4.0 ENVIRONMENTAL CONSIDERATIONS

The PEROW/WSAB Corridor Alternatives Analysis (AA) transportation alternatives may have direct and indirect effects on the physical environment of the Corridor. This section analyzes the environmental consequences associated with the implementation of the No Build, Transportation Systems Management (TSM), Street Car, Light Rail Alternative (LRT) and Low Speed Maglev alternatives. Specific physical environment impact areas analyzed include: land use and economic development, acquisition and displacement, visual and aesthetics, cultural resources, air quality, climate change, noise and vibration, parks and recreation resources, environmental justice, and safety and security. The potential impacts on traffic and circulation and transit services are discussed separately in Section 3.0, Transportation Analysis.

Each environmental impact area assessment discusses existing conditions as well as possible effects of the Corridor alternatives during operation and construction. Operational impacts would generally be more substantial as they are on-going, while construction impacts would be temporary. Potential site-specific impacts are described based on planning efforts to date and currently available information. These impacts are considered reasonably representative for the purpose of comparing alternatives. During any subsequent preliminary engineering efforts, system design will become more detailed and revised assessments of environmental effects will be prepared and described in any subsequent Environmental Impact Report/Environmental Impact Statement (EIR/EIS) efforts. An example of this would be stormwater quality regulations both during construction and operation and all associated water quality controls boards, and state and local permits. Detailed information would be identified and addressed in future environmental phases.

The alternatives are evaluated based on study area section and alignment alternative within that study section and then the resulting benefits and impacts are summarized. The study area sections and alignment alternatives are previously described in Section 2.0 of this report.

4.1 Land Use and Economic Development

This section identifies the land uses around along the alignment and the potential station areas which demonstrate support for development of a transit system.

4.1.1 Affected Environment

The land use assessment identified existing and future land uses and their ability to support transit investment as well as any adopted transit-supportive plans within each city and future development and/or economic revitalization plans within a half mile radius of the station areas, regardless of alignment alternative. The study area has a diverse mix of land uses, including:

- Residential development is the highest percentage of land use with 50 percent of the property in the study area devoted to single-family homes and multi-family apartments and townhouses. Much of the housing in the Los Angeles County portion of the corridor was built during the

1930s to 1950s era. Southern California growth pushed south into Orange County in the 1960s; the Orange County portion of the corridor has a housing stock typically built during the 1960s and 1970s.

- Approximately 30 percent of the study area land is occupied with commercial and industrial uses, which is higher in the Northern Connections portion of the study area. This area was the manufacturing heart of Southern California up to the 1950s. A concentration of older industrial, manufacturing, and warehousing space is located in Los Angeles, Vernon, Bell, Bell Gardens, Cudahy, Downey, Huntington Park, Lynwood, and South Gate.
- The remaining study area land is occupied with a mix of uses including: public facilities, including civic centers, hospitals, and educational facilities; parks and recreational uses; freeways, streets, flood channels, and utilities; and other uses. A higher percentage of land in the Northern Connections Area is devoted to transportation and utility activities due to the freight rail and related intermodal facilities located in Los Angeles, Vernon, Huntington Park, and South Gate.

4.1.2 Applicable Laws and Regulations

There are no federal or state regulations governing land use, which are articulated primarily in regional and local plans. The Southern California Association of Governments (SCAG) defines the regional planning principles for the Corridor, while local municipalities define land uses for specific areas within their jurisdictional boundaries.

4.1.3 Evaluation Methodology

Land use data was used to identify current activities and uses, as well as apparently vacant and underutilized parcels, and to assess the extent to which opportunities for additional development exist within a 0.5 miles of the proposed stations. The evaluation takes into consideration known current and planned public and private development activities within each proposed station area. The compatibility of these opportunities with local land use policies that guide future land use and transportation planning was assessed.

Land Use Effects

A majority of the Corridor cities encourage and support development of transit through policies in their respective general plans, specific plans, and designation of redevelopment areas and development of related plans. Common objectives include:

- Serve Corridor activity centers;
- Achieve a high quality of life through a balanced mix of attractive residential neighborhoods, high-quality public services and economically viable and attractive commercial areas;
- Preserve residential neighborhoods and commercial and industrial districts; and
- Provide an integrated transportation system for the safe and efficient movement of people and goods with a minimal disruption to the environment within and through the city.

Economic Development Effects

The transportation investment can provide opportunities for transit-oriented development (TOD), which can serve as catalysts for public and private economic revitalization. As demonstrated by other transit projects, such as those completed by Metro, investments in transit station area development can provide economic benefits and enhanced quality of life to communities, while accommodating forecast population and employment growth. Analysis shows that many of the alternatives have a high number of possible TOD opportunities.

Additionally, the various city and community plans within the study area discuss goals and objectives for developing strong and competitive commercial sectors. Plans identify that development could include a mixture of land uses, promote economic vitality, and serve the needs of the community through well-designed, safe, and accessible areas, while preserving historic and cultural character.

4.1.4 Land Use and Economic Development Assessment

A station by station land use and policy assessment was completed in order to identify current land uses, compatible transit development, economic development opportunities, and redevelopment potential. Table 4.1 and Table 4.2 present the overview for which stations are associated with each alternative.

Additionally, a description of the Corridor cities' plans and policies located within a 0.5 mile radius of each proposed station area is presented, along with land use maps. The land use breakdown key is shown for reference in Figure 4.1.

Figure 4.1 – Land Uses

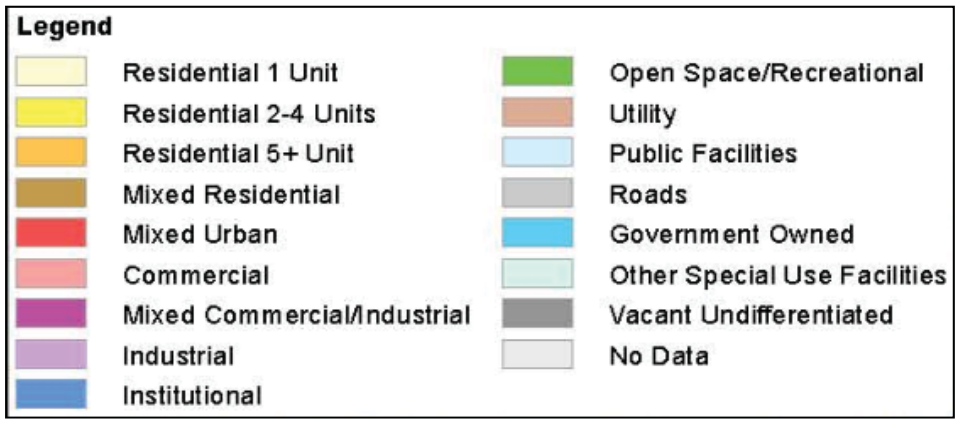


Table 4.1 – BRT Alternatives: Proposed Stations

Street-Running Alternative		HOV Lane-Running Alternative	
Northern Connection Area			
City	**Station**	**City**	**Station**
Los Angeles	Union Station	Los Angeles	7th/Metro Center
	Metro Gold Line Soto Station		
	Soto St./Whittier Blvd.		
	Soto St./Olympic Blvd.		
Vernon	Soto St./Vernon Ave.		**Harbor Transitway Stations**
Huntington Park	Pacific Blvd./Slauson Ave.		37th St./USC
	Pacific Blvd./Florence Ave.		Slauson/Harbor Freeway
South Gate	Long Beach/Firestone Blvds.		Manchester
	Firestone/Atlantic Blvds.		Harbor Freeway
Downey	Firestone /Lakewood Blvd.	Downey	
	Green Line Lakewood Station		Green Line Lakewood Station
PEROW/WSAB Corridor (common to both alternatives)			
Bellflower	Lakewood Blvd.	Bellflower	Lakewood Blvd.
	Bellflower Blvd.		Bellflower Blvd.
Cerritos	183rd St. /Gridley Rd.	Cerritos	183rd St. /Gridley Rd.
Artesia	Pioneer Blvd.	Artesia	Pioneer Blvd.
Cerritos	Bloomfield Ave.	Cerritos	Bloomfield Ave.
Cypress	Cypress College	Cypress	Cypress College
Anaheim	Knott Ave.	Anaheim	Knott Ave.
Stanton	Beach Blvd.	Stanton	Beach Blvd.
Garden Grove	Magnolia St.	Garden Grove	Magnolia St.
	Brookhurst St.		Brookhurst St.
	Euclid St.		Euclid St.
Garden Grove/ Santa Ana	Harbor Blvd.	Garden Grove/ Santa Ana	Harbor Blvd.
Southern Connection Area (common to both alternatives)			
Harbor Boulevard/1st Street/SARTC			
Santa Ana	Harbor Blvd./1st St.	Santa Ana	Harbor Blvd./1st St.
	1st St. /Fairview St.		1st St. /Fairview St.

	1st St. /Bristol St.		1st St. /Bristol St.
	SARTC		SARTC
Westminster/17th Street/Main Street/SARTC			
Santa Ana	17th St./Bristol St.	Santa Ana	17th St./Bristol St.
	Main St./Civic Center Dr.		Main St./Civic Center Dr.
	SARTC		SARTC

Table 4.2 – Guideway Alternatives: Proposed Stations

City	Station	East Bank Alternative			West Bank Alternative 1			West Bank Alternative 2			West Bank Alternative 3		
		SC	LRT	MLV	SC	LRT	MLV	SC	LRT	MLV	SC	LRT	MLV
Northern Connection Area													
Los Angeles	Union Station	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Soto St.	✓	✓	✓									
	7thSt./Alameda St.										✓	✓	✓
Vernon	Leonis/District Blvds.	✓	✓	✓	✓	✓	✓						
	Vernon Ave.							✓	✓	✓	✓	✓	✓
Huntington Park	Pacific Blvd.							✓	✓	✓	✓	✓	✓
	Gage Ave.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
South Gate	Firestone Blvd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Downey	Gardendale St.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PEROW/WSAB Corridor													
Paramount	Green Line (new)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Paramount Blvd./ Rosecrans Ave.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bellflower	Bellflower Blvd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cerritos	183rd St./Gridley Rd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Artesia	Pioneer Blvd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cerritos	Bloomfield Ave.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cypress	Cypress College	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Anaheim	Knott Ave.	✓	✓		✓	✓		✓	✓		✓	✓	
Stanton	Beach Blvd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Garden Grove	Magnolia St.	✓			✓			✓			✓		
	Brookhurst St.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Euclid St.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Garden Grove/ Santa Ana	Harbor Blvd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Southern Connection Area													
Santa Ana	**Harbor Boulevard/1st Street/SARTC Alternative**												
	Harbor Blvd./1st St.	✓	✓	--	✓	✓	--	✓	✓	--	✓	✓	--
	1st St./Fairview St.	✓	✓	--	✓	✓	--	✓	✓	--	✓	✓	--
	1st St./Bristol St.	✓	✓	--	✓	✓	--	✓	✓	--	✓	✓	--
	SARTC	✓	✓	--	✓	✓	--	✓	✓	--	✓	✓	--
	Westminster Boulevard/17th Street/Main Street Alternative												
	Westminster Blvd./ 17thSt./Bristol St.	✓	✓	--	✓	✓	--	✓	✓	--	✓	✓	--
	Main St./Civic Center Dr.	✓	✓	--	✓	✓	--	✓	✓	--	✓	✓	--

Note: SC – Street Car Alternative; LRT – Light Rail Transit Alternative; MLV – Low Speed Maglev Alternative.

Union Station

Description: This station is considered the transportation hub of Los Angeles as the central meeting point for various transit agencies in the county and across the western region. The station is adjacent to various culturally significant destinations as well as civic centers.

Predominant land uses surrounding the station area are industrial including rail yards and a federal jail. In addition, there is a balance of institutional uses in and around the civic center, as well as commercial and residential along culturally important corridors such as Olvera Street, Chinatown, and Little Tokyo.

Specific plans which support mixed use/TOD development in/around the station area include:

Central City North Community Plan: Part of the City of Los Angeles' Land Use Element the station area is located within Central City North Community Plan, which balances being a governmental, financial, and industrial hub while being the historic birthplace of the city.

Alameda District Specific Plan: Designated as a regional center, the plan envisions Union Station and its surrounding areas as the transportation hub of Southern California. Part of the Central City core, intensity of development stresses balance future transit investment while providing a livable community for its diverse residents and as the historical center of Los Angeles, to serve as a resource for tourists and city residents. Part of this plan encompasses the recent purchase of Union Station by Metro and through the Union Station Master Plan the agencies' continued effort to create a multi-modal, mixed-use urban district.

Clean Tech Corridor: A four mile district with areas surrounding Union Station, the goals are to support and create clean technology that will create jobs, stimulate the growth of a large marketplace for clean technology, and create a better quality of life through these new environmental solutions.

The Angels Walk Pedestrian Master Plan: Identifies specific networks to link the transit and pedestrian districts of historic downtown Los Angeles, including Little Tokyo, Bunker Hill, and the Music Center. It ties the public investment in bus and rail transit to urban design improvements which make the city more attractive to pedestrians.

The Project would be consistent with various General Plan policies including:

Transportation – Policy 2.20: Promote the multi-modal function of transit centers (bus and rail) through improved station design and management of curb lanes to facilitate transfers between modes (e.g. rail to bus or shuttle or taxi).

Transportation – Policy 2.21: Identify and develop transit priority streets which serve regional centers, major economic activity areas and rail stations to enhance the speed, quality and safety of transit service.

Transportation – Policy 5.7: Continue to expand the role of Union Station as the major regional hub for Amtrak, Metrolink, Metrorail, and high-speed rail service.

Housing – Policy 2.2.6: To accommodate projected growth to 2014 in a sustainable way, encourage housing in centers.

7th Street/ Alameda Street Station

Description: This station is located in an exciting area of downtown Los Angeles which is heavily influenced by the manufacturing history of the surrounding land uses but is evolving into an innovative corridor for new industry and capturing a diverse and eclectic art community as well.

Predominant land uses surrounding the station area are industrial and manufacturing, with pockets of commercial activities throughout. Much of the residential is occurring in converted industrial spaces.

Specific plans which support mixed use/TOD development in/around the station area include:

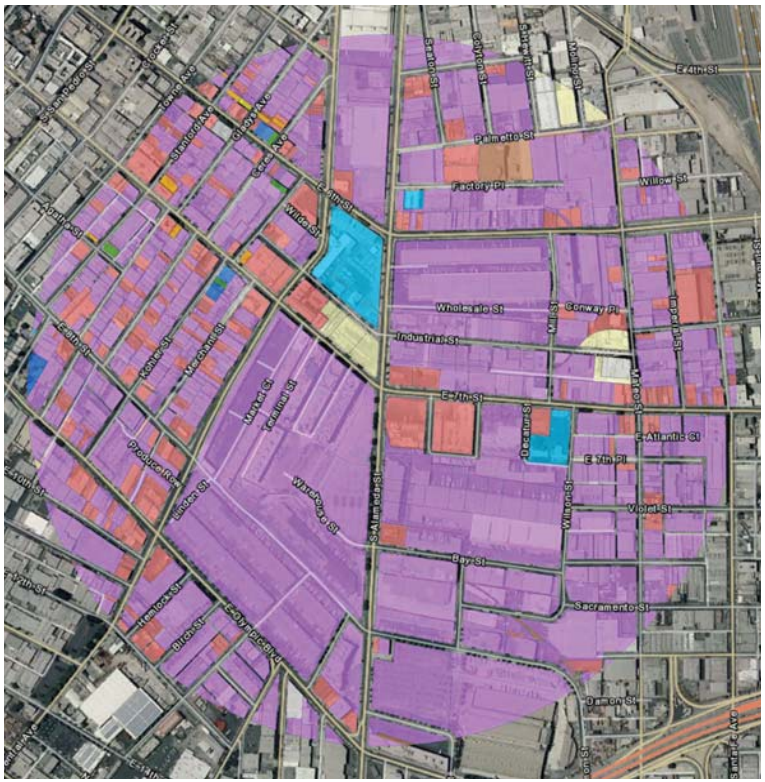
Central City North Community Plan: Part of the City of Los Angeles' Land Use Element and characterizes the station area within the Central City East district where heavy industrial and manufacturing jobs exist, while balancing the various social services and residential uses.

Alameda East Redevelopment Study Area: As identified by the CRA, the area involves an assessment of existing conditions and the potential to redevelop the Alameda East area as a "modern" industrial area.

Artists-in-Residence District: The station area is adjacent to an eclectic community of artists. The largest concentration of artists is located just northeast of the station between First and Palmetto Streets. This district is an integral part of the Central City North community.

Clean Tech Corridor: A four mile district encompassing the 7th/Alameda station area, the goals are to support and create clean technology that will create job opportunities, stimulate the continued growth of a large marketplace for clean technology, and create a better quality of life through these new environmental solutions. Immediately outside the half mile station area is the location of the CRA owned site designated as the Clean Tech Campus.

The Los Angeles River Revitalization Master Plan: The 20–year blueprint for development and management of the LA River, it's aim is to celebrate ecclectic neighborhoods, protect the health of the river, and leverage economic development and revialtzation projects.



The Project would be consistent with various General Plan policies including:

Transportation – Policy 1.7: Provide improved transportation services to support Citywide economic development activities and related economic revitalization initiatives.

Transportation – Policy 5.3: Actively support transportation projects which serve industrially designated districts.

Housing – Policy 2.2.3: Provide incentives and flexibility to generate new housing and to preserve existing housing near transit.

Soto Street Station

Description: This station is located on the outskirt of downtown Los Angeles in the community of Boyle Heights, adjacent to heavily trafficked corridors and industrial uses.
Predominant land uses surrounding the station area are industrial and manufacturing on the west and southwest; however, the station area also contains single and complex housing on the northeast.

Specific plans which support mixed use/TOD development in/around the station area include:

Boyle Heights Community Plan: Part of the City of Los Angeles' Land Use Element the station area is located within Boyle Heights Community Plan. The Plan promotes the vision of the community in preserving and enhancing characteristics of existing neighborhoods, improving economic vitality of commercial corridors, maximizing opportunities of future rail transit systems and planning the remaining commercial and industrial development opportunity sites for needed job-producing uses. Special Study areas located within the station area and identified as proposed concepts under the plan include: Sears: A major opportunity site for buildout or redevelopment opportunities which would significantly impact the surrounding uses and neighborhood; Wyvernwood: A new, mixed use/housing development; Mixed-Use node with incentives for neighborhood-serving uses; A proposed river improvement overlay zone.
Eastside Enterprize Zone: The station area is located within the zone which provides a variety of tax credits to eligible businesses as well as financing programs and other incentives to preserve existing businesses and encourage business expansion within the zone.
Los Angeles River Revitalization Master Plan: Identified as the Boyle Heights River Gateway Park, the Plan connects the large Sears site to the River and provide a much-needed multi-purpose park with both active and passive amenities in an underserved area. The project would result in improved River access, would complement and enhance the redevelopment of the Sears site and leverage economic development.

The Project would be consistent with various General Plan policies including:

Housing – Policy 1.4.1: Provide incentives to include affordable housing in residential development, particularly in mixed use development, Transit Oriented Districts and designated Centers.

Transportation – Policy 1.7: Provide improved transportation services to support Citywide economic development activities and related economic revitalization initiatives.

Transportation – Policy 2.8: Continue to integrate transit and environmental planning to enhance environmental preservation.

Vernon Avenue Station

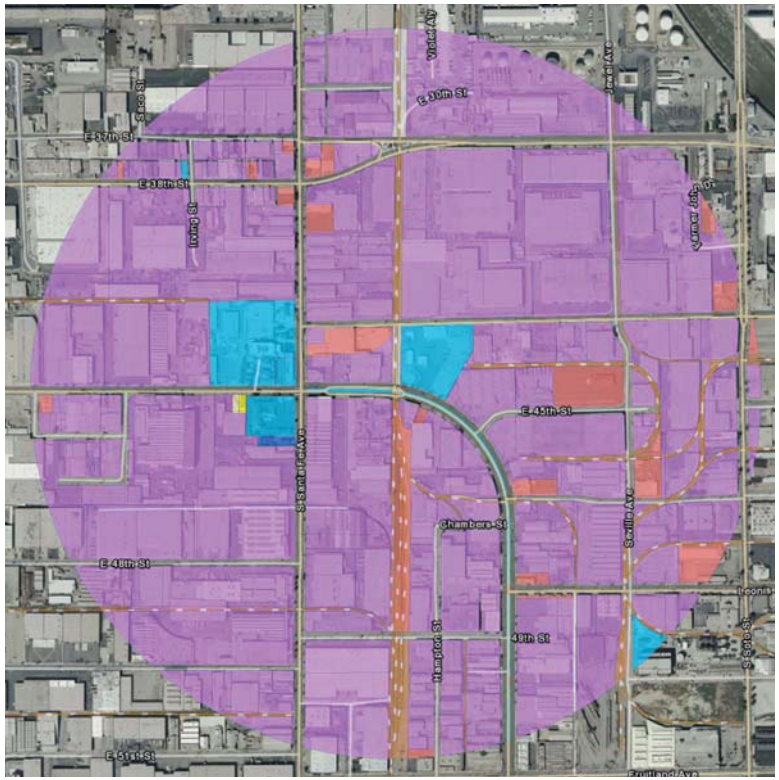
Description: This station is located in the heart of Vernon's industrial and manufacturing district which contributes to industries throughout the Southern California region, such as food and agriculture, apparel, steel, plastics, logistics and home furnishings.

The predominant land uses around the station area are industrial/manufacturing. The station is also adjacent to the city's civic center.

Specific plans which support mixed use/TOD development in/around the station area include:

Industrial Redevelopment Project Area: The station area is located within the city identified redevelopment area which emphasizes the importance of the maintenance of facilities to better aid the surrounding industries and their related workforce. The key policy objective of the city is to remain an exclusively industrial city, serving the needs of industry, including local, national, and international consumers of goods produced by manufacturers.

Commercial Overlay District: The Commercial Overlay District, encompassing 210 acres, is established along Santa Fe Avenue and along portions of Soto Street to accommodate retail, commercial, service, and restaurant uses that support the needs of the daily employee population.



The Project would be consistent with various General Plan policies including:

Circulation Policy 1.2: Continue to coordinate with the rail companies to provide for efficient rail service that minimizes impacts on the local street system.

Circulation Policy 1.7: Encourage the continued improvement of services provided by Metro to Vernon and adjacent cities to provide good access from home to job and job to home for persons employed in Vernon.

Circulation Policy 1.8: Encourage the use of ride sharing and public transit for persons employed in the City to reduce traffic congestion and the need for off-street parking in the City.

Leonis Boulevard/ District Boulevard Station

Description: This station is located within Vernon's employment dense manufacturing and industrial center.

The predominant land uses around the station area are industrial/manufacturing with some single and multi family residential on the southeast corner. The station area is also adjacent to the Los Angeles river.

Specific plans which support mixed use/TOD development in/around the station area include:

Industrial Redevelopment Project Area: The station area is located within the city identified redevelopment area which emphasizes the importance of the maintenance of facilities to better aid the surrounding industries and their related workforce. The key policy objective emphasizes the desire to remain focused on the needs to local industry and commerce while providing needed services to local residents.

The Los Angeles River Revitalization Master Plan: The 20–year blueprint for development and management of the LA River, it's aim is to celebrate ecclectic neighborhoods, protect the health of the river, and leverage economic development and revialtzation projects.

The Project would be consistent with various General Plan policies including:

Circulation Policy 1.7: Encourage the continued improvement of services provided by Metro to Vernon and adjacent cities to provide good access from home to job and job to home for persons employed in Vernon.

Circulation Policy 1.8: Encourage the use of ride sharing and public transit for persons employed in the City to reduce traffic congestion and the need for off-street parking in the City.

Circulation Policy 1.13: Cooperate with the Metropolitan Transportation Authority and other local agencies in their efforts to complete a bicycle path along the levee of the Los Angeles River connecting to adjacent jurisdictions.

Pacific Boulevard Station

Description: This station is located in a dynamic area of the City of Huntington Park, surrounded by an eclectic mixed use corridor and vibrant pedestrian activity including commercial, entertainment, and retail all while maintaining a vibrant cultural influence. Pacific Boulevard is a key transit hub servicing more than 14,000 weekly Metro and DASH users.

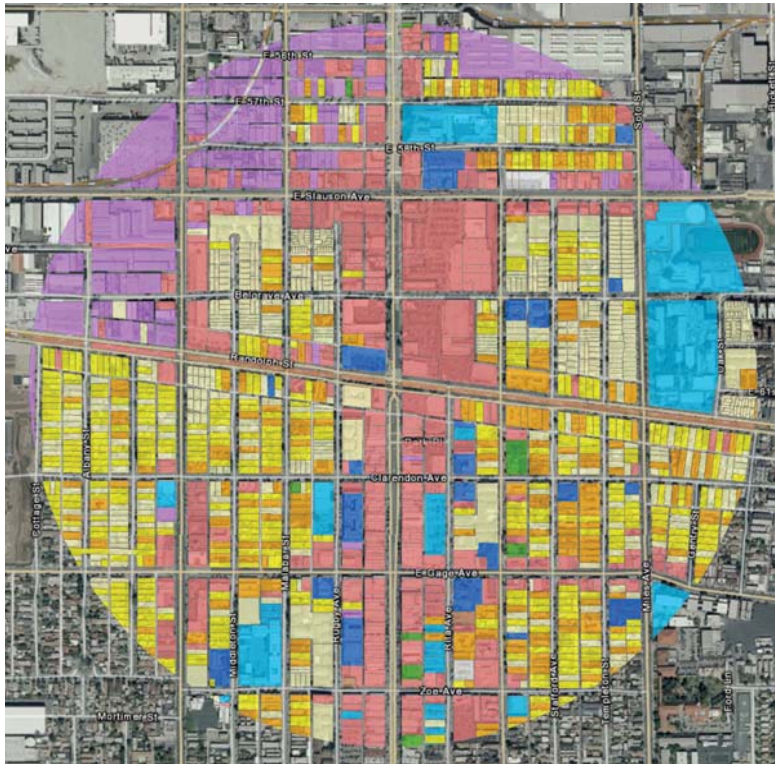
Commercial activities dominate along the major north-south corridor, Pacific Blvd, as well as smaller 'node' centers around the station area. Single and multi-family residential to the south are mixed with industrial land uses to the north and northwest with some institutional as well.

Specific plans which support mixed use/TOD development in/around the station area include:

Downtown Huntington Park Specific Plan: Downtown Huntington Park is one of the most successful and popular retail shopping areas in Southern California for the Latino population and revitalization is meant to strengthen the ties to the community and provide a place for events and street fairs. The vision for the Plan is to integrate Hispanic cultural needs with historical architecture and traditions through preservation, restoration, and promoting identity along storefronts, and businesses. Four distinct districts makes up the plan and provide the vision for development: A) Gateway, B) Festival, C) Neighborhood, and D) Zoe

Merced/ Santa Fe Redevelopment Area: Bound by the city limits to the west and north, State St. and Seville Ave. to the east, and Randolph St. and Florence Ave. to the south. The area was established to enhance the economic stability of the city through economic development and affordable housing programs.

Downtown Business Improvement District (BID): The strategic plan is a companion to the city's redevelopment plans and Downtown Specific Plan to guide efforts for downtown beautification, promotion/ marketing strategies, economics /business forecasts, cleanliness/ security issues, and parking/transportation.



The Project would be consistent with various General Plan policies including:

Land Use Element Policy 1.2: Encourage community-oriented retail in Huntington Park while continuing to revitalize Pacific Boulevard as a regional retail destination.

Circulation Element Policy 4.2: Work with the Southern California Rapid Transit District to coordinate connections to the light rail Blue Line running from Long Beach to Los Angeles west of Huntington Park.

Circulation Element Policy 5.7: Pursue alternative uses of the Southern Pacific Railroad ROW on Randolph St., such as green space, parking areas, and bike paths, if the right-of-way is abandoned for rail use.

Gage Avenue Station

Description: This station is located adjacent to the City of Huntington Park's major industrial centers in addition to being surrounded by long established communities and large open spaces/parks.

The predominant land uses surrounding the station area are single and multi family residential on the east and west with large industrial/manufacturing parcels and parks along the north –south corridor, Salt Lake Ave. Commercial land uses align the east-west Gage Ave. corridor.

Specific plans which support mixed use/TOD development in/around the station area include:

Neighborhood Preservation Redevelopment Project Area: Objectives of the plan include providing affordable housing and homeownership opportunities, revitalize rundown neighborhoods, improve street lighting, and improve the overall quality of life for residents.

Economic Development Strategic Plan: Conclusions of the Plan identify industrial development and contemporary retail development as the key economic opportunities in the city. Based on the city's job growth, the market has potential to absorb considerable industrial uses; this includes the areas north of the Gage station.

Existing Park Opportunities and Constraints: The city identified potential redevelopment areas for the largest park in Huntington Park, Salt Lake Park, adjacent to the Gage station area. The park is the most developed and offers the most recreational opportunities however support exists for musical and theatrical performance centers and pavilions. The proposed station area is within walking distance and would be an asset to children and seniors who are frequent users of the park services.

The Project would be consistent with various General Plan policies including:

Circulation Element Policy 5.1: Maintain existing pedestrian facilities and encourage new development to provide pedestrian walkways to adjacent developments.

Open Space Element Policy 4.8: Increase access to all City open space and recreational areas, including for the disabled and those who depend on public transit.

Open Space Element Policy 1.6: Encourage bike paths and lanes to reduce vehicular travel and air pollution. Bike paths could be developed along portions of the LADWP utility easement and along the Southern Pacific Railroad ROW on Randolph St., should the ROW be abandoned.

Firestone Boulevard Station

Description: This station is located along one of the City of South Gate's busiest thoroughfares, Firestone Blvd., within a major industrial district and adjacent older neighborhoods.

Predominant land uses surrounding the station area consist of industrial on the north and southeast along with a large recreational parcel and single/multifamily residential on the southwest.

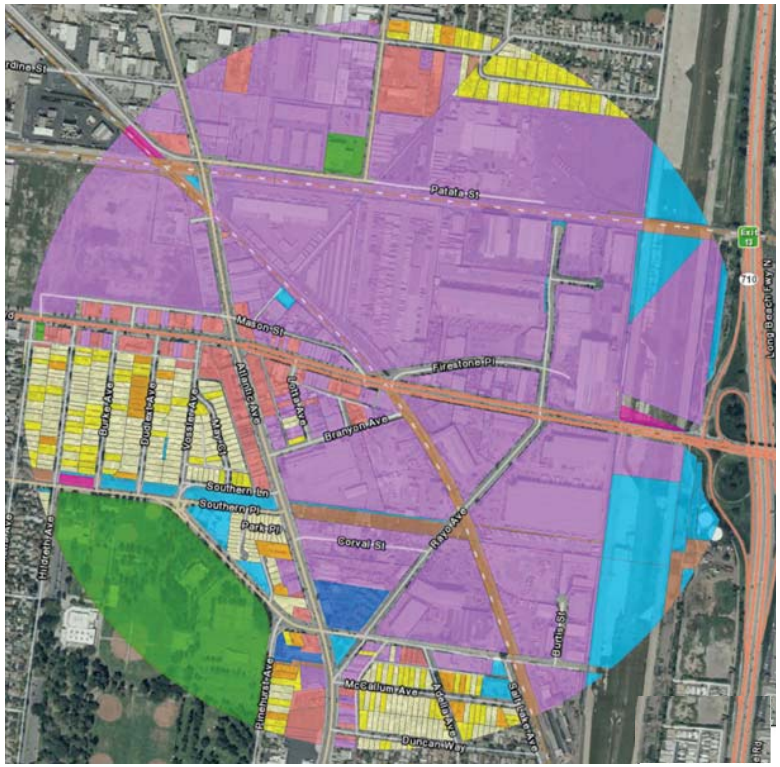
Specific plans which support mixed use/TOD development in/around the station area include:

Rayo Industrial District: As identified in the City of South Gates General Plan, the station is located within the Rayo Industrial District. The various districts identified throughout the city are areas intended to be higher intensity development. This particular area is seen as a new transit-oriented village near the intersection of Firestone and Atlantic, to create a pedestrian and transit-oriented environment. New transit uses should be explored for the area and a mixed use district with high density housing, retail, and office use.

Gateway District: The Gateway District will be transformed from an industrial area into a retail, entertainment and transit-oriented mixed use District that serves as the visual gateway to South Gate. The District will also support the city's vision of creating a destination retail and entertainment corridor on Firestone between San Miguel and the Rio Hondo Channel. The district has 4 sub-areas : 1)regional retail destination 2) multimodal station 3) higher intensity employment uses and 4) mixed use with ground floor retail uses below office and residential uses.

