Adverse impacts related to noise and vibration, displacement and relocation, and pedestrian safety and security in low-income and minority communities.

As mentioned in Section 4.18.1.2, Little Tokyo is the only established ethnic community in the PSA. For this analysis, disproportionate impacts to Little Tokyo will be evaluated.

4.18.3 Environmental Issues

The following are potential environmental justice impacts associated with the proposed project.

At-Grade Emphasis LRT Alternative

- Transit Service Equity Impacts. The At-Grade Emphasis LRT Alternative would bypass and place stations outside the only established minority community in the PSA, Little Tokyo, but would keep the current location of the Little Tokyo/Arts District station along Alameda St. Additionally, as shown in Figure 4-11, Little Tokyo contains a high concentration of elderly, which are often transit dependent. Routing the alignment and locating a proposed station outside Little Tokyo can be perceived as a potential environmental justice impact because it can be interpreted as a lack of transit infrastructure investment in an under-represented community. However, the close proximity of the Little Tokyo/Arts District Station (one-quarter mile away), which is part of the Metro Eastside Extension, minimizes the potential of these justice impacts.
- Displacement Impacts. Pertaining to the homeless, changes in sidewalk widths may potentially have direct impact on homeless encampments.

Underground Emphasis LRT Alternative

- Transit Service Equity Impacts. The alignment for the Underground Emphasis LRT Alternative would traverse Little Tokyo underground and surface at a proposed portal at 1st and Alameda Sts. The Underground Emphasis LRT Alternative would introduce a station on 2nd St. between Los Angeles and Main Sts. Although the station is not *within* Little Tokyo, it is located next to the Little Tokyo branch library as well as the future location of the Block 8 development which is a significant Japanese inspired condominium and rental housing property scheduled to be opened in the Spring of 2009.

- Noise Impacts. The proposed project has potential to have noise impacts related to the proposed portal location at 1st and Alameda Sts. There are sensitive receptors around the portal area (museums and residences). This could be considered disproportionate because the portal would be located in the only minority community in the PSA.

- Construction Impacts. Bored tunnel construction impacts would be largely concentrated at portal areas where equipment is inserted for underground use or where debris from tunnel mining is removed. Portals will be concentration points of construction activity, including workers, stationary equipment, and truck activity. Construction in the portal area within the Little Tokyo community may be particularly disruptive to residences and businesses in this minority community.

4.19 Major Utilities

As part of the evaluation of existing conditions along the different alignment alternatives, major utilities are identified in order to assess potential impacts to the infrastructure. This process allows for identification of potential conflicts and resolution to these issues in the early stages of design and development of alternatives.

4.19.1 Affected Environment

There are several items that control the utility work design, including gravity lines, sanitary sewers, storm drains, telephone cables, and other power lines such as water and gas. The physical dimensions of these utilities vary from one to the next and various elements affect the placement and relocation of each. Gravity lines are usually the deepest utility which eventually controls the top of the station structure; sanitary, sewer, and storm drains are in this category. For sanitary sewers, polyvinylchloride (PVC) is utilized temporarily during underground station construction. Permanent vitrified clap pipe (VCP) is then installed during the restoration phase. For storm drains, temporary lines are installed during underground station construction. Permanent reinforced concrete pipe (RCP) is then constructed during the restoration phase.

Generally, it is preferable to save telephone cables. During underground and at-grade station construction support, the existing telephone duct bank remains in place. If the telephone duct bank is shallow, then breaking the existing ducts is required and lower

supports are needed in order to clear the decking structure. During restoration phase, the telephone duct is encased in concrete.

Overhead power lines impacted by construction are to be relocated or new underground cables are installed as needed. For an underground configuration, during station construction, electrical ducts should be supported in place. If the electrical duct bank is shallow, then it requires lowering and supporting to clear the decking structure. Existing water lines are usually cast iron, which means they tend to have weak joints. During underground construction, new steel water lines will be constructed above the excavation, to be supported from the decking structure. The use of ductile iron pipes is restricted to lengths up to 20 feet. Also, for underground structures, new steel gas lines are to be installed above the excavation and to be supported from the decking structure.

The identification of all the above utilities is essential in order to understanding the existing conditions in the PSA as well as to understand potential design restrictions which must be considered.

4.19.2 Evaluation Methodology

The main source used for utility locations is the City of Los Angeles' Electronic Vault. This resource, which is part of the Bureau of Engineering division, provides detailed data history and utility characteristics which aid in assessing the impacts of construction.

For assessing the impact of construction, the existing utility data and information is incorporated and superimposed on LADOT Traffic Geometric plans, along with all the potential alternative alignments. One of the crucial issues for drawing existing utilities from as build maps to the various alternative corridors is to locate the exact location of the current right of way (ROW). The mapping and discussions related to utilities are directed at street segments where a number of conflicts and/or issues may arise. Existing utility data is first obtained at intersections along the alignment, including Alameda St., 2nd St. and Flower St. Other key locations are intersections along 2nd St, including Central Ave, San Pedro St., Los Angeles St., and Main St., and the Flower St. segment with intersections at 3rd, 4th, 5th and 6th Sts.

4.19.3 Environmental Issues

Implementation of the Underground Alternative would result in potential impacts to underground utility lines that would be avoided with the At-Grade Emphasis LRT Alternative. The following describes the utility issues along the alignment for the Underground Emphasis LRT Alternative and the impacts they may present.

At-Grade/Underground Affects on Flower St. and Intersections at 6th, 5th, 4th, and 3rd Sts.

Between 3rd and 4th Sts. there is a 33-inch storm drain line. There is a large gravity line, 72-inch to 84-inch reinforced concrete pipe (RCP) which turns from 4th St. onto Flower St. and continues south to 6th St. At 5th St., the 84-inch pipe changes temporarily to an eight-foot six-inch by 36-inch concrete box to allow a sanitary sewer line to cross underneath. At 6th St., the 72-inch RCP discharges into a 48-inch line and a 36-inch line. At the intersection

of Flower and 6th Sts., the pipes are approximately 15-feet deep. There are also two storm drain manholes within this intersection.

Heading south on Flower St. from the potential station at Grand Ave., the alignment heads underground. The large gravity lines in this area will impact the location of the underground structures such as the tunnel, cut and cover, and stations. Identification of these lines in plan and cross sections are being studied at the present time.

A 15-inch concrete sanitary sewer crosses 7th St. 12 feet below grade. A 21-inch sanitary sewer crosses Wilshire Blvd. 14 feet below grade. A 20-inch sanitary sewer crosses 5th and 6th Sts. 12-feet below grade. A 30-inch storm drain crosses 4th St. one to 15 feet below grade and an 18-inch sanitary sewer crosses 3rd St. 27 feet below grade.

One of the noticeable things about the sanitary sewer pipes is the change in sizes throughout various segments of the pipeline. This may indicate merging pipe through deep man holes or junction structures. These would impact the underground structures.

At-Grade/Underground Affects on 2nd St. between Hill St. and Spring St.

An information gap for the section of 2nd St. between Hill St. and Spring St. exists in data files and further research is being conducted in order to correctly identify all utility types and locations. Currently, relieving pressure system discharges storm water over the 2nd St. tunnel, directing 12-inch to 24-inch diameter drain lines located at both sides of the tunnel adjacent to the sidewalks. More investigation is needed to identify the causes of this occurrence. A storm drain is also located on the north side of 2nd St., east of the 2nd St. tunnel.

At-Grade/Underground Affects on 2nd St. between Main St. and Los Angeles St.

Currently, there is a large storm drain gravity line, nine-feet six-inch by 11-feet six-inch reinforced concrete box. There is also a 14-inch storm drain line running on the northern side of the 2nd St., approximately 13 feet away from the northern property line and about four feet underground. There are two sanitary sewer lines located on each side of the nine-foot six-inch by 11-foot six-inch storm drain, with an 18 inch distance from the center line to the face of the larger pipe. One of the lines is a 14-inch diameter pipe with 17.5 feet distance from the northern line of the property, located 16 feet underground. The second line is an eight-inch diameter pipe with 23-foot distance from the southern line of the property, located 16 feet underground.

Other utilities in this area are telephone, cable, and power lines with three-inch to 22-inch diameter conduits located approximately four feet underground. Water and gas lines are also located four feet underground and between two inches to six inches in diameter. Two gas lines are abandoned and one line of gas and the water line are active lines.

One of the options for the Underground Emphasis LRT Alternative is the location of a potential station somewhere in between these streets on 2nd St. Although the location of this station has not been determined, existing utility lines may impact the station wall footings and catenary pole footings.

At-Grade/Underground Affects on 2nd St. between Los Angeles St. and Central Ave.

Between Los Angeles St. and Central Ave. there is a large storm drain gravity line and an 11-foot six-inch by 13 foot reinforced concrete box. There is also a 44-inch storm drain line running on the north side of 2nd St., 16 feet away from the northern property line and about six feet underground. There are two sanitary sewer lines located on both sides of the large storm drain 18 inches or more in distance away from the storm drain line's outside face. The first line is an eight-inch sanitary sewer line, 23 feet away from the northern property line, located 16 feet underground. The second line is an eight-inch sanitary sewer line, 18 feet away from the southern property line, located 16 feet underground.

Other utilities in this area are telephone, cable, and power lines with four inches to 25 inches diameter conduits located approximately four feet underground. Water and gas lines are also located four feet underground, with the water line at eight inches and the gas line at six- inches in diameter.

Potential impacts may occur in the area where the alignment curves off Alameda St. to enter southwest through private properties toward 2nd St. This area has a higher than average level of congested utility lines and this would need to be further studied and evaluated.

At-Grade/Underground Affects on 2nd St. between Main St. and Spring St.