South Gate Enterprise Zones: The station area is located within an established enterprise zone which offers special state and local incentives to encourage investment and promote the creation of new jobs.

Firestone Blvd Corridor: Firestone Blvd is the main east to west arterial roadway through South Gate and is considered the city's "window to the world." The corridor is envisioned as having major destination retail centers, streetscape improvements, and gateway treatments.



The Project would be consistent with various General Plan policies including:

Mobility Element 2.1– Policy 8: The City should coordinate the provision of the non-motorized networks (bicycle and pedestrian) with adjacent jurisdictions to maximize connectivity.

Mobility Element 2.2 – Policy 2: The City should encourage Metro to enhance regional transit connections in South Gate through additional routes and increased service frequency.

Mobility Element 2.2 – Policy 7: The City should encourage and support all potential rail transit serving the City, including a high speed, grade separated, environmentally friendly transit system along the Union Pacific Railroad right-of-way.

Gardendale Street Station

Description: This station is located in a dynamic area of the City of Downey where redevelopment and revitalization plans are creating a visionary mixed-use regional employment and destination center

The predominant land uses surrounding the station area are single institutional to the north and northeast and single family residential south and southwest. Industrial uses dominate the main north-south corridor.

Specific plans which support mixed use/TOD development in/around the station area include:

Rancho Los Amigos Specific Plan: The business center, located in the southwest corner of the city, is a public/private joint venture between the County and Fremont Properties on County-owned Rancho Los Amigos Medical Center land. The concept involves phasing out the existing medical center and replacing it with commercial manufacturing, including professional offices, research and development activities, light manufacturing, financial institutions, and restaurants. Retail uses would also be of convenience to employees and visitors of the other uses in the area.

Redevelopment Plan for the Downey Redevelopment Project: The proposed station is located within *SITE A, Gardendale/Paramount Area*. The Plan includes the city's desire to improve, upgrade, and revitalize all areas of the city which have become blighted because of deterioration, disuse and unproductive conditions. Objectives include providing construction and employment opportunities in the new industrial/ commercial establishments as well as encouraging existing, surrounding owners, businesses, and tenants to participate in the redevelopment activities, thus sustaining the existing economic base of the community.

The Project would be consistent with various General Plan policies including:

Land Use Policy 1.2.1 – Program 1.2.1.2: Promote mixed-use developments with housing on the same site or in proximity to commercial services to reduce the need for trips by vehicles.

Economic Development Policy 9.1.2 – Program 9.1.2.2: Capitalize on the regional draw generated by Stonewood Mall, Downey Landing site, and other regional-oriented land uses.

Circulation Element Policy 2.4.1 – Program 2.4.1.1: Coordinate with Caltrans, MTA, SCAG, Gateway Cities COG and other agencies to promote multi-modal improvement strategies to improve the regional transportation network.

Metro Green Line Station

Description: This station is located at the intersection of the 105 FWY and Lakewood Boulevard, at the existing Metro Green Line station. The station is between the City of Downey and the City of Paramount.

The currently running Green Line serves predominantly surrounding residential uses, followed by commercial and mixed uses along the major thoroughfares on the northern and southern edges of the half mile area. There also exists a number of institutional/education uses.

Specific plans which support mixed use/TOD development in/around the station area include:

Downey Specific Plan: The station area is located along Lakewood Boulevard, which is identified as a major connection corridor to the City of Downey's downtown and the Specific Plan area. The Plan establishes five districts in the approximately 85-acre Downey downtown area and intensifies residential uses by 79 percent and commercial uses by 58 percent in the downtown. New development would be within proximity of major regional transportation opportunities, including several major highways and the Metro Green Line. Therefore, the Specific Plan would be consistent with SCAG goals to reduce the prominence of the suburban development pattern that exists throughout the region.

The Project would be consistent with various General Plan policies including:

Circulation Policy 2.2.2 – Program 2.2.2.2: Establish a bikeway master plan to link employment centers, recreational facilities, and bikeways along Rio Hondo River, the San Gabriel River, Union Pacific Railroad Line, and those neighboring communities via a network of bike routes, lanes and paths.

Circulation Policy 2.2.4 – Program 2.2.4.4: Evaluate providing a transit stop for the intercommunity transit service (DowneyLINK) at the Green Line Metro Rail Stations at Lakewood & 105 FWY and at Studebaker Road in the City of Norwalk to provide added convenience for transfer passengers to MTA routes.

Paramount Boulevard/Rosecrans Avenue Station

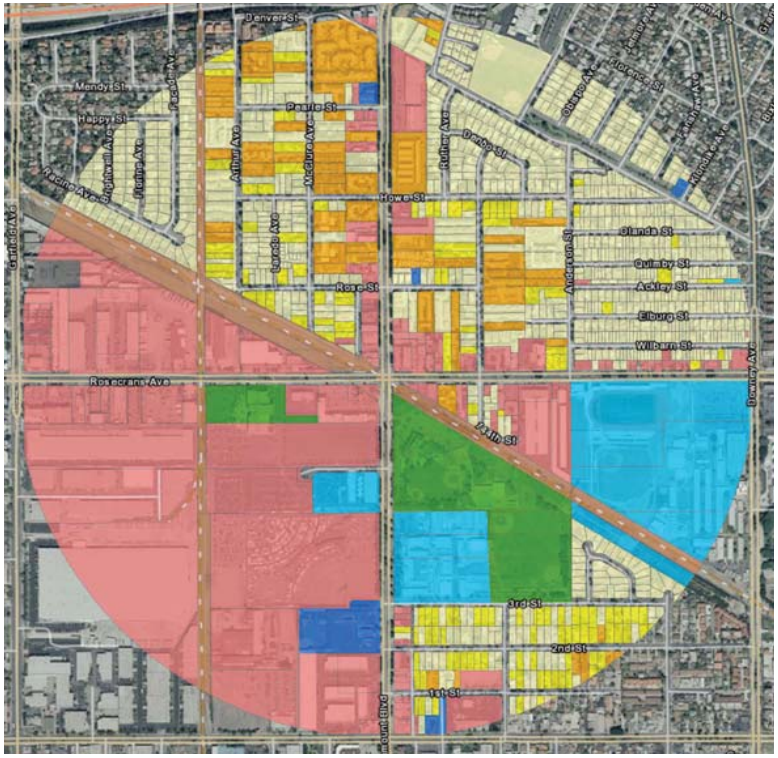
Description: This station is located at the northern end of the PEROW/WSAB Corridor, the nearest connection to the 105 FWY, adjacent to the heart of the City of Paramount's commercial core.

Predominant land uses surrounding the station area consist of commercial and institutional/open space on the southeast and southwest and high single/multifamily on the north.

Specific plans which support mixed use/TOD development in/around the station area include:

Paramount Area Plans (Redevelopment Areas): The station area falls between Redevelopment Area 1 and Area 2 which are targeted for special revitalization opportunities; The Clearwater East Area Plan, the Clearwater North, and Howe Orizaba Area Plan. Area 1 promotes offices, commercial and light industrial uses and adjacent to the arterials and ROW. Area 2 Plans are designed to encourage the development of high quality residential that are compatible with existing neighborhoods.

Paramount Area Plans (Redevelopment Areas): The commercial rehabilitation program is the city's tool to achieve its urban landscape goals. It's aimed at revitalizing commercial and industrial properties, including many within the station area. Utility and railroad corridors were identified as presenting special opportunities for beautification.



The Project would be consistent with various General Plan policies including:

Transportation Element – Policy 6: The City of Paramount will continue to support the development and expansion of the region s public and mass transit system.

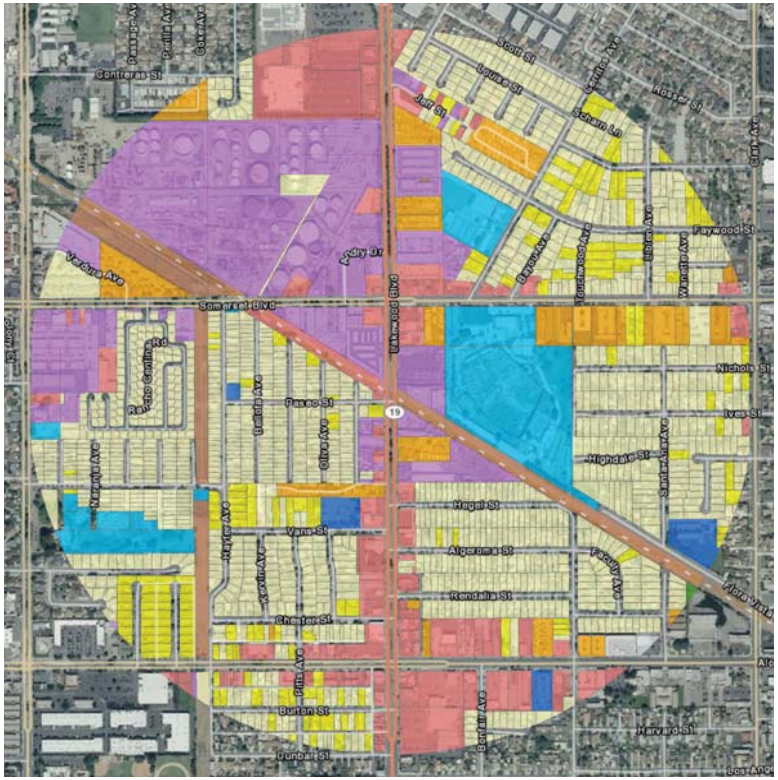
Transportation Element – Policy 11: The City of Paramount will continue to support the local public transit system and ongoing efforts to improve connections with other regional transit facilities and services (MTA bus service, Long Beach Transit, Green Line, etc.)

Land Use Element – Policy 17: The City of Paramount will develop new open space area in utility rights-of-way, along the Los Angeles River, and as part of future park development.

Lakewood Boulevard Station

Description: This station is located adjacent to major industrial/manufacturing while still maintaining a neighborhood scale feel.

The land uses around the Lakewood station area are quite a mix of single and multifamily on the southwest and east while immediately adjacent there are industrial uses and commercial along the north-south corridor. The Bellflower bike path intersects the station location and is an excellent example of recreational uses along and underutilized corridor and provides opportunities for creative synergy with future transit systems.



The Project would be consistent with various General Plan policies including:

Circulation Element – Policy 4.3: Provide pollution–free and congestion-reducing bicycle, jogging, walking, handicapped-accessible pathways and lanes which link major destination centers within the City as practical.

Circulation Element – Policy 4.1: Promote the use of alternative forms of transportation other than single passenger cars to reduce congestion, traffic, noise and air quality impacts.

Land Use Goal 1 – Policy 1.2: Encourage opportunities to sensitively integrate different, but compatible, land uses.

Bellflower Boulevard Station

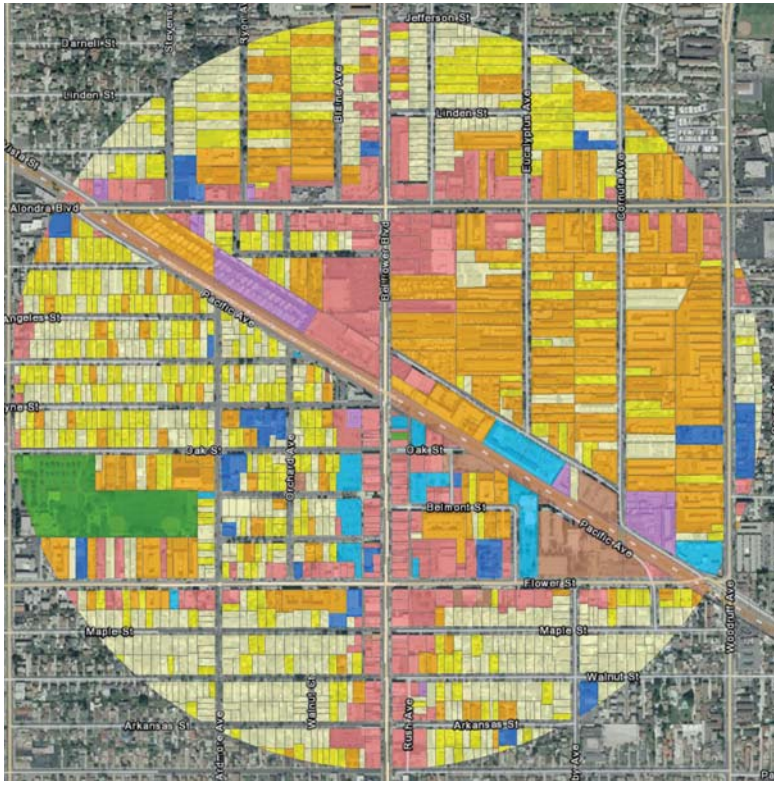
Description: This station is located in the heart of the City of Bellflower's main street which consists of small scale, pedestrian friendly corridor aligned with mixed commercial and gives an "old town" feel. The location is adjacent to the city's civic center and is surrounded by extremely walkable small streets which lead to close knit residential neighborhoods.

There is an eclectic mix of land uses around the station area. The main north-south corridor and east-west arterials consist of mixed-uses and commercial while single and multifamily residential make up the fabric throughout. Various institutional uses are located within the station area as well, including Bellflower City Hall, a courthouse and various schools.

Specific plans which support mixed use/TOD development in/around the station area include:

Downtown Bellflower Revitalization Vision Strategy: The station area is located within the Project Area 1, the original impetus for identifying revitalization and redevelopment opportunities with emphasis on eliminating blight and creating affordable housing. The Strategy contributes to pedestrian plazas and mixed use development and current plans include adoption of a future specific plan and/or overlay zone through SCAG Compass Blueprint, which will include TOD and sustainable development language and provisions.

Bellflower Village Overlay Zone – North: The intent of the overlay zone is to emphasize the importance of Downtown Bellflower in providing a tangible link to the city's rich historical past, geographic central focal point, a recognizable town center and a hope for renewed civic vitality. The zone establishes location and intensity and character of uses for redevelopment as well as connectivity, whether through transit, pedestrian linkages, or bike paths. Additionally, the existing Bellflower bike path which crosses through the zone provides great linkage opportunities for the local communities and possibly a regional connection.



The Project would be consistent with various General Plan policies including:

Land Use Element – Town Center - Policy 3: Accommodate uses and provide for physical features which induce and enhance positive social uses and high levels of pedestrian activity in Town Center.

Land Use Element – Commercial – Policy 3: Through zoning overlay districts or specific plans, create unique commercial shopping opportunities.

Open Space – Policy 3.6: Work with the MTA and local agencies to complete the "West Santa Ana Branch Bikeway – Greenway" project.

183rd Street/Gridley Road Station

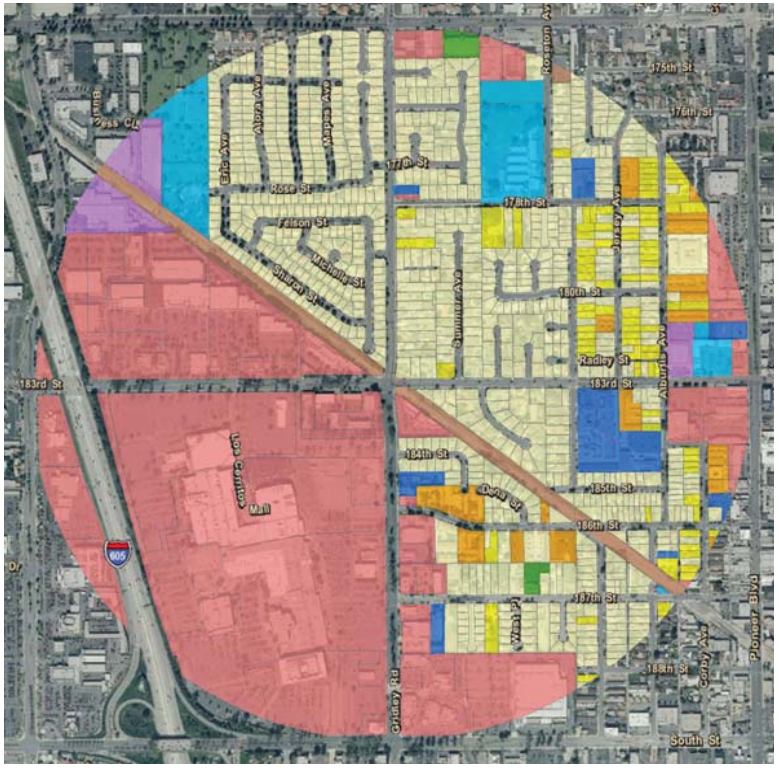
Description: This station is located adjacent to one of the City of Cerritos' major commercial and employment centers, Cerrito's Auto Square. This center is a regional powerhouse, attracting people from outside the city while providing considerable employment to the community.

The land uses in the station area are split almost evenly with commercial making up the entire southwest and single and multi family to the east and northeast. Institutional and open spaces are found throughout as well.

Specific plans which support mixed use/TOD development in/around the station area include:

Los Cerritos Development Plan (Redvelopment Area) : The main objectives of the Plan are to promote new community development that is viable, both physically and economically. The Plan strives to assist the private sector in providing the type of development that will maximize development and prevent reoccurrence of blighted conditions.

Specific Plan - Area Development Plan Five (ADP-5): Cerritos Auto Square : Located within the Los Cerritos Redevelopment Area, the objectives are to establish a regional automobile shopping complex, establish cooperation and coordination of local participants, establish a long-range and ongoing source of economic strength for the community, protect and enhance all attributes of development so as not to detrimentally affect existing developments, and incorporate innovative and quality site planning and architectural features. The Auto Square is a regional destination center and fully developed.



The Project would be consistent with various General Plan policies including:

Circulation Element Policy 6.6: Encourage the provision of additional regional public transportation services and support facilities, including park-and-ride lots near the freeway interchanges and within village centers.

Circulation Element Policy 6.3: Require new development to incorporate design features which facilitate transit service and encourage transit ridership such as bus stop facilities, and efficient pedestrian paths through projects to transit stops.

Circulation Element Policy 8.6: Participate in local and regional transit system/commuter-rail/transportation demand management planning and implementation activities to improve connections between the systems and ease of use of systems

Pioneer Avenue Station

Description: This station is located at the end of the City of Artesia's main commercial corridors with an integrated mixed use of retail plazas, cultural destinations, restaurants, and adjacent single family residential.

Various types of existing land uses are found around the station area including commercial corridors along Pioneer Blvd and South St., multi and single family housing on the north and south and a regional park.

Specific plans which support mixed use/TOD development in/around the station area include:

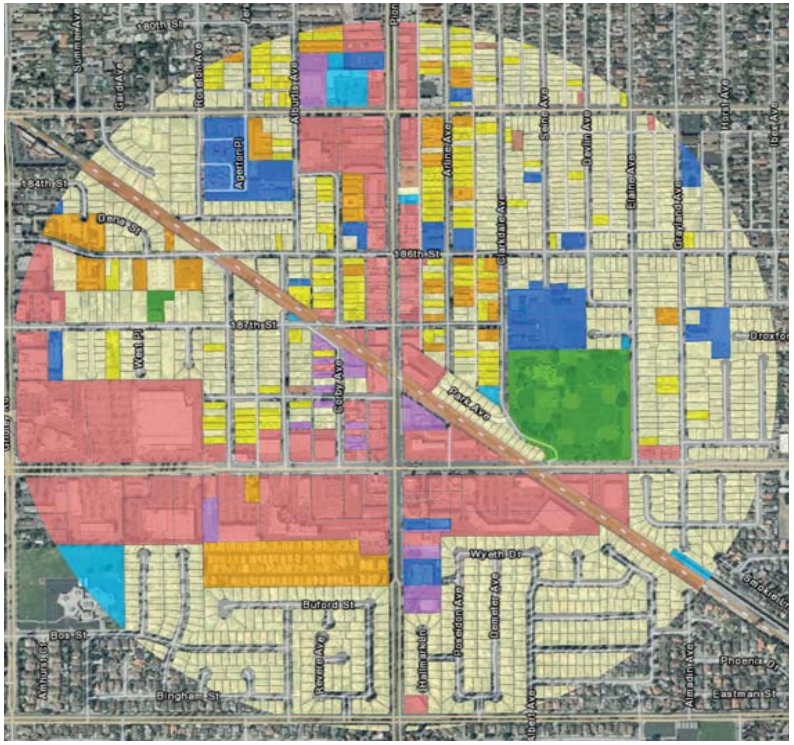
Pioneer Specific Plan: The plan encourages locally serving commercial retail development that enhances functional integration of adjacent single family neighborhoods with this major mixed-use, pedestrian friendly corridor.

Artesia Blvd (Corridor) Specific Plan: Establishes and strengthens the future commercial development for the corridor.

South Specific Plan: The South Street Gateway commercial area is envisioned as a commercial node that enhances functional connectivity with the City Center Mixed Use Area with the focus of introducing higher intensity and integrated development.

Downtown Specific Plan: The City Center mixed use designation encourages the development and redevelopment of a complementary mix of commercial retail, office and residential uses to expand economic vibrancy and livability in the city's core commercial area.

Auto Center Corridor Specific Plan: The Plan was established to help promote the continued development of auto dealerships along Artesia Blvd. and provide continued preservation, and enhancement of related commercial/retail uses in an attractive setting that is unique and distinctive.



The Project would be consistent with various General Plan policies including:

Circulation Policy 4.1: Promote a balance of residential, commercial, institutional and recreational uses with adjacencies that reduce vehicle miles traveled.

Circulation Policy 5.1: Promote the use of public transit.

Circulation Policy 6.3: Continue to foster partnerships with adjoining cities and regional agencies, as well as utility companies and transportation agencies with right-of-ways within the City, in order to facilitate transit opportunities.

Bloomfield Avenue Station

Description: This station is located adjacent the City of Cerritos' regional park, as well as various recreational facilities and schools, and surrounding established neighborhoods.

The predominant land uses in the station area are single family residential throughout the north and south and open space/institutional immediately adjacent to the station and to the southwest.

Specific plans which support mixed use/TOD development in/around the station area include:

Los Coyotes Development Plan (Redvelopment Area) : The main objectives of the Plan are to promote new community development that is viable, both physically and economically. The Plan strives to assist the private sector in providing the type of development that will maximize development and prevent reoccurrence of blighted conditions.

Specific Plan - Area Development Plan Four (ADP-4): Shadow Park: Located within the Los Coyotes Redevelopment Area, residential development is the main category of land use. The intent of the area is to capitalize upon the highly desirable characteristics of the area and its vicinity by integrating common open space with low density single family residential. The objectives are to provide a residential environment that fosters human interaction, neighborhood identity and pedestrian-oriented uses all while complimenting the beauty of Cerritos Regional Park.

The Project would be consistent with various General Plan policies including:

Open Space Policy 1.1: Promote the development of aesthetically pleasing landscaped corridors that promote a sense of the natural environment.

Circulation Element Policy 8.2: Promote an increase in the use of public transit and para-transit services.

Community Design Element Policy 2.5: Promote pedestrian circulation throughout the community through the provision of sidewalks and other pedestrian paths that connect neighborhoods, parks, schools, shopping, employment centers and other major activity centers.

Cypress College Station

Description: This station is located adjacent to the City of Cypress' college, along one of the city's main commercial corridors, Lincoln Blvd., lined by various mixed use uses and development.

Immediately around the station area there is a mix of mixed-use commercial surrounded by medium to high density residential neighborhoods .

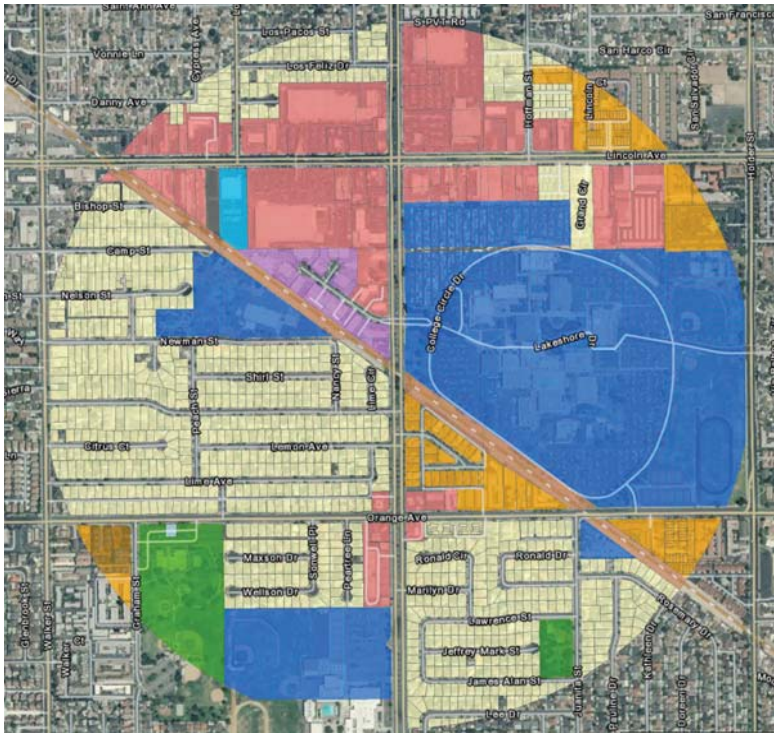
Specific plans which support mixed use/TOD development in/around the station area include:

Lincoln Avenue Specific Plan: The Specific Plan promotes the creation of unique "activity nodes" along the corridor to encourage economic stimulation, including higher density residential and plazas. The plan also stresses the importance of upgrading the visual image and creating an exciting atmosphere to visit.

Lincoln Avenue Redevelopment Area: The station area falls within the Redevelopment Area which highlights Lincoln Avenue as one of the major commercial corridors in the City of Cypress and consists mainly of mixed-use and highway-oriented businesses.

Civic Center Redevelopment Area: Within the 0.5 mile station area, the Redevelopment Area consists of five project areas, focusing on expanding civic and governmental services, developing underutilized parcels, and enhancing a variety of educational and open space resources.

Cypress College Comprehensive Master Plan: The Plan is part of a District-wide approach to the development of an organized plan for the future – including education and facilities plan forecasted for the next 10 years. The Plan recognizes the potential for transit uses along the ROW for both students, faculty, and community residents.



The Project would be consistent with various General Plan policies including:

Land Use Policy 4.1: Develop citywide visual and circulation linkages through strengthened landscaping, pedestrian lighting, and bicycle trails.

Land Use Policy 19.1: Encourage the extension of Light Rail through the City to serve Lincoln Avenue and Cypress College.

Circulation Policy 2.1: Encourage development and improvements which incorporate innovative methods of accommodating transportation demands.

Circulation Policy 2.2: Give high priority to the establishment of a high-quality public transit system that minimizes dependency on the automobile.

Knott Avenue Station

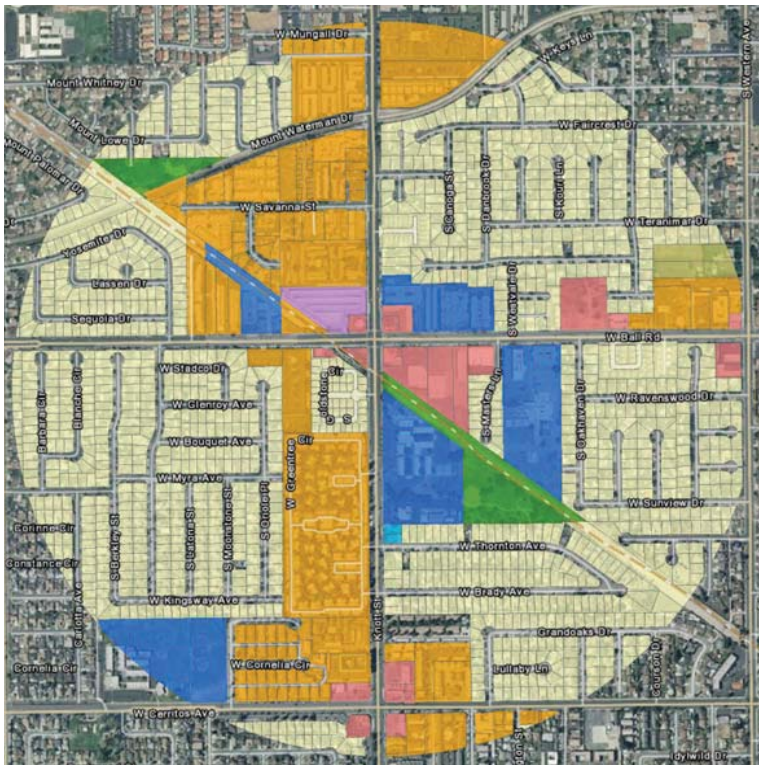
Description: This station area is located at the western edge of one of the City of Anaheim's main transportation corridors. This key arterial provides connections to the cities world class tourist destinations, and commercial centers.

Adjacent land uses within the station study area include a variety of institutional and recreational/open space as well as higher density residential along the north-south corridor and high number of single family residential.

Specific plans which support mixed use/TOD development in/around the station area include:

West Anaheim Commercial Corridors Redevelopment Area: The station area is located within one of the City of Anaheim's six redevelopment project areas. The focus is to encourage new residential development along focused commercial corridors concentrating and enhancing commercial uses at strategic intersections, creating recognizable mixed-use areas.

City of Anaheim Bicycle Master Plan: The Plan emphasizes the importance of linkages between bicycling and other modes of transportation, including bus services, commuter rail service, and park-and-ride locations. The Plan identifies Knott Ave. at Ball Rd. as a proposed Class II bikeway as well as the location of bicycle parking amenities.



The Project would be consistent with various General Plan policies including:

Circulation Goal 5.1 –Policy 3: Support transit supportive land uses in new development.

Circulation Goal 6.1 –Policy 1: Support efforts to enhance intercity and commuter rail systems and services.

Circulation Goal 7.1 –Policy 7: Maximize the use of easements and public rights-of-way along flood channels, utility corridors, rail lines and streets for bicycle and pedestrian paths.

Beach Boulevard Station

Description: This station is located in the heart of the City of Stanton's Town Center, which includes a balance of business, office, and residential uses.

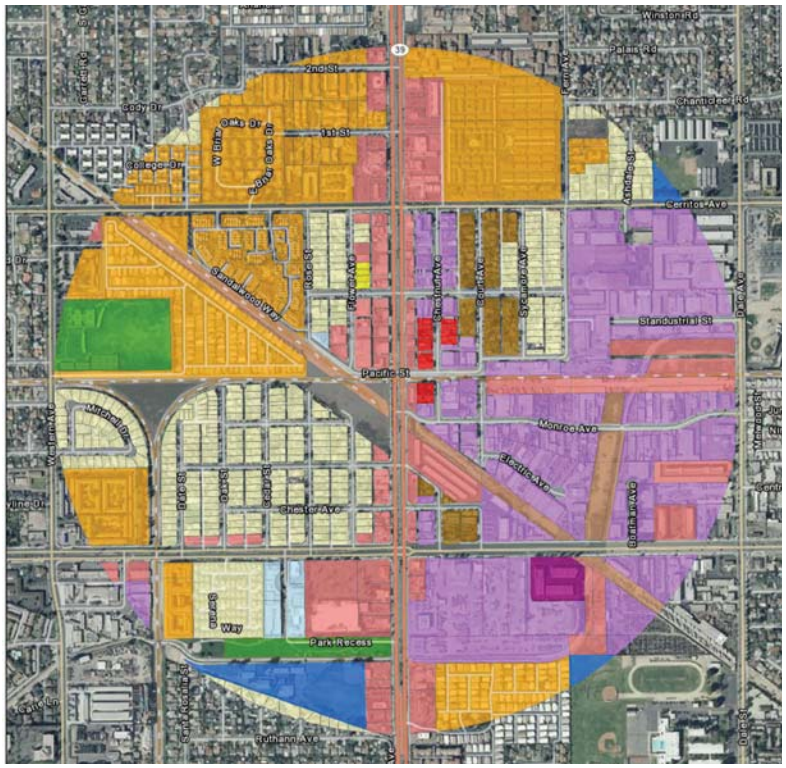
There exists a mix of high-mid density residential to the northeast and southeast and industrial uses dominate the southeast. Mixed uses exist along the main north-south corridor.

Specific plans which support mixed use/TOD development in/around the station area include:

The Town Center Mixed-Use Redevelopment District: Focused on community-serving uses in a transit supportive environment, with emphasis on a balance of residential, office, and commercial uses. The District is intended to be a pedestrian friendly district with strong linkages between different uses and easy access to future transit.

Stanton Civic Center District: This District emphasizes the evolving, redevelopment of the District's several older commercial centers. Mixed-use designations along Beach Blvd. and Katella Blvd. build upon the city's vision to encourage development and higher densities in key areas. Additionally, Beach Blvd. is a Caltrans-designated "Super Street" and serves as a primary corridor transecting the center of the city and Katella Blvd. is an OCTA "Smart Street".

Stanton Plaza Specific Plan: The site is located in the central portion of the city and is envisioned to serve as a recognizable place with its own unique character that portrays a positive aesthetic image to residents and visitors alike. It is an especially valuable asset to the city's most important corridor. Intended to capture regional traffic along Beach Blvd. as well as linking with surrounding neighborhoods by creating a special, mixed-use place attractive as a destination as well as a neighborhood serving complex.



The Project would be consistent with various General Plan policies including:

Community Dev Action CD-4.1.2 (b): Utilize areas such as railroad rights-of-way and flood control channels to provide additional multi-use paths for both pedestrians and bicyclists.

Economic Dev Action 5.1.2 (b): Conduct and implement a plan for expanding transit opportunities and transit supportive development within the City.

Transportation Action ICS-1.2.2 (a): In conjunction with OCTA, conduct preliminary planning for several alternative uses of the Pacific Electric and Union Pacific Corridors that take advantage of future opportunities to place Stanton as a regional mass transit center, and ensure the safety and convenience of Stanton residents.

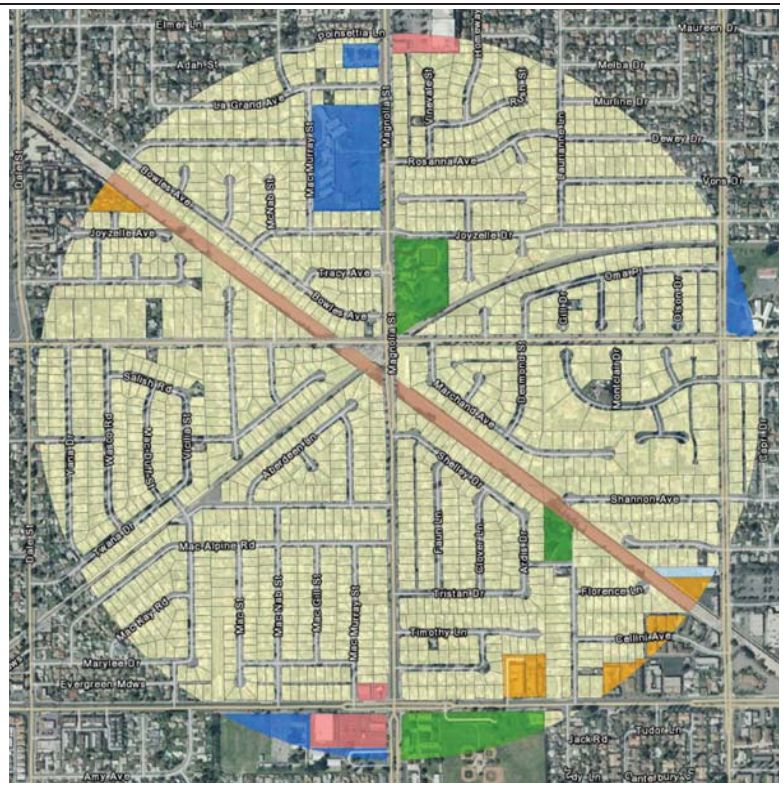
Magnolia Street Station

Description: This station is located within established residential neighborhoods where smaller scale development and pedestrian amenities enhance the "hometown" feel and character of the community.

The predominant land use in the station area is single family residential with a few open space/parks and schools on the northern and southern edges.

Specific plans which support mixed use/TOD development in/around the station area include:

Garden Grove General Plan 2035: Although currently not designated as a mixed-use district, the Magnolia station area is seen as high potential for a small scale, neighborhood station which could incorporate pedestrian and bike amenities along the ROW and connections to the two major stations east. The diverse range of neighborhoods includes areas with the city's older homes and beatifically maintained communities and this is where it is key to balance the needs of these residents while revitalizing unused parcels.



The Project would be consistent with various General Plan policies including:

Land Use Policy 1.4: Encourage active and inviting pedestrian-friendly street environments that include a variety of uses within commercial and mixed use areas.

Land Use Policy 2.1: Protect residential areas from the effects of potentially incompatible uses where new commercial or industrial development is allowed adjacent to residentially zoned districts, maintain standards for circulation, noise, setbacks, buffer areas, landscaping and architecture, which ensure compatibility between the uses.

Circulation Policy 5.3: Provide appropriate bicycle access throughout the City of Garden Grove.

Brookhurst Street Station

Description: This station is located adjacent to one of the City of Garden Grove's main commercial/mixed-use centers, including entertainment and shopping that is walkable from the surrounding neighborhoods.

The ROW intersects the station area at a key location along a major thoroughfare, and surrounded by commercial uses along the north-south corridor and surrounded by single family residential.

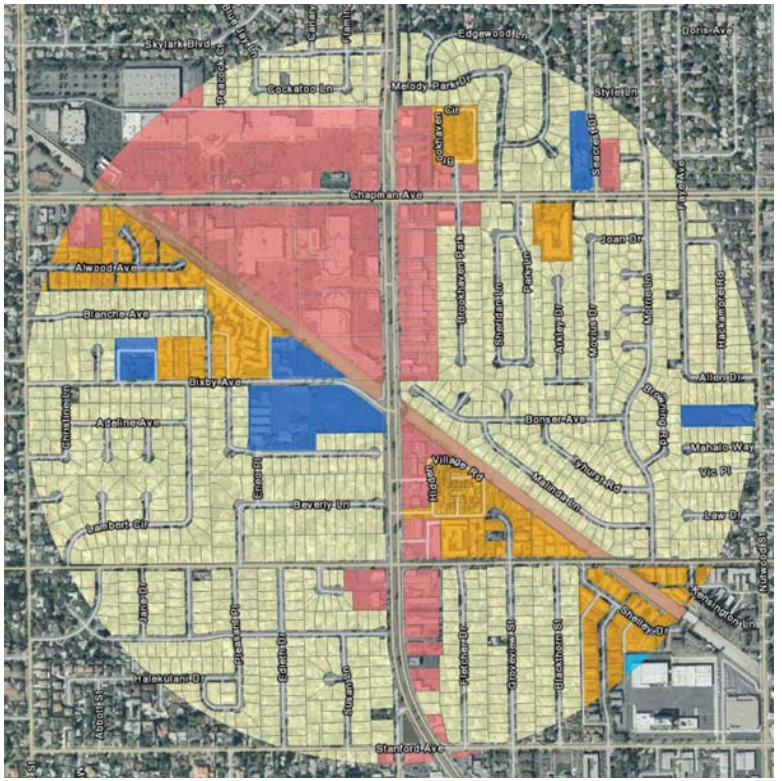
Specific plans which support mixed use/TOD development in/around the station area include:

Garden Grove General Plan 2035 – Focus Area I: The station location is located within *Focus Area I – Brookhurst St. and Chapman Ave.* which currently houses multi-tenant strip mall development. The intent is to change the area to mixed-use land use designations, and adding residential uses to help revitalize the areas that surround the two large shopping centers.

Garden Grove General Plan 2035 – Focus Area F: The station location is located within a city identified "Focus Area". *The Focus Area F – Brookhurst Triangle Area* is located at a major crossing of two main commercial thoroughfares and is at the entrance to the Korean Business District. It is identified as a prominent location for taller, mixed-use development, modern buildings, and vibrant streetscape.

Brookhurst/Chapman Specific Plan – "The Triangle": The site is seen as a mixed-use, multi-generational, multi-modal development with enhanced pedestrian infrastructure and respond to future utilization of the PEROW, and a future stop, through fixed guideway applications.

Community Redevelopment Project Areas: One of the six identified mixed-use districts throughout the city where rezoning will occur in order to accommodate the mix of land uses. The Brookhurst station area is located within the Neighborhood Mixed Use District.



The Project would be consistent with various General Plan policies including:

Land Use Policy 6.4: Work with property owner(s) of commercial developments that have been, or are currently, in a state of deterioration to revitalize these centers. This includes areas in Focus Areas I,J, K, M, and N.

Land Use Policy 8.2: Prepare a plan for the first phase of use of the OCTA right-of-way that lies between Chapman Avenue to the north and Garden Grove Boulevard to the south.

Circulation Policy 4.1: Strive to achieve a balance of land uses whereby residential, commercial, and public land uses are proportionally balanced.

Euclid Street Station

Description: This station is located in the "Heart of Garden Grove" amongst the city's main civic center, commercial and retail centers, mixed-use corridors while maintaining a balance of a pedestrian friendly environment within a busy destination district.

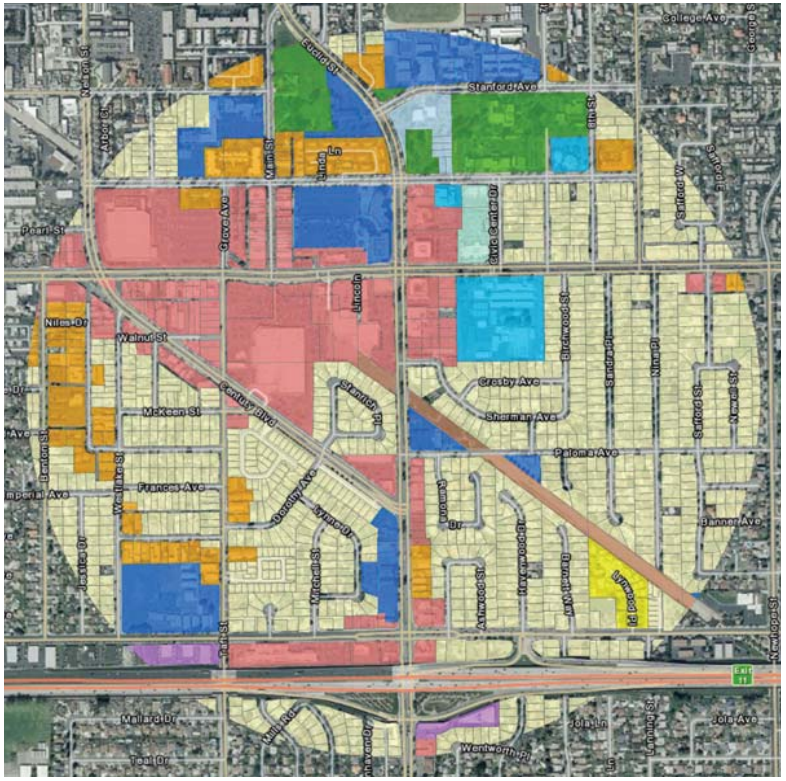
There is an eclectic mix of land uses within the station area including commercial/mixed-use adjacent to the station, institutional, open space, and having single family residential to the east.

Specific plans which support mixed use/TOD development in/around the station area include:

Garden Grove General Plan 2035 – Focus Area E1: The station location is located within a city identified "Focus Area". *The Focus Area E1 – Civic Center (Area 1)* includes City Hall, Acacia St., Garden Grove Blvd., Main St., the Community Meeting Center, and Village Green. The goal for the area is a mixed use designation that promotes civic, commercial, open space, and residential uses while maintaining a human scale while providing a balance between vehicular and pedestrian needs.

Community Center Specific Plan (Streetscape Overlay District): One of the initial efforts to identify areas/corridors for redevelopment. Twelve use districts were established by the Specific Plan. The Plan emphasized the importance of the community centers physical, social, and economic potential as well as promoting a sense of place and a place of special character, historically, culturally, and aesthetically.

Community Redevelopment Project Areas: One of the six identified mixed-use districts throughout the city where rezoning will occur in order to accommodate the mix of land uses. The Euclid St. station area is located within the Civic Center Mixed-Use District.



The Project would be consistent with various General Plan policies including:

Circulation Policy 13.1: Coordinate with the OCTA to facilitate the potential development of an alternative transportation system along the OCTA right-of-way. The City shall support such a use while recognizing that any impacts to the community must be appropriately mitigated.

Land Use Policy 1.2: Encourage modern residences in areas designated as Mixed Use. Mixed use housing should minimize impacts on designated single-family neighborhoods.

Land Use Policy 4.2: Ensure that infill development is well-planned and allows for increased density in Focus Areas along established transportation corridors.

Harbor Boulevard Station

Description: This station area is located at the southern end of the PEROW, blocks away from the City of Santa Ana's vibrant and dynamic urban center. Additionally, this would be a potential gateway to the connection of two transit systems.

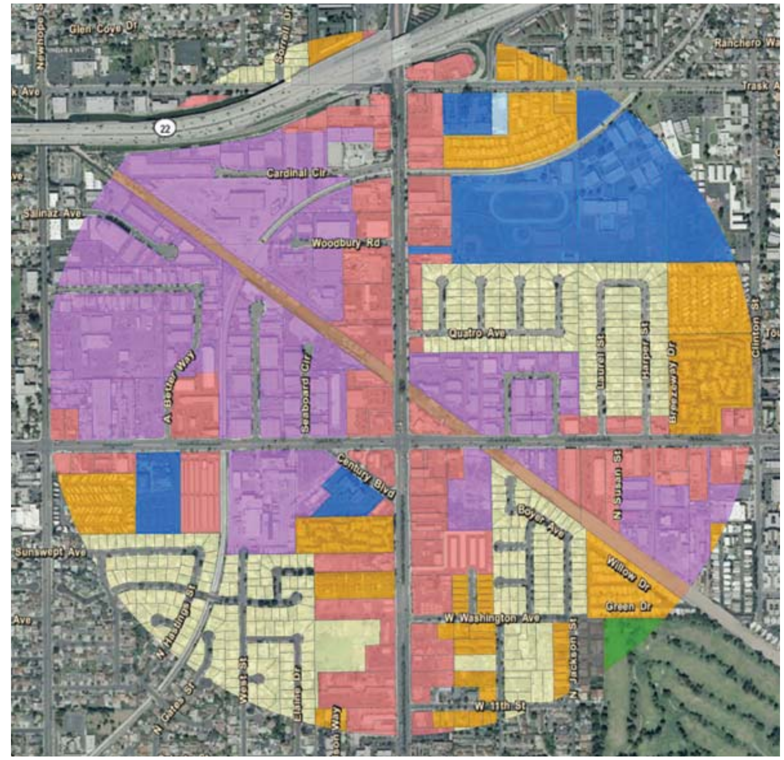
The main north-south Harbor Blvd. corridor is dominated by mixed commercial uses. Within the station area there also exist large number of industrial/manufacturing uses to the north east, and residential in the form of single family and higher density.

Specific plans which support mixed use/TOD development in/around the station area include:

North Harbor Specific Plan: The Plan promotes quality commercial development and land use compatibility along Harbor Blvd. while respecting and preserving the historical and cultural features of the area. Additionally, it encourages uses that have high-quality design values and emphasizes the balance of shopping and employment opportunities for local residents and the region. The Plan identifies Focus Areas that have potential for development that can alter the economic viability along the corridor – whether culturally significant, automotive oriented, recreation or commercial.

Santa Ana Transit Zones: The station area is adjacent to city identified Transit Zones whose objective is to establish and maintain attractive distinctions between each neighborhood zone, such as Transit Village, Urban Center Zone, Corridor Zones, and Urban Neighborhoods.

Santa Ana Renaissance Specific Plan: The station area is adjacent to the 421-acre plan area which lays out the master plan for the future of Santa Ana's downtown and its development into a regional attraction for employment, tourism and commerce. The Plan area straddles several economically-related boundaries including Central City Redevelopment Area, Inter City Redevelopment Area, Enterprise Zone, Business Improvement District, Empowerment Zone, and International Foreign Trade Zone.



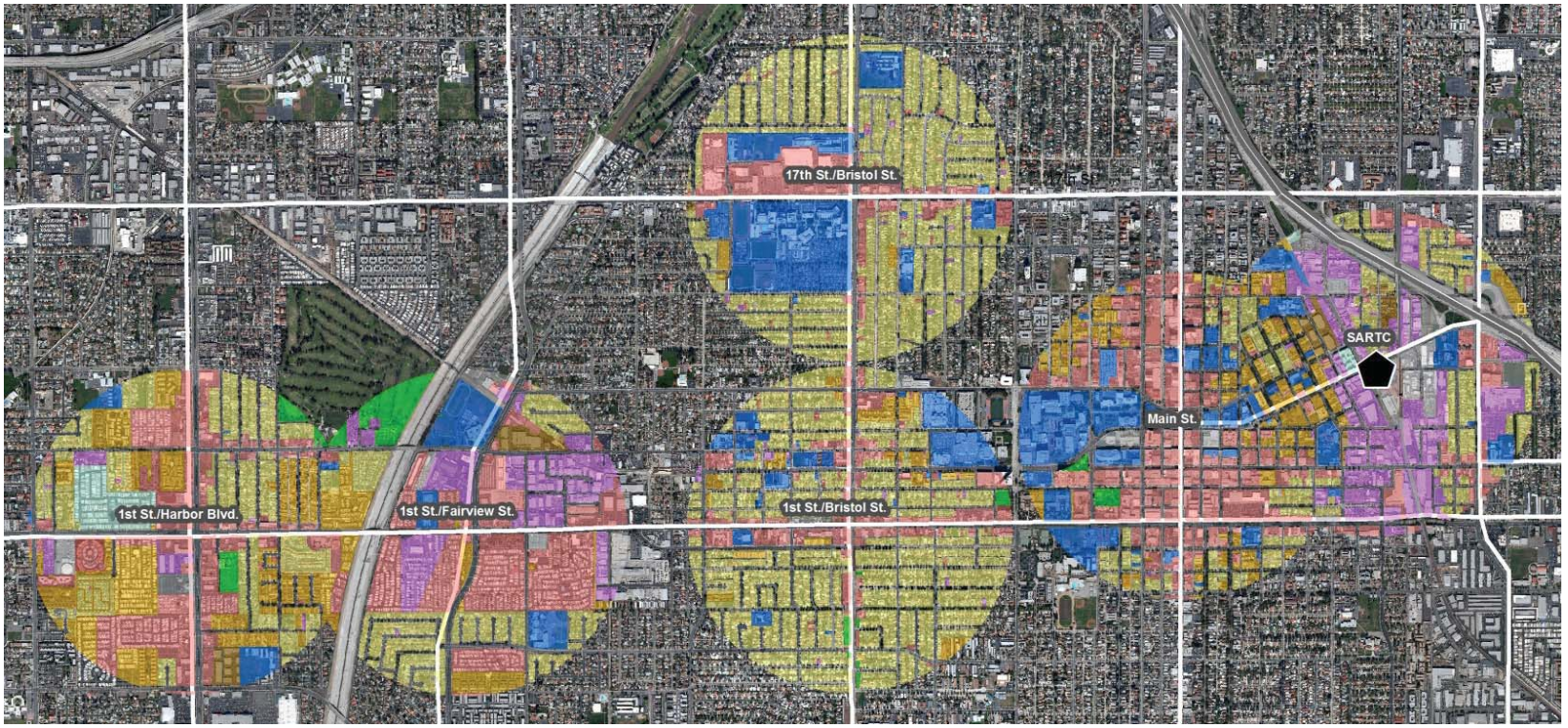
The Project would be consistent with various General Plan policies including:

Land Use Element – Policy 4.5: Encourage development of employment centers and mixed use projects within targeted areas adjacent to major arterial roadways, transit and freeway corridors.

Circulation Element –Policy 1.9: Program future use of the Pacific Electric Railroad right-of-way as a transportation corridor.

Circulation Element –Policy 3.4: Encourage the development of multi-modal transit opportunities within major development areas.

Circulation Element –Policy 3.8: Develop bicycle paths that maximize access to major activity centers, neighboring jurisdictions, and regional bicycle paths.



Currently, the cities of Santa Ana and Garden Grove are studying reuse of a portion of the PEROW/WSAB Corridor Right of Way (ROW), along with connections through the City of Santa Ana from where the ROW ends at Raitt Street, to provide Street Car service. The Fixed Guideway study is scheduled for completion in 2011, with preparation of a draft environmental document by the Summer of 2012. The Santa Ana-Garden Grove Fixed Guideway Project, which will utilize a portion of the PEROW/WSAB Corridor, is funded through the "Transit Projects" portion of the Orange County's LRTP. For the Street Car Alternative included in this AA study, there is an opportunity to interline service (operate both street car systems on the same track), but all of the other alternatives will require a transfer between the PEROW/WSAB and SAGGFG systems.

The stations located within the city include a station at 1st Street and Harbor Boulevard, 1st and Fairview Street, 1st and Bristol Street, 17th Street and Bristol Street, Main Street, and a terminus at SARTC. As shown, the predominant land uses are residential and commercial. These are followed by institutional uses, including downtown Santa Ana, City Hall, Santa Ana city services and courthouses, and various schools and medical centers.

Summary

During the Final Screening phase, a summary of TOD opportunities at station areas along the proposed alignments was completed and is presented below in Table 4.3. At this level of analysis, station-related sites offering development opportunities were defined as city-adopted plans and policies, property that was vacant, used for surface parking, or was underutilized when compared to both the current surrounding land uses and future land use plans.

All of the jurisdictions which contain a station in the study area have developed policies in support of the incorporation of transit service. In addition, policies call for specific land use types, such as multi-family housing, to be concentrated around station areas for a multi-modal transit center and TOD. All jurisdictions within the project study area have one or more plans guiding future development around proposed stations. The plans include guidelines for both TOD as well as anticipated land uses. As stated in the SCAG Regional Transportation Plan (RTP), TOD at new or improved transit stations can work so long as the appropriate combinations of higher-density, mixed-use zoning, parking policies, urban design guidelines, and redevelopment investments are implemented. This type of high density and mixed residential and commercial development should facilitate attracting residents and workers with higher propensities for transit trips.

As shown in the detailed station descriptions, improving the existing transportation network and encouraging multiple modes of transportation are shared goals of the jurisdictions. Each has invested considerable time and effort in developing policies and plans for transportation improvements. As described above, all improvements involve multi-modal solutions.

Methodology

The impact analysis was based on information collected during the affected environment analysis, field research in the project study area, site visits to proposed stations, in-depth review of aerial photography of the project study area, and information provided by local planners gathered as part of the proposed station area planning process. The station area planning process included direct discussions with city representatives, city planners, city websites and resource libraries and planning charrettes. Using this information, evaluation criteria were developed that analyzed the impacts of both short-term construction and long-term operations.

Table 4.3 – Summary of Transit Supportive Land Use Plans

City	Station Location	TOD Compatible	Specific Plans	Redevelopment Area
Los Angeles	Union Station	✓	✓	✓
	7th St./Alameda St.	✓	✓	✓
	Soto St./Olympic Blvd.	✓	✓	✓
Vernon	Leonis Blvd./District Blvd.	-	-	✓
	Vernon Ave.			

City	Station Location	TOD Compatible	Specific Plans	Redevelopment Area
Huntington Park	Pacific Blvd.	✓	✓	✓
	Gage Ave.	✓	✓	✓
South Gate	Firestone Blvd.	✓	✓	✓
Downey	Gardendale St.	✓	✓	✓
	Metro Green Line Station	✓	✓	-
Paramount	Paramount Blvd./Rosecrans Ave.	✓	✓	✓
Bellflower	Bellflower Blvd.	✓	✓	✓
Cerritos	183rd St./Gridley Rd.	✓	✓	✓
Artesia	Pioneer Blvd.	✓	✓	✓
Cerritos	Bloomfield Ave.	✓	✓	✓
Cypress	Cypress College	✓	✓	✓
Anaheim	Knott Ave.	✓	-	✓
Stanton	Beach Blvd.	✓	✓	✓
Garden Grove	Magnolia St.	-	-	-
	Brookhurst St.	✓	✓	✓
	Euclid St.	✓	✓	✓
Santa Ana/Garden Grove	Harbor Blvd.	✓	✓	✓

4.2 Acquisition

A majority of the proposed transit system improvements will be located within the public ROW including the former PE Railway ROW, city streets, the Metro-owned Harbor Subdivision, and active and inactive railroad ROWs. This section presents the initial findings for parcels outside of the public ROW that may potentially be impacted.

4.2.1 Affected Environment

Currently, land use types adjacent to the Corridor alignments consist of residential, commercial, industrial, public facilities, open space, and transportation/utilities. Refer to the Land Use Section 4.1. for an overview of station area uses and land use policies.

The affected environment for the analysis was limited to the areas within and directly adjacent to the Corridor alignments. For this conceptual level of analysis, an estimate of potentially impacted parcels was identified through the use of the engineering and station concept plans. Future phases of the project may provide further detail on the types of land uses, square footage of properties, potential acquisitions, and any other parcel characteristics.

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, only a portion of a lot fronting the alignment is required, but not the building itself. Full takings occur when either the majority of a property is required for horizontal alignment because of insufficient public ROW or when damage to a property is great, causing to it be deprived of beneficial use.

4.2.2 Applicable Laws and Regulations

The Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) of 1970, as amended (Public Law 91-646), 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, either through just compensation or other means, for persons displaced from their homes and businesses and establishes uniform and equitable land acquisition policies.

The provisions of the California Relocation Assistance Law (Government Code, Section 7260, et seq.) apply if a public entity undertakes a project for which federal funds are not present. The Relocation Act seeks to:

- Ensure the consistent and fair treatment of owners of private property;
- Encourage and expedite acquisitions by agreement to avoid litigation and relieve congestion in the courts; and
- Promote confidence in public land acquisitions.

4.2.3 Evaluation Methodology

For this level of the analysis, parcels that may be potentially impacted by implementation of a transit system were summarized based on each alternative, and ROW requirements for the proposed alignments and station sites. Although a majority of the project would be located within the public ROW, there are areas where parcels may be impacted or property acquisitions would be required. To identify properties not located on public ROW that would be needed for the project, conceptual engineering drawings with detailed locations of the proposed alignments and stations were reviewed. Additional resources included aerial photographs and assessor maps.

4.2.4 Real Estate and Acquisitions Assessment

Conceptual station locations and plans were identified in working sessions with the affected Corridor cities. A total of eight working sessions with multiple cities were conducted, in the Conceptual Screening and Initial Screening phases. In the future, with development of preliminary engineering plans and in the environmental document, more detailed acquisition plans may be defined.

When building a transportation system, property acquisition may be required for:

- Alignment and system requirements; and
- Stations, bus and circulator transfer plazas and layover spaces, parking, and other facilities.

As presented below in Table 4.4, possible acquisition at a parcel level was identified for the alternatives. The possible acquisition of property primarily occurs where the alignments of the proposed alternatives transition at the northern terminus of the PEROW/WSAB Corridor ROW to travel north along the San Pedro Subdivision ROW, and at the southern end of the Corridor to travel through the City of Santa Ana to the Santa Ana Regional Transportation Center (SARTC).

Table 4.4 – Possible Property Acquisition (Parcels)

TSM	BRT		Street Car	LRT	Low Speed Maglev
	Street-Running	HOV-Running			
0	TBD	TBD	15 - 20	15 - 20	50 – 70

The BRT Alternative would not require any property acquisition for alignment purpose as it is proposed to travel in either city streets or freeway High Occupancy Vehicle (HOV) lanes after leaving the Corridor. The Street Car Option also would not require any acquisition as its tight turning radius, approximately 50-65 feet, could be accommodated within the PEROW/WSAB Corridor ROW, while the wider turning radius needs of the LRT, approximately 100 feet, and Low Speed Maglev Alternative, approximately 246 feet, would require acquisition of approximately between 15 and 70 parcels. For all of the alternatives, property acquisitions would be required for each alternative and alignment curves as well as provision of a maintenance and storage facility. Table 4.4 provides an approximate number of parcels needed for a maintenance and/or storage facility in an undetermined location along the alignment. Under the BRT alternative, opportunities may exist to store buses along the actual ROW; however this will be analyzed further.

4.3 Visual and Aesthetic

This section discusses the existing visual and aesthetic character throughout the Corridor and provides a preliminary assessment of the local character as well as the visual quality and aesthetic resources surrounding each alignment alternative.

4.3.1 Affected Environment

This effort evaluated potential impacts to views and vistas, natural landscapes, monuments, parks, historic structures, and the aesthetic compatibility of the introduced transit system with the surrounding environment. Transportation infrastructure can often result in visual impacts to a community through obstruction of views by overhead catenaries, and possible inconsistencies with local architectural scale

when considering an elevated system. However, it can also introduce positive effects such as opportunities for increased lighting, enhanced streetscape and landscape opportunities, as well as development of more inviting pedestrian environments.

4.3.2 Applicable Laws and Regulations

There are several regulations that govern the assessment and consideration of visual quality and aesthetic character. These regulations consider the protection and enhancement of existing resources and aesthetic character, as well as the incorporation of design considerations in the development and construction of projects. The following federal and state regulations and policies apply to the evaluation of visual effects for the proposed project.

- The U.S. Environmental Protection Agency (USEPA) (42 United States Code (USC) Section 4231) puts regulatory responsibility on the federal government to "use all practicable means" to "assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings."
- The Federal Highway Administration (FHWA) and the Urban Mass Transportation Administration, now the FTA, established Environmental Impact and Related Procedures (23 Code of Federal Regulations 771) for the evaluation of urban mass transit projects and the compliance of these projects with 23 USC 109(h) and 303, as well as other federal statutes.
- FTA Circular 9400.1A, Design and Art in Transit Projects, encourages the use of design and artistic considerations in transit projects. The FTA recognizes that specific types of transit projects require an assessment of visual effects. The circular provides guidance on opportunities for incorporating art and design into transit projects.
- The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Sections 6002-6009, places additional emphasis on environmental considerations such as mitigation, enhancement activities, context sensitive solutions and Section 4(f). It also advances the idea of coordinating public and agency involvement and promoting the use of visualization techniques to improve stakeholder understanding of the proposed alternatives.
- The United States Department of Transportation (USDOT) Act, Section 4(f) applies to agencies within the USDOT and is generally referred to as 49 USC 303. Section 4(f) focuses on the preservation of public parks and recreation lands, wildlife and waterfowl refuges, and historic sites, and includes the preservation of their aesthetic integrity.
- Section 106 of the Historic Preservation Act of 1966 furthers the preservation of historic resources, including resources that any Indian Tribe or Native Hawaiian Organization has attached religious and cultural significance to or with. This is applicable to a visual impacts analysis because historic resources are often considered to be potential visual resources.
- California Environmental Quality Act (CEQA) requires an evaluation of several aspects of visual and aesthetic issues including: effects on scenic vistas; damage to scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway; effects on the visual character or quality of the site and its surroundings; and effects from new light or glare which may affect nighttime views in the area.

4.3.3 Evaluation Methodology

A preliminary analysis of existing visual and aesthetic qualities in the study area and potential changes to these qualities resulting from implementation of a transit system improvement has been completed as all of the alternatives have the potential to affect visual and aesthetic resources. Aesthetic resources and visual character were evaluated at a conceptual qualitative level. This evaluation was based on field observations as well as through preliminary identification of culturally significant structures. Each alignment alternative was analyzed based on its potential impact to the visual quality of the immediate environment. A more detailed analysis may be provided through possible future study efforts.

4.3.4 Assessment of Visual Character

Residential properties represent more than 50 percent of the land uses along the PEROW/WSAB Corridor ROW. Reuse of the ROW, the San Pedro Subdivision among other active and inactive railroad ROWs, and city streets to accommodate the northern and southern system connections would have significant visual and privacy impacts on adjacent residential and other properties. The following section discusses the potential visual impacts of each alignment through all three segments of the Corridor study area.

Aerial structures for the Low Speed Maglev Alternative and aerial sections of the LRT and Street Car alignments would have the most notable impacts on privacy and visual character. Construction of an aerial alignment structure and stations would impact the scale, visual character, and privacy of adjacent neighborhoods. Overhead catenary wires and poles, as well as station platforms and substations, are components of at-grade LRT and Street Car systems may have impacts on visual character. However, these elements would not contribute to major obstruction of views and would be less invasive. A BRT system would have the least visual impacts, as no significant permanent structures are required, and buses are proposed to travel in existing streets and freeways when leaving the PEROW/WSAB Corridor ROW.

Northern Connection Area

BRT Alternatives The alternatives would travel in mixed-flow traffic north of the PEROW/WSAB Corridor ROW from Lakewood Boulevard with minor to no visual and aesthetic impacts. The Street-Running BRT option would operate through dense residential and industrial communities, but there are no major transit structures along city streets that would obstruct views or impact aesthetic resources. The HOV Lane-Running option would operate primarily along highways and the existing Harbor Transitway on the I-110 Freeway and the HOV lanes of the I-105 Freeway, as well as through Downtown Los Angeles, resulting in no new impacts to the existing visual character.