Between Main and Spring Sts. there is a large storm drain gravity line and a 9.5 foot by 11.5 foot reinforced concrete box. There is also a 14-inch storm drain line running on the north side of the street approximately 15 feet away from the northern property line, about six feet underground. There are two sanitary sewer lines located along this segment. One of the lines is an eight-inch sanitary sewer line located above the large storm drain pipe, located ten feet underground. The second line is an eight-inch sanitary sewer line located on the north side of the large storm drain pipe, located ten feet underground, and approximately 25.5 feet away from the northern property line.

Other utilities in this area are telephone, cable, and power lines with diameters ranging from 12-inch to 29-inch located at a maximum of six feet underground. Water and gas lines are also located four feet underground, and range from four inches to six inches in diameter. Two gas lines and one water line are abandoned.

At-Grade/Underground Affects on 2nd St. between Spring St. and Broadway

Between Spring St. and Broadway there is a large storm drain gravity line, and a 9.5 foot by 11.5 foot reinforced concrete box. There is a 14-inch line running on the north side of the street, approximately 15 feet in distance from the northern property line and six feet underground.

There are two sanitary sewer lines located along this segment. One of the lines is an eight-inch sanitary sewer line located above the large storm drain, approximately ten feet underground. The second line is also an eight-inch sanitary sewer line located north, off the large storm drain line, approximately ten feet underground, and 25.5 feet away from the northern property line.

Other utilities in this area are telephone, cable, and power lines with 12-inch to 29-inch diameter conduits located approximately six feet underground. Water and gas lines ranging from four inches to six inches in diameter are located at a maximum of four feet underground. Two gas lines and one water line are abandoned.

At-Grade/Underground Affects on 2nd St. between Broadway and Hill St.

Between Broadway and Hill St. there is a storm drain large gravity line, ten-inch diameter reinforce concrete pipe (RCP) approximately 22 feet underground. This line alignment moves north approximately 15 feet after passing the Hill St. intersection. There are also two eight-inch storm drain lines running on the north and south sides of the street, approximately three feet underground.

An eight-inch sanitary sewer line is located north of the large sanitary sewer approximately 18 feet underground.

Other utilities in this area are telephone, cable, and power lines with 22-inch to 41-inch diameter conduits located at a maximum of six feet underground. This particular location, however, also has a deeper line at 16 feet underground. Water and gas lines ranging from four inches to eight inches in diameter are located at a maximum of four feet underground. There is an eight-inch gas line that is abandoned.

Affects on Alameda St. at Temple St. (At-Grade), 1st St., and 2nd St. (Underground)

In the PSA, Alameda St. is a very heavily trafficked corridor that is used by both automobiles and large freight trucks. The land uses around the Alameda St., 1st St., and 2nd St. intersections has experienced a change from low scale industrial, to residential/commercial in the past years. Because a grade separation is being proposed as a solution for possible congestion issues, utilities in and around the area must be identified thoroughly in order to design the station and tunnel to appropriate standards.

Currently, there is a 12-inch water line located approximately in the center of Alameda St. and another 36 inch water line located on the west side of the street. A 14-inch sanitary sewer is located on the eastern side of Alameda St. A 75-inch storm drain is also located on the eastern side of Alameda St. as well as 14-inch lines that run along the length of the street. There also exist electrical boxes with two and three conduits, telephone lines, and a six-inch abandoned gas line. This area is critical because a grade separation (underpass) built along Alameda St. from approximately north of Temple St. to south of 2nd St. will mean the removal and relocation of these utility lines.

For this particular scenario, it is advised that the 75-inch storm drain cannot be located under the northbound bus deck because there would not be enough room. Instead, two possibilities are suggested; one: changing the pipe alignment to make it run under the southbound bus deck (west of Alameda St.) or two: relocate the alignment east of the Metro Eastside Extension LRT tracks where there is a passage. For the option to relocate the storm drain, the pipe would instead begin passing the grade separation (north of Temple St.) to meet its original alignment passed the grade separation south of 2nd St. The relocation of the storm drain would be the preferred option as the alignment locations have already been identified as the most promising with the communities and the public,

that a change in this stage of the project would require significant more analysis. Once the large storm drain is relocated, the smaller pipes can be moved under the bus deckway. The crossing utility lines can be supported from the beam bridge decks at Temple and 1st Sts.

4.20 Summary of Environmental Issues

Table 4-33 Comparison of Alternatives

Environmental Resource Area	No Build	TSM	At-Grade	Underground
Land-Use and Development	0	+	+	+
Displacement and Relocation of Existing Uses	0	+	-	-
Community and Neighborhood Impact	0	+	-	-
Visual and Aesthetic Impacts				
Air Quality Impacts	0	+	+	+
Noise and Vibration	0	-	-	-
Ecosystems/Biological Resources	0	-	-	0
Geotechnical/Subsurface/ Seismic and Hazardous Materials Impacts	0	0	-	-
Water Resources	0	0	0	0
Energy				
Historic, Archeological and Paleontological Impacts	0	0	-	-
Parklands and Other Community Facilities	-	+	-	-
Economic and Fiscal Impacts	-	-	-	-
Safety and Security	-	-	-	-
Construction Impacts	-	-	-	-
Growth Inducing Impacts	+	+	+	+
Environmental Justice				
Major Utilities				
Total				