Guideway Alternatives The alternatives would use a combination of railroad ROWs and city streets. All of the guideway alternatives would operate on the San Pedro Subdivision north to Randolph Street, and their impacts would depend primarily on their vertical configuration, whether at-grade or grade-

separated. A majority of the land uses adjacent to the San Pedro ROW in the cities of Downey, South Gate, Cudahy, Bell, and Huntington Park are a combination of residential and industrial with some commercial. Because this portion of the alignment proposes to operate on a currently active ROW, the impacts to the surrounding residential and industrial communities would be minor with the at-grade LRT and Street Car alternatives. The Low Speed Maglev Alternative would operate in an entirely elevated configuration and would pose greater impacts to the existing visual character, especially to the one- and two-story residential communities in the previously mentioned cities.

Tracks infrequently used along Salt Lake Avenue in Cudahy, Bell, and Huntington Park.

Several single family homes adjacent to the tracks through South Gate, Cudahy, and Bell.

East Bank and West Bank 1 Alternatives The alternatives would continue north from Randolph Street on the San Pedro Subdivision through a heavily industrial landscape along Downey Road to approximately Vernon Avenue, where they split to run along either bank of the Los Angeles River. The East Bank alignment operates within a railroad ROW used by passenger and freight rail services, while the West Bank 1 alignment would operate along a utility ROW and then along tracks used by Metrolink, Amtrak, and Metro into Union Station. These alternatives would not significantly alter the existing visual character in the cities of Huntington Park, Vernon and Los Angeles. Small pockets of residential properties south of Fruitland Avenue may incur privacy impacts.

The Low Speed Maglev Alternative would have significant visual impacts along the Los Angeles River, as it would need to cross over six historic bridges and two highway bridges – I-10 and US-101. This would negatively impact the view of historic resources and potentially obstruct views of Downtown Los Angeles to the west and the San Gabriel Mountains to the east. An aerial structure may be out of character and significantly out of scale with the distinct architecture of these historic bridges. While both alignment alternatives would primarily operate through highly industrialized rail corridors, existing residential pockets throughout this area would be significantly impacted.

Pockets of residential complexes exist between heavy and light industrial uses along Downey Road.

Historic bridges cross the Los Angeles River adding visual interest among the dense industrial landscape.

West Bank 2 and West Bank 3 Alternatives The alternatives would turn west on Randolph Street and then north on Pacific Boulevard and onto the Metro-owned Harbor Subdivision before diverting at the Redondo Junction. Currently, inactive rail tracks in the median of Randolph Street mark a clear boundary between the residential and industrial uses in Huntington Park. Introducing a new transportation system within the existing rail corridor infrastructure, would nominally alter the local character. Farther east on Randolph Street, residential properties may experience privacy impacts, especially near a proposed aerial transition section by the San Pedro Subdivision.

Mature trees along the median of Randolph Street enhance Corridor visual character.

Distinct architecture and a dense mix of commercial uses make Pacific Boulevard a key destination.

Implementing a new at-grade transportation system may generate low visual and aesthetic impacts along Pacific Boulevard, given its extended width and densely urbanized commercial and industrial character. Proposed to travel along the northern end of Pacific Boulevard's commercial corridor, these transit system alternatives would avoid visually disturbing the historic architecture along the main retail corridor. North of Randolph Street, Pacific Boulevard is lined with large scale commercial, light industrial and manufacturing uses that may experience a lower level of visual and aesthetic impacts.

Farther north along the Harbor Subdivision, the impacts would be minimal as the alignments are proposed to operate on an existing ROW faced by the back walls of manufacturing and industrial buildings. Despite that the LRT, Street Car, and Low Speed Maglev alternatives are proposed to operate in an elevated configuration here, their impacts would almost be seamless, given the existing dense industrial landscape of the local environment. Minerva Street north of the Harbor Subdivision, however, may experience visual effects from the proposed elevated structure due to its narrow width.

At the north end of the Harbor Subdivision, West Bank Alternative 2 would veer northeast to follow the West Bank Alternative 1 alignment along existing passenger rail tracks to Union Station. West Bank Alternative 3 would head northwest to travel along Santa Fe Avenue in an aerial configuration and transition to below-grade service at 8th Street to resurface in Little Tokyo and use the existing Metro Gold Line tracks to access Union Station. The majority of visual impacts would occur on Santa Fe Avenue between 8th and 12th Streets. Land uses along that portion of Santa Fe Avenue are predominantly industrial and manufacturing; however, the proposed aerial structure of all the guideway alternatives would impact the architectural scale of its one- and two-story buildings, including the historic Southern California Gas Company Administration Building. The limited width of Santa Fe Avenue has a high potential to impede any views north to Downtown Los Angeles, as well as significantly cover natural lighting due to the 49 foot width of an aerial structure. The underground portion would have no impacts to visual quality since it would not require any permanent infrastructure on the surface, this includes the underground station at 7th and Alameda Streets.

American Apparel textile factory overlooks downtown Los Angeles northwest of 7th and Alameda Streets.

A mix of residential, commercial, and institutional buildings surrounds Little Tokyo Gold Line Station.

In Little Tokyo, the alignment would operate from Traction Avenue to 1st Street along Alameda Street. The guideway is proposed to resurface through a tunnel portal approximately at the intersection of Traction Avenue and Alameda Street and continue to run at-grade level. The area's existing transit oriented development elements include high density housing, commercial, and institutional uses and create a highly urbanized environment supportive of new transit infrastructure.

PEROW/WSAB Area

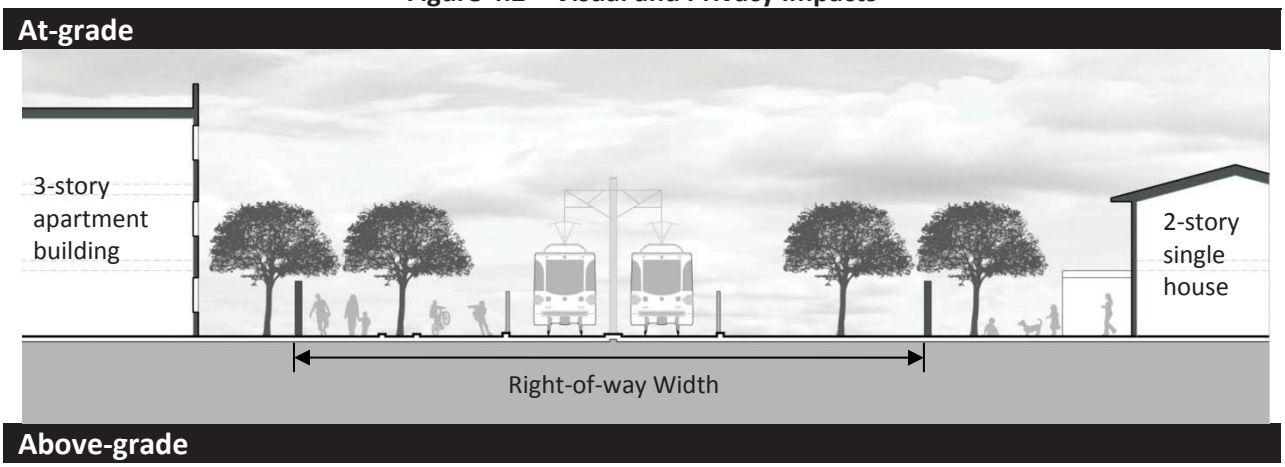
All of the modal alternatives are proposed to operate along the same alignment through the PEROW/WSAB Corridor. BRT would operate completely at-grade; while the LRT and Street Car would operate in a combination of at-grade and aerial service due to some proposed grade-separation at major street intersections. The Low Speed Maglev option would operate completely above-grade.

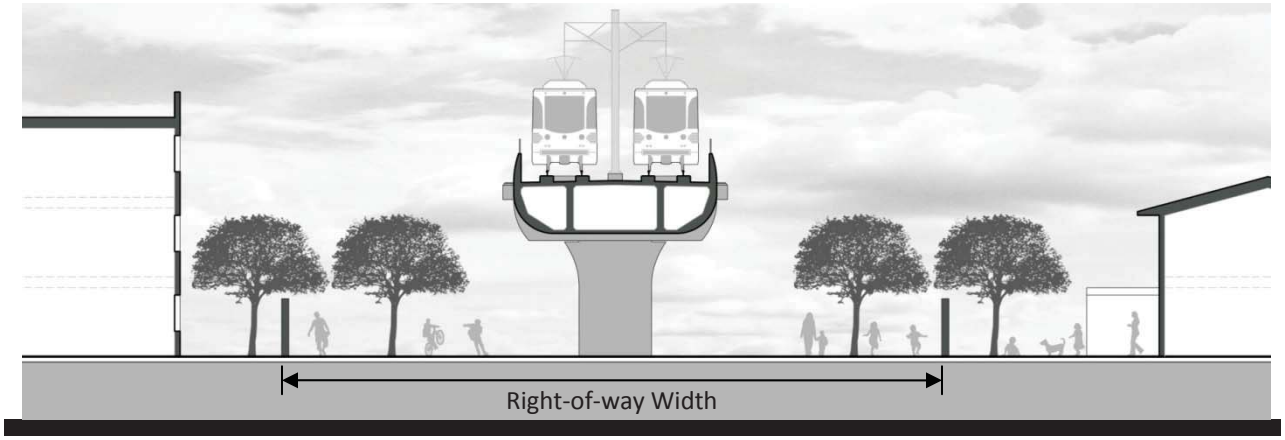
The average width of the PEROW/WSAB Corridor ROW is 100 feet, with approximately 30 feet required for an at-grade system and 12-15 feet for an above-grade alternative, except at station locations. Where ample space is vacant, the remainder of the ROW could be used for an integrated pedestrian and bicycle facility, and provide space for landscaping and sound walls to mitigate visual and privacy impacts. Such measures would be most effective on the at-grade alignment and to a lesser degree on the aerial alignment.

For an aerial alignment, the height would be approximately 30 feet to the top of the structure and 40 feet to the top of the vehicles. Mature, 45 foot and higher trees could mitigate the visual and privacy impacts along the ROW. As previously mentioned, the width of an aerial structure is typically 49 feet from edge to edge, as shown in Figure 4.2.

Visual and aesthetic impacts would vary by city depending on their unique character. The following discusses individual sections of the PEROW/WSAB Corridor ROW and possible impacts to the visual and aesthetic character of the area.

Figure 4.2 – Visual and Privacy Impacts





Paramount to Cerritos This part of the alignment is composed of a variety of land uses including low and high density residential, commercial with various retail options, as well as some industrial and manufacturing uses. The City of Paramount is densely developed, and given the combination of residential, commercial, and institutional land uses along Rosecrans Avenue and Paramount Boulevard, the proposed transit system would not be out of character with the local landscape. Impacts to Paramount would be most notable near residential properties, schools, and parks where elevated structures may cause scale inconsistencies with existing infrastructure.

A mix of commercial retail along Pioneer Avenue contributes to the visual character of Little India.

Plazas and outdoor seating just off Bellflower Boulevard create a distinct streetscape.

The cities of Bellflower and Artesia would experience similar visual impacts to adjacent homes. However, Bellflower Boulevard's quaint commercial core and heavily-used bike path along the Corridor may be visually suited with the introduction of new transportation infrastructure. Such development as the Belmont Court mixed use project will further enhance and reinforce TOD style development along the Bellflower Boulevard downtown area, all within easy walking distance to the proposed station. With a mix of retail uses complemented by wide sidewalks and outdoor plazas, Bellflower Boulevard enhances the pedestrian experience. Artesia's Pioneer Boulevard offers a mix of retail and commercial uses that mark Little India as a landmark for cultural and commercial activities, and additional

transportation infrastructure may be successfully integrated into the visual character of its unique commercial core.

The City of Cerritos, while predominantly residential, also has a variety of large scale commercial development, including the Cerritos Town Center and Cerritos Auto Square near Gridley Road, where visual impacts would be less pronounced. Farther south on Bloomfield Avenue, Cerritos' visual character is comprised of a combination of public green space, commercial, and housing uses. Careful integration of a transit system could fit the character and diversity of land uses.

The grade-separated Low Speed Maglev Alternative would have significant visual impacts on these predominantly residential communities. Given the lower scale of residential and retail corridors in the cities of Bellflower and Artesia, a 30-plus foot transit structure would visually dominate an urban streetscape lined by one- and two-story buildings.

La Palma to Garden Grove The Corridor travels through many residential neighborhoods that would face similar privacy impacts as previously mentioned. The character in La Palma and Cypress, specifically, is almost entirely suburban and single-family residential, with the exception of some small-scale commercial and Cypress College.

Farther south, cities also have high levels of single family homes adjacent to the Corridor with large scale commercial and mixed retail along major corridors like Knott and Katella Avenues in Anaheim, Beach Boulevard in Stanton, as well as Brookhurst and Euclid Streets in Garden Grove. Specifically, Katella Avenue and Dale Street; Brookhurst Street and Chapman Avenue; and Euclid Street and Garden Grove Boulevard are notable intersections with a wide variety of land uses. Areas such as Garden Grove's Historic Main Street and Cypress College's weekend Swapmeet add distinct visual qualities and community character to their cities.

Cypress College's main entrance serves as a key destination for the college's day and evening students.

Historic Main Street provides distinctive visual character to Garden Grove.

While the majority of the alignment through this section may operate at-grade, some of the most notable effects would be privacy impacts to homes adjacent to the Corridor, as well as visual and

aesthetic impacts by an aerial structure proposed to extend from Nelson Street to just east of Euclid Street. While this area has large scale commercial development, such a structure would affect surrounding residential neighborhoods, as well as alter the distinct aesthetic character of the general area and specifically to the Historic Main Street just north of the corridor.

Southern Connection Area

Two potential alignments have been identified to operate on Santa Ana's city streets after leaving the south end of the PEROW/WSAB Corridor ROW: the Northern Alignment would run east on Westminster Boulevard/17th Street and south on Main Street to end at the Santa Ana Street Car station; and the Southern Alignment would operate south on Harbor Boulevard, east on 1st Street, north on Santiago Street to the SARTC.

The visual quality and urban ambiance of the City of Santa Ana has multiple elements. With a heavily commercial urban landscape on the west, a well defined Civic Center, and historic core in the center, and a combination of industrial and low and high density residential to the east, this city's character is variable and distinct. The City of Santa Ana is currently studying the implementation of a Street Car system to connect its Civic Center with the City of Garden Grove, adding a local transit component to its unique aesthetic and visual character.

Modern lofts adjacent to industrial complexes serve as a buffer for single family homes near SARTC.

The distinct architecture along Broadway creates a unique space for walking and shopping.

Santa Ana's history is well preserved through its architecture and urban landscape. Its visual character is distinguished by its historic landmarks including the City Hall Building, the Old Orange County Courthouse, and the immediate historic commercial buildings along Broadway. The Civic Center complex has a dominant presence and unique landscape with curvilinear streets and modern civic structures. Beyond the historic and civic districts, recent loft housing development near the SARTC has diversified a dense industrial landscape and even created a transitional barrier for surrounding single-family homes.

Historic Orange Courthouse on Civic Center Drive just west of Main Street.

Mature trees and landscaping along the median of Harbor Boulevard.

Considering modal alternatives on either alignment, a BRT system would operate in mixed flow traffic and would have no aesthetic impacts to the visual character of the city. An at-grade rail system through the streets of Santa Ana would cause impacts mostly to narrow streets such as Main Street, but fewer visual impacts compared to an aerial system.

Harbor Boulevard as well as 1st and 17th Streets are wide arterials lined by dense and large scale commercial development. Generally, introducing rail along Harbor Boulevard, 1st and 17th Streets would fit with the wide and urbanized character of those areas. While historic structures are within a short distance from both alignments, an at-grade system would minimally obstruct any views or cause any major streetscape alterations. However, an aerial system for any of the modal alternatives would have more significant visual impacts to the local character especially along Main Street and possibly to residential properties adjacent to major corridors. The area near the SARTC may experience fewer visual impacts, as its current aesthetic quality is predominantly industrial.

4.4 Cultural Resources

This section describes the cultural resources in the study area and along the potential ROW of each alternative, and identifies the potential effects of the alternatives. Those alternatives that minimize disruptions to cultural resources are typically preferred. An evaluation of the consequences of the alternatives on cultural resources is presented.

4.4.1 Affected Environment

Potential impacts to cultural resources include any archaeological, historical, or paleontological resources. A brief description of each cultural resource is provided below:

- Archaeological Resource: Remnants of human activity from an earlier time.
- Historical Resources: Buildings, structures, improvements, and remnants associated with a significant historic event or person(s) and/or have a historically significant style, design, or

achievement. Generally, any resource more than 50 years old has the potential to be considered a historical resource.

- Paleontological Resource: Remnants of prehistoric plants and animals (e.g. fossils)

4.4.2 Applicable Laws and Regulations

NEPA directs federal agencies to use all practicable means to "preserve important historic, cultural, and natural aspects of our national heritage" (Section 101[b][4]).

The National Historic Preservation Act (NHPA) established a program for the preservation of historic properties throughout the United States. The NHPA establishes the National Register of Historical Properties (NRHP), which is "an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). To be eligible for listing in the NRHP, a property must be at least 50 years old (or have reached 50 years old by the project completion date) and possess significance in American history and culture, architecture, or archaeology to meet one or more of four established criteria:

- Association with events that have made a significant contribution to the broad patterns of our history;
- Association with the lives of persons significant in our past;
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
- Have yielded, or may be likely to yield, information important in prehistory or history.

Historic resources eligible for listing in the NRHP are considered "historic properties", and may include buildings, sites, structures, objects and historical districts.

The FTA established Environmental Impact and Related Procedures (23 CFR 771) for evaluation of public transit projects and compliance of these projects with 23 USC 109h) and 303, as well as other USCs.

Section 4(f) of the Department of Transportation Act (40 USC 303) affords protection to parks, recreation areas, wild refuges and historic sites. Section 4(f) properties can include historic sites that are in or eligible for NRHP (23 CFR Section 771.135). The Department of Transportation (DOT) will not approve the use of a Section 4(f) property unless: 1) there is no feasibly and prudent avoidance alternative to use land from a property and; 2) all possible planning has been done to minimize harm from the use. However, the DOT may authorize the use of a property protected under Section 4(f) if it will have a negligible impact, as further defined in the rule.

Section 21084.1 of CEQA states that a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment. CEQA defines a historic resource as any resource listed, or determined to be eligible for listing, in the

California Register of Historical Resources. In addition, historic resources included in a local register of historic resources or otherwise deemed significant per Public Resources Code 5024.1 are presumed to be historically or culturally significant unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant.

4.4.3 Evaluation Methodology

Identification of cultural resources in the vicinity of the proposed routes and modes, as well as potential issues that should be addressed, is important during the alternatives analysis phase of the project. This will help determine the relative potential for concerns that each refined alternative may present so that appropriate actions may be taken early in project development to avoid adverse impacts on these precious resources.

To identify resources in the vicinity of the refined alternatives being considered, a review of readily available information was conducted. For this task, the following sources were reviewed:

- National Register Information System (NRIS) – website database contains information on historic properties listed in the NRHP, July 2011.
- California State Office of Historic Preservation (OHP) – Historic Resource Information – public website database contains information regarding State Historic Landmarks and points of historical interest, July 2011.
- California Department of Transportation (Caltrans) – Historical Bridge Registry – website database contains information on statewide historic bridges, July 2011.
- Searches of the Los Angeles County website and websites of the following municipalities: Garden Grove, Bellflower, Huntington Park, South Gate, Stanton, Cypress, La Palma, Hawaiian Gardens, Cerritos, Artesia, Norwalk, Downey, Cudahy, Bell, and Maywood, August 2011.

4.4.4 Cultural Resources Assessment

Cultural resources in the vicinity of the proposed alternatives were identified and documented based on a review of readily available information, including city, regional, state, and federal lists. Note that additional work will need to be undertaken in future environmental phases to determine locations of all cultural resources in the vicinity of the alternatives that will be studied in that environmental document. The identified cultural resources along all of the alternatives as listed in Table 4.5 and illustrated in Figure 4.3, Figure 4.4, and Figure 4.5. The following sections identify cultural resources within 0.5 miles of each alternative being considered.

Table 4.5 – Cultural Resources Adjacent to the Alternatives

Alternative	Cultural Resource	Address[1]	City
NRHP			
WB1, WB2, WB3, EB, BRT	Atchison, Topeka, and Santa Fe Railway Steam Locomotive No. 3751	2435 E. Washington Blvd.	Los Angeles
WB1, WB2, WB3, EB, BRT	Bridge: Cesare Chavez Ave (Macy Street) beneath Union Station	Bridge ID: 53C-0131	Los Angeles
WB1, WB2, EB	Bridge: First Street Bridge over the LA	Bridge ID: 53C-1166	Los Angeles

Alternative	Cultural Resource	Address[1]	City
	River[2]		
WB1, WB2, EB	Bridge: Fourth Street over the LA River[2]	Bridge ID: 53C-0044	Los Angeles
WB1, WB2, EB	Bridge: North Main Street Bridge[2]	Bridge ID: 53C-1010	Los Angeles
WB1, WB2, EB	Bridge: North Spring Street Bridge[2]	Bridge ID: 53C-0859	Los Angeles
WB1, WB2, EB	Bridge: Olympic Boulevard over LA River[2]	Bridge ID: 53C-0163	Los Angeles
WB1, WB2, EB	Bridge: Seventh Street over LA River[2]	Bridge ID: 53C-1321	Los Angeles
WB1, WB2, EB	Bridge: Sixth Street Bridge over the LA River[2]	Bridge ID: 53C-1880	Los Angeles
WB1, WB2	Bridge: Washington Boulevard over the LA River[2]	Bridge ID: 53C-1375	Los Angeles
BRT	Congregation Talmud Torah of Los Angeles/Breed Street Shul	247 N. Breed St.	Los Angeles
WB3	Fire Station No. 23	225 E. 5th St.	Los Angeles
WB3	Fire Station No. 30--Engine Company No. 30	1401 S. Central Ave.	Los Angeles
WB1, WB2, WB3, EB, BRT	Little Tokyo Historic District	301--369 First and 106--120 San Pedro Sts.	Los Angeles
WB1, WB2, WB3, EB, BRT	Los Angeles Union Passenger Terminal	800 N. Alameda St.	Los Angeles
WB1, WB2, WB3, EB, BRT	Los Angeles Plaza Historic District	10 Olvera St.	Los Angeles
WB3	San Fernando Building, The	400--410 S. Main St.	Los Angeles
WB1, WB2, BRT	Santa Fe Coast Lines Hospital	610-30 S. Louis St.	Los Angeles
WB2, WB3	Santa Fe Freight Depot	970 E. 3rd St.	Los Angeles
WB1, WB2, EB, BRT	Sears, Roebuck & Company Mail Order Building	2650 E. Olympic Blvd.	Los Angeles
WB1, WB2, WB3, EB, BRT	Spring Street Financial District	401 S. Main St. and 405-11 S. Main St.	Los Angeles
WB1, WB2, WB3, EB, BRT	US Court House and Post Office	312 N. Spring St.	Los Angeles
WB3	US Post Office--Los Angeles Terminal Annex	900 Alameda St.	Los Angeles
Westminster/17th Street Harbor/1st Street	Builders Exchange Building	202--208 N. Main St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Downtown Santa Ana Historic Districts (North, Government/Institutional and South, Retail)	Roughly bounded by Civic Center Dr., First, Ross, and Spurgeon Sts.	Santa Ana
Westminster/17th Street Harbor/1st Street	Ebell Society of Santa Ana Valley	625 N. French St.	Santa Ana
Westminster/17th Street Harbor/1st Street	French Park Historic District	Roughly bounded by N. Bush, E. Washington, and N. Garfield Sts., and Civic Center Dr. E.	Santa Ana
Westminster/17th Street Harbor/1st Street	Harmon-McNeil House	322 E. Chestnut St.	Santa Ana
Westminster/17th Street	Howe-Waffle House and Carriage	Sycamore and Civic	Santa Ana

Alternative	Cultural Resource	Address[1]	City
Harbor/1st Street	House	Center Dr.	
Westminster/17th Street Harbor/1st Street	Lighter-than-Air Ship Hangars	Valencia and Redhill Aves.	Santa Ana
Westminster/17th Street Harbor/1st Street	Minter, George W., House	322 W. 3rd St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Odd Fellows Hall	309-311 N. Main St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Orange County Courthouse	211 W. Santa Ana Blvd.	Santa Ana
Westminster/17th Street Harbor/1st Street	Pacific Electric Sub-Station No. 14	802 E. 5th St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Rankin Building	117 W. 4th St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Santa Ana City Hall	217 N. Main St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Santa Ana Fire Station Headquarters No. 1	1322 N. Sycamore St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Santora Building	207 N. Broadway	Santa Ana
Westminster/17th Street Harbor/1st Street	Smith-Tuthill Funeral Parlors	518 N. Broadway	Santa Ana
Westminster/17th Street Harbor/1st Street	Southern Counties Gas Co.	207 W. 2nd St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Spurgeon Block	206 W. 4th St	Santa Ana
Westminster/17th Street Harbor/1st Street	US Post Office Station--Spurgeon Station	605 Bush St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Walkers Orange County Theater	308 N. Main St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Wright, George L., House	831 N. Minter St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Yost Theater--Ritz Hotel	301--307 N. Spurgeon St.	Santa Ana
Westminster/17th Street Harbor/1st Street	Young Men's Christian Association--Santa Ana-Tustin Chapter	205 W. Civic Center Dr.	Santa Ana
California Register of Historic Properties			
WB1, WB3, EB	La Mesa Battlefield	4490 Exchange Avenue at Downey Road	Vernon
WB1, WB2, WB3, EB, BRT	No. 156 Los Angeles Plaza	500 Block of North Main Street	Los Angeles
WB2, WB3, BRT	No. 656 Bella Union Hotel Site; Fletcher Bowron Square	300 block of N Main, between Temple and Aliso Street	Los Angeles
WB3	No. 744 The Mirror Building (Site of Butterfield Stage Station)	145 South Spring Street	Los Angeles

Alternative	Cultural Resource	Address[1]	City
WB2, WB3, BRT	Fox West Coast California Theater	6524 Pacific Boulevard	Huntington Park
WB2, WB3, BRT	The Woman's Club of Huntington Park	6828 Rugby Avenue	Huntington Park
WB2, WB3, BRT	Warner Brothers Huntington Theater	6710 Pacific Boulevard	Huntington Park
Historic Places under Local Listings			
WB1, WB2, EB	Boyle Hotel - Cummings Block	101-105 North Boyle Avenue	Los Angeles
WB1, WB2, EB	Commerce Engineer Co Foundry Company	2416-2454 Porter Street	Los Angeles
BRT	Ellis Residence	1914 Michigan Avenue	Los Angeles
WB1, WB2, EB	Gless Farmhouse	131 South Boyle Street	Los Angeles
WB1, WB2, EB	Granite Block Paving (between Alameda and N Main Street)	Bruno Street	Los Angeles
WB1, WB2, EB	International Institute	435 South Boyle Avenue	Los Angeles
WB1, WB2, EB	National Biscuit Company	1850 Industrial Street	Los Angeles
BRT	Old 6th Street Wooden Bridge (Former Site of)	Across Hollenbeck Park Lane	Los Angeles
WB1, WB2, EB	Residence	2700 Eagle Street	Los Angeles
WB1, WB2, EB	Residence	1030 Cesar E. Chavez Avenue	Los Angeles
WB1, WB2, EB	Residence of 1620 Pleasant Avenue (Former Site of)	1620 Pleasant Avenue	Los Angeles
WB1, WB2, EB	Rhodes Residence	325-327 South State Street	Los Angeles
WB1, WB2, EB	River Station Area	1231 North Spring Street	Los Angeles
WB1, WB2, EB	Santa Fe Inbound Freight House	355 South Santa Fe	Los Angeles
WB1, WB2, EB	Southern California Gas Company Administration Building	1700 South Santa Fe Avenue	Los Angeles
WB1, WB2, EB	Union Station Passenger Terminal Grounds	357 Aliso Street	Los Angeles
WB1, WB2, WB3, EB, BRT	Brownell-Carlson House	7030 Marconi Street	Huntington Park
WB2, WB3, BRT	Civic Center	6550 Miles Avenue	Huntington Park
WB2, WB3, BRT	Garlow House	6610 Malabar Avenue	Huntington Park
WB2, WB3, BRT	Home	6125 Rugby Avenue	Huntington Park
WB2, WB3, BRT	Home	6139 Rugby Avenue	Huntington Park
WB2, WB3, BRT	Home	6205 Rugby Avenue	Huntington Park
WB2, WB3, BRT	Laguna Residence	2743 East 57th Street	Huntington Park
BRT	Malabar Street Historic District (MSHD) : 1926 One Colonial bungalow	2468 Saturn Avenue	Huntington Park
BRT	Moore-Sanchez House	6727 Santa Fe Avenue	Huntington Park
BRT	MSHD: 126 two building Spanish court	7111-7113 Malabar Street	Huntington Park
BRT	MSHD: 1921 Craftsman bungalow	6915 Malabar Street	Huntington Park
BRT	MSHD: 1921 Craftsman bungalow	7029 Malabar Street	Huntington Park

Alternative	Cultural Resource	Address[1]	City
BRT	MSHD: 1922 Spanish duplex	6914-9616 Malabar Street	Huntington Park
BRT	MSHD: 1923 Colonial bungalow	7005 Malabar Street	Huntington Park
BRT	MSHD: 1923 four building Colonial court	7110-7112 Malabar Street	Huntington Park
BRT	MSHD: 1923 four building Spanish court	7016-7018 Malabar Street	Huntington Park
BRT	MSHD: 1923 Spanish duplex	7012-7014 Malabar Street	Huntington Park
BRT	MSHD: 1924 Six building English court	7103-7105 Malabar Street	Huntington Park
BRT	MSHD: 1924 Spanish Court	7017-7019 Malabar Street	Huntington Park
BRT	MSHD: 1925 Tudor half court	7120 Malabar Street	Huntington Park
WB2, WB3, BRT	MSHD: 1926 Spanish duplex	2472-2746 Saturn Avenue; 6901 Malabar Street	Huntington Park
BRT	MSHD: 1940 U-shaped minimal traditional court apartment	6920-6922 Malabar Street	Huntington Park
BRT	MSHD: 1946 Minimal Half Court	7023 Malabar Street	Huntington Park
BRT	MSHD: Two 1921 & 1923 colonial bungalow with garage; 1948 Apt building	6909 Malabar Street	Huntington Park
WB1, WB3, EB	Newell Residence	6700 Newell Street	Huntington Park
WB2, WB3, BRT	Post Office	6606 Sevile Avenue	Huntington Park
WB2, WB3, BRT	Queen Anne Residence	2458 Randolph Street	Huntington Park
WB1, WB2, WB3, EB	Squire Residence	3427 Olive Street	Huntington Park
WB1, WB2, WB3, EB	St. Matthias Church	3095 East Florence Avenue	Huntington Park
WB2, WB3, BRT	Warner Theater	6714 Pacific Boulevard	Huntington Park
PEROW/WSAB ROW	Pacific Electric Train Depot	Mayne Street & Bellflower Boulevard	Bellflower
PEROW/WSAB ROW	Garden Grove Historic Main Street	Main Street	Garden Grove

Source: AECOM 2011

[1]Historic properties located within 0.5 mile of the proposed alignments and stations.

[2]These properties are eligible for inclusion to NHRP.

CRHP = California Register of Historic Places; NRHP = National Register of Historic Places;

WB1 = West Bank Alternative 1; WB2 = West Bank Alternative 2; WB3 = West Bank Alternative 3; EB = East Bank Alternative; BRT = Bus Rapid Transit Northern Alignment Alternative; Westminster Boulevard/17th Street/Main Street Alternative; Harbor Boulevard/1st Street/SARTC Alternative

Figure 4.3 – Los Angeles County Historical Resources

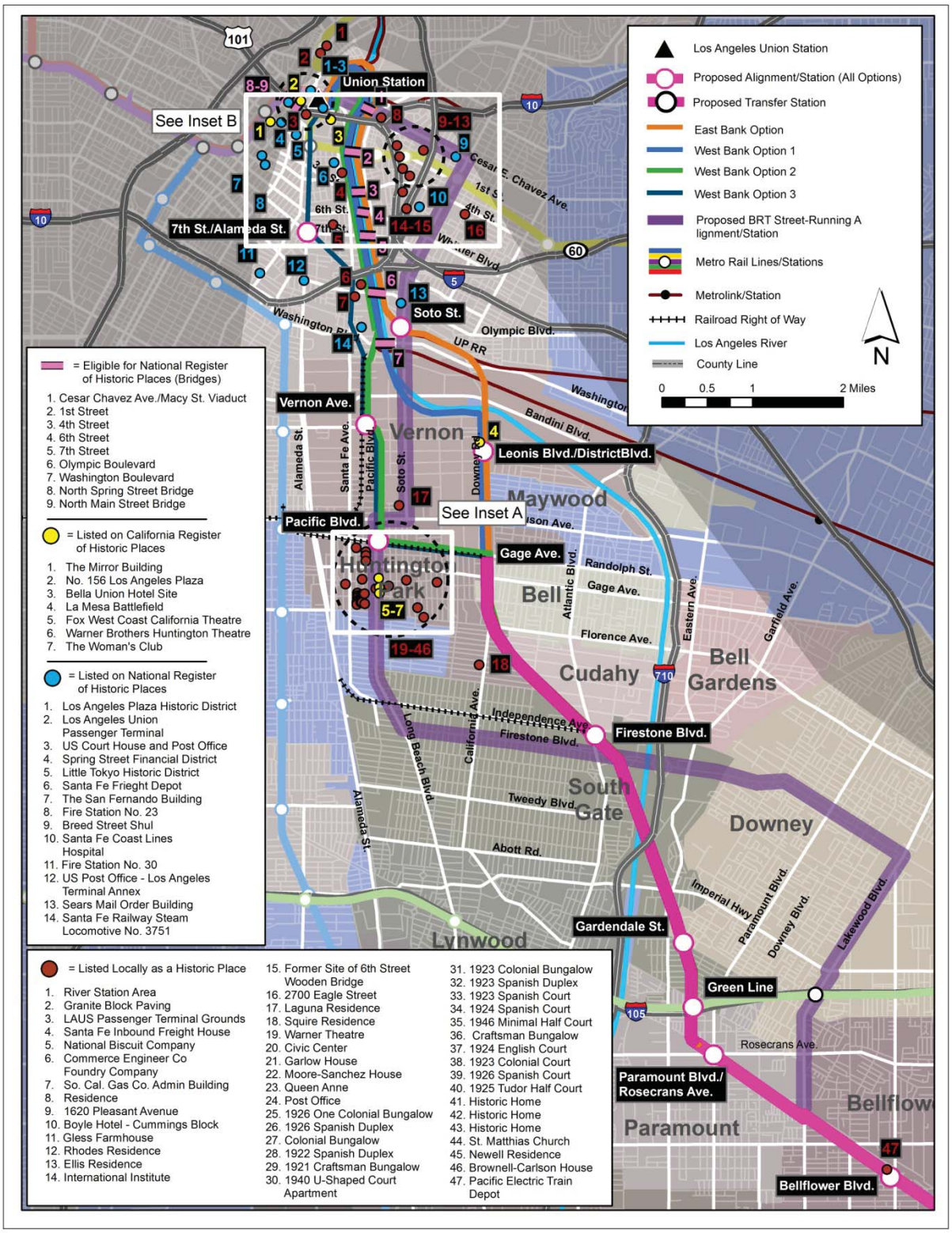


Figure 4.4 – Historic Resources Huntington Park and Los Angeles Insets

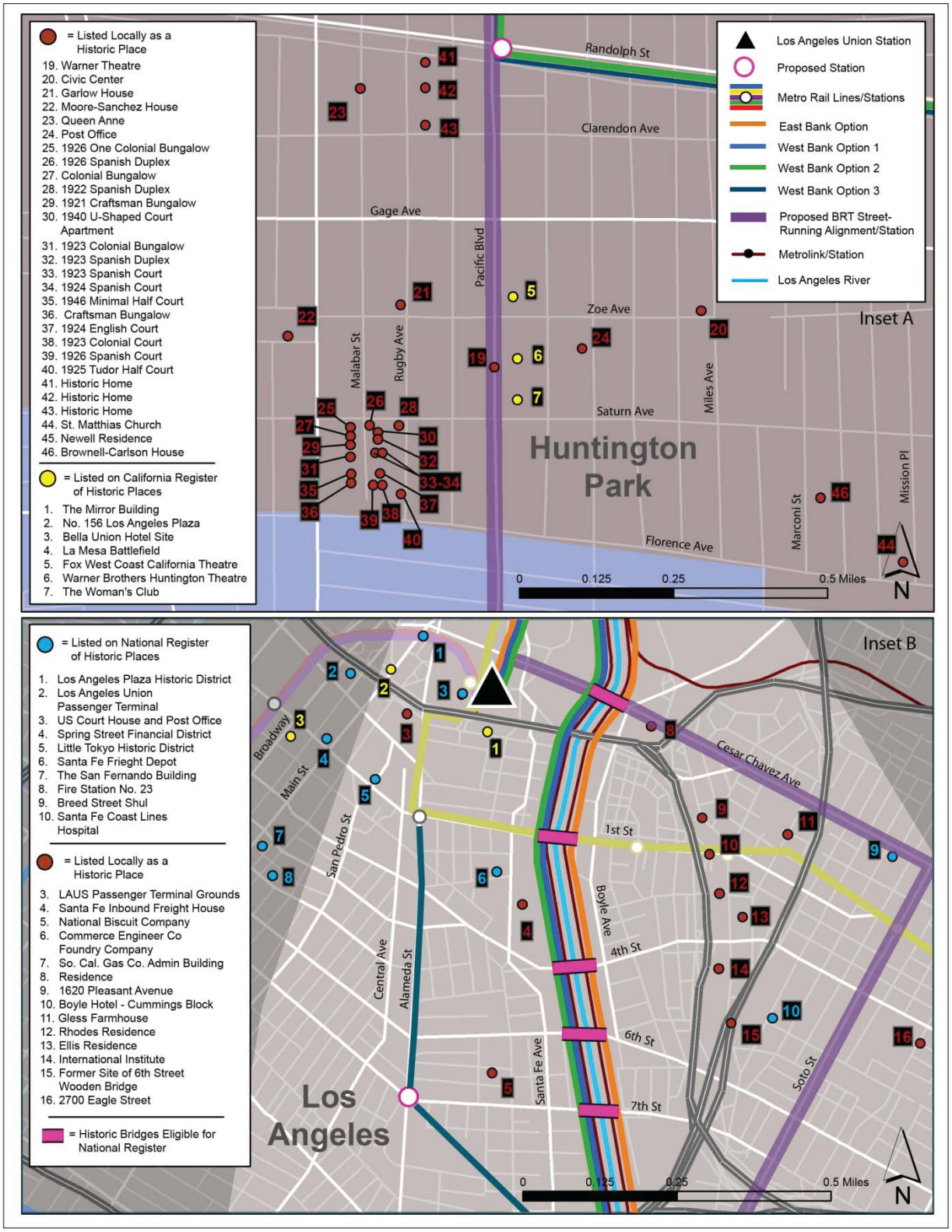
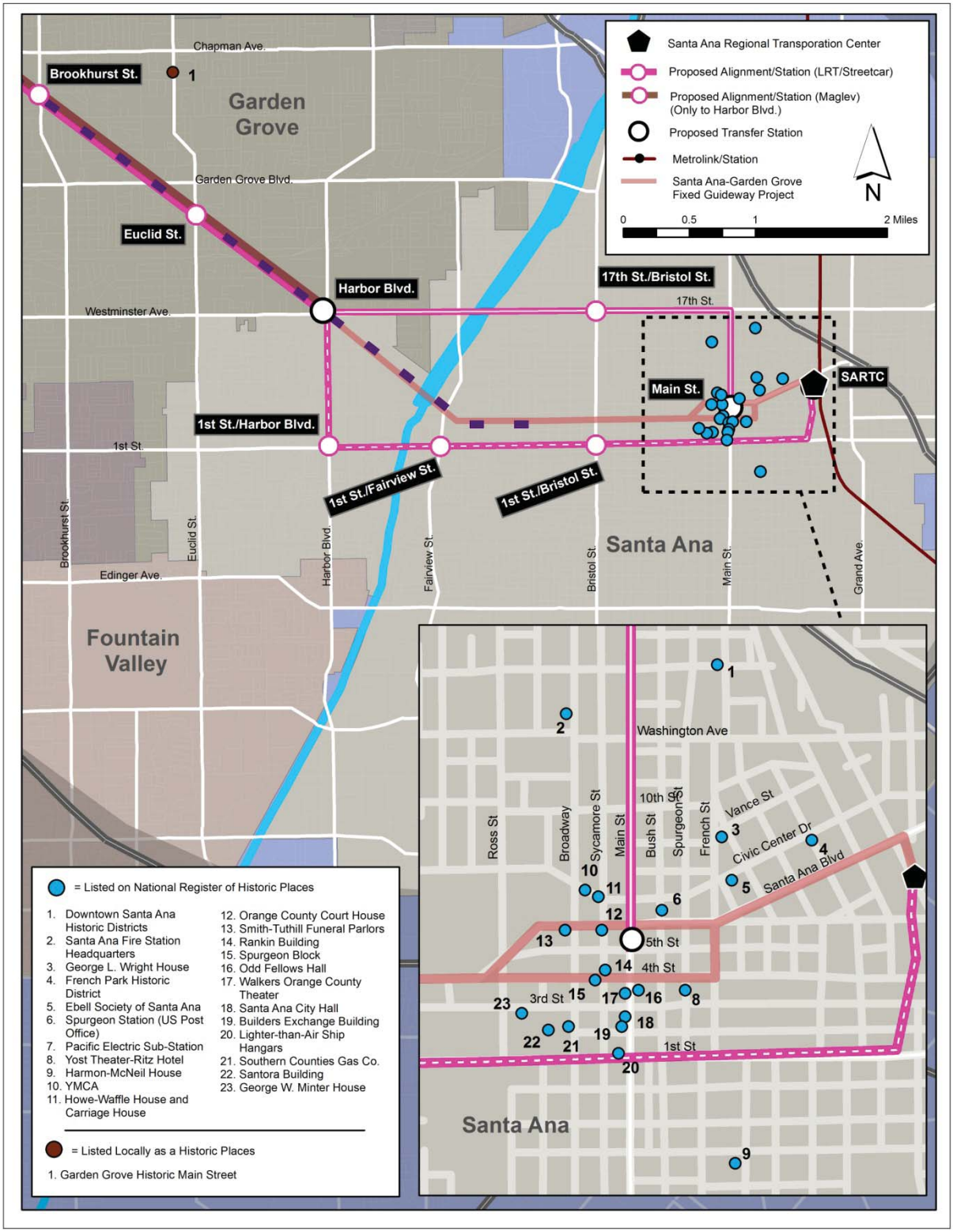


Figure 4.5 – Orange County Historical Resources



Cultural Resources Potential Impacts

Conditions in the PEROW/WSAB Corridor vary from densely-developed areas obscured by buildings, pavement and concrete to vacant properties with unmaintained landscaping. Potential impacts to cultural resources are when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that quality for the National Register of Historic Places (NRHP) in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association. Some examples of these impacts include, but are not limited to:

- Physical destruction of or damage to all or part of the property;
- Alternation of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access;
- Removal of the property from its historic location;
- Change of the character of the property's use or physical features within the property's setting that contributes to its historic features; and
- Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.

The criteria above apply to "historic properties": archaeological, historic and architectural resources that are listed in or eligible for listing in the NRHP.

In areas containing archaeological and paleontological sensitive units, certain ground disturbance has the potential to impact known and unknown surface and subsurface fossils and/or resources. These resources will be identified and analyzed in detail in proceeding environmental phases of the project.

4.5 Air Quality

This section describes existing air quality conditions, the regulatory framework, and potential impacts from the construction and operation of the TSM and build alternatives. Air emissions will primarily be generated during construction, with minimal operational impacts. The significance of potential air quality impacts were determined using criteria established through CEQA and adopted by the South Coast Air Quality Management District (SCAQMD).

4.6.1 Affected Environment

The proposed TSM and build alternatives are located in the counties of Los Angeles and Orange, within the South Coast Air Basin (SCAB). The SCAB is a sub-area of the SCAQMD jurisdiction that is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. It is a 6,600-square-mile area that encompasses all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. In terms of overall air quality, the SCAB is considered to have some of the worst air quality in the U.S. The SCAQMD is the regulatory agency responsible for ensuring that the SCAB meets or has plans to meet both Federal and State air quality standards.

Ambient Air Quality

Health-based air quality standards have been established by the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns (PM_{10}) and 2.5 microns in diameter ($PM_{2.5}$), sulfur dioxide (SO_2), and lead. The Federal standards are called National Ambient Air Quality Standards (NAAQS), and the California standards are called California Ambient Air Quality Standards (CAAQS).

The USEPA classifies air basins as either attainment or "non-attainment" for each criteria pollutant based on whether or not the NAAQS have been achieved. Some air basins have not received sufficient analysis for certain criteria air pollutants and are designated as "unclassified" for those pollutants. Similarly, areas have been designated as attainment, non-attainment, or unclassified with respect to the CAAQS. The CAAQS and NAAQS and the corresponding attainment status for the SCAB are listed in Table 4.6. The SCAB is non-attainment for both the Federal and State ozone, PM_{10}, and $PM_{2.5}$ standards.

The SCAB has until 2021 to achieve the Federal 8-hour ozone ambient air quality standard, and has requested a 5-year extension from the USEPA due to the severity of the $PM_{2.5}$ problem.

Table 4.6 – State and Federal Ambient Air Quality Standards

South Coast Air Basin Attainment Status					
Pollutant	Averaging Time	California Standards (CAAQS)		Federal Standards (NAAQS)	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone	1-hr	0.09 ppm	Non-attainment (moderate)	--	--
	8-hr	0.070 ppm	Non-attainment (moderate)	0.075 ppm	Non-attainment (Severe-17)
PM_{10}	24-hr	50 µg/m^3	Non-attainment	150 µg/m^3	Non-attainment (Serious)
	Annual Arithmetic Mean	20 µg/m^3	--		--
$PM_{2.5}$	24-hr	No separate state standard	Non-attainment	35 µg/m^3	Non-attainment
	Annual Arithmetic Mean	12 µg/m^3	--	15 µg/m^3	--
Carbon Monoxide (CO)	8-hr	9.0 ppm	Attainment/ Unclassifiable	9 ppm	Attainment/ Unclassifiable
	1-hr	20.0 ppm	--	35 ppm	--
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	--	0.053 ppm	--
	1-hr	0.18 ppm	Attainment/ Unclassifiable	0.1 ppm	Attainment/ Unclassifiable
Sulfur Dioxide (SO_2)	24-hr	0.04	Attainment/ Unclassifiable	--	Attainment/ Unclassifiable
	1-hr	0.25 ppm	--	0.075 ppm	--

Source: California Air Resources Board; USEPA Green Book

The SCAQMD has 38 air quality monitoring stations that monitor and collect ambient air quality measurements for these specific pollutants within the basin. The nearest monitoring station to the study area is located in Anaheim, 4 miles northeast of the proposed alignment. Peak ambient air quality concentrations and the number of monitored days above the designated standard for the latest 3 years for which data are available, 2007–2009, are presented in Table 4.7.

As shown in Table 4.5, CO, NO_2 and SO_2 concentrations recorded at the nearby monitoring station are well below federal and state standards. Ozone concentrations have exceeded federal and state AAQS between 2006 and 2008. Measured PM_{10} and $PM_{2.5}$ concentrations at the monitoring stations have also exceeded state standards over the past three years.

Table 4.7 – Background Air Quality Data (2007 - 2009)

Maximum Observed Concentration (Number of Standard Exceedances - most restrictive)					
Constituent	**State Standard**	**Federal Standard**	**2007**	**2008**	**2009**
CO					
1-hr	20.0 ppm	35.0 ppm	4 (0)	4 (0)	3 (0)
8-hr	9.0 ppm	9.5 ppm	2.9 (0)	3.6 (0)	2.7 (0)
Ozone					
1-hr	0.09 ppm	0.12 ppm	0.127 (2)	0.105 (2)	0.093 (0)
8-hr	0.07 ppm	0.08 ppm	0.099 (7)	0.086 (10)	0.077 (2)
NO_2					
1-hr	0.25 ppm	---	0.10 (0)	0.09 (0)	0.07 (0)
Annual	---	0.053 ppm	0.0208 (0)	0.0203 (0)	0.0179 (0)
SO_2					
1-hr	0.25 ppm	---	--	--	--
3-hr	---	0.5 ppm	--	--	--
24-hr	0.04 ppm	0.14 ppm	--	--	--
Annual	---	0.03 ppm	--	--	--
PM_{10}					
24-hr	50 µg/m^3	150 µg/m3	75 (5)	61 (3)	63 (1)
Annual	20 µg/m^3	--	31.0	28.6	30.9
$PM_{2.5}$					
24-hr	12 µg/m^3	65 µg/m^3	79.4 (14)	67.9 (13)	64.6 (4)
Annual	--	35 µg/m^3	14.5	13.7	11.8

Notes: '---' denotes insufficient or no data.
Source: SCAQMD Historical Data; available at: www.aqmd.gov/smog.

4.5.2 Applicable Laws and Regulations

Most federal programs to monitor and regulate stationary source emissions are delegated to regional air quality management districts, such as the SCAQMD, in California. State programs administered through the CARB primarily control air quality pollutants from the operation of mobile sources. Federal, state and local authorities have adopted various rules and regulations requiring evaluation of the impact on air quality of a planned project and appropriate mitigation for air pollutant emissions. There are several

federal regulations that govern the assessment and consideration of regional and local air quality impacts. These regulations establish health-based standards and evaluation criteria for assessment of impacts.

The Federal Clean Air Act (CAA) was adopted in 1963 to improve air quality and protect citizen's health and welfare. The CAA established two types of national air quality standards: primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly, and secondary standards set limits to protect public welfare, including protection against decreased visibility, or damage to animals, crops, vegetation, and buildings. The USEPA has established NAAQS for six principal or "criteria" pollutants.

The EPA's Transportation Conformity Rule (40 Code of Federal Regulations (CFR) Parts 51 and 93) was established to implement requirements set forth in the CAA specific to transportation plans, programs and projects. The Conformity Rule requires Metropolitan Planning Organizations (e.g., SCAG), the Federal Highway Administration (FHWA) and the FTA to make conformity determinations on transportation and transit projects prior to approval. Projects that are funded or approved by the FTA must conform to the regulatory requirements by resulting in operational emissions below the applicable conformity thresholds (de minimus thresholds).

The California Clean Air Act (CCAA), administered by the CARB, requires that each area exceeding the state ambient air quality standards develop a plan aimed at achieving those standards. The California Health and Safety Code, Section 40914, requires air districts to design a plan that achieves an annual reduction in district-wide emissions of 5 percent or more, averaged every consecutive 3-year period. To satisfy this requirement, the local Districts' are required to develop and implement air pollution reduction measures, which are described in their Air Quality Management Plans (AQMPs) and outline strategies for achieving the state ambient air quality standards for criteria pollutants for which the region is classified as non-attainment.

The CARB establishes and enforces emission standards for motor vehicles, fuels, and consumer products; establishes health-based air quality standards; conducts research; monitors air quality; identifies and promulgates control measures for Toxic Air Contaminants (TACs); provides compliance assistance for businesses; produces education and outreach programs and materials; and oversees and assists local air quality districts that regulate most non-vehicular sources of air pollution.

The CARB is responsible for regulating and reducing emissions from mobile sources. Specifically, the CARB's In-Use Off-road Diesel Vehicle Regulation establishes various requirements for owners of off-road diesel vehicles equipped with engines of 25 horsepower (HP) or greater, including reporting and recordkeeping, limits on non-essential idling (5 minute limit), and emission performance requirements effective January 2014.

CEQA requires projects to evaluate the potential local level of CO impacts of a project. Elevated levels of CO typically occur in urbanized areas and are typically measured at roadway intersections where there is increased congestion from mobile sources including cars and trucks. CO concentrations vary considerably over longer distances; therefore, areas with higher levels of CO concentrations are referred to as "hot spots." Projects that could increase CO concentrations, such as transportation-related projects, are required to evaluate the potential for a CO hotspot at roadway intersections. Per 40 CFR Part 93.123 (c)(5), analysis of CO hotspots are not required to consider construction-related activities, which result in temporary increases in emissions.

The SCAQMD is the regional agency responsible for regulation and enforcement of federal, state, and local air pollution control regulations in the South Coast Air Basin (SCAB). The SCAQMD operates monitoring stations in the SCAB, develops and enforces rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections.

Each of the local jurisdictions within the study area have established goals and policies within the General Plan, designed to achieve regional attainment status with the NAAQS and CAAQS, as well as goals to reduce fugitive dust generated during construction activities.

4.5.3 Evaluation Methodology

Emission sources during operation include regional vehicle miles traveled (VMT), worker commute trips, and transit service. Based on limited data availability prior to project design, air quality impacts have been evaluated based on predicted regional VMT reductions due to implementation of the TSM, BRT, and build alternatives compared to existing conditions.

4.5.4 Air Quality Assessment

This section evaluates the potential air quality and climate change impacts and benefits from implementation of the various modal alternatives considered in this AA study, compared to the No Build Alternative. The alternatives include No Build, TSM, BRT, Street Car, LRT and Low Speed Maglev. Various alternatives include alignment options, which have also been evaluated to identify the alternative which could result in the greatest air quality and/or climate change benefit. A detailed description of each alternative and alignment is included in Section 1.0 and 2.0 of this report.

Operational impacts of each alternative have been evaluated based on the reduction in VMT compared to the No Build Alternative, as presented in Table 4.8.

Table 4.8 – Daily Emissions Summary (lb/day)

Incremental Change in Daily Emissions Compared to No Build Alternative						
Alternative	**Criteria Pollutant**					
	VOC	**NOx**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
No Build	133,788.75	144,697.65	1,634,870.21	5,770.04	938,283.25	181,617.40
TSM	(186.00)	(201.16)	(2,272.79)	(8.02)	(1,304.40)	(252.49)
BRT-HOV	(381.24)	(412.32)	(4,658.58)	(16.44)	(2,673.65)	(517.82)
BRT-Street	(298.11)	(322.42)	(3,642.83)	(12.85)	(2,090.69)	(404.68)
LRT East Bank	(389.52)	(421.28)	(4,759.81)	(16.80)	(2,731.75)	(528.77)
LRT West Bank 2	(376.61)	(407.32)	(4,602.01)	(16.24)	(2,641.18)	(511.24)
LRT West Bank 3	(386.35)	(417.86)	(4,721.12)	(16.66)	(2,709.54)	(524.47)
Street Car West Bank 3	(353.70)	(382.54)	(4,322.04)	(15.25)	(2,480.50)	(480.14)
Low Speed Maglev West Bank 3	(361.49)	(390.97)	(4,417.30)	(15.59)	(2,535.17)	(490.72)

Implementation of the proposed alternatives would reduce commuter VMT and mobile source exhaust emissions generated during daily commuter trips, when compared to the No Build Alternative. Reducing mobile source exhaust emissions would result in local and regional air quality benefits and would be consistent with regional air quality attainment goals.

Summary

The proposed TSM and build alternatives will result in emissions of criteria pollutants, TACs, and greenhouse gases during construction and operation. GHG emissions and their potential impacts are evaluated in the Climate Change Section. Metro has adopted the Green Construction Policy which would result in NOx, PM_{10}, PM_{25} and GHG emissions reductions. However, due to the level of anticipated construction activity associated with the Build Alternatives, it is anticipated that construction emission impacts would result in a potentially significant impact for NOx emissions.

Annual regional VMT is expected to decrease as a result of the TSM or build alternatives. Therefore, emissions generated from on-road vehicles are anticipated to decrease, resulting in a regional and localized air quality benefit.

4.6 Climate Change

The regulatory framework, methodology and significance thresholds used to analyze climate change impacts are described in the following sections.

4.6.1 Affected Environment

Climate change, often referred to as "global warming" is a global environmental issue that refers to any substantial change in measures of climate including temperature, precipitation, or wind which extends for a period (decades or longer) of time. Climate change is a result of both natural factors, such as volcanic eruptions, and anthropogenic, or man-made, factors including changes in land use and burning of fossil fuels (EPA, 2010). Anthropogenic activities, such as deforestation and fossil fuel combustion, emit heat-trapping GHG emissions. GHGs are defined as any gas that absorbs infrared radiation within the atmosphere, which is referred to as a "Global Warming Potential" (GWP). Each GHG has a GWP, which is a value based on the heat-absorbing ability of each gas relative to the heat trapping potential of CO_2. GHGs include, but are not limited to: water vapor, CO_2, CH_4, N_2O, and chlorofluorocarbons (CFCs).

GHGs, both naturally-occurring and anthropogenic, prevent heat from escaping the atmosphere and thereby regulate the Earth's temperature. Anthropogenic sources of GHGs have elevated GHG concentrations within the atmosphere, which has led to an increase in the Earth's average surface temperature. According to National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration data, the Earth's average surface temperature has increased by about 1.2 to 1.4 degrees Fahrenheit (ºF) in the last century. The eight warmest years on record (since 1850) have all occurred since 1998, with the warmest year being 2005. Based on available data, the rise in temperature is most likely due to anthropogenic sources (EPA, 2010). Unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, GHGs are global pollutants and climate change is a global issue. Six recognized GHGs are described below.

- **Carbon Dioxide (CO_2)** is a colorless odorless gas. Natural sources include: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic degassing. Anthropogenic sources of carbon dioxide include burning fuels, such as coal, oil, natural gas and wood.
- **Chlorofluorocarbons (CFCs)** are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically nonreactive in the troposphere (the level of air at the Earth's surface).
- **Methane (CH_4)** is a gas that is the main component of natural gas used in homes. Methane forms naturally from the decay of organic matter.
- **Nitrous Oxide (N_2O),** also known as laughing gas, is a colorless gas. N_2O is produced by microbial processes in soil and water, including those reactions which occur in nitrogen-rich fertilizers.

- **Ozone (O_3)** is a GHG; however, unlike the other GHGs, ozone in the troposphere is relatively short-lived and, therefore, is not global in nature.
- **Water Vapor** is the most abundant and variable GHG in the atmosphere. It is not considered to be a pollutant; it maintains a climate necessary for life in the atmosphere.

National and State Greenhouse Gas Inventories

The EPA publication Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990-2008, provides a comprehensive emissions inventory of the nation's primary anthropogenic sources of GHG emissions. In 2008, total US GHG emissions were approximately 6,956.8 million $MTCO_2e$, 84.1 percent of which was from the combustion of fossil fuels. Sources of fossil fuel combustion include electricity generation, transportation sources, industrial processes and residential/commercial sources (EPA, 2010).

California is the second largest contributor in the U.S. and the 16th largest in the world. In 2004, CARB conducted a detailed inventory of statewide sources and estimated a statewide emission of 484 million $MTCO_2e$; the two largest contributors were the transportation and industrial sectors, accounting for 38 and 20 percent, respectively, of total CO_2e emissions. Transportation sources are the fastest-growing source of GHG emissions in the U.S., accounting for 47 percent of the net increase in total emissions since 1990 (EPA, 2010). Nearly 97 percent of transportation GHG emissions are generated through direct combustion of fossil fuels, while the remaining 3 percent is generated through electric-driven services, such as rail service (United States Department of Transportation, 2006). Electricity production, agriculture, forestry, commercial and residential activities comprise the balance of California's GHG emissions inventory.

4.6.2 Applicable Laws and Regulations

The Intergovernmental Panel on Climate Change (IPCC) is the leading body for the assessment of climate change. The IPCC is a scientific body that reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. The scientific evidence brought up by the first IPCC Assessment Report of 1990 unveiled the importance of climate change as a topic deserving a political platform among countries to tackle its consequences. It, therefore, played a decisive role in leading to the creation of the United Nations Framework Convention on Climate Change (UNFCCC), the key international treaty to reduce global warming and cope with the consequences of climate change.

The CAA is the law that defines the USEPA responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. Until recently, GHG emissions have not been regulated under the CAA; however, a 2007 Supreme Court case, Massachusetts v. EPA (Supreme Court Case 05-1120), found that GHG emissions from motor vehicles were air pollutants covered by the CAA. In response to the ruling, the EPA and the U.S. Department of Transportation's National Highway Traffic Safety Administration announced a joint final rule establishing a "National Program," which was designed to

decrease GHG emissions and improve fuel economy through implementation of carbon dioxide (CO_2) emission standards for motor vehicles.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA. These included:

- The Endangerment Finding: The current and projected concentrations of the six key well-mixing GHGs – carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride – in the atmosphere threaten the public health and welfare of current and future generations.
- Cause of Contribute Finding: The EPA Administrator finds that the combined emissions of these well-mixing GHGs from new motor vehicles and (new motor) engines contribute to GHG pollution which threatens public health and welfare.

Assembly Bill 32 California Global Warming Solutions Act of 2006 California's major initiatives for reducing climate change or GHG emissions are outlined in Assembly Bill (AB) 32 (signed into law in 2006). These initiatives require GHG emissions to be reduced to 1990 levels by 2020 – a reduction of about 25 percent – and to be reduced 80 percent below 1990 levels by 2050. The AB 32 Scoping Plan contains the main strategies California will use to reduce the GHG emissions that cause climate change. Pursuant to AB 32, the CARB adopted the Climate Change Scoping Plan (CCSP) which outlines how emissions reduction will be achieved from significant sources of GHGs via regulations, market mechanisms, and other actions.

Senate Bill (SB) 375, which was signed into law in September 2008, establishes regional targets for reducing GHG emissions from passenger vehicles. Recommendations and strategies designed to support metropolitan planning organizations (SCAG in the case of the Los Angeles area) in the development of effective regional targets are provided in the 2009 Final Regional Targets Advisory Committee Report. Specific regional targets have yet to be developed; however, the AB 32 Scoping Plan presents a general regional transportation-related GHG reduction target of five million $MTCO_2e$ by 2020.

4.6.3 Evaluation Methodology

The methodology used to analyze the proposed project alternatives' contribution to global climate change includes an evaluation based on predicted regional VMT reductions due to implementation of the TSM, BRT, and build alternatives compared to existing conditions. Mobile source GHG emissions were evaluated using the CARB-approved URBEMIS model, version 9.2.4. Emissions from the proposed alternatives were compared to existing conditions (2011) to determine the net decrease in VMT and subsequent emissions reductions resulting from project implementation. Following completion of the AA study, a more detailed GHG emissions impact analysis would be included in future study efforts.

4.6.4 Climate Change and Emissions Assessment

Annual regional VMT is expected to decrease as a result of implementation of the TSM or build alternatives. Therefore, GHG emissions, evaluated in Metric Tons of Carbon Dioxide Equivalents (MTCO2/Yr) per year, generated from on-road vehicles are anticipated to decrease, resulting in a regional reduction in GHG emissions and climate change impacts, as presented in Table 4.9.

Table 4.9 – Annual Emissions Summary (MTCO2)

Incremental Change Compared to No Build	
Alternative	**$MTCO_2$/Yr**
No Build	91,316,365.0
TSM	(126,947.7)
BRT HOV-Running	(260,207.4)
BRT Street-Running	(203,472.1)
LRT East Bank	(265,879.6)
LRT West Bank 2	(257,047.3)
LRT West Bank 3	(263,700.6)
Street Car West Bank 3	(241,409.4)
Low Speed Maglev West Bank 3	(246,730.3)

It is anticipated that the net emissions impacts from construction and operation would not result in a significant contribution to regional or global climate change. In addition, based on the reduction in regional VMT, it is anticipated that the TSM and build alternatives would contribute to the state-wide reduction targets for the transportation sector per AB 32. Therefore, consistency with existing plans and policies geared towards reducing GHG emissions and climate change impacts is expected based on implementation of any of proposed modal alternatives.

Summary

The proposed TSM and build alternatives will result in emissions of GHG during construction and operation. It is anticipated that the net emissions impacts from construction and operation would not result in a significant contribution to regional or global climate change. Based on the reduction in regional VMT, it is anticipated that the TSM and build alternatives would contribute to the state-wide reduction targets for the transportation sector per AB 32. In addition, Metro's Green Construction Policy is geared towards the use of new model construction equipment, consistent with the CARB's In-Use Off-Road Diesel Regulation, and would result in reductions of CO_2 during equipment operation. Therefore, consistency with existing plans and policies geared towards reducing GHG emissions and climate change impacts is expected.

Climate Change and Air Quality Comparative Summary

The preliminary analysis is based on reductions in regional VMT, which represents the best available data at the time of the AA study. Additional onsite and offsite sources of operational emissions contributing to the impacts and benefits of each alternative would be evaluated as part of future study efforts.

A comparative summary of each alternative is presented in Table 4.10, based on the level of criteria pollutant and GHG emission reduction, compared to the No Build Alternative. The comparative summary is presented on a "rating scale." The rating scale ranges from 1 to 5; a rating of "5" indicates the greatest reduction in criteria pollutant and GHG emissions, and a rating of "1" indicates the least reduction in criteria pollutant and GHG emissions. The ratings are presented by general modal type in Table 4.10.

Table 4.10 – Air Quality and Climate Change Benefits - Comparative Summary

Modal Option	Rating[1]	Description
TSM Alternative	1	Could adversely impact air quality and climate change because it produces some mobile source emissions from combustion of natural gas or other alternative fuel type.
BRT Alternatives(HOV-Running)	4	Could adversely impact air quality and climate change because it produces some mobile source emissions from combustion of natural gas or other alternative fuel type.
LRT Alternatives	5	Does not adversely impact air quality because it is electrified and does not result in mobile source emissions. Could adversely impact climate change because it requires off-site electricity generation for transit power; electricity is assumed to meet renewable portfolio standard (RPS).
Street Car Alternative	2	Does not adversely impact air quality because it is electrified and does not result in mobile source emissions. Could adversely impact climate change because it requires off-site electricity generation for transit power; electricity is assumed to meet RPS.
Low Speed Maglev Alternative	3	Does not adversely impact air quality because it is electrified and does not result in mobile source emissions. Could adversely impact climate change because it requires off-site electricity generation for transit power; electricity is assumed to meet RPS.

Notes: 1. Rating is based on reduction in commuter VMT compared to the No Build Alternative, which represents the best available data at the time of the Alternative's Analysis.

In conclusion, the electrified modes, including LRT and Low Speed Maglev, and BRT alternatives are anticipated to provide the greatest benefit in terms of air quality and GHG emissions, while the TSM and Street Car modes would result in a lesser beneficial impact due to lower reductions in commuter VMT. While the electric-driven options would result in climate change impacts due to electrical demand, compared to the TSM and BRT options, it has been assumed that these alternatives would receive power from generators meeting the California RPS. Therefore, any offsite impacts would continue to be reduced through statewide efforts aimed at reducing GHG emissions from power generators.

4.7 Energy

This section describes the affected environment, regulatory framework, evaluation methodology, and alternative energy analysis by mode.

4.7.1 Affected Environment

Transportation is a major consumer of energy in the Southern California region with various energy service providers serving the region. Within the study area, the Los Angeles Department of Water and Power (LADWP), City of Anaheim Public Utilities Department, and Southern California Edison (SCE) provide electricity, and the Southern California Gas Company (TGC) provides natural gas. Electrical and natural gas services are readily available to the study area.

4.7.2 Applicable Laws and Regulations

The United States Department of Energy (DOE) is committed to reducing America's dependence on foreign oil and developing energy efficient technologies for buildings, homes, transportation, power systems and industry. The mission of the Office of Energy Efficiency and Renewable Energy is to strengthen America's energy security, environmental quality and economic vitality in public-private partnerships that:

1. Enhance energy efficiency and productivity;
2. Bring clean, reliable and affordable energy technologies to the marketplace; and
3. Make a difference in the everyday lives of Americans by enhancing their energy choices and their quality of life.

The California Energy Commission (CEC) is the state's primary energy policy and planning agency. Created by the legislature in 1974, the commission has the following major responsibilities:

1. Forecasting future energy needs and keeping historical energy data;
2. Licensing thermal power plants 50 megawatts or larger;
3. Promoting energy efficiency by setting the State's appliance and building efficiency standards and working with local government to enforce those standards;
4. Supporting public interest energy research that advances energy science and technology through research, development and demonstration programs;

5. Supporting renewable energy by providing market support to existing, new and emerging renewable technologies;
6. Providing incentives for small wind and fuel cell electricity systems;
7. Providing incentives for solar electricity systems in new home construction;
8. Implementing the State's Alternative and Renewable Fuel and Vehicle Technology Program; and
9. Planning for and directing the State's response to energy emergencies.

The CEC published the 2009 Integrated Energy Policy Report (IEPR) in December 2009. The IEPR was prepared in response to Senate Bill (SB) 1389, Chapter 568, Statutes of 2002, which requires that the CEC prepare a biennial integrated energy policy report. This report contains an integrated assessment of major energy trends and issues facing the state's electricity, natural gas and transportation fuel sectors and provides policy recommendations to: conserve resources; protect the environment; ensure reliable, secure and diverse energy supplies; enhance the state's economy; and protect public health and safety. The IEPR fulfills the requirement of SB 1389. Metro has several similar policies to the CEC's as discussed below.

SCAG is required by state and federal mandates to prepare a regional transportation plan every four years. The 2008 RTP is a long-range regional transportation plan that provides a blueprint to help achieve a coordinated and balanced regional transportation system. The SCAG 2008 RTP describes energy production and consumption throughout the SCAB and provides VMT by county. SCAB is a sub region of the SCAQMD, the agency principally responsible for comprehensive air pollution control in the State. SCAB includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, including the Salton Sea Air Basin, the South Central Coast Air Basin, the Mojave Air Basin, and the Southern California Air Basin. VMT is an indicator of the extent to which vehicles are used, providing a valuable factor in calculating the amount of energy consumed by transportation.

Metro also has an Energy and Sustainability Policy to control energy consumption and embrace energy efficiency, energy conservation, and sustainability to avoid unnecessary expenditure; help in protecting the environment; improve cost effectiveness, productivity, and working conditions; and prolong the useful life of fossil fuels by using resources more efficiently.

4.7.3 Evaluation Methodology

Energy consumption involves energy used by the operation of vehicles (automobile, truck, bus, or train) within the project alignments. Energy consumption estimates give consideration to annual VMT for automobiles, trucks, buses, and rail vehicles; and the variation of fuel consumption rates by vehicle type. A general evaluation of energy usage by mode was performed based on readily available data sources.

4.7.4 Energy Assessment

For the build alternatives, electricity for the trains would be provided via service connections within the study area. These connections would be provided by both overhead and underground lines. The

overhead lines both transmit and distribute electricity, while underground lines are used entirely for distribution of electricity. For the BRT alternatives, buses would be fueled at Metro or OCTA maintenance and fueling facilities, likely using compressed natural gas (CNG) or other alternative fuels. BRT, LRT, and Street Car alternatives are expected to reduce energy consumption by reducing dependency on automobile use. Table 4.11 shows a comparison of energy uses by various modes.

Table 4.11 – Transportation Energy Intensity

Transport Mode	Energy Use (BTU/mile)
Passenger Vehicles (Cars)	5,517
Personal Trucks	6,788
Motorcycles	2,224
Buses (Transit/Intercity/School)	39,408
Transit Rail (Light and Heavy)	62,833

Source: Oak Ridge National Laboratory, 2009

Low Speed Maglev technology typically has lower operation and maintenance costs than the LRT, BRT, or Street Car, but has very high energy consumption. The maglev technology proposed for the PEROW/WSAB Corridor project is low-speed; however given that maglev is a new technology, energy consumption information is not widely known.

Generally, implementation of public transit projects such as the proposed alternatives would help to remove excess vehicles from roadways and freeways, easing the increase in VMT, and the usage of energy. In addition, lower VMT would also result in a reduction of vehicles emissions. As such, the proposed alternatives would likely have beneficial effects with regard to the region's energy resources. As the set of alternatives is reduced and becomes more refined, a more detailed analysis would be provided through future study efforts.

4.8 Noise and Vibration

As part of the AA study, a noise and vibration screening assessment was conducted to compare the potential for impact from different transit modes and alternative alignments. The noise and vibration assessment was prepared in accordance with NEPA and the guidelines set forth by both the FTA's *Transit Noise and Vibration Impact Assessment*[1] and the Federal Railroad Administration's (FRA) *High-Speed Ground Transportation Noise and Vibration Impact Assessment*[2]. The results of the noise and vibration screening assessment are described in the following sections.

[1] *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, U.S. Department of Transportation, Federal Transit Administration, Office of Planning and Environment, Washington, DC, May 2006.

[2] *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, U.S. Department of Transportation, Federal Railroad Administration, Office of Railroad Development, Washington, DC, October 2005.

4.8.1 Affected Environment

The Corridor includes a mixture of land use types interspersed between interstate highways ranging from single- and multi-family homes to parks and playgrounds (such as Paramount, Floral Vista, and Artesia Parks) to retail businesses and light industrial and manufacturing. As a result, the current ambient noise environment in the project area is generally dominated by traffic along the interstate highways (such as the I-105, I-605 and I-710) and major arterial streets that intersect the PEROW/WSAB Corridor. Estimated day-night noise levels along the Corridor are expected to range from 55 A-weighted decibel (dBA) within remote residential neighborhoods away from major highways and arterials to 65 dBA along highway corridors such as the I-105.

These noise levels are generally representative of urban land uses and reflect the dominance of vehicle traffic noise within the study area. These noise levels were estimated using the FTA General Assessment guidelines based on the population densities of Los Angeles and Orange Counties as well as proximity to major transportation corridors such as highways, arterials, and railroad corridors.

Similarly, existing vibration along the Corridor is mainly due to vehicular traffic on major arterials as well as local roads. Unlike noise, vibration is event based and highly dependent on the surface or rail conditions and the distance between the source and the receiver. Estimated single-event vibration levels from buses and trucks along the project corridor are expected to range from 57 Vibration decibels (VdB) at receptors approximately 100 feet from local roadways to over 70 VdB at land-uses immediately adjacent to an active roadway. These vibration levels were estimated using the FTA General Assessment guidelines based on average travel speeds from rubber-tired vehicles as well as proximity to arterials and local roadways.

4.8.2 Applicable Laws and Regulations

FTA Noise- and Vibration-Screening Distances

The Federal Noise Control Act of 1972 (Public Law 92-574) requires that all federal agencies administer their programs in a manner that promotes an environment free from noises that could jeopardize public health or welfare. Therefore, the noise- and vibration-screening assessment was prepared in accordance with NEPA and the guidelines in FTA's *Transit Noise and Vibration Impact Assessment* (FTA 2006). These guidelines form the basis for comparing different transit modes and alignments during the preliminary phase of transit projects.

As shown in Table 4.12, the FTA land use categories reflect different sensitivities to transit noise and for different time periods [e.g., the peak-hour Leq(h) for institutional receptors and the 24-hour Ldn for residential receptors]. However, as part of the preliminary screening assessment, the primary focus is on residential properties that are exposed to transit noise 24 hours per day particularly during the nighttime when people are sleeping. For the screening assessment, other institutional land uses were also included to reflect their sensitivity to transit noise such as schools, parks, libraries, and churches. Hospitals and hotels were also included in the screening assessment.

Table 4.12 – FTA Land-Use Categories and Noise Metrics

Noise Metric	Land-Use Category	Description
Leq(h)	1	Tracts of land set aside for serenity and quiet, such as outdoor amphitheaters, concert pavilions, and historic landmarks.
Ldn	2	Buildings used for sleeping such as residences, hospitals, hotels, and other areas where nighttime sensitivity to noise is of utmost importance.
Leq(h)	3	Institutional land uses with primarily daytime and evening uses including schools, libraries, churches, museums, cemeteries, historic sites, and parks, and certain recreational facilities used for study or meditation.

Source: FTA, 2006.

As shown in Table 4.13, noise-screening distances were developed for each of the five different transit modes. The noise-screening distances reflect the cumulative noise effects from the project over a 24 hour period including nighttime operations between 10:00 PM and 7:00 AM. The noise-screening distances range from 25 feet for in street-running BRT service to 550 feet for LRT service. The LRT-screening distance of 550 feet, for example, reflects five-minute headways during the peak periods and three-car consists for a total of 474 vehicle trips per day.

Table 4.13 – Project Noise- and Vibration-Screening Distances (feet)[1]

Transit Mode	Type Description	Document Source	Noise[2] "obstructed"	Vibration[3] "frequent"
BRT-HOV	Busway	FTA	55	50
BRT-Street	BRT, exclusive road	FTA	25	50
Street Car	Low- / Intermediate-Capacity Transit	FTA	150	100
LRT	Light Rail Transit	FTA	550	150
Low Speed Maglev	Maglev on concrete	FRA	40	7

Notes:
1 All screening distances are intended to be applied from the proposed corridor centerline.
2 The FTA noise screening distances were adjusted to reflect the proposed operating schedule for each transit mode. Additionally, due to the high building density along the project corridor, the FTA "obstructed" screening distances were utilized (as opposed to the "unobstructed" distances) to account for building shielding.
3 The FTA vibration screening distances reflect "frequent" transit service with more than 70 events per day expected.
Source: AECOM, October 2011.

The FTA criteria for evaluating ground-borne vibration impacts from transit vehicle passbys at nearby sensitive receptors are applied to the same land use categories as for noise, as shown in Table 4.12. Since the FTA vibration criteria are evaluated for single events rather than cumulative exposure, the vibration screening distances reflect single-event transit vehicle passbys.

The FTA's experience with community response to ground-borne vibration indicates that, when only a few trains pass by per day, it takes higher vibration levels to evoke the same community response that

occurs from more frequent trains. As a result, the vibration-screening distances reflect the FTA "frequent" event criteria rather than the less-stringent "occasional" or "infrequent" vibration events criteria. The "frequent" events category is defined as more than 70 trains per day; the occasional events category is defined as between 30 and 70 trains per day; and the infrequent events category is defined as fewer than 30 trains per day. To be conservative, the FTA "frequent" events screening distances were used to evaluate the potential for ground-borne vibration impacts along the proposed transit corridors.

As a result, the vibration-screening distances range from only seven feet for Low Speed Maglev vehicles to 150 feet for LRT service. The LRT screening distance of 150 feet, for example, reflects the heaviest vehicle of the group operating on steel rails. The rubber-tired BRT vehicles (with their damped suspension) and the "floating-on-air" maglev vehicles are expected to create minimal vibration effects along the Corridor.

FRA Noise- and Vibration-Screening Distances

For the maglev vehicles, the noise and vibration screening assessment was prepared in accordance with the guidelines in the FRA's *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA 2005). The FRA utilizes the same noise criteria as the FTA. Additionally, with only minor differences, the FRA vibration criteria are also essentially the same as the FTA criteria. As a result, the noise screening distance was developed for the maglev transit option based on the default FRA distance for high speed maglev on concrete. As shown in Table 4.13, the noise-screening distance for low-speed maglev vehicles is only 40 feet, which reflects both the slower speed compared to the typical high speed options and the lack of contact between the train and the track.

Similarly, the vibration-screening distance for the low-speed maglev trains is only seven feet, which also reflects the maglev vehicles' ability to float on air rather than ride on steel rails. All screening distances are intended to be applied from the proposed Corridor centerline.

4.8.3 Evaluation Methodology

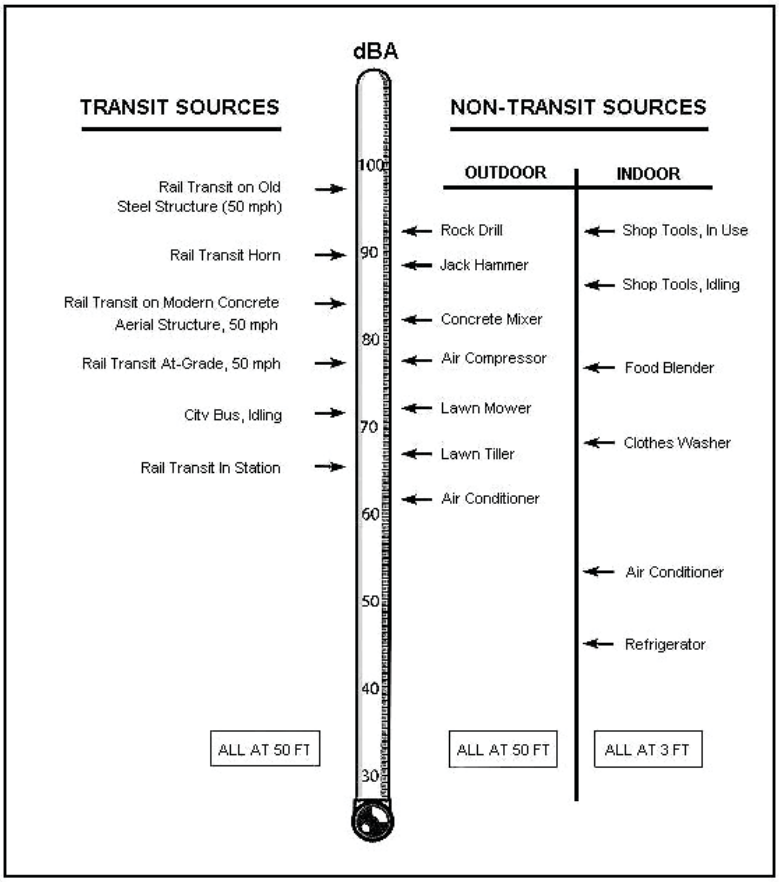
Noise

Noise is "unwanted sound" and, by this definition, the perception of noise is a subjective process. Several factors affect the actual level and quality of sound (or noise) as perceived by the human ear and can generally be described in terms of loudness, pitch (or frequency), and time variation. The loudness, or magnitude, of noise determines its intensity and is measured in decibels (dB) that can range from below 40 dB (the rustling of leaves) to over 100 dB (a rock concert). Pitch describes the character and frequency content of noise, such as the very low "rumbling" noise of stereo subwoofers or the very high-pitched noise of a piercing whistle. Finally, the time variation of noise sources can be characterized as continuous, such as with a building ventilation fan; intermittent, such as for trains passing by; or impulsive, such as pile-driving activities during construction.

Various sound levels are used to quantify noise from transit sources, including a sound's loudness, duration, and tonal character. For example, the A-weighted decibel (dBA) is commonly used to describe the overall noise level because it more closely matches the human ear's response to audible frequencies. Because the A-weighted decibel scale is logarithmic, a 10 dBA increase in a noise level is generally perceived as a doubling of loudness, while a 3 dBA increase in a noise level is just barely perceptible to the human ear. Typical A-weighted sound levels from transit and other common sources are shown in Figure 4.6.

Several A-weighted noise descriptors are used to determine impacts from transit related sources including the L_{max}, which represents the maximum noise level that occurs during an event such as a bus or train passby; the L_{eq}, which represents a level of constant noise with the same acoustical energy as the fluctuating noise levels observed during a given interval, such as one hour; and the L_{dn}, or the 24-hour day-night noise level, which includes a 10-decibel penalty for all nighttime activity between 10:00 PM and 7:00 AM.

Figure 4.6 – Typical A-Weighted Noise Levels



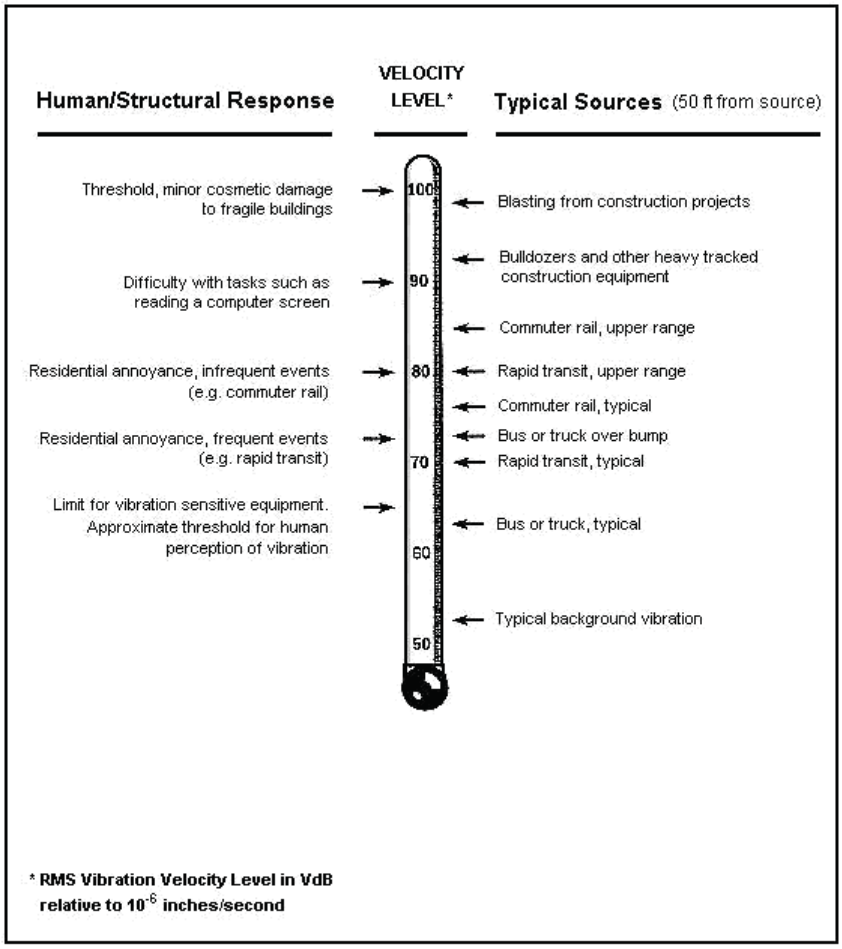
Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, Washington, DC, May 2006.

Vibration

Ground-borne vibration associated with vehicle movements is usually the result of uneven interactions between wheels and the road or rail surfaces. Examples of such interactions (and subsequent vibrations) include train wheels over a jointed rail, an untrue rail car wheel with "flats," and a motor vehicle wheel hitting a pothole, a manhole cover, or any other uneven surface. Unlike noise, which travels in air, transit vibration typically travels just below the surface of the ground. Depending on the geological properties of the surrounding terrain and the type of building structure exposed to transit vibration, vibration propagation can be more or less efficient. Buildings with a solid foundation set in bedrock are "coupled" more efficiently to the surrounding ground and experience relatively higher vibration levels than buildings located in sandier soil. On the other hand, heavier buildings (such as masonry structures) are less susceptible to ground-borne vibration than wood-frame buildings because they absorb more of the vibration.

Vibration induced by vehicles passing by can generally be discussed in terms of displacement, velocity, or acceleration. However, human responses and responses by monitoring instruments and other objects are most accurately described with velocity. Therefore, the vibration velocity level is used to assess vibration impacts from transit projects. To describe the human response to vibration, the average vibration amplitude (called the root mean square, or RMS, amplitude) is used to assess impacts. The RMS velocity level is expressed in inches per second or vibration decibels (VdB). All VdB vibration levels are referenced to 1 micro-inch per second. Typical ground-borne vibration levels from transit and other common sources are shown in Figure 4.7.

Figure 4.7 – Typical Ground-Borne Vibration Levels



Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, Washington, DC, May 2006.

Operating Assumptions

The FTA/FRA screening distances were applied to the project corridor for different transit modes (including BRT, Street Car, LRT and Low Speed Maglev) and different alternative alignments. The transit modes and alternative alignments included in this screening assessment are summarized below.

Transit Modes

- BRT
- Street Car
- LRT
- Low Speed Maglev

Alignments

- BRT HOV Lane-Running
- BRT Street-Running
- East Bank Alignment (except BRT)

- West Bank Alignment 1 (except BRT)
- West Bank Alignment 2 (except BRT)
- West Bank Alignment 3 (except BRT)

The following modeling assumptions were applied to the noise- and vibration-screening assessment:

- Total daily operations for all rail transit modes (Street Car, LRT and Low Speed Maglev) were determined based on five-minute headways during all peak periods of the day between 6:00 and 9:00 AM and 3:00 and 7:00 PM. A detailed breakout of headway time for the rail modes by period of the day was presented in Section 3.0.
- Total daily operations for the BRT service were also determined based on five-minute headways during all peak and off-peak periods of the day between 6:00 and 9:00 AM and 3:00 and 7:00 PM. A detailed breakout of headway time for the BRT service by period of the day was presented in Section 3.0
- All headway times are based on the *2011 Metro Transit Service Policy*.
- Maximum travel speeds of 35 miles per hour (mph) were used for all segments of the proposed BRT alternatives, while a maximum speed of 50 mph was used for the guideway alternatives.
- The screening distances summarized in Table 4.11 reflect the type of transit mode, the number of operations, and the travel speed. Other noise sources such as passenger stations, grade crossing bells or warning horns were not incorporated into the screening distances. These factors would be applied during any future study phase when these other factors are better defined.
- In accordance with the FTA/FRA methodologies, the noise screening distances generally reflect where the project noise reaches 50 dBA for the descriptor shown.
- Similarly, the vibration-screening distances generally reflect “normal” vibration propagation and where the project vibration reaches the threshold of impact of 72 VdB including a 5-decibel factor of safety.

4.8.4 Noise and Vibration Assessment

In accordance with the FTA and FRA guidelines, screening distances were applied along the Corridor to determine the location of any noise- or vibration sensitive receptors. The FTA screening distances were applied to the BRT, Street Car and LRT vehicle types, while the FRA screening distances were applied to the Low Speed Maglev vehicle. The default FTA/FRA noise screening distances were adjusted to reflect the project’s operating characteristics including headway times, consist size and travel speeds. These minor adjustments were applied to the noise distances only to reflect the cumulative nature of the 24-hour day-night noise levels. Vibration impacts are based on single events so no adjustments were applied to the FTA/FRA vibration screening distances. The project screening distances are summarized in Table 4.13.

No Build Alternative

The study area is characterized by densely built-out urban communities that include major highways and arterials. Irrespective of other projects in the Transportation Improvement Program (TIP), ambient noise and vibration under the No Build Alternative should be similar as under existing conditions without the PEROW/WSAB Corridor. Therefore, since no significant noise and vibration impacts are expected under the No Build Alternative.

TSM Alternative

Currently, there are numerous transit lines in the study area, both in Los Angeles and Orange counties. The TSM Alternative would not substantially change conditions with respect to land uses, visual quality, parklands and community facilities, or other environmental areas. For example, heavily trafficked streets in some parts of Orange County currently operate 200 or more buses daily. The addition of the TSM into current traffic flow would not significantly change or add to noise and vibration issues.

Build Alternatives

Noise

As shown in Table 4.14, the FTA/FRA noise screening distances applied along the project alignments indicate the potential for impact at several noise sensitive land uses. Under the BRT alternatives, for example, the number of noise sensitive land uses identified within the screening distances ranges from 1,558 properties along the HOV Lane-Running alignment to 2,405 properties along the in Street-Running alignment.

Table 4.14 – Number of Noise-Sensitive Land Uses Identified within the FTA/FRA Screening Distances

Alignment	BRT	Street Car	LRT	Low Speed Maglev
BRT-HOV	1,558	--	--	--
BRT-Street	2,405	--	--	--
East Bank	--	8,509	27,384	1,542
West Bank 1	--	8,410	26,971	1,519
West Bank 2	--	8,857	28,141	1,585
West Bank 3	--	8,772	27,882	1,570

Source: AECOM, October 2011.

- All of the guideway alternatives have the East Bank and West Bank 1 in common. For the Street Car service, the number of noise sensitive land uses identified within the screening distances ranges from 8,410 properties along the West Bank Alignment 1 to 8,857 properties along the West Bank Alignment 2.

- For the heavier LRT vehicles, the number of noise sensitive land uses identified within the screening distances ranges from 26,971 properties along the West Bank Alignment 1 to 28,141 properties along the West Bank Alignment 2.

- For the Low Speed Maglev vehicles, the number of noise sensitive land uses identified within the screening distances ranges from 1,519 properties along the West Bank Alignment 1 to 1,585 properties along the West Bank Alignment 2.

Vibration

As shown in Table 4.15, the FTA/FRA vibration-screening distances applied along the project alternatives indicate the potential for impact at several vibration sensitive land uses.

- For the BRT service, for example, the number of vibration sensitive land uses identified within the screening distances ranges from 2,793 properties along the HOV Lane-Running alignment to 3,574 properties along the Street-Running alignment.

Table 4.15 – Number of Vibration-Sensitive Land-Uses Identified within the FTA/FRA Screening Distances

Alignment Alternative	BRT Alternative	Street Car Alternative	LRT Alternative	Low Speed Maglev
HOV Lane-Running	2,793	--	--	--
Street-Running	3,574	--	--	--
East Bank	--	5,625	8,509	293
West Bank 1	--	5,629	8,410	290
West Bank 2	--	5,898	8,857	305
West Bank 3	--	5,848	8,772	302

Source: AECOM, October 2011.

- Similarly for the Street Car service, the number of vibration sensitive land uses identified within the screening distances ranges from 5,625 properties along the East Bank Alignment to 5,898 properties along the West Bank Alignment 2.

- For the heavier LRT vehicles, the number of vibration sensitive land uses identified within the screening distances ranges from 8,410 properties along the West Bank Alignment 1 to 8,857 properties along the West Bank Alignment 2.

- For the Low Speed Maglev vehicles, the number of vibration sensitive land uses identified within the screening distances ranges from 290 properties along the West Bank Alignment 1 to 305 properties along the West Bank Alignment 2.

Summary

Based on the results of the noise and vibration screening assessment, the following findings summarize the approach along the PEROW/WSAB AA study:

- A screening assessment was conducted to assess the potential for noise and vibration impacts from each of the different transit modes and proposed alternative alignments.
- The default FTA and FRA screening distances were adjusted to reflect the estimated project transit modes and operating schedules.
- The FTA screening distances were applied to all BRT, Street Car and LRT transit modes, while the FRA screening distances were applied to the Low Speed Maglev vehicles only.
- This assessment was conducted using both the FTA and the FRA screening methodologies for noise and vibration sensitive receptors including residences, parks, schools, hospitals, and churches.
- The number of noise and vibration sensitive properties identified within the FTA and FRA screening distances are summarized in Table 4.16.

Table 4.16 – Summary of Noise- and Vibration-Sensitive Land Uses Identified within the FTA/FRA Screening Distances

Alternative	Metric	BRT	Street Car	LRT	Low Speed Maglev	Rank[1] (Alternatives)
BRT HOV Lane-Running	Noise	1,558	--	--	--	1
	Vibration	2,793	--	--	--	
BRT Street-Running	Noise	2,405	--	--	--	2
	Vibration	3,574	--	--	--	
East Bank	Noise	--	8,509	27,384	1,542	2
	Vibration	--	5,625	8,509	293	
West Bank 1	Noise	--	8,410	26,971	1,519	1
	Vibration	--	5,629	8,410	290	
West Bank 2	Noise	--	8,857	28,141	1,585	4
	Vibration	--	5,898	8,857	305	
West Bank 3	Noise	--	8,772	27,882	1,570	3
	Vibration	--	5,848	8,772	302	
Rank of Impacts	Noise	2	3	4	1	
	Vibration					

1. The BRT alternatives are ranked separately from the rail alternatives.
Source: AECOM, October 2011.

- The properties identified within the noise- and vibration-screening distances are not impacts, but rather areas of concern that should be evaluated in more detail during the next phase of the project once the preferred alternative has been selected.

- As shown in Table 4.16, a ranking or comparison of the four transit modes as well as the six alignment alternatives is rated from the lowest number of affected properties (1) to the highest (4).

Noise and Vibration Potential Impacts

Noise is generally defined as unwanted sound, to the degree to which noise can impact 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). Factors that influence individual response include the intensity, frequency and pattern of noise, the amount of background noise represent before the intruding noise, and the nature of work or human activity that is exposed to the noise source. Vibration impacts at high levels may cause physical personal injury or damage to buildings. However, ground-borne vibration levels rarely affect human health.

The land uses in the PEROW/WSAB Corridor differ greatly from the northern to the southern end. For example, in the Northern Connection Area, land uses are densely developed and contain manufacturing and industrial uses as well as developed urban commercial areas. A transit system and any noise/vibration associated with implementation of a transit system would not pose significant disturbance due to the non-sensitive land uses in the surrounding areas. In the PEROW/WSAB Area, where land uses adjacent to the corridor are of a more suburban environment i.e. residential, institutional, and/or open space, potential noise and vibration resulting from a new transit system could be an impact to people.

4.9 Parks and Recreation Resources

This section describes parklands and recreational facilities in the study area and along the potential ROW of each of the alternatives, and identifies the potential effects of the alternatives. An evaluation of the benefits and consequences of the alternatives on parkland and recreational facilities is presented.

4.9.1 Affected Environment

Potential impacts to parkland and recreational facilities include both constructive use and direct effects. Constructive use effects include noise and vibration; impediment or alteration of access; changes in visual setting; and the introduction of conflicts with facility patrons, pedestrians, and bicyclists. Direct effects include acquiring parkland or recreational areas as right of way for an alternative and complying with regulatory requirements, as presented below.

4.9.2 Applicable Laws and Regulations

The following regulatory provisions apply to projects having potential impacts on parkland and recreational facilities.

The Department of Transportation Act of 1966 stipulates in Section 4(f) that federal funds cannot be used for any “program or project (other than any project for a park road or parkway under Section 204

of Title 23) requiring the use of any publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site)." Exceptions may be made if "(1) there is no feasible and prudent alternative to using that land, and (2) the program or project includes all possible planning to minimize harm to the park, recreational area, wildlife and waterfowl refuge, or historic site resulting from the use. "

In addition, Section 6009(a) of the SAFETEA-LU amended Section 4(f) at Section 138 of Title 23 and Section 303 of Title 49 to address projects that have only de minimis (no adverse effect) impacts on lands protected by Section 4(f).

Section 6(f) of the Land and Water Conservation Act of 1965 prohibits the conversion of property acquired or developed with Act grants to a non-recreational purpose without the approval of the U.S. Department of the Interior's National Park Service.

Future environmental analysis would consider the potential effects of Section 4(f) involvement and associated mitigation measures in dealing with publicly owned parks within the study area. Potential Section 4(f) implication of parkland acquisition will be further investigated as part of future study efforts.

The California Public Park Preservation Act of 1971 (California Public Resources Code §5400 et seq.) requires a public agency that acquires public parkland for non-park uses to either provide compensation sufficient enough to acquire substantially equivalent replacement parkland or provide replacement parkland of comparable qualities.

4.9.3 Evaluation Methodology

The parkland and recreational facilities analysis was completed at a preliminary level as site-specific details have not been developed. Each alternative is evaluated in this section based on the number of parkland and recreational facilities within 0.5 miles of the alignment and the type and degree of impacts resulting from each alternative. Consideration is also given to beneficial impacts, including increased connectivity between parkland and recreational areas and the public.

4.9.4 Parklands and Recreation Assessment

Parkland and recreational facilities were identified along the alignments of each of the proposed alternatives as illustrated Figure 4.7, Figure 4.8, and listed in Table 4.17. A preliminary evaluation of the potential benefits and impacts on resources was developed. Resource impacts may occur during construction and operation of a transit project. Possible impacts fall into two categories:

- Constructive use effects include noise and vibration impacts, impediment or alteration of access, changes in the visual setting, and the introduction of conflicts with resource patrons; and
- Direct use effects include acquisition of parkland or recreational areas as ROW for an alternative, requiring compliance with applicable federal, state, and local regulatory laws.

On the federal level, Section 4(f) of the Department of Transportation Act of 1966 prohibits the direct use of parklands and recreational areas for federally funded transportation projects unless no other prudent alternative exists. At the state level, the California Public Park Preservation Act of 1971 requires a public agency that acquires public parkland for non-park uses to either provide compensation sufficient enough to acquire substantially equivalent replacement parkland, or provide replacement parkland of comparable qualities.

A preliminary parkland and recreational resource impact analysis was prepared. While most of the alternative alignments operate through highly-developed, urbanized areas with no parkland or recreational resources, there are a significant number of resources within the Corridor that are summarized below.

Parkland Setting Adjacent to the Alternatives

Parkland and recreational facilities adjacent to or near each of the alternative alignments are presented in Table 4.17 and illustrated in Figures 4.8 and 4.9. It should be noted that three Section 6(f) parks were identified immediately adjacent to the proposed build alternatives:

- Paramount Park in Paramount;
- Cerritos Regional County Park in Cerritos; and
- Flower Street Park in Santa Ana.

Table 4.17 – Parklands and Recreational Facilities

Alternative	Parkland/Recreational Facility	Location	City
Northern Connection Area			
WB3	6th and Gladys Park	6th & Gladys Street	Los Angeles
WB1, WB2, EB	Aliso Pico Recreation Center	370 South Clarence Street	Los Angeles
BRT	Aliso Triangle Park	1313-1321 Pleasant Avenue	Los Angeles
BRT	Boyle Heights Sports Center	901-999 South Mathews Street	Los Angeles
WB1, WB2, WB3, EB	Camp Little Bear Park and Lodge	6712 Orchard Avenue	Bell
WB1, WB2, WB3, EB	Circle Park	10129 Garfield Avenue	South Gate
WB3	City Hall Park	200 North Main Street	Los Angeles
BRT	Colombia Memorial Space Centre	12400 Columbia Way	Downey
WB1, WB2, WB3, EB	Corona Park/Freedom Park	3801 East 61st Street	Huntington Park
BRT	Crawford Park	7000 Dinwiddie Street	Downey
WB1, WB2, WB3, EB	Ernest Debs Park	3709 Gage Avenue	Bell
BRT	Golden Park	8840 Golden Street	Downey
BRT	Hollenbeck Park	415 South Louis Street	Los Angeles
WB1, WB2, WB3, EB	Hollydale Community Park	12221 Industrial Avenue	South Gate
WB1, WB2, WB3, EB	Hollydale Park	11501-11599 Rio Hondo Drive	South Gate
WB1, WB2, WB3, EB	Huntington Park and	3401 East Florence Avenue	Huntington

Alternative	Parkland/Recreational Facility	Location	City
	Community Center/ Salt Lake Park		Park
WB1, WB2, EB	LA Plaza Park	615 Echandia Street	Los Angeles
BRT	Lani Vest Pocket Park	1st Street & Chicago Street	Los Angeles
WB1, WB2, WB3, EB	Los Amigos Golf Course	7295 Quill Drive	Downey
EB	Lou Costello Jr. Youth Center/Hostetter Park	3101-3199 East Olympic Boulevard	Los Angeles
WB1, WB2, WB3, EB	Lugo Park Community Center	4234 Elizabeth Street	Cudahy
WB1, WB2, WB3, EB	Paramount Park	14382-14488 Paramount Boulevard	Paramount
WB1, WB2, EB, BRT	Pecan Park	1600-1698 East 1st Street	Los Angeles
BRT	Prospect Park	Enchandia & Judson Street	Los Angeles
WB1, WB2, WB3, EB, BRT	South Gate Park/Swim Stadium/3 Par Golf Course/Triangle Park	9615 Pinehurst Avenue	South Gate
BRT	Stanford Avenue Park	2714 Iowa Avenue	South Gate
BRT	State Street Recreation Center	700-798 North State Street	Los Angeles
PEROW/WSAB Area			
PEROW/WSAB	Acadia Park	5645-5699 Newman Street	Cypress
PEROW/WSAB	Arnold Cypress Park	8611 Watson Street	Cypress
PEROW/WSAB	Artesia Park	11925-11999 South Street	Artesia
PEROW/WSAB	Baroldi/Sycamore Park	6616 Cerritos Avenue	Cypress
PEROW/WSAB	Buena Park	4471 Lincoln Avenue	Cypress
PEROW/WSAB	Cerritos Regional County Park & Sports Complex	19800 Bloomfield Avenue	Cerritos
PEROW/WSAB	Community Center Park/Village Green Park	12732 Main Street	Garden Grove
PEROW/WSAB	Cypress Senior Center	9031 Grindlay Street	Cypress
PEROW/WSAB	Denni Street Park/ El Rancho Verde Park	7743-7787 Barbi Lane	La Palma
PEROW/WSAB	Caruthers Park/Cerritos Iron-Wood Nine Golf Course	10500-10546 Flora Vista Street	Bellflower
PEROW/WSAB	Gutosky Park	9201 Ferris Lane	Garden Grove
PEROW/WSAB	Hansen Park	1330 South Knott	Anaheim
PEROW/WSAB	Hare School Park	12012 Magnolia Street	Garden Grove
PEROW/WSAB	Jacob Park	19801-19899 Norwalk Boulevard	Cerritos
PEROW/WSAB	John Beat Park	6660 Mt Shasta Circle	Buena Park
PEROW/WSAB	Larwin Park	6150 Ball Road	Buena Park
PEROW/WSAB	Magnolia Park	11402 Magnolia Street	Garden Grove
PEROW/WSAB	Oak Knoll Park/Cypress Community Center	5700 Orange Avenue	Cypress
PEROW/WSAB	Palms Park	20492-20698 Norwalk Boulevard	Lakewood
PEROW/WSAB	Pat Nixon Park & Senior	12340-12398 South Street	Cerritos

Alternative	Parkland/Recreational Facility	Location	City
	Center		
PEROW/WSAB	Pinewood Park	9675 Juanita Street	Cypress
PEROW/WSAB	Progress Park	15500-15544 Downey Avenue	Paramount
PEROW/WSAB	Rosewood Park	17715 Eric Avenue	Cerritos
PEROW/WSAB	Simms Park	16607-16699 Clark Avenue	Bellflower
PEROW/WSAB	Stanton Golf Center Walkerhill	10660 Western Avenue	Stanton
PEROW/WSAB	Stanton Park	11111 Cedar Street	Stanton
PEROW/WSAB	Veterans Memorial Park	10970 Cedar Street	Stanton
PEROW/WSAB	Woodbury Park	13800 Rosita Place	Garden Grove
PEROW/WSAB	Zuniga Park	10902 Date Street	Stanton
Southern Connection Area			
Westminster/17th Street Harbor/1st Street	Angels Community Park	914 West Third Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Birch Park	210 North Birch Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Cesar Chavez Campensino/ Willowick Municipality Golf Course/Spurgeon Park	3311 West Fifth Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Riverview Park/Edna Park	2140 West Edna Drive	Santa Ana
Westminster/17th Street Harbor/1st Street	El Salvador Park & Community Center	1825 West Civic Center Drive	Santa Ana
Westminster/17th Street Harbor/1st Street	Flower Street Park	600-608 West 1st Street	Santa Ana
Westminster/17th Street Harbor/1st Street	French Park	901 North French Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Friendship Park	2210 West Myrtle Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Logan Recreational Center/Chepa's Park	1009 North Custer Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Neal Machander Tennis Center	West 1st Street & South Flower Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Saddleback View Park	631 Patricia Lane Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Santa Ana Stadium	602 North Flower	Santa Ana
Westminster/17th Street Harbor/1st Street	Santa Anita Park & Recreation Center	710 North Jackson Street	Santa Ana
Westminster/17th Street Harbor/1st Street	Sasscer Park	502 West Santa Ana Boulevard	Santa Ana

Source: AECOM 2011

[1]Parks and recreational facilities included in table are located within 0.25 mile of the alignment and 0.5 mile of the stations. WB1 = West Bank Alternative 1; WB2 = West Bank Alternative 2; WB3 = West Bank Alternative 3; EB = East Bank Alternative; BRT = Bus Rapid Transit Northern Alignment Alternative; Westminster Boulevard/17th Street/Main Street Alternative; Harbor Boulevard/1st Street/SARTC Alternative

Figure 4.8 – Los Angeles County Parks and Recreational Facilities

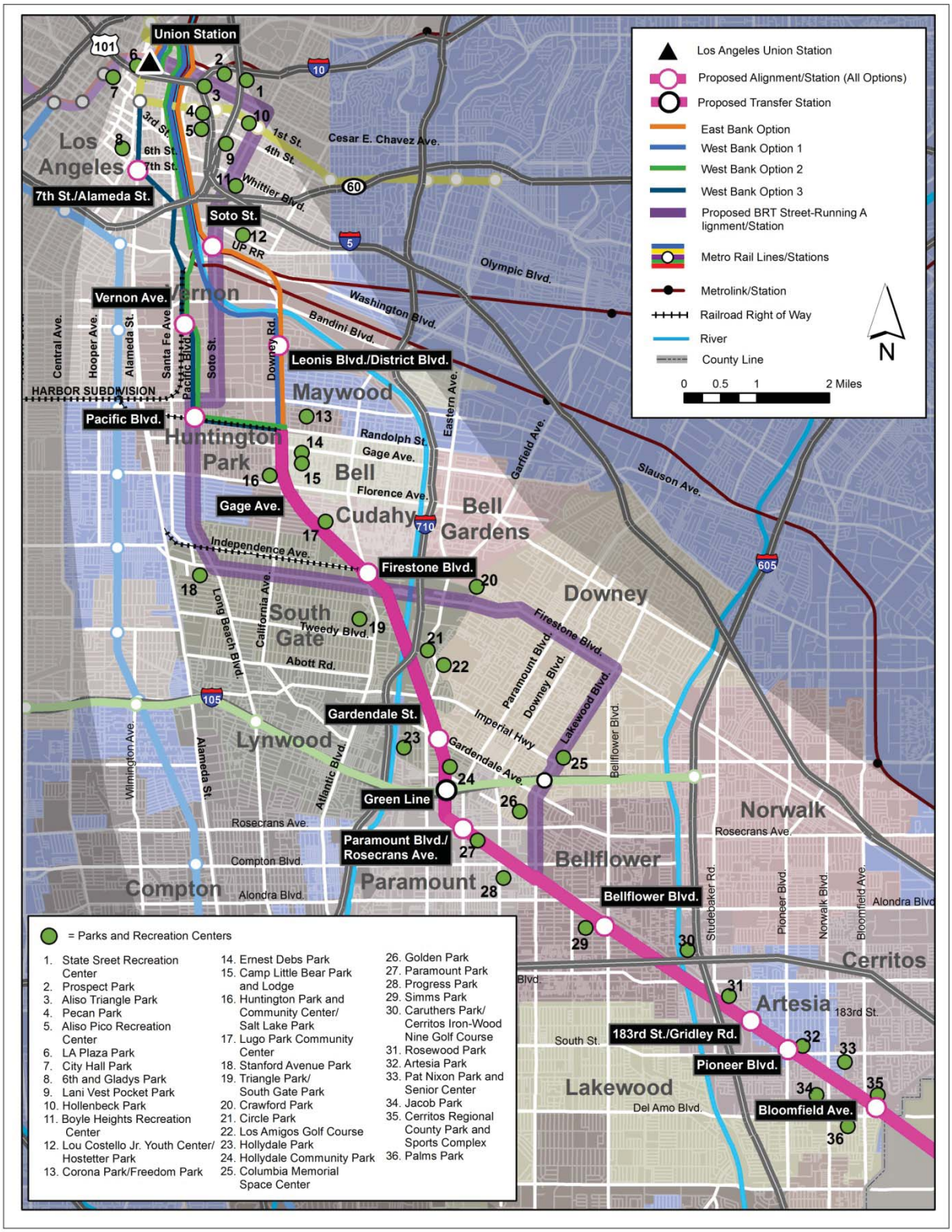
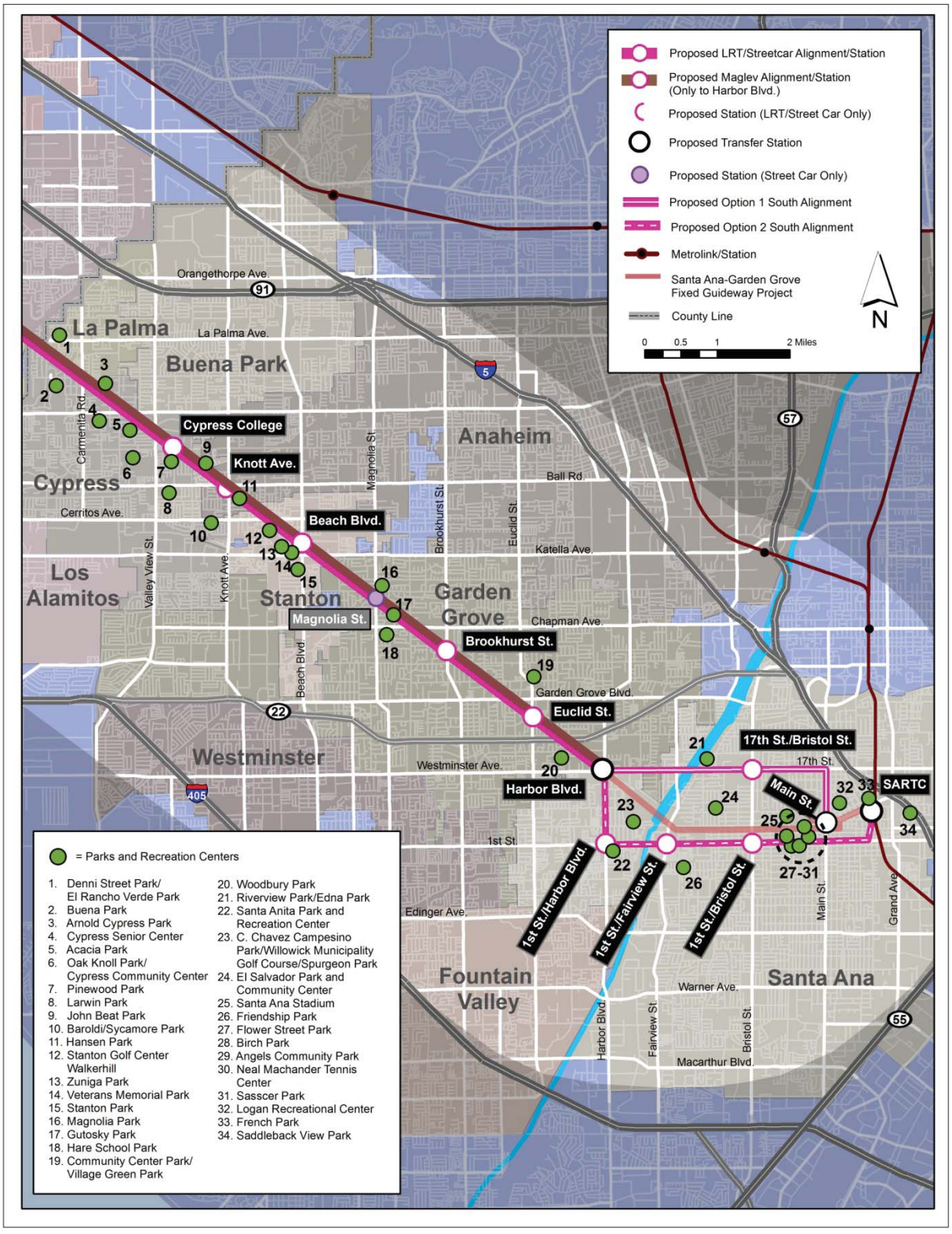


Figure 4.9 – Orange County Parks and Recreational Facilities



Summary

In general, the proposed alternatives have 70 parks and recreational facilities within 0.5 miles of the alignments and several of these are immediately adjacent to the alternatives as shown in Table 4.17 and Figure 4.7 and Figure 4.8. Currently, the PEROW/WSAB Corridor ROW is a vacant land use and not used for parklands or recreation; as such, direct use impacts would be minimal due to the vacant nature of the land. However, the parks and recreational facilities immediately adjacent to the PEROW/WSAB Corridor ROW may have constructive use impacts such as noise and vibration impacts, impediment or alteration of access, changes in the visual setting, and the introduction of conflicts with resource patterns. These impacts would be further identified and analyzed in subsequent environmental phases of the project.

4.10 Safety and Security

This section describes the 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 discussed is security impacts resulting from implementation of a transit system.

4.10.1 Affected Environment

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 likely cross the train ROW, enter the stations, or encounter other transit facilities. Related to safety issues are instances of encroachments onto the ROW. While there have been several encroachments approved by both Metro and OCTA for storage, commercial development, parking, and open space, there are also portions of the ROW where residential and commercial properties have been built on the ROW over the years.

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. The affected environment is the security on the rail system, both at the stations and in the transit vehicles. Topics discussed include crime prevention, law enforcement, and protection against terrorism.

4.10.2 Applicable Laws and Regulations

NEPA does not include specific guidance or direction with respect to the evaluation of alternatives and their relative effects on public safety and security.

SAFETEA-LU was passed to address issues such as safety, security, reducing traffic congestion, improving efficiency in freight movements, increasing intermodal connectivity, and protecting the environment.

The California Public Utilities Commission (CPUC) has adopted General Order 143-B (GO143B), the Safety Rules and Regulations Governing Light-Rail Transit in California. The order describes all the general requirements for light rail transit, including braking, lighting, operating speeds, ROW standards, and the requirements for maintenance of LRVs.

Appendix G of the CEQA Guidelines provides guidance that can be used to address public safety by including language used to identify projects that would:

- Interfere with an emergency response plan or emergency evacuation plan;
- Affect delivery of community safety services, such as police, fire, or emergency services;
- Substantially increase hazards due to a design feature or incompatible uses; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Public services (i.e. police and fire protection) are generally regulated by local agencies. Therefore, design of these components and operation of the proposed project alternatives would be regulated primarily by the policies and agencies of Los Angeles and Orange counties and those communities the proposed alternatives traverse. Metro also implements policies, plans, and actions specifically directed towards maintaining safety and security in the operation of the transit system.

4.10.3 Evaluation Methodology

Pedestrian and motorist safety along the alternatives are evaluated on a qualitative level based on observations of existing and planned land uses. For the purposes of this study, locations with land uses conducive to high pedestrian and vehicular activity were considered to be at a higher risk for potential safety and security impacts. School aged children near the alignment were also considered at higher risk for safety impacts as well. Although there would be pedestrian and vehicular interaction with the proposed build alternatives throughout the alignment, it is anticipated that the pedestrian and vehicle interaction would increase substantially mostly at the proposed station locations; thus the analysis focuses mainly on the station areas.

4.10.4 Safety and Security Assessment

This section discusses locations where pedestrian and vehicular activity is anticipated to increase and interaction with the trains could occur. While the all portions of the proposed alternatives are susceptible to safety and security issues, the locations highlighted in this section are of particular interest due to high pedestrian activity and nearby activity centers.

Northern Connection Area

The Northern Connection Area land use is predominately industrial and manufacturing with pockets of commercial activities throughout. Much of the residential development is occurring in converted industrial spaces. In addition, the Northern Connection Area experiences a high influx of truck traffic. The proposed stations included in the Northern Connection Area include Union Station, 7th

Street/Alameda Street, Soto Street, Vernon Avenue, Pacific Boulevard, Gage Avenue and Firestone Boulevard. The stations with mixed land uses that would likely contribute to a higher influx of pedestrian, vehicle, and/or light rail interaction would be Union Station, Soto Street, Pacific Boulevard and Gage Avenue station areas.

- **Union Station** is considered the transportation hub of Los Angeles as the central meeting point for various transit agencies in the county and across the western region. The station is adjacent to various culturally significant destinations as well as civic centers.
- **The Soto Street station** area is located on the outskirt of downtown Los Angeles in the community of Boyle Heights, adjacent to heavily trafficked corridors and industrial uses. While the predominate land uses surrounding the station area are industrial and manufacturing, specific plans designate this area for redevelopment opportunities for transit oriented development.
- **The Pacific Boulevard station** area is located in a dynamic area of the City of Huntington Park, surrounded by eclectic mixed use corridor and vibrant pedestrian activity including commercial, entertainment, and retail.
- **The Gage Avenue station** area is located adjacent to the City of Huntington Park's major industrial centers in addition to being surrounded by long established communities and large open spaces/parks.

In addition to the station area land uses conducive to increased pedestrian circulation, there are also several schools located near the alignment that may have school age children using the train or crossing the track to get to school or home. Potential safety impacts may occur if proper safety design measures and educational programs are not implemented. Table 4.18 lists the schools and Figure 4.10 displays the school locations in Los Angeles County. The West Bank Alternative 1, West Bank Alternative 3, and East Bank Alternative have nine schools located within 0.25 miles of the alignment. West Bank Alternative 2 and BRT Alternative Northern Alignment have 16 schools located within 0.25 miles of the alignment.

The activity centers, land uses, and schools surrounding the alignment and station areas will attract pedestrian and vehicular activity to the area. The influx of pedestrian and vehicle traffic due to the new operation of the build alternatives could pose these areas to be at risk for safety and security impacts and should be further studied at the EIR/EIS level.

Table 4.18 – Los Angeles County Schools Near Proposed Alternatives

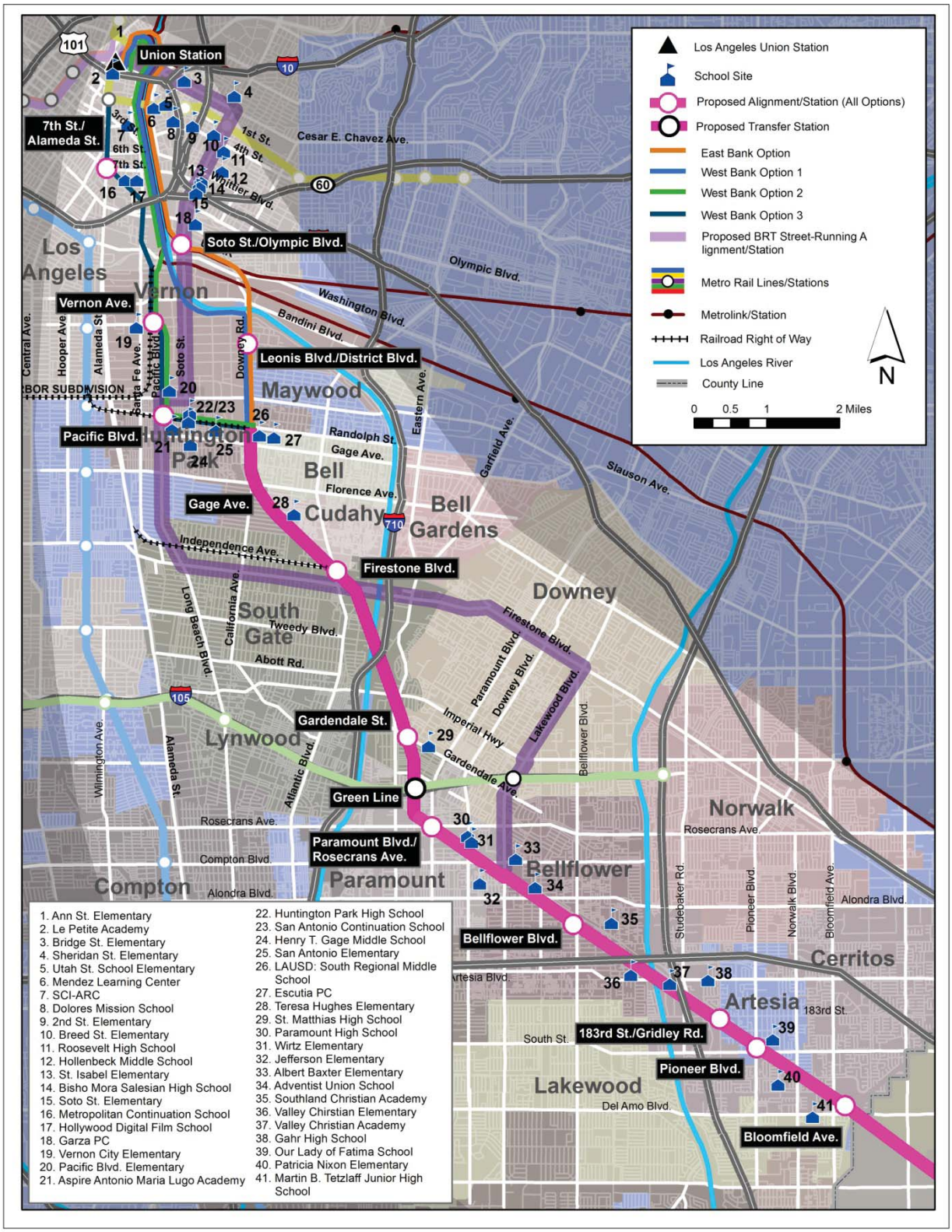
Alternative	School	Location	City	Approximate Distance to Alignment/ Station (feet)
PEROW/WSAB	Our Lady of Fatima School	18626 Clarkdale Avenue	Artesia	400
WB1, WB2, WB3, EB, BRT	Escutia PC	6401 Bear Avenue	Bell	1180
WB1, WB2, WB3, EB, BRT	LAUSD: South Region Middle School #2	6421 Loma Vista Place	Bell	935
PEROW/WSAB	Albert Baxter Elementary	14929 Cerritos Avenue	Bellflower	1190
PEROW/WSAB	Southland Christian Academy	16400 Woodruff Avenue	Bellflower	1000
PEROW/WSAB	Valley Christian Elementary	17408 Grand Avenue	Bellflower	900
PEROW/WSAB	Adventist Union School	15548 Santa Ana Avenue	Bellflower	340
PEROW/WSAB	Gahr High School	11111 Artesia Boulevard	Cerritos	660
PEROW/WSAB	Martin B Tetzlaff Junior High School	12351 East Del Amo Boulevard	Cerritos	650
PEROW/WSAB	Patricia Nixon Elementary School	19600 Jacob Avenue	Cerritos	835
PEROW/WSAB	Valley Christian Academy	18100 Dumont Avenue	Cerritos	Immediately Adjacent
WB1, WB2, WB3, EB, BRT	Teresa Hughes Elementary School	4242 Clara Street	Cudahy	670
WB1, WB2, WB3, EB, BRT	St Matthias Catholic Girls High School	7851 Gardendale Street	Downey	1100
WB2	Aspire Antonio Maria Lugo Academy	2665 Clarendon Avenue	Huntington Park	510
WB2	Henry T. Gage Middle School	2880 East Gage Avenue	Huntington Park	1225
WB2	Huntington Park High School	6020 Miles Avenue	Huntington Park	1225
WB2, WB3	Pacific Boulevard Elementary	2660 East 57th Street	Huntington Park	Immediately Adjacent
WB2	San Antonio Continuation	2861 Randolph Street	Huntington Park	Immediately Adjacent
WB2	San Antonio Elementary School	6222 State Street	Huntington Park	Immediately Adjacent
BRT	2nd Street Elementary School	1942 East Second Street	Los Angeles	350
WB1, WB2, EB, BRT	Ann Street Elementary School	126 Bloom Street	Los Angeles	925
BRT	Bishop Mora Salesian High School	960 South Soto Street	Los Angeles	Immediately Adjacent
BRT	Breed Street Elementary School	2226 East Third Street	Los Angeles	550
BRT	Bridge Street Elementary School	605 North Boyle Avenue	Los Angeles	400
BRT	Dolores Mission School	170 South Gless Street	Los Angeles	330
BRT	Garza PC	2750 East Hostetter Street	Los Angeles	Immediately Adjacent
BRT	Hollenbeck Middle School	2510 East Sixth Street	Los Angeles	Immediately Adjacent
WB1, WB2, WB3, EB	Hollywood Digital Film School	800 South Santa Fe Avenue	Los Angeles	670

Alternative	School	Location	City	Approximate Distance to Alignment/ Station (feet)
WB3	Le Petite Academy	750 North Alameda	Los Angeles	835
WB1,WB2,EB	Mendez Learning Center	1200 Plaza Del Sol	Los Angeles	600
WB3	Metropolitan Continuation High School	727 South Wilson Street	Los Angeles	Immediately Adjacent
BRT	Roosevelt High School	456 South Mathews Street	Los Angeles	430
BRT	Santa Isabel Elementary School	2424 Whittier Boulevard	Los Angeles	Immediately Adjacent
BRT	Sheridan Street Elementary School	416 North Cornwell Street	Los Angeles	430
BRT	Soto Street Elementary School	1020 South Soto Street	Los Angeles	Immediately Adjacent
WB1, WB2, EB	Southern California Institute of Architecture	960 East 3rd Street	Los Angeles	1100
WB1, WB2, EB	Utah St	255 Gabriel Garcia Marquez Street	Los Angeles	1245
WB2, WB3	Vernon City Elementary School	2360 East Vernon Avenue	Los Angeles	880
PEROW/WSAB	Jefferson Elementary School	8600 Jefferson Street	Paramount	1270
PEROW/WSAB	Paramount High School	14429 Downey Avenue	Paramount	Immediately Adjacent
PEROW/WSAB	Wirtz Elementary School	8535 Contreras Street	Paramount	675

Source: AECOM 2011

WB1 = West Bank Alternative 1; WB2 = West Bank Alternative 2; WB3 = West Bank Alternative 3; EB = East Bank Alternative; BRT = Bus Rapid Transit Northern Alignment Alternative; Westminster Boulevard/17th Street/Main Street Alternative; Harbor Boulevard/1st Street/SARTC Alternative

Figure 4.10 – Los Angeles County Schools near Proposed Alignment



PEROW/WSAB Area

The PEROW/WSAB Area is primarily residential development devoted to single-family homes and multi-family apartments and townhouses. In addition to residential development, the PEROW/WSAB Corridor is also occupied by mixed uses including public facilities such as civic centers, schools, hospitals, and educational facilities as well as parks and recreational centers, flood channels, utilities and other uses.

The proposed stations included in the PEROW/WSAB Corridor include Gardendale Street, Paramount Boulevard/Rosecrans Avenue, Lakewood Boulevard, Bellflower Boulevard, 183rd/Gridley, Pioneer Boulevard, Bloomfield Avenue, Cypress College, Knott Avenue, Beach Boulevard, Magnolia Street, Brookhurst Street, Euclid Street, and Harbor Boulevard. All the proposed stations in the PEROW/WSAB Corridor are mixed use and have a high residential presence as well.

However, the stations with mixed land uses and development policies that would likely attract a higher amount of pedestrian, vehicle, and/or light rail interaction would be at Bellflower Boulevard, 183rd Street/Gridley Road, Pioneer Boulevard, Cypress College, Brookhurst Street, and Euclid Street.

- **Bellflower Boulevard Station** area is located in the heart of the City of Bellflower's main street which consists of small scale pedestrian friendly corridor aligned with mixed commercial and gives an "old town" feel. The location is adjacent to the city's civic center and is surrounded by extremely walkable small street which lead to close knit residential neighborhoods.
- **183rdStreet/Gridley Road Station** area is located adjacent to some of the City of Cerritos' major commercial and employment centers, The Auto Square and the Los Cerritos Shopping Center. Both locations are regional powerhouses, attracting people from outside the city while providing considerable employment to the community. Institutional and open spaces are found throughout as well.
- **Pioneer Boulevard Station** area is located at the end of the City of Artesia's main commercial corridors with an integrated mixed use of retail plazas, cultural destinations, restaurants, and adjacent single family residential.
- **Cypress College Station** area is located adjacent to the City of Cypress' college, along one of the city's main commercial corridors, Lincoln Boulevard, lined by various mixed uses and development. Immediately around the station area, there is a mix of mixed use neighborhoods surrounding.
- **Brookhurst Street Station** area is located adjacent to one of the City of Garden Grove's main commercial/mixed use centers, including entertainment and shopping that is walkable from the surrounding neighborhoods.
- **Euclid Street Station** area is located in the "Heart of Garden Grove" amongst the city's main civic center, commercial and retail centers, mixed use corridors while maintaining a balance of a pedestrian friendly environment within a busy destination district. There is an eclectic mix of land uses within the station area including commercial/mixed use adjacent to the station, institutional, open space, and heaving single family residential to the east.

In addition to the station area land uses conducive to increased pedestrian circulation, the PEROW/WSAB Corridor has 28 schools located within 0.25 miles of the alignment. Table 4.19 lists the schools in close proximity to the alignment in Orange County. The locations of the schools are shown in Figure 4.10.

The activity centers, land uses, and schools surrounding the alignment and station areas will attract pedestrian and vehicular activity to the area. The influx of pedestrian and vehicle traffic due to the new operation of the build alternatives could pose these areas to be at risk for safety and security impacts and should be further studied at the EIR/EIS level.

Southern Connection Area

The Southern Connection Area land use is consistent with that of the PEROW/WSAB in regards to residential and mixed land uses that would likely attract a higher amount of pedestrian activity to the area. The proposed stations included in the Southern Connection Area include Harbor Boulevard, 1st Street/Harbor Boulevard, 1st Street/Fairview Street, 1st Street/Bristol Street, 17th Street/Bristol Street, Main Street, and SARTC. Of the Southern Connection Area alignments, the Southern Connection North Alternative has 15 schools located within 0.25 miles of the alignment and the Southern Connection South Alternative has 14 schools located within 0.25 miles of the alignment. Schools located near the alignment as part of the Southern Connection Area are also listed in Table 4.19 and the locations of the schools are shown in Figure 4.11.

Table 4.19 – Orange County Schools near Proposed Alternatives

Alternative	School	Location	City	Approximate Distance to Alignment/ Station (feet)
PEROW/WSAB	Hansen Elementary School	1330 South Knott Avenue	Anaheim	Immediately Adjacent
PEROW/WSAB	Clara J. King Elementary School	5851 Newman Street	Cypress	Immediately Adjacent
PEROW/WSAB	King Elementary School	8710 Moody Street	Cypress	Immediately Adjacent
PEROW/WSAB	Cypress College	9200 Valley View Street	Cypress	Immediately Adjacent
PEROW/WSAB	MacKay Daniel T Elementary School	8721 Cypress Street	Cypress	425
PEROW/WSAB	Cypress Montessori Academy	8622 La Salle Street	Cypress	500
PEROW/WSAB	Rancho Alamitos High School	11351 Dale Street	Garden Grove	Immediately Adjacent
PEROW/WSAB	Brookhurst Elementary School	9821 Catherine Avenue	Garden Grove	425
PEROW/WSAB	Street Columban Catholic School	10855 Stanford Avenue	Garden Grove	675
PEROW/WSAB	Skylark Elementary School	11250 MacMurray Street	Garden Grove	755
PEROW/WSAB	Garden Grove Country Day School	9221 Chapman Avenue	Garden Grove	965
PEROW/WSAB	Woodbury Elementary School	11362 Woodbury Road	Garden Grove	980
Westminster	Santiago High School	12342 Trask Avenue	Garden Grove	1160
PEROW/WSAB	Bryant Elementary School	8371 Orangewood Avenue	Garden Grove	1240
PEROW/WSAB	Peter's Elementary School	13162 Newhope Street	Garden Grove	1300
Westminster	Leroy L Doig Intermediate School	12752 Trask Avenue	Garden Grove	1300
PEROW/WSAB	John Fitzgerald Kennedy High School	8281 Walker Street	La Palma	1195
PEROW/WSAB	Steve Luther Elementary School	4631 La Palma Avenue	La Palma	1245
Westminster/17th Street Harbor/1st Street	OCHSA	1010 North Broadway Street	Santa Ana	Immediately Adjacent
Westminster/17th Street	Loyola Law School: D'Carpio Bital	1502 North Main Street	Santa Ana	Immediately Adjacent
Harbor/1st Street	Katharine Irvine Day School	1002 West 2nd Street	Santa Ana	Immediately Adjacent
Harbor/1st Street	Martin R. Heninger Elementary School	417 West Walnut Street	Santa Ana	Immediately Adjacent
Westminster/17th Street	Orange County Educational Arts Academy	825 North Broadway	Santa Ana	435
Harbor/1st Street	Santa Ana High School	520 West Walnut Street	Santa Ana	435
Westminster/17th Street	Santa Ana Community College	1530 West 17th Street	Santa Ana	520
Harbor/1st Street	Lydia Romero-Cruz Elementary School	1512 West Santa Ana	Santa Ana	675

Alternative	School	Location	City	Approximate Distance to Alignment/ Station (feet)
		Boulevard		
Westminster/17th Street Harbor/1st Street	Everest College	600 West Santa Ana Boulevard	Santa Ana	800
Westminster/17th Street	Mendez Intermediate School	2000 North Bristol Street	Santa Ana	800
Westminster/17th Street	El Sol Santa Ana Science and Arts Academy	1010 North Broadway Street	Santa Ana	820
Westminster/17th Street Harbor/1st Street	Nicholas Academy Center	412 West 4th Street	Santa Ana	840
Westminster/17th Street Harbor/1st Street	James A. Garfield Elementary School	850 Brown Street	Santa Ana	850
Harbor/1st Street	George Washington Carver Elementary School	1401 West Santa Ana Boulevard	Santa Ana	945
Westminster/17th Street	Broadway School	321 West Washington Avenue	Santa Ana	975
Westminster/17th Street Harbor/1st Street	St Joseph's School	608 East Civic Center Drive	Santa Ana	1100
Westminster/17th Street	Davis Elementary School	1405 North French Street	Santa Ana	1100
Harbor/1st Street	R. F. Hazard Elementary School	4218 West Hazard Avenue	Santa Ana	1125
Harbor/1st Street	Walker Elementary School	811 East Bishop Street	Santa Ana	1135
Harbor/1st Street	Roosevelt Elementary School	501 Halladay Street	Santa Ana	1175
Westminster/17th Street Harbor/1st Street	Nova Academy Early College High	2609 West 5th Street	Santa Ana	1270

Source: AECOM 2011

WB1 = West Bank Alternative 1; WB2 = West Bank Alternative 2; WB3 = West Bank Alternative 3; EB = East Bank Alternative; BRT = Bus Rapid Transit Northern Alignment Alternative; Westminster Boulevard/17th Street/Main Street Alternative; Harbor Boulevard/1st Street/SARTC Alternative

Figure 4.11 – Orange County Schools near Proposed Alignment

Safety and Security Potential Impacts

Existing conditions in the PEROW/WSAB Corridor are assessed above in order to establish a baseline by which potential impacts may be identified against. For purposes of safety and security, these were identified on a qualitative basis. Potential impacts could affect pedestrians and bicyclists, system passengers and employees, and response times for emergency services (police, fire, and ambulance).

In general, the pedestrian and bicycle circulation system varies across the study area, depending on density, mix of land uses and vehicular circulation patterns. The entire arterial street system network is considered open to pedestrian and bicycle traffic, either on sidewalks or road shoulders. However, in some areas pedestrian and bicycle flow is impeded due to missing, inadequate or unattractive sidewalks and crossings. Other potential areas of concern include the following:

- Traffic queuing
- Approach and corner sight distance
- Visual confusion/sign or signal clutter
- Posted prevailing traffic speed
- Heavy pedestrian volumes
- Presence of adequate lighting
- Emergency access route
- Gate drive around potential
- Delineation and roadway marking
- Pedestrian sight distance
- School access routes
- Special generators

Security impacts could be related to police and fire response, emergency evacuation, and addressing criminal and terrorist activity. Other impacts would be those associated with assault, robbery, petty theft and other similar crimes.

4.11 Environmental Justice and Equity

This section describes the potential effects of the project on environmental justice (EJ) populations. EJ populations are defined those that are minority and/or low-income as defined below. This section will identify the potential benefits of the project alternatives as well as any potential disproportionate negative effects.

4.11.1 Affected Environment

The USDOT Order on Environmental Justice (5610.2) provides clear definitions of the minority populations addressed by Executive Order 12898. These populations are:

- Black – A person having origins in any of the black racial groups of Africa;
- Hispanic – A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race;
- Asian American – A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent or the Pacific Islands;
- American Indian and Alaskan Native – A person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition; and

- Native Hawaiian or Other Pacific Islander – A person having origins in any of the original peoples of Hawaii, Guam, Samoa or other Pacific Islands.

Low-income populations are defined as any individual or household with income at or below the U.S. Census poverty thresholds, which are derived by the U.S. Census using the U.S. Department of Health and Human Services (HHS) poverty thresholds, as shown in Table 4.20.

Table 4.20 – 2008 U.S. Department of HHS Poverty Guidelines

Household Size	Income Threshold
One-Person	$10,400
Two-Person	$14,000
Three-Person	$17,600
Four-Person	$21,200
Five-Person	$24,800
Six-Person	$28,400
Seven-Person	$32,000
Eight-Person	$35,600
For each additional person, add	$3,600

Source: *Federal Register*, Vol. 73, No. 15, January 23, 2008, pp. 3971–3972

4.11.2 Applicable Laws and Regulations

Environmental Justice is defined by the USEPA Office of Environmental Justice as:

> *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 policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. (EPA, 1996)*

State law defines environmental justice in California Government Code Section 65040.12, as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations and policies." While there is no requirement under CEQA to address environmental justice, California law requires the Office of Planning and Research to coordinate with federal agencies regarding environmental justice based on Executive Order 12898.

In the Environmental Handbook Volume 4 (1997), Caltrans provides guidance to ensure that environmental justice is promoted and that programs and projects are implemented in a socially equitable fashion. As such, it directs that the environmental analysis should identify ethnic and racial minority and low-income population groups in the affected community. It states, that "the analysis should be integrated in a manner that is 'clear, concise, and comprehensible' within the general format suggested by 40 CFR 1502.10." It also states that a transportation agency should ensure that Title VI and

environmental justice concerns are included in any public participation program, including the development of appropriate project avoidance and mitigation options.

SCAG is required to conduct an environmental justice analysis for its RTP, and its environmental justice program includes two main elements: technical analysis and public outreach. Specifically, it is SCAG's role to ensure that when transportation decisions are made, low-income and minority communities have ample opportunity to participate in the decision-making process and that they receive an equitable distribution of benefits and not a disproportionate share of burdens. The environmental justice analysis in the recently released 2012 RTP incorporates performance measures to discuss the overall social and environmental equity in the region. They are:

- RTP Revenue Sources in Terms of Tax Burdens
- Share of Transportation System usage
- RTP/SCS Investments
- Impacts of proposed VMT fees
- Distribution of travel time savings and travel distance reductions
- Jobs-housing Imbalances or Jobs-housing Mismatch
- Accessibility to Employment and Services
- Accessibility to Parks
- Gentrification and displacement
- Environmental Impact Analysis
- Rail-related impacts

Metro seeks to ensure that all segments of the population, including environmental justice groups, enjoy more transit access and benefits. As such, Metro is committed to ensuring that no person is excluded from participation in, or denied the benefits of its service on the basis of race, color or national origin. Metro includes guidelines and planning policies regarding environmental justice issues in its current Long Range Transportation Plan (LRTP). Metro complies with federal environmental justice and Title VI requirements by including environmental justice populations in its community outreach activities and by analyzing the benefits and effects of the projects included in the LRTP on environmental justice populations. The PEROW/WSAB Corridor is included in the LRTP as part of the Recommended Financially Constrained Plan.

Community involvement that has occurred for this project is described in Section 6.0, Public Involvement and Agency Coordination.

4.11.3 Evaluation Methodology

Consideration of equity and environmental justice is required to ensure that both economic and environmental costs and benefits are distributed fairly across communities and population groups

located throughout the study area. Alternatives and their alignment segments that deliver more or as many benefits as they do impacts in Corridor communities are rated more highly than those that separate benefits from costs and serve some communities or populations better than they do others. Particular attention is given to the alternatives that better serve minority populations and low-income and transit-dependent households.

Concentrations of minority and low-income groups (i.e., environmental justice areas) within the study area were identified through analysis of US Census Bureau data (and SCAG data, if available) at both the county and the Traffic Analysis Zone (TAZ) level. The TAZ data were compared to the countywide data to determine whether any of the TAZs would qualify as having large concentrations of one or more special populations. A TAZ was categorized as having a large concentration of either minority or low income population if:

- At least 50 percent of the population in the TAZ is minority or low-income; or
- The population of minority or low-income residents of the TAZ is at least 10 percent greater than the average of the minority or low-income population in the county. Ten percent is used in this analysis since environmental justice guidance under NEPA states that, "the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis." Typically, 10 percent has been considered to be statistically meaningful in similar studies across the country.

For purposes of this study, Los Angeles County is the larger geographic community or "community of comparison" that functions as the basis for a comparative demographic analysis of the environmental justice community. The demographic characteristics of Los Angeles County are shown in Table 4.21.

Table 4.21: Los Angeles County – Demographic Characteristics

Demographic Characteristics	Value
Total Population	9,818,605
Total Households	3,217,889
Percent Population Low-Income	15.7%
Median Household Income	$55,476
Percent Minority	74%
Percent Limited English Proficiency, Age 5 or older	27%
Percent of Population over 65 years of Age	10.9%
Unemployment Rate	12.5%

Source: AECOM, 2010; US Census Bureau, 2010

4.11.4 Environmental Justice Assessment

Table 4.22 shows demographic data for the population and households in the study area. As shown in Table 4.22, approximately 81 percent of the Corridor's population in the study area belonged to a minority group in 2008. The minority group with the largest representation in the study area was Hispanic or Latino (60 percent). The second largest minority group was Asian (12 percent) and the third largest minority group was Black or African American (6 percent).

Table 4.22 – Environmental Justice Populations in the Corridor Study Area

Population	2008 Population	Percent of Population
Total Population	2,777,441	--
White	532,647	19%
Hispanic or Latino	1,670,969	60%
Black or African American	165,014	6%
American Indian	9,793	0%
Asian	344,405	12%
Other	54,613	2%
Total Minority	2,244,794	81%
Households	**2008**	**Percent of Households**
Total Households	717,510	--
Zero-Car Households	68,658	10%
Median HH Income	$41,514	--
HHs with income $25k or less	206,885	29%
HHs with income $25k to $50k	215,175	30%
HHs with Income $50k to $100k	214,109	30%
HHs Income > $100k	81,341	11%

Source: Metro Model, 2006.

Approximately 29 percent of the households in the study area had an income of $25,000 or less a year and 10 percent were without a car or transit-dependent. Figure 4.12 and Figure 4.13 shows the distribution of minorities, low income households, and zero-car households. In addition, while the LA County unemployment average is 12%, several of the cities in the Northern Connection Area have unemployment rates ranging as high as 20%, such as Lynwood at 18.6% and Paramount at 20 % in October 2011.

The number and percentage of low-income households is higher in the Northern Connection Area than in the PEROW/WSAB Area. In the areas with the highest number of low-income households, the percentage ranges from 180 to 200 percent higher than the county average. With the forecast loss of jobs in the Northern Connection Area, the high number and percentage of low-income households in the Los Angeles County portion of the study area is anticipated to continue and increase. Transit-

dependent households are defined as households without access to an automobile. Transit-dependence has a strong inverse correlation with household income. The subregions with the highest percentage of transit-dependent households are all located in the Northern Connection Area, and the subregions with the highest number of transit-dependent households are Central Los Angeles West and Downtown Los Angeles. In the Southern Connection Area the two alignments, Westminster Boulevard/17th Street/Main Street Alternative and Harbor Boulevard/1st Street/SARTC Alternative are different from each other as well. Generally, there are differences in the income along both routes, where the Westminster alignment has higher income households than along the Harbor route, and an in depth analysis for households along both alternatives may be completed in subsequent environmental phases.

As presented above, a general discussion of the environmental justice communities along the corridor provides an overview location, and in future environmental phases, detailed analysis will include impacts to minority owned businesses, impacts to parks and other open spaces adjacent to EJ communities and impacts to places of work.

Implementing improved transit service could create both beneficial and adverse impacts on all populations in the study area, including environmental justice populations. Possible adverse effects to all populations would be related to quality of life, which could include noise and vibration impacts, traffic, air quality, barrier effects, aesthetics, and safety, particularly near station areas. Construction impacts could also include impacts on minority businesses. Overall, at this stage in the project development, disproportionate adverse effects to environmental justice populations are not anticipated since all populations in the study area may be affected. All populations, including environmental justice populations, would benefit from improved mobility options and greater accessibility that would be provided by new transit service.
Information pertaining to potential visual and aesthetic effects is discussed in Section 4.3 Visual and Aesthetics, and a preliminary noise and vibration impact assessment is included in Section 4.8 Noise and Vibration. Safety and security is discussed in Section 4.10 Safety and Security. A summary of the performance of the alternatives in terms of environmental justice is provided below.

Safety and Security

The activity centers and land use surrounding the proposed station areas would attract pedestrian and vehicular activity to the area. In addition, with the addition of a station, more pedestrian and park-and-ride trips are likely to be drawn to the area as well. The influx of pedestrian and vehicle traffic combined with the new operation of the build alternatives could result in safety and security impacts related to transit operation and may be studied through a possible future environmental review document. These potential safety and security effects would affect all populations in the study area and would not likely result in disproportionate adverse effects to environmental justice populations.

Parks and Recreation

In general, the proposed alternatives have 70 parks and recreational facilities within 0.5 miles of the alignments and several of these are immediately adjacent to the alignment of the alternatives. Currently, the PEROW/WSAB Corridor ROW is an abandoned land use and is not used for parklands or recreation; as such, direct use impacts would be minimal due to the vacant nature of the land. However, the parks and recreational facilities immediately adjacent to the PEROW/WSAB Corridor may have constructive use impacts such as noise and vibration impacts, impediment or alteration of access, changes in the visual setting, and the introduction of conflicts with resource patrons. These potential effects would affect all populations in the study area and would not likely result in disproportionate adverse effects to environmental justice populations.

Figure 4.12 – Los Angeles County Environmental Justice Populations

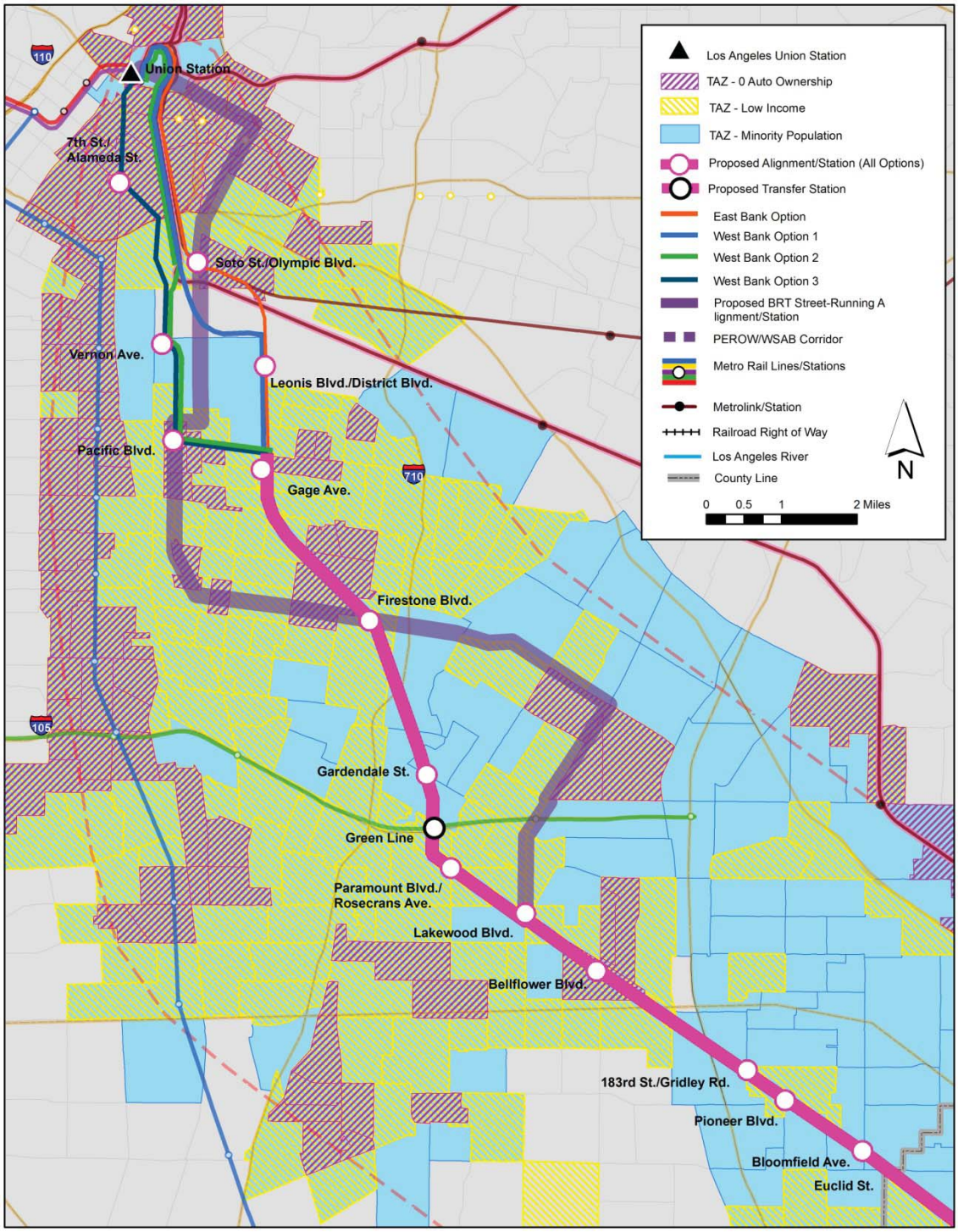
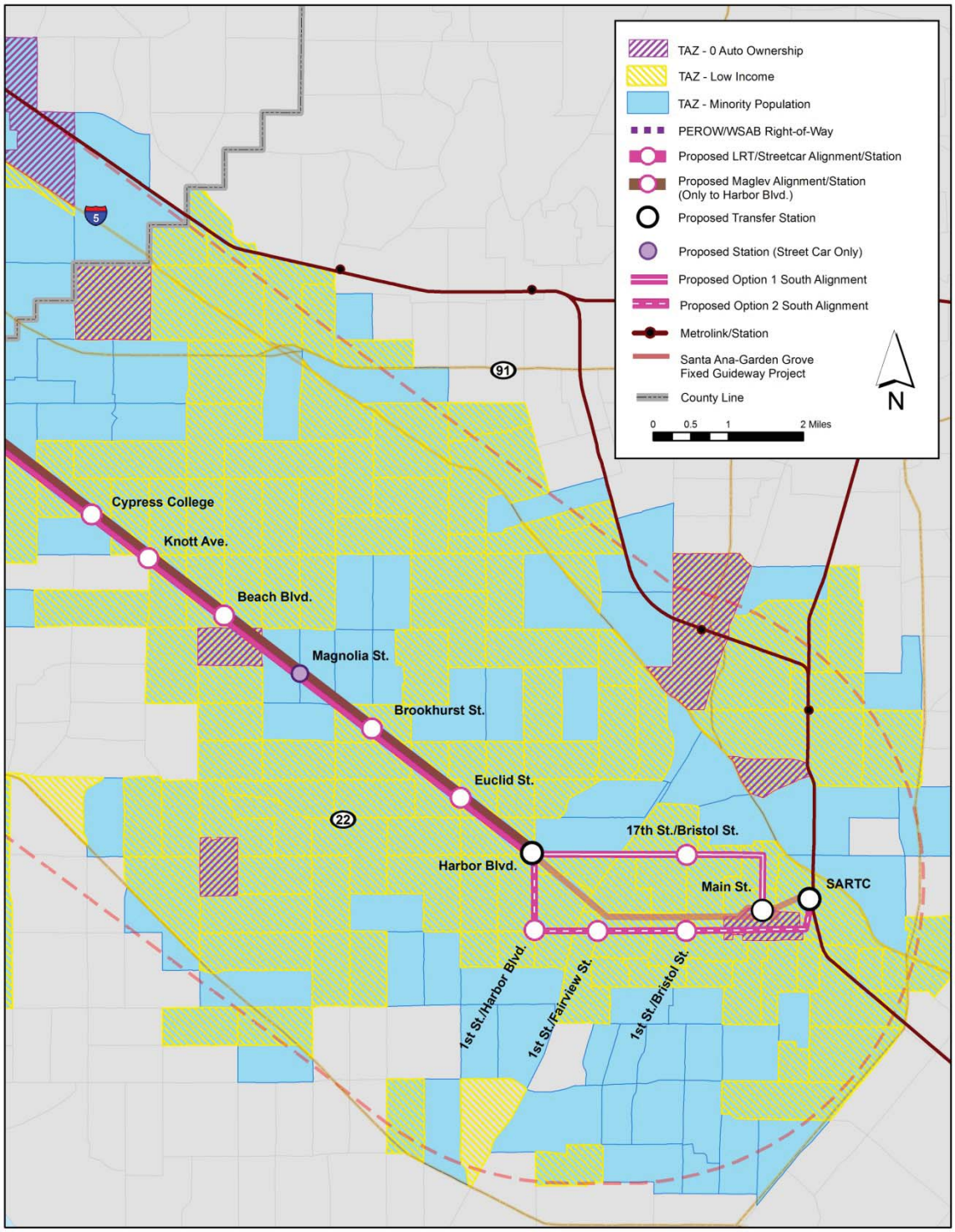


Figure 4.13 – Orange County Environmental Justice Populations



Noise and Vibration

The proposed alternatives have the potential for impact at several noise and vibration sensitive land uses. Under the BRT alternatives, the number of noise sensitive land uses identified within the screening distances ranges from 1,558 properties along the HOV Lane-Running alignment to 2,405 properties along the in Street-Running alignment. The number of vibration sensitive land uses identified within the screening distances ranges from 2,793 properties along the HOV Lane-Running alignment to 3,574 properties along the in Street-Running alignment.

Similarly for the Street Car service, the number of noise sensitive land uses identified within the screening distances ranges from 8,410 properties along the West Bank Alignment 1 to 8,857 properties along the West Bank Alignment 2. The number of vibration sensitive land uses identified within the screening distances ranges from 5,625 properties along the East Bank Alignment to 5,898 properties along the West Bank Alignment 2.

For the heavier LRT vehicles, the number of noise sensitive land uses identified within the screening distances ranges from 26,971 properties along the West Bank Alignment 1 to 28,141 properties along the West Bank Alignment 2. The number of vibration sensitive land uses identified within the screening distances ranges from 8,410 properties along the West Bank Alignment 1 to 8,857 properties along the West Bank Alignment 2.

For the Low Speed maglev vehicles, the number of noise sensitive land uses identified within the screening distances ranges from 1,519 properties along the West Bank Alignment 1 to 1,585 properties along the West Bank Alignment 2. The number of vibration sensitive land uses identified within the screening distances ranges from 290 properties along the West Bank Alignment 1 to 305 properties along the West Bank Alignment 2.

More detailed analysis during future study efforts will be required to determine if disproportionate adverse effects related to noise and vibration would occur to environmental justice populations.

Summary

As shown in the Figure 4.12 and 4.13 above, all proposed alternatives would serve environmental justice populations and provide mobility and connectivity benefits. However, as described in the Section 3.0, Transportation Analysis , the LRT West Bank Alternative would result in the most riders at 87,150 and greatest user benefit of 27,075 hours.

4.12 Summary of Environmental Impacts and Benefits

An initial environmental analysis of the Final Alternatives was prepared and an initial environmental review was updated to reflect possible impact areas that implementation of the proposed transportation alternatives.

At this preliminary level of analysis, with alignment engineering and station design information at a five percent level of completeness, there are minor differences in the level of environmental impacts between the Final Alternatives as summarized below in Table 4.23. And while there does not appear to be any insurmountable environmental challenges, there are remaining areas of concern requiring further analysis during any subsequent Draft EIS/EIR effort:

Table 4.23 – Summary of Environmental Impacts

Alternative	Environmental and Community Impacts
No Build	This baseline option represents the completion of Corridor transportation improvements which have committed local, regional, state, and federal funding as identified in constrained plans of the adopted Metro and OCTA LRTPs. The No Build Alternative is used for comparison purposes to assess the relative benefits and impacts of constructing a new transit project in the study area versus implementing only currently planned projects.
TSM	The alternative: • Would support land use plans. • Would require minimal property acquisitions other than what would be needed for maintenance facilities. • Would have minimal impacts to visual and aesthetics. • Would result in minimal impacts to noise and vibration. • Could impact air quality and climate change because it produces some mobile source emissions from combustion of natural gas or other alternative fuel type. • Would have little minimal impact on culturally sensitive resources or parkland and recreational facilities. • Would have major traffic impacts due to the increase in the number of busses using the Corridor's highway system.
BRT	The alternative: • Would support land use plans. • Would require minimal acquisition of property for dedicated bus lane space, other than what would be needed for maintenance facilities. • Would have minor impacts to visual and aesthetics, particularly in the HOV-Running alignment. • Could have potentially minor impacts to noise and vibration from

	increased bus service, in addition to major traffic impacts due to the increase in the number of buses. • Could potentially impact air quality and climate change due to the increase in bus emissions from combustion of natural gas and other fuel. • Would have minimal impacts to cultural or parklands resources.
Street Car	The alternative: • Would support land use plans and provide economic development opportunities on a community-oriented rail system. • Would require minor property acquisitions for rail ROW, specifically required for rail turning radius' and maintenance facilities. • Could have impacts to noise and vibration. • Lower travel speeds and more frequent stops could increase congestion and other traffic impacts, primarily at intersections. • Would have visual and aesthetic impacts, particularly when at-grade adjacent to residential or commercial corridors, in addition to overhead catenary system, etc. • Would have minimal impact on culturally sensitive resources or parkland and recreational facilities. • Would not impact air quality because it is electrified and does not result in mobile source emissions however potential impacts to climate change, due to off-site electricity generation for transit power exist. This could, in turn, attribute to local climate change benefits.
LRT	The alternative: • Would support land use plans and be a catalyst for public/private economic revitalization and development opportunities. • Would require minor property acquisitions for rail ROW, specifically required for rail turning radius' and maintenance facilities. • Would have minimal impact on culturally sensitive resources or parkland and recreational facilities. • Would have visual and aesthetic impacts, particularly when at-grade adjacent to residential or commercial corridors, in addition to overhead catenary system, etc. • Would have noise and vibration impacts, particularly adjacent to residential neighborhoods, or sensitive land uses such as schools, hospitals, churches, etc. • Would not impact air quality because it is electrified and does not result in mobile source emissions. However, it could adversely impact climate change, because it requires off-site electricity generation for transit power. This could, in turn, attribute to local climate change benefits. • Would have traffic impacts, particularly in at-grade sections and

	intersections.
Low Speed Maglev	The alternative: • Although grade-separated, this alternative would support economic development opportunities and could encourage dynamic uses of the PEROW/WSAB Corridor at grade. • Would require significant property acquisitions for system turning radius, column structures, and maintenance facility. • May have some impacts to culturally significant resources, specifically in older, established neighborhoods. • Would have significant impacts to visual and aesthetic resources due to the scale of the alternative and being completely grade-separated. These impacts would be significant adjacent to single family residential communities in addition to blocking important views. Additional visual and noise impacts include those to parklands and recreational resources. • Would have noise and vibration impacts, particularly adjacent to residential neighborhoods, or sensitive land uses. • Would not impact air quality because it is electrified however; it could adversely impact climate change because it requires off-site electricity generation for transit power. The maglev technology proposed for the PEROW/WSAB Corridor project is low-speed; given that maglev is a new technology, energy consumption information is not widely known. • Would have some traffic impacts due to the structural column placement along the ROW to support the grade-separated system, particularly at intersections